APEC Informatization Survey for Small and Medium Enterprises

APEC Small and Medium Enterprises
Working Group

2003

Asia-Pacific
Economic Cooperation
APEC Small and Medium Enterprises
Working Group

Korea Information Management Institute
for Small and Medium Enterprises

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2003 APEC Secretariat

APEC#204-SM-01.1 ISBN 981-05-1331-3

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FOREWORD

The member economies in the APEC region are well aware that small and medium enterprises (SMEs) have the potential to enhance their business competitiveness. Many member economies have taken different approaches and implemented different policies for their SMEs. However, in the era of the digital economy, a member economy can no longer survive on its own. As the world becomes globalized, competition will occur anywhere, anytime and by anyone using Information and Communication Technology (ICT). SMEs are most vulnerable to this changing competitive environment since they do not have enough finances, technical skills, and human resources to implement ICT. One of the characteristics of the digital economy is that the digital gap widens much faster in this economy than before. In particular, the digital gap between large and small companies needs to gain special attention because unless the gap closes, balanced economic development will not be achieved and the social security net will be undermined.

APEC recognized the importance of ICT for SMEs and started the promotion of the use of ICT. At the 2000 APEC SME Ministerial meeting, ministers discussed how to enable SMEs to access ICT easilyand to utilize e-Commerce, and stressed the needs to collaborate with APEC Electronic Commerce Steering Group (ECSG) and Telecommunication Working Group (TELWG). In 2002, ministers emphasized the development of policies for the informatization of micro-enterprises (MES).

While discussions made in APEC focused on technical issues such as coordination of standards, regulations, and securitymeasures for e-Commerce, there has been little discussion on the support policies, support organizations, education and training, and awareness levels regarding SME informatization in member economies. Taking this into account, the Korea Small and Medium Business Administration (SMBA) and Korea Information Management Institute for SMEs (KIMI) made a proposal to conduct a project to develop an e-APEC strategy for the better promotion of SME informatization. The project has three phases and this document contains the outcome of the first phase whose title is "APEC Informatization Survey for SMEs."

The objective of the *APEC Informatization Survey for* SMEs was to identify the levels of SME informatization by analyzing and evaluating ICT strategies, infrastructure readiness, systems building and utilization, ICT education and training, and etc. The survey was based on a research framework that consists of three components: the national ICT infrastructure, business environment and supporting organizations. For the survey, overall information related to SME informatization from 21 member economies was gathered by way of web-site searches and the e-mailing of the questionnaire. And for more specific information, the research team interviewed government officials in 12 economies regarding their government's support policies, support organizations, and others. The team also conducted 18 case studies in 10 economies on the informatization levels of these economies by evaluating infrastructure readiness, systems buildingand utilization, and etc. As a result, the team compiled and categorized all the information gathered into individual member economies'profiles, analyzed the characteristics of ICT policies of each member surveyed, compared the informatization levels among the economies, derived best practices and made suggestions for the enhancement of SME informatization in the APEC region. The interviewees were found to believe that the benefits of SME informatization were great and welcomed this survey research for the

promotion of SME informatization at the APEC level.

Finally, I would like to express my deepest appreciation to all the people involved in this survey research. First of all, without the proactive cooperation from the focal points in APEC SMEWG, this survey would not have been possible. In particular, I want to give my warm-hearted thanks to the following seven economies: Canada, Hong Kong, Japan, Korea, Philippines, Russia and Chinese Taipei. They were very cooperative in our compilation of the member economies'profiles by answering our questionnaire. Special thanks also go to the Korean research team. Many thanks to KIEP (Korea Institute for International Economy Policy), first of all, for their role as the leading researcher as commissioned by KIMI. From KIEP, there were Drs: Seong-Bong Lee, Chang-In Yoon, Sangkyom Kim, Jun-Gu Kang, and others. From CenterWorld, a participant from the private sector, Dr. Jin-Young Sirh. From Universities, there were Professors: Sundong Kwon, Yong-Yeop Sohn and Hee-DongYang. From KIMI, there were Drs: Joo-Yong Kim, Juhwan Oh and Hunwha Yang. And, last but not least, a special appreciation to Ms Bong-Yeon Hwang, deputy director of SMBA for enabling this project.

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EXECUTIVE SUMMARY

The informatization of SMEs (e-business and ICT adoption by SMEs) can not only strengthen their corporate competitiveness, but also contribute to the stable growth of each APEC economy. In this regard, Korea started the "APEC SME Informatization Project (Enabling e-MES Environment through survey and e-community based capacity building)"in 2003 to develop an e-APEC strategy for SMEs, which can help expandthe opportunities for APEC SMEs to enhance the ICT use and adoption. As the first phase of this project, this study aims at contributing to the promotion of informatization of SMEs in APEC by sharing Best Practices based on member economies' experiences such as policies, supporting structures, and needs of and barriers to SME informatization.

The study has two core research agendas. The first one, "***SME Informatization Policies and Approaches in APEC Member Economies***," looks into the policies each governmentuses to promote and improve SME informatization and the intermediaries that support SME informatization. The other one, "***SME Informatization Survey***," which includes the case studies (18 cases) in 10 member economies and a questionnaire survey of Korea's SMEs, reviews the current status, characteristics and major issues of SME informatization from the SMEs' point of view. For both research agendas, the research team categorized the APEC member economies into two tiers in the National Informatization Index (NII) and compared these two main groups.

SME *Informatization Policies and Approaches in APEC Member Economies*

Regarding the policies and approaches for promoting SME informatization in APEC member economies, we found that only a few member economies have launched a set of integrated policies for SME informatization, pursuing generic SME support and SME informatization at the same time. In contrast, the economies in the low tier in the NII have not taken any systematic approach towardsSME informatization.

In the case of the economies in the high tier in the NII, some member economies do have specific policy frameworks for SME informatization (SME-focused ICT policy) but others do not (generic ICT policy). The former member economies have taken many approaches to promote SME informatization (providing useful information, resources, financial support, and training and consulting), while the latter member economies have only taken some basic approaches to SME informatization (providing information and expanding the ICT infrastructure).

This study reviews the intermediaries playing an important role in promoting SME informatization. This study also confirms the importance of intermediaries and that governments lack the ability to identify the needs of SMEs and provide tailored solutions to them. The intermediaries can be categorized into public and private intermediaries, and have different roles and approaches in their responsibilities (mainly endowed by the government). Diverse cases on the efforts of intermediaries to meet SME needs for informatization are presented.

SME *Informatization Survey*

The survey and case studies analyze the levels of SME informatization in terms of ICT adoption, ICT awareness and readiness, ICT benefits and factors affecting ICT adoption.

Regarding ICT adoption in APEC SMEs, there are substantialdifferences between low tier and high tier SMEs in their levels of hardware, software and Internet usages. Moreover, limited access to the Internet and the high cost of computer equipment are the most serious problems low tier SMEs face.

In terms of ICT awareness, the case studies show a significant difference in the levels of ICT infrastructure and financial resources between the low tierand high tier SMEs. The low tier SMEs do not have adequate levels of equipment such as hardware, software and networks for they view these products to be too expensive to buy. Although many CEOs and employees of the SMEs in the case studies showed a high level of awareness of the importance of ICT development, many SMEs lack ICT organization and systems management, ICT education and training, and ICT maintenance capability.

As for the benefits ICT offers, many SMEs in this study have increased their business efficiency by using ICT. However, there does exist disparity in efficiency between the low and high tier SMEs in the NII. Only high tier SMEs have increased their business performance for both internal and external operations using ERP, CRM and SCM.

In the case studies, we identified the factors affecting ICT adoption by SMEs such as the national ICT infrastructure, the business environment and supporting organizations. The low tier SMEs have more problemswith accessing the Internet due to the slow speed and high cost. Moreover, they have less pressure to adopt ICT from business partners such as buyers, vendors or competitors. In some cases, however, intermediaries do function as a bridge between SMEs and the government for SME informatization.

The survey on the Korean SMEs shows that they do not have sufficient ICT experts/staff, and that they only manage the internal processes with the basic software rather than conduct B2B transactions over the networks. The three major reasons for this outcome are the lack of financial resources, human resources and ICT capabilities.

Suggestions

All interviewees SME businesspeople, governmentofficials and SME informatization intermediaries in member economies believe that the potential benefits of SME informatization are great and welcome the involvement of APEC economies in lowering the barriers to SME informatization effortsnot only at the individual governmental level, but also at the APEC level. Based on the research results, we offer suggestions to facilitate SME informatization for individual APEC SMEs, intermediaries, member governments, APEC as a whole, and the future research.

(1) Suggestions for APEC SMEs

- ***Recognize the need for informatization and raise theICT awareness and knowledge of CEOs of SMEs***. APEC SMEs should thoroughly examine the potential benefits of utilizing ICT, developing new products and services, and creating new markets through new approaches to customers. Raisingthe ICT awareness and knowledge of SME CEOs is critical,considering the absolute influence of CEO leadership in small companies.
- ***Use ICT for integrating SMEs and business partners into the value chain.*** Integrating processesand data through community-based networks with partners in the value chain is desirable because by doing so they can share costs as well as the benefits of the integrated system.

(2) Suggestions for Intermediaries

· ***Intermediaries in charge of promoting SME informatization should assess the needs of SMEs and develop programs from the SME point of view***. Both public and private intermediaries should be reviewing whether they are meeting the SME needs through their programs. In order to keep up with the changing ICT environment and SMEs' needs for informatization, intermediaries should have more knowledge and flexibility in their approaches to promote SME informatization.

(3) Suggestions for Governments

· ***Governments should give priority to enhancing the national ICT infrastructure***. Governments should try to lower Internet access fees and increase Internet access speed. Without low-cost efficient ICT infrastructure in place, SMEs will not be able to see the benefits of informatization. Governments should also support the growth of the ICT industry so that SMEs can use locally produced software and access contents at reasonable prices.

· ***Develop diverse, business-driven supporting programs and team up with support intermediaries***. The government shoulddevelop diverse programs responding to the changing informatization needs of SMEs. To address the imbalances between government policy and SMEs' demands, governments should keep in close contact with SMEs. As governments will depend on many intermediaries, they should ensure that effective cooperation takes place between diverse intermediaries to create the desired synergy effects.

· ***Consider the gender issue in the development and implementation of supporting programs for SME informatization***. While limited, this report presents the case studies on how to improve the role of women in SME informatization. These cases demonstrate that governments need to pay more attention to the gender issue in developing SME informatization policies.

(4) Suggestions at the APEC Level

· ***Improve the ICT infrastructure across the APEC region***. Collective measures at the APEC level should be taken to ease the burden of purchasing computers for SMEs in the low tier economies in the NII. For example, tariff rates on PCs in APEC member economies could be lowered collectively, or outdated computers in high tier members could be resold to low tier members at low costs.

· ***Prepare collective measures at the APEC level to enhance the effectiveness of the SME supporting intermediaries***. The "APEC SME Informatization Forum" in 2004, to be held in Korea following this study, can provide the momentum for this. In addition, the "APEC Training Program for SME Informatization" in 2004 could become the cornerstone for enhancing the ability of key staffs in these intermediaries to respond quickly to SME demand for informatization.

(5) Suggestions for Future Research

- ***The relationship between the ICT infrastructure and SME informatization***. The correlation between the digital divide among the companies and the indexes of digital divide among member economies should be analyzed in detail. In addition, the digital divide between SMEs and large enterprises in member economies also needs to be studied.
- ***The relationship between SME informatization and the business environment***. Discussion at the APEC level is needed to assert the benefits of ICT. The discussion should not only cover the promotion of SME informatization, but also the required business conditions for SMEs to gain the benefits of informatization.
- ***In-depth study on SME informatization***. An in-depth study on the current status of SME informatization by industry should be undertaken, taking into account the different characteristics of each industry. Future studies should consider the regional differences when analyzing the informatization levels of member economies.

I. Introduction

1. Background
2. Objectives
3. Research Framework
4. Research Methods

1. Background

In APEC member economies, small and medium enterprises (SMEs), especially micro enterprises,[1] play a vital role in enhancing the stability and competitiveness of an economy.

According to a report published by the APEC SME Working Group,[2] SMEs make up over 98 percent of all enterprises, accounting for around 60 percent of the private sector employment in the APEC economy. Moreover, they generate about 30 percent of direct exports and 50 percent of sales and added value. APEC and its member economies are well aware of the potential of SMEs and thus make great efforts to support SMEs and increase their competitiveness.

In general, SMEs face a number of different kinds of barriers, including the lack of information, limited financial and technical resources, and absence of the well-trained work force. Information and Communication Technology (ICT) can be an effective tool for SMEs to overcome such limits. SMEs have also gradually recognized the positive impact of ICT on their business. Both at the firm and inter-firm levels, ICTs can offer benefits for a wide range of SME business processes.[3] A number of business solutions can improve management within a firm, leading to more efficient business processes and performance. At the inter-firm level, use of the Internet and e-commerce can help to reduce transaction costs and increase transaction speed and reliability while deriving maximum value from the SME value chains. In this regard, the informatization of SMEs (for example, e-business and ICT use)[4] will not only strengthen corporate competitiveness, but also contribute to the stable growth of each APEC economy.

At the APEC level, some discussions have been made regarding how to promote APEC SMEs to use ICT. At the APEC SME Seventh Ministerial Meeting in Bandar Seri Begawan on June 22-23, 2000, ministers discussed how to enable APEC SMEs to access ICT easily and to utilize electronic commerce. This issue was one of the four main agendas of the meeting where there was a broad consensus that governments could and should assist SMEs in overcoming the problem of high initial costs of investment in ICT by creating a favorable environment for e-commerce. Moreover, ministers stressed the needs for collaboration with relevant APEC fora including the APEC Electronic Commerce Steering Group and the Telecommunication Working Group.[5] At the 2001 SME Ministerial Meeting in Shanghai, ministers shared their ideas on the governments' efforts to facilitate the development of science and technology, particularly information and communication technologies, to enhance SME growth and development. At the 2002 SME Ministerial Meeting in Acapulco, the ministers emphasized that member economies needed to continuously develop the policies that are closely relevant to the informatization of micro-enterprises, financing and human resources development in order to achieve the balanced economic development and enhance the social security net.

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1) This study, SMEs are taken as companies with fewer than 50 employees, thus this term can be used as a substitute for used by MES. However, each APEC economy has different definitions on SME and micro enterprises. This study considers every category of SMEs found in APEC economy regardless of the different definitions used by each economy

2) Hall, C. 2002. "Profiles of SMEs and SME Issues in APEC 1990-2000", APEC SME Working Group, pp. 1.

3) OECD. 2002. "Promoting ICT Use and E-Business Adoption by SMEs", DSTI/IND/PME 7/REV3, pp. 8.

4) SME informatization can be defined as an SME's adoption and use of ICT for business processes and practices. This definition encompasses computerization, e-commerce, and e-business. A detailed explanation of this will follow in the subsequent sections.

5) Telecommunications Working Group (TEL) initiated a survey and study on electronic commerce adoption, uptake and use by SMEs in all 21 APEC member economies. The final report "SME Electronic Commerce Study", was released in September 24, 1999. The TEL Working Group also initiated another study on technical issues of electronic commerce, "APEC e-Business: What Do Users Need?" which was carried out by CSIRO (2001).

Despite these combined efforts and the ICT projects[6] underway in some APEC economies, there has not been much progress in improving SMEs' utilization of ICT. The discussions on promoting ICT use by APEC SMEs have been concerned with technical issues such as the coordination of standards and regulatory and security measures for e-commerce. There has been relatively little comparative discussion on the current status and influential entities for SME informatization in each member economy. Against this backdrop, Korea proposed the "APEC SME Informatization Project (Enabling e-MES Environment - Through Survey and E-Community-Based Capacity Building)" in 2003 to help develop an e-APEC strategy for SMEs, which can contribute to the diffusion of ICT among SMEs in the APEC region. This study is the first phase of our APEC SME Informatization Project, which will proceed through three sub-projects.[7]

2. Objectives

This study aims at contributing to promoting the informatization of APEC SMEs by sharing good practices and policies among member economies. Supporting mechanisms and implementation issues regarding SME informatization will also be discussed. SME informatization issues may vary among APEC member economies due to the different levels of economic development and various business environments. On top of looking into such issues, this study will suggest various alternatives for APEC member economies to enhance their SME informatization and provide the direction for related entities including SMEs, governments and supporting organizations.

The more specific issues of this study can be listed as follows:

- To analyze issues and entities responsible for the success of SME informatization
- To identify good supporting policies on SME informatization in APEC member economies by examining not only the government agencies in charge of SME informatization, but also other important public and private institutions involved
- To assess the levels of SME informatization and identify the impediments to informatization by conducting empirical case studies and surveys.

The study results will provide the ground for the policy forum for SME informatization and the subsequent training program of the APEC SME Informatization Project.

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6) The previous projects launched by the APEC SME Working Group included the following: An e-commerce symposium on SMEs (2001), an electronic commerce impact study for SMEs (2000), Wa workshop on electronic commerce (2000), an APEC SME network (1999), and an APEC human resource management symposium (1999).

7) The APEC SME Informatization Project has three sub-projects: (1) conducting a survey on SME informatization (July-December 2003); (2) holding a policy forum (a two-day forum planned in 2004); and (3) organizing a training program for relevant government officials, dedicated managers and leaders from business associations and NGOs (two-week program planned in 2004).

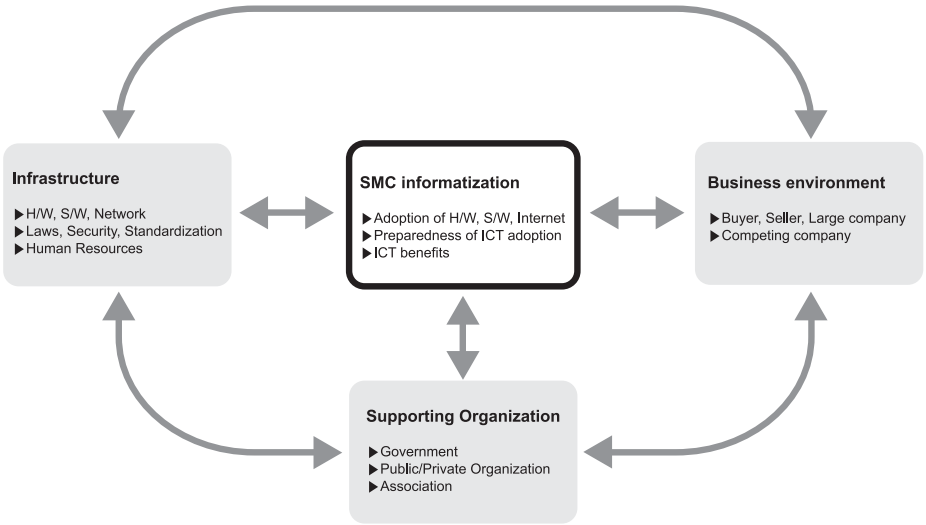
8) For designing this framework, the following articles were used: Lyytinen, K. and J. King (2002); Benbasat, C.I. and A.S. Dexter (1998); Cragg P.B. and M. King (1993); Grover, V. and M.D. Goslar (1993); Iacovou, C.L., Benbasat, I. and A.S. Dexter (1995); Kaplan, R.S. and D.P. Norton (1996); Loh, L. and N. Venkatraman (1992); Lyytinen, K. and J. King (2002).

3. Research Framework

A research framework was developed regarding external entities that are important for SME informatization (Figure 1-1).[8] Three external entities are recognized in the model: infrastructure, the business environment, and ICT supporting organizations.

Each entity is explained in detail below.

<Figure 1-1> Research Framework



ICT Infrastructure

While it is quite difficult to provide a single definition of the national ICT infrastructure, it is widely accepted that the national ICT infrastructure includes the computer and network infrastructure, trust infrastructure and ICT industry/market. In terms of SME informatization, the level of *the computer and network infrastructure* indicates whether SMEs can use computers and access the Internet at affordable prices. Affordable PC prices and broadband connectivity are key components for ICT adoption and use by SMEs. Many SMEs in member economies cannot implement advanced computer systems or services due to inferior Internet infrastructure and poor logistics. *Trust infrastructure*, such as security, privacy, and consumer protection, is another important component for SME informatization for it provides a stable, secure and transparent environment for SMEs to use ICT.

The ICT industry/market affects the availability and development of software, hardware, and networks in the ICT market. The liquidity, quality, and size of the ICT market are strongly related to the levels of SME informatization. Governments support the development of the ICT market in many different ways (such as offering subsidies and conducting projects) because well-developed ICT industries/markets, along with the development of a national ICT infrastructure, are prerequisites for the effective use and adoption of ICT by firms, especially SMEs.

Business Environment

The business environment that influences SME informatization can be understood through the SME value chain. The SME value chain is composed of vendors, buyers, large firms and mother companies that influence or force SMEs to implement informatization for business-oriented purposes. For example, many SMEs inevitably use certain types of computer systems in order to maintain business relationships with strong business partners. In this regard, reviewing the relationships between vendors (suppliers), buyers (customers), large-sized companies and mother companies is needed for the accurate analysis of the SME informatization issues. Industry characteristics such as market growth, competitiveness and entry barriers need to be studied as well.

Supporting Organizations

There are various supporting organizations that can directly and indirectly facilitate the use and adoption of ICT by SMEs in the APEC member economies. They are either governmental or non-governmental organizations. *Governmental supporting organizations* include the national steering committees, related ministries, and related administration offices within the government. Non-governmental supporting organizations (also called *intermediaries* in our study) act as a bridge between the government and SMEs in promoting SME informatization. They can be further categorized into public intermediaries (various government-funded organizations, partnerships between government and non-governmental organizations, and government-funded research and education institutions) and private intermediaries (industry and trade associations, private sector initiatives, private research and education institutions, and some private companies). In many cases, intermediaries are mandated by the government to facilitate SME informatization. They take many approaches and various measures toward promoting SME informatization.

Informatization of SMEs

The levels of SME informatization can be identified by assessing the types of hardware, software and networks implemented and used. The benefits and the user's attitude towards the use of ICT are also factors affecting ICT decisions. For this study, we examined not only the current status of ICT, but also the various factors that facilitate or inhibit informatization which should be reflected in future ICT policies of governments in APEC.

In order to understand the influence of entities in the research framework on SME informatization, we raised the following research questions:

- What roles do the government organizations play in promoting SME informatization? What policies and approaches have been adopted by APEC member economies?
- What kinds of intermediaries are supporting SME informatization?
- What is the impact of the business environment (such as vendors, buyers and large companies) on the informatization of SMEs?
- What is the relationship between the supporting organizations and other influential entities in improving ICT for SMEs?
- What are the factors inhibiting SME informatization, and what are the roles of government and other supporting organizations to overcome such barriers?

4. Research Methods

The Korean research team had two different research agendas. The first one, "SME Informatization Policies and Approaches in APEC Member Economies", looks into the policies and approaches each government uses to promote and improve SME informatization and reviews the intermediaries supporting SME informatization.

The other agenda, "APEC SME Informatization: Case Studies and Survey", reviews the current status, characteristics and major issues of SME informatization from the perspective of ICT consumers (SMEs). The research methodology for each agenda is explained in detail below.

4.1. SME Informatization Policies and Approaches

The following three research methods were used: (1) a literature review, including the Web search; (2) a survey using a well-designed questionnaire for a focus group of government officials; and (3) site visits and interviews with government officials in charge of SME informatization.

This well-structured questionnaire was distributed to all focal points of the APEC SME Working Group by e-mail and fax. The questionnaire dealt with the major policies of member governments, progress in policy implementation, types of related agencies, major supporting governmental organizations or intermediaries, and information about SME informatization related projects and personnel.[9] The questionnaire was distributed to all 21 member economies, but only seven member economies replied.[10]

The interviews were conducted in the selected 12 member economies due to time and budgetary constraints. According to the National Informatization Index (NII),[11] the research team categorized the APEC member economies into the following two tiers (See Table 1-1 below) and selected six member economies from each tier:

- U.S., Canada, Japan, Korea, Australia, and Chinese Taipei from the high tier in the NII; and
- Malaysia, China, Indonesia, Mexico, Russia and Thailand from the low tier in the NII.

<Table 1-1> The NII and Selection of Member Economies for Interviews

National Informatization Index	Stage	Member Economies
60 - 100	Growth or maturity stage: High tier in the NII	**U.S.**, Hong Kong, **Canada**, Singapore, **Japan, Korea**, New Zealand, **Australia, Chinese Taipei**
0 - 60	Introduction stage: Low tier in the NII	**Malaysia**, Chile, **China**, Peru, **Indonesia, Mexico**, Philippines, **Russia, Thailand**, Vietnam, Papua New Guinea, Brunei

Notes: The member economies listed in bold type were those visited for intervisws.

9) For details of the questionnaire, see Appendix A.
10) Those member economies are Canada, Hong Kong, Japan, Korea, Philippines, Russia and Chinese Taipei.
11) For the categorization according to the level of national informatization, see NCA (2003).

The interviewees were from government bodies and intermediaries, for example, expert groups or SME industry associations deeply involved with planning and implementing policies for SME informatization.

The findings from the interviews are well summarized in Appendix B in the following sequence: (1) Trends of Informatization; (2) Definition of Small and Medium Enterprises; (3) Strategy and Progress of SME Informatization; (4) Government Organizations for SME Informatization; (5) Major Policies and Projects for Enhancing SME Informatization; (6) Efforts for SME Informatization from the Private Sector; and (7) Overall Assessment of SME Informatization

4.2. APEC SME Informatization: Case Studies and Survey

Two empirical studies were conducted: (1) case studies in 10 member economies; and (2) a questionnaire survey of the Korean SMEs.[12] The comparison of cases among the member economies produced meaningful implications that help to take successful approaches to the informatization of APEC SMEs.[12]

Case Studies

The following 10 member economies were selected for the case study - Australia, China, Indonesia, Japan, Korea, Malaysia, Mexico, Chinese Taipei, Thailand, and the United States.[13] Two cases (companies) from each member economy (except for Australia and Korea) were selected and analyzed, equalling 18 cases in total.

In choosing the industries for the case studies, the research team initially planned to select one or two industries common in the member economies surveyed for the sake of easy comparison using two criteria: the industry's contribution to GDP; and the informatization levels. However, these criteria were difficult to apply.[14]

As an alternative, the team suggested three industries to focus on: (1) electrical and electronics equipments; (2) machinery and transport equipment; and (3) wholesale and retail sales. These industries were recommended because they commonly existed in all 10 economies. If a member economy could not find any appropriate case in these industries, the team suggested that the focal points find appropriate cases in other industries. As a result, the cases were chosen from a wide range of industries, making accurate comparison difficult. The SMEs that the team targeted for the survey were those located in large cities or urban areas.

The case study surveyed the following issues:[15]

- The business environment: buyers, vendors, large firms, alliances, and industry characteristics
- Attitude towards ICT: Attitudes of CEOs and ICT organization

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12) The Korean research team originally had planned to conduct surveys on four member economies: Korea, Canada, Japan and Chinese Taipei. However, due to difficulties in data collection, only Korea was chosen for the survey.
13) The case study was not carried out in Russia and Canada, in which the on-site interviews for the SME informatization policies were made.
14)Some member economies did not provide detailed information of some economic indicators. For example, very few member economies provided a breakdown of GDP by industry. We concluded that it was impossible to choose and study the industries that commonly exist in all APEC member economies.
15) For details of the questionnaire of the case study, see Appendix C.

- The current status regarding ICT adoption: hardware (HW), software (SW), and networks (NW)
- Benefits of ICT introduction
- ICT facilitators and barriers: funds, training and education, experiences and knowledge, consulting, and technologies
- Gender consideration in SME informatization

The results of the case studies are summarized in Appendix D in the following sequence: (1) Company Introduction; (2) Status of ICT Adoption; and (3) Factors influencing ICT Adoption.

Questionnaire survey of the Korean SMEs

The questionnaire survey of the Korean SMEs was conducted by KIMI (Korea Information Management Institute for SMEs) using a statistical sampling method to choose SMEs representative of the various business clusters and informatization levels. Samples were 334 small and medium manufacturers with the number of employees between five and 50. The survey period was one month from June to July 2003. Face-to-face interviews and site visits were conducted together with data collection by email. The survey covers the current status of ICT utilization, ICT benefits, ICT adoption and application, and barriers to ICT use. The results are introduced in Appendix E.

II. SME Informatization Policies and Approaches of APEC Member Economies

1. Policies and Approaches for SME Informatization in APEC Member Economies
2. Comparison of Intermediaries for SME Informatization in APEC Member Economies
3. Summary of Comparison

In this chapter, SME informatization policies and approaches of APEC economies will be comprehensively analyzed (see Appendix B) based on the data collected by the researchers for this study.

This chapter classifies SME informatization policies and approaches APEC member economies implement. In particular, this chapter identifies and compares the characteristics and roles of SME supporting government agencies and intermediaries and specific support programs of APEC member economies. In conclusion, this chapter provides practical suggestions for promoting SME informatization for APEC economies, especially for SMEs in member economies in the low tier in the NII.

1. Policies and Approaches for SME Informatization in APEC Member Economies

1.1. Classification of the Policies and Approaches for SME Informatization

The table below (Table 2-1) summarizes the current government policies APEC member economies put into practice for the promotion of SME informatization. In order to extract general patterns, APEC member economies are categorized into high and low tiers in the National Informatization Index (NII), as mentioned in Chapter I.

As can be seen in the table, regardless of its position in the NII, every APEC member economy has government-led policies for nation-wide informatization and has government organizations for this purpose. This result indicates that every member has made efforts to enhance its national competitiveness through upgrading its level of informatization.

Every APEC economy has government organizations responsible for developing and implementing SME support policies. This trend demonstrates that nurturing SMEs is on the primary agenda of every member economy. However, only a few member economies have launched a set of integrated policies for SMEs combining both general business support and specific informatization promotion efforts.

The first column of Table 2-1 introduces the government departments in charge of the overall national informatization. The second column shows the government organizations created for developing generic policies to support SMEs. The third column lists the government organizations that indirectly support SME informatization. The last column (shaded), which is the main issue of this section, summarizes the policies and approaches to specifically promote SME informatization.

<Table 2-1> Policies and Approaches for SME Informatization in APEC Member Economies

High Tier in NII

Member economy	Government Department for National Informatization	Government Organization for Generic SME Support	Other Government Organizations partly related to SME informatization	Policies*1 & Approaches*2 for SME informatization
Australia	Department of Communications, Information Technology and the Arts (DCITA)	Office of Small Business (OSB)	National Office of Information Economy (NOIE) (promoting SME e-business), State governments	1/abe
Canada	Industry Canada (IC)	Industry Canada (IC)	Provincial governments	1/ab
Hong Kong	Commerce, Industry and Technology Bureau (CITB)	Small and Medium Enterprises Office (SMEO)	Industrial Support Division of Trade and Industry Department, The Information Technology Services Department (ITSD)	1/abd
Japan	Ministry of Economy, Trade and Industry (METI)	Small and Medium Enterprise Agency (SME Agency)	Prefectural Governments	2/abcde
Korea	Ministry of Information and Communication, Ministry of Commerce, Industry and Energy	Small and Medium Business Administration	Ministry of Information and Communication, Ministry of Commerce, Industry and Energy	2/abcde
New Zealand	Electronic Commerce Action Team (ECAT)	Ministry of Economic Development (MED)	n/a	1/ab
Singapore	Infocomm Development Authority of Singapore (IDA)	SPRING Singapore	Ministry of Trade and Industry	1/abcd
Chinese Taipei	Ministry of Economic Affairs (MOEA)	Small and Medium Enterprise Administration (SMEA)	Commerce Department of MOEA, Industrial Development Bureau of MOEA	2/abcd
U.S.	Department of Commerce	Small Business Administration (SBA)	Department of the Treasury, FTC, Federal Communications Commission (FCC), National Telecommunications and Information Administration (NTIA) of the Department of Commerce, Office of Management and Budget (OMB)	2/abcd

*1: 1= Generic ICT policy, 2= SME-focused ICT policy, 0=No noticeable SME informatization policy.
*2: a=Information, b=Infrastructure, c=Financial support, d= On-site ICT training & consulting, e=e-Business network

Low Tier in NII

Member economy	Government Department for National Informatization	Government Organization for Generic SME Support	Other Government Organizations partly related to SME informatization	Policies*1 & Approaches*2 for SME informatization
Brunei	BIT Council	Promotion and Entrepreneurial Development Division (PEDD)	Ministry of Industry and Primary Resources	0/a
Chile	Ministry of Transportation and Telecommunications	Chilean Economic Development Agency (CORFO)	n/a.	0/a
China	National Informatization Promotion Office of the State Council, Ministry of Information and Industry	Department of Small and Medium-Sized Enterprises	n/a	0/ab
Indonesia	Ministry of Industry and Trade	Ministry of Cooperatives and Small and Medium Enterprises	Ministry of Research and Technology	0/a
Malaysia	Ministry of Energy, Communication and Multimedia (MECM)	Ministry of Industry Development Authority (MIDA)/ Small and Medium Industries Development Corporation (SMIDEC)*3	n/a	0/ab
Mexico	Ministry of Trade and Industrial Development	National Council for the Mexico, Small and Medium Enterprises	Ministry of Economy, Ministry of Trade and Industrial Development	0/a
Papua New Guinea	Office of Information and Communication (OIC)	n/a	n/a	0/ n/a
Peru	Committee for the Expansion of Computers, National Council of Science and Technology	n/a	n/a	0/a
Philippines	Department of Trade and Industry	Bureau of Small and Medium Enterprise Development, Department of Trade and Industry	Department of Science and Technology (DOST)	0/a
Russia	Ministry of Economic Development and Trade	Ministry of Antimonopoly Policy and Support of Entrepreneurship	Ministry of Telecommunications and Informatization, Ministry of Education, Ministry of Science and Technology	0/a
Thailand	Ministry of Information and Communications Technology (MICT)	Office of Small and Medium Enterprises Promotion (OSMEP)	Department of Industrial Promotion (DIP)	0/ab
Vietnam	Department General of Post and Telecommunications	Vietnam Chamber of Commerce and Industry (VCCI) *3	n/a	0/a

*1: 1= Generic ICT policy, 2= SME-focused ICT policy, 0=No noticeable SME informatization policies.
*2: a=Information, b=Infrastructure, c=Financial support, d= On-site ICT training & consulting, e=e-Business network
*3: It is unclear that the VCCI of Vietnam and the SMIDEC of Malaysia are government agencies.

SME informatization policies are divided into three categories: (1) generic ICT policy; (2) SME-focused ICT policy; and (3) no noticeable policy.

Generic ICT policy directs the related government organizations to disseminate ICT information to businesses as a whole without any specific focus on SMEs. Moreover, generic ICT policy is designed to enhance the ICT infrastructure that is useful for the business community as a whole. Pursuing standardization and building the network base are examples of efforts to improve the overall ICT infrastructure.

SME-focused ICT policy enables a specialized government institution to play a comprehensive role for SME informatization and to involve in all SME informatization efforts (financing, technical consulting, etc.). Therefore, these institutions develop comprehensive policy frameworks for SME informatization and work on not only improving the ICT environment, but also individual SMEs' adoption of ICT.

If an APEC member economy does not have an ICT related policy in place, it is classified as an economy with "no noticeable policy" (code as zero).

Approaches or programs to improve SME informatization mentioned above are means to support SMEs under the SME informatization policies. There are 5 major types of support programs providing 1) information, 2) basic ICT infrastructure, 3) financial support, 4) on-site ICT training and consulting, and 5) e-business networks.

The first support program, providing information, includes running a portal site that provides information such as government support and new business opportunities that can facilitate the adoption and use of ICT by SMEs. Some programs offer more useful information such as the introduction of Best Practices in SME informatization, research results on the benefits of ICT and its importance.

The second type of program, providing ICT infrastructure, is necessary for promoting SME informatization. A typical example is establishing trust infrastructure (security and authentication systems) upon which SMEs can securely operate and participate in e-commerce. Training and educating IT staff for SMEs are also important activities included in these programs. The purpose of these programs is to create a favorable ICT environment

The third type of program is financial support. This program helps SMEs to reduce their financial burden in implementing informatization by offering government support. Cash grants, loans, leases and tax reductions are examples.

The fourth type of program, on-site training and consulting, supports SMEs to overcome the challenges they face while pursuing informatization by providing specialized ICT consulting.

The fifth type of program is to help SMEs establish an e-business network with other companies in the same industry. For this purpose, the government offers financial support and training programs for ICT experts.

1.2. Policies and Approaches of Member Economies in the High Tier in NII

Member economies in the high tier in the NII can be further divided into the economies with the SME-focused ICT policy and those only with the generic ICT policy in place. The former group includes the United States, Japan, Chinese Taipei and Korea, and the latter includes Australia, Canada, Hong Kong, New Zealand and Singapore.

In the first group, SME support institutions have a special framework for developing policies for

SME informatization, whereby they develop various SME informatization policies and programs. In the United States, the Small Business Administration (SBA) provides technical assistance, financing, training, and market information with a clear objective of promoting SME e-commerce. The Small and Medium Business Administration of Korea, the Small and Medium Enterprise Administration (SMEA) of Chinese Taipei, and the Small and Medium Enterprise Agency (SME Agency) of Japan are organizations responsible for SME informatization.

All five types of programs mentioned previously are found to be in place in these four member economies. These member economies have established well-designed systems providing a wide range of information such as successful SME case stories and ICT benefits. In addition, they work to establish trust infrastructure to help SMEs securely operate and participate in e-commerce. The governments of Chinese Taipei, Japan, Korea and the United States all provide financial support for SME informatization though in different forms. They also provide SMEs with on-site training and consulting programs to overcome various problems faced during ICT implementation. As for building e-business networks, government financing and technical support for the Networking of Micro Enterprise in Korea is a good example.

In the second group, member economies do not have programs or policies specific to SME informatization, but instead focus on creating a favorable ICT environment and developing generic SME-supporting policies. This group of member economies has two approaches in common, that is, providing information and building SME capacity. As a member of this group, Hong Kong has successfully adopted on-site training programs, and Australia has unique financial support programs for SMEs as part of an e-business network project the ITOL Program run by Australia's NOIE. The Australian government supports SME e-business networks by funding consortium based applicants through matching fund arrangements.

1.3. Policies and Approaches of Member Economies in the Low Tier in NII

Most of the member economies categorized as the low tier economies in the NII do not have any specific policy framework for SME informatization. Consequently, economies in the low tier in the NII usually do not have any noticeable supporting programs for SME informatization. Some countries (China, Malaysia, Thailand and Indonesia) in the low tier, however, have started to put support policies for SME informatization in place as a means to strengthen their national competitiveness .

The government of China is building an SME network to provide useful information and help SMEs share and exchange information with each other. Malaysia has established the SMIDEC to take full charge of promoting SMEs and support SME informatization through funding and training. Thailand has the OSMEP (Office of Small and Medium Enterprises Promotion) for the same purpose as Malaysia's. Recently, Thailand reviewed SMEs' request for assistance for their informatization, and as a result, banks were told to extend their financial support to SMEs. Indonesia has created such institutions as Business Development Services (BDS) and the Center for the Development of SME (CD-SME) to support micro-business clusters in selected areas.

2. Comparison of Intermediaries for SME informatization in APEC Member Economies

2.1. Intermediaries for SME Informatization in APEC Member Economies

As mentioned in the previous sections, most APEC economies have different policies and approaches to support SME informatization. These differences could influence the types and roles of intermediaries that facilitate SME ICT. Many governments have depended on these intermediaries to promote SME informatization because of the governments' lack of expertise and the overwhelming administrative burden they face. Such intermediaries are summarized in Table 2-2 below. The table explicitly compares the characteristics of the intermediaries in the member economies in the high tier and those in the low tier in the NII.

<Table 2-2> Intermediaries for SME Informatization in APEC Member Economies

High Tier in NII

Member economy	Public	Private
Australia	n/a	Consortium for ITOL
Canada	Canadian Network for the Advancement of Research, Industry and Education, Communications Research Centre Canada, Canada Business Service Centres	Canada National Research Council' Institute for Information Technology, Canadian Federation of Independent Business, Canadian Chamber of Commerce, Canadian Manufacturers and Exporters, Canadian e-Business Initiative
Hong Kong	Hong Kong Trade and Development Council, Hong Kong Productivity Council, Vocational Training Council	n/a
Japan	Japan Small and Medium Enterprise Corporation, Prefectural/regional SME Support Centers, SME/Venture Business Support Centers, Governmental financial institutions (e.g., Small Business Finance Corporation, National Life Finance Corporation and Shoko Chukin Bank), Public industrial technology research institutes, National Small Business Information Promotion Center (NIC)	Commerce and Industry Associations, Chamber of Commerce and Industry, National Federation of Small Business Associations, IT Coordinators Association, Designated lease companies
Korea	National Computerization Agency (NCA), Korea Institute for Electronic Commerce, Electronic Commerce Resource Center, Korea Informatization Management Institute for Small and Medium Enterprises (KIMI), Small Business Corporation (SBC)	Korea CALS/EC Association, Korea E-Trade/Technical Association, Korea Federation of Small and Medium Business, Korea Chamber of Commerce and Industry, Korea Association of Information and Telecommunication
New Zealand	Economic and Trade Development Agency	n/a
Singapore	Infocomm Development Authority, SPRING Singapore	Chinese Chambers of Commerce & Industries, Indian Chambers of Commerce & Industries, Malay Chambers of Commerce & Industries, Association of Small and Medium Enterprises, Singapore Manufacturers' Federation, Singapore Infocomm Technology Federation, Association of IT Consultants (Singapore), relevant industry and trade associations/ bodies
Chinese Taipei	Industrial Technology Research Institute, Institute for Information Industry	Information Service Industry Association, InfoBank Technology, National Association of Small & Medium Enterprises, Mitac Inc., Taipei Computer Association
U.S.	Small Business Development Centers (SBDCs), WBCs: Women's Business Centers, E-Business Institute as a virtual campus housing free training courses, workshops, and knowledge resources, PRO-Net for government procurement, OWBO: The SBA's Office of Women's Business Ownership, Business Advisor	Counselors to America's Small Business (SCORE)

Low Tier in NII

Member economy	Public	Private
Brunei	BSME NET	n/a
Chile	n/a	Centro de Productividad Industrial CEPRI S.A.
China	China SME Infonet, Chinese Academy of Science and network	SME Network, SME associations, trade groups and agencies
Indonesia	Business Development Services (BDS), Center for the Development of SME (CD-SME)	n/a
Malaysia	Small and Medium Industries Development Corporation (SMIDEC), 19 training providers with the financial supports for the training cost from SMIDEC (e.g., German-Malaysian Institute)	(PIKOM Association of the Computer & Multimedia Industry Malaysia)
Mexico	Business Information Center, Business Link Centers, The Technological Services Information System (SISTEC), projects of the Small and Medium Enterprises System, Technology Transfer Unit (UTT), COMPITE (National Committee for Productivity and Technological Innovation) Program	n/a
Papua New Guinea	n/a	n/a
Peru	Center for the Exchange of Technology and Information of the National Society of Industry, PROMpyme	n/a
Philippines	n/a	Philippine Chamber of Commerce and Industry (PCCI)
Russia	Russian SME Resource Center (RCSME), SIORA for services to entrepreneurs	Chamber of Commerce and Industry of the Russian Federation
Thailand	SME Development Center	Association of Thai Computer Industry (ACTI)
Vietnam	Vietnam Chamber of Commerce and Industry (VCCI) including SME Promotion Center as its affiliate	Vietnam Software Association

2.2. Public Intermediaries vs. Private Intermediaries

Intermediaries for SME informatization can be categorized into public and private intermediaries. The distinction between public and private intermediaries is the level of government involvement in the establishment and operation of these intermediaries. The government pays for the entire expenditures or a substantial amount of money is spent on the establishment and operation of public intermediaries, whereas the government does not get involved in the establishment and operation of private intermediaries.

Examples of public intermediaries include 100-percent government-funded institutions (Japan Small and Medium Enterprise Corporation, Korea National Computerization Agency), government-private partnerships with considerable contributions from government (Small Business Development Centers in the United States, Canada Business Service Centres, National Small Business Information Promotion Center of Japan, Korea Information Management Institute for Small and Medium Enterprise) and government-funded research and education institutions (Communications Research Centre Canada, Industrial Technology Research Institute of Chinese Taipei).

Private intermediaries are industry and trade associations (chambers of commerce, federations of small businesses or specific industry associations in member economies), consortiums formed by SMEs (Consortiums for ITOL of Australia), private IT service providers, and consulting firms.

2.3. Intermediaries of Member Economies in the High Tier vs. Low Tier in NII

The distribution of public and private intermediaries is different from economy to economy depending on the national informatization levels. Economies in the high tier in the NII have the balanced distribution of public and private intermediaries and have high dependency on them in supporting SME informatization.

On the other hand, only a handful of economies in the low tier in the NII have public intermediaries and, in very rare cases, private intermediaries. This result suggests that the economies in the low tier in the NII are in the beginning stages in implementing SME informatization and rely heavily on the public sector to lead SME informatization.

The intermediaries in the low tier in the NII play a limited role and thus only provide SMEs with business information through the Internet. Only a few member economies in the low tier have the intermediaries that offer education and training programs for upgrading IT usage (the Technology Transfer Unit (UTT) of Mexico).

We identified a few interesting characteristics of the intermediaries in the high tier in the NII. First, even the economies in the high tier in the NII have a higher dependency on the public sector than on the private sector in promoting SME informatization. This relatively high dependency on the public sector is due to the lack of such resources as monetary funds, ICT information, and human resources for SMEs. In addition, private capital hardly goes to SMEs to support informatization. Thus, governments (or government-supporting intermediaries) play the role in reducing the risks and uncertainties SMEs are likely to face in doing business, especially when SMEs confront an unfavorable business environment.

Second, a few economies in the high tier in the NII have established public intermediaries specializing in SME informatization, whereas most other economies let the existing intermediaries take charge of the SME sector, including SME informatization. Japan and Korea have many public and private intermediaries and each economy also set up a public intermediary specializing in SME

informatization (Korea Informatization Management Institute for Small and Medium Enterprises (KIMI) and Japan's National Small Business Information Promotion Center (NIC)).

2.4. Supporting Programs of Intermediaries in APEC

The intermediaries of APEC economies offer many programs to promote SME informatization according to the policies and approaches set out by respective governments:

- Providing information to SMEs to help them to succeed in market adaptation (most APEC economies provide this service including even economies in the low tier in the NII such as SME Infonet of China);
- Providing IT-related information that guides internal informatization or e-commerce for SMEs (e.g., Canadian e-Business Initiative);
- Conducting IT education and training programs for SME employees (e.g., Vocational Training Council of Hong Kong and E-Business Institute of the U.S.);
- Offering financial support for SMEs to purchase IT equipment (e.g., the Small Business Corporation of Korea handles funds from the Korean government for SME informatization); and
- Offering on-site training and consulting services to help SMEs to implement ICT (e.g., The IT Coordinators Association of Japan).

The kinds of programs public intermediaries adopt are affected by government policy. In light of this, intermediaries play the role of establishing channels to reflect the diverse needs of SMEs in the support programs they develop. An example of such a public intermediary is the E-business Institute of the United States, which was designed to assist entrepreneurs and employees in SMEs in an Internet-based learning environment by offering online courses, workshops, publications, information resources, learning tools, direct access to electronic counseling, and other forms of technical assistance.

Private intermediaries are more likely to reflect the demands and needs of SMEs in the programs they offer. In particular, consortium-based private intermediaries launched by a group of SMEs are most proactive in trying to satisfy the needs of SMEs as much as possible. A typical example is the consortium-based organizations supported by the ITOL (Information Technology Online) funding program of Australia. This private intermediary in the form of a consortium is a collaborative network of the supply chain that facilitates e-business for various SMEs.

There are programs in which the government only provides the funds and the actual operation of the support program is delegated to private intermediaries (the Information Service Industry Association (CISA) and Taipei Computer Association (TCA) of Chinese Taipei). These intermediaries provide training and education programs as well as consulting services on a contract basis with the government to enhance the e-business capabilities of SMEs.

2.5. Gender Issues

Among the various intermediaries involved in SME informatization, two intermediaries in the United States have a particular interest in promoting informatization of female-owned SMEs. Women's Business Centers (WBCs) provide counseling and training for women nationwide, host a Web site in eight languages and offer mentor programs for women running small businesses. OWBO, the SBA's Office of Women's Business Ownership, promotes the growth of female-owned

businesses through programs that offer business training and technical assistance, and it provides access to credit and capital, federal contracts and international trade opportunities. OWBO helps women start and build businesses by using the FastTrac training curriculum and by inviting speakers to lecture on a variety of topics. It runs quarterly networking programs as well as the monthly and quarterly mentoring group meetings , which are in the beginning stages of development.

3. Summary of Comparison

This section summarizes the findings introduced in section 1 and 2 of this chapter. The following table (Table 2-3) summarizes SME informatization policies and approaches as well as the roles of intermediaries in APEC member economies. There are three different groups of member economies depending on the directions of their ICT policies and the NII categorization.

<Table 2-3> SME Informatization Policies and Approaches in APEC Member Economies

	SME-focused ICT Policy	Generic ICT Policy
High in NII	**Group I** ▶ Economies: Japan, Korea, Chinese Taipei and the United States ▶ Common Approaches: provision of Information, Resources, Financial Supports and On-Site Training and Consulting ▶ Intermediaries: public Intermediaries are more dominant than private intermediaries	**Group II** ▶ Economies: Australia, Canada, Hong Kong, New Zealand, Singapore ▶ Common Approaches: provision of Information and Resources ▶ Intermediaries: No specific tendency
Low in NII		**Group III** ▶ Economies: Remaining 11 Member Economies ▶ Common Approaches: provision of Information ▶ Intermediaries: Private or public intermediaries are in the introduction stage

3.1. Group I

Group I consists of the economies in the high tier in the NII that implement SME-focused ICT policies. These APEC member economies are Japan, Korea, Chinese Taipei and the United States. These economies take comprehensive approaches to developing SME informatization policies that encompass ICT information and resources, financial support, on-site training and consulting. The governments of these member economies are aware of the need for SME informatization and have maintained a proactive stance towards supporting SME informatization with financial and technical support.

Such an active government role is not new to Japan, Korea, and Chinese Taipei because these economies have always stressed the importance of the government's involvement in leading the economic development. Considering the economic policy in the U.S. has traditionally assisted market-led economic growth, it may be noticeable that the U.S. government is taking various policy approaches to offering government support for SMEs to adopt ICT. The U.S. government's strong support for SMEs' adoption of ICT is, after all, the result of its traditionally active role in assisting

SMEs and promoting worldwide e-commerce.

In order to ensure the successful implementation of such policies, these member economies have relied on various private and public intermediaries but it is the public intermediaries that play a more important role. Japan and Korea, in particular, set up some public intermediaries specializing in SME informatization that have strong influence over the SME issues, backed by government support.

3.2. Group II

Group II consists of member economies in the high level in the NII that have generic ICT policies in place. These economies mainly focus on creating a favorable ICT environment. Australia, Canada, Hong Kong, New Zealand and Singapore belong to this group. The two common approaches these member economies have taken are providing useful information and strengthening the basic capacity of SMEs . Australia, Canada, and New Zealand view that SME informatization is a matter of choice for individual firms themselves to decide and thus maintain that the government's role should be limited to improving the surrounding environment in which individual firms can adopt and use ICT as needed. No common characteristics these intermediaries share were found but the study shows that the public intermediaries in this group of economies play a smaller role in generic than in the member economies that have SME-focused ICT policies. This results from the fact that the governments of Group II economies are not implementing ICT policies that specifically focus on promoting SME informatization.

3.3. Group III

Group III is composed of the members in the low tier in the NII that lack SME-focused ICT policy. The remaining 11 APEC member economies belong to this group. However, some member economies in this group have just introduced SME informatization policies after recently recognizing its importance. Although currently limited to providing information to SMEs, they plan to launch diverse supporting policies for SME informatization as their national information plans proceed. With few supporting policies from the government, the roles of intermediaries are very limited and it is up to the individual member economies whether they can advance to group I or group II in terms of SME informatization. Their choice should be based on a number of situations, including the economic development process of the government in the past, the levels of ICT infrastructure and the industrial structure of their economy.

III. APEC SME Informatization Survey

1. Case Studies
2. Survey Results of Korea

This chapter aims to examine the current status of SME informatization and the catalysts of and barriers to ICT. Generally, SMEs are more likely to pursue informatization when influenced by external entities than making the ICT decision voluntarily. The results of two empirical studies are presented in this chapter - case studies in 10 member economies and a questionnaire survey of the Korean SMEs.

1. Case Studies

1.1. Characteristics of Data Samples

Target Industries and Company Size

This case analysis focused on the manufacturing sector (89 percent), but it also included other industries (food and beverages, and retail) in those member economies where there were no active manufacturing companies available for this case study. Table 3-1 below provides the related statistics.

<Table 3-1> Sample Distribution by Industry and Size

Industry	Frequency	Percentage	Size	Frequency	Percentage
Manufacturing	16	89	≤ 50	10	56
Food/Beverage	1	6	51-70	3	17
Retail	1	6	≥ 71	5	28
Sum	18	100	Sum	18	100

Our study focused on the SMEs that employ fewer than 50 people. However, each member economy had different definitions of what a small-sized company is and the distribution of SMEs in the urban areas where the case samples were collected was different from economy to economy. As a result, in some cases, some companies with more than 50 employees were included in the analysis. In our samples, 56 percent of the companies in our study had fewer than 50 employees, 17 percent had between 51 and 70 employees and 28 percent had more than 71 employees.

Grouping

For the analysis, the NII shown in Chapter I was used to categorize 10 target member economies into low and high tiers. The high tier economies in this case study had an average NII of 82 and the low tier economies an average of 15, which indicates a large gap in the NII between high tier and low tier economies. See Table 3-2 below.

<Table 3-2> Grouping Sample

Description	NII	Member economies
Low tier in NII	15	China, Indonesia, Malaysia, Mexico, Thailand
High tier in NII	82	Australia, Japan, Korea, Chinese Taipei, USA

1.2. Analysis and Discussion of ICT Adoption

The case studies were analyzed and discussed from the perspectives of ICT adoption, ICT awareness and readiness, ICT benefits, and factors affecting ICT adoption.

1.2.1. Levels of Hardware Usage

Purchasing PCs is the first step toward informatization. The number of PCs per employee in small businesses according to our data is 0.5. Further categorization into high tier and low tier small businesses reveals that high tier small businesses have an average 0.66 computers whereas those in the low tier have 0.34 computers per employee. In conclusion, the high tier small businesses have almost double the number of PCs per employee than the low tier small businesses do (See Table 3-3).

< Table 3-3 > Ownership of PCs

Description	PCs per employee
Low tier in NII	0.34
High tier in NII	0.66
Average	0.50

The gap in PC ownership rates results from the different levels of income.[16] Noticeably, the average PC price in some of the low tier member economies is relatively far more expensive than in the high tier member economies, mainly due to high value-added taxes and tariffs on imported computers. The high levels of taxes and tariffs are causing a heavy burden on the low tier economies to purchase PCs. For example, SMEs in the high tier member economies such as Australia and Japan pay the equivalent of three weeks of wages for a PC, whereas SMEs in the low tier member economies such as Indonesia and China would pay six to eight months worth of wages for a computer.

The PC price affects the ICT investment decisions made by SMEs. As long as labor and ICT are substitutes for each other, SMEs will prefer increasing employees to PCs if the computers seem too expensive and if they think the prices of computers are affordable, then they will choose to buy computers over hiring more workers. For this reason, the current informatization gap will continue to widen unless there are efforts to make PCs affordable. SMEs perceive PCs affordable to buy when increasing a PC is more beneficial than increasing other resources.

16) In 21 APEC economies, the price of PCs and GDP per capita has a significant correlation of 0.85 (p<0.01 level). In our sample, the number of PCs per employee and the NII also shows a high correlation of 0.85 (p<0.01). The figures of the GDP per capita came from “The World Bank, World Development Indicators, 2003”. PCs per capita came from ITU.

1.2.2. Levels of Software Usage

All the SMEs we studied use application programs for Document Management, and 78 percent of the SMEs surveyed use them for Financial and Accounting Management. Other application programs in use include Inventory Management (72 percent), Sales Management (67 percent), Procurement Management (61 percent), Production Management (56 percent), Customer Management (56 percent), Cost Management (56 percent), Human Resource Management (56 percent), ERP (50 percent) and Supply Chain Management (33 percent) as shown in Table 3-4 on page 27.

SMEs in the low tier in the NII have limited use of application programs in general. In our study, companies from China use application programs for Financial/Accounting Management and Document Management, whereas companies in Indonesia and Thailand used them solely for Document Management. Through interviews with managers and owners of the SMEs, we found that they often have many difficulties in acquiring the appropriate application programs due to the limited options available. Thus, they undergo substantial trial and error in the process of ICT implementation, which often results in wasted financial and non-financial resources.

APMR and Bodibasis of Malaysia are companies that have unique features compared with the SMEs in other member economies. Bodibasis uses a wide range of application programs including MRP, ERP and SCM. APMR has also adopted various application programs except for SCM. The interviewees from these companies stated that their informatization was substantially facilitated by their government's active support policies.

<Table 3-4> Application Programs in Use

Application	Frequency	Percentage
Document Management	18	100
Financial and Accounting Management	14	78
Inventory Management	13	72
Sales Management	12	67
Procurement Management	11	61
Production Management	10	56
Customer Management	10	56
Cost Management	10	56
Human Resource Management	10	56
ERP	9	50
Supply Chain Management	6	33

Cases in China and Mexico are also quite unique. The Chinese government has implemented the system of only accepting tax documents that are processed through computerized programs. Due to such proactive policies for ICT promotion, most SMEs in Shanghai and Beijing cities own PCs for document management and accounting. Considering China's low-tier status in the NII, this is quite a remarkable development for China. Mexico also has a similar policy on B2G transactions in which the government creates a favorable environment for bidders that use ERP systems. Consequently, the SMEs that do business with the government are ones with high levels of ICT use. All these cases show that tax incentives and business transaction policies have a positive impact on promoting SME informatization.

The Challenges of Using Applications in the High Tier Economies

The high tier group uses about eight computer applications, whereas the low tier group uses only one or two applications, showing a large discrepancy between the high and low tier economies. 100 percent of the higher tier SMEs use application programs for Inventory, Sales, Financial/Accounting and Documentation, 86 percent use programs for Procurement and Cost Accounting; and 60 percent for Customer management, Human Resource Management and Production Management. However, a relatively limited number of companies are using ERP (40 percent) and SCM (20 percent).[17)]

High tier SMEs have seen the potential benefits of ICT for their business management, competitiveness and productivity. These companies continue to adopt more advanced programs to upgrade the existing systems and thus increase ICT benefits. For example, iCanTek in Korea pursues

17) In this analysis, we excluded SMEs that employ more than 100 people.

to become a super efficient company by using Application Service Provider (ASP) services. User companies rent application programs from ASPs on a monthly subscription basis. iCanTek has access to top-notch application programs by using ASP services, which in turn reduces the burden of employing ICT experts, paying expensive license fees and paying for ICT maintenance.

Furthermore, high tier SMEs maintain up-to-date information on alternative technologies and programs. They are also concerned with risks and challenges resulting from the adoption of new technologies and programs. To reduce avoidable costs, these companies study similar cases and practices in the same or other industries in which new and advanced information technologies have been adopted.

1.2.3. Levels of Internet Usage

The degrees of Internet usage are analyzed using the following three criteria: e-mail, Web usage and homepage development. No significant difference is found statistically in the Internet usage between high and lower-tier SMEs. For example, 100 percent of SMEs in both tiers use e-mail and the Web, whereas 60 percent of low tier SMEs and 70 percent of high tier SMEs have their own homepages. However, substantial differences are found in the purpose and style for which two groups use the Internet.

E-mail usage

In the low tier SMEs, ICT staff members usually use e-mail only for business communications with their counterparts, while the staff members of the high-tier SMEs use e-mail for both business and personal purposes.

Web usage

Employees in the high tier SMEs use the Web for a wide range of purposes, whereas only the ICT staff members in the low tier SMEs can have access to the Web. The low tier SMEs have a low awareness of the benefits of the Internet due to the lack of available contents. Language barriers are also found to be one of the main obstacles to developing a variety of contents on the Internet. For example, companies in Indonesia, a non-English-speaking member economy, believe there is not enough information on the Internet, whereas companies in Australia, an English-speaking member economy, enjoy rich contents by visiting Web sites in the United States and the UK in addition to their own economy's sites. The linguistic differences are causing the network externality effect where only English-speaking users can access more contents on the Internet whereby exhibiting further desire in searching for value-added information on the Internet while non-English-speaking users feel the internet is not useful for searching for information. Thus, the different attitudes towards using the Internet widen the digital gap between developed and less-developed APEC member economies.

Homepage usage

There is a substantial difference between low tier and high tier SMEs in terms of the homepage usage. The low tier SMEs are in the initial stages of experimenting with building and using

homepages but without a clear business model. One example is a small business operating its homepage only during business hours. By contrast, the high tier SMEs are running homepages with the clear business objectives of using the internet as a new marketing tool and a new market itself.

1.3. ICT Awareness and Readiness of SMEs

1.3.1. Overall Review

According to the analysis of companies' ICT preparedness (See Table 3-5),[18] ICT awareness ranked the highest (2.72).[19] In our case analysis, most CEOs and employees of SMEs were highly aware of the importance of ICT utilization for their business. Other aspects of ICT preparedness are ranked in the following order: ICT infrastructure (2.33), financial status (2.39), change management (1.61), and standardization (1.89). The average of all was 2.00. Standardization of business processes, a prerequisite for SME informatization, was lacking in SMEs because of their intrinsically limited capacity. For example, the Japanese SMEs do not seem to have high levels of standardization even though this member economy ranks high in the NII. The lack of standardization is much more common in most small companies than in medium-sized and large-sized companies. SMEs also recognize their inability of change management in response to changing regulations, organization and systems management of ICT, among other things. Furthermore, insufficient ICT education and training, ICT staff management, and ICT maintenance are challenges for SMEs to address.

<Table 3-5> ICT Preparedness of SMEs

Description	ICT Infrastructure	Financial Status	Awareness of ICT	Change Management	Standardization
Low Tier in NII	1.8	1.9	2.7	1.5	1.6
High Tier in NII	3	3	2.75	1.75	2.25
Average	2.33	2.39	2.72	1.61	1.89

Note: ICT preparedness was measured on a 3 point scale (3: sufficient, 2: average, 1:insufficient)

1.3.2. Comparative Analysis by Group

The group analysis of ICT preparedness shows a significant difference in ICT infrastructure and financial status[20] between the low tier and high tier SMEs. The low tier SMEs are not adequately prepared in terms of the deployment of equipment such as hardware, software and networks due to the unaffordable prices of these products. There is one exceptional case: Bodibasis of Malaysia has increased its productivity and revenues by implementing ICT and reinvesting the profits back into upgrading its ICT equipment. Among the high tier SMEs, small businesses in Japan and Korea continue to enhance their ICT utilization with tax and financial incentives provided by the

18) Please refer to the Appendix for the details of ICT preparedness.
19) Insufficient ICT preparedness is allocated one point, the average two points, and sufficient level three points.
20) *t*-tests demonstrated the significant difference between two groups in terms of ICT infrastructure and financial status ($p<0.01$), whereas awareness of ICT, change management, and standardization were not significantly different.

government.

The following considerations are suggested for governments to improve the ICT infrastructure and financial status of SMEs:

- For the ICT Infrastructure: Governments of the low tier member economies should upgrade and expand the ICT infrastructure for SMEs; and
- For the support policies and other incentives: Governments should create a business-friendly environment, e.g., ICT-related financial markets and resources.

1.4. ICT Benefits

ICT benefits were examined using the Balanced Scorecard model, which comprehensively analyzes the following categories: the financial perspective, the customer services perspective, the internal business processes perspective, and the learning and growth perspective.[21)]

1.4.1. Overall Benefits

The benefits of ICT SMEs perceive to be gaining depend upon the types of ICT implemented(See Table 3-6 on page 32): 100 percent of companies surveyed said they saw the benefits of ICT in the area of learning and growth; 83 percent in internal business processes; 50 percent in customer services; but only 28 percent said they benefited from the financial point of view.

However, the results on the financial benefits of ICT need further interpretation. Most SMEs responded negatively when asked whether they had seen reductions in cost or labor. Nevertheless, they were found to have enhanced business performance without increasing the number of workers. As the company would have had to hire more workers to improve business performance if they had not deployed ICT, it can be said that the adoption of ICT has saved additional labor cost, and thus had financial benefits. In other words, the financial benefits can be seen, considering the opportunity cost of the ICT implementation.

<Table 3-6> ICT Benefits

(Unit : %)

Description	Finance	Customer service	Internal business process	Learning and growth
Low Tier in NII	10	20	70	100
High Tier in NII	50	88	100	100
Average	28	50	83	100

Note: Benefits are measured on a binomial scale (1: experienced benefits, 0: no experience)

In conclusion, the SMEs that see the benefits of ICT adoption are greatly motivated to achieve a higher level of informatization. As SMEs using ICT continue to enhance their ICT levels while

21) ICT benefits were scored on a binomial scale. SMEs that reported to have experienced benefits were credited with one point, whereas companies that did not report any benefit received zero.

SMEs without ICT tools do not see the incentive to do so, the digital divide between the two types of SMEs continue to grow. To narrow the digital divide among SMEs in the low tier economies in the NII in particular, governments should seek help from these early ICT adopters to lead the SME informatization efforts.

1.4.2. ICT Benefits by Category

The primary benefit of ICT adoption for SMEs is in the area of learning and growth. CEOs and employees have come to learn the value of ICT and recognized the potential benefits of ICT in innovating business processes. More specifically, by using the Internet and e-mail, errors were reduced and communications with business partners were facilitated. Furthermore, by establishing databases, reusing documents and reports became possible.

Considering the benefits to the internal business processes, ICT adoption reduces the time and efforts invested in work and improves value-added business processes such as analysis, planning, forecasting, and strategic policy-making. However, some of the low tier SMEs surveyed were not able to gain these benefits, partly because they were in the initial stages in informatization and partly because they were unable to find appropriate application programs to improve their business processes.

As for customer services, small businesses and their customers benefited mostly from the improvement in communications and reduction in customer waiting time. However, there is a wide gap between high tier SMEs (88 percent) and low tier SMEs (20 percent) in terms of the effectiveness of customer services. This results from the fact that the low tier SMEs are at the beginning stages of informatization and mainly focus on internal automation rather than on customer services or business relationships.

The financial benefits ICT offers are gained mostly by the high tier SMEs in the form of reduced labor costs, increased value-added services and sales revenue. iCanTek of Korea is a good example reaping these financial benefits. The company uses application programs through ASP services for which it pays a fixed subscription fee monthly. By using the services ASPs provide, iCanTek does not need to recruit IT experts and thus saves considerable money and time in maintaining up-to-date ICT and upgrading software programs.

1.5. Factors Affecting ICT Adoption

1.5.1. National ICT Infrastructure

The telecommunications infrastructure is a major part of the national ICT infrastructure. In this study, it was found that there was a huge gap in accessibility to telecommunications infrastructure between high and low tier SMEs. 78 percent of SMEs use high-speed broadband and stable Internet lines overall. Specifically, 100 percent of the high-tier SMEs use broadband Internet lines, whereas only 60 percent of the low-tier SMEs use them. In other words, 40 percent of the low-tier SMEs still use the Internet through a slow dial-up modem. Moreover, Internet access cost is substantially higher in the low tier economies. For example, the Indonesian SMEs use e-mail and the Internet through a dial-up modem at a cost of US$38 per month.[22] Considering the weak financial situations of these

22) Yinping of China spends US$13 for broadband Internet lines. , and iCanTek of Korea spends US$25 per month.

economies, the high cost of internet access is a barrier to the informatization efforts. This is a more explicit problem for the member economies with low GDP per capita and large territories. Unless these issues are addressed properly, the current digital disparity between the low and high tier SMEs will continue to widen. Governments should make efforts to lower the cost and increase the speed of Internet access by seeking new alternatives both at the individual economy and APEC levels.

1.5.2. Business Environment

The business environment for informatization was analyzed in terms of the requests from buyers and sellers to utilize ICT, influence from the conglomerates (encouragement, pressure, cooperation, etc) and industry-wide standardization of business processes. The influence of the business environment was evaluated on a scale of 1 to 3: 1 for "low", 2 for "average" and 3 for "high". The average score for the low-tier SMEs was 1.1, while the average score for the high-tier SMEs was 2.75. The high-tier SMEs were pressured or encouraged to adopt ICT by business partners such as buyers, vendors or competitors. However, the low tier SMEs had less pressure from business partners to adopt ICT and thus were implementing informatization on a voluntary basis.

Pressure from business partners also influences the types of application programs SMEs adopt. For example, application programs such as Procurement Management have been adopted by 88 percent of the high tier SMEs, whereas only 40 percent of the low tier SMEs have adopted this.[23] Based on this fact, the governments of the low tier in NII are advised to seek new alternatives to facilitate SMEs' transactions with their business partners, especially with big buyers. The business environment is typically beyond the control of SMEs, thus, APEC governments are advised to take the leading role of facilitating programs in which business partners can conduct transactions more efficiently through computer systems.

1.5.3. Supporting Organizations

As mentioned in Chapter I, supporting organizations include the government and intermediaries. The main role of intermediaries is to develop and provide government services that meet SMEs' demands for informatization as much as possible. The following reviews the examples of these intermediaries from the standpoint of individual SMEs.

As analyzed in Chapter II, Japan, Korea, Chinese Taipei and the United States have implemented SME-focused ICT policies in which a wide range of supporting programs are offered. SMEs in these member economies are familiar with the government policies and programs for SME informatization and take advantage of them in upgrading their ICT levels. For example, the Korean government launched various ICT support policies including the nurturing of the leading SMEs in informatization, promoting ASP services by introducing tax incentives and low interest financing for investment in ICT. iCanTek is one of the beneficiaries of the Korean government's proactive ICT-support policy to diffuse ASP services.

Meanwhile, whether in high tier or in low tier, the SMEs in the member economies with only the generic ICT policy in place were found to be unaware of the government policies and programs that were available for them. For example, a company in the high tier economy explored various channels to upgrade its ICT level, but had considerable difficulty in doing so as it could not find a

23) The correlation between the pressures from business partners and the adoption of procurement management application is significant (0.49, $p<0.05$).

way to communicate effectively with the government agencies in charge. To develop government policies to meet as many as possible the demands of SMEs, the government is advised to increase the effectiveness of their communications with the end users.

It is seen that in some cases, such a dilemma could be overcome most efficiently by utilizing private intermediaries such as business or industry associations. For example, Hong Ya of Chinese Taipei leads the informatization of SMEs with the help of the Franchise Promotion Association. Sanohatsu of Japan implemented SME ICT with the help of Tokyo Fasteners Cooperative Association. As can be seen in these cases, associations could function as a bridge between SMEs and government and between business partners and stakeholders for promoting SME informatization.

In some cases in low tier member economies, it can be seen that even though the policies have no direct focus on SME informatization, they nevertheless influence the informatization of SMEs,. For example, the government of China requires SMEs to make tax reports in a computerized standard format that has had a positive impact on SME informatization.

1.6. Gender Issues

This case study also analyzes the gender distribution and its relationship to SME informatization. In terms of the distribution of genders involved in the case study, 56 percent of employees were males and 44 percent females. According to our study, the ICT field is considered more appropriate for women compared to other fields as it requires less physical labor than other types of work. In this respect, an increase in the level of SME informatization will lead to a rise in employment opportunities for women. For example, HengFu, a kitchen manufacture in Shanghai, China, has traditionally employed mostly male workers, mainly because duties include heavy labor. Recently, however, the company has adopted information systems as a part of its business practices. As a result, the number of female employees has grown, and the female workers are mostly in charge of computer design projects. Since adopting ICT, HengFu has hired seven women. Among the seven, five of them are working as technical experts in departments such as computer-aided design and computer-aided manufacturing.

Similar cases can be found in Korea. Because knowledge is the prime concern in the ICT field, less gender discrimination can be seen in this field. iCanTek employed two female experts in ICT and more female workers are expected to be hired in the future.

2. Survey Results of Korea

This section is based on the survey in Korea conducted by KIMI between June and July 2003 with over 334 effective samples. The survey reviewed the informatization of small manufacturing enterprises near Seoul with fewer than 50 employees. This section covers such issues as the current status of ICT implementation, ICT benefits and barriers.

2.1. Status of ICT Implementation

This section reviews the current status of ICT implementation in terms of human resources (ICT staffs, training and education), equipment (SW, NW) and e-commerce facilities.

ICT Staff, and ICT Training and Education: ***SMEs lack ICT experts***

It was found that 60.2 percent of SMEs in Korea do not have a separate ICT department in their firms. In other words, the existing employees were found to be handling ICT tasks in addition to other responsibilities (66.3 percent). The average number of ICT employees in Korean SMEs was 2.5, according to the survey. But the respondents said they needed another 2 ICT experts on average to meet their ICT needs. In 2003, only 18.9 percent of SMEs trained employees for the ICT sector, and most of the trainees were either workers handling administration or ICT related tasks.

ICT Equipment: ***Basic level of SW has been deployed. NWs are for internal processes.***

The two most popular types of software are Office Automation (OA) applications and homepages (See Table 3-7 below), but many companies were skeptical of increasing future demand of these. Many SMEs were found to be satisfied with using ICT as a stand-alone system and for internal business processes rather than doing B2B transactions with other partners. Internal networks are used for information sharing (30.2 percent), information retrieval about technology and the market (23.7 percent), and raw materials and inventory management (22.4 percent).

External B2B networks were found to be used for product information exchange (28.7 percent), purchasing and sales (24.7 percent), and placing and receiving orders (23.0 percent). See Table 3-8 below.

<Table 3-7> ICT Resources in Korean SMEs

(Unit : % of respondents)

SW Types		In Use	Future need
Office Management	OA	74.3	61.6
	Groupware	18.9	37.9
Transaction Management	EDI (VAN, Web)	19.5	30.5
	e-Commerce	13.0	31.4
	POS	5.9	22.0
Data Management	DW/DSS	9.0	23.4
	KMS	3.1	18.1
Production/Process Management	CIM/MES/POP	4.8	25.7
	CMMS	4.8	27.4
Integration Management	ERP	16.9	42.9
	SCM/PRM	1.7	16.9
	CRM	2.3	17.5
Others	Home-page	54.5	50.8

<Table 3-8> E-Commerce Adoption by Korean SMEs

(Unit : % of respondents)

		Full dependency	Considerable use	Average	Little use	No use
B2C	Order/Sales	2.5	4.7	5.7	8.2	78.9
	Marketing	1.8	4.4	5.1	7.7	81.0
	Services	1.1	4.4	5.2	5.2	84.1
B2B	Purchasing/Sales	4.3	9.0	10.4	11.5	64.7
	Partner Management	2.2	3.0	7.1	5.9	81.8
	Services	2.6	2.2	6.7	5.6	82.8

E-Commerce: ***More than 65 percent of the Korean SMEs do not conduct e-commerce.***

Those companies that did not engage in e-commerce pointed to the unfavorable e-commerce environment for their products (30.2 percent) as the main reason for not conducting e-commerce. Other reasons include inadequate system equipment (10.5 percent), timing (8.8 percent), lack of ICT experts (6.8 percent) and high e-commerce expenses (4 percent).

2.2. Benefits of ICT

As for individuals' work productivity, benefits included decreased workload (66.7 percent), reduced costs and efforts in information search and retrieval (39.8 percent) and increased information sources (39.3 percent).

2.3. Barriers to ICT Adoption

ICT barriers have been studied from the ICT implementation and use perspectives. The barriers to ICT implementation are the lack of financing (57.6 percent), human resources (45.2 percent), and ICT knowledge and capability (34.2 percent).

SMEs in our survey looked to the government to address the first two barriers for them. They mostly wanted help from the government regarding the financial support for ICT costs (28.3 percent) and recruiting technical staff (22.7 percent).

The third barrier can be overcome through ICT education and learning, which SMEs need in the area of system maintenance (66.9 percent), network construction (63 percent), system security (50 percent), home-page construction and e-commerce (45.5 percent), ICT awareness (40 percent), availability of successful SME ICT cases (30 percent) and application software (27 percent).

2.4. Implications of the Survey Results

In summary, the Korean small businesses do not have enough ICT experts or staff members, most of them have only deployed basic SW and are content with conducting internal processes with ICTs rather than doing B2B transactions over the networks. More than half of the SMEs surveyed had their own homepages set up but rarely conduct e-commerce. Many Korean SMEs, however, do recognize the value ICT delivers such as improved work productivity and cost savings. Despite the general consensus, the lack of financial resources, human resources and ICT capabilities are hindering their prompt adoption of ICT . The government is advised to help improve the situation by taking the lead in addressing these challenges.

IV. Conclusions and Suggestions

1. Conclusions
2. Suggestions for APEC SMEs
3. Suggestions for Intermediaries
4. Suggestions for Governments
5. Suggestions at the APEC Level
6. Suggestions for Future Research

1. Conclusions

This study was an important undertaking by APEC and the Korean government to examine the current status of SME informatization, SME ICT promotion policies, the role of supporting organizations and other factors influencing SME informatization in the APEC region. The research framework consists of three components influencing SME informatization: the national infrastructure, business environment, and supporting organizations. Various study methods were applied to identify and compare the different SME informatization levels in APEC member economies, different government support policies for SMEs, and the benefits and impediments of SME informatization.

Based on the research framework mentioned above and the qualitative/quantitative methods, a comparative analysis was made from which the similarities and diversities regarding SME informatization in APEC economies were derived. Of particular importance to this project was the understanding of the different levels of SME informatization, the many factors and mechanisms influencing SMEs' ICT decisions, and the diverse perspectives on the supporting policies and intermediaries in different groups of APEC economies.

There are various policies and approaches for promoting SME informatization in APEC member economies. Although every APEC member economy has both government-led policies for nation-wide informatization and for supporting SMEs in general business operations, only a few member economies have launched a set of integrated policies for SME informatization (combining generic SME support and SME informatization policies). More specifically, the low tier economies in the NII have not taken any systematic approach towards SME informatization. By contrast, high tier economies with the policy framework for SME informatization have taken diverse approaches to SME informatization such as providing useful ICT information, resources, financial support, and ICT training and consulting. However, high tier economies in the NII that do not have a policy framework for SME informatization have taken only the basic approaches towards SME informatization such as providing useful information and expanding the ICT infrastructure.

This report also reviewed the intermediaries that play an important role in promoting SME informatization in the APEC community. These intermediaries can be categorized into public and private intermediaries, and have different roles and approaches in carrying out their responsibilities endowed by the government. Diverse cases were presented regarding the efforts of intermediaries to better meet SMEs' needs for informatization.

This report examined the status of SME informatization in the APEC region, factors influencing SME informatization, ICT benefits, and obstacles to ICT adoption through case studies conducted in many APEC economies and the informatization survey of the Korean SMEs. We identified numerous implications facilitating successful SME informatization will have on the APEC economy by comparing the cases from high and low tier economies in the NII. In the same vein, the survey of the Korean SMEs contributes to raising the understanding of the need for SME informatization.

All the interviewees - SME businessmen, government officials, and key staff members of supporting intermediaries for SME informatization in member economies - believe that the potential benefits of SME informatization are great and welcome the involvement of APEC economies in promoting SME informatization by lowering the barriers to it not only at the individual governmental level, but also at the APEC level. The followings are the suggestions to facilitate SME informatization for individual SMEs, intermediaries, member governments, APEC as a whole, and future research.

2. Suggestions for APEC SMEs

Recognize the need for informatization, and raise the ICT awareness and knowledge of SME CEOs.

According to our studies, many SMEs enhanced their business efficiency by using ICT tools such as document management, financial and accounting management, and inventory management. But only a few companies increased business performance in internal and external operations using the more sophisticated ICTs such as ERP, CRM and SCM.

From a financial perspective, companies were able to reduce labor cost related to business processes and increased sales revenue after adopting ICT. From the internal business processes perspective, they reduced the time and effort wasted in conducting businesses and improved the analysis, planning, forecasting and strategic policy making processes. From the customer services perspective, ICT implementation increased communications efficiency with customers and decreased customer waiting time. From the learning and growth perspective, ICT improved communications speed with trading partners through the use of the Internet and e-mail. Over time, CEO and employees that implemented ICT came to see the benefits and value of ICT and thereby raised the awareness of the importance of informatization.

Considering these positive effects of informatization, APEC SMEs should further study the potential benefits of ICT to reduce cost as a result of enhancing the efficiency of management processes, developing new products and services, and developing new markets through new approaches to customers. Raising the ICT awareness and knowledge of CEOs of SMEs is critical considering the absolute influence of CEO leadership in small-sized companies. Strong ICT leadership armed with high-tech knowledge will further facilitate SME Informatization .

Use ICT for integrating SMEs and business partners into the value chain.

Integration with business partners is desirable as it helps achieve the economy of scale. Integrating business processes and data through community-based networks with partners in the value chain is highly effective in sharing costs and benefits of the integrated system. As business hubs, large enterprises have many business partners and have a strong tendency of pressuring their small-sized business partners to adopt the ICT platforms they use. As compatibility is most critical in system integration, large enterprises need to build standardized platforms by cooperating with SMEs. Using application programs at moderate costs through ASP (Application Service Provider) services is a good option in this regard. When forming a network in an industry association, establishing consortiums between the ICT industry and user enterprises is advisable.

3. Suggestions for Intermediaries

Intermediaries (both public and private) in charge of promoting SME informatization should identify SMEs' needs and develop programs from an SME standpoint.

This report reviewed the roles of intermediaries for SME informatization. As SMEs in general have limited financial, technological and human resources and experience numerous difficulties in pursuing informatization, government support is indispensable for SME informatization. Governments could provide various support programs in which ICT information, ICT resources for SMEs and financial support are offered. However, governments lack the ability to identify SME needs and provide tailored solutions to SMEs. The best way to overcome such limits is to make use of SME support intermediaries to carry out the policies the government develops. On the government's part, it must ensure that effective SME policies are continuously developed. The more supporting programs governments develop, the more important the role of intermediaries in SME informatization will become.

Considering their increasing importance, intermediaries should be keen on whether they are truly meeting SME needs through their programs, regardless of whether the intermediaries are public or private. In order to identify the changing ICT environment and SME needs for informatization, intermediaries should have more knowledge and flexibility in their approaches to SME informatization. This applies especially to the public intermediaries, because they are likely to be less responsive to the changing needs of SMEs than private intermediaries are.

4. Suggestions for Governments

Governments should give priority to enhancing the national ICT infrastructure.

Some 40 percent of SMEs from the member economies in the low tier in the NII still use the Internet through slow dial-up modems, and Internet access costs were found to be substantially high for these SMEs to afford. Unless this challange is addressed, the current digital gap between the low and high tier SMEs will continue to widen. Governments should, therefore, try to lower Internet access fees and improve Internet access speed. Without low-cost, efficient ICT infrastructure in place, SMEs will not be able to understand the benefits of informatization.

For the economies in the low tier in the NII, one of the options to expand the ICT infrastructure is establishing the Mobile Networks. Member economies such as China and Australia may have difficulty in setting land lines across their large territories. These member economies could turn to satellite and mobile technologies instead of the traditional wired-line technologies for building the national ICT infrastructure. It is also important for the government to develop legitimate trust infrastructure in addition to increasing SME participation in e-commerce.

The availability and development of the ICT markets for software, hardware and networks are an increasingly significant part of the national infrastructure for SME informatization. Local software and contents access at reasonable prices will accelerate the informatization of SMEs. Governments should assist the growth of the ICT industry, and in particular, they should develop policies and projects that can promote the ICT market and SME informatization simultaneously.

Develop diverse, business-driven supporting programs and team up with support intermediaries.

The most effective way for SME informatization is helping SMEs feel the need to implement ICT in their business operations. In this sense, the government should design diverse programs responding to the changing informatization needs of SMEs. This includes providing useful information regarding the benefits and costs of adopting ICT, technical and managerial assistance to adopt ICT, and financial support programs. To address the imbalances between government policy and SMEs' demands, governments should increase the effectiveness of their communications so as to keep in close contact with SMEs. In addition, the government should develop programs for supporting the establishment of an e-marketplace in each industry through building computer networks connecting SMEs. Within the e-marketplace, SMEs can build business relationships with partners throughout the value chain.

As the government will depend on diverse intermediaries (both public and private) to develop high quality supporting programs for SME informatization, it must ensure that effective cooperation takes place between diverse intermediaries and the government to create the desired synergy effect in the informatization efforts.

Consider the gender issue in the development and implementation of supporting programs for SME informatization.

While limited, this report reviewed the improving role of women in SME informatization by introducing the U.S. case of supporting women-owned businesses in Chapter II and the contribution of SME informatization to the employment of women in Chapter III. These cases demonstrate that governments need to pay more attention to the gender issue in developing the SME informatization policies. For this purpose, governments may well invite the participation of official and unofficial associations of women-owned SMEs in the process of launching SME informatization policies.

5. Suggestions at the APEC Level

Improve the ICT infrastructure across the APEC region.

SMEs should be able to have access to affordable computer equipment and the Internet. In this respect, collective measures should be taken to ease the burden of purchasing computers for the SMEs in the low tier economies in the NII. For example, APEC member economies can collectively lower the tariff rates on PCs, or outdated computers in high tier members could be resold to low tier members at low prices.

APEC economies also need to discuss how APEC member economies can cooperate with one another to help SMEs in the APEC region to purchase software at reasonable prices. APEC member economies need to provide software at low prices to SMEs in the low tier member economies through license arrangements, or help them develop and use affordable software produced locally.

Prepare collective measures at the APEC level to enhance the effectiveness of supporting intermediaries

Currently, APEC member economies are adopting various policies and different approaches to facilitate SME informatization. The effectiveness of these policies needs to be discussed among APEC member economies. The APEC SME Informatization Forum in 2004, to be held in Korea following this survey, can provide the initiative for this. To keep the momentum for promoting SME informatization and ensure the objectives of the 2004 forum are met, the forum should become a regularly held event. For this purpose, APEC should lead the efforts to make this forum an officially held event.

In addition, training staff members for a number of various supporting intermediaries of each member economy will be crucial for enhancing member economies' ability to better respond to SMEs' demand for informatization. In this sense, the APEC Training Program for SME Informatization in 2004 could become a cornerstone for building a strong foundation for supporting intermediaries. It can become a training program regularly held for the key staff members (e-leaders) from SME support intermediaries.

6. Suggestions for Future Research

The relationship between the ICT infrastructure and SME informatization

The correlation between the digital divide among the companies and the indexes of the digital divide among member economies should be analyzed in detail. In addition, the digital divide between SMEs and large enterprises in member economies needs to be further studied, for the relationship between ICT infrastructure and SME informatization can be clearly identified as a result.

The relationship between SME informatization and the business environment

Discussion at the APEC level is needed to assert the benefits of ICT. Discussion should not only cover the promotion of SME informatization, but also the business conditions required for SMEs (especially in the member economies in the low tiers in the NII) to gain the benefits of informatization through concrete policy programs.

In-depth study on SME informatization

An in-depth study on SME informatization by industry should be undertaken, taking into account the different characteristics of each industry. As our case studies only involved SMEs located in or near capital cities, it may only pertain to SMEs located in urban areas, limiting the comprehensive application of our study. As a result of our interviews, we identified that there is a substantial gap in informatization between SMEs in urban and rural areas, particularly in China and Mexico. Future studies should consider the regional differences when analyzing the informatization levels of member economies.

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Appendix A

First Research Questionnaire on SME Informatization Policy

Appendix A.1. First Research Questionnaire

Appendix A.2. Survey Guidelines: Korean Case

Appendix A.1. First Research Questionnaire

APEC SME Informatization Survey

Republic of Korea

Foreword

This survey is part of the Korean project of "Enabling e-MES environment", proposed at the APEC WG Meeting in February 2003 and approved by the APEC BMC in July 2003. As the host of the 2005 APEC Meeting, Korea has been committed to informatization of SMEs in the APEC region.

The "APEC SME Informatization Project has three sub-projects": (1) conducting a survey on SME informatization (July-December 2003), (2) holding a policy forum (a 3-day forum planned in May 2004), and (3) organizing a training program for relevant government officials, dedicated managers and leaders from business associations and NGOs (2-week program planned in September 2004).

The survey aims to contribute to promoting informatization of SMEs in the APEC region by proposing solutions and sharing best practices of member economies' relevant experiences - policies, support structures, and needs of and impediments to SME informatization. It further aims to identify e-leaders in SME (leader organizations and their leaders) to initiate and take actions in building a cooperative network of SME informatization at local level and in the APEC region.

Introduction

The scope of SMEs subject to this survey will be basically limited to companies with less than 50 employees. However, different categorization standards of each member economy will be reflected. The survey will be conducted in three main stages.

(1) The first set of survey focuses on informatization policies and systems for supporting SMEs. Questionnaires in the 1st will be about major policies of government and related agencies, progresses of policy implementation, major driver organizations and personnel (public, private), and major features of their efforts as well as the relevant departments and personnel committed to SME informatization. The policies and projects for SME informatization include infrastructure, e-production, e-commerce, consulting, education & training, etc. (including women-owned businesses).

(2) The 2nd survey will be conducted on the government bodies and expert groups in the public sector responsible for establishing and implementing relevant policies, SME associations in respective industries, and e-leaders in major businesses promoting informatization.

(3) The 1st and 2nd surveys will be the basis for our final report and comparative analysis on the level of SME informatization of APEC member economies as well as for our policy recommendations for further commitment on the APEC level.

Please refer to the Survey Guidelines to answer the questions. It would be grateful, if you could reply no later than 20 August 2003 via e-mail (Please note that we plan to complete the 1st template by August 20).

This questionnaire, as a preliminary survey, is very important for defining the sample of the 2nd survey that drive or benefit from the SME informatization projects in each economy.

Additional opinion or feedback on the survey is also welcomed (via e-mail). As a preliminary survey to the 2nd research, this is very important for defining the entities that drive or benefit from the SME informatization projects in each economy.

Your response should be sent to:

Mr. Joo-Yong KIM (jooykim@kimi.or.kr, Tel: +82 2 3787 0430) at Korea Information Management Institute for Small and Medium Enterprises (KIMI)

1st Research Questionnaire

1.Briefly describe the nation-level structure of and the cooperation among different organizations responsible for SME informatization policies or projects. (The answer should be written in English and on a separate sheet of paper in order to cover the sufficient information requested).

2. List the government or public organizations dedicated to informatization of SMEs and briefly describe the major policies and projects of each organization.

2.1 Name the government (central and local) organizations related to SME informatization and describe their major projects. Name the departments and personnel for each project (including their contact points: e-mail, fax, phone).

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2.2 Describe the nature of the public organizations responsible for SME informatization and their major projects and name the departments and personnel dedicated to each project (including their contact points).

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3. List the non-government organizations and SME-related associations in various industries that support SME informatization, and briefly describe their major policies and projects.

3.1 Describe the nature of the non-government organizations and the industry-specific associations and their major projects for SME informatization. Name the departments and personnel dedicated to each project (including their contact points).

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3.2 Describe the major relevant projects of large companies or their partners that lead SME informatization. Name the divisions and personnel in charge of each project (including their contact points).

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3.3 Describe the nature and major projects of non-government bodies (NGOs, universities, etc.) that support SME informatization. Name the divisions and personnel in charge of each project (including their contact points).

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3.4 Describe major projects of international organizations and related bodies that support SME informatization in your economy, if any. Name the departments and personnel committed to each project (including their contact points).

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4. Briefly outline the overall strategy and progress of SME informatization in your economy.

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5. Explain if there are priorities, by industry or region, in your strategy and projects for SME informatization. If so, explain the rationale for such priorities.

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6. Describe how SME and micro enterprises are defined in your economy in regard to the statistical regulations.

7. Describe the sources for and the access to statistical documents or white paper, if any, on the government's informatization policies, SMEs circumstances, progress of SME informatization, etc.

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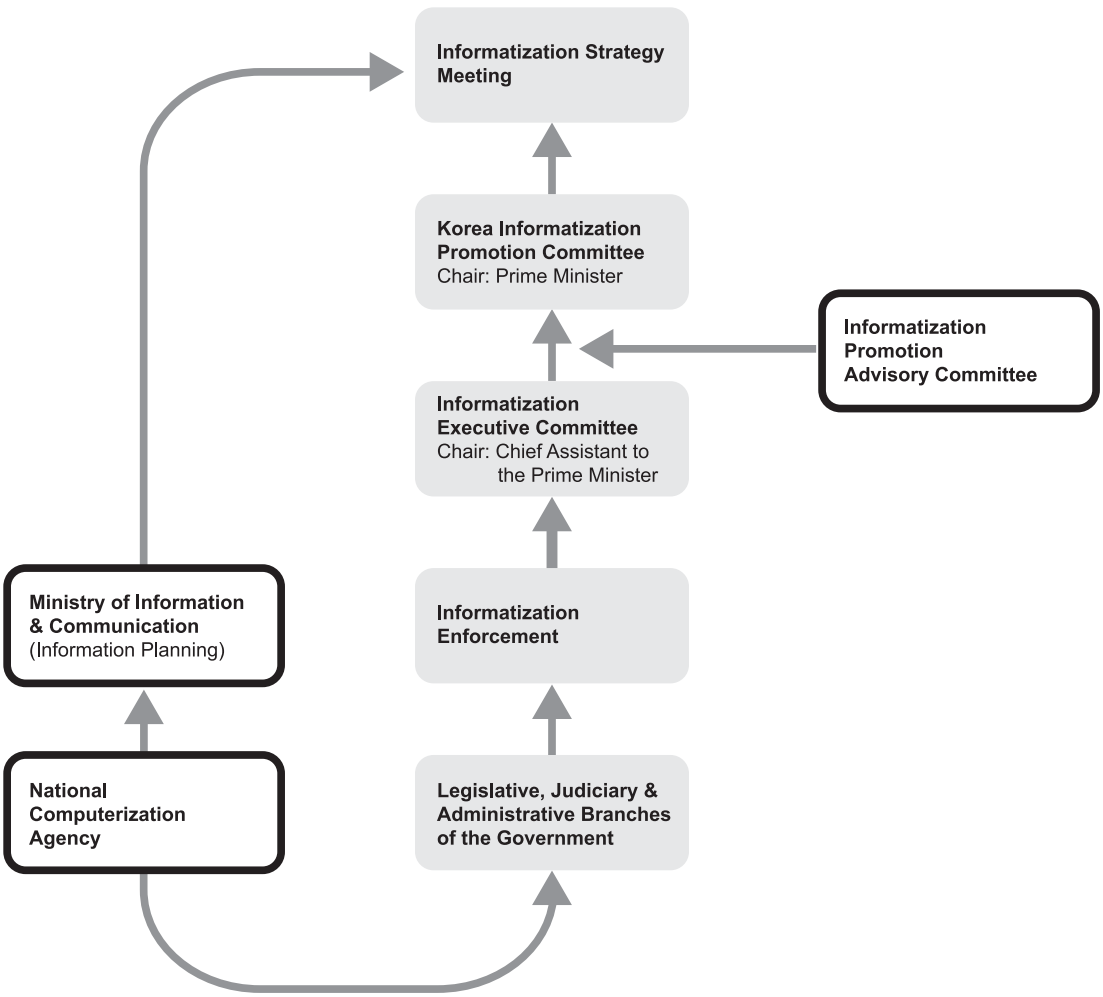
Appendix A.2. Survey Guidelines: Korean Case

1.The nation-level structure of and the cooperation among different organizations responsible for (SME) informatization policies or projects.

1.1 Nation-level structure for (SME) informatization



Informatization Promotion Committee was established pursuant to Framework Act on Informatization Promotion (August 1995). It is the highest deliberation body responsible for nation-level policy for informatization. The committee establishes mid-to-long term national informatization plan based on the relevant plans of each government ministry.

In this overall structure, the Ministry of Commerce, Industry, and Energy (MOCIE), the Ministry of Information and Communication (MIC), and the Small and Medium Business Administration (SMBA) build basic policies for SME informatization to be implemented by their sub organizations.

2. The government or public organizations dedicated to SMEs informatization and the major policies and projects of each organization.

2.1 Government and Public Organizations

2.1.1 Ministry of Commerce, Industry and Energy (MOCIE)

Nature	Sets up basic strategy for industry informatization and promotes e-commerce
Major Projects	**Promoting e-commerce in industries** ▶promotes e-transformation of manufacturing businesses, supports SME informatization **Building e-commerce infrastructure** ▶builds and implements national strategy for e-commerce promotion ▶aligns laws and regulations, supports standardization **Globalizing e-commerce** ▶establishes infrastructure for e-trade ▶expands multilateral and bilateral e-business cooperation
Focal point	**Website: www.mocie.go.kr** **Chang-han Lee (E-commerce Policy Division Director)** ▶ Tel : 02)2110-5151 ▶ e-mail: chlee10@mocie.go.kr **Jun-dong Kim (E-commerce Assistance Divsion Director)** ▶ Tel : 02)2110-5161 ▶ e-mail: jdk@mocie.go.kr

< Sub organizations >

(1) Korea Institute for Electronic Commerce

Nature	**Supports e-commerce promotion projects** ▶ a special corporation established under MOCIE ▶ governed by Framework Act on Electronic Commerce Article 22
Major projects	**Developing e-commerce promotion projects** **Developing and distributing e-commerce standards** **Managing E-Commerce Dispute Settlement Committee** **Nurturing e-commerce workforce**
Focal point	**Website: www.kiec.or.kr** **Michael Ahn (International Unit Researcher)** ▶ Tel : 02)528-5706 ▶ e-mail: mikeahn@kiec.or.kr

(2) Korea CALS/ EC Association

Nature	**Promotes informatization by networking suppliers and consumers of e-commerce** ▶ Korea E-Trade Association (under MOCIE): promotes e-business from consumer perspective ▶ Korea E-Trade / Technical Association (under MIC): creates environment and provides technologies from supplier perspective
Major projects	**Managing e-CEO Consultative Body** **Supports Golden Card System (inviting leading e-biz workers from overseas)** **Managing a B2B network building project** **Developing standards for e-catalog**
Focal point	**Website: www.kcals.or.kr** **Jason Lee (EC Division Team Leader)** ▶ Tel : 02)551-1478 ▶ e-mail: jason@kcals.or.kr

(3) Electronic Commerce Resource Center (ECRC)

Nature	**Promotes e-commerce promotion and builds national capacity** ▶ Around 40 ECRCs designated nationwide (under MOCIE) ▶ Governed by Framework Act on Electronic Commerce Article 26
Major projects	**Nurturing human resources** ▶ Local training tours, corporate training programs, school for start-ups **Consulting and Technological assistance** ▶ for companies, organizations, and potential CEOs **Distributing technology information and brokering trade** ▶ developing & distributing technologies for SME-specific IT systems **International cooperation and promotions**
Focal point	**Website: www.ecrc-korea.or.kr** **Yang seob Baek (Korea Institute for Electronic Commerce, ECRC Team Manager)** ▶ Tel: 02)528-5701 ▶ e-mail: ysbaek@kiec.or.kr

2.1.2 Ministry of Information and Communication (MIC)

Nature	**Establishes nation-level IC policy and promotes relevant projects**
Major projects	**Networking small businesses** ▶ provide IT education ▶ provide IT services: develop SME-specific business models and hub **Distributing industry-specific ASP** ▶ industry-specific ASP success models, online ASP support centers **Purchasing IC equipment and supporting facility replacements** ▶ support financial assistance for hardware, software, wired/wireless network at low interests
Focal point	**Website: www.mic.go.kr** **Gi Hoon, Paek (Internet Policy Division Director)** ▶ Tel : 02)750-1240 ▶ e-mail: khpaek@mic.go.kr

< Sub Organizations >

(1) National Computerization Agency

Nature	**Promotes informatization of central/local government bodies and develops relevant policies** ▶ a special corporation established under MIC ▶ governed by Framework Act on Informatization Promotion Article 10
Major projects	**Managing IC network of public organizations and supporting expertise for management** * dedicated to networking of small enterprises
Focal point	**Website: www.nca.or.kr** **Hyeon kon Kim (IT Policy Development Department Director)** ▶ Tel : 02)2131-0140 ▶ e-mail: khk@nca.or.kr

(2) Korea Association of Information & Telecommunication

Nature	**A consultative body of private IC industries** ▶ ASP Industry Consortium Korea, IT industry statistics, LBS Industry Council, Korea Linux Council, IT Venture startup network, ALSII, i-safe Mark and ePrivacy Mark, ITBT2Korea, 'Find a mobile Phone' Call Center, Home Network Council, IHD CP, etc.
Major projects	**Promoting global marketing and nurturing human resources** **Surveying trends of the IT industry** **Providing IC services** * solely responsible for distributing industry-specific ASPs
Focal point	**Website: www.kait.or.kr** **Overseas business team** ▶ Tel : 02-580-0581 - Fax : 02-580-0599 **External cooperation team** ▶ Tel : 02-580-0630 - Fax : 02-580-0639

2.1.3 Small and Medium Business Administration (SMBA)

Nature	**Establishes and promotes policies for SME informatization**
Major projects	**Building/coordinating SME informatization plans for related organizations i.e. Informatization Management Institute**
Focal point	**Website: www.smba.go.kr** **Jong-Dae Lee (Infomatization Assistance Division Director)** ▶ Tel : 042) 481-4399 ▶ e-mail: leejd@smba.go.kr

< Sub Organizations >

(1) Korea Information Management Institute for Small and Medium Enterprises (KIMI)

Nature	**Supports SMEs' management innovation and productivity improvement through informatization** ▶ a special entity established under SMBA ▶ governed by Promotion of Technology Innovation of Small and Medium Enterprise Act Article 20
Major projects	**Digitizing production information of SMEs** **SME Informatization Innovation Consortium** **Supporting TIMPs** (dedicated to innovative informatization of SMEs) **Building IT infrastructure in SME-concentrated areas** **Building IT network for industry associations** **Building informatization management system** **Providing IT education to employees in SMEs** **Developing e-business models for small enterprises**
Focal point	**Website: www.kimi.or.kr** **Juhwan Oh (Strategy Research Team Manager)** ▶ Tel : 02)3787-0431 ▶ e-mail: eujinn@kimi.or.kr

3. Non-Government Organizations and SME-related Associations in Industries dedicated to SMEs informatization and the major policies and projects of each organization.

3.1 Non-Government Organizations and SME-related Associations in Industries

(1) Korea Chamber of Commerce & Industry

Nature	**Promotes growth of commerce & industry and balanced development of the national and regional economies** ▶ a private economic body of 118 year-history, established and managed by the Chambers of Commerce and Industry Act, with 65 branches in 65 cities nationwide
Major projects	**Offers web portal (www.korchambiz.net) for various corporate information** ▶ users can register and search information on 150,000 domestic companies ▶ users can register product/trade/transaction information **Providing web-hosting service for corporate websites** ▶ Makes and hosts customized corporate websites (web mail, shopping mall) **Distributing SMERP** ▶ distributes ERP for SMEs at low cost and provides user training **Sub organizations** ▶ Integrated Forum on Electronic Commerce: a private organization dedicated to building infrastructure for e-commerce related standardization (www.ecif.or.kr) ▶ EAN Korea: an organization specialized in informatization of logistics, i.e. provision of EAN code, POS, data service, EDI (www.eankorea.or.kr)
Focal point	**Website: www.korcham.net** **Chang Ho Kim (Business Information Service Team Director)** ▶ Tel : 02) 316-3720 ▶ e-mail: 06966@korcham.net

(2) Korea Federation of Small and Medium Business

Nature	**A non-profit organization established under Small and Medium Enterprises Cooperative Act** **Types of SME cooperatives:** ▶ Cooperatives (national cooperatives, regional cooperatives) ▶ Business cooperatives (business cooperatives, market cooperatives, etc.) ▶ Cooperatives Association (by industry, by region) ▶ Central Association of Cooperatives
Major projects	**Researching SME-related issues and making policy recommendations** **Cooperation with SMEs** **Supporting SMEs in marketing, sales, and export** **Supporting SME informatization** **Developing training programs for SMEs and providing management information** **Assisting SMEs regarding product liability system**
Focal point	**Website: www.kfsb.or.kr** **Jeong Heon Seo (Informatization Technology Assistance Division Manger)** ▶ Tel : 02-2124-33152 ▶ e-mail address : sjh@kfsb.or.kr **Ko, Jong seob (International cooperation Team Manger)** ▶ Tel: 02-2124-3222 ▶ e-mail: kjs@kfsb.or.kr

4. The overall strategy and progress of SME informatization in Korea

4.1 Building infrastructure for informatization of industries (1996~2000)

Until 2000, the government's policy focus was on building a comprehensive infrastructure for digitization of the industries including establishing systems for information sharing and e-commerce. Various projects were launched, such as building an e-commerce support center (ECRC), digital incubators, SMEs' e-commerce shopping malls, and SME database, etc. However, this period was when the government put much weight on building the information infrastructure and promoting digital attitude in the SMEs.

4.2 Promoting E-commerce (2000)

The government started to realign relevant laws for promoting SME digitization, to nurture IT and IT workforce, to build the basis for online trade, and promoted ecommerce in the public and industrial sectors. Major projects include "Digital Industry Complex" "Special Zone for SME Informatization" "Promoting ASP for SME and Consulting Pilot ERP for SMEs."

4.3 Spreading Informatization (2001~2005)

Integrating the existing policy measures, the Korean government is now offering more detailed and wider assistance for SME digitization. Its efforts are focused on building industry-specific networks and information networks led mainly by digital leaders, enabling SMEs to informatize themselves.

5. The priority industries in implementing information in Korea vary according to the objectives of each government ministry.

< Priority by Industries >

The Ministry of Commerce, Industry and Energy committed to entrenching e-business in the 6 key industries. It aims to build a B2B network in the 6 key areas and expanding it to other industries (currently B2B network building project is underway for total 40 industries).

Industry	E-commerce progress/ Stage		Core Tasks
	2000 →	2003	
Electronic	8.5% (Early Growing)	30.0% (Entrenched)	▶ Share standardization ▶ Cooperate with leading foreign companie
Automobile	2.4% (Starting)	14.0% (Growing)	▶ Build an industry-wide network (KNX) ▶ Enhance competitiveness of parts industry
Shipbuilding	2.5% (Spreading)	15% (Early entrenched)	▶ Build collaborative system for design & production industries ▶ Entrench a culture of inter-company collaboration
Steel	2.3% (Starting)	14% (Growing)	▶ Led by POSCO ▶ Early establishment of e-commerce system
Machinery	2.0% (Starting)	12.5% (Growing)	▶ Standardize classifications and codes ▶ Digitize parts industry
Textile	2.0% (Starting)	15% (Early entrenched)	▶ Entrench digital transactions ▶ Build co-infrastructure, i.e. QR

- SMBA: prioritizes informatization of manufacturing businesses
- MIC: focuses on informatization of non-manufacturing industries

< Priority by region >

MOCIE and Samll and Medium Business Administration selects and concentrates on hub cities and organizations in each region as part of the strategy to build innovation clusters via public-private-academic cooperation.

6. The Definition of SME and micro enterprises in Korea in regard to statistical regulations.

Classification	Scope	Reference
SME (middle- rank)	Enterprises with less than 300 full-time employees Or less than KRW 8 billion capital stock (for manufacturing industry)	Framework Act on Small and Medium Enterprises Article 3 (Scope of SME)
Small enterprise	Less than 50 full-time employees (for manufacturing, mining, and construction industries) ▶ less than 10 full-time employees (others)	Framework Act on Small and Medium Enterprises Article 8 (Definition of SME)
Small trader (micro enterprise)	▶ less than 10 full-time employees (for manufacturing, mining, and construction industries) ▶ less than 5 full-time employees (others)	Special Act on Small Enterprises Article 2 (Scope of small businessman)

* 94.6% of Korea's total 2.9 million enterprises fall under the category of a micro enterprise.

* As of the end of 2000, micro enterprises account for 94.6% of the total number of businesses, 51.2% of employees. 2001 figures are 94.2% and 51.2% respectively.

7. Statistics or White paper on National and SME Informatization Policy

White Paper on National Informatization	**Made by Korea Computerization Agency (NCA)** **Major contents: refer to the English version (summarized)** ▶ Progress of nation-level informatization, i.e. national digital index ▶ Vision and plan for nation-level informatization ▶ Progress of building infrastructure for e-business **Annual publication since 1993** **Available at www.nca.or.kr (pdf download)** **Contact: NCA Informization Policy Division** ▶ Tel) 02-2131-0113 Fax) 02-2131-0109
Korea Internet Whitepaper	**Made by: Korea Computerization Agency (NCA)** **Major contents: refer to the English version** ▶ Domestic Internet trend and index in 2002 ▶ Overall Internet landscape, i.e. Internet use and infrastructure ▶ Internet-related policies, i.e. related laws and regulations **Annual publication since 2000** **Available at www.nca.or.kr (not downloadable)** **Contact: NCA National Informatization Center**
White Paper on e-Business	**Made by: MOCIE & Korea Institute for E-Commerce (KIEC)** **Major contents** ▶ Domestic e-business landscape (by industry, user, and region) ▶ Latest e-business technology trend, i.e. mobile business ▶ E-business related policies, i.e. new laws and regulations **Annual publication since 2001** **Available at www.kiec.or.kr (pdf download)** **Contact: KIEC Policy Research Team** ▶ Tel) 02-528-5798 Fax) 02-528-5715 ▶ e-mail: e-business@kiec.or.kr

Appendix B

SME Informatization Policies and Approaches in APEC Member Economies: Member Economy Profiles

Appendix B contains SME Informatization Policies and Approaches of 21 APEC Member Economies. Each member economy profile addressesinvestigates the kinds of policies and approaches each government uses to fosterentice and improve SME informatization and the kind of intermediaries supporting SME informatization. The following three research methods were used: (1) a literature review, including a Web search; (2) a survey using a structured questionnaire for a focus group of government officers; and (3) site visits and interviews with government agents in charge of SME informatization.

Each profile has the following standardized list of contents:

(1) Trends of Informatization
(2) Definition of Small and Medium Enterprises
(3) Strategy and Progress of SME Informatization
(4) Government Organizations for SME Informatization
(5) Major Policies and Projects for Enhancing SME Informatization
(6) Efforts for SME Informatization from the Private Sector
(7) Overall Assessment of SME Informatization

Appendix B.1. Australia

1. Trends of Informatization

Australia is one of the most advanced economies in the world as well as in APEC in terms of ICT utilization. This does not mean, however, that Australia's optical broadband network has been established nationwide and is strong compared to other economies. Australia is so vast and sparsely populated in its rural areas that it is very costly to install fiber optic cables throughout the economy. Among residents in metropolitan areas such as Sydney and Melbourne, modems are still in use for a certain proportion of Internet users. Nevertheless, a high proportion of Australians use information technology in their communications for business and entertainment purposes.

The APEC KBE data clearly shows the advanced informatization of Australia. Some 630 of every 1,000 people use telephone mainlines (170 percent of the APEC average), and 656.8 people have mobile phones per 1,000 (151 percent of the APEC average). Australia is also ahead of other APEC members in many other areas: there are 630 computers per 1,000 people, a figure more than two times the APEC average. Of the Australian population in 2002, 53.05 percent were Internet users, a figure significantly above the APEC average of 32.24 percent, and the number of Internet hosts was much higher than other members who are forerunners in Internet user saturation. Accordingly, Australia belongs to the top group of APEC members in terms of e-commerce, with 0.71 percent of commercial transactions being made with the help of electronic commerce.

<Table 1> Informatization of Australia (as of 2000)

(Unit: Persons, %)

	Australia	APEC average
Mobile telephones in use per 1,000 people	656.8	434.02
Telephone mainlines in use per 1,000 people	630	372.71
Computers (PCs, mainframes, etc) per 1,000 people	630	310.59
Internet users, as % of population (1999)	29.1	15.13
Internet users, as % of population (2000)	53.05	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.71	0.46

Source: APEC (2003), *KBE Indicators.*

2. Definition of an SME

In 1999, the Australia Bureau of Statistics (ABS) conducted a review of the definition of an SME. It was recommended from the review that, for statistical purposes, firm-size classifications be based on full-time equivalent (FTE) employment. The review also recommended that public companies and businesses in parent or subsidiary relationships and cooperatives and associations should be excluded from the "small enterprise" category. The boundaries for enterprise classification, in accordance with the review by the ABS, are defined in the table below.

<Table 2> Definition of SMEs in Australia

Business Classification	Definition
Small businesses	**Businesses employing fewer than 20 people**
Non-employing businesses	▶ Sole proprietorships and partnerships without employees
Micro businesses	▶ Businesses employing 4 people or less, including non-employing business
Other small businesses	▶ Businesses employing 5 or more people, but fewer than 20 people
Medium businesses	**Businesses employing 20 or more people, but fewer than 200 people**
Large businesses	**Businesses employing 200 or more people**

Source: Australia Bureau of Statistics (Catalogue 1321.0 (2001)

Due to the fact that agricultural businesses often have large-scale operations that employ a large number of seasonal workers but few permanent employees, the ABS developed a definition for agricultural small business that is not based on employee numbers. For statistical purposes, the ABS records a measure of the Estimated Value of Agricultural Operations (EVAO) based on:

- The area of crops sown;
- Head of livestock; and
- Crops produced and livestock turn-off (mainly sales) during the year.

A small agricultural business is defined as having an EVAO of between AU$22,500 and AU$399,000. Businesses with an EVAO of less than AU$22,500 are excluded from ABS statistics because their contributions to commodity aggregates are generally insignificant.

As with other APEC member economies, SMEs are very important to the Australian economy, which has 1.1 million small businesses, representing more than 96 percent of all businesses. Around 30 percent of Australia's economic activity is generated by the small business sector. Small businesses are responsible for generating almost 3.3 million jobs, or 47 percent of private sector non-agricultural employment. SMEs are also leading the dynamic movement of the economy. From 1983/84 to 2000/01, the number of small businesses has grown by 3.5 percent per annum compared to growth of 2.5 percent for large businesses.

SMEs are contributing to the balanced development of the Australian economy and hence to equalizing income distribution across households, as approximately 34 percent of small businesses operate in regional areas and 67 percent of small businesses operate from home. Approximately thirty percent of home-based businesses are run by women. The number of women operating home-based small businesses grew by 17 percent between November 1999 and June 2001 compared to a growth of 13 percent for small businesses operated by men during the same period.

Small businesses are very actively responding to the information economy. About 81 percent of small businesses in Australia are now connected to the Internet. The resilience and stability of the Australian economy in the difficult international environment can be attributed to the good performances of its small businesses.

3. Strategy and Progress of SME Informatization

In the Australian government, which has done a great job of inducing Australia to become a leader in information economy, there are few, if any, policies specifically aiming at the informatization of SMEs. The strategy followed by the government for SME informatization has concentrated on providing sufficient information on the benefits and processes of adopting ICT and e-business for the private sector rather than providing direct support or subsidies to individual firms. The government has also been involved in helping firms build an e-commerce network among SMEs and providing an environment for flourishing e-commerce by establishing a strong legal and institutional framework. Owing to this background, we are focusing on the strategies and measures of the Australian government that are related to the information economy.

Creating a national framework for the information economy began in 1996 when the commonwealth government established the Online Council (OC), which operates as the top ministerial forum across commonwealth, state, territory and local governments for consultation and coordination on the information economy. This key initiative of the Australian government is the outcome of an agreement between all tiers of governments to facilitate cooperation on online issues needed to promote consistency on a national level. Membership of the Council comprises the Minister for Communications, Information Technology and the Arts (Chairman), a senior Minister from each state and territory, and the head of the Australian Local Government Association. Meetings are held in each state and territory. The Department of Communications, Information Technology and the Arts (DCITA) provides secretariat support for the OC, which meets annually to consider key issues and facilitate a nationally consistent approach to Australia's participation in the information economy. Online Council Ministers are supported by a group of senior officials representing all jurisdictions.

In 1997, the Australian government committed to guiding Australia rapidly (but smoothly) into the information economy. It was recognized that worldwide electronic commerce would offer great benefits to Australian producers and consumers by breaking down the barriers of time and distance and by being so accessible to potential partners in the world, and that ushering in the information economy comes down to encouraging more consumers and businesses to conduct more of their business online. In order to strengthen the confidence of Australian businesses and consumers, the government saw the need to spell out a framework that embodies all of the government's policies to enable electronic commerce to flourish. To accomplish a vision of the information economy and a clear legal and regulatory framework for electronic commerce, the Australian government established the Ministerial Council for the Information Economy (MCIE). The National Office for the Information Economy (NOIE), which was also established in 1997, played a role in helping to coordinate government activity in the information economy via the MCIE and the Online Council.

The foundation of the commonwealth government's strategy for the information economy was released in the Investing for Growth statement in 1997. The strong theme of this statement was the link between the information economy and Australia's growth, employment and social prospects. It identifies the Internet as a key engine of change and as the platform for new productivity-enhancing technologies.

During 1998, a public consultation process for policy priorities for Australia's information economy was undertaken involving the community, industry and all three tiers of government. The Australian Information Economy Advisory Council (AIEAC) was established in October 1998 as the premier advisory body for industry and community input to the commonwealth government on the information industries and information economy issues, replacing the Advisory Board to the NOIE and the Information Industries Consultative Group. Council meetings have canvassed a broad range

of topics, including broadband communications, innovation in Australian information industries and improving Australia's international competitiveness in electronic service markets. AIEAC sub-committees have investigated the issues of Australia's skills shortage in information industries, stimulating innovation and entrepreneurship, and the availability, access and pricing of bandwidth.

NOIE coordinated the process of a whole-of-government collaboration that was designed to bring together a full range of government bodies and create a strategic framework for all commonwealth actions to develop the information economy. The result was A Strategic *Framework for the Information Economy - Identifying Priorities for Action*. It described the global and national context of Australia's information economy, including the impact of the Internet and its potential to help address the distance problem that has hampered Australia's economic and social development. The Strategic Framework also set out several principles to guide government actions: (1) all Australians should be able to participate and benefit from the information economy; (2) the government's role is to create the environment, while the private sector takes the lead in investment and market development; (3) and national approaches were favored in order to best promote Australia's interests internationally.

The *Strategic Framework* described the vision for Australia's information economy and set out 10 priorities for action. These priorities were consistent with three action agendas set out in Investing for Growth, namely promoting confidence, getting Australia online and developing the ICT industries. The 10 priorities were:

- Maximizing the opportunities for all Australians to benefit from the information economy;
- Delivering the education and skills Australians need to participate in the information economy;
- Advancing the growth of a world-class infrastructure for the information economy;
- Increasing the use of electronic commerce by Australian business significantly;
- Developing a legal and regulatory framework to facilitate electronic commerce;
- Promoting the integrity and growth of Australian content and culture;
- Developing the Australian information industries;
- Unlocking the potential of the health sector;
- Influencing emerging international rules and conventions for electronic commerce; and
- Implementing a world-class model for the delivery of all appropriate government services online.

Action Plans were developed for each of these priorities with responsibility for implementation falling to appropriate government agencies, including NOIE. All state and territory governments have developed their own strategies. These range from developing e-government initiatives through comprehensive visions for business skills development and rural and regional participation to investment in infrastructure. However, the Australian government has managed to keep the principles stated in the *Strategic Framework*: widespread access to basic and advanced communication services and private sector leadership in investment and market development within the facilitating environment created by the government.

From 2003, the Australian government gave priority to establishing a nationwide broadband network and encouraged business entities to connect to broadband. A lesser priority was collating information from SMEs to facilitate deals with large enterprises and foreign entities.

As for Australia's progress in the information economy since 1998, a number of independent international analyses have found Australia to be a leader in the development, deployment and use of information technologies and services, and a model economy for the regulatory and business environment needed to encourage private sector investment in the information economy. Some highlights include:[1)]

- The commonwealth government has allocated AU$1 billion to Social Bonus Funds from the second partial sale of Telstra. Of this, AU$670 million was committed with the primary objective of

improving communications and information technology services, particularly in regional, rural and remote Australia.

- Significant growth has occurred in Australia's participation in the information economy: some 52 percent of Australian households were online in September 2001 compared with only 16 percent in 1998, and some 69 percent of all business firms were online in June 2001 compared with 29 percent in June 1998.
- A robust and globally recognized regulatory framework for electronic commerce is being implemented in conjunction with the state government, addressing areas such as privacy, security, authentication, content regulation, consumer protection and legal recognition of online transactions.
- Australia successfully met the Prime Minister's commitment to all appropriate commonwealth government services being online by 2001.
- Developing and implementing comprehensive strategies in the education and health sectors to promote new ways of delivering services using ICT.
- Introducing the five-year AU$2.9 billion Innovation Action Plan, Backing Australia's Ability, to enhance Australia's capacity to generate ideas, accelerate the commercial application and develop skills so as to strengthen the nation's generic research capability and build competitive advantage in key sectors, including ICT, in particular, the AU$129.5 million ICT Center of Excellence.
- Enhancing venture capital tax arrangements to promote the formation of innovative companies and create the conditions necessary for a more entrepreneurial culture.
- Reforming the *Copyright Act* to improve conditions for the commercial online exploitation of content and facilitate online access to educational and cultural materials. Software copyright reforms were also introduced to assist software developers and others in the creation of interoperable products, error correction and security testing.

During the process of forming an information economy, small businesses showed a very active response. As mentioned above, approximately 80 percent of small businesses are now connected to the Internet, and the percentage of small businesses that paid for products and services over the Internet almost doubled for 2001-2002 (from 23 percent to 40 percent).[2)]

4. Government Organizations for SME Informatization

The Ministerial Council for the Information Economy is a high-level Australian government body established in 1997 by the Prime Minister to coordinate a whole-of-government action agenda for Australia's participation in the information economy, the secretariat of which is DCITA. The MCIE is chaired by the Minister for Communications, Information Technology and the Arts and its members include the Deputy Prime Minister and Minister for Transport and Regional Services, the Treasurer, the Minister for Trade, the Minister for Finance and Administration, the Minister for Health and Ageing, the Attorney-General, the Minister for Education, Science and Training, the Minister for Industry, Tourism and Resources, and the Minister for Employment, Workplace Relations and Small Business.

The Prime Minister has charged MCIE with responsibilities for the following whole-of-government action agenda, consulting with the States and Territories as appropriate:

- Framing an approach to electronic commerce;

1) For details, see NOIE. 2002. *Advancing Australia, The Information Economy Progress Report 2002*.
2) See Yellow Pages eBusiness Report. 2002. *The Online Experience of Small and Medium Enterprises*.

- Formulating a comprehensive regulatory and legal framework for information and online services;
- Further developing a National Information and Online Services Strategy, outlining public and private sector roles and priorities for action;
- Overseeing the government's positions for international fora;
- Continuing to design a whole-of-government blueprint for the Australian government as a leading user of new information and online technology.

The Department of Communications, Information Technology and the Arts (DCITA) is in charge of developing information technology and building infrastructure (physical as well as administrative). Programs and activities related to information technology and e-commerce are the ICT Center for Excellence, the ICT framework for the future report ("Enabling our Future"), the Incubator Program, indigenous communications and industry development arrangements for ICT procurement, among others.

The NOIE was an executive agency that provided leadership and advocated the value of participating in e-business. It facilitated bringing together firms to develop standards and interoperable solutions. A strategy for promoting e-business for SMEs was developed in 2001 by NOIE that is comprised of initiatives with the common objective of getting more SMEs online and deepening their engagement in e-business: e-business pathways guide, case studies, e-security (trusting the Internet) and broadband for small businesses. The office promotes the benefits of the information economy, acting as catalyst for change in the wider community and focusing debate on the use of new information tools in the Australian economy. Projects undertaken by NOIE fell within the following broad categories:

- Access, participation and skills;
- Adoption of e-business;
- Australia's strategic framework;
- Confidence, trust and security;
- Environment for information economy firms;
- E-government strategies and implementation; and
- International dimensions.

Among those categories, the 'adoption of e-business' is most related to the informatization of SMEs. This category is composed of three sub-categories: advancing with e-business, developing e-business and e-business environment. To advance with e-business, the NOIE tries to inform firms of e-business practices and the benefits of adopting online services and IT technology for business. Projects related to this adoption of e-business are the e-businessguide, the benefits of e-business, case studies,[3] e-business for small business and e-business strategy, among others. Various types of information on specific matters are provided to firms, including leaflets, booklets, papers and Web materials.

To develop e-business, the NOIE makes efforts to accelerate the start-up of e-business by including smaller business take-up of e-business, collaborative e-business/ITOL and sector facilitation. The focus of the support is on the collaborative networking of supply chains and firms forming a consortium and on the activities with externality such as testing a new technology or products. It also facilitates e-business in various SMEs to help create an e-business environment by dealing with standards, property rights and security issues. The Broadband Advisory Group (BAG) provided high-level advice to the NOIE on broadband development and provided a vehicle for fostering

3) NOIE commissioned professional services firm Ernest & Young to examine small and medium enterprises across 12 sectors in Australia. The case studies were drawn from all states and territories. The results are at [http://www.dcita.gov.au/ie/ebusiness/advancing/case_studies].

communication between stakeholders on both the supply side and demand side of the broadband issue.

On 8 April 2004, the Australian Government Information Management Office (AGIMO) was established, replacing NOIE. Functions of the former NOIE that relate to the promotion and coordination of the use of new information and communications technology to deliver Government policies, information, programs and services were placed with AGIMO. Functions of the former NOIE relating to broader policy, research and programs were transferred to the Office for the Information Economy in the Department of Communications, Information Technology and the Arts.

The Information Management Strategy Committee (IMSC) is the top commonwealth information technology strategy body, established as a result of recommendations outlined in a report, *The Australian Government Use of Information and Communications Technology: A New Governance and Investment Framework*, which was released by the Management Advisory Committee (MAC) on 15 October 2002.

This report outlined the framework of this body to:

- Facilitate a 'big picture' approach to ICT issues, although agencies will continue to be responsible for their own ICT arrangements;
- Promote closer collaboration between agencies in the next phase of ICT implementation, which will involve delivery of more integrated and interactive information and services online and require greater investment; and
- Encourage a cooperative approach to decisions on standards, investment, security, privacy, shared infrastructure and the reuse of intellectual property, and ensure that these reflect the impacts and benefits across government rather than on individual agencies alone.

No formal or statutory powers are proposed for the IMSC. However, if formal authority is required to achieve the desired outcomes, the IMSC will report to the MAC and to the Minister for Communication, Information Technology and the Arts.

Under the Department of Industry, Tourism and Resources, the Office of Small Business (OSB) covers the small business policies for all government bodies in areas such as financial, marketing and management services.DCITA and other government bodies cooperate with the OSB when they devise and implement their own specific projects related to small businesses.

State governments are involved in contacting individual firms and trade associations located in their own states, giving information and other kinds of support, but the commonwealth government is concentrated on policy-making for the economy as a whole. As a consequence, the relationship of state governments to firms and associations is closer than that of commonwealth government. They frequently share business information and sometimes act together against the commonwealth government to pursue common interests.

5. Major Policies and Projects for Enhancing SME Informatization

5.1. Providing Tools and Information

In September 2001, the commonwealth government allocated an assistance package worth AU$22 million for small businesses to advance with e-business. One element of the package was an AU$6.5 million NOIE initiative to facilitate the SME uptake of e-business. This package had two components: AU$3.25 million to encourage the uptake of e-business by SMEs and AU$3.25 million to facilitate online access to government purchasing.

To get more SMEs online and deepen their engagement in e-business, the NOIE provided three guides and case studies for SMEs:

- E-businessguide The e-businessguide is the overarching element of SME informatization. Research showed that the majority of SMEs were in the early stages of e-business adoption and there was confusion on how to apply it to their businesses. This guide outlines how to get online, the typical pathway a business might follow to integrate e-business into their business and the sort of e-business options available depending on business size and sector. It provides practical assistance such as checklists, questions to ask when seeking solutions and expenditure guidelines;
- E-security: Trusting the Internet - A simple guide to improve SME confidence in e-security business applications. Security concerns remain one of the top impediments to SME adoption of e-business; in particular, SMEs remain confused about what security controls they need to protect their business once it is online;
- Second series of case studies: *Advancing with e-Business* - The first set was released in October 2001. The case studies respond to one of the major needs identified by small business in going online - having an improved understanding of business cases;
- Broadband for small business - This project identified and profiled early SME broadband adopters, emerging applications and business cases for its wider use. Although there is anecdotal evidence that a small proportion of SMEs are embracing broadband, in general, SMEs have a poor understanding of broadband and the business case for its adoption.

5.2. Financial Support for Collaborative B2B e-Commerce

To develop SME e-business, there are two projects: the Information Technology Online (ITOL) Funding Program and sector facilitation. ITOL, a commonwealth government-funding program administered by DCITA, is designed to accelerate the national adoption of e-business solutions, especially by SMEs, across a broad range of industry sectors and geographic regions. It supports the adoption of collaborative e-business across a wide range of industry sectors, especially by clusters of SMEs, by offering competitive funding of up to AU$200,000.

ITOL encourages industry groups and small business to adopt commercial uses of the Internet to support productivity and profitability. It is a catalyst for industry groups to collaborate to solve common problems on an industry-wide basis rather than working individually and developing multiple solutions, and in some cases, unnecessarily duplicating efforts. Applications for funding are restricted to consortium-based organizations with at least three enterprises that are broadly representative of the industry sector and able to demonstrate strong industry support for the project.

ITOL supports 50 percent of the expenditure of the selected project and the consortium should raise the other 50 percent. Since 1996, over AU$10.7 million has been allocated to 102 projects across a diverse range of industry sectors and geographic regions through the ITOL Program.

There are four approaches in the sector facilitation project. The first approach is the research to scope out the issues in a sector, such as in health, road transport and insurance. The second is to build business cases through data analysis. Workshops with industry to develop collaborative solutions such as those conducted in the e-health and road freight transport sectors are the third approach, and the last approach is the modest seed funding for a range of projects through the ITOL program.

DCITA supported AU$3.3 million for 17 projects in the IT industry chosen by competition by the Testing and Conformance Infrastructure Program (Test-IT), but this program stopped a few years ago and is no longer funded.

5.3. e-Procurement

Commonwealth Government agencies are implementing e-procurement to improve the way in which they do business with their suppliers. Since the announcement of the Commonwealth Electronic Procurement Implementation Strategy in April 2002, commonwealth agencies have made considerable progress in implementing e-payment and most agencies have a basic e-procurement capability and are doing some online purchasing, generally from a few major suppliers. The lack of e-commerce-enabled trading partners has been nominated by agencies as a major impediment to increasing the uptake of e-procurement.

As mentioned above, half of the funding of AU$6.5 million to the NOIE in 2001 was to develop and implement a strategy to assist small businesses and Commonwealth government agencies to implement electronic trading. During 2002, the NOIE supported small business suppliers and commonwealth agencies in developing more sophisticated e-commerce capabilities. The eProcurement Demonstration Implementation Projects are a key aspect of the eProcurement Initiatives in Commonwealth Government Agencies Program, which was created to continue to enhance online service provisions for interactive transactions between the government and SMEs. In 2002/03, NOIE provided funding to encourage four key commonwealth agencies, including the Australian Antarctic Division, to advance the implementation of eProcurement initiatives. AGIMO will release a guide that will document agency experiences and illustrative case studies in addition to providing “how to” information and tools in 2004.[4)]

5.4. Networking the Nation

A complementary program to the ITOL is “Networking the Nation”, a five-year Regional Telecommunications Infrastructure Fund of AU$250 million designed to help bridge the gaps in telecommunications services, access and costs between urban and non-urban Australia. Established in 1997 and administered by DCITA, the program provides grants to nonprofit organizations to enable them to undertake projects that address various telecommunications needs in regional, rural and remote Australia.

4) For details, see [www.agimo.gov.au/business/e-proc_demos/].

5.5. BITS Incubator Program

The Incubator Program (AU$78 million) is a major component of the Building on the IT Strength Program (AU$158 million). Incubators are provided with funds so that they can assist start-up IT firms to turn ideas and R&D into successful businesses.

There are other programs to support businesses, such as tax concessions for R&D, authentication and e-security, and support for training high-skilled labor, but most of them are not for small businesses but for businesses in general.

6. Efforts for SME Informatization from the Private Sector

Since SMEs account for about 80 percent of the supply chains for large corporations, they are forced to transact electronically with their larger buyers. In the 1970s, electronic commerce took place between suppliers and a large corporation, either upstream or downstream, through a closed system such as EDI or ATM. Most B2B e-commerce and adoption of IT technology, even if open to the world through the Web, is still induced by large corporate interest. If a large corporation seeks to save costs and strengthen vertical control over its suppliers, SME informatization is unavoidable.

Conversely, independent small businesses are free to choose their involvement in adopting and using IT technology. The most challenging impediments to the adoption of e-commerce applications by SMEs are lack of capital and skilled personnel, the high cost of e-commerce applications and the need to re-engineer the core business of SMEs. Most governments, including Australia, are willing to work to abate those impediments.

Australia, like Canada and the United States, tries to keep government separate from private businesses, therefore it will not support private firms directly (at least at the federal level). The commonwealth government manages to confine itself to building an environment that is business friendly to information economy and to provide legal and institutional apparatus and useful information for private firms to use. The entities making investments to develop and adopt IT-related technology and equipment are private firms.

Trade associations for various industries are very active in dealing collectively with the different levels of governments as partners or as counterparts. The participation of trade associations in policy-making and policy implementation is essential to ensure a better outcome in a free economy such as Australia. Trade associations often suggest some policy options to the government - and then the government decides whether to adopt and support these options, although the government would rather lead the process at the beginning where a new type of technology or system is initially introduced to the economy.

ITOL plays a critical role in providing grants to enable industry groups to collaborate in solving common problems on an industry-wide basis. ITOL program emphasizes collaboration between and among industry groups since these industry groups have a strategic role in diffusing e-commerce technologies and in encouraging e-commerce uptake among SMEs. In Australia, this ITOL program has been helpful for a range of industry groups to participate in e-commerce. In the first five years of the program's operation (1996-2001), 67 IT projects have been funded.[5)]

5) See Table 3, G. Michael McGrath and Elizabeth More. 2002. "Forging and Managing Online Collaboration: The ITOL Experience", ITOL research monograph. This can be downloaded from [www.dcita.gov.au].

The following is an example that shows the close cooperation between association and the government where the government supports the association at the early stage of the project. The Federation of Automotive Product Manufacturers (FAPM) initiated establishing the Australian Automotive Network eXchange (AANX) with initial support from the ITOL program, which provides an IP based extranet for the Australian automotive industry. The ITOL program extended a grant in its early stage of development, and in a recently published case study, NOIE described the AANX project in detail.

7. Overall Assessment of SME Informatization

Australia is a sparsely populated economy spread over a vast area (except in some metropolitan areas). These conditions are not positive toward informatization since it is costly to build up a broadband network throughout the economy. Nevertheless, the degree of Australia's informatization is one of the highest in APEC members and e-commerce takes up more than 70 percent of all commercial trade. Thus, it can be said that the level of informatization is not proportionate to that of the nationwide broadband network. Many Australians are still connecting to the Internet by telephone modem and thus Internet usage fees are calculated by total connection time. However, most businesses, regardless of their size, are using the Internet or email for business, and they know how to optimize their choice of communication and information methods.

At the federal level, the Australian government does not subsidize an individual enterprise directly, even if it is small. It provides the private sector with a vision of the future and sufficient information for a firm to choose to adopt IT technology to its interest. It is more interested in establishing a business environment of legal and regulative institutions suitable to building the IT industry and e-commerce. Rather than a direct subsidy to an individual firm, the government likes to focus on externalities and network effects that a firm is likely to experience on an individual basis. Support for the testing of new embryonic technology and for consortiums of firms to build up new electronic network systems are typical examples of the way in which the Australian government assists the private sector financially.

The commonwealth government utilizes trade associations to gather information on what their respective members need and issue advice on what these associations, and the businesses they represent, should do to respond to the new trends they will face. Australian governments (federal and state) do not assist private businesses directly; rather, they work to lead them indirectly. This kind of support scheme seems to be very effective in reducing firm-level moral hazard and dependency on the government such as is prevalent in the economies where firms are directly supported by government.

Until 2001, there was no specific policy for promoting SME informatization in Australia. NOIE and other state governments put more efforts to give SMEs proper information on IT, e-commerce and knowledge-based economy. In particular, the ITOL program administered by the NOIE is helpful for a consortium of firms to find e-commerce solutions through collaboration. The fund, supported by ITOL, serves as a catalyst for the active participation of small businesses in e-commerce. The government takes applications from industry groups or associations on a competition basis and then financial support is given to these selected projects.

Another avenue of SME informatization is when a large corporation requires its suppliers or outlets to be connected to its intranet or to adopt IT solutions. It helps large corporations to standardize the management pattern through their respective supply chains or standardize the quality of goods and services. They often use this kind of informatization as a way of vertical control. In Australia, quite a

large portion of small businesses uses both Internet and intranet because of enforced informatization by large corporations.

Appendix B.2. Brunei Darussalam

1. Trends of Informatization

The Brunei government has shown its support for informatization by initiating the construction of an ICT infrastructure for its economy, which is based on the petroleum industry (an estimated 51 percent of GDP). The Brunei government recognizes that Bruneis economy needs to be broadened in order to survive an uncertain future. Brunei SMEs are encouraging to invest in IT to provide the necessary business information and related services to facilitate effective and efficient operations and stimulate business development for promising industrial and commercial enterprises.

The level of informatization achieved in Brunei is generally lower than the reference level (APEC average). However, it recorded remarkable growth in the Number of Internet users (from 7.77 per 1,000 in 1999 to 10.23 in 2001), indicating that ICT usage is spreading quickly in Brunei.

<Table 1> Informatization of Brunei Darussalam (as of 2001)

(Unit: Persons, %)

	Brunei	APEC Average
Mobile telephones in use per 1,000 people	400.58	434.02
Telephone mainlines in use per 1,000 people	258.59	372.71
Computers (PCs, mainframes, etc) per 1,000 people	73.09	310.59
Internet users, as % of population (1999)	7.77	15.13
Internet users, as % of population	10.23 (2001)	32.24 (2002)
Internet commerce (B2B +B2C) as % of total commerce	n./a.	0.46

Note: This data was recalculated from ITU based on KBE Indicators
Source: ITU. 2003. *World Telecommunication Indicators 2003.*

2. Definition of an SME

Definition of SMEs and Micro Enterprises in Brunei Darussalem

SMEs are defined as:	Number of Employees
Manufacturing, trading and wholesale, service and other sectors	≤ 100 people

The government recognizes the strategic role that SMEs play in the overall economic growth and diversification of Brunei Darussalam. From data provided by the Department of Economic Planning and Development, it is estimated that in 1994, Brunei SMEs accounted for 98 percent of all active

business enterprises. SMEs contributed 92 percent of employment in the private sector and a little over 66 percent of GDP in the non-oil sector. The government expects that SMEs will continue to play a pivotal role in the economy's economic development in the new millennium.

SMEs in Brunei are defined as businesses with 1-100 employees. However, statistics show that majority of businesses in Brunei are micro-enterprises and small enterprises. Micro-enterprises, those with 1-5 employees, account for 43 percent of SMEs while small enterprises (6-50 employees) account for 53 percent of SMEs. Medium enterprises (51-100 employees) account for only 4 percent of SMEs..[1)]

3. Strategy and Progress of SME Informatization

On the national level, the government has formed the Brunei Darussalam Information Technology Council (BIT Council), which aims to lead and facilitate the strategic development and diffusion of the state-of-the-art IT for the entire nation. More information is available at the government Web site.[2)]

The conceptual framework of the National IT Plan is as follows. [3)]

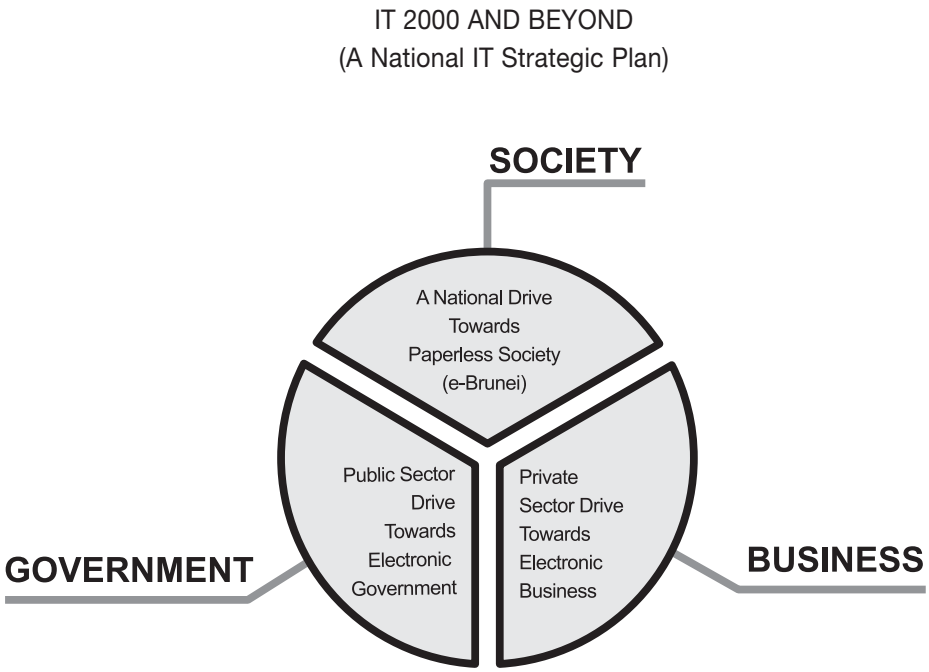
In line with the core strategy of the National IT Strategic Plan, Brunei Darussalam has embarked on establishing E-Government Strategic Initiatives and Framework specifically for implementing e-Government programs. This is known as the e-Government Strategic Framework for Action 2001-2005 (EG21 - Governance). The e-Government program seeks to improve the internal operations of the government ministries and departments in addition to how they deliver their services to the people of Negara Brunei Darussalam. Improvements are expected to include aspects of convenience, accessibility and the quality of interactions between government agencies, government agencies and business as well as the government agencies and the public.

The e-Government Core Strategies highlight the government's role as:

- The principal institution to facilitate the civil service in performing meaningful paperless governance and services; and
- The catalyst to drive home demand and support the set-up of innovative ICT- related and supporting industries in Brunei Darussalam.

1) Source: BSMENet.
2) [http://www.bit.gov.bn]
3) [http://www.bit.gov.bn/dwnload/BIT-COUNCIL.pdf]

<Figure 1> Organizational Structure for National Informatization of Brunei Darussalam



Three core strategies have been identified to drive the strategic goals for the e-government program as follows:

- Core strategy #1: Institute an e-government structural framework to realize and sustain bona fide outcomes:
  · Institutional infrastructure;
  · E-government architecture; and
  · Monitoring and regulatory mechanism.
- Core strategy #2: Inject small amounts of capital into building reliable infrastructure and accessible content:
  · E-government infrastructure;
  · Common e-government applications and services;
  · Specific e-government applications and services.

Thus, the e-government initiative may be viewed as a catalyst for the national IT plan, which is expected to encourage both government ministries and SMEs to utilize ICT in their business transactions.

SME informatization can be defined as the processes that are undergone in order to transform SME s into an informed community so that they are revitalized and develop a culture of innovation that can enhance their business competitiveness. In this regard, the government is committed to using IT as a critical ingredient in that process. For the Ministry of Industry and Primary Resources, in May 2003, the Promotion and Entrepreneurial Development Division (PEDD) published a new Web site (http://navision-data.pusatsumber.gov.bn) that will eventually provide on-line services to

entrepreneurs, including e-commerce support services. At present, those services are limited to information on the library collection for the Sinaut, Tutong office of the PEDD, as well as information on financing schemes, business advisory services, training programs, business incubator programs and information on local food producers and their products. SMEs can also register their products on-line. As part of the Business Advisory Program, SMEs can apply on-line to become a member and send their problems and read responses from resource personnel. For training programs, entrepreneurs can view the schedule of programs and register for courses on-line. This Web site, which is called the Entrepreneur and Business Development Website (EBDW), will complement the existing BSME Net. The BSME Net and EBD Web sites are continually being updated to provide most recent information and better on-line services to entrepreneurs. Those developments are part of the projects under the National Development Plan, which is now in its eighth phase (NDP 8, 2001-2005).

4. Governmental Organizations for SME Informatization

The SME informatization process of Brunei is led by the Ministry of Industry and Primary Resources. Within the ministry is the Promotion and Entrepreneurial Development Division. Programs and activities of the government agencies and parts of the private sector responsible for SMEs are increasingly being coordinated by this division.

Ministry of Industry and Primary Resources

Major Projects	Details
Training Program	
Entrepreneur Development scheme	Enhance the entrepreneurship qualities and business management abilities of Brunei entrepreneurs and increase the participation of SMEs in new and productive economic activities. The training program includes in using computer applications (word processing, spreadsheet, database and iInternet).
Enterprise Development Scheme	Increase the production capacity of SMEs, improve product quality, assist in developing new products and the use of technology; diversification and development of contractual activities and increasinge the effectiveness of marketing, management and technology transfer of existing entrepreneurs.
Regional Cooperation project	Encourage local enterprises to develop, modernize and expand their operations through the establishment of regional cooperation projects, i.e., joint ventures and strategic alliances.

4.1. Sub-Organization

The government of Brunei has recognized the significant role that SMEs play in the economic development of the nation. It is therefore creating a good business environment to strengthen the competitiveness of SMEs by providing administrative support; financial assistance schemes, investment and trade promotion opportunities, training and other technical assistance to SMEs.

The Promotion and Entrepreneurial Development Division was formed in late 2002 from the amalgamation of two agencies in the Ministry of Industry and Primary Resources, namely: the Resource and Standards Centre and the Planning and Industrial Promotion Division. It is now the agency that serves as a focal point for SME development in Brunei Darussalam. Its main missions are to create self reliant and competitive entrepreneurs and facilitate the development of high quality marketable products that can contribute to the nation's goal of economic diversification.

The main objectives of the Promotion and Entrepreneurial Development Division are:

- To identify potential entrepreneurs and support their development to become enterprising and socially responsible business owners and managers of enterprises engaged in the primary resources and industry sectors
- To identify locally produced goods and services in the primary resources and industry sectors that have commercial potential and support their development as competitive and marketable products in local and international markets

5. Efforts for SME Informatization from the Private Sector

5.1. Training Programs

i. Brunei Shell LiveWire Programme (for Young entrepreneurs)
ii. ASEAN EC Management Centre
iii. SEAMEO VOCTECH

5.2. BSMENet

BSME NET (http://www.bsmenet.org.bn) is an upgraded version of the Brunei Darussalam Small and Medium Enterprise Homepage (BSME HP), which was released on 15 November 1997. The revised and improved version of the BSME HP Web site is a collaborative effort of Resource and Standard Centre (now amalgamated into the Promotion and Entrepreneurial Development Division) of the Ministry of Industry and Primary Resources (MIPR) and two private organizations, the Brunei Shell Petroleum Sdn Bhd and Brunei LNG Sdn Bhd. The Web site was launched in April 2000 by the Permanent Secretary of MIPR, Yang Mulia Dato Paduka Awang Hj Danial bin Hj Hanafiah, at the Dewan Setia Pahlawan of MIPR building in Bandar Seri Begawan.

The BSME NET web is primarily aimed at providing the necessary business information and related services to facilitate effective and efficient operations and business development of promising industrial and commercial enterprises, particularly SMEs, in Brunei Darussalam. Similarly, it has the

also an objective of facilitating the exchange of business related information between investors and businesspersons on Brunei's attractive and competitive business opportunities and environment.

5.3. Business Associations

The National Chamber of Commerce and Industries Brunei Darussalam has Wweb site[4] that disseminates information for entrepreneurs.

6. Overall Assessment of SME Informatization

Brunei's informatization is in its initial stage and is not based on a step-by-step approach. The Brunei government has a strategy for SME informatization, but this is part of an overall strategy to promote e-government. It recognizes the importance of SME informatization for economic diversification and is propelling investment in IT infrastructure.

There are not many governmental ICT projects catered to business needs, but the government launched a Web site[5] that offers e-commerce and provides supporting services to entrepreneurs. Other government activities to support SME informatization, such as ICT training and financial support for SMEs, are in their initial stages and specific progress has not been reported.

The Brunei Darussalam government has led strategies to promote businesses, and because major businesses, including SMEs, are state-owned corporations, it is highly likely that the government will lead the effort to informatize SMEs as well.

4) [http://www.nccibd.com]
5) [http://navision-data.pusatsumber.gov.bn]

Appendix B.3. Canada

1. Trends of Informatization

The "Connectedness Agenda" has been a key priority for the Canadian government. In 1997, the government set the goal of making Canada the most connected economy in the world by making the information and knowledge infrastructure accessible to all Canadians by 2000. Special focus was given to three areas: infrastructure, use and content. As a result of these efforts, the level of informatization of Canada is assessed to be high.

In Canada, 385.2 per 1,000 people use mobile phones, 87 percent of the APEC average of 434.02, and telephone mainline subscription was 696 out of 1,000 people, or 187 percent of the APEC average of 372.71. The number of computers per 1,000 inhabitants is 647, far above the APEC average of 310.59.

<Table 1> Informatization of Canada (as of 2000)

(Unit: Persons, %)

	Canada	APEC Average
Mobile telephones in use per 1,000 people	385.2	434.02
Telephone mainlines in use per 1,000 people	696	372.71
Computers (PCs, mainframes, etc) per 1,000 inhabitants	647	310.59
Internet users, as % of population (1999)	39	15.13
Internet users, as % of population (2000)	56.97	32.24
Internet commerce (B2B +B2C) as % of total commerce	1.01	0.46

Source: APEC. 2003. *KBE Indicators*.

Despite Canada's progress in informatization, there is evidence of a digital divide between the information "haves" and "have-nots". There is a strong and documented relationship between the use of the Internet and household income as well as the education level of the household head. In 2002, 78 percent of households in the highest income group had a member who used the Internet from home. In contrast, among the households in the lowest income group, only 25 percent had a member who used the Internet from home. The penetration rate for households where the head has a university degree (86.8 percent) was almost three times higher than the rate for households in which the head did not complete high school (30.2 percent).

Another issue of concern to policymakers is that of barriers to access for people located in rural and remote areas. Elsewhere, Statistics Canada has identified subsets of the general population use the Internet less than the general population, that is, rural Canadians, Francophone Canadians, seniors, low income earners and people with low levels of education. Increasingly, attention is being paid to patterns of Internet use for individuals.

2. Definition of an SME

As of June 2002, there were approximately 2.2 million businesses in Canada, and almost all of these businesses were SMEs. Small businesses (those with fewer than 100 employees), account for about 98 percent of all Canadian businesses. Medium-sized businesses are defined as having between 100 and 499 employees and large businesses have 500 or more employees. SMEs account for about 60 percent of Canada's private-sector payroll employment. About half of all business establishments in Canada are called employer businesses since they maintain a payroll of at least one person (possibly the owner).

Non-employer businesses account for 1.1 million or about 52 percent of all businesses in Canada. Non-employer businesses may well provide employment on a contract basis for the owner or other individuals. All non-employer businesses are considered to be micro-enterprises as they have fewer than five employees. Nearly 80 percent of all employer and non-employer businesses in Canada are micro-enterprises. Micro-enterprises are three times more likely to be unincorporated - that is, proprietorships, unincorporated joint ventures or partnerships-as compared to other small businesses.

3. Strategy and Progress of SME Informatization

Canada provides various types of counseling using advanced ICT technologies along with provincial chambers of commerce to support SMEs from business setup to legal services, and business advice. However, the informatization of SMEs is in the domain of the private sector, led by the market. The government is making efforts to create a favorable environment for ICT by improving the legal framework for privacy, certification, and electronic signatures.

3.1. Strategy for SME Informatization

Industry Canada of the Canadian federal government has two strategic objectives connectedness and innovation - that constitute the overall strategy of SME informatization in Canada.

3.1.1. Connectedness Agenda

The Connectedness Agenda, established in 1998, aims to provide Canadians with new opportunities for learning, interacting, transacting business and developing their social and economic potential. Connectedness ensures basic connectivity and high-speed affordable broadband access to the Internet, enabling Canadians to benefit from ICT and contribute to Canadian content on-line.

The Connectedness Agenda focuses on three main program areas, infrastructure, use and content, in six areas of activity:

- Promoting and ensuring Canadians' access to a world-class information infrastructure;
- Encouraging the development of smart communities;
- Developing Canadian digital content;
- Putting governments on-line;

· Globally, branding a connected Canada; and
· Making Canada a world leader in electronic commerce.

Industry Canada is a founding partner in the Government On-Line (GOL) initiative. The key goals of GOL include increasing satisfaction with government services by providing on-line access to the most commonly used federal services (the services that touch the lives of the greatest number of Canadians and businesses) by 2005.

As of 2003, the GOL initiative included over 130 services from 30 federal departments and agencies. Many of these services are actually a combination of multiple programs. Canada has made substantial progress in putting information and transaction services on-line. All federal laws, regulations and policies are available through the Internet, as is information about important programs. Similarly, all key forms are available on-line. In fact, almost all services are now at least partly on-line and are continually becoming more sophisticated.

The GOL initiative is now looking towards the next phase of GOL, which includes multi-channel, client-centric service transformation on a whole of-government scale. Work is underway to construct a government vision for service transformation. The goal of this is to build systems and services that transform the way the Canadian government delivers services to citizens, for example, by reducing processing times and integrating services across departments and jurisdictions.. (http://www.gol-ged.gc.ca)

3.1.2. Innovation Strategy

In 2002, the federal government made a major commitment and investment in promoting innovation by launching Canada's Innovation Strategy with the release of two documents "Achieving Excellence: Investing in People, Knowledge and Opportunities" and "Knowledge Matters: Skills and Learning for Canadians". Collectively, this strategy aims to improve innovation, skills and knowledge in Canada. The Innovation Strategy links human resources (skills and knowledge) with technological infrastructure.

Innovation is the process of generating new business concepts and applying conceptual knowledge to the development and commercialization of new products and services. Innovation is closely linked with the expansion and growth of SMEs through investment in computers and Internet technology as a means of conducting commercial transactions and improving internal operations. By incorporating innovation into business practices, SMEs are more likely to identify new and unique market niches and differentiate their products and services from other competitors.

3.2. Progress of SME Informatization

Recent research indicates that while Canadian SMEs are connected to the Internet, they are not effectively leveraging this new technology to stay competitive. A clear majority of Canadian businesses (76 percent in 2002) use the Internet; however, few are investing resources to explore more sophisticated e-business applications. About 8 percent of firms used the Internet to sell goods or services and 32 percent of firms bought goods or services over the Internet in 2002 (compared to 22 percent in 2001 and 18 percent in 2000). In this context, Canada is endeavoring to ensure that this growth continues, and that business owners understand the business opportunities that electronic commerce presents.

4. Governmental Organizations for SME Informatization

Canada's Minister of Industry is accountable to Parliament for all matters related to SMEs. The mission statement of this ministry specifies that promoting small business development is one of its program areas, and the ministry reports on the policy and programs developed and implemented by a portfolio of 13 departments and agencies the Industry Portfolio.

Industry Canada's mandate is to help make Canadians more productive and competitive by promoting growth in productivity, employment and income while fostering sustainable development. Industry Canada works with other members of the Industry Portfolio towards achieving of five strategic objectives:

- Building a fair, efficient and competitive marketplace.;
- Improving Canada's position as a preferred location for domestic and foreign investment.;
- Increase Canada's share of global trade.;
- Making Canada the most connected economy in the world.; and
- Improving Canada's innovation performance.

As SMEs account for 99.8 percent of all businesses in Canada, most federal government departments contribute to SME informatization. However, Industry Canada has a leading role to play in terms of connecting Canadians to the Internet over wide and remote expanses of land, and encouraging them to generate business models and apply their knowledge to the development and commercialization of new products and services for the global marketplace. Two sectors in Industry Canada are dedicated to the development of SME informatization policies and programs - the Policy Sector, and the Spectrum, Information Technology and Telecommunications (SITT). Outlined below are the major plans, policies and programs for these divisions.

5. Major Policies and Projects for Enhancing SME Informatization

5.1. Policy Sector

5.1.1. Innovation Policy Branch

Industry Canada's Innovation Policy Branch aims to improve Canada's overall innovation performance by increasing investments in research and development (R&D), advanced technologies, and knowledge workers. Accordingly, the branch conducts policy research and analysis on issues relating to science and technology, innovation in the marketplace, and knowledge infrastructure. The Innovation Policy Branch leads Canada's long-term effort to double its R&D expenditure by 2010. Doubling R&D spending will mean, for example, increasing the external patent applications and the number of research workers in the labor force. It will also entail fostering improvements in management skills.

Most federally funded R&D in ICT is performed through governmental research centers and in partnership with industry and universities. Examples are:

- Canadian Network for the Advancement of Research, Industry and Education (CANARIE Inc.) - Canada's Advanced Internet Development Organization operates as a not-for-profit corporation supported by its members, project partners and the federal government. CANARIE's mission is to accelerate Canada's advanced Internet development and use by facilitating the widespread adoption of faster, more efficient networks and by enabling the next generation of advanced products, applications and services to run on them. (http://www.canarie.ca)
- Advanced Internet Network Infrastructure (CA*net3) - CANARIE, in partnership with the federal government, launched CA*net3 in 1998 to design and deploy a next-generation broadband network in support of the national research and education community in Canada. CA*net 3 provides the innovation backbone that enables scientists and educators in Canada to collaborate regardless of time, location and distance. The network provides optical Internet inter-linking between federal and provincial research institutions, the Networks of Centres of Excellence, and universities and colleges. The network is also linked to international peer networks in Asia, Europe and North/South America.
- National Research and Innovation Network (CA*net4) - In 2002, the federal government provided five-year funding to CANARIE to develop, deploy and operate CA*net4, Canada's National Research and Innovation Network, through 2007. Both CA*net 4 and CA*net 3 connect provincial research networks with universities, research centres, government research laboratories, schools and other eligible sites to each other and to international peer networks. The project is intended to contribute to the creation of a sustainable research network for Canada's research community and provide equipment manufacturers, carriers and others in the information and communications technology sector with a unique showcase for their cutting-edge technology.
- Communications Research Centre Canada (CRC) offers SMEs space, access to unique labs and facilities, a world-class research team and a portfolio of leading-edge patented technologies. CRC helps SMEs face particular difficulties in developing and marketing their ideas, and overcoming financial and managerial obstacles.
- Canada National Research Council (NRC) - The National Research Council's Institute for Information Technology (NRC-IIT) creates and commercializes new software and systems technology, strengthens software engineering practices in the private sector, and communicates, educates and consults to help Canada prosper in the information age and knowledge economy. Along

with the NRC Institute for Microstructural Sciences, NRC-IIT operates three Industry Partnership Facilities in Canada to help SMEs access to NRC expertise and exploit emerging technologies by providing a supportive working environment (http://www.nrc.ca). NRC-IIT's main research areas include:

- Information analysis and retrieval;
- Software engineering;
- Artificial intelligence technologies;
- Security and privacy ;
- Visual information technologies;
- e- Business;
- Wireless systems;
- High-performance computing; and
- Human- computer interaction.

Other programs and organizations supported through the Innovation Policy Branch include:

- Technology Partnerships Canada (tpc.ic.gc.ca);
- Pre-competitive Applied Research Network (PRECARN);
- Genome Canada;
- Fuel Cells Canada; and
- BioProducts Canada.

5.1.2. Small Business Policy Branch

Industry Canada's Small Business Policy Branch (SBPB) provides the Minister of Industry and other stakeholders with strategic policy and program advice and information on a range of issues affecting SMEs. SBPB's core role is to conduct research and analysis on issues affecting small businesses, and to promote the development of policies and programs based on the results.

SBPB aims to deepen the Canadian SME knowledge base. To diffuse this knowledge, SBPB assesses existing information on Canada's small businesses, identifies gaps in policies and strategic information, and develops business information products to fill these gaps. To promote SME informatization, SBPB makes the following information products available on-line:

- Sources of Financing http://strategis.gc.ca/sources
  A comprehensive database of financial providers including banks, leasing companies, venture capital, government assistance programs, credit unions and micro-credit providers; and tools such as the SME Financial Service Charges Calculator, and the Lease or Buy Calculator.
- Performance Plus http://sme.ic.gc.ca
  An interactive, on-line financial performance tool to help new and established firms make the best operational decisions and determine how they measure up to the competition.
- Steps to Growth Capital http://growth.ic.gc.ca
  The Canadian entrepreneur's guide, with practical tools, links and resources that help firms secure risk capital by determining whether they a're ready to meet investors' needs.
- Contact! The Canadian Management Network™ http://strategis.gc.ca/contact
  A directory of business support organizations and accredited professionals that provide advice on everything from business start-ups to home business operations, and dealing with foreign business practices.

SBPB works closely with Canada's regional development agencies and other members of the Industry Portfolio, provincial and territorial governments and an extensive network of associations and community-based, non-profit organizations to provide useful on-line information on products

and services for SMEs. In order to tap into the entrepreneurial capacity and growth potential of small, localized businesses, SBPB shares its strategic analysis through a dynamic network of Web-sites. The main partnerships and networks facilitating this effort are:

- *Strategis: Canada's Business and Consumer Site* http://strategis.ic.gc.ca. Strategis provides a link to popular business sites such as Contact! *The Management Network, Sources of Financing, and Performance Plus*. Strategis also provides a link to the federal government's Internet strategy - *Government On-Line (GOL)*, which is represented through the portal www.Businessgateway.ca .
- Canada Business Service Centres (CBSCs) http://www.cbsc.org The CBSC initiative was designed to improve service to the business community by creating a single access point to comprehensive information on government programs and services of interest to business. To date, 10 offices have been opened, one in each province. Each CBSC offers a variety of products and services to help clients obtain, quick, accurate and comprehensive business information. This enables clients to make well-informed business decisions in an increasingly global economy. The following is a list of some of the key products and services that may be made available:
  - A CBSC has been established in each major urban center with a toll-free front-line telephone information and referral service;
  - Business Information System (BIS): a comprehensive database containing information on the services and programs of participating provinces; and
  - Each CBSC offers a variety of products and services to help clients obtain, quick, accurate and comprehensive business information. The CBSCs minimize telephone run-around, inadequate departments and organizations.

The CBSCs are managed through a complex partnership of organizations. The initiative is a collaborative effort between federal, provincial and private sector organizations. There are currently 31 federal business departments participating in these initiatives as well as other levels of government and non-government organizations.

- Community Futures Development Network - http://www.communityfutures.ca. The CFDC Network is an extensive, grassroots network of more than 250 federally- funded, non-profit, local development organizations run by volunteer boards of directors and salaried staff. This community-based network is supported by Canada's regional economic development agencies: the Atlantic Canada Opportunities Agency (ACOA), Canada Economic Development for Quebec Regions (CED), Federal Office for Development in the Northern Ontario Region (FedNor), and Western Economic Diversification (WD).

5.2. Spectrum, Information Technologies and Telecommunications

Spectrum, Information Technologies and Telecommunications (SITT) is responsible for analyzing issues and developing policies and programs relating to the adoption and use of the Internet and ICT. There are two sections in SITT - Spectrum Management and Telecommunications (a legislative and regulatory organization that manages the radio frequency spectrum to ensure fair and equitable access to the radio frequency spectrum) and Information and Communication Technologies (promotes the growth and competitiveness of Canada's ICT industry through innovation, investment, international trade, and policy analysis). SITT consists of the following branches:

- Electronic Commerce ;
- Information and Communications Technologies;
- Radio-Communications and Broadcasting Regulations;
- Telecommunications Policy;
- Spectrum Engineering; and

· Information Highway Applications Branch.

5.2.1. Electronic Commerce Branch

SITT's Electronic Commerce Branch introduced the Electronic Commerce Strategy in September 1998. The strategy supports the analysis of the regulatory environment relating to SME Informatization in areas such as licensing Internet-based services, technology-neutral taxation, and the need to consult with private sector advisory groups. Canada has been pursuing objectives for ICT and e-commerce in a trade context, including greater market access and national treatment obligations, irrespective of the mechanism of delivery, across a broad range of relevant goods and services; a permanent ban of customs duties to electronic transactions; and a transparent and non-discriminatory regime for domestic legislation and regulations that apply to electronic commerce.

The Electronic Commerce Branch develops a number of domestic policies relating to ICT adoption and use by SMEs, including:

· Cryptography Policy;
· Authentication;
· Privacy;
· Consumer Protection;
· Digital Signatures; and
· Strategy to Promote Safe, Wise and Responsible Internet Use.

5.2.2. Information Highway Applications Branch

Given the increasing importance of information and knowledge in the information age, the government is concerned with giving all Canadians the opportunity to participate in economic and social benefits. The Information Highway Applications Branch (IHAB) develops and implements several programs to help encourage the diffusion of computers and the Internet to schools, libraries and community organizations. A few of these programs are outlined below:

· SchoolNet - SchoolNet is a collaborative initiative designed to promote the effective use of information technology in learning and to foster the development of employability. SchoolNet's work is guided by the SchoolNet National Advisory Board, which includes members of the provincial and territorial Ministries of Education, professional associations and volunteer sector. On March 30, 1999, Canada became the first economy in the world to connect its public schools, including First Nations schools, and public libraries to the Internet. SchoolNet undertakes a number of projects to facilitate the integration of ICT in learning settings. The SchoolNet portal is a recognized world leader in learning content with an extensive inventory of over 7,000 learning resources. (http://www.schoolnet.ca)
· Computers for Schools (CFS) - CFS aims to increase access to information and communications technologies for Canadians by recycling surplus computerss, donated from both the public and private sectors, to schools and public libraries. Under the direction of Industry Canada, CFS oversees more than 60 repair and refurbishing centres throughout Canada, where surplus computers are cleaned, refurbished, and prepared for delivery. Workshops are staffed by volunteers, including current and retired telecommunications professionals and students, thus providing Canadian youth with the opportunity to gain hands-on technical experience in computer refurbishment. To date, 425,000 computers have been delivered to schools and libraries across Canada. (http://www.schoolnet.ca/cfs-ope)
· Smart Communities - Smart Communities have a vision of the future that involves the use of ICT in new and innovative ways to empower residents, institutions and regions as a whole. To promote

these efforts the federal government allocated $55 million over three years to fund 12 Smart Communities demonstration projects: one in each province, one in the North, and one in an Aboriginal community. These communities are becoming world leaders in the integration of ICT into everyday life in areas such as health care, education, training and business. The lessons learned from these demonstration projects will advance the use of ICT at the community level across Canada. (http://smartcommunities.ic.gc.ca)

- Community Access Program (CAP) - CAP's overall objective is to provide Canadians with affordable, convenient public access to the Internet, at the local community level. In partnership with communities, provincial, territorial and municipal governments, the private sector and not-for-profit organizations, the government has helped to establish a nation-wide network of public Internet access sites, in such locations as libraries, schools and community centres. (http://cap.unb.ca)

6. Efforts for SME Informatization from the Private Sector

Industry Canada engages SMEs through a wide range of industry associations. A sample of these organizations is described below.

- Canadian Federation of Independent Business (CFIB) - CFIB works on behalf of more than 100,000 independent business owners in every sector and region in Canada. Taking direction of its members, through regular surveys, CFIB lobbies for SMEs at the federal, provincial and local levels of government. (http://www.cfib.ca)
- Canadian Chamber of Commerce - The Canadian Chamber of Commerce is the national leader in public policy advocacy on business issues. Our customers reflect a strong, diverse network and include: chambers of commerce, boards of trade, corporate members, business associations and-businesses of all sizes in all regions as well as non-members who purchase Canadian products and services. The chamber seeks to create a business climate of competitiveness, profitability, and job creation for businesses of all sizes in all sectors across Canada. (http://www.chamber.ca/)
- Canadian Manufacturers and Exporters (CME) - Canadian Manufacturers and Exporters, has represented the interests of Canadian business for more than 130 years, keeping members on the competitive edge of world-class manufacturing and trade. With divisions in every province, CME is a national association and champion of business issues in Canada. CME's mission is to continuously improve the competitiveness of Canadian industry and expand export business. (http://www.cme-mec.ca/)
- Canadian e-Business Initiative (CeBI) - A voluntary, private sector-led partnership that aims to further Canada's e-business success by creating the right environment, advocating e-business adoption and use amongst SMEs, advising on tax and investment rules, branding Canada as a tech-savvy economy and benchmarking Canada's performance in the digital economy.

7. Overall Assessment of SME Informatization

Canada's goal is to become the most connected nation in the world. In 1998, Canada's e-strategy was released, outlining initiatives designed to establish Canada as a world leader in the adoption and use of electronic commerce. Since the announcement, the government has been working in close collaboration with the private sector. The federal government has concentrated on creating the most favorable environment possible in areas necessary for the rapid development of e-commerce.

In particular, the government, in cooperation of chambers of commerce, offers information on markets by region where would-be business owners want their start-ups to be opened, and provide counseling service on all aspects of business such as production, marketing, and distribution by utilizing ICT, including the Internet. This service is available to all Canadians through Businessgateway - is a single access point offered by the CBSC. Through this process, Canada assists in CEO decisions to improve the start-up, survival and growth rates of SMEs. The internal informatization of SMEs is led by market functions. The government provides support in areas where the private sector is not able to effectively function.

Despite the government progress, Canadian SMEs have seemingly been unable to effectively lever on-line technologies and services to stay competitive. In addition, there seems to be a growing digital divide between household incomes and education levels in regards to Internet use. Therefore, the government is are turning its attention to subsets of SMEs that are not using information technologies efficiently - those in rural and remote areas, seniors, low-income earners and people with low levels of education. At the same time, Canada''s Innovation Strategy aims to improve the skills and knowledge base of human resources in SMEs, particularly those in very small or micro-businesses,, by improving their access and use of technological infrastructure in business practices.

Since the establishment of Federal/Provincial Labour Market Development Agreements in 1999, the Innovation Strategy has been closely linked to education and training - an area falling under provincial government jurisdiction. In December 2003, Canada's new Prime Minister announced that SME investment is a priority for enabling and transformative technologies as well as education and training for individuals. By collaborating with provincial and municipal governments, Canada's new government aims to improve small business access to markets by levering technologies - or SME informatization - more effectively.

Appendix B.4. Chile

1. Trends of Informatization

Chile ranks first in personal computer penetration among Latin American economies, and it records explosive growth in the number of Internet users. Chile's rapid expansion of the information highway is particularly notable. Chile makes twice as many on-line transactions on average with the United States and Europe as do all other Latin American economiescombined and has the largest number of Internet hosts per person in Latin America. It has usedthis experience to expand commercial ventures into electronic commerce and become a leader in this area.

As of 2000, the Internet penetration rate exceeded 22 percent. However, in most ICT indicators, the level of informatization in Chile is assessed to be lower than the APEC average. In Chile, 407 per 1,000 inhabitants use mobile phones (94 percent of the APEC average of 434.02 people) and telephone mainline subscription was 236 out of 1,000 people (63 percent of the APEC average of 372.71). The number of computers per 1,000 inhabitants was 120, somewhat behind the APEC average of 310.59; however, computer penetration is expected to grow to over 30 percent in 2004.

<Table 1> Informatization of Chile (as of 2000)

(Unit: Persons, %)

	Chile	APEC Average
Mobile telephones in use per 1,000 people	407	434.02
Telephone mainlines in use per 1,000 people	236	372.71
Computers (PCs, mainframes, etc) per 1,000 people	120	310.59
Internet users, as % of population (1999)	3.8	15.13
Internet users, as % of population (2000)	22.22	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.22	0.46

Source: APEC. 2003. *KBE Indicators*.

2. Definition of an SME

SMEs are defined bytheir annual sales. Micro-enterprises have annual sales of less than about US$62,000, small enterprises between US$620,000 and US$650,000, and medium enterprises between US$650,000 and US$2.5 million.

As of 2001, there were about 650,000 enterprises in Chile, and among these enterprises, 535,000 enterprises (or 99 percent of the total) were SMEs. Micro enterprises occupy about 82 percent of the total enterprises. Only about 1 percent of enterprises are classified as large enterprises. SMEs represented 83 percent of total employment and generated 27 percent of GDP in 2000.

3.Strategy and Progress of SME Informatization

In the 1980s, the Chilean government sought to attract foreign capital by opening up the market, including the ICT market. As a result of deregulation and national treatment for foreign investment, many multinationals advanced into the Chilean market. Through these efforts, the infrastructure of Chile is well developed with the Internet and e-commerce sectors fast developing.

Chile has recognized the importance of the digital economy and actively pursued adoption of ICT in the economy. President Lagos set up the Committee of Ministers for Information and Communication Technologies with members from various ministers and other high-level government officials in June 2000. The committee started to work on a number of projects that were clustered in five thematic areas:

- promotion of access;
- electronic government;
- new technologies in businesses;
- human resources development; and
- information and public participation.

Each of these areas are led and coordinated by the institution that has a jurisdictional function on the area. The promotion of access project, for example, is led by the sub-secretary of communications (Subtel). In the short term, the committee has been working on the development of policy and concrete projects in the areas of access, government, human resources and ICT in business.

4. Governmental Organizations for SME Informatization

4.1.Ministry of Transportation and Telecommunications

Chile's ICT policy is led by the Ministry of Transportation and Telecommunications, which is establishing the Internet Telecenter to encourage the public use of information and infocenters to facilitate use of ICT in social organizations. The Telecommunications Development Fund was introduced to support telecommunications facilities in underdeveloped areas.

4.2. Chilean Economic Development Agency (CORFO)

CORFO promotes ICT projects by providing tax incentives and introducing the new stock market (Balsa Emergente) to support ICT businesses including venture companies. In order to be more competitive internationally, Chile has proposed the expansion and modernization of its productive base. This way, the economywill increase manufacturing and industrial output, raise the quality levels of both goods and services, and incorporate higher value-added levels of intelligence, technology and know-how in them. CORFO has institutional branches in each of Chile's 13 administrative regions and an office in New York City, the United States.

The current SME support programs are incorporated in the Industrial Development Program,

administrated and coordinated by CORFO. In the new orientation, the SMEs are considered as a source of competitiveness, particularly when relating to external markets or to large dynamic enterprises. CORFO serves as a good source of important information and the main data point for SMEs because they control enterprise formation via fiscal tax exemption.

Another affiliated organization of the CORFO is the Servicio de Cooperacion Tecnica Sercotec (Technical Cooperation Service), which specializes in SME technical support.

5. Major Policies and Projects for Enhancing SME Informatization

In May 2000, President Lagos announced a number of projects aimed at modernizing the Chilean government and society as follows:

- Establishing infocenters across the economy
- Further expandingthe Enlaces program (connecting schools to the Internet);
- Providing easier access to computers for small businesses and teachers;
- Passing a digital signatures law;
- Launching public procurement over the Internet;
- Establishing the Ventanilla Unica(Single Window) program; and
- Setting up Cultural Links network.

As of April 2001, all of these initiatives were completed or were in the process of being implemented:

- More than 100 infocenters have been set up across the economycovering all regions;
- The digital signature law is in Congress to be approved;
- The program of electronic public procurement was launched;
- A number of legal reforms were introduced to enhance the development of risk capital;
- The program to ease the purchase of PCs for small business and teachers is being implemented;
- On March 2001, the Chilean government opened an office in Silicon Valley in the United States and
- The Cultural Links network and the Ventanilla Unica program are being implemented.

6. Efforts for SME Informatization from the Private Sector

Centro de Productividad Industrial CEPRI S.A. provides Technical Assistance Programs for SME human resource development including management and operation of Funds for Technical Assistance (FAT), Management and Operation of Foment Project (PROFO) and others.

The objectives of FAT are to promote the development and modernization of SMEs and strengthen their participation and competition in world markets. This program provides public funds for technical assistance including ICT support. These funds let contract advisors incorporate new and modern methods of management and apply modem technologies to their production areas.

7. Overall Assessment of SME Informatization

Chile is trying to build ICT infrastructure under the leadership of its president, and the government efforts are advancing its goals. The Chilean economy has been committed to building ICT infrastructure since the 1980s by opening the ICT market and has streamlined the process of information exchangeand administrative work with the nationwide network of Infocenters and e-government.

The government efforts have resulted in a 61-percent Internet penetration rate for businesses in the economy where only 1 percent of businesses are large companies.

Considering that more than 100 infocenters have been set up across the economy covering all regions, that the digital signature law has been approved by Congress, that the program to ease the purchase of PCs for small business and teachers has been implemented and that there is a high Internet penetration rate for businesses, it is assessed that the framework for SME informatization has been laid in Chile.

Appendix B.5. People's Republic of China

1. Trends of Informatization

The People's Republic of China started to build a communication infrastructure in 2001 and develop on-line content in 2002. In terms of ICT infrastructure, the government of the People's Republic of China supports informatization starting with basic infrastructure such as networks, hardware and software. There is a significant disparity between ICT infrastructure levels in metropolitan areas (such as Beijing and Shanghai) and rural areas. Due to the Republic of China's vast land area, building a communications infrastructure will incur high costs and take a long time. Although there are some difficulties in establishing an ICT infrastructure, the Republic of China's government recognizes importance of ICT for the national economy and is pushing national informatization.

As the KBE ICT indicators show, the ICT level in the People's Republic of China is generally lower than the average APEC level. However, it recorded a remarkable growth in the number of Internet users from 1999 to 2002, indicating that ICTs are spreading fast into the Chinese society (see Table 1).

<Table 1> Informatization of People's Republic China (As as of 2002)

(Unit: Persons, %)

	China	APEC Average
Mobile telephones in use per 1,000 people	161.1	434.02
Telephone mainlines in use per 1,000 people	138	372.71
Computers (PCs, mainframes, etc) per 1,000 people	27	310.59
Internet users, as % of population (1999)	0.4	15.13
Internet users, as % of population (2000)	4.21	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.14	0.46

Source: APEC. 2003. *KBE Indicators.*

2. Definition of an SME

The definition of SMEs and micro enterprises in the People's Republic of China with regard to statistical regulations:

SMEs are defined as	People	Volume of Sales (million Yuan)	Asset (million yuan)
Industrial Sector (Medium/Small)	>2000/300	>300/30	>400/40
Construction (Medium/Small)	>3000/600	>300/30	>400/40
Wholesale (Medium/Small)	>200/100	>300/30	
Retail (Medium/Small)	>500/100	>150/10	
Transportation (Medium/Small)	>500	>30	
Posts (Medium/Small)	>400	>30	
Hotels and restaurants (small/medium)	>400	>30	

SMEs in the Republic of China have played an important role in the national economy. Statistics provided by Developmental Report of China's Small and Medium-Sized Enterprises in 2001 show that there are some 39.8 million SMEs in the People's Republic of China using a broad definition of SMEs. About 10 million of these are registered under the Bureaus of Industrial and Commercial Administration and possess a staff of eight or more members, taking up about 99 percent of all registered enterprises all over the economy. The sum total of their capital takes up 48.5 percent of that of all enterprises, 57.1 percent of sales, 43.2 percent of revenue, and 69.7 percent of all employment. In particular, small enterprises contribute to 32.7 percent of all capital, 42.6 percent of sales, 28.7 percent of revenue and 52.7 percent of employment.[1)]

3. Strategy and Progress of SME Informatization

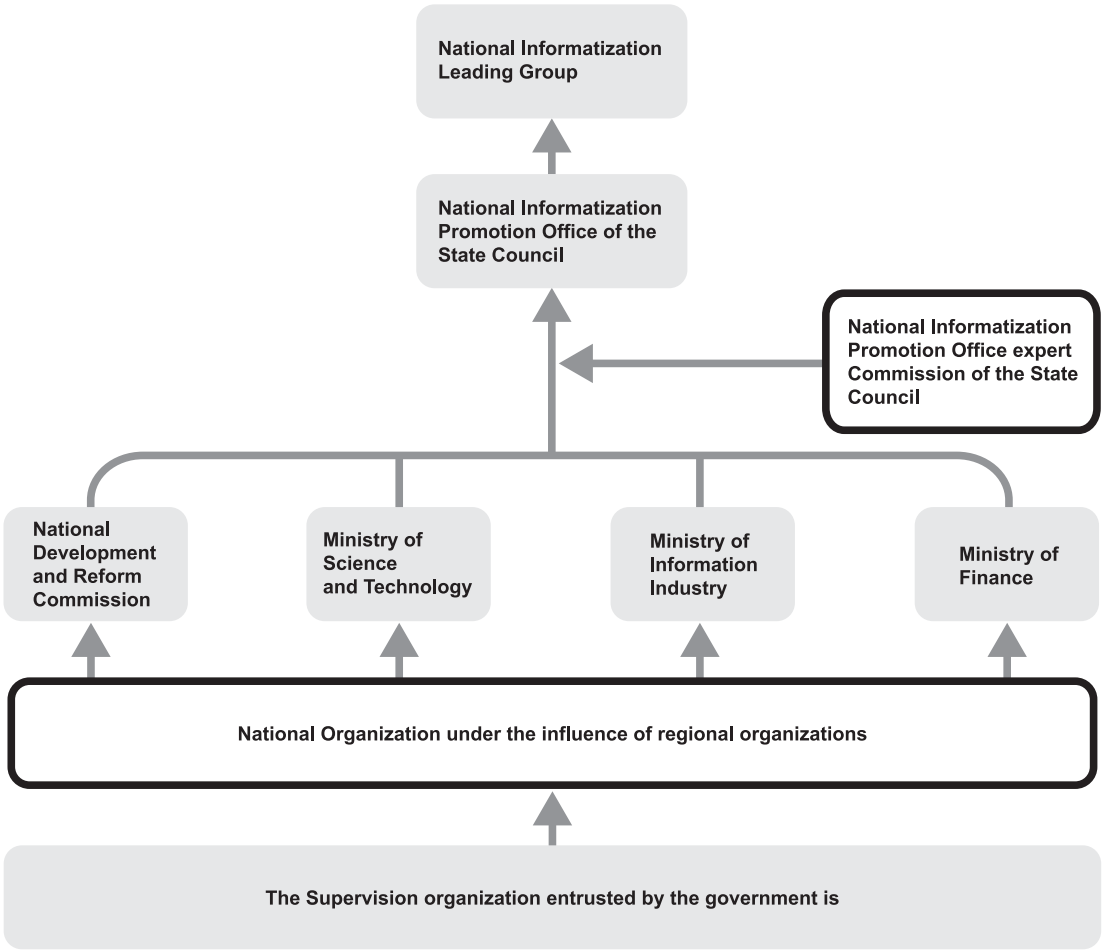
The informatization of SMEs in the People's Republic of China is led by a group of commissions under the State Council. Among the commissions, the National Development and Reform Commission makes policies for informatization of SMEs, the Ministry of Information Industry and the Ministry of Science and Technology support planning budgeting, and funding as well as providing technology, while the Ministry of Finance manages funds allocated to planning SME informatization. The commissions under the State Council have their own sub-organizations that assist in implementing policies nationwide, and the progress of their projects is monitored by a supervision organization designated by the government.

1) "Developmental Report of China's Small and Medium-Sized Enterprises in 2001"

The three development phases for the informatization of Chinese SMEs are as follows:

- Creation of a favorable business environment for Internet access so that companies can easily search and share information;
- Establishment of an SME information system that enable businesses to easily input information on supply and demand; and
- Development of e-commerce among SMEs.

<Figure 1> Organizational Structure for National Informatization in the People's Republic China



Source : Department of Small and Medium-sized Enterprises, PRC

4. Government Organizations for SME Informatization

The National Informatization Leading Group, headed by the premier of the state council, is in charge of establishing and managing national ICT strategies and policies. The National Informatization Promotion Office of the State Council implements and executes informatization policies under the supervision of the National Informatization Leading Group.

The National Development and Reform Commission builds core strategic policies and plans to

develop and reform the economy. In particular, the commission makes policies to promote various types of property ownership and SME development. Its major responsibilities include projects to lead strategies in forming and improving the industrial structure, and studying various kinds of "ownership" economies, and private organization and enterprises.

The Department of Small and Medium-Sized Enterprises was established to study the relationship between SMEs and development of a non-state-owned economy. As its major activities, the department promotes fair competition, and development of private companies, researches policies and measures beneficial to the development of SMEs, facilitates joint ventures with foreign companies, built an SME service system and promotes cooperation and coordinates balancing SME development and that of the private economy.

The Ministry of Information and Industry is in charge of national strategies, and overall plans for development of the information industry. Its objectives are:

- To oversee management of the national communications infrastructure (including the mainland and electronic networks), the TV network (both wired and wireless) and other communications networks and related industries ;
- To establish policies, systems, and standards in regard to technologies in electronics, information, product manufacturing, communications, and software ;
- To study and propose plans to develop new technologies in the engineering industry ;
- To allocate and manage public communications resources such as spectrum for wireless and satellite communications, network codes, domains and addresses ; and
- To promote R&D activities in electronics, information, product manufacturing, communications and software, address difficulties in developing important sectors in the science and technology industry, facilitate the introduction, creation and commercialization of new technologies developed through scientific research, and develop the engineering industry as a key national industry.

The Innovation Fund for Industry of IT was established to financially support the research, development and commercialization of core technologies in the electronic and information industries, including software, integrated circuits, computers, communications, networks, digital media and newly developed component technologies. Its main responsibilities include managing the budget for the fund, responding to inquiries on budget and account settlement, and ratifying and monitoring allocation and use of the fund. In regard to budget management, it manages accounts, reporting on funding applications, carrying out preliminary examination on accounts, and budgeting procedure.

The Ministry of Science and Technology was established to build a long-term strategy to develop science technology, policies to facilitate technology- led economic and social development, study the relationship between science technology and socio-economic development, identify priorities in technological development and research, pursue the strategy to build a "chuangxin" (innovation, recreating old technology) structure for national science technology and enhance creativity of national science and technology. As major projects, it conducts research on development of new technology in the engineering sector and industrialization policy and set up plans to develop state-of-the-art technology in the engineering sector. It also initiated the R&D plan to develop advance technologies in information, automation, energy and the new material sector, leading the chuangxin process of science and technology as well as preparing plans to clear obstacles to science and technology. Its responsibilities include overseeing a national-level technology industrial complex, reforming the science and technology structure in the engineering industry and pursuing plans to

build a technical service system.

The Innovation Fund for Small Technology-Based Firms was raised to promote development of SMEs and facilitate technological innovation and SME development of new technology. Major roles of the Innovation Fund for Small Technology-Based Firms are:

- To support technological innovation at technology-intensive SMEs;
- To help technology-intensive SMEs develop technologies;
- To facilitate commercialization of developed technology;
- To develop technology-intensive SMEs with Chinese characteristics;
- To accelerate development of advanced technology;

Currently, there are approximately 6,000 Web sites run by the government or government agencies (registered as gov.cn): 130 sites are for SMEs, but most of them provide just brief information. Among them, only a few provide IT support services. Most information services for SMEs are in their initial stages and there are not many IT projects. Therefore, IT services should be set in place to identify and develop individual properties of SMEs. SMEs can enhance their profitability if they are provided a variety of services over the Internet in addition to information.

5. Major Policies and Projects for Enhancing SME Informatization

5.1. Providing Infrastructure and Facilitating Business Access to the Internet

In 2001, the government set up plans toward putting the government and businesses online, building an infrastructure for the Internet by increasing investment considerably. By introducing broadband, ISDN, and ADSL, businesses were able to go online (the first step toward informatization) broadening their outlook by accessing a wider range of information.

In 2002 and 2003, businesses started to build their corporate networks. The SME Network was established and began operation, along with a newly developed system to enable SMEs to construct their Web sites by themselves. With the system, SMEs can manage and protect their information on the Internet. About 10,000 companies build Web sites by using this system.

5.2. Facilitating the Development of e- Commerce

By facilitating SME connection to the Internet, SMEs were able to conduct Web searches, post information about their business and set up Web sites. This SME informatization led to online business, increased sales and online transactions (e-commerce). It is important to note here that SMEs, which are connected through the SME Network, are facin shortages of IT human resources.

5.3. Providing Information Services

SME Network is an information channel for SMEs that provides information through 100 branch sites while collecting information. The member subscription-based network offers information to SMEs on policies, laws, regulations, new technology, new products, raw materials and supply and demand.

5.4. Building a Credit System

The SME Network built a system that analyzes and manages SME credit through its information channel. With means of informatization such as e-commerce, it builds a credit data bank for SMEs to provide credit assessment and guarantee service.

6. Efforts for SME Informatization from the Private Sector[2)]

China SME Infonet is a Web site run by an intermediate organization under government supervision. It enables businesses to obtain and share information by combining a number of Web sites that offer paid services and provides a link between the government, intermediate organizations and SMEs by eliminating information barriers. It also supports e-government and the national SME Galaxy Training Project.

Research on national policy for SME informatization is undertaken by academic organizations and research centers (represented by the Chinese Academy of Science), about 100 colleges with information/IT or software classes, and independent science research organizations. They also consult with SMEs on informatization and technology development, and provide SME training.

There are SME associations, trade groups and agencies that act as intermediaries to facilitate exchange of information among SMEs, broker services, offer training and provide up-to-date technology.

Companies such as Legend Group Limited, UFSoft, Ueusoft, and Rising contribute to informatization on development by providing necessary facilities and products. They provide high-performance inexpensive products for the informatization of SMEs as well as network facilities related to IT infrastructure, software related to informatization (i.e., accounting software), and IT security and vaccine products.

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2) The following is a list of private organizations that support informatization in China:.
China Network of SME [www.cnsme.com]
China-Enterprise Network (China-Enterprise ASP Ltd) [www.cen.com.cn]
China Companies Information Network [www.chinacoms.com]
China National Enterprise Network [www.chinabbc.com]
China-Enterprise Managing Information Network [www.cem.com.cn]
Industry and Commerce Information Network [www.zghd.com]
The Whole World Enterprise Information Network [www.wwei.com.cn]

7. Overall Assessment of SME Informatization

The government of the People's Republic of China supports SME informatization by building ICT infrastructure through the Internet and e-commerce.

Local governments in addition to the central government make major contributions to supporting SME informatization. The central government produces a blue print for SME informatization, and local governments, financially support SMEs in the adoption of ICT and carry out specific projects. In 2002, when the central government emphasized SME informatization, the government of the Hei long jiang Province provided funds to facilitate SME informatization. The government led strategies to spread ICT into the Juljang, Jangso area industry. However, SMEs themselves also make efforts to their competitiveness under pressure from the market economy.

There is support for SMEs at the government level, but the detailed framework for the policy is not in place yet. Currently, ICT use is limited to SMEs located in developed areas such as the Pearl River Delta in Guangdong Province and the Chang River Delta in Shanghai. In order to address the development gap among regions, the government of People's Republic of China focuses on developing SMEs in underdeveloped region, seeking ways to encourage the private sector to voluntarily participate in the process.

Appendix B.6. Hong Kong, China

1. Trends of Informatization

The level of informatization of Hong Kong, China is relatively high as compared with the other APEC economies. Hong Kong, China is a generally well-educated, English-speaking and internationally focused business economy that controls huge flows of goods, services and investment. Hong Kong, China has a strong services sector with a full range of modern business services and an ICT infrastructure that was built from necessity.

According to most KBE indicators, Hong Kong, China ranks far above the reference level (APEC average), reflecting the strong policy thrust. In particular, the number of mobile telephones in Hong Kong, China is more than double the APEC average (see Table 1). 30 out of 100 inhabitants use Internet in 2000, which is 200 percent of the APEC average.

<Table 1> Informatization of Hong Kong, China (as of 2003)

(Unit: Persons, %)

	Hong Kong, China	APEC Average
Mobile telephones in use per 1,000 people	1056	434.02
Telephone mainlines in use per 1,000 people	559	372.71
Computers (PCs, mainframes, etc) per 1,000 people[1)]	N.A	310.59
Internet users, as % of population (1999)	30.3	15.13
Internet users, as % of population (2000)	52.2	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.3	0.46

Sources: APEC. 2003. *KBE Indicators.*
Trade and Industry Department, Hong Kong, China

2. Definition of an SME

SMEs are the backbone of Hong Kong, China's economy. According to a sample survey conducted by the Census and Statistics Department (C&SD), as of December 2003, there were approximately 284,000 SMEs in Hong Kong, China, accounting for 98 percent of local enterprises. They employed more than 1.3 million people, which is about 60 percent of private sector employment. SMEs are engaged in different trades and industries, and nearly 90 percent of SMEs have fewer than 10 employees (Hong Kong, China does not distinguish micro enterprises from SMEs).

1) 67.5% of households with PC at home and 60% of households with PC at home connected to the Internet.

SMEs are defined as:	
Manufacturing Industries	<100 employees
Non-Manufacturing	<50 employees

3. Strategy and Progress of SME Informatization

The Commerce, Industry and Technology Bureau (CITB) constructed the main policy for IT development in Hong Kong, China. It is also responsible for general promotion of e-business adoption by the private sector, while other government bureaux and departments are responsible for implementing e-government or e-business initiatives in specific sectors under their respective purviews. The Information Technology Services Department (ITSD) is the executive arm of CITB, which also seeks advice from the Legislative Council Panel on Information Technology and Broadcasting[2] and the Information Infrastructure Advisory Committee,[3] which is the government's major advisory body on IT development matters.

The government promulgated in 1998 the first Digital 21 IT Strategy, which is the blueprint for driving IT development in Hong Kong, China. The focus was to build Hong Kong China's information infrastructure and create an enabling environment for e-business to prosper. The Strategy was updated in 2001 with the aim of making Hong Kong, China a leading e-business community and digital city.

To sustain the momentum created in the last five years in making Hong Kong, China a leading digital city and continue to harness the benefits of IT for our community, Hong Kong, China promulgated in March 2004 an updated Digital 21 Strategy[4] with eight main areas of action to take Hong Kong, China forward in this information economy:

(a) Government leadership
(b) Sustainable e-government programme
(c) Infrastructure and business environment
(d) Institutional review
(e) Technological development
(f) Vibrant IT industry
(g) Human resources in a knowledge economy
(h) Bridging the digital divide

The specific strategies for SME informatization are as follows:

2) [http://www.legco.gov.hk/general/english/panels/yr00-04/itb.htm]
3) [http://www.info.gov.hk/citb/ctb/english/it/relevant.htm]
4) [http://www.info.gov.hk/digital21/eng/strategy2004/strategy_main.html]

3.1. High Capacity Communications Systems

・Telecommunications Infrastructure

The government of Hong Kong, China adopts pro-competition and pro-consumer telecommunications policies with the objectives of:

- Facilitating the availability of the widest range of quality telecommunications services to the community at a reasonable cost;
- Telecommunications services being provided in the most economically efficient manner possible; and
- Hong Kong, China serving as the regional communications hub now and into the next century.

All sectors of Hong Kong's telecommunications market have been liberalized. The telecommunications regulatory regime is pro-competition and pro-consumer. As a result of the these policies, there are currently:

- 11 licensees for local fixed-line telecommunications network services;
- 197 licensed Internet Service Providers providing dial-up or broadband services;
- Around 1.25 million customers using broadband services with speeds of up to 10 megabits per second;
- 226 external telecommunications services licensees;
- 22 external facilities licensees operating satellite-based or cable-based facilities with connectivity at 900 gigabits per second;
- 11 2G and one 3G digital public mobile phone services networks serving 7.2 million customers with a penetration rate of 106 percent.

・Electronic Service Delivery Infrastructure

To provide public services to business[1] and the community with constant access through a wide range of electronic access means, the Electronic Service Delivery portal is providing over 180 public services from over 50 government departments/public agencies online.

Private sector participation is encouraged in the setting up of this common information infrastructure, which is fully funded by a private sector operator. The infrastructure is being used by the private sector for the conduct of e-commerce services alongside the e-government services. In this regard, a common information infrastructure is now available to the whole community for various kinds of electronic transactions.

・Smart ID card infrastructure

The Government rolled out a multi-application smart ID cards to replace the existing ID cards in June 2003. The replacement exercise for the whole population will take 4 years. In addition to the traditional immigration functions (as a means of identification), the smart ID card can be used to store a digital certificate (personal e-Cert issued by Hongkong Post, which is a recognized public certification authority for the purpose of the Electronic Transactions Ordinance) and be used for all e-Cert based services; as a public library card; for automated immigration clearance at border control points from around end 2004; and for driving licence-related uses in about 2006. Capacity has been reserved for an e-purse and other possible future (government and commercial) applications. The smart ID cards, together with its capacity for a digital certificate, are creating a territory-wide information infrastructure for the further development of e-government and e-business in Hong Kong, China. It will also create a critical mass of digital certificate users and the incentive for the application developers to develop more business application services that adopts digital certificates.

· Asia Pacific Internet Traffic Hub
Hong Kong, China aims to establish itself as a gateway to the Asia Pacific region with regard to Internet traffic and electronic commerce information flow.

3.2. Secure Electronic Transactions

· Common Software Interface for Secure Electronic Transactions
To develop an open and common Chinese language interface for users in the community who prefer to communicate in Chinese. This open and common interface is in place to facilitate the community in using Chinese for electronic communication and data exchange both within Hong Kong, China and with other parts of the world.

· Regulation and Legislation
The Electronic Transactions Ordinance (ETO) was enacted in January 2000 to provide a clear legal framework for e-business. It accords electronic records and digital signature the same legal status as that of their paper-based counterparts and establishes a voluntary recognition scheme for certification authorities (CAs) that issue digital certificates for the conduct of secure e-business. The Electronic Transactions (Amendment) Bill 2003 was introduced into the legislature in June 2003 to update and improve the ETO. The plan is to complete the legislative process within 2004 so that legal framework of Hong Kong, China keeps pace with international e-business practices and technological advancement.

· Key public infrastructure
Under the voluntary recognition scheme for certification authorities set up under the ETO, one public CA, the Hongkong Post, and two commercial CAs are recognized under the ETO.

3.3 Human Resources

· IT in education
To work with the Education and Manpower Bureau (EMB) and other educational organizations in the application of IT in education.

· IT manpower supply
To provide adequate and quality IT manpower to meet market demand by training local IT talent. Where there is a gap or shortage in specific areas, IT talent elsewhere can be recruited to meet demand.

3.4. Cultural Environment to Stimulate Creativity and Advances in the Use of IT and e-business

· Government IT exploitation
To develop the capacity, capability and commitment of officers and staff at all levels within the government to take full advantage of the benefits and opportunities offered by new information technologies. Hong Kong, China has an e-government strategy and programme to drive the adoption of IT in internal operations as well as provision of services to the public. By taking the lead in the use of IT, the Government drives the adoption of IT in the business sector as well as the wider

community.

- Asia Pacific Internet content Hub
  To encourage the development and hosting of innovative and attractive Web sites locally, especially those that contribute to developing Hong Kong, China as a gateway for electronic commerce with the Mainland of China.
- Chinese Language Applications
  To encourage the development of close working ties with the Mainland through provision of a simplified Chinese version of Hong Kong government Web sites. The HKSAR government is actively facilitating the electronic communication and exchange of Chinese character data through promoting standards adoption, engaging in dialogue with the public sector on the Mainland and other economies using Chinese language, and facilitating private sector and academic efforts to develop Chinese language applications.
- IT industry Support
  To collaborate with industrial support organizations and relevant trade associations to identify ways to support the development of the local IT industry.
- IT funding support
  To collaborate with Trade and Industry Department[5] and the Innovation and Technology Commission[6] to provide funding support to the local IT industry, SMEs, trade associations, industrial support organizations and academic institutions through a variety of funding mechanisms for IT projects beneficial to economic development and the adoption of IT by SMEs in general and SMEs in specific sectors.
- IT excellence
  To encourage and promote the use of IT throughout the private sector, especially in SMEs, by sponsoring IT excellence awards organized by the industry.
- Knowledge and awareness of IT and information services
  To promote knowledge and awareness of IT and information services in the business sector so that businesses will be able to make informed decisions on the deployment of resources and investment.
- IT in Community
  To raise the awareness, confidence and familiarity of the community towards using IT in all spheres of their lives, especially towards life-long learning and knowledge renewal, the government is facilitating free IT awareness courses, IT Easy Link service providing IT enquiry service for the public as well as IT enquiry and advisory services for the business sector, infotainment television programs, IT promotion activities and free public computer facilities with Internet connections..

4. Governmental Organizations for SME Informatization

The Commerce, Industry and Technology Bureau (CITB) has policy responsibility for IT development in Hong Kong, China. It is also responsible for the general promotion of e-business adoption by the business sector and the community, while other government bureaus and

5) [http://www.tid.gov.hk]
6) [http://www.info.gov.hk/itc/]

departments are responsible for e-government or e-business initiatives in specific sectors under their respective purviews.

The Industrial Support Division of Trade and Industry Department provides services specifically for SMEs. The department aims to facilitate the development of SMEs in Hong Kong, China and help them enhance competitiveness, and towards this goal, it established the Small and Medium Enterprise Office.

Public bodies such as the Hong Kong Trade and Development Council, Hong Kong Productivity Council and the Vocational Training Council work closely with (but independently from) government departments to enhance the competitiveness of SMEs through informatization.

4.1. Trade and Industry Department

Major Activities	▶ develop policy initiatives and programs for services to enhance the competitiveness of SMEs and their long-term development; ▶ coordinate the efforts of the public sector and industry support organizations for SME development ; ▶ provide SMEs with one-stop information on SME support services of the public sector, business start-up, government business licenses and export market tariff rates, as well as consultation services and support facilities through the Support and Consultation Centre for SMEs; ▶ administer four SME funding schemes: SME Loan Guarantee Scheme SME Export Marketing Fund SME Training Fund SME Development Fund ▶ provide a formal channel of communication between the government and SMEs and organizations representing SMEs; ▶ support and serve the Small and Medium Enterprises Committee; and ▶ support Hong Kong, China's participation in activities under the aegis of the Asia Pacific Economic Cooperation.

In order to strengthen the co-ordination and development of services for SMEs, the Small and Medium Enterprises Office (SMEO) was set up under former Industry Department on April 1, 1999 and then transferred to the Trade and Industry Department in July 2000. The SMEO is tasked to take the lead in coordinating efforts being undertaken by the public sector to assist SMEs, removing duplication, fragmentation or compartmentalization of services and ensuring that new policy initiatives may be developed in a comprehensive and coherent manner. The major activities of the SMEO include policy development and coordination of support programs, as well as provision of SMEs specific services.

4.2. Information Technology Services Department

The Information Technology Services Department is responsible for implementing government policy on the development of information technology in Hong Kong, China. The department promotes and enables the extensive use of IT in government and in the community. It also aims to enable individuals, businesses and the government to interact easily and securely through the use of IT.

5. Efforts for SME Informatization from the Private Sector

Hong Kong Trade Development Council

Major Projects	Details
The Business InfoCentre	A business information centre where you can access the latest business directories, trade information, books, journals and multimedia resources from around the world. In particular, the China Trade and Investment Resource Centre contains the most comprehensive information for exploring the China market.
Business School for SMEs	A business school for SMEs that offers practical courses in five streams plus e-learning opportunities online.
SME Market Day	An annual exhibition, SME Market Day, highlighting SME support services and providing opportunities to network with SMEs from many economies and regions.
Federation of Hong Kong Business Association Worldwide	With the help of the Hong Kong Trade Development Council, these associations formed the Federation of Hong Kong Business Association Worldwide in November 2000. The federation aims to achieve synergy among the global network of Hong Kong Business Associations. It provides an effective base for member associations to network and exchange information, thereby generating business opportunities.

Hong Kong Productivity Council

Major Projects	Details
SME Centre - SME IT-based Model Office	An IT-based model office demonstrating major IT applications for SMEs.
SME Centre - Value-added Consultancy Service	Leveraging the cross-divisional capabilities of HKPC and alliances with relevant outside organizations, the SME Centre is a one-stop service provider for every link of the business value chain, for example organization, organization design and management, banking and finance, information technology, customer services management, sales and marketing. The centre has set up various expert hotlines to provide free enquiry services to SMEs.
ITnostic Study for SMEs	To identify opportunities for IT application for enhancing the operational efficiency and competitiveness of textiles and clothing enterprises.
IT Management	This service offers professional support on acquiring, installing, applying, training and maintaining IT/IS systems on monthly subscription basis so that SMEs can focus their resources on managing their core business.
Implementation of IT Strategies for SMEs	To identify appropriate software systems to cater for the operational needs of SMEs and oversee installation, training and implementation.
Trade@Anywhere	A service especially designed for SMEs to execute the day-to-day operations through the Internet. All the program and company data will be stored in the central server in HKPC. SMEs only need to use Internet browsers to access and process their own company's business information.

Vocational Training Council

Major Projects	Details
Applying IT in Workplaces	ITTDC has designed a suite of training solutions, Apply IT (AIT), which leverages the existing basic IT applications and adapts them to the current workplace environment of various sectors. Without acquiring novel technologies, companies can exploit the full potential of IT in enhancing quality and productivity.
Committee on Information Technology Training and Development (CITTD)	CITTD supports government strategy by offering high-quality IT training in a cost-effective manner to SMEs.
Information Technology Training and Development Centre (ITTDC)	Mandated to carry out CITTD's strategies and directives in developing IT training in accordance to market needs. In addition to meeting the immediate needs of industry and government, the ITTDC also takes into account the long-term manpower development requirements of industries and the requirements for utilizing available TTDC resources

6. Overall Assessment of SME Informatization

In Hong Kong, China, informatization of SMEs is pursued based on a step-by-step approach. The procedure begins with improving ICT infrastructure to create a favorable environment for informatization followed by the institution of related laws and provision of IT training.

A blueprint for informatization strategies has been proposed by the government of Hong Kong, China, and relevant authorities are charged with implementing these strategies. What is notable in the case of Hong Kong, China is that both public and private organizations are involved in planning and implementing strategies and projects to informatize SMEs. The combined effort demonstrates that SMEs themselves recognize the needs of ICT in order to survive the competition in the market.

The government of Hong Kong, China contributes to the environment for SME informatization by improving the infrastructure and instituting relevant laws as well as providing funds. Detailed projects are carried out by private organizations such as the Hong Kong Trade Development Council, the Hong Kong Productivity Council and the Vocational Training Council.

SMEs are particularly important in the economy of Hong Kong, China, therefore the government is actively promoting development of SMEs, focusing on e-government and e-commerce to maximize efficiency with limited land space and resources. The government support is leading to a synergy effect that benefits all industries.

Hong Kong, China seeks to facilitate communication between businesses and raise efficiency through SME informatization. By developing the High Capacity Communications Systems, the Common Software Interface for Secure Electronic Transactions and IT in education, it tries to strengthen the competitiveness local SMEs in the global market. Hong Kong, China plans to enhance the competitiveness of SMEs through government-led to private-sector-led informatization.

Appendix B.7. Indonesia

1. Trends of Informatization

Compared to other members of APEC, Indonesia is relatively behind in informatization in part because its scattered archipelago hinders the development of an ICT infrastructure. The underdevelopment of the overall Indonesian economy and the low average income are major obstacles to the informatization of the economy. High costs associated with purchasing computer equipments and accessing the Internet have made adopting IT equipment unaffordable for members of the general public and most SMEs. The Indonesian government is currently focusing on promoting industrialization rather than informatization.

However, as the whole world is pursuing knowledge-based economy and information society, Indonesia cannot afford to fall behind in this trend. To meet the challenge caused by the global change toward the information economy, the Indonesian government has formulated a number of policies for promoting the adoption of IT and e-commerce. However, it is unlikely, at least in the short run, that Indonesia will be successful in narrowing the informatization gap between it and advanced economies in the IT sector because of the low level of communication infrastructure and personal computer ownership.

<Table 1> Informatization of Indonesia (as of 2002)

(Unit: Persons, %)

	Indonesia	APEC Average
Mobile telephones in use per 1,000 people	48.5	434.02
Telephone mainlines in use per 1,000 people	41	372.71
Computers (PCs, mainframes, etc) per 1,000 people	13	310.59
Internet users, as % of population (1999)	0.6	15.13
Internet users, as % of population (2000)	2.71	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.08	0.46

Source: APEC. 2003. *KBE Indicators*.

The degree to which an economy is informatized can be assessed using a number of related indicators. The APEC KBE data for 2003 shows that 13 out of every 1,000 Indonesians own personal computers as in <Table 1>. This figure is much lower than the APEC average, which is 310 computers per 1,000 people. In Indonesia, 48.5 mobile phones are in use per 1,000 people, which is about one-tenth of the APEC average (434.02 phones). Telephone lines in use are 41 per 1,000 Indonesians, slightly more than one-tenth of the average number of APEC members. Accordingly, the share of Internet users among Indonesians was less than 3 percent of the population in 2000, although this was a significant increase from the previous year. Transactions that are completed with electronic assistance take less than 0.1 percent of total commercial transactions. All these indicators show that Indonesia is not yet strong in the informatization of its economy.

2. Definition of an SME

In Indonesia, the Law No. 9 of 1995 defines small enterprises to be those:

- with assets (not including land and building) of less than Rp200 million or with annual sales volume not more than Rp.1 billion;
- owned by Indonesian citizens;
- independent and unaffiliated with large enterprises; and
- individual businesses, with or without legal licensing, including cooperatives.

Medium-sized enterprises are defined as business entities with total assets of more than those of small enterprises but less than Rp.10 billion (US$1.176 million).

Informatizing SMEs is a major issue for Indonesia since its economy is basically characterized by grassroot SMEs that make up nearly 99.95 percent of the total number of enterprises. There are 41 million small economic units in the overall economy (including the agricultural sector), 60,000 medium-sized enterprises and more than 2,000 large enterprises. As of 2000, small enterprises accounted for 89 percent of total employment and medium-sized enterprises accounted for 10.55 percent. Conversely, small enterprises only accounted for 41 percent of GDP and medium enterprises 16 percent. Accordingly, the success in promoting SMEs is widely recognized as critical to long-term sustainable economic growth.

The main weakness of the SME sector in Indonesia is low productivity. The productivity gap between the SME sector and large enterprises is so wide that the value added per worker in the SME sector is about 0.5 percent of that of the large enterprises on average. Science and technology are expected to play a major role in overcoming the low productivity of the SMEs compared to large enterprises. Therefore, promoting the adoption of information technology and active e-commerce within SMEs is the SME policy direction shared by the Indonesian government bodies in charge of the SMEs. To make the SME-related projects more effective, the Indonesian government has chosen to dedicate itself to adopting a clustering approach with help from non-governmental organizations such as Business Development Services, members of which are spread throughout the nation.

<Table 2> Changes in the Distribution of Businesses by Size (1997-2002)

〔Unit: No. of business (% of the total)〕

Year	Small	Medium	Large	Total
1997	39,704,661 (99.843)	60,449 (0.152)	2,097 (0.005)	39,767,207 (100)
1998	36,761,689 (99.854)	51,889 (0.141)	1,831 (0.005)	36,815,409 (100)
1999	37,859,509 (99.857)	52,114 (0.138)	1,885 (0.005)	37,913,608 (100)
2000	38,669,355 (99.854)	54,632 (0.141)	1,973 (0.005)	38,725,960 (100)
2001	39,869,505 (99.850)	57,681 (0.145)	2,084 (0.005)	39,929,270 (100)
2002	41,301,263 (99,847)	61,052 (0.148)	2,198 (0.005)	41,364,513 (100)
Annual Growth (%)	0.80	0.20	0.96	0.80

Source: Central Agency for Statistic (2003).

3. Strategy and Progress of SME Informatization

Indonesia made a decision in 1997 to put its effort into building Nusantara 21, the Indonesian National Information Infrastructure (NII). Nusantara 21 is a reflection of Indonesia's vision of entering the information era as an important part of the global economy. The basic concept and strategy of Nusantara 21 can be summarized as follows.

Nusantara 21 was designed as a vehicle for transforming Indonesia into a knowledge-based society. It will focus on facilitating cooperation between private sector IT actors and regulators, thus enabling the private sector to take an active role in building the NII. Most incentives will be directed toward locally generating human resources to support information technology - human capital and society building will be the most important aspects of Indonesia's NII.

The NII is composed of three main elements: the Archipelagic Super Highway, Multimedia Cities and the Nusantara Multimedia Community Access Center. Action plans have been formulated for the development of applications such as e-government, e-commerce, health care, education, telecommunicating, banking and financial services. Local research and development programs, software and hardware industry programs and accelerated human resources development programs are to support these initiatives. However, Nusantara 21 has been facing some challenges, including the lack of technology, management expertise, legal and regulatory support systems, human resources development and preparing society for change. The ultimate challenge has been capital, especially during the Asian financial crisis of the late 1990s.

For the promotion of SMEs, Indonesia adopted a clustering strategy since the early 1970s, particularly in regards to technological development. Clustering is the optimal strategy for promoting SMEs since businesses are scattered throughout the Indonesian Archipelago and small businesses tend to gather according to similarities in their input, output, technology and machinery, among other factors.

The Ministry of Cooperatives and Small and Medium Enterprises was established in 1993 solely to support the development of SMEs. The involvement of the government in promoting SMEs has been assigned formally to the Ministry since Law No. 9 of 1995 for Small Enterprises was enacted. The purpose of the law is two - fold: First, to create a conductive business environment; and second, to strengthen the capacity and capability of the SMEs in order to promote them as economic actors.

To implement this objective, the government has formulated six main programs, so-called Action Plans, in promoting SMEs:

- Action plan for creating a business-conductive environment: The government takes part in formulating regulations required by SMEs.
- Action plan for market access: The government works to facilitate market access and opportunity.
- Action plan for financial access: The role of the government is divided into two areas. The government can provide a special scheme for SMEs, setting up procedures and standard requirement, and it can cooperate with financial institutions to provide financial resources for SMEs.
- Action plan for information access: This program is a part of marketing access plan, a current weak point in SME marketing. This action plan is about business networking through information technology.
- Action plan for technology and technology sharing: In this action plan, the government can assist SMEs in the field of increasing awareness to apply proper technology to the enhancement of competitiveness.
- Action plan for human resources development: Improvement of organization and management capacity is mainly focused on improving SME human resources development. According to the six action plans, the Ministry of Cooperatives and SMEs established seven deputy organizations, with the fourth, sixth and seventh deputies involved in the informatization of SMEs.

The Ministry of Cooperatives and SMEs has been involved in clustering strategy for promotion of SMEs. It was found that supply-driven SME development programs led by strong government in the past few decades created dependency and in many cases the programs were hampered by frequent changes in the policy setting. Therefore, the Ministry set up the new basic principle of SME promotion through clustering: transferring SME support from being the responsibility of bureaucracy to the control of Business Development Services (BDS) over three years. No direct government involvement in the SME promotion implies that Business Development Services are a catalyst to extend outreach.

With regard to information technology clustering, it is very important to facilitate SME access to support centers and the global market. Since the Internet utilization by SMEs in Indonesia is considerably low, there needs to be strong support from the government. To do so, different types of IT programs have been prepared, one of which is to modernize IT facilities for credit cooperatives under the clustering program to make them able to provide online services among them. In addition, ministries and departments related to the Center for the Development of SME (CD-SMEs) are collaborating to formulate and implement their respective action plans. Many universities and trade associations are involved in these action plans, and the National Development and Planning Agency seeks to coordinate the CD-SME ministries with other bodies participating in related projects.

Nevertheless, the level of SME informatization is still considerably low; fewer than 5 percent of small enterprises have access to the Internet for business while fewer than 20 percent of them use personal computers in the workplace. It is highly probable that most industries are in the situation where an industry has not yet reached to its critical mass of e-commerce among related firms in the same industry. Export-oriented firms that have passed their own critical mass, such as furniture and garment manufacturers, adopt and use the Internet most actively for the business purposes while small firms affiliated with large petroleum corporations or others in the natural resources industry are connected through a closed intranet system.

4. Governmental Organizations for SME Informatization

The Ministry of Cooperatives and Small and Medium Enterprises was established in 1993 to develop and implement SME-related policies and coordinate other government bodies on matters of cooperatives and SMEs. The ministry has seven deputies established under the six Action Plans. The first deputy is in charge of statistics related to Indonesian SMEs. The fourth deputy deals with business information for SME. Although this business information is supposed to be transmitted over the Internet, the network is not available across all parts of Indonesia yet. The sixth deputy takes charge of business development. Some 116,000 units within industry clusters are working under the guidance of the sixth deputy, which works to encourage the SME adoption of personal computers. Finally, the seventh deputy supports the activities of cooperatives and SMEs assessment. This deputy is also given the task for international cooperation and networking.

The Ministry of Research and Technology supports IT kiosks at enterprises with Telkom, an international telecommunication company, and builds ICT infrastructure, including broadband lines. IPTEKNET (Information Science and Technology NET) is run by the government, while universities and business groups are operating a Web site that links all information-related institutions.

The Ministry of Industry and Trade is interested in the adoption of ICT in business, but it does not limit its interest to SMEs. It has developed the Center Data and Information Services, and information provided by the ministry via its Web site encompasses the import-export industry, industry capacity, tax tariffs, information for potential investors, industry technology and industrial R&D centers. Streamlining legal provisions for e-commerce and e-trade is also one of the main responsibilities of the ministry, and as part of the ministry's undertakings, it leads an e-commerce certification project with help from the National Certification Authority.

Many other government bodies are related more or less to the informatization of SMEs. The Ministry of Information and Communication is in charge of building the ICT infrastructure and the Bank Indonesia supports the promotion of SME informatization to provide SMEs with financing funds. The Ministry of Education and Culture deals with training highly skilled workforce and induce universities to actively provide business services for small enterprises independently or in cooperation with a proximate BDS provider.

5. Major Policies and Projects for Enhancing SME Informatization

The low level of telecommunications infrastructure, the limited budget and the lack of coordinated policy for SME informatization across the government bodies are major obstacles to promotion of informatizing SMEs. Considering those limits, the Indonesian government is gearing up to develop industrial clusters across the economy with the help of BDS providers that are located in all parts of the economy and connected to each other through association networks.

The government has introduced many models for promoting SMEs, including business incubators, business consulting clinics and technology centers. However, those sponsoring programs have not been productive and could not sustain themselves for a long time. The government then turned to supporting BDS providers to serve a certain cluster in a selected area. Under the new program, each BDS enters into a contractual partnership arrangement with the government to serve for three years; in exchange, the government provides start-up capital to a BDS provider that is paid back by servicing clusters nearby within a three-year period. The contracted BDS providers are required to

attend consultation meetings with the government officers in charge at the field level and hand in a regular reports on their activities and the progress of the clusters.

The fundamental problems being faced by SMEs are the lack of funding and inaccessibility of financial institutions. SMEs, micro enterprises in particular, are often excluded from banking services. To modernize credit cooperatives that serve micro enterprises in the cluster area, the government channels a fund to the credit cooperatives through the assigned bank on a contractual basis, which is forced to train and supervise the operation of micro credit. To encourage modern financial institutions to provide services to SMEs in the cluster, the government also provides matching funds for venture capital companies in the region. Other matching funds are provided by the government to credit guarantee companies to assist SMEs in gaining access to credit from the banking sector. In addition, matching funds are provided to the Business Incubator Institution.

There is no special program or fund particularly designed for the informatization of SMEs, except for the promotion of technical centers in the banking office to facilitate linking SMEs and the banking sector and the expansion of micro credit through expanding micro banking and improving non-banking financial institutions. The government promotes an entrepreneurship program through universities and other relevant institutions organized by the Ministry of National Education.

6. Efforts for SME Informatization from the Private Sector

Although the SME informatization of Indonesia is led by the government, government bodies are not equipped to cover vast regions and various types of SMEs scattered throughout the economy without support from other organizations interested in SME promotion. Of the many organizations helping promote SMEs are Business Development Services providers in Indonesia.

The BDS providers basically operate in most of the big cities and universities. There are at least three sources of funding for non-government BDS providers, namely universities, including technology and incubation centers, NGOs and international organizations, and privately funded BDS providers that have developed in many fields of business service centers. However, in less developed regions at the district level and on the outer island of Java, the absence of BDS providers is still a common phenomenon. In those areas, the government has introduced a large number of project models to support SMEs, such as business incubators in different sectors, business consulting clinics and technology centers. However, the program sponsoring the promotion of business advisory units was not always successful in being a productive regulator and facilitator of market and product development for BDS providers. In the new cluster program that the government is planning to activate shortly, each BDS forms a contractual partnership arrangement with the government to serve the cluster for three years; in exchange, government provides start-up capital to the BDS providers. The seed money is paid back in the form of servicing other clusters nearby or in other areas as agreed upon by both parties within the three-year period.

A BDS provider is the center of a business cluster of small businesses in a region, providing them with business consulting services, business and regulatory information, and information on financial funds available. It also helps SMEs with emailing and e-commerce through computers in the BDS office, even though electronic services are not its main undertaking. Electronic service is taking about 5 percent of its routine activities.

The Center for Development of SMEs (CD SMEs) is another non-government organization located all over Indonesia, though heavily concentrated in the urban areas. CD SMEs are members of an international organization that specialize in the promotion of financial SMEs, with SME financial institutions as its members.

Most of the Indonesian trade associations are not interested in informatizing their SME members. Informatization is still a matter for individual enterprises, but some industry groups or trade associations that are actively trading with firms abroad are collaboratively engaged in the adoption of IT technology to communicate with their foreign counterparts. For example, the Furniture Exporting Association of Indonesia helps its member entities adopt PCs for accessing the Internet for business communication and gathering information, as most of their partners are in developed economies and take email for granted as well as e-commerce; as a result, electronic communication and commerce are essential for conducting business.

7. Overall Assessment of SME Informatization

Indonesia is assessed as having a low degree of informatization in terms of the APEC KBE indicators. Although the Indonesian government recognizes the importance of promoting SME informatization, it does not have sufficient resources to put its full weight on the policy for the informatization of SMEs. Since SME businesses are not in relatively good shape, financial, legal, technological and marketing services are very important and urgent for most SMEs. In 2003, the government started to establish a set of laws for utilizing information for SMEs, but this process is still underway.

Promoting e-commerce for SMEs in Indonesia is probably not an immediate target of SME policy in Indonesia at the moment. PCs cost around the same as an ordinary worker's salary for eight months, therefore buying a PC is a large transaction for a small firm. Furthermore, Indonesian broadband lines for high-speed Internet are not accessible to most of the economy, with most Internet services being accessed through modems. Accordingly, Internet costs are calculated according to connection time and the unit rate per minute is significantly high. These conditions do not allow a small enterprise to utilize information technology for its business. As a result, e-commerce among competitors and/or suppliers has not reached critical mass in many industries. Therefore, addressing the ICT infrastructure shortfall should be the most important agenda for the government as a complement to its focus on encouraging PC use at SMEs.

One other factor contributing to the low informatization is computer illiteracy. To address this problem, the Indonesian government needs to allocate more resources to education, a move that will help reduce overall illiteracy. Professional education for policy-makers and top managers would be effective when provided by a foreign institution of experience. A local institution can, instead, provide mass education for common laborers.

Even though many government bodies are interested in the informatization of SMEs, interdepartmental policies are not sufficiently coordinated. In particular, the promotion of SME informatization is not clearly promoted for the general public. Therefore, devising policy that can be seamlessly coordinated across government bodies to enable industry to pass the critical mass of e-commerce within a short period of time should be a government focus.

Indonesia needs to take a step-by-step approach to boosting ICT. Improving the network of telephone lines and the ICT infrastructure, legislating ICT-related laws and education in computer and Internet skills are prerequisite for the promotion of informatization. It is not too late for Indonesia's IT policy to be successful, but to do so, the aforementioned conditions must be met. Weak policy coordination is also a problem that needs to be addressed soon it is a problem common to an economy at the beginning stage of informatization. Even if it is probable that the policy for clustering small enterprises with help of BDS and CD SMEs will bear fruit, streamlining policy goals and tools among related government bodies and coordinating the activities of participating institutions will be essential for these policies to be effective.

Appendix B.8. Japan

1. Trends of Informatization

In terms of IT, Japan is one of the most advanced economies in the world, and with the catchphrase to become the world's most advanced IT nation by 2005, Japanese government is propelling informatization through the acceleration and advancement of IT policies.

The overall level of informatization achieved in Japan is higher than the APEC average mainly due to explicit and well-resourced national strategies for ICT promotion. In particular, the APEC KBE indicators (Table 1) suggest that the number of phone lines in Japan far exceeds the APEC average. The relatively higher e-commerce indicator (0.68 percent) also reflects strong policy development in this field. On the other hand, indicators demonstrates a remarkable increase in Internet users from 15.2 percent in 1999 to 50.92 percent in 2002, with the proportion of Internet users in Japan sitting a little over the APEC average. Transforming Digital Divides into Digital Opportunities, published by APEC in 2002, attributed Japan's slow catch-up in Internet users as an outcome of limited services provided by fixed-line telecommunication operators.[1)]

In the field of ICT infrastructure management, Japan concentrates on security, standardization and compatibility based on well-equipped networks, hardware and software. E-mail and EDI (Electronic Data Interchange) systems, among others, serve as major tools to facilitate e-business activities for Japanese SMEs. At the same time, ICT infrastructure that includes e-procurement, e-marketplace and databases are being developed to intensify SME informatization across the economy.

<Table 1> Informatization of Japan (as of 2002)

(Unit: Persons, %)

	Japan	APEC Average
Mobile telephones in use per 1,000 people	577.1	434.02
Telephone mainlines in use per 1,000 people	604	372.71
Computers (PCs, mainframes, etc) per 1,000 people	477	310.59
Internet users, as % of population (1999)	15.2	15.13
Internet users, as % of population (2000)	50.92	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.68	0.46

Source: APEC. 2003. *KBE Indicators.*

1) APEC. 2002. *Transforming Digital Divides into Digital Opportunities.*

2. Definition of an SME

The Small and Medium Enterprise Basic Law (1999) qualifies small enterprises as being enterprises with a regular workforce not in excess of 20 people (or five people for enterprises that are principally engaged in commerce or the service industry).

SMEs are defined as:	
Manufacturing, mining, etc	Not more than 300 employees or ￥300 million
Wholesale Industry	Not more than 100 employees of ￥100 million
Retail Industry	Not more than 50 employees of ￥50 million
Service Industry	Not more than 100 employees of ￥50 million
Definition of "Small-Scale Enterprises"	
Manufacturing etc.	Not more than 20 employees
Commerce, Services	Not more than 5 employees

Japanese SMEs play a significant role in the national economy. Of the total work force, 81 percent are employed by SMEs and more than 99 percent of business establishments are classified as SMEs. At the same time, 51 percent of shipped manufactured goods are produced by SMEs; in the wholesale industry, this figure is 62 percent, while in retail, it represents 73 percent (2002).[2)]

3. Strategy and Progress of SME Informatization

The Japanese government developed its SME policies under the former SME Basic Law, enacted in 1963, aimed at rectifying the gaps between SMEs and large enterprises. In this context, the core points of the policies were “to remedy disadvantages in business activities” as steps to modernize SMEs by each type of industry.

With the advent of the IT revolution and the progress of the globalization, the Japanese government fundamentally revised and restructured conventional SME policies, including the SME Basic Law. The new SME Basic Law, which encourages SME self-help, presents the following three key tenets for SME policies: “Promoting business innovation and new business start-ups”, “Strengthening the management base of SMEs” and “Facilitating adaptation to economic and social changes”. With regard to the implementation of SME informatization measures, the law introduces policy systems relevant to promoting business innovation (support for technology, equipment and intangible management resources) and start-ups (information services, training, programs and facilitating fund supply).[3)]

2) Source: Japan Small and Medium Enterprise Corporation (JASMEC).
3) For more details please visit [http://www.chusho.meti.go.jp/english2002/index.html].

The strategy for the SME informatization of Japan is to use the SME Support Strategy or link to the IT Promotion Strategy. E-Japan Strategy II (2003) illustrates how Japanese SME informatization policies are being propelled under these policy frameworks. E-Japan Strategy II is a blueprint of an IT-based society of the future, and in this society, people will be connected to each other regardless of geographic or physical constraints by a web of knowledge and information that will make life more stimulating, convenient and worry-free. It consists of a basic philosophy with seven main areas: 1) medical services; 2) food; 3) lifestyle; 4) SME financing; 5) knowledge; 6) employment and labor; and 7) public services for IT utilization and improved social infrastructure through IT utilization. According to the e-Japan Strategy II blueprint, the e-Japan Priority Policy Program 2003 consists of concrete measures (366 measures) that concentrate on five major policy areas infrastructure, human resources, e-commerce, e-government and information security and is revised every year. (IT Strategic Headquarters: http://www.kantei.go.jp/foreign/policy/it/index_e.html)[4)]

4. Governmental Organizations for SME Informatization

SME support policies are mapped by a joint effort of the Ministry of Economy, Trade and Industry (METI) and the Small and Medium Enterprise Agency (SME Agency). These policies are followed up and implemented by the Japan Small and Medium Enterprise Corporation (JASMEC).

METI secures the budget for SME informatization, then METI and eight regional Bureaus of Economy, Trade and Industry develop supporting projects by inviting participation from the public as well as from private support agencies. The framework for SME informatization is then formed by the SME Agency under the supervision of METI (in the SME White Paper) and other relevant authorities. Although approaches to informatization are different according to the nature of a project, most projects benefit from the synergy effect created by assistance and cooperation through the SME Agency.

JASMEC[5)] is a government-affiliated institution that aims at contributing to promotion of SMEs, improvement of welfare for small-scale enterprises and stabilization of SME management. JASMEC implements those policies that ministries and their sub-organizations established. JASMEC contributes to implement SMEs informatization policy by:

- promoting information for SMEs through computer networks and the Internet;
- supporting technical development and R&D for SMEs in collaboration with academic institutions;
- supporting SMEs in making technical manuals for manufacturers and promoting internship programs;

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4) With a catchphrase To become the world's most advanced IT nation by 2005, Japan has taken the following steps towards attaining its goal:

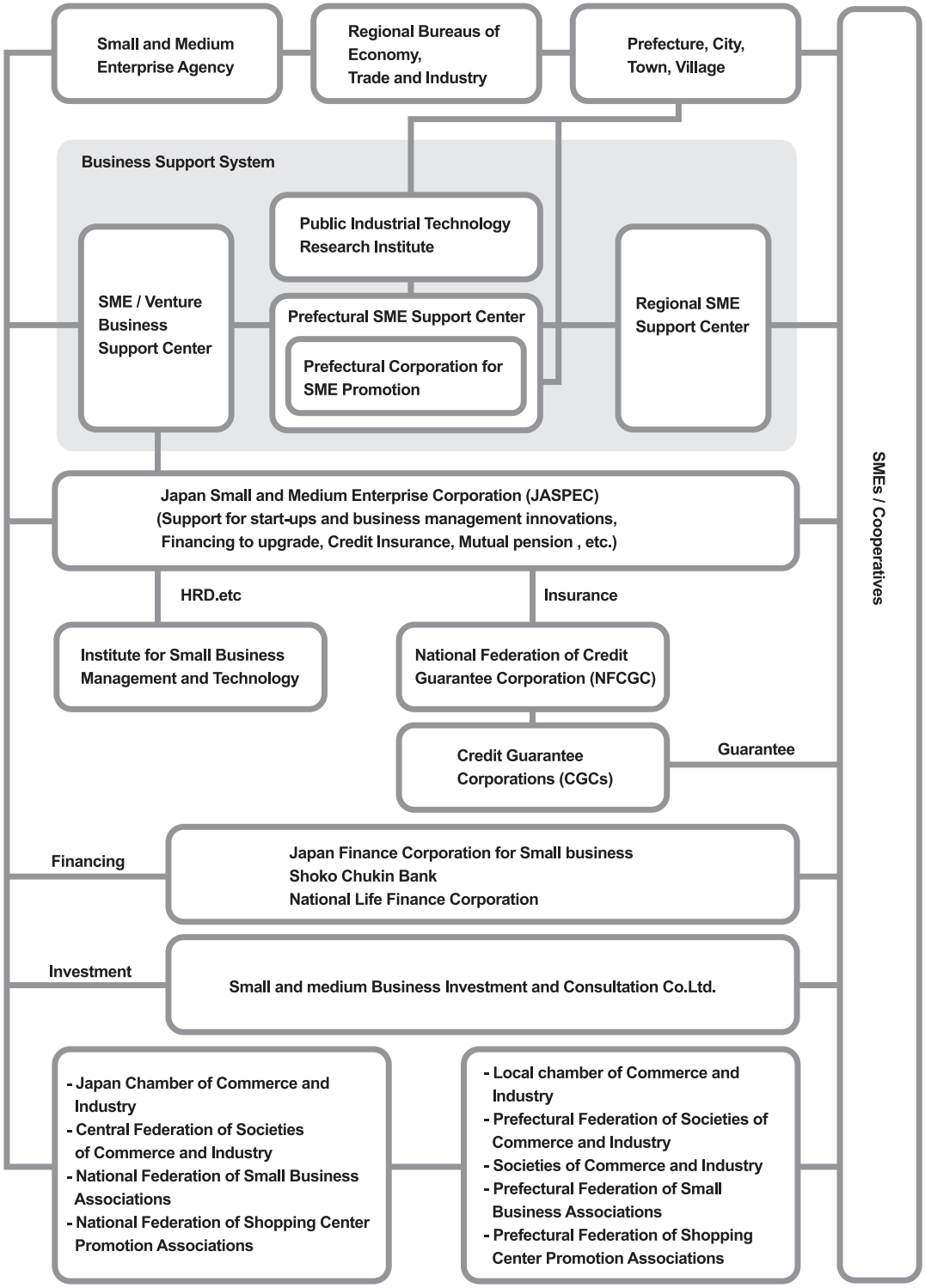
August 8, 2003	e-Japan Priority Policy Program 2003
July 2, 2003	e-Japan Strategy II
June 18, 2002	e-Japan Priority Policy Program 2002
December 6, 2001	Direction for Structural Reform in the IT Sector (Report by the Research Council on IT-related Regulatory Reform)
November 7, 2001	Acceleration and Advancement of e-Japan Priority Policy Program and e-Japan 2002 Program - Structural Reform Schedule of IT-related Policy Areas
June 26, 2001	e-Japan 2002 Program
March 29, 2001	e-Japan Priority Policy Program
January 22, 2001	e-Japan Strategy

5) For more details please visit [http://www.jasmec.go.jp/].

- supporting seminars and workshops to provide overseas information for promoting internationalization of Japanese SMEs;
- conducting study and research for SME promotion.

The implementation system for Japan's SME policies is given in Figure 1. The Small and Medium Enterprises Agency has improved the three types of SME Support Centers: Prefectural SME Support Centers, Regional SME Support Centers and SME/Venture Business Support Centers. These three centers, in collaboration with the present SME support institutions (Commerce and Industry Associations and the Chamber of Commerce and Industry), serve as one-stop service counters to provide information concerning SME support strategies and implement support projects such as over-the-counter consultation services and the dispatch of experts. The Japan Finance Corporation for Small business, Shoko Chukin Bank and National Life Finance Corporation under the supervision of Commerce and Industry Associations and Chamber of Commerce and Industry are responsible for SME financing. On the other hand, Small and Medium Business Investment and Consultation Companies support SMEs that establish a new business and enterprises with advanced or creative technology and know-how.

<Figure 1> Implementing System for Japan's SME Policies



Source: METI.

5. Major Policies and Projects for Enhancing SME Informatization

Japanese government enhances SME informatization policies in the following five fields by providing relevant services. These policies are being implemented under the auspices of the following rules and regulations: that is, the electronic transactions law, the electronic signature law and the protection act of computer program (copyright).

5.1. Improvement in Awareness of IT Use and Development of Human Resources

In order to improve awareness of IT use and development of human resources, there are various programs such as seminars, forums and training programs related to IT.

Major Projects	Details
Holding IT seminars	Prefectural SME Support Centers hold seminars for education and dissemination of IT for executives in local SMEs using IT coordinators, management consultants, etc.
Holding IT forums	The state holds IT forums to introduce SMEs that have succeeded in business innovation using IT, IT-applied new products and technologies, specific know-how for IT use, etc.
Implement practical IT training programs	Prefectural SME Support Centers implement practical IT training programs for executives of SMEs to introduce IT-applied cases, how to be able to participate in electronic commerce through the Internet and other matters.
Training programs on satellite broadcasting and the web at the Institute for Small Business Management and Technology	JASMEC implements effective training programs for as many people as possible including SMEs in remote places, using satellite broadcasting and the Internet.
PC training programs by Commerce and Industry Associations, Chambers of Commerce and Industry, the National Federation of Small Business Associations, etc	Commerce and Industry Associations, Chambers of Commerce and Industry, the National Federation of Small Business Associations, etc., using equipment such as PCs, implement practical IT use training programs that contribute to management including Web site construction and e-commerce for SMEs and small-scale enterprises.
Development of IT coordinators	Personnel who can provide accurate advice on IT-applied business innovation, advancement and improvement are required. The IT Coordinators Association aims to develop IT coordinators who can meet such requirements.

5.2. Advice and Consultation for IT-based Systematization

The government provides the following consulting program to SMEs to build environment that generate SME informatization.

Major Projects	Details
Project to activate investment for strategic informatization	The state aggressively promotes consulting activities through continuous visits to companies using IT coordinators and exchange meetings for executives, and aims to improve the environments where SMEs are able to actively use such experts.

5.3. Financial Support

The following activities of financial institutions are being conducted to provide a stable supply of fixed long-term and low-interest funds to SMEs for SME informatization.[6)]

Major Projects	Details
IT loan system	Governmental financial institutions (Small Business Finance Corporation, National Life Finance Corporation and Shoko Chukin Bank) extend loans to facilitate the supply of funds for facilities, land, buildings and operation necessary for investment in informatization. Special interest rates are applied to informatization investment plans that are drafted after examination and advice by experts such as IT coordinators who are dispatched from Prefectural SME Support Centers.
Strategic lease project	For SMEs to promote strategic informatization such as the introduction of POS system to respond to the IT revolution, the state implements projects where designated lease companies lease equipment for strategic informatization to SMEs at low lease rates.
Support on tax systems	The statutory useful life of computers has been shortened and the SME investment promotion taxation, which allows tax deductions of 7 percent of the acquisition cost or special depreciation of 30 percent for specific equipment and appliances (PCs, digital copy machines, etc.) at the price of not less than 1 million yen, is extended to the end of FY2001.

6) In addition, National Small Business Information Promotion Center (NICC) under the supervision of Small and Medium Business Administration provides construction funds to SMEs. In case of equipment funds, NIC and Finance Corporation for Small Business provide loans to SMEs. The Small and Medium Business Administration is responsible for the SME tax system.

5.4. Improvement of Software

Software is critical for building an environment for SME informatization. In this regard, the following projects have been designed to support business innovation using information technology and CAD/CAM training programs for SMEs.

Major Projects	Details
Project to support business innovation using information technology	In order to promote the business innovation of SMEs using information communication technology, the state subsidizes projects for development of business application software and product databases through consortiums that are established by manufacturing, distribution and sales companies (makers, wholesalers, retailers) and subcontractors in collaboration with relevant businesses, and for large-scale verification projects concerning the software and product database system the consortiums have developed.
CAD/CAM training programs for SMEs	In order to promote the merging of article-making in SMEs and IT, the state implements CAD/CAM training programs at public industrial technology research institutes.

5.5. SME Network Support: Provision of Information for IT Promotion

Major Projects	Details
e-SME Agency and Network Implementation	The Small and Medium Enterprises Agency aims to spread and publish its measures to as many SMEs as possible by directly offering information on its measures through mail magazines. In addition, the agency endeavors to grasp the needs of individual SMEs by preparing a service corner on its Web site to receive opinions and information from SMEs and reflect their opinions, on improvements to measures for SMEs. **(http://www.chusho.meti.go.jp/)**
Provision of technical information through "Techno-Knowledge Network"	In order to solve SME technical troubles and promote responses to technical development and the IT revolution, the state provides, through the Internet, a database on the technical consultations extended to SMEs by public industrial technology research institutes throughout the economy (Q&A data) and a database on welding and cutting, which is useful for the simulation of processing conditions. **(http://www.techno-qanda.net/)**
Information provided through Commerce and Industry Associations, Chambers of Commerce and Industry, the National Federation of Small Business Associations, etc.	As an information exchange project using the Internet, the Commerce and Industry Associations collaborated with other industry representatives to build Web sites to transmit information on local SMEs for domestic and international enterprises and consumers with the aim of increasing the business opportunities for local commercial and industrial enterprises through matching information.

6. Efforts for SME Informatization from the Private Sector[7)]

6.1. National Small Business Information Promotion Center[8)]

National Small Business Information Promotion Center (NIC), a public service corporation with a nationwide network, is an SME informatization promotion agency that was established by the Small and Medium Business Administration, agencies related to SMEs and financial institutions. The NIC cooperates with local SME informatization support agencies (local SME support centers) and strengthens local informatization networks to promote the following six areas:

- research related to SME informatization promotion;
- activities related to SME informatization promotion;
- collection and distribution of information related to SME informatization;
- promotion of education and training on SME informatization;
- cooperation with relevant agencies related to SME informatization; and
- technical support for SME informatization.

6.2. The Japan Chamber of Commerce and Industry

The Japan Chamber of Commerce and Industry (JCCI) is the central organization to which all local chambers of commerce belong. As an opinion leader in economic circles, JCCI represents the local chambers by presenting their suggestions to the government and other bodies, and helping implement them. JCCI also plays an important role in the dissemination of information concerning government policies and programs, and the promotion of nationwide projects.

JCCI provides opportunities for small and medium-sized Japanese businesses by distributing information on international trade, investment, and technological networks. JCCI assists business development through its eight overseas Japanese Chambers of Commerce and Industry in the economies where many Japanese companies have expanded.

JCCI also supports small and medium-sized enterprises through local chambers of commerce and industry by posting management and bookkeeping instructors.

AS for SME informatization, JCCI started to manage Certificate Authority (issuing electronic certificate) with local CCIs. In addition, JCCI also issues online shopping trust mark to prevent the trouble caused by internet shopping.

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7) There are many support non-governmental organizations for SMEs other than the National Small Business Information Promotion Center (NICC) and Japan Chamber of Commerce and Industry (JCCI). They are the Central Federation of Societies of Commerce and Industry, the National Federation of Small Business Associations, National Federation of Shopping Center Promotion Associations, Local Chambers of Commerce and Industry, Prefectural Federation of Societies of Commerce and Industry, Societies of Commerce and Industry, Prefectural Federation of Small Business Associations and the Prefectural Federation of Shopping Center Promotion Associations. They cooperate with each other to implement government policy and support for SMEs.

8) [http://www.n-i-c.or.jp]

6.3. Other Private Organizations

The following is a list of representative information promotion organizations in Japan:

- Japan Information Processing Development Corporation (JIPDEC):
  http://www.jipdec.jp/kyotu_page/outline.html
- Japan Electronics and Information Technology Industries Association (JEITA):
  http://www.jeita.or.jp/english/index.html
- Japan Information Technology Services Industry Association (JISA):
  http://www.jisa.or.jp/en/index.html
- Information-technology Promotion Agency, Japan (IPA):
  http://www.ipa.go.jp/ipa-e/index-e.html
- IT Coordinators Association (ITCA):
  http://www.itc.or.jp/index/html (Japanese only)

7. Overall Assessment of SME Informatization

In order to strengthen SME responses to the changing global economic environment, Japan takes a step-by-step approach to SME informatization based on the following three stages. The first stage is "IT supporting measures for intangibles", for which several activities are being carried out, including:

- awareness and human resources development (IT seminars, hands-on IT training, remote training (Web-based lectures) and training courses on PC use and other topics held by Commerce and Industry Associations, CCIs, the National Federation of Small Business Associations;
- dispatch of advisors for consultation (fostering IT coordinators, dispatching IT advisors, IT Solution Square Project (ITSSP)); and
- support for the introduction of IT through loan and lease systems (low-interest loans for introduction of IT provided by government-affiliated financial institutions, strategic low-rate lease project and support in taxation area).

The second stage is "Improvement of IT Infrastructure for SMEs", for which related activities include:

- development and propagation of common basic software (support of IT-based management-innovative models and CAD/CAM training opportunities for SMEs);
- providing technical information for IT promotion (e-SMEA & Network, enhanced one-stop support by J-Net21 and technical information through Techno Knowledge Network); and
- facilitation for e-commerce (electronic authentification of government procurement).

The final stage is "promoting collaboration among related organizations". Related activities include cooperation between businesses and universities as well as regional alliances (supporting projects by regional IT-promoting associations).

The Japanese government has led SME development, but SMEs in Japan recognize the need for informatization to grasp the changing needs of consumers and quickly respond to competition. At the same time, it is also noticeable that strong government support for SME informatization is heavily concentrated on the initial stages of building informatization infrastructure. In response, private sectors actively participate in the SME informatization to accommodate increasing market demand.[9] Therefore, each SME develops its own customized strategy to improve its informatization infrastructure in line with government supporting policy.

9) Recently, large private companies have been supporting their suppliers or partners by establishing and managing corporate networks. For example, Fuji Xerox, leading office printer and copier manufacturer, developed the Beat Program that offers SMEs security and management service, am eHRD Total Solution, and the company plans to expand the program to include SMEs in the APEC region.

Appendix B.9. Korea

1. Trends of Informatization

Korea made rapid progress in national informatization in the 1990s and became one of world's most informatized economies at the beginning of the 2000s. A communication network was built rapidly through investment from the government and private sector. Services connecting users to the Internet through modems were established at the beginning of the 1990s and a super high-speed communication network (includingADSL) spread dramatically after it was introduced in the late 1990s. Most Internet users in Korea now use ADSL, VDSL and ISDN.

Korea fostered the industries related to information and communication through an industrial restructuring process from the late in 1980s, and as a result, Korea became a worldwide production economy in the late 1990s.[1] ICT goods were available to private users, the business sector and the public sector through improvements to production bases.[2] Although the United States is the main market for software and applications, Korea has a large market share and technical power in office programs and Web-based programs. Korea ranks among the top three in the world in terms of content-based Web pages and has made rapid progress in security, standardization and compatibility, yet the English-language content on the Internet is still of an insufficient quality.

<Table 1> Informatization of Korea (as of 2002)

(Unit: Persons, %)

	Korea	APEC Average
Mobile telephones in use per 1,000 people	678.9	434.02
Telephone mainlines in use per 1,000 people	457	372.71
Computers (PCs, mainframes, etc) per 1,000 people	342	310.59
Internet users, as % of population (1999)	9.2	15.13
Internet users, as % of population (2000)	55.73	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.56	0.46

Source: APEC. 2003. *KBE Indicators.*

The level of informatization in Korea in general is very high compared to that of other economies. Korea's indicators, as shown in Table 1, are above APEC averages, most notably in terms of mobile phone subscribers (678.9 per 1000 peoplein Korea, as compared to the APEC average of 434.02) and the number of fixed line subscribers (457 out of 1000 people in Korea, compared to the APEC average of 372.71). The number of PCs per 1000 people is 342, greater than the APEC average of 310.59, and in Korea, 55.73 percent of the population use the Internet, exceeding the APEC average

1) Korea became a leader in the production of computer-related parts such as RAM, CTR and LCD.
2) In particular, PCs were available at low prices in the late 1990s.

of 32.24. In particular, the proportion of the population using the Internet (up from 9.2 percent in 1999) shows that ICT is spreading very fast in Korean society. Due to the active use of ICT in Korea, e-commerce takes up 0.56 percent of the total commercial transactions, a higher record than the average of 0.46 percent in the APEC region.

In particular, Korea has accomplished rapid development in terms of national informatization since 1999 (see Table 2). The number of Internet users was increased by 30 percent annually from 1999 to 2002, which takes up 55 percent of the total population. The diffusion rate of computers increased by 24 percentannually however, according to data from the National Computerization Agency of Korea and the OECD, Korea had the highest level of ultra-high-speed Internet as of 2002. As mentioned above, it is common to connect to the Internet through ultra-high-speed Internet (ADSL and VDSL) at home and offices rather than using a modem. This is quite different from other economies, which use ISDN even when the ultra-high-speed Internet access is available. The informatization level of Korea has been greatly enhanced since 1999, but the number of Internet hosts is still relatively low,as indicated in the reports of National Computerization of Korea and OECD.[3] Meanwhile, in e-commerce, B2C and B2B have increased and expanded into government procurement and distribution of agricultural products since 2000.

<Table 2> Informatization Level of Korea Since 1999

	1999	2002	Annual growth rates
Cellular mobile telephone subscribers per 100 people	51.3	67.9	6.6
Internet hosts (thousand)	461.0	694.2 [1)]	22.7 [2)]
Internet users per 100 people	23.8	55.2	29.9
Personal computers per 100 people	25.2	55.6	24.0

Note: 1) Data from 2001
2) Annual growth rate from 1999 to 2001
Source: ITU. 2003. *World Telecommunication Indicators 2003*.

3) Although the number of Internethosts in Korea has increased by 20 percent annually in recent years, this rate is relatively low compared to OECD member economies.

2. Definition of an SME[4)]

In Korea, SMEs are defined as companies that have fewer than 300 employees or those with paid-in-capital of below 8 billion won. More specific standards on the classification of SMEs are stipulated in "Article 2 of the Framework Act on Small and Medium Enterprises" (Table 3).

<Table 3> Classification of SMEs in Korea

Industrial classification	Definition
Manufacturing	▶ Fewer than 300 employees or less than US$ 6.7 million in paid in capital
Mining Transportation, Construction	▶ Fewer than 300 employees or US$ 2.5 million in paid in capital
Farm, Forestry, Fishery	**seeding, fishery: fewer than 200 employees or less than US$16 million in sales** **farming, forestry: fewer than 50 employees or less than US$4 million in sales**
Services	▶ fewer than 300 employees or less than US$25 million in sales - information processing, etc. (9 categories) ▶ fewer than 200 employees or less than US$16 million in sales - communication, etc (43 categories) ▶ fewer than 100 employees or less than US$8 million in sales - communication sales, etc. (84 categories) ▶ fewer than 50 employees or less than US$4 million in sales - wholesale, etc. (14 categories) ▶ fewer than 30 employees or less than US$1.6 million in sales - retail, etc. (224 categories)

Source: SMBA, The Framework Act on Small and Medium Enterprises.

To be classified as an SME, a company should not be a subsidiary of one of the nation's 30 largest firms. As of 2001, SMEs took up 99.8 percent of the number of firms and 85.6 percent in terms of employment in the national economy (Table 4). The ratiosof SMEs in electricity, gas and water supply (89.2 percent) and finance and insurance (96.4 percent) industry were relatively low when compared to the ratios of over 99percent in most other industries. Ratiosof SMEs in terms of employee numbers were relatively low in finance and insurance (29.6 percent) and electricity, gas and water supply (44.4 percent) industry but over 70 percent in other industries. Therefore, SMEs in Korea account for a high proportion of the number of firms and employment.

4) SMBA Web site [http://www.smba.go.kr].

<Table 4> SME Distribution and Employment by Industry (as of 2001)

Industry	Total		SME		Ratio of SMEs (%)	
	Firms	Employees	Firms	Employees	Firms	Employees
Total	2,876,817	11,650,034	2,871,951	9,969,797	99.8	85.6
Agriculture, forestry	572	5,299	562	4,266	98.3	80.5
Fishery	134	5,427	129	3,982	96.3	73.4
Mining	2,002	20,170	1,997	15,930	99.8	79.0
Manufacturing	330,592	3,466,293	329,685	2,673,774	99.7	77.1
Electricity, gas, and water supply	195	14,674	174	6,512	89.2	44.4
Construction	72,719	634,522	72,613	570,046	99.9	89.8
Wholesale, retail and consumer appliance repair	890,035	2,500,377	889,014	2,292,669	99.9	91.7
Lodging and restaurants	616,886	1,651,509	616,536	1,598,824	99.9	96.8
Transportation, storehouse	286,571	779,185	286,408	692,252	99.9	88.8
Communication	4,252	56,360	4,217	39,369	99.2	69.9
Finance and insurance	9,009	149,222	8,684	44,210	96.4	29.6
Real estate, lease	84,388	252,108	84,067	207,651	99.6	82.4
Business service	69,476	669,388	68,722	467,732	98.9	69.9
Education service	87,583	370,085	87,190	337,948	99.6	91.3
Health, and social welfare business	53,410	261,345	53,363	255,155	99.9	97.6
Entertainment, culture, and recreation service	113,064	282,766	112,874	249,662	99.8	88.3
Other public, social, consumer appliance repair and individual service	255,929	531,304	255,716	509,815	99.9	96.0

Note: General standards were applied to the range of SMEs.

Source: 2001 Survey Report on Basic Workplace Statistics (2003) published by the National Statistical Office.

<Table 5> Woman-Owned Enterprises (as of 2001)

(Unit : million)

	Total Firms of SME		Woman-owned Enterprises		Proportion (%) Woman-Owned firm	
	1999	2001	1999	2001	1999	2001
Firms	2.77	2.87	0.96	1.04	34.7	36.3

Source: 2001 Survey Report on Basic Workplace Statistics (2003) published by the National Statistical Office.

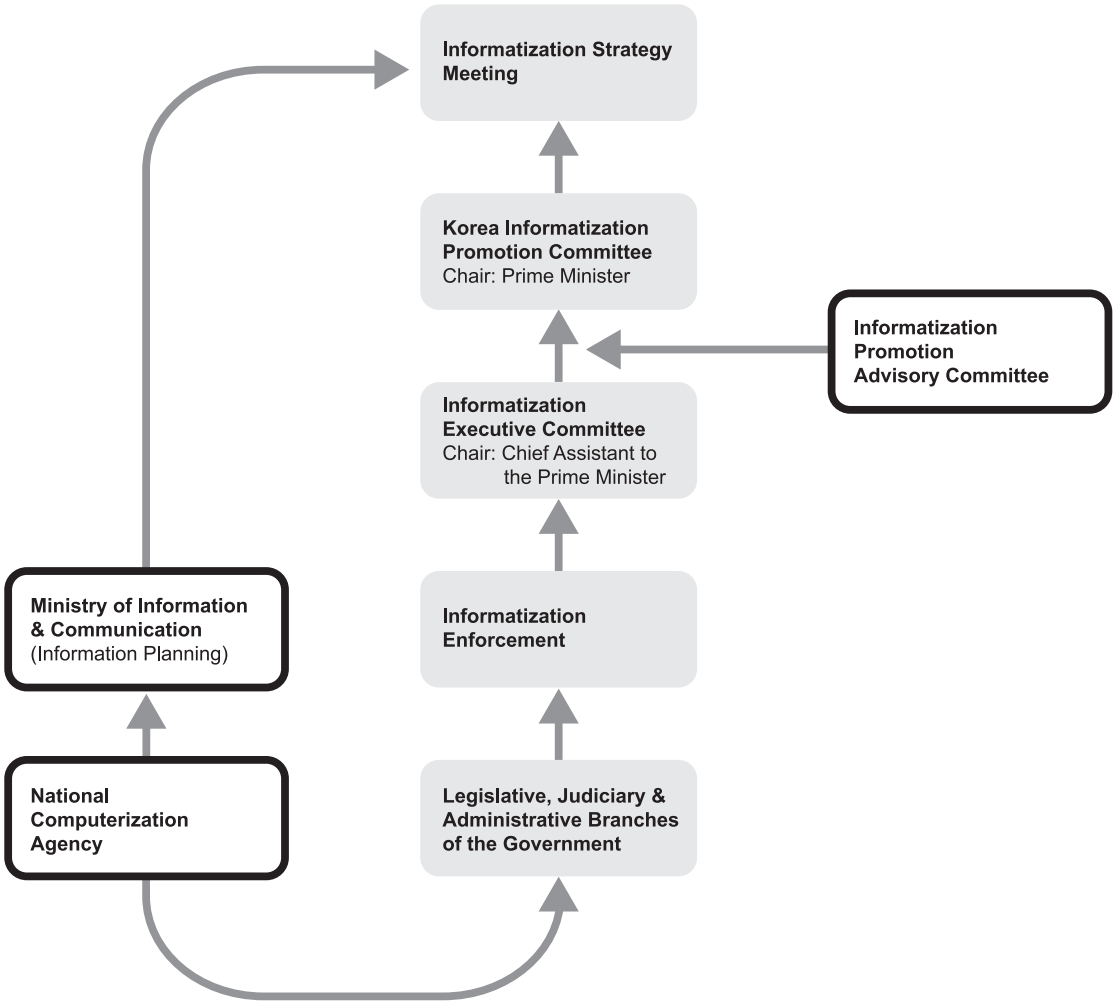
In Korea, 36.3 percent of the total SMEs are owned by women (see Table 5), and according to the Small and Medium Business Administration (SMBA), 34.1 percent of firms with fewer than four employees are owned by women.

3. Strategy and Progress of SME Informatization

3.1. National Informatization Policies

Korea has consistently pursued informatization policies to respond to the information era of the 21st century. Pursuant to the Framework Act on Informatization Promotion, the Informatization Promotion Committee was established to coordinate the informatization promotion plans of several ministries and prepare long-term informatization promotion plans. The government structure for informatization promotion is shown in <Figure 1>.

<Figure 1> National-Level Structure for Informatization in Korea



The Informatization Strategy Meeting is the highest decision-making organization within government for the national informatization policy. The president decides the topics of these meetings.

The Informatization Promotion Committee oversees and coordinates awhole range of informatization implementation policies. As a non-permanent agency, the committee is headed by the Prime Minister and represented by the legislative, judiciary and administrative branches of the government, with 24 ministers (including the Chairman (Prime Minister), Vice Chairman (Minister of Finance and Economy)) acting as the members of the committee. The Prime Minister's Office presides over meetings of the committee, and the committee examines and deliberates on a broad range of policies, plans and projects to facilitate the nation's shift into an advanced information society.

The Informatization Executive Committee (an executing subcommittee of the Informatization Promotion Committee) is composed of the Chair(Chief Assistant to the Prime Minister) and 24

deputy ministers from various ministries. The committee discusses implementation issues assigned by the Informatization Promotion Committee.

The Informatization Promotion Advisory Committee has 26 members consisting of private-sector experts from academic, business and R&D circles. The members are experts with extensive knowledge and experiences on their respective relevant fields of information. The committee provides consulting services on overall information policies for the aforementioned two committees.

Members of the Informatization Enforcement Sub-committee include 15-20 government officials and experts from 21 major private sectors (chaired by the deputy minister of the ministry in charge). The members of the sub-committee review and examine information policies by sector.

At the ministerial level, the Ministry of Information and Communication is in charge of planning and implementing national informatization policies. The National Computerization Agency is responsible for managing the national information and communication network.

Among several national informatization policies, the policy aimed at informatization of businesses is being implemented in accordance with the Industry Informatization Promotion Plan. The Ministry of Commerce, Industry and Energy is at the center of the Industry Informatization Promotion Plan, in cooperation with the Ministry of Information and Communication and the Small and Medium Business Administration. MOCIE's Industry Informatization Subcommittee coordinatespolicies in e-commerce, informatization through sectoral plans, international trade and national resource management, and tries to maximize the synergy effects of the policies. Government organizations, trade groups, individual business entities, universities and research centers are all involved in projects for the informatization of industries. Among the organizations, the SMBA plays a central role in SME informatization in Korea. The SMBA is now leading several projects to spread ICT to Korean SMEs.

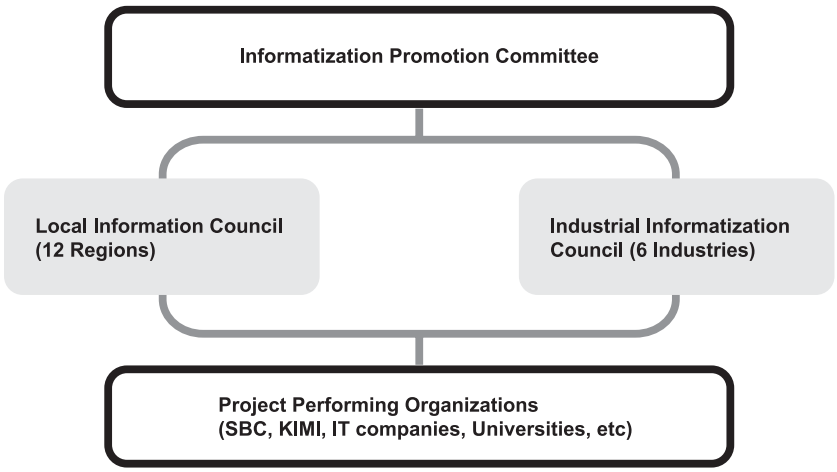
3.2. Organizational Structure for the Informatization of SMEs

SMBA prepares and implements strategies for SME informatization, overseeing the SME Informatization Promotion Committee, which sets up comprehensive plans to support informatization of SMEs, coordinates roles of relevant organizations and evaluates their performances. The deputy commissioner of the SABA chairs the committee, which has a number of subcommittees (see Figure 2).

There are Informatization Councils for each of the six key areas that seek ways to informatize SMEs. As SMEs are divided into six key areas according to industry, the sixInformatization Councils focus on their respective areas, and identify and resolve difficulties thatSMEs consider obstacles to informatization, building up strategies to promote e-commerce in each area.

Twelve local SME Informatization Councils are also in place. The councils, governed by the local SMBAs, prepare concrete strategies for SME informatization and carry out projects in their local areas in consultation with related local organizations. The Korean government leads a variety of projects to encourage SMEs to take advantage of ICT. It is a broad range of public and private organizations that practically carry out the projects. The projects for SME informatization will be introduced in this report.

<Figure 2> SME Informatization Promotion System



3.3. Strategies for Informatization of SMEs

The Korean government has pursued informatization of SMEs by taking several steps. The first step was to set up policies to build infrastructure for informatization of industries (1996-2000). Until 2000, the government's policy focus was on building a comprehensive infrastructure for digitization of the industries including establishing systems for information sharing and e-commerce. Various projects were launched, such as building an e-commerce support center (ECRC), digital incubators, SME e-shopping and SME database. However, this was a period when the government put much weight on building the information infrastructure and promoting SME use of ICT.

In 2000, the government started to revise relevant laws for promoting SME digitization, to nurture IT and IT workforce, to build the basis for e-trade (online trade) and promoted e-commerce in the public and industrial sectors. Major projects include “Digital Industry Complex”, “Special Zone for SME Informatization”, “Promoting ASP for SME” and “Consulting Pilot ERP for SMEs.”

The next policy focus is on spreading Informatization (2001-2005). While integrating the existing policy measures, the Korean government is now offering more detailed and wider assistance for SME digitization. Its efforts are focused on building industry-specific networks and information networks led mainly by digital leaders, enabling SMEs to informatize themselves.

Korea has tried to set up and implement informatization policies according to the lifecycle of company informatization. The measures for informatization include a survey of informatization status, building infrastructure, consulting of informatization promotion, building intranet, supporting informatization management, informatization training, building and maintaining a major database. Furthermore, the Korean government seeks to support companies by clearing obstacles toinformatization and creating a favorable environment for each company. For example, the government and government agencies made a considerable part of investment for selected companies to solve the problem of short of funds, free training to produces experts that are lacking, the lack of experts, consulting services to help companies utilize technologies and IT training for CEOs.

4. Government Organizations for SME Informatization

The Ministry of Commerce, Industry, and Energy (MOCIE) sets up basic strategies for industry informatization and promotes e-commerce. MOCIE is undertaking three major projects: promoting e-commerce in industries building e-commerce infrastructure and globalizing e-commerce. As for the first project, MOCIE promotes e-transformation of manufacturing businessesand supports SME informatization. The second project, "Building e-Commerce Infrastructure," aims at building and implementing national strategies for e-commerce promotion as well as reform law and regulation, and supporting standardization. The "Globalizing e-Commerce" project is designed to establish infrastructure for e-tradeand expands multilateral and bilateral e-business cooperation.

The Korea Institute for Electronic Commerce, the Korea CALS/EC Association, and the Electronic Commerce Resource Center are sub-organizations of MOCIE. As a special corporation established by MOCIE, the Korea Institute for Electronic Commerce supports projects for e-commerce promotion. Its key missions include developing e-commerce promotion projects, developing and distributing e-commerce standards, managing the E-Commerce Dispute Settlement Committee and developing e-commerce workforce.

The Korea CALS/EC Association promotes informatization by networking suppliers and consumers of e-commerce with the Korea E-Trade Association (under MOCIE), which promotes e-business from the consumer perspective, and the Korea E-Trade/Technical Association (under MIC),which provides technologies from the supplier perspective. It manages the e-CEO Consultative Body, supports the Golden Card System that aims to attract leading e-biz workers from overseas. The association is carrying out projects for B2B networks and e-catalog.

The Electronic Commerce Resource Center promotes e-commerce and builds national capacity. Around 40 ECRCs were established nationwide by MOCIE. The main responsibilities of the center are to develop human resources through local training tours, corporate training programs, school for start-ups, spread technology by developing and distributing technologies for SME-specific IT systems.

The National Computerization Agency and the Korea Association of Information and Telecommunication are sub-organizations of the MIC. Governed by the Framework Act on Informatization Promotion, the National Computerization Agency was designated as a special corporation by MIC in order to promote informatization of central and local government bodies and to develop relevant policies.

The SMBA was established to develop policies for SME informatization. It coordinates and sets up SME informatization plans for organizations such as the Korea Informatization Management Institute for Small and Medium Enterprises.

The Small Business Corporation (SBC) and the Korea Information Management Institute for Small and Medium Enterprises (KIMI) are the sub-organizations of the SMBA.

The SBC, established by SMBA and governed by the Promotion of Technology Innovation of Small and Medium Enterprise, supports projects that are related to the development of SMEs. Its main responsibilities include supporting SME digitization, providing consulting services on informatization management, training informatization professionals, supporting e-commerce and operating informatization machinery and tools, and exhibiting and training centers.

The Korea Information Management Institute for Small and Medium Enterprises (KIMI) supports SME management innovation and productivity improvement through informatization pursuant to Article 20 of the Promotion of Technology Innovation of Small and Medium enterprise Act. Its activities are:digitizing production information of SMEs, SME Informatization Innovation

Consortium, supporting TIMPs (dedicated to innovative informatization of SMEs), building IT infrastructure in SME-concentrated areas, building IT network for industry associations, building informatization management system, providing IT education to employees in SMEs and developing e-business models for small enterprises.

5. Major Policies and Projects for Enhancing SME Informatization

5.1. Projects of Ministry of Commerce, Industry and Energy

The Ministry of Commerce, Industry and Energy is committed to entrenching e-business in the six key industries. It aims to build a B2B network in the six key areas and expanding it to other industries.

<Table 6> The Status of e-Commerce Development in Six Key Industries

Industry	E-commerce progress/ Stage		Core Tasks
	2000 →	2003	
Electronic	8.5% (Early Growing)	30.3% (Entrenched)	▶ Share standardization ▶ Cooperate with leading
Automobile	2.4% (Starting)	14.0% (Growing)	▶ Build an industry-wide network (KNX) ▶ Enhance competitiveness of parts industry
Shipbuilding	2.5% (Spreading)	15% (Early entrenched)	▶ Build collaborative system for design & production industries ▶ Entrench a culture of inter-company collaboration
Steel	2.3% (Starting)	14% (Growing)	▶ Led by POSCO ▶ Early establishment of e-commerce system
Machinery	2.0% (Starting)	12.5% (Growing)	▶ Standardize classifications and codes ▶ Digitize parts industry
Textile	2.0% (Starting)	15% (Early entrenched)	▶ Entrench digital transactions ▶ Build co-infrastructure, i.e. QR

Source: MCIE

<Table 7> Projects of Ministry of Commerce, Industry and Energy

Project	Major Project Features	Organization
Supporting SME informatization	Supports informatization in SMEs (informatization of unit work, distribution of ERP, building SCM, support building e-learning)	Small business Corporation
E-commerce promotion project	Develops and distributes e-commerce standards, nurtures e-commerce workforce, and makes statistical reports and analysis	Korea Institute for Electronic Commerce
Building a digital industry area	Digitalizes national industrial area to provide on-line administrative service comprehensively to the residence companies	Korea Industrial Complex Corp.
Building B2B network	Develops e-commerce model appropriate for each company's feature	Korea CALS/EC Association
Operating e-commerce Support center	Designating 40 ECRCs nationwide, nurtures workforce and provides consulting, technological support, develops and distributes technologies for e-commerce	Electronic Commerce Resource Center

Source: MCIE

5.2. Projects of the Small and Medium Business Administration

The SMBA promotes informatization projects mainly for the manufacturing industry. Support for SME informatization by SMBA has three objectives:

- Construction of a foundation for SME information system;
- Construction of a comprehensive information network to assist SMEs; and
- Support for SMEmanagement rationalization through information systems.
- Main projects of SME informatization conducted under these objectives are:
- digitalizing production information of SMEs;
- supporting SME informatization innovation consortium;
- building IT infrastructure in SME-concentrated areas;
- building IT infrastructure for industry association;
- training of acquiring informatization management system certificates;
- operating informatization supporting group;
- survey of current status of SME informatization;
- supporting TIMPs (dedicated to innovative informatization of SMEs);
- developing standardized model of work process; and
- SME IT education.

Details for these are listed in Table 8 andcandidates by industry, ratio and the maximum amount of money provided for the informatization support projects are listed in Table 9.[5)]

5) See [http://www.smba.go.kr] for the details of SMBA's SME informatization projects.

<Table 8> Projects of the Small and Medium Business Administration

Project	Main Points	Performing Organization
Digitalizing production information of SMEs	Supports informatization utilizing computers and IT at workplace	Korea Information Management Institute for Small and Medium Enterprises
Supporting SME informatization innovation consortium	Supports consulting service by forming a consortium with universities, SI companies and related organizations	Korea Information Management Institute for Small and Medium Enterprises
Building IT infrastructure in SME-concentrated areas	Supports building informatization infrastructure for regional information hub in SME-concentrated areas	Korea Information Management Institute for Small and Medium Enterprises
Building IT infrastructure for industry association	Builds e-commerce infrastructure for association-centered community	Korea Information Management Institute for Small and Medium Enterprises
Training of acquiring informatization management system certificates	Directs acquiring informatization management system certificate to transform management into informatization management	Korea Information Management Institute for Small and Medium Enterprises
Operating informatization supporting group	Operates informatization supporting group in order to break the difficulties of SME informatization	Korea Information Management Institute for Small and Medium Enterprises
Survey of current status of SME informatization	Performs researches on the actual condition of SME informatization to estimate the level of SME informatization	Korea Information Management Institute for Small and Medium Enterprises
Supporting TIMPs (dedicated to innovative informatization of SMEs)	Seeks SMEs in excellence of informatization to spread excellent cases to other SMEs	Korea Information Management Institute for Small and Medium Enterprises
Developing standardized model of work process	Spreads and distributes standardized work process by every industry	Korea Information Management Institute for Small and Medium Enterprises
SME IT education	Provides informatization education for SME workers and CEOs	Korea Productivity Center (KPC)

Source: SMBA.

<Table 9> Present Status of Each SMBA Informatization Project

	Budget	Candidates	Goal
Digitalizing production information of SMEs	6.7 billion Won	Small and medium sized manufacturing enterprises	About 130 firms
Supporting SME informatization innovation consortium	10.5 billion Won	SMEs	About 1,300 firms
Supporting TIMPs (dedicated to innovative informatization of SMEs)	4 billion Won	Small and medium sized manufacturing enterprises	About 100 firms
Building IT infrastructure in SME-concentrated areas	3 billion Won	Regional industrial park, agriculture and industry park, factory building, etc	10 regions
Building IT infrastructure for industry association	2.75 billion Won	Cooperative association of small and medium sized manufacturing enterprises	6 associations
Training of acquiring informatization management system certificates	2.7 billion Won	SMEs	About 200 firms
Operating informatization supporting group	0.22 billion Won	SMEs	About 150 firms
SME IT education	1.15 billion Won	SMEs	About 8,200 people
Developing standardized model of work process	2 billion Won	Non-manufacturing industry association	4 organizations

Source: SMBA.

SMBA is supporting women-owned enterprises to enhance the competitiveness of these firms by increasing the participation of women in the economy through the promotion of start-up companies by women and enhancing their competitiveness under the following activities:

- Creating atmosphere for the start-up of women-owned firms;
- Seeking and fostering promising categories of business for women-owned firms;
- Assisting to extend domestic and international markets for women-owned firms;
- Amicable funding and supporting business reforms for women-owned firms; and
- Providing preferential treatment when enforcing policy.

5.3.Projects of the Ministry of Information and Communication

The Ministry of Information and Communication (MIC) promotes informatization projects mainly for non-manufacturing industries.

<Table 10> MIC Projects for Informatization

Project	Main Points	Performing organization
Supporting SME network	supportsSupports informatization training for SME IT service for diffusion of high speed network in SMEs	National Computerization Agency
Development of SME e-business model	Supports development of e-business model appropriate for SMEs	National Computerization Agency, Korea Federation of Small and Medium Business
Distribution of ASP classified by industry	Supports development of new appilcationapplication for newly integrated IT service and development of transition technology of existing application	ASP companies

6. Efforts for SME Informatization fromthe Private Sector

The Korea Federation of Small and Medium Business is a non-profit organization established according to the Small and Medium Enterprises Cooperative Act. It consists of several types of SME cooperatives including general cooperatives (national cooperatives, regional cooperatives), business cooperatives (business cooperatives, market cooperatives), cooperatives associations (by industry, by region) and a central association of cooperatives. Its roles are researching SME-related issues and making policy recommendations, cooperating with SMEs, supporting SMEs in marketing, sales and exports, and supporting SME informatization. It is also involved in developing training programs for SMEs and providing management information, and assisting SMEs regarding product liability system.

As a private economic body, the Korea Chamber of Commerce and Industry promotes the growth of commerce and industry as well as balanced development of the national and regional economies. The law governing this organization is the Chamber of Commerce and Industry Act, and 65 branches in 65 cities are in operation nationwide. To facilitate informatization, it offers a Web site (www.korchambiz.net) for corporate information. Users can register and search information on 150,000 domestic companies, and companies can register product, trade and transaction information. In addition, it provides Web-hosting services for corporate Web sites, and constructs and hosts customized corporate Web sites (Web mail, shopping malls). The chamber of commerce also distributes ERP for SMEs at low cost and provides user training. It oversees its sub-organizations such as the Integrated Forum on Electronic Commerce and EAN Korea. The Integrated Forum on Electronic Commerce is a private organization dedicated to building infrastructure for e-commerce related standardization (www.ecif.or.kr)and EAN Korea: an organization specialized in informatization of logistics such as provision of EAN code, POS, data service and EDI (www.eankorea.or.kr).

The Korea Association of Information and Telecommunication is a consultative body of private IC industries. The association consists of several organizations,including ASP Industry Consortium

Korea, the IT Industry Statistics, the LBS Industry Council, the Korea Linux Council, the IT Venture Startup Network, ALSII, i-safe Mark and ePrivacy Mark, ITBT2Korea, the “Find a mobile Phone” Call Center, the Home Network Council and IHD CP. The group seeks to promote global marketing and develop human resources, identify IT-industry trends and provide IC services. It is responsible for distributing industry specific ASPs.

7. Overall Assessment of SME Informatization

One of the main characteristics of Korea's effort to informatize SMEs is that the government is leading the process of informatization. A step-by-step approach has been taken in this process. The Korean government first improved ICT infrastructure and adopted policies to develop e-commerce, then began its industry informatization program.

The government has emphasized benefits of informatization to enhance SME awareness of the importance of ITC when it pursues informatization programs. Generally, the process of SME informatization is led by the government, but in implementing ICT programs for businesses, the government encourages businesses to actively participate in the programs.

In addition, Korea utilizes various kinds of support programs to facilitate the informatization of SMEs. Not limited to financial support, the efforts include technical support and training programs to resolve difficulties in introducing ITC solutions to businesses. The efforts to maximize synergy effects are accompanied with an emphasis on coordination between government agencies and private-sector organizations. The Korean government hopes that Korea will ultimately achieve a high-level of SME informatization led by the private sector through voluntary participation of the private sector.

Appendix B.10. Malaysia

1. Trends of Informatization

Malaysia, a developing economy, is relatively less developed in terms of its ICT when compared to developed APEC member economies. The national information level in Malaysia is lower than the average level of APEC, but Malaysia has making rapid progress through strong national informatization support from the government.

With a vast territory and abundant natural resources, Malaysia, has made rapid economic progress since the 1980s, especially in the manufacturing industry, which is a significant recipient of foreign investment. In the 1990s, government policy turned to knowledge-based economy and thereafter imposed a number measures, including those related to informatization laws, IT infrastructure, IT training, computers and the informational communication network. The result of these efforts has been rapid progress in informatization.

<Table 1> Informatization of Malaysia (as of 2002)

(Unit: Persons, %)

	Malaysia	APEC Average
Mobile telephones in use per 1,000 people	372.9	434.02
Telephone mainlines in use per 1,000 people	206	372.71
Computers (PCs, mainframes, etc) per 1,000 people	137	310.59
Internet users, as % of population (1999)	5.7	15.13
Internet users, as % of population (2002)	26.87	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.24	0.46

Source: APEC. 2003. *KBE Indicators.*

According to APEC KBE indicators, Malaysia ranks low compared to most of the ICT APEC averages (see Table 1). The number of mobile phone subscribers is 372.9 per 1,000 people not very different from the APEC average of 434.02, but the number of fixed phone line subscribers is 206 per 1,000 people, just 55 percent of the APEC average of 372.71 people. In Malaysia, there are more mobile phone subscribers than mainline phone subscribers. This is a recent trend that has been evident in most APEC economies (more obviously in developing economies). On the other hand, the number of computer users is 137 per 1,000 people, less than half of the APEC average of 310.59. Some 26.87 percent Malaysians use the Internet, while the APEC average is 32.24 percent.[1] The Internet user rate is a five-fold increase from the 5.74 percent in 1999, meaning that Malaysia is rapidly moving toward an information society. Although e-commerce has been activated in Malaysia, traditional business methods are still favored.[2]

2. Definition of an SME

Malaysia defines SMEs in the manufacturing and manufacturing related services as companies with annual sales turnover not exceeding RM25 million or no more than 150 full-time employees. Small enterprises are defined as those with no more than 50 employees and annual sales turnover of no more than 10 million RM. Medium enterprises are defined as companies with 51-150 employees and annual sales and turnover of between 10 million RM and 25 million RM. (see Table 2).

<Table 2> Classification of SMEs in Malaysia

	Small Enterprises	Medium Enterprises
Employment	Not more than 50	51-150
Annual Sales & Turnover	Not more than 10 million RM	More than 10 million RM but less than 25 million RM

Source: SMIDEC Web site.

As of 1996, SMEs represented 93.8 percent in the industry (76.0 percent for small enterprises and 17.8 percent for medium enterprises; see Table 3). On the other hand, SMEs occupy 27.3 percent of output in the manufacturing industry, 25.8 percent of value-added, 27.6 percent of fixed assets and 38.9 percent of employment.

1) According to the ITU, ISDN only had 29,000 users as of 2001. According to the survey by Technowledge Asia and Micro Malaysia (1999), 84.3 percent of Malaysia's enterprises use Internet, 59.6 percent of these enterprises lack informatization infrastructure, using dial-up modem. The survey shows that only 30 percent of the surveyed enterprises have their corporate Web site. As of 2001, there were approximately 74,000 Internet hosts.
2) According to the IDC, the scale of Malaysia's e-commerce in 2001 was US$675 million, and B2B occupied about 66.8 percent of total e-commerce. However, e-commerce has not been active because of the low diffusion rates for computers and credit cards.

<Table 3> Status of Malaysian Manufacturing Industry (as of 1996)

	Total	Share by Size of Firm (%)				
		Small	Medium	SMEs	Large	Total
No. of Firms	20,204	76.0	17.8	93.8	6.2	100.0
Output (RM million)	273,439	3.9	23.4	27.3	72.7	100.0
Cost of Input (RM million)	201,901	3.6	24.2	27.8	72.2	100.0
Value-added (RM million)	71,538	4.7	21.1	25.8	74.1	100.0
Employees (1,000)	1,449	11.4	27.5	38.9	61.1	100.0
Salaries (RM million)	19,170	8.2	24.8	33.0	67.0	100.0
Fixed Assets (RM million)	112,831	4.0	23.6	27.6	72.4	100.0

Source: SMIDP Study Report (2000).

In terms of number of enterprises, there are many SMEs in textiles and apparel (17.5 percent), wood-based products (15.6 percent), food (15.3 percent) and, fabricated metal products (11.9 percent). In terms of employment, wood- based products (20.3 percent) are relatively important to SMEs, along with food (12.6 percent), textiles and apparel (8.8 percent) and, fabricated metal products (8.4 percent).[3)]

According to SMIDEC, Malaysia now provides public incentives (tax incentives, grant assistance, loans, credit and equity participation) and infrastructural support services for SMEs.[4)]

3. Strategy and Progress of SME Informatization

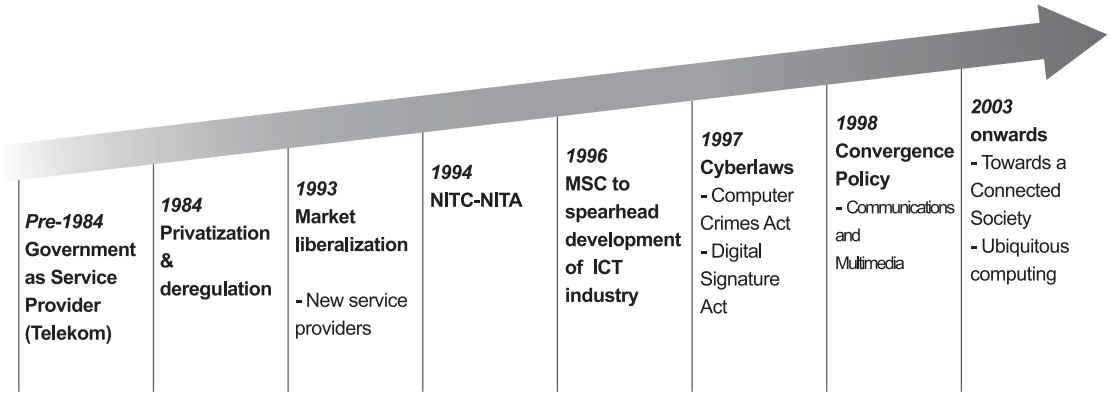
3.1 National Informatization Policies

Malaysia pursues informatization through the National IT Agenda (NITA), the 8th Malaysian Plan (2001-2005) and the Multimedia Super Corridor Project (MSC). It prepared and implemented a number of policies to facilitate use of ICTs in the 1980s before the Vision 2020 Plan, which aims to transform Malaysia into a knowledge-based society. As suggested Figure 1, Malaysia began to deregulate and privatizethe information and telecommunications sector in 1984, opening up its markets. The national framework for informatization was established in 1994 as the National IT Council (NITC) formed the NITA. Since then, the NITC has carrying out various projects such as the MSC, NISER, DAGS, Governance Agenda, MIU, SJ2005, Knowledge Economy, Bridging the Digital Divide, TIGeR, KMAP and Knowledge Measurement.[5)] The government instituted Cyberlaws such as the Computer Crimes Act and the Digital Signature Act in 1997 and the

3) Refer to the SMIDP Study Report (2000).
4) Refer to the SMIDEC Web site [http://www.smidec.gov.my].
5) Refer to the NITC Web site [http://www.nitc.org.my] for details of the NITC Initiative.

Communication and Multimedia Act in 1998 to lay institutional framework for an information society.

<Figure 1> Major Informatization Policies of Malaysia



Source: NITC

The NITA was launched in December 1996 by the NITC.[6] The NITA vision is to utilize ICT to transform all of Malaysian society into an information society, then to a knowledge society,and finally to a values-based knowledge society. With the theme "Turning Ripples into Tidal Waves", NITA focuses on the development of people, infrastructure and applications to create value, to provide equity and access to all Malaysians, and to qualitatively transform thesociety into a values-based knowledge society by the year 2020.[7]

As an added aspect of NITA realization, the NITC has formulated the NITC Strategic Agenda that involves a step-by-step transformation from the current governance structure to a participatory one involving an active tripartite partnership between the public, private and community-interest sectors. The Strategic Agenda highlights five areas: e-community, e-public services, e-learning, e-economy and e-sovereignty.

6) Chaired by the Prime Minister,the NITC comprises members from the public, private and community-interest sectors and functions as a think tank that advises the government on ICT strategy. MIMOS Berhad, as the Secretariat to the NITC, assists and supports the Council's activities, including the development and realization of NITA.

7) The "ripples" are focused initiatives by the government to create the necessary environment and empower the people, so that they will bring about the tidal wave of change required to achieve the NITA vision. The Multimedia Super Corridor (MSC), the earliest strategic initiative of the NITC, is such a ripple. Acknowledging the need to involve all Malaysians in the NITA process, another major ripple initiated by the NITC is the Demonstrator Application Grant Scheme (DAGS), which encourages Malaysians to participate in and utilize the opportunities made available by ICT. MIMOS Berhad, as Secretariat, manages and administers DAGS.

<Table 4> National IT Agenda (NITA)

NITA promoted by NITC		
Infrastructural Development	**Infostructural Development**	**Industrial Development**
▶ Liberalization ▶ MSC ▶ Tariff rebalancing	▶ Cyber laws ▶ Content Development ▶ Smart School Initiative ▶ Tele Tele-health ▶ e-Government ▶ e-Community ▶ IT education	▶ Licensing ▶ Competition ▶ Communication &/ Multimedia Act 1998

The NITC promotes the notion that knowledge and information will be the most valuable assets in the economy of the new millennium.

The National IT Framework (NITF) is a strategic and synergistic combination of a number of key componentsworking in tandem. The framework is best viewed as an interconnected triangle consisting of three key elements: people, "infostructure"and applications.

The Malaysian government established the 8th Malaysian Plan to transform its economy into a knowledge-based economy, developing human resources, strengthening hardware and software infrastructure, increasing the Internet diffusion rate and fostering the introduction of IT to SMEs.[8] The 8th Malaysian Plan has been promoting the following:

- Transforming Malaysia into a leading IT nation and multimedia hub
- Eliminating the digital divide by setting up a communication infrastructure and increasing the Internet diffusion rate;
- Fostering IT human resources;
- Fostering e-commerce;
- Strengthening the capacity for digital content;
- Fostering IT-related SME; and
- Developing MSC application as soon as possible

MSC, created by Malaysia's former Prime Minister Mahathir,was launched in 1995. MSC, an NITC initiative, is a part of a project to transform Malaysia into a digitalized knowledge-based economy by 2020. The project is to construct a new concept city in an area occupying a 15-km by 50-km corridor connecting Putrajaya, the new administrative capital, and the Kuala Lumpur City Center. Its goal is to attract investment from overseas (IT and multimedia companies). MSC extends financial and non-financial incentives. Financial incentives include tax exemptions, R&D grants and duty-free importation of multimedia equipment non-financial incentives include a supporting policy for MSC-status companies by MDC under Bill of Guarantee.[9] The Bill of Guarantee, created for MSC companies, is designed to provide MSC companies with facilities, infrastructure and services guaranteed by the Malaysian government on the basis of contracts signed by MSC companies and MDC.[10]

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8) According to the 8th Malaysian Plan, US$1.3 billion (RM4.9 billion) of the total government budgets were allocated to ITand US$261.58 million (RM994 million) was spent in 2002. Of this, 35 percent was spent on developing the first step application, 31 percent was allocated to public service and government computerization and 21 percent was spent on closing the national digital divide.

9) Refer to "11. Multimedia Super Corridor (MSC) promoting policy" of MIDA

Putrajaya is being fostered as Malaysia's new government and administrative capital, introducing the new concept of government. Cyberjaya is an intelligent city based on IT to attract the regional headquarters of MNCs. MDC, promoting MSC on the authority of the government, provides an effective one-stop agency service to MSC companies and customers.

MDC plans to promote MSC project for 20 years through three steps. The first step is to establish communication infrastructure, develop Internet-oriented system, found Cyberjaya and Putrajaya, andselect seven main applications (Electronic Government, Multipurpose Cards, Smart School, Telehealth, R&D Clusters, E-Business andTechnopreneur Development). The second step is to expand MSC facilities and foundations (Web service and cyber laws), establish a worldwide network and make international cyber law. The third step is to make a test-bed for development application, complete the knowledge-based society, link with worldwide high-speed information networks and create the foundation of a global cyber court. More than 700 companies from about 50 nations are participating in MSC, one-third of which are from other economies.

3.2. Organizational Structure for Informatization of SMEs

Although the government is promoting informatization, the organization system is not distinctly promoting SME informatization. The Small and Medium Industries Development Corporation (SMIDEC) is themain organization that prepares and implements strategies for the informatization of SMEs. SMIDEC promotes the informatization of small enterprises in the Eighth Malaysia Plan (2001-2005) and SMI Development Plan (2001-2005) (SMIDP), providing various Skills Upgrading Programs is a special feature.

3.3. Strategies for the Informatization of SMEs

The framework for informatization of Malaysian SMEs is suggested in the Eighth Malaysia Plan (2001-2005), and the SMIDEC builds and implements related policies, and the SMI Development Plan (2001-2005) (hereinafter SMIDP).

The ICT policy targeting SMEs in the Eighth Malaysia Plan (2001-2005) is as follows.[11] To achieve the objective of developing more resilient and competitive SMEs, a broad range of assistance program were implemented during the review period. In order to enable SMEs to penetrate the export markets, the SMIDEC provided assistance to SMEs to certify their products and processes to fulfillthe requirements of importing economies. In this respect, SMIDEC provided a matching grant of up to RM 250,000 per company under the Productivity and Quality Improvement and Certification Scheme (ITAF 3) for the SMEs to improve their productivity and quality. A sum of RM

10) The Bill of Guarantee aims to: 1) Provide a world-class physical and information infrastructure; 2) Allow unrestricted employment of local and knowledge workers from overseas; 3) Ensure freedom of ownership for MSC companies; 4) Ensure freedom to invest in MSC; 5) Provide competitive financial incentives, including no income tax for up to 10 years or an investment tax allowance, and duty-free multimedia equipment imports; 6) Provide intellectual property protection and apply cyber laws; 7) Ensure no Internet censorship; 8) Provide globally competitive telecommunications tariffs; 9) Provide flexible terms of MSC infrastructure contracts to companies willing to use the MSC as their regional hub; 10) Provide an effective one-stop agency [http://www.msc.com.my/flag.asp). For details, refer to [http://www.mdc.com.my/status/higher/chap4].

11) Malaysia Government. 2003. *Mid-Term Review of the Eighth Malaysia Plan 2001-2005*. Chapter 9.

29.7 million was provided to 966 SMEs during the review period. To fulfill the demand for skilled workers in the new business environment, the Skill Upgrading Program was implemented to provide training to employees of SMEs through 16 skill development centers. A grant equivalent to 80 percent ofthe cost of training was extended to companies to assist in reducing the cost of training. A total of RM5.7 million was spent to train some 8,000 SME employees during the review period.

During the review period, SMIDEC also embarked on three new programs in line with the Small and Medium Industry Development Plan. These programs were the Headstart 500 Program, which aimed at providing SMEs with financial and technical know-how to accelerate their transformation from domestic-oriented operators to global manufacturers; the SME Information and Advisory Centre, which provided virtual business matching and collective purchasing of services and content for SMEs; and the SME Expert Advisory Program, where retired professionals in various technical and management fields assisted SMEs that required their professional services.

Recently, Malaysia has encouraged SMEs to respond to changes in the domestic and international business environments through its SMI Development Plan (2001-2005) (SMIDP). The SMIDP seeks to integrate both new and existing SMEs into the main industrial base. Against the perspective of SMI development and current performance of SMEs, the objectives of the SMIDP are to create a conducive policy environment to spur the development of SMEs into globally competitive enterprises and promote the development of knowledge-based SMEs. The strategic goals of the SMIDP are to enable SMEs to be productivity-driven, technologically capable and globally competitive facilitate organizational change at the enterprise level to accelerate the transition towards globalized production platforms; and promote lead enterprises to drive SMEs to deepen cluster development. To reinforce the recent focus on enterprise and entrepreneurial development, the action plans under the SMIDP will be targeted at: strengthening existing initiatives; introducing new initiatives; fine-tuning existing broad-based programs; and selected priority industry sectors.

Moreover, Malaysia arranged Cyber Laws during the Seventh Malaysia Plan (1996-2000) on purpose to foster the lawful foundation of informatized society.Cyber laws, combinations of a variety of regulations related to informatization, are established by integrating existing laws and arranging new laws. Cyber laws include the Digital Signature Act 1997, Computer Crimes Act 1997, Copyright Act 1997, Telemedicine Act 1997, Communications and Multimedia Act 1998, and Malaysian Communications and Multimedia Commission Act 1998. The Personal Data Protection Bill is currently in the process of drafting to follow international standards.

4.Government Organizations for SME Informatization

The Ministry of Energy, Communication and Multimedia (MECM), which is in charge of information and telecommunication policies, was established on November1, 1998 through a restructuring of the Ministry of Energy, Telecommunications and Posts. MECM has shifted from being service provider to a policy formulator and service regulator for the energy, communication and multimedia sectors. The Ministry's mission is to develop and formulate strategic and innovative policies, self-regulatory framework and establish a vibrant, effective and efficient management system. The regulatory function of the ministry is undertaken through its regulatory bodies, namely, the Energy Commission and the Communications and Multimedia Commission.[12)]

Jabatan Telekom Malaysia (JTM), which was under the former information ministry, was in charge of managing information and communication polices, regulating and supervising the entire telecommunications industry. JTM supplied computers to schools, households and companies to promote informatization and foster the IT industry.

The Ministry of Industry Development Authority (MIDA) is the Malaysian government's principal agency for promotion and coordination of industrial development in Malaysia. It was established according to the Federal Industrial Development Authority and started operations in 1967. The major functions of MIDA are promoting foreign and local investment in the manufacturing and related services sectors, planning for industrial development, andrecommending policies and strategies on industrial promotion to the Minister of Trade and Industry. MIDA evaluates applications for incentives for industrial activities, applications for manufacturing license and tariff protection/duty exemption for raw materials, components and machinery. MIDA is also in charge of the implementation and operation of projects of new and existing companies, offering assistance through direct consultation and cooperation with the relevant authorities at both the federal and state levels. MIDA is implementing investment promotion policies in order to attract foreign capital concerning ICT.[13] Other investment promotion policies (below) are implemented to attract foreign capital concerning MCS.[14]

The Multimedia Development Corporation (MDC) was established under the MSC law to promote the MSC. MDC has two affiliated agencies: the International Advisory Panel (IAP) and the Implementation Council (ICM). The IAP has the total 50 members from the public and private sectors while the ICM is composed of 13 members, including the Prime Minister, Deputy Prime Minister and directors of related divisions.

As a result of the Malaysian government's efforts to establish MDC to promote MSC and attract investment from the public and private sectors (especially foreign capital), the quality of products has improved and the IT market has expanded. In addition, development of the related industries has been accelerated. In particular, Malaysia is now moving to secure competitiveness in the coming knowledge-based economy by fostering information infrastructure through the MSC.

NITC was established in 1994 to correspond with the policies presented in the Vision 2020. NITC acts as a consultant and advisor for the government onIT for national development of Malaysia. The council aims at promoting sustainable growth of IT development and application through R&D planning and strategy, the acquisition of technology, integrating new technology into society, the economy and estimating the expected impact of IT on the economy. NICT performs the role of secretariat of the Global Knowledge Partnership Network (GKP).

The SMIDEC was established in 1996 to foster SMEs. SMIDEC aims to improve SMEproductivity and strengthen efficiency by providing advisory services, financial support, infrastructure, market access and other programs.SMIDEC supports the Industrial Linkage Program, the Global Suppliers Program, the Market Development Program, the Technology Development Program and the Skills

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12) The objectives of MECM are as follows:
- To facilitate the establishment of an integrated, efficient and high quality infrastructure for the energy, communications & multimedia industry
- To ensure a conducive climate for the development of the energy, communications and multimedia industry.
- To ensure continuous technological advancement for the energy, communications & multimedia industry through encouragement of research and development.
- o ensure an efficient and effective universal delivery of energy, communications & multimedia services at affordable prices and to increase the productivity of business and quality of life.
- To ensure a secure and reliable supply or provision of energy, communications & multimedia services.
- To establish a dynamic and progressive regulatory system to promote market development and manage the impact of the energy, communications and multimedia industries on society and the environment.
- To continuously enhance corporate management support systems.

13) For more details, refer to the MIDA Web site [http://www.mida.gov.my]. (Incentives for Information and Communications Technology in the Investors' Guide to Incentives for Investment.)

14) For more details, refer to the MIDA Web site [http://www.mida.gov.my]. (Incentive for the Multimedia Super Corridor in the Investors' Guide to Incentives for Investment.)

Upgrading Program.[15)]

SMIDEC stressed the SME use of knowledge and the adoption of ICT at the Second Industrial Master Plan (IMP2, 1996-2005). SMIDEC prepared the Small and Medium Industries Development Plan (SMIDP, 2001-2005) by complementing IMP2 so that SMEs can be prepared for the challenges and opportunities that will be induced by trade liberalization, globalization and ICT.[16)]

5. Major Policies and Projects for Enhancing SME Informatization

5.1. The Priority Industrial and Regional Sector in Malaysian SME Informatization Promotion and Business Support

SMIDEC's support is focused on SMEs in the manufacturing industry to boost informatization also targets SMEmanufacturers. There is no priority region in the policy supporting informatization of Malaysia. However, the Cyberjaya region, where the MSC is located, and Kuala Lumpurand the industrial complex near Kuala Lumpur are given more benefits. In particular, in Cyberjaya, high-speed information communications networks are established, companies operating in the region provided various IT services and facilities.

5.2.Major Policies and Projects for Enhancing SME Informatization

As stated above, SMIDEC is in charge of implementing strategies relating SME developments suggested in the Eighth Malaysia Plan (2001-2005). Direct SMIDEC programs to promote SME informatization are the "Skills Upgrading Program" and "Infrastructure Development," and indirect programs to support informatization include the Industrial Linkage Program, the Global SupplierProgram and the SME Expert Advisory Panel.[17)]

The Skills Upgrading Program is aimed at enhancing the skills and capabilities of employees of SMEs at the technical and managerial levels, particularly in critical areas such as the electrical and electronics, information technology, industrial design and engineering fields. Currently, theSMIDEC has appointed 19 training providers to undertake technical skills training for SMEs: the German-Malaysian Institute Sarawak Skills Development Centre Johor Skills Development Centre Penang Skills Development Centre Terengganu Advanced Technical Institute Malaysia France Institute Pahang Skills Development Centre Kedah Industrial Skills and Management Development Centre Perak Entrepreneur and Skills Development CentreSelangor Human Resource Development Centre Negeri Sembilan Skills Development Centre Malacca Industrial Skills Development Centre Sabah Skills and Technology Centre SIRIM Bhd, Technology Park Malaysia Malaysian Institute for Nuclear Technology Research National Productivity Corporation Kumpulan IKRAM Sdn Bhd and the National Institute of Occupational Safety and Health.

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15) For more details, refer to the two Web sites:
[http://www.smidec.gov.my/detailpage.jsp?section=aboutus&subsection=function&level=2]
[http://www.smidec.gov.my/detailpage.jsp?section=smidecprogrammes&level=1]

16) The main contents of the Small and Medium Industries Development Plan (SMIDP, 2001-205) will be complemented with the reference of SMIDC Web site [http://www.smidec.gov.my].

17) For more details, refer to the SMIDC Web site [http://www.smidec.gov.my].

SMEs that send their employees for courses at any of the training providers will be eligible for a 50-percent training grant from SMIDEC. In addition, the remaining costs can be claimed through the Human Resource Development Fund if a company is registered with the Human Resources Development Board.

SMIDEC, together with the Malaysian Industrial Estates Berhad and Perbadanan Kemajuan Negeri Selangor, has developed industrial estates all over the economy to assist SMEs in the operation of their business in approved areas.

SMIDEC will continue to promote and encourage SMEs to relocate their businesses to approved areas to ensure that SMEs have the foundation and facilities to operate in the most conducive environment.

In addition, the Malaysian government supports ICT businesses through arranging an ICT fund (50 billion RM, as of 2000)and helps businesses to obtain easy access to informatization infrastructure by constructing five cyber cities.

6. Efforts for SME Informatization from Private Sector

Although the Malaysian government is at the center of SMEs informatization promotion, the non-government sector also plays an important role in informatization. The non-government sector involves civil associations such as PIKOM, research institutions such as MIMOS and universities.

Persatuan Industri Komputer and Multimedia Malaysia (PIKOM the Association of the Computer & Multimedia Industry Malaysia) was established in 1986 to represent the IT industry in Malaysia. PIKOM plays a leading role in national informatization and business informatization, promoting computer supply, technology development in IC, program development and a variety of fora. In addition, PIKOM provides its business members with information related to ICT on purpose to help them to properly respond to dramatically changing ICT.

In addition, the Malaysian Institute of Microelectronic Systems (MIMOS) is a representative ICT industry research institution that was established as an affiliated institution of the office in 1985 but was later transferred affiliated institution of Ministry of Science, Technology and the Environment in 1990. It was finally designated as the major promotion agency of NITC in 1995. MIMOS, established as an affiliated research institution of the government, privatized as MIMOS Berhad in 1996and maintains policy cooperation relationship with the government after its privatization. The major functions of MIMOS are to advise the government with technology development policies and its major tasks are Next Generation Internet development, Peer-to-Peer Computing development, Adaptive Information Managementdevelopment and Cryptography technology development.

7. Overall Assessment of SME Informatization

The Malaysian government is promoting ICT through a step-by-step approach. In particular, with the NITC and NITA, the systematic approach to informatization became possible after NITA was established. Malaysia is assessed to have prepared ITC infrastructureas a result of its industrial development and informatization projects. However, this infrastructure is not widely accessible except for in some cities, such as Kuala Lumpur, Cyberjaya and the new administrative capital.

In Malaysia, the government leads the national informatization efforts. Nevertheless, it has not

established a structure that would support informatization of SMEs. Organizations that support SME informatization are MECM, MIDA, MDC and SMIDEC.

SMIDEC, responsible for policies regarding SMEs, gives priority to the manufacturing sector in its investment in SME informatization and others. Policies to support theinformatization of SMEs employed by SMIDEC include financial support, training service, review and improvement of law and regulations, technical support and portal service. MIDA provides SMEs with financial and non-financial incentives for investment in MSC and ICT. In the case of MDC, its support is not limited to SMEs it also provides infrastructure to IT companies domestically and internationally.

Malaysia promotes a knowledge-based society through various policies presented in Vision 2020. The current ITC infrastructure is not sophisticated, but Malaysia's move toward an information-society is very promising considering the economic progress that Malaysia has made for the past 20 years.

Malaysia's policies to support ICT use (including by SMEs) have been focused on the manufacturing sector and some regions and have been led by the government so far, but they will be broadened in scope when the Eighth Malaysia Plan is complete in 2006. SMEs are the backbone of the Malaysian economy, therefore, Malaysia is expected to prepare polices to facilitate SME utilization of ICT in order to enhance productivity and efficiency as well as strengthening the international competitiveness of SMEs internationally.

Appendix B.11. Mexico

1. Trends of Informatization

For a long time, Mexico has recognized the strategic importance of ICT. To take advantage of advances in technology, the former administration prepared the Informatics Development Program 1995-2000, which has been established as a reference frame for the efforts made in this area.

The change of the government in December 2000 involved the revision and redefinition of public policies. Therefore, there has been a process of preparing a new promotion program to use and exploit technology with the objective of channeling the efforts made by the sectors with relation to ICTs. The main objective of the process is to use and benefit from the solutions based on the technology and not the technology by itself, and that the ultimate objective is the use of knowledge and information. This process is aligned with the strategic project called the "e-Mexico System."

The e-Mexico (National System) is a national technology project with an aim of ensuring that most of the population has access to new technologies and integrates four sub-systems, e-government, e-education, e-healthand e-commerce. It was launched with the inauguration of Vincente Fox's presidency in 2001, whose objective is to eliminate the barriers to information and public services. This project also seeks to reduce the digital divide between rural areas, the urban population and the rest of the world.

The current the level of informatization in Mexico, however, is assessed to be low compared to the APEC average. In Mexico, 262.3 per 1,000 people use mobile phones, 60 percentof the APEC average of 434.02 people, and telephone mainline subscription was 137 out of 1,000 people, which is 28 percent of the APEC average of 372.71. The number of computers per 1,000 inhabitants is 88, far behind of the APEC average of 310.59.

<Table 1> Informatization of Mexico (as of 2000)

(Unit: Persons, %)

	Maxico	APEC Average
Mobile telephones in use per 1,000 people	262.3	434.02
Telephone mainlines in use per 1,000 people	137	372.71
Computers (PCs, mainframes, etc) per 1,000 people	88	310.59
Internet users, as % of population (1999)	n/a	15.13
Internet users, as % of population (2000)	6.58	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.2	0.46

Source: APEC. 2003. *KBE Indicators.*

2. Definition of an SME

The Mexican Ministry of the Economy is legally stratifying micro, small and medium enterprises by number of employees (<Table 2>).

<Table 2> Stratification of SMEs by number of Employees

Sector/Size	Industry	Commerce	Services
Micro	0-10	0-10	0-10
Small	11-50	11-50	11-50
Medium	51-250	31-100	31-100

Now there are approximately 2.84 million enterprises in Mexico, of which 99.7 percent are SMEs, that generate 42 percent of GDP and 64 percentof total employment. Within the manufacturing sector, firms with fewer than 500 employees generate 66 percentof employment, firms with fewer than 100 employees account for 38 percent and small firms withfewer than 50 employees are responsible for 31 percent of employment in manufacturing.

3. Strategy and Progress of SME Informatization

With the e-Mexico National System or simply the e-Mexico project, the Mexican government seeks to transform the economy through the application of modern technology and the interconnection of businesses, linking communication between the governmental departments and initiating an education reform to create a digital Mexico. The Ministry of Transportation and Communications leads the project, with the participation of the Ministry of Economy, the Ministry of Education and the Ministry of Health.

The e-Mexico portal (http://www.e-mexico.gob.mx) will reach 80 percent of Mexican population through 20 percent of high impact services, converting itself into a vehicle to promote public participation. The portal is expected to become a channel to connect people with similar aims, in addition to being an instrument to democratize access to information.

The e-Mexico National System has launched the first satellite network of connectivity. It is the first network that links at least one point of high-speed connectivity in all the municipalities of the economy and the 16 political delegations of the Federal District. Currently,there are 3,200 Digital Communitarian Centers (DCC) activated and working throughout all the economy. DCCs are located in public places to provide easy and free-of-charge access to computers for the population of the bordering localities extending services to the surrounding communities. Centers are in schools, libraries, health centers, social development centers, municipal presidencies, telegraph and post offices.

The e-Mexico project, which integrates four sub-systems, e-government, e-education, e-health, and e-commerce, enables the population to have access to commerce services through the e-economy subsystem. Through e-commerce, employment is supported as well as production and the competitiveness of companies. There is special interest in helping and developing micro enterprises and SMEs.

4. Governmental Organizations for SME Informatization

4.1. The National Council for the Mexico, Small and Medium Enterprises

The National Council for the Mexico, Small and Medium Enterprises is responsible for formulating policies, actions and instruments to assist SMEs and to promote their competitiveness. Major trade groups are participating in the council. The council evaluates each program according to its objectives and goals. The council's evaluation recommendations are reflected into government programs.

4.2. The Ministry of the Economy

The Ministry of Economy promotes the use of informatics in SMEs as an instrument to improve productivity and competitiveness. One of itsmandates is to promote the competitiveness of enterprises in order to generate more jobs. Other public administration entities are making efforts to contribute to facilitating procedures and information interchange processes, and to promote the development of databases with the aim to foster and coordinate relations between the entities.

The ministry provides the CONTACTO PyME information system, which covers SME requirements in its diffusion of business information as well as supporting the adoption of appropriate information technology application. SMEs can acquire information on the market, their position with regard to competitors, developments in standards, administrative procedures and business opportunities.

CONTACTO PyMe provides information on 117 government support programs, business tools, technology and innovation support. Such services as quality assurance, export promotion, benchmarking and self-diagnostic tools, and statistical information by sector were added. (www.economia.gob.mx)

In addition to the programs mentioned above, there are several different programs for informatization.

First, FIrst Contact Entreprenurial adviser center (FIRST STOP SHOP) began in 1998 with the purpose to offer to the businessmen an integral service of information regarding the procedures for the business opening, federal government's support programs, business opportunities (clients and suppliers of products and services), orientation of foreign trade and on the free trade agreements. To obtain this information, the companies can attend to the information center offices, or they can outline their consultation by phone (01 800 410-2000), by electronic mail and by conversation forums.

Secondly, the AUTODIAGNOSTIC SYSTEM provides to the micro, small and medium entrepreneur, a tool, that allows him to know the strengths and weaknesses of 15 different areas of his company, evaluating the practices and internal procedures, allowing to diagnosethe degree of productivity and competitiveness of the company. It is available, on Internet for free by filling of autoapplicable and independent questionnaires. An automatic interpretation is obtained through a traffic light, which indicates the degree of competitiveness providing recommendations about how to strength the evaluated practices.

Thirdly, the COMPETITIVENESS' EVALUATION INDICATORS (BENCHMARKING) is an Internet information system, which allows the users to evaluate themselves by an autoapplicable questionnaire with anonymous and confidential information, and to obtain a comparison of

competitiveness indicators with regard to the best manufacture's practices by its size, sector, region, level of development and productive orientation. Which is used as a identify strategies database that allows to support or improve its competitive position allowing the comparison with similar companies. This contributes to the improvement of the entrepreneurial modernization and to the competitiveness. It provides to the micro, small and medium entrepreneur a tool that allows him to evaluate his company in sectors like: automotive parts, apparel, textiles, leather and footwear, electrical, electronic, furniture, metal mechanic and plastic, obtaining a comparison in competitiveness indicators with regard to better national or international practices of manufacture.

4.3. The Business Information Center

The Business Information Center provides information on government support programs for SMEs, and Business Link Centers have been established so as to facilitate access to information and technological innovation for SMEs. These centers also provide training, technical assistance, advisory and business plan support. Business Link Centers also offer technical support and promote the adoption of information and communication technologies by SMEsand seek to guide enterprises toward the highest quality and productivity standards in the global market. This organization of technology forums at national, regional, local government levels promotes exchange between industry and higher education institutions and provides easier access for SMEs to new technologies. And the Binding Entrepreneurial Centers are a basic attention network to the SME's and its objective is to promote the entrepreneurial formation. These centers make out to be easier and induce the use of information between the SMEs through personal and direct attention, so in that way it will be bound with the technological innovation alternatives to support them to increase its competitiveness capacity through entrepreneurial informative tools in supplies, inventories, sellers, accounting, financial analysis, tax affairs as well as productive and administrative process. These centers have three branches such as training and information, advising and consultancy, and businesses opportunities.

4.4. The Technological Services Information System (SISTEC)

The Technological Services Information System (SISTEC) fosters a technological culture in SMEs by providing information on the capability of technological services. SISTEC is aimed at small and medium manufacturing or services enterprises that have had doubts or the need to solve technological and technical problems. It offers a database with information about services that are provided by more than 225 development research institutes and centers and specialized consultants. (www.rtn.net.mx/sistec/que.html)

5. Major Policies and Projects for Enhancing SME Informatization

5.1. The Committee Program and Cetro-Crece Program

In addition, some of the initiatives of the federal government to improve the performance of the productive sector through ICT, mainly in SMEs(PyMES) include two programs. The Committee Program (National Committee of Productivity and Technological Innovation) allows for the improvement of the competitive position of the micro enterprises and SMEs through the maximization of the performance of its resources. Cetro-Crece Program provides effective support in benefit of SMEs and micro enterprises including integral consulting, managerial training, research of viability, market research and sectoral and financial analysis.

To establish immediate, viable and low-cost solutions to the arising problems, it especially applies to SMEs with the exception of the automobile industry. The program provides the enterprises with a strategy that works under the traditional concept of massive productionin order to develop an efficient method of production. With this method, operations that do not give added value to the final product or generates unnecessary costs that increase the price of the product are eliminated.

The program consists ofintensive workshops organized in the production lines selected by the enterprises. These workshops take place in the enterprises' facilities during four or fivedays and they are conducted by authorized consultants with the participation of an interdisciplinary group established by the company.

The program includes an analysis of the enterprises' situation based on 4 parameters: productivity, request time, inventories and enterprises' layout. This analysis is aimed at identifying short run problems and solutions. Based on this analysis, some measures are implemented immediately followed by a productivity increase evaluation. The objective is to optimize the above-mentioned parameters.

5.2. The project of the Small and Medium Enterprises System

The project of the Small and Medium Enterprises System aims at the incorporation of SMEs to a national infomatics network, which allows themto contribute information about markets and inputs and to realize transactions with suppliers and customers. The subprojects of this system in the years 2000 and 2001 the Mexican Enterprises Information System (SIEM) and the Mexican System of External Promotion (SIMPEX). The objective of SIEM is to link enterprises, particularly SMEs, to productive chains through the integration of a national database or enterprise registry that permits the identification of the characteristics, supply and demand in order to detect potential customers or suppliers. It aims to set up an Enterprise Information System thatintegrates information from first using the same updating methodology. By 2001, it contained 584,284 records. (www.siem.gob.mx)

5.3. The Technology Transfer Unit

The Technology Transfer Unit (UTT) is a non-profit organization created by the Mexican government through the Ministry of Trade and Industrial Development, and the private sector through the National Chamber of Manufacturing Industry, with the participation of IBM of Mexico,

S.A. to provide SMEs with processed and customized solutions according to their needs and means. UTT services are especially designed to satisfy information and technical assistance needs of SMEs, but UTT is also useful for other industries such as associations and chambers, service companies, financial institutions, government and non-government institutions, international organizations and foreign companies. UTT taps national and international entities to provide its users with the information and technical assistance needed to solve technological and production problems, and to increase their competitiveness in the marketplace.

6. Efforts for SME Informatization from the Private Sector

SME policies are implemented to reduce the disadvantages between SMEs and large enterprises in areas such as financing, human resources development, technology development, access to foreign markets, technology transfer and development for supporting industry, to ease the process towards increased quality and competitiveness. This is important because SMEs are facing new challenges as a result of tariff reductionsand increasing competition in the domestic market. The modernization of facilities and the incorporation of more efficient technologies have become priorities for most enterprises.

6.1. COMPITE

The Mexican government has implemented COMPITE (National Committee for Productivity and Technological Innovation, www.compite.org.mx) Program in order to enhance SMEcompetitiveness and efficiency. Under the program, managerial and technical expertise is provided to SMEs at their own facilities. COMPITEprovides specialized consultancy and support services under the COMPITE framework. The centers seek to guide enterprises towards the highest quality and productivity standards in the global market with the aim of reinforcing the competitiveness level of the enterprises, increasing productivity through the efficient use of production processes and making optimal use of the enterprises'resources. The program offers a four-day consulting service in the form of a workshop. A group of workers, supervisors, production managers and owners participate according to the results of its consultancy services and customized application systems are provided to the SMEs.

Compite also provides information through the Quality Portal to entrepreneur about quality relating to training, consultancy and support for the insurance and certification as well as events promotion and quality congresses, among others. This portal is directed to the SMEs, and all kind of people.

6.2. NAFIN

The second-tier banking institution NAFIN (www.nafin.com.mx) has a collection of electronic services for its users that includes the online processing of credit, factoring and payment services. It has trained more than 37,000 businesses online and assists more than 25,000 SMEs using individualized online files. It has successfully adopted the main solutions and strategies for standard electronic banking.

7. Overall Assessment of SME Informatization

The Mexican government set its target of transforming Mexico into the world's IT leader by the year 2010. It has made progress in realizing the goal with its project, the e-Mexico National System. Despite the opposition of TELMEX, the leading telecom company in Mexico, the government lifted restriction on foreign investment in the telecommunication market to take up the task of building IT infrastructure. Through the process, Mexico is leading development of ICT in Latin America, and through e-Mexico's DCCs, all Mexicans can have access to computers. In two years, 53,000 computers have been distributed all over the economy.

Four sub-projects under the e-Mexico project, including e-economy and vitalization of SMEs, are the core objectives of e-economy. The government is committed to enhancing the competitiveness of SMEs through ICT,including the Internet, specialized consultancy and support services under the COMPITE framework and NAFIN, an effective electronic banking system. However, SMEs are not able to fully utilize ICT yet - except for in some limited sectors.

Appendix B.12. New Zealand

1. Trends of Informatization

New Zealand, one of the highest-income APEC members, has a high level of informatization compared to other APEC members and imports most of its IT product needs.[1] Its main industries are tourism and primary industries such as agricultural, forestry, livestock, fisheries and mining.

<Table 1> Level of Informatization of New Zealand (as of 2002)

(Unit: Persons, %)

	New Zealand	APEC Average
Mobile telephones in use per 1,000 people	190.60	434.02
Telephone mainlines in use per 1,000 people	507.00	372.71
Computers (PCs, mainframes, etc) per 1,000 people	571.00	310.59
Internet users, as % of population (1999)	25.80	15.13
Internet users, as % of population (2002)	47.03	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.80	0.46

Source: APEC. 2003. *KBE Indicators*.

New Zealand passes the APEC average for nearly all APEC Knowledge-Based Economy Indicators on informatization, except for mobile phone penetration (see Table 1). The number of mobile phone users per 1,000 inhabitants was 190.6, much lower than the APEC average of 434.02. However, the number of telephone mainlines per 1,000 inhabitants was 507, higher than the APEC average of 372.71, and the number of computers per 1,000 inhabitants was 571 (almost double the APEC average of 310.59). In New Zealand, 47.03 percent of people have access to the Internet, higher than the APEC average of 32.24 percent. The share of Internet users has doubled for the past three years. E-commerce takes up 0.8 percent of total commercial transactions, also higher than the APEC and OECD averages.[2]

1) According to Statistics New Zealand (http://www.stats.govt.nz), the five major export items of New Zealand are dairy products (NZ$5.81 billion), meat (NZ$4.18 billion), timber (NZ$2.22 billion), fisheries (NZ$1.34 billion) and aluminum (NZ$1,29 billion), while major import items are machinery, car parts, electronic appliances and plastic products. One of the main industries of New Zealand is the tourism industry, with more than 2 million overseas visitors annually.

2) According to Statistics New Zealand, 32.9 percent of total households had more than one computer as of 1998 and this percentage is expected to grow to 42.8 percentin 2000. According to the Ministry of Economic Development (MED), the ratio of households using the Internet in New Zealand amounts to about 50 percent, the ratio of e-mail account owners is about 50 percent and the rate of e-commerce use is 11 percent. The number of hosts, as of January 2000, was 271,003 (or 52 out of 1000 peopleas of 1998). In 1998, there were 104 hosts in Finland, 79 in the United States, 78 in Norway, 78 in Iceland, 62 in Sweden, 51 in Denmark, 46 in Australia and 42 in the Netherlands.

2. Definition of an SME

A clear definition or classification for SMEs is not set down in law, a report released by the Ministry of Economic Development defines SMEs as enterprises employing 19 or fewer full-time equivalent employees(FTEs).

<Table 2> Definition of an SME

"...for the purposes of this report, SMEs will be defined as enterprises employing 19 or fewer full-time equivalent employees** unless otherwise stated. Within this, small enterprises will be depined as those employing 0-5 FTEs and medium enterprises as those employing 6-19 FTEs.

Note: * Burrell M and Lynch C. 1994. *Small Business Employment*. Department of Labour, p. 2.

** The number of FTEs is calculated as the number of full-time employees and working proprietors plus half the number of part-time employees and working proprietors.

Source: Ministry of Economic Development. 2003. "*SMEs in New Zealand: Structure and Dynamics*."

3. Strategy and Progress of SME Informatization

3.1. National Informatization Policies

A close look at New Zealand's path toward becoming an information society reveals a very notable difference from those of most other APEC economies. In most economies, a government establishes a vision for national informatizationand leads ICT policies with private sector involvement. Furthermore, economiesgenerally take a step-by-step approach to informatization of the whole economy through building IT infrastructure, developing the IT sector and IT professionals, and introducing ICT to education and industry, with e-government as a key government initiative. However, even though the Ministry of Communication and the Ministry of Information Technology are responsible for informatization of the economy, there was no ICT vision set by the government until the 1990s. Moreover, the role of the government in informatization was minimal and the private sector has led ICT development. This is more evident considering that the Information Technology Advisory Group (ITAG), the main organization in charge of informatization in New Zealand, consists of private sector organizations. While other APEC members try to informatize the whole economy in a step-by-step manner, focusing on the development of e-commerce, the New Zealand government has not set up a plan to improve the administrative system through e-government. However, recently, New Zealand has been forming a policy vision for development of the IT industry and started the process of establishing e-government.

As stated above, a specific informatization vision has not been prepared in New Zealand, However, ITAG suggested a picture of the future economy in "*ImpacT 2001: How Information Technology Will Change New Zealand"*, [3] (March 1996) and *"The Knowledge Economy*"[4] (1999), wherein ITAG discussed the importance of the knowledge-based economy, being a competitive economy in the knowledge-based economy and six key issues of the New Zealand economy.[5]

3) See [http://www.med.govt.nz/pbt/infotech/impact/impact.html].
4) See [http://www.med.govt.nz/pbt/infotech/knowledge_economy/index.html].

As a fundamental framework for the informatization of New Zealand, ITAG suggested seven objectives: all school students being IT literate, IT courses being available to all, access to the information superhighway, protection of individual rights in the information age, access to quality IT for business, advice on IT for government and maximization of New Zealand's international IT competitiveness. The main focus of New Zealand's ITC policy today is e-commerce and education/training (IT training and online education).

New Zealand Parliament passed the Electronic Transactions Act on 10 October 2002. The objective of the Act is to confirm the legality of electronic transactions and facilitate the use of electronic technology for meeting thousands of statutory requirements for information to be in writing, signed, retained or produced. The Electronic Transactions Act and the Electronic Transactions Regulations came into force in November 2003.[6)]

3.2. Strategies for SME Informatization

As stated above, the informatization of New Zealand is led by the private sector and there is no policy specifically aimed at promoting informatization, particularly in regards to SME informatization.However, there is an emphasis on developing e-commerce involving SMEs. Although government policy on SMEs is not implemented by a government agency in charge of SMEs, there are several relevant agencies and private organizations directly or indirectly engaged in SME promotion.

The New Zealand government believes that economic development through e-commerce depends on the role of the government. Based on this belief, the government sets related laws, develops skilled labor, spread e-commerce and established IT infrastructure.

The purposes of the development strategies for electronic commerce are the following:

- to gain competitive advantages in the networked world;
- to provide an environment to encourage creative business-minds;
- to developthe best commerce technology to strengthen creation, technology and management ability; and
- to provide the environment to develop information communication technology infrastructure, business performance and personal economic welfare.

The roles of the government toward forming a development strategy for electronic commerce are as follows:

- to enhance recognition on e-commerce and spread Champion E-commerce throughout the nation;
- to expand the scope of e-commerce capabilities through information and surveys of good quality;
- to provide the nation with quick, low-cost on-line services using electronic commerce and e-procurement;
- to supply skilled human resources continuously.

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5) The reports mentioned above can be found on [www.med.govt.nz/pubs/publications-04.html#P1406_54858].
6) For further information on the Electronic Transactions Act and the Electronic Transactions Regulations, see [http://www.med.govt.nz/irdev/elcom/transactions/index.html].

4. Government Organizations for SME Informatization

The Ministry of Economic Development (MED)is in charge of economic, regional and industrial development. MED sets policies concerning economic, regional and industrial development, energy and communications. MED is responsible for providing consultation on the economic and regulatory environment to promote the development and success of SMEs and is also responsible for support, capital access, surveys and advice on the issue related to SMEs.

The Electronic Commerce Action Team (ECAT), under the supervision of MED, is organized through public-private cooperation with thecentral government, local governments, businesses, the education community, and Maori and local community organizations in order to promote the national e-commerce strategy. ECAT, which was launched in 2000 and began to operate in earnest in March 2001, reports on progress in regard to promoting the national strategy to the government every six months.

The Economic and Trade Development Agency is in charge of economic and trade development in New Zealand. Its main function is to make policies to support economic projects, export, sectoral and regional development and attract investment. The agency also provides SMEs with education programs.

ITAG is made up of 13 leading private sector IT individuals, including chairpersons and managing directors of New Zealand's leading IT companies. Its role is to advise the Minister for IT on issues relating to the government's role as an economic policymaker (but from the perspective of suppliers and users). It is particularly charged with acting as an interface between the IT industry and government. It has put considerable effort into the development of IT in education, and itdoes not involve itself in any issues relating to the purchase of IT equipment by government departments. The Ministry of Commerce Information Technology Policy Group provides administrative and policy support to ITAG.

The Small Business Advisory Group (SBAG) exists under MED. This Advisory Group will provide a means for departments and the government to take more fully into account the interests of SMEs in policy initiatives and to provide a deeper understanding of how government can work most effectively with SMEs. The Advisory Group will also provide the means for dialogue with SMEs that go beyond individual and immediate issues.

Functions of SBAG are as follows:

- To provide on-going advice to the Ministerial Group on Small Business on any issues affecting SMEs:
  - Identifying issues impacting the growth and development of SMEs
  - Suggesting priorities
  - Exploring solutions
- To provide assistance and advice to government departments on consultation with SMEs
- To provide, for discussion with government agencies, suggestions on ways for enhancing SME and government agency performance.

5. Overall Assessment of SME Informatization

New Zealand Trade and Enterprise (NZTE) was established in July 2003 from integration of Trade NZ and Industry NZ, and performs the functions of these two institutions.

New Zealand does not have a clear vision for informatization of its society, but taking a step-by-step approach, the government it working to achieve informatization of its society and industry by developing ICT infrastructure and human capital, and preparing related laws. Nevertheless, compared to other economies, the level of the ITC industry and public awareness on ICT is not very high. Although the level of informatization is generally high (except for the mobile phone penetration)compared to other APEC members, the ICT industry is not emphasized. However, recently, the New Zealand government has moved to transform the society into an information society with great interest in ICT industry development, human capital and the informatization of schools.

The private sector is playing a major role in informatizing the economy and SMEs. In particular, plans suggested by private sector organizations such as ITAG and SBAG are well reflected in the decision-making process in the governmentand government agencies give assistance to the private sector.

Recently, New Zealand has been increasingly interested in informatizationand the government is expected to prepare national informatization agenda and SME informatization policies. However, since laws regulating an information society are not fully established yet, New Zealand needs to address legal issues in regard to IT.

Appendix B.13. Papua New Guinea

1. Trends of Informatization

The level of informatization in Papua New Guinea is not presented in the APEC Knowledge-Based Economy Indicators (KBE Indicators). Therefore, to understand the level of informatization in Papua New Guinea, we use the five informatization indicators and other comparable indicators from the ITU documents that provide thesource of KBE Indicators.

<Table 1> Level of Informatization in Papua New Guinea (as of 2002)

(Persons, %)

	Papua New Guinea	APEC Average
Mobile telephones in use per 1,000 people	2.0	434.02
Telephone mainlines in use per 1,000 people	11.7	372.71
Computers (PCs, mainframes, etc) per 1,000 people	56.7	310.59
Internet users, as % of population (1999)	0.7	15.13
Internet users, as % of population (2002)	0.9	32.24
Internet commerce (B2B +B2C) as % of total commerce	n/a	0.46

Note: ITU data has been recalculated to standards set for KBE indicators.
* Data of Papua New Guinea are for 2001.
Source: ITU. 2003. *World Telecommunication Indicators 2003*.
APEC. 2003.*APEC Knowledge-Based Economy Indicators*.

The level of informatization in Papua New Guinea is much lower than the other APEC member economies (see Table 1). However, in Papua New Guinea, the diffusion rate of computer is relatively high while the diffusion rate of mobile telephone and telephone mainlines are very low when compared to economies like Vietnam that are at similar stages of informatization. In detail, there are only two mobile telephones in use per 1,000 people, which is equal to 0.5 percent of the APEC average. In addition, the number of telephone mainlines in use per 1,000 people is 11.7, which is much lower than the 372.21 APEC average. This may be due in part to Papua New Guinea's geographical circumstances (as an island economy). The number of computers per 1,000 inhabitants is 56.7, which is just 20 percent of the APEC average of 310.59. In addition, the rate of Internet users is given as just 0.9 percent, but figures regarding Internet commerce as a percentage of total commerce in Papua New Guinea are not available due to limited data availability. However, it is expected that Papua New Guinea's information indicators for 2002 will be somewhat improved, as indicators used here are for 2001 but for other economies in this study are for 2002.

Meanwhile, it is estimated that Papua New Guinea has not set down a detailed vision or plans for national information, including SME informatization. Papua New Guinea is focused on the tourism industry, and although it has a considerable number of computers in use nationally, as well as Internet hosts and Web pages, these are utilized mostly in tourism.

2. Strategy and Progress of SME Informatization

Papua New Guineadoes not appear to have a support system for SME informatization. However, the government provides financial support as well as administrative and institutional support for the tourism sector, which accounts for a large portion of industry.

The government agency in charge of informatization in Papua New Guinea is the Office of Information and Communication (OIC). This office is in charge of establishing communication policy, R&D and policies regarding National Information Services that relate to public sectors and ICT. The followings are the main functions of the institution:[1)]

- Facilitating and providing coordination role between the Minister and the Communication entities on the implementation of government policy initiatives and development strategies
- Developing and implementing information and communication policies and research;
- Collecting, collating and disseminating government and development information for awareness and public use; and
- Providing an electronic network through intra-net and Internetfor all government departments.

3. Overall Assessment of SME Informatization

OIC takes charge of informatization policy of Papua New Guinea but does not have a definite informatization policy. Moreover, as yet, there are no agencies in charge of SME support.

There is increased use of Internet to provide tourist information and online reservation services for the tourism industry, which is important to Papua New Guinea's economy, and it is expected that changes to the external environment for informatization will have a significant stimulus effect on national informatization.

1) Refer to the Office of Information and Communication Web site [http://www.communication.gov.pg] for details.

Appendix B.14. Peru

1. Trends of Informatization

According to the economy indicators from the World Telecommunication Indicators Database,[1] in most ICT indicators, the level of informatization in Peru is assessed to be lower than the APEC average. The number of Internet users in Peru was 48 people per 1,000, which is only 15 percent of the APEC average of 310. The ratio of Internet users was 7.7 percent as of 2000, which is 24 percent of the APEC average (32.24 percent).

<Table 1> Informatization of Peru (as of 2000)

(Unit: Persons, %)

	Peru	APEC Average
Mobile telephones in use per 1,000 people	59.2	434.02
Telephone mainlines in use per 1,000 people	78	372.71
Computers (PCs, mainframes, etc) per 1,000 people	48	310.59
Internet users, as % of population (1999)	n/a	15.13
Internet users, as % of population (2000)	7.7	32.24
Internet commerce (B2B +B2C) as % of total commerce	n/a	0.46

Source: World Telecommunication Indicators Database (7th Edition), April 16, 2003.

2. Definition of an SME

In Peru, SMEs are defined by their annual sales. Micro-enterprises are businesses recording less than US$40,000 in annual sales. Small-sized enterprises generate $40,000-$750,000 and medium-sized enterprises $750,000-$5 million in annual sales. According to this definition, large enterprises are businesses with more than $5 million in annual sales.

Enterprises employing four or fewer people take up about 96 percent of Peruvian businesses. However, micro-enterprises, which account for 67 percent of employment, represent only 9 percent of sales revenue generated by Peruvian businesses and the combined sales of SMEs are only 43 percent of the total, with the remainder being generated by large enterprises.

1) KBE Indicators of the APEC for Peru are not available.

3. Strategy and Progress of SME Informatization

The Peruvian government transferredthe function of telecommunications promotion and ICT support to the private sector due to a perceived lack of public financial resources to support informatization. For this reason, there are no comprehensive government-level policies for informatization.

In accordance to the Act on Promotion of Telecommunications and Information Service (Decreto Suprema 013-93-TCC) and the Telecommunications Market Development Law (La Ley de Politica de Aperturaal Mercado de Telecommunicacions), which took effect in 1993 and 1998, the government has opened up the market.

Since the launch of the Toledo government in 2001, Peru has made effort to broaden access to the Internet. In particular, the government has expanded its support of underdevelopedregions in terms of telecommunications by providing fixed-line and wireless networks and equipment. Measures essential to informatization and ICT development have been taken to protect intellectual property by the Ministry of Justice and the Ministry of the Interior, and tariffs on ICT equipment have been reduced from 12 percent to 4 percent.

The government plans to fully open the ICT market to foreign investment. Furthermore, as part of the effort to boost the number of Internet users, the government is implementing the "HUASCARAN Plan", which aims to provide Internet networks and 100,000 computers to public and private schools by 2005.

4. Governmental Organizations for SME Informatization

In October 2001, the Peruvian government established "the Committee for the Expansion of Computers" composed of the Ministry of Transportation and Communication, the Ministry of Economy, the Ministry of Education and representatives from the private sector and built concrete plans.

The National Council of Science and Technology (CONCYTEC) gives support to facilitate the technological and scientific services required by SMEs and expand the coverage of the scientific-technological services to the rural and forestry industries.CONCYTEC during the year 2001 held several forums on Knowledge and Information Society.

5. Major Policies and Projects for Enhancing SME Informatization

The government has made efforts for widespread use of the Internet in the underdeveloped areas in terms of telecommunication service and expanded its support by providing wired and wireless networks and equipment. At the same time, the government is promoting the following programs.

- PROMpyme is an organization that supports SMEs and operates a Web site (www.prompyme.gob.pe) for procurement and online bidding. The organization runs 80 Internet cafs nationwide, including three in Lima, in order to encourage SME participation in bidding. It plans to gradually increase the number of Internet cafs. Also, the Presidencia de Consejo de Ministros (PCM) has a project for an electronic system of government procurement called Sistema Electrnico de Adquisiciones y Contrataciones del Estado (SEACE) which includes different institutions (PROMPYME, CONSUCODE and others).

· PROMPEX, a government export promotion agency, operates a Web site for e-commerce to boost exports from Peruvian SMEs. The B2B site was developed following a cooperation agreement signed by PROMPEX and Corporation Andina de Fomento (CAF).

6. Efforts for SME Informatization from the Private Sector

The Center for the Exchange of Technology and Information of the National Society of Industry promotes improvedproduction practices and the competitiveness of small businesses and helps them to incorporate new technologies in their production processes. Small businesses, specifically those with only 5-49 employees, were provided access to the information from this center, which includes information about technical norms, machines and equipment, industrial materials, and documents about experts and consultants in specialty fields. Some of the benefits of this project include the strengthening of the relationship between small businesses and universities and technical institutes, as well as aiding new businesses in increasing the efficiency of their operations.

7. Overall Assessment of SME Informatization

The Peruvian government recognizes that Peru has to facilitate the use of the Internet and build communications networks, and that ICT is essential to enhance competitiveness of the economy in the 21 century. To develop the ICT industry and facilitate informatization, the government has taken some measures including promoting investment by the private sector and broadening the Internet user base.

Peru is now in the stage of laying the foundation for informatization. The Peruvian government has actively privatizedstate-owned companies related to ICT since the early 1990s. In line with these measures, the government let the private sector introduce and utilize ICT on its own while limiting governmentfunctions to building plans and approvingbusinesses. Therefore, the informatization process of Peru is led by the private sector, in particular, foreign-invested companies.

It is important to mention that there is a gap between local supply and IT for SMEs because in many cases these products are not really for this kind of enterprise: first, they are too expensive, they may be designed for example for the European market. However, considering the lack of financial resources and the unfavorable conditions of many micro-enterprises, the informatization of Peruvian SMEs is expected to take considerable time.

Appendix B.15. The Philippines

1. Trends of Informatization

The Philippines is at a low stage of informatization. It is composed of thousands of islands and there is a big discrepancy between urbanized areas such as Manila and other rural parts of the economy. Those factors are obstacles that prevent the Philippines from installing its communications infrastructure rapidly; but the government and private sectors have recognized the importance of ICT at an early stage and are concentrating on improving their ICT infrastructure and the adoption of information technology.

According to the APEC KBE data, the Philippines is not advanced in informatization. The number of people who own personal computers is an average 25 out of 1,000 people, which is much lower than the 310.59 APEC average. Internet users accounted for 1.5 percent of the population in 1999 and 5.74 percent in 2002.[1] Those figures show that the Philippines has low Internet usage and its usage rate has increased slowly in comparison to other economiesin the world. Owing to the poor IT environment, e-commerce takes up only 0.18 percentof total commercial transactions, which is far less than the APEC average rate of 0.46 percent.

<Table 1> Informatization of the Philippines (as of 2002)

(Unit: Persons, %)

	Philippines	APEC Average
Mobile telephones in use per 1,000 people	189.12	434.02
Telephone mainlines in use per 1,000 people	46	372.71
Computers (PCs, mainframes, etc) per 1,000 people	26	310.59
Internet users, as % of population (1999)	1.5	15.13
Internet users, as % of population (2000)	5.74	32.24

Source: APEC. 2003. *KBE Indicators*.

2. Definition of an SME

In the Philippines, an SME is defined as any business activity or enterprise engaged in industry, agriculture and/or services (whether single proprietorship, cooperative, partnership, or corporation) with total assets (inclusive of those arising from loans but exclusive of land on which the particular

1) According to a paper by Janette Toral at the Philippine Internet Commerce Society, the number of Philippine Internet users ranged from 3 to 4 million in 2002, which is equivalent to 3.5-4.7 percent. See a Janette Toral's paper "Philippines Responding to the Challenge of the Digitized Society" presented at ASEAN+3 IT & Telecom Business Forum in South Korea in 2002.

business entity's office, plant and equipment are situated) of a value falling under the following categories.

<Table 2> Categories of Enterprises by Size

Categories	In Philippine Pesos	In US Dollars (approximation)
Micro	Less than P 3,000,000	Less than $ 6,000
Small	P 3,000,0001- P 15,000,000	$ 6,001- $ 300,000
Medium	P 15,000,001- P 100,000,000	$ 300,001- $ 2,000,000
Large	Above P 100,000,000	Above $ 2,000,000

The SME sector is recognized as the backbone of the Philippine economy. It constitutes about 99.6 percent of all registered firms nationwide, employs 69.9 percent of the labor force and contributes 32 percent to the economy. SMEs help ensure a more equitable distribution of income and disperse economic activities to the countryside. With this in mind, the Philippine government has set a policy to promote the establishment of Barangay Micro Business Enterprises by providing various incentives and benefits to entrepreneurs.

3. Strategy and Progress of SME Informatization

The Philippines is prepared to meet the ICT era, formulating various plans and measures to transform the economy to be more acceptableto the information society. The former president of the Philippines, Joseph Estrada, established the Information Technology and Electronic Commerce Council (ITECC) during his presidency to promote nationwide informatization. It is the highest policy-making body of the Philippines for information and communication technology and e-commerce. The council is composed of the president of the Philippines as Chairperson and co-chaired by the Secretary of Department of Trade and Industry, with the following members:

Government Members	Private Members
▶ Department of Science and Technology ▶ Department of Transportation and CommunicationOther small ▶ Department of Budget and Management ▶ National Economic and Development Authority ▶ Department of the Interior and Local Government ▶ Department of Education ▶ Commission on Higher Educatione ▶ National Computer Center	▶ Tomas I. Alcantara, Alsons Consultingo ▶ Jaime Augusto Zobel de Ayala, Ayala Corporation ▶ Antonio L. Go, Equitable PCI Banko ▶ Dr. Reynaldo De Jesus, Mapua Institute of Technology ▶ Augusto C. Lagman, IT Foundation of the Philippines ▶ Dr. William T. Torres, Philippine Internet Service Organization (One Vacancy)

According to the national informatization policy, the Philippines is supposed to provide a plan to facilitate the informatization of SMEs,but there has been no concrete policy targeting the goal until now. That is, it is hard to find a key linkage between the central government policy and the SME sector, because the Philippine government made a policy agenda without detailing specific actions in

IT 21, even though the IT 21 Action Agenda was enacted in 1998.

The National Information Technology Plan for the 21stCentury documents the Philippine's common vision and presents a broad strategy to spur global competitiveness through information technology. The plan provides the basic requirements for speeding up the growth of the ICT industry as follows.

3.1. Improving the Policy Environment

- Adopt and implement policies to promote increased investments;
- Adopt more investor-friendly policies, systems and procedures in government;
- Implement commitments to international agreements that affect the IT sector; and
- Adopt administrative measures to effectively enforce intellectual property rights laws, particularly as they affect IT products and services.

3.2. Enhancing the Physical Infrastructure

- Accelerate universal access by completing telecommunications programs, especially in underserved areas;
- Fast-track the formulation and implementation of the Philippine Information Infrastructure;
- Intensify investment promotion in the telecommunications industry;
- Formulate appropriate cyber laws in the use of networks, particularly the Internet, to ensure information security and network reliability; and
- Promote telecommuting/teleworking, particularly in software development and multimedia production.

3.3. Develop an IT Manpower Base

- Produce critical mass of IT professionals and IT-literate manpower, including competent IT educators and teachers, at all levels;
- Designate from among IT training institutions, universities or colleges, IT centers of excellence as a form of recognition and reward;
- Organize a nationwide network of Core Competency Institutions in IT, in partnership with local and international development institutions and business organizations;
- Conduct continuing IT education for teachers/trainers, IT practitioners and workers;
- Adopt a dual-tech approach in IT education and training; and
- Develop and implement life-long learning through the Internet.

3.4. Pump-Prime IT Industry Development

- Implement a government-wide computerization program;
- Implement the RPWEB to connect all government offices and units through the Internet Service Providers (ISP) in their area, linking all ISPs through Internet exchanges;
- Organize and monitor government and business response to the year 2000 problems and opportunity;

- Set up an IT Development Fund or other appropriate financing scheme for outsourcing information system development and deployment in government;
- Promote technological innovation and experimentation by creating new products, services and applications, and developing value-added services and networks;
- Provide appropriate financing support to allow active participation by the private sector in R&D and in the development and the incubation of new products and solutions; and
- Fast-track measures to streamline administrative processes and procedures in government procurement, budgeting, accounting, auditing, monitoring, reporting, etc.

3.5. Organize for Action: Institutional Reforms

- Reorganize the NITC to broaden and strengthen private sector involvement in IT development activities;
- Constitute NITC forces to carry out specific IT21 programs/actions;
- Organize a 50-member private sector advisory council to facilitate meaningful private sector participation in the implementation of IT21;
- Strengthen the NCC to enable it to better carry out its primary mandate of promoting widespread use of IT in government; and
- Create a comprehensive database management, monitoring and benchmarking system for Key IT indicators;

3.6. Marketing the National IT Plan for the 21stCentury

- Organize task forces to undertake a nationwide communication and advocacy program, including focused IT trade missions and international road shows;
- Develop, produce and disseminate promotional materials on IT21 and the Philippine IT Action Agenda; and
- Create a Web site promoting IT21 the IT Action Agenda.

The Philippines is among the first economy in Asia to adopt an electronic commerce law (legislated in 2000). Anyone, regardless of nationality, is welcome to invest in the Philippines in almost anyarea and up to the extent of 100-percent ownership. This landmark legislation sets up the legal infrastructure that now governs online transactions in the Philippines, thus paving the way for the full proliferation of e-commerce in the economy. It now prepares the Philippines for full participation in global e-commerce, even if the ratio of e-commerce (0.18 percent) is lower than the 0.46-percent APEC average.

The highlights of the Electronic Commerce Law 2000 include legal recognition of electronic documents, signatures and transactions, and penalizing cyber crimes such as hacking into, altering, forging, inflicting damage on, violating the secrecy of and illegally misusing electronic documents sent, received, stored or compiled. It also mandatesgovernment agencies to be e-commerce-ready in two years.

However, there seems to be no actual policy for implementing promotion of SME informatization in the Philippines. Under the condition that the ICT infrastructure of the Philippines is not sufficient to facilitate SMEs to adopt informatization technology and to undertake e-commerce, the government policies targeting the informatization of SMEs, devised as sub-concepts of the national informatization program, are more or less merely gestures.

4. Governmental Organizations for SME Informatization

The National Computer Center (NCC) guides the economy's ICT environment for the strategic application of ICT in government.[2] NCC was created and placed under the Office of the Presidentin 1971 as a joint project of the Presidential Economic Staff, the Department of National Defense and the National ScienceDevelopment Board. Its fundamental functions were to provide information bases for integrated planning and the implementation of development programs and operational activities in the government. It was also tasked with providing computer service support, integrating electronic data processing (EDP) operations in government and establishing an EDP Educational Center.

In the 1990s, the NCC became involved in the aggressive promotion of ICT in large-scale, strategic, mission-critical, public service delivery-oriented and revenue-generating information systems in government. In 2000, the government ordered the transferal of the NCC functions to the Department of Science and Technology (DOST)to effectively mobilize and coordinate collective resources and talents. The move also ensured more effective administrative supervision and ICT policy and program coordination.

The principal function of the Department of Trade and Industry is to promote and enhance the growth of the economy's existing and thriving industries.[3] To support the IT needs of industry, it undertakes policy research, provides business facilitation, matching and tracking, coordinates the delivery of IT training services, maintains Web sites and a databank of IT companies and organizes road shows and e-services exhibitions.

The DOST is mandated to provide central direction, leadership and coordination of all science and technology activities in the economy, as well as formulating science and technology (S&T) policies, programs and projects in support of national development priorities.[4] More specifically, the policy directions of the DOST are summarized as the following: forging more active partnerships in technology development and utilization; aggressively acquiring and adapting technology from domestic and foreign sources; increasingprivate participation in S&T activities; upgrading S&T services; and strengthening international S&T linkages. The flagship program of DOST on IT is the Comprehensive Program to Enhance Technology Enterprises (COMPETE). The program includes strengthening of technological innovation capabilities in selected industrial technology areas through the establishment of Virtual Center for Technological Innovation (VCTI).

The National Telecommunications Commission (NTC) is the sole body that exercises jurisdiction over the supervision, adjudication and control over the telecommunications services throughout the economy.[5] The NTC is to face the challenge to ensure that the Philippines is equipped with the needed elements to become an active member of the new global economy. Thus, it supports convergence up to the extentpermitted by the laws and the Philippine constitution. It has also pushed for deregulation of the telecommunications industry to lower costs and allow a greater number of Filipinos to access the Internet.

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2) Refer to the National Computer Center Web site for details [http://www.ncc.gov.ph].
3) Refer to the Department of Trade and Industry Web site for details [http://dti.gov.ph].
4) Refer to the Department of Science and Technology Web site for details [http://dost.gov.ph].
5) Refer to the National Telecommunications Committee Web site for details [http://ntc.gov.ph].

5. Major Policies and Projects for Enhancing SME Informatization

In compliance with President Gloria Macapagal Arroyo's directive, in 2002, the Department of Trade and Industry (DTI) convened with the key players in SME development, including the pertinent government departments and agencies, and produced the National SME Development Agenda. It contains targeted and collaborative interventions in five areas: financing, marketing, training, product development and technology intervention, and advocacy.[6)]

In support of the National SME Development Agenda, the government financial institutions (GFIs) collaborated to design a uniform lending programtailored fit to meet the funding needs of SMEs. Under the unified lending program, the participating GFIs shall apply simplified and standardized lending procedures and guidelines, for example, loan purposes, fee structures, interest rates, application forms, financial ratios and other lending parameters, for evaluating SME loan applications. To adapt to the financing needs of SMEs, two types of loans are available under the program: short-term loans payable in one year and long-term loans that are payable in up to five years. The unified scheme is provided in addition to the existing services of the participating GFIs.

The marketing development programs of the National SME Development Agenda are composed of trade fairs (virtual and physical), buying and selling missions, buyer-supplier matching, and permanentmini-Philippine SME trade houses. They seek to increase the exposure of SME products in domestic and foreign markets and to improve distribution of SME products among and between the local manufacturing and trade sectors. The Bureau of Small and Medium Enterprise Development, the Bureau of Domestic Trade, the Bureau of Export Trade Promotion and the Center for International Trade Expositions and Missions are participating in these marketing programs.

The training and entrepreneurship development programs seek to provide existing and potential entrepreneurs with the necessary skills and knowledge to become competitive players in local and global markets. They also help create a pool of SME trainers, advisors and counselors to effectively assist SMEs nationwide.

The product development component of the National SME Development Agenda seeks to provide existing and potential entrepreneurs with services in product and package design and development to create and sustain a competitive edge in the domestic and export markets. Product development encompasses all areas from generating ideas for applied research on materials, processes and technologies to the full-scale introduction of a product to the market.

The advocacy component informs SMEs, the business community, media and other stakeholders of available government services for SMEs and builds the awareness of the general public regarding the important economic roles of entrepreneurs and SMEs. It seeks to advocate improvements in the business environment so that SMEs can emerge and grow.

Many public and private organizations are participating in each program and component but SME centers that are located nationwide are envisioned to be the focal points for SMEs seeking assistance or information on government and private sector programs and services. Business counselors have been trained to man these centers and assist existing entrepreneurs. Some 25 SME Centers are given priority assistance and support under the National SME Development Agenda. They operate through close cooperation with the Department of Trade and Industry, local government units, local chambers of commerce and provincial SMED councils.

Even though IT 21 was enacted in 1998, it is clear that the SME Development Agenda targeting

6) The content of this section mostly follow the questionnaire completed by a contact point for this survey in the Philippines.

economic activities of SMEs was set out in 2002. The SME Development Agenda does not seem to contain any specific mission to promote the informatization of SMEs, but it uses many supporting tools to boost SME businesses in general. There does not seem to be a linkage between central government policy and the SME sector. Therefore, it is highly probable that the informatization of SMEs is a low policy priority for the government, and it does not have the momentum to spread through the whole economy, regardless of the private and public sector.

6. Efforts for SME Informatization from the Private Sector

The Philippine Chamber of Commerce and Industry (PCCI) is a voluntary organization composed of business enterprises, chambers of commerceand industry associations nationwide. Its objective is business growth and community development. PCCI sends and receives trade missions including IT missions from different economies and institutions. It also maintains a Web site (www.philcham.com) to provide its members and entrepreneurs with business information, but it does not seem to be very popular with SME members.

The Confederation of Philippine Exporters Foundation (PHILEXPORT) is the Philippines' umbrella organization for exporters all over the Philippines. Databases of the organization contain information about most products exported from the Philippines. Contact information on over three thousand exporting companies and on almost all Philippine-made products exported are included in the databases, which are posted at its web site (www.philexport.org).

A non-stock and non-profit organization serving as the private sector advocate of Internet and electronic commerce is the Philippines Internet Commerce Society (PICS). Since it is established in 1997 to promote the growth of e-commerce through the Internet, the organization has undertaken activities to enhance and facilitate the advancement and development of Internet and e-commerce on local, regional and national level, such as organizing E-Commerce Anniversary/Awards and Phil.Cyberfair, taking charge of the PICS website of information on IT industryand creating a CD databases of Philippine IT industry.[7)]

7. Overall Assessment of SME Informatization

The Philippine government has endeavored to meet the challenge of the informatization of industry and commerce. In 2000, the Information Technology and E-Commerce Council was launched by then President Estrada and in the following year President Arroyo transferred the chairmanship of ITECC to the president. This move symbolized the devotion of the Philippine government to promotingITC industry. The IT 21 Program, which was initiated in 1998, has had a real chance to get attention of the government officials to help ICT development in the economy, but it is too early to expect the Philippine government to arrange the full set of policies for informatization of the economy. The Philippines has not taken a step-by-step approach to the SME informatization; however, many policy agendas and tools are interlinked with each other.

The Philippines' SME Development Plan has a specific purpose to provide business development services, including ICT-based services, to SMEs through the operation of SME Centers. Part of the

7) For further information, see the website of the Philippine Internet Commerce Society, www.pics.org.ph.

plan is the establishment of a national SME database which will promote SME use of ICT. Although the components of the Plan do not directly address the complete informatization of SMEs, they are consistent with a market oriented strategy to provide SMEs access to business technologies, including ICT, instead of providing direct subsidy-backed ICT capabilities to SMEs.

Even though the Philippine government has provided its people with an informatization program at the national level, it has not been successful in devising specific policy tools aiming at a certain sector or industry. The SME Agenda was set out in 2002, but there was almost no provision in the agenda on the measures to facilitate the adoption of IT technology and trade usinge-commerce by SMEs. That is, the Philippines is one of the economies that have a generic ICT Policy. Building up ICT awareness and knowledge of SMEs and promoting the use of ICT for integrating SMEs with business partners in the value chain are initial steps that the Philippines can adopt by way of SME specific informatization strategies.

The cost issues on the informatization of SMEs in the Philippines is a tall hurdle for SMEs that would like to adopt ICT. One of the fundamental problems discouraging the Philippines from being more informatized is its poor ICT infrastructure that forces members of the general public to pay a high cost for accessing and using Internet. Another problem is that computers are too expensivefor the general populace. These economic costs hinder households and small enterprises from adopting IT instruments and equipmentin their activities. To encourage the private sector to participate in transforming the economy to a highly developed ITC society, the Philippine government needs to devote itself to building up its IT infrastructure.

Appendix B.16. Russia

1. Trend of Informatization of Russia

Russia is at the very initial stage of informatization a level that is relatively low compared to APEC member economies. The ICT infrastructure of Russia is not very strong outside metropolitan areas such as Moscow, and most IT-related projects rely on support from outside Russia, including European economiesand the United States and Japan. The main reason for the inadequate ICT infrastructure is that Russia is a vast landmass, much of which is uninhabited, which inhibits the installation of networks. As a result, Internet services are not available in many parts of the economy and connection charges are so high that most households and small enterprises cannot subscribe to Internet services.

According to the APEC KBE data, the number of telephone mainlines in use is just over half the APEC average. One in 10 Russians use a mobile phone (about one-quarter of the APEC average), and 77 out of 1,000 people have personal computers (less than one-quarter of the APEC average). Internet services are generally accessed through telephone modem and therefore Internet user fees are calculated according to connection time and are considerably high. Thus, e-commerce is not common in Russia, except for big oil companies that have their own closed system with suppliers. A broadband network is being built in the Moscow area, but the relatedservice fees are so high that only a small number of people can access the network.

<Table 1> Informatization of Russia (as of 2002)

	Russia	APEC average
Mobile telephones in use per 1,000 people	111.3	434.02
Telephone mainlines in use per 1,000 people	198	372.71
Computers (PCs, mainframes, etc) per 1,000 people	77	310.59
Internet users, as % of population (1999)	Na	15.13
Internet users, as % of population (2000)	9.28	32.24
Internet commerce (B2B +B2C) as % of total commerce	Na	0.46

Source: APEC. 2003. *KBE Indicators*.

The Russia Federation is composed of 21 republics, six krais, 49 oblasts and an autonomous oblast. These administrative regions are very different in their traditions and cultures as well as in their economic interests. The resultant differences in government often cause conflictbetween the central government and local governments, with central government policies sometimes overlooked by local governments. Therefore, coordinating between central and local governments as well as streamlining the different duties and priorities of central government ministries will be crucial for enhancing the efficacy of the central government's informatization policy.

After the breakdown of the Soviet Union in 1992, the Russian government struggled to adopt policy

apparatus that embraced the market economy. The ensuing legal structure has caused much confusion because of its frequent amendments and conflicts between numerous statutes and regulations.

There has been a strong demand from businessmen and specialists in the IT industry for the establishment of an electronic communication infrastructure that canfacilitate e-business and boost the public use of the Internet. The Russian government accordingly formulated a policy for the informatization of the Russian economy, releasingthe Electronic Russia Project in 2002.[1)]

The Russian government has approved a US$2.6 billion-program, Electronic Russia 2002-2010, to boost e-commerce and Internet use in the economy. The architects of the program estimatethat by the end of the program in 2010, the IT sector in Russia will account for 2 percent of the economy (compared with the current level of 0.61 percent) and IT exports should reach $1-2 billion per year. The main targets of the program are:

- perfecting regulationsand legal backing;
- securing informational transparency and opening the state tocivil society;
- modernizing state authorities by adopting information and communication technologies;
- coordinating government with economic entities and creating conditions for IT introduction in the real sector;
- developing staff and training
- developing infrastructure for public access networks; and
- contributing to the development of independent mass media by introducing information and communication technologies.

The Ministry for Telecommunication and Information of Russia coordinates the program and the Ministry for Economic Development and Trade actively takes part in its execution, sharing nearly half of the burden. The two ministries are joined by industry associations and non-profit organizations that take part in tenders to fulfill different projects within the framework of the program.

At the regional level, informatization goals are achieved through regional programs for entrepreneurship development, reflectingspecial issues in developing information resources for SMEs at the regional and local levels. Various organizations participate in those activities through competition.

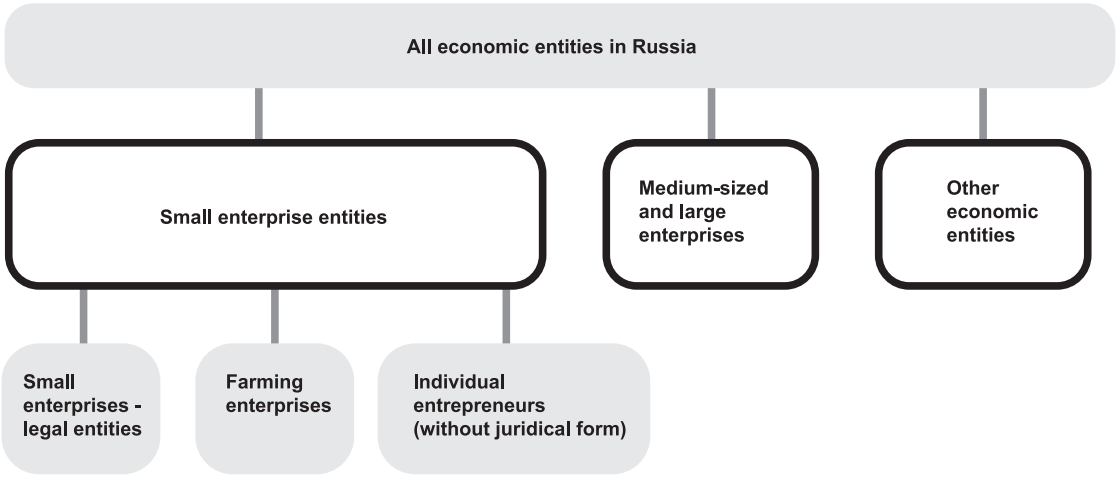
2. Definition of SMEs and Micro-Enterprises

Russian legislation and state statistics deal with two categories of enteprises: small, medium-sized and large enterprises. Small enterpreneurial entities are defined in Federal Law No. 88-FZ of June 14, 1995, “State Support of Small Entrepreneurship in the Russian Federation.” According to this law, small enterprises are divided intothree categories, as shown in Figure 1:

- Individual entrepreneurs (without juridical form) (IEs);
- Farm enterprises (FEs); and
- Small enterprises registered as legal entities (SEs) that meet the following criteria:
  - The share of state property of the Russian Federation and its constituents, municipal property, property of non-governmental and religious organizations, charities and other foundations in the

1) For further information, visit [www.neweco.ru/main.html].

charter capital should not exceed 25 percent;
- the capital share belonging to one or several legal entities that are not small enterprise subjects should not exceed 25 percent; and
- the average workforce should not be more than:
  100 people in industrial production, construction and transport;
  60 people in agriculture and science;
  30 people in retailing and consumer services; or
  50 people in the other sectors and types of businesses.



<Figure 1> Framework of Economic Entities in Russia

Although the classification of small enterprises includes IEs, FEs and SEs, according to legislation, state statistical reporting only considers SEs as legal entities under this category. The statistical data on small enterprises therefore excludes IEs and FEs, resulting in the recorded number of small enterprises being much smaller than it is in reality. It should also be noted that there is no separate category formedium-sized enterprises in Russian legislation or state statistics.

The number of small enterprises, once we include individual entrepreneurs that have not been registered, shows a positive trend between 1998 and 2001 (as seen in Table 2), but the share of SMEs in Russia is not as large as that in EU. The SME share in the number of enterprises in Russia is less than 90 percent, smaller than the nearly 100-percent share in the EU, and the SMEshares of employment and total sales are much smaller in Russia relative to those in the EU (see Tables 3 and 4).[2)]

2) Russian SME Resource Center. Russian SME Observatory Report 2001. For further information, see [www.rcsme.ru/eng/].

<Table 2> Number of Small Enterprises (including individual entrepreneurs) 1998-2001

(1,000 Unis)

	1998	1999	2000	2001
Individual Entrepreneurs	3, 599	3, 875	4, 237	4, 497
Small Enterprises	868	891	879	843
Farms	270	261	262	262
Total	4,737	5,027	5,378	5,602

The data from the recent Sixth European SME Observatory shows the following share of enterprises with up to 250 employees proportionate to the contribution made by all enterprises in the European Union. The corresponding share of enterprise with up to 250 employeesproportionate to the total value of all enterprises of Russia is estimated as in Table 4.

<Table 3> SME Shares in the European Union, 2001

Share in the total value of enterprises	99.8 percent
Share in total employment	65.8 percent
Market share (share of the total sales revenue)	56.7 percent

<Table 4> SME Shares in the Russian Federation, 2001

Share in the total value of enterprises	Not less than 90%
Share in total employment	Not less than 45%
Market share (share of the total sales revenue)	Not less than 40%

According to a survey conducted in 2001 by the Russian SME Observatory Report, about 30 percent of small enterprises in large cities already use the Internet to an extent. The main use of the Internet is for information searchesand business communication via email. One in four of the small enterprises that use the Internet do so for market research one in five of these small entities use theInternet for internal communications and only one in 20 use the Internet for trade.

Financial cost is given as the main reason for two-thirds of enterprises not using the Internet. More than 40 percent of small enterprises have listed Internet service fees as too expensive for use, and more than 20 percent of small enterprises mention a lack of computers as a barrier to use.

3. Strategy and Progress of SME Information

In Russia, it can be said that there are very few, if any, specific policy strategies for SME informatization, as it is only vaguely mentioned in the e-Russia program. Therefore, we need to look into the e-Russia program a little further to lead us to the SME informatization policy.

The e-Russia 2002-2010 program addresses four main areas: regulatory and legal environment Internet infrastructure e-government and e-education. First, all of the enabling legislation and institutional framework for the e-Russia program are expected to be in place by the end of 2002. All cities in Russia with populations of over 30,000 are to be connected to each other as part of the economy's fiber-optic backbone network, although connections to individual homes and offices across the economy might be relatively disadvantaged during the onset of this operation. Thousands of villages in Russia do not even have a single telephone line, so it will be many years before some of the more sparsely populated areas can have a fully supportive telecommunications infrastructure. Many options are under consideration to provide this infrastructure, including wireless satellite delivery.

The e-Russia plan seeks to deliver an increasing number of government services online and alleviate part of the heavy bureaucratic burden on Russia's citizens and businesses. Such tasks as tax filing and business registration are plausible candidates for online applications.

The plan also aims to improve the quality of higher education in IT and develop new independent media on the basis of Internet resources. Two characteristics of Russia its vast geographic area and the financial difficulty facing its education system have encouraged Russian planners to seek creative solutions to the provision of education throughout the economy. The delivery of distance learning programs via the Internet (e-education) is a priority for the Russian government.

The overall blueprint for e-Russia was established in 2001. During the course of 2002, an interagency working group refined the plan, identified necessary feasibility studies and defined pilot projects. These studies and pilot projects are to be conducted during 2003 and 2004, with full implementation expected to begin in 2005.

The e-Russia program is implemented under the general management of the Interagency Commission headed by German Gref, the Minister of Economic Development and Trade of the Russian Federation. The commission has formed a council of experts that includes executives of IT companies, universities, scientific organizations, the Russian Academy of Sciences,and state and municipal bodies. A task force headed by the Ministry of Telecommunications is assigned to undertake operational management and technical support for the program. The task force includes representatives of the following ministries and state agencies:

- The Ministry of Economic Development and Trade of the Russian Federation (RF);
- The Ministry of Industry, Science and Technology of the RF;
- The Ministry of Education of the RF;
- The Russian Aviation and Space Agency;
- FAPSI (Federal Agency of Government Communications);
- The Russian Agency for Systems Management;

The implementation period of the e-Russia program is from 2002 to 2010, and it is strategically divided into three phases:

- Phase I (2002): Creating a supportive regulatory environment (US$230 million);
- Phase II (2003-2004): Conducting feasibility studies and pilot projects (US$804 million); and
- Phase III (2005-2010): Implementing the program throughout all federal and regional public organizations (US$1.59 billion).

The total amount earmarked for the program is US$2.6 billion US$1.3 billion from the federal budget, US$769 million from regional and municipal budgets and US$500 million from extra-budget sources. Planned expenditure from the federal budget includes capital investment of US$723 million and feasibility study and research funds of US$95 million.

All 24 ministries under the federal government of Russian Federation are involved in the e-Russia project, and there are four main projects that are supportive of business informatization:

- Introducing IT into interactions between government authorities and economic entities, and developing the circulation of electronic documents;
- Implementing pilot projects for the creation of technoparks (technopolises) throughout Russia and for property support for SMEs that deal with information and communication technologies;
- Realization of pilot projects for the creation of electronic industrial and territorial databases for R&D results in order to develop innovation business and support technology transfer;
- Promotion of domestic ICT goods and services in the world market as well as export support for ICT intellectual products.

The Ministry of Economic Development and Trade, the Ministry of Antimonopoly Policy and Support to Entrepreneurship, the Ministry of Industry, Science and Technology and the Ministry of Telecommunications and Information, among others, are sharing responsibility for these projects. As the projects are in their initial stages, a concrete structure for government bodies and the appropriate implementation tools have not been well prepared. The agency responsible for the whole project and coordinating various layers of governments should be fixed shortly to carry out the project as planned. Insufficient funding for the e-Russia project is also a major problem to be overcome by the Russian government. Some economies, including the United States and the EU, have shown their willingness to donate funds to help Russia carry out the e-Russia program as planned.

4. Governmental Organizations for SME Informatization

Existing federal and state government bodies have yet to incorporate SMEs into normal processes. Furthermore, SME entrepreneurs have yet to identify common interests and collectively demand measures beneficial to them, thus, the mechanismsthat would make these interests an important topic of political debate are not in place.[3)]

With regard to informatization policy, the Russian government announced the e-Russia program in 2002, but up until now, no action has been taken toward practical planning to realizethe goals set out in the project. Even in the documentation for the project, the only section that addresses SMEs is the section concerning pilot projects for creating “technoparks” and R&D databases.

One of the reasons for brushing overSMEs in the political process is said to be their enforced position of semi-legality inthe present administrative, legal and taxation systems. Since many existing business practices are at odds with numerous laws and enactments, many entrepreneurs are hindered from applying for government support and from expressing themselves to administrative bodies for fear of administrative prosecution.

The system for the government support of SMEs is still new the current system of state support was set up by the Federal Law No. 88F3 (June 14, 1995), “State Support of Small Business in Russian Federation”, and the implementation of this law is the responsibility of the Ministry of

3) See page 23 of the report by Russian SME Resource Center mentioned in Footnote 1.

Antimonopoly Policy and Support of Entrepreneurship. However, there are two federal bodies for one federal program whilst the Ministry of Antimonopoly Policy is charged with the responsibility of drafting the SME Development Program, the Federal Fund for SME Support, which was set up in 1995, is facilitating effective federal-level implementation and cooperation with regional execution bodies. The Ministry of Economic Development and Trade is in charge of the e-Russia program and devising financial support measures for SMEs, and the Ministry of Telecommunications and Informatization is concerned with infrastructure development. The Ministry of Education deals with the framework for higher professional education, and international donor organizations have played a significant role in supporting SMEs. The funding for SME development from those organizations has reached hundreds of millions of dollars.

In December 2001, the State Council of the Russian Federation approved a new SME support and development program. The main directions of state SME support and the enhancement of entrepreneur policy are the optimization of normative and legislative foundations of small business government regulation, development of financial and credit support mechanisms and improvements in the tax system for small enterprises. Regardless, the program does not explicitly express support for the informatization of SMEs and insufficient attention is extended to the needs of individual enterprises.

5. Major Policies and Projects for Enhancing SME Informatization

In Russia, there is a lack of specific policies and projects for promoting SME informatization, though there have been a few SME development programs. In addition, Russia has not adopted measures for SMEs that are popular in other economies such as facilitating electronic commerce by providing a proper legal system and supporting SME businesses through funding and tax exemptions.

One of the problems with the tax system is the frequent changes in tax law and the tax collection procedures - an important barrier to further SME development. Even though there is a simplified taxation system for SMEs, the majority of small enterprises use a traditional scheme instead. Tax reform for SMEs is still a hotly debated policy topic.

SMEs need ongoing legal and judicial reforms. In particular, the legal status of business entities should be addressed. There is a continuing problem of a lack of special simplified procedures for small and medium enterprises.

The banking sector shows signs for improvement, increasing prospects for SME financing, but banking systems and procedures still require adaptation to lend efficiency to SMEs. Venture capital organizations are scarce in Russia. Currently, development of venture capital depends on international and donor organizations. The Ministry of Science and Technology has initiated important equity financing schemes, but informal equity financing of SMEs is still more common than formal venture capital.

The one area in which Russian government bodies actively support SMEs is the provision of business-related information. The Government of Russian Federation Law No. 98 of February 14, 2003 stimulated the creation of regional Web sites as well as sites for federal executive bodies.

To ensure SME access to information on government ministries and bodies, the Ministry of Antimonopoly Policy and Support to Entrepreneurship has begun aproject to create a specialized Internet information system Information Portal for Small Entrepreneurship. The Russian business portal “Alliance Media” was established to give information support to Russian entrepreneurs,

develop business partnerships, promotegoods and services and build e-business mechanisms.[4] It unites over 10 information sites for small businesses that were created with the support of the Moscow government. The system of interregional marketing centers is also an initiative of the Moscow government. Regional information and marketing companies collaborate closely with local authorities, unions and entrepreneurial associationsand other enterprises that are interested in building horizontal economic relations.

The service business-net, SIORA (established in 1977 with the participation of the Ministry of Antimonopoly Policy and Support to Entrepreneurship, the Federal Fund for Support to Entrepreneurship and the EU Tacis project) offers a wide range of services for the support of entrepreneurs, the establishment and development of small and medium-sized businesses, strategic consulting, business planning, marketing research, business education and Internet services.

6. Efforts for SME Informatization from the Private Sector

In Russia, it is difficult to identify a trade association that is interested in the informatization of its SME members, but some large corporations are pushing their suppliers and sub-contractors to connect to their intranets or use a standardized solution for trade. This is the main avenue for a private sector entity to helpSMEs adopt IT technology.

The Chamber of Commerce and Industry of the Russian Federation is the most important organization for dealing with problems in SME informatization. Attached to the chamber are the committee for entrepreneur dataware and the committee for the development of private entrepreneurship and SMEs, which deals directly with SME informatization. One of the chambers is the Center for Business Information and Consultation, which offers entrepreneurs access to a database of Russian enterprises and organizations and commercial and investment proposals from domestic and foreign companies by means of the Internet.

The Russian SME Resource Center(RCSME), a non-commercial foundation initially established under Tacis program, performs research in SME development, provides policy advisory services and information support to the SME community. The mission of the Russian SME Resource Center isto provide assistance to the development of private entrepreneurships in the Russian Federation.

The key objectives of the Russian SME Resource Center are:

- To provide information support and policy advisory services to business support institutions and entrepreneurs;
- To conduct research and disseminate publications on SME issues;
- To provide available information and resource materials on small business development through its Web site;
- To promote and strengthen cooperation in small business development with interested Russian, international and foreign partners.

The RCSME has also developed databases and provides access through its Web site that have:

- up-to-date statistical information on SME sector, including data on individual entrepreneurs, farm enterprises and medium-sized enterprises;

4) See for details at [www.allmedia.ru].

- information on SMEs (regional databases, Web-resources, publications), contact information, functions and information resources of business support organizations across Russia;
- an electronic library on small entrepreneurship, a large collection of analytical and practical materials on small businesses in Russia;
- results of surveys on SME development in Russia (statistical reports, SME environment in EU economiesand in Russia, new financial technologies for SMEs, innovations in small business).

The Information Portal of Irkutckaya Region was created under a program called "Support and Development of Entrepreneurship in Irkutsk Region in 2001-2002." The Irkutsk agency for business development are filling and actualizing the portal, which delivers all kinds of business information valuable in the Irkutsk region, manuals for inexperienced entrepreneurs and business catalogues of SME goods from theIrkutsk region.

7. Overall Assessment of SME Informatization

Russia, having launched the e-Russia program in 2002, is at the starting point of informatization, focusing on regulatory and legal environment, Internet infrastructure, e-government and e-education. As yet, the program lacks a detailed agenda and assignment distribution for each related ministry and agency and it has not been given the full coordinated support of the state government. This program aims to create a communications and manpower infrastructure suitable for the IT society and accordingly addresses industry as a whole rather than SMEs in particular. Therefore, it is not expected that policies promoting SME informatization will be introduced in the near future; the e-Russia program will only contribute in the sense that it plans to informatize the economy all at once to rectify Russia's position of being behind in adopting informatization policy in a very competitive world.

Russia is so vast and heterogeneous, especially in rural areas, that it is not easy for the government to build an ICT infrastructure. Most Internet users need to access telephone lines through a modem but telephone lines are not available to most villages in rural areas and hence the Internet is out of reach. Internet user fees are so high that only a few small firms can use the Internet for business, and the price of computers is high due to the high tariffs imposed on them.

Policy tools aiming at SME informatization have not been set out well by the Russian government because of its lack of experience in supporting private SMEs in the market economy and Russia's insufficient tax revenue. In this situation, some funds donated by other economies such as European economies, the United States and Japanare of great value in terms of allowing Russians to make use of information technology more frequently and supporting some specific projects, although it is not altogether clear of who will benefit the most from the input of these funds: the donors or Russians.

Appendix B.17. Singapore

1. Trends of Informatization

Singapore is one of the most advanced economies in APEC in terms of informatization. Singapore was one of the first economies to build a nationwide broadband, pushing its people into becoming an information society. It has good built-in conditions favourable for an information society. It is a small economy with a high-density population living mostly in urban areas and in large apartment complexes. This type of living pattern helps reduce the cost of building ICTinfrastructure. Above all, the present status of Singapore as one of the developed economies in the Asia-Pacific area is attributable to its forward-looking leaders, who have successfully oriented Singapore's resources and public interest toward a knowledge-based information society.

The APEC KBE indicators show that Singapore is a developed economy in terms of ICT use. The information-related indicators of Singapore shown in Table 1 are higher than the APEC average of respective indicators: 831 of every 1,000 Singaporeans use mobile phones, 1.9 times the APEC average. There are 453telephone mainlines per 1,000 inhabitants, some 100 greater than the APEC average. AS at 2003, there are 740 computers per 1000 people, 2.4 times the APEC average. Furthermore, the portion of the population that are Internet users increased more than 3 times from 1999 to 2003, a rate faster than the APEC average. More than half of its population uses Internet in 2003, while about a third of the population of APEC members uses the Internet on average.

<Table 1> Informatization of Singapore (as of 2003)

(Unit: Persons, %)

	Singapore	APEC average
Mobile telephones in use per 1,000 people	831	434.02
Telephone mainlines in use per 1,000 people	453	372.71
Computers (PCs, mainframes, etc) per 1,000 people	740	310.59
Internet users, as percent of population (1999)	19.7	15.13
Internet users, as % of population (2003)	54.7	32.24

Source: APEC. 2003. *KBE Indicators*.

2. Definition of an SME

SMEs in Singapore are defined as establishments with net fixed assets value not exceeding S$15 million (manufacturing) and employment not exceeding 200 workers (non-manufacturing).

3. Strategy and Progress of SME Informatization

In general, the infrastructure in Singapore catering to the requirements of the knowledge-based economy is as comprehensive and developed as it is anywhere else in the world. The information highway was built in the 1980s and its physical infrastructure is in excellent condition. Singapore is one of the advanced economies in terms of Internet penetration as seen in Table 1. The ICT sector in Singapore began to develop in 1981 when the National Computer Board (NCB) was set up to drive the development of the local IT industry and a pool of local IT manpower to support a thriving high-tech industry. In 1992, the IT2000 blueprint was launched to transform Singapore into an "intelligent island" with IT spreading over every sphere of economic and social activity. One notable initiative was Singapore ONE(One Network for Everyone), a national broadband high-speed network established in 1997. It aims to deliver interactive multimedia applications and services to almost every home, school and office in the economy. Since then, a variety of broadband offerings from service providers for example, cable modem access provided by StarHub Cable Vision - have established a presence in the market.

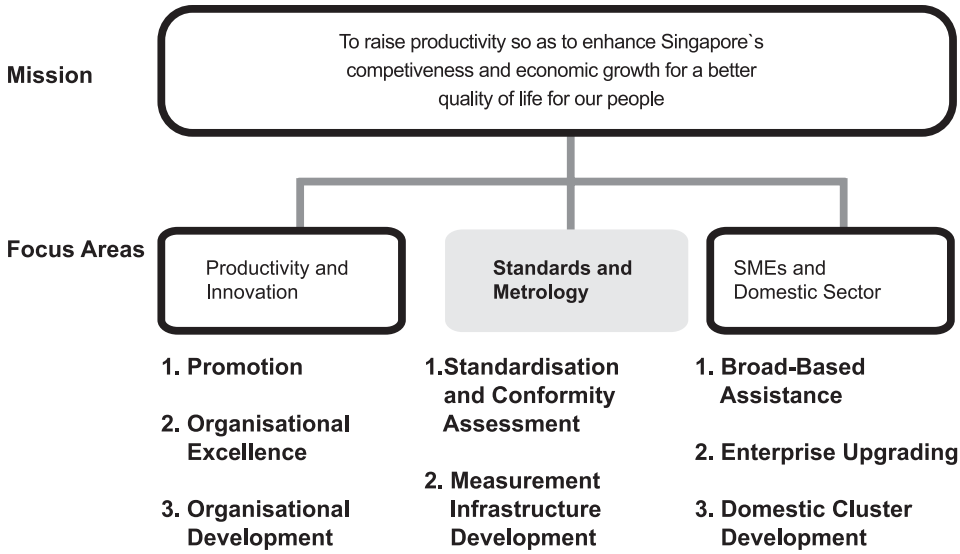
Since IT2000, the government has rolled out a number of IT development blueprints, namely, Infocomm 21 in 2000 and Connected Singapore in 2003. The latter was conceptualised to help the people, businesses and government of Singapore further exploit ICT to increase efficiency, create new businesses and enrich lives. For example, the eCitizen portal launched in 1999 is a comprehensive government Web portal with links to government agencies, allowing Singaporeans to conduct a full range of transactions with government agencies on the Web. These include matters relating to business, education, employment, family, health, housing, law and order, and transport, with the site thoroughly integrated and organized by function rather than government agency.

In a highly informatized society, policy provisions and tools to implement them are well prepared to activating every aspects of the economy. Regarding the SMEs informatization policies of Singapore, SPRING Singapore (Standards, Productivity and Innovation Board), as the lead agency for SME development, worked closely with the Infocomm Development Authority of Singapore (IDA), IT vendors as well as the trade and industry associations and various chambers of commerce to ensure that a concerted effort is taken to assist SMEs.

Jumpstart e-commerce programme was one key initiative rolled out by SPRING Singapore to encourage SMEs to adopt "ready-made packages" provided by B2B/ B2C transactional portals/ Application Service Providers (ASPs). This outsourcing approach offered a cheaper and faster alternative for SMEs to access a ready pool of online buyers and sellers, instead of developing their own e-commerce projects from scratch. In addition, SPRING Singapore encouraged SMEs to explore incorporating Internet as a business strategy and make e-commerce part of the supply chain management by electronically linking up with its suppliers, customers and its internal operations for higher efficiency.

A survey was conducted by Centre for Best Practices, NUS Business School in January 02 to ascertain the level of online business transactions amongst Singapore SMEs in the year 2001. It was found that there was a high Internet penetrationof 77% in year 2001, compared to 73% in the previous year. At the same time, there were 33% of SMEs conducting business transactions online, increasing from 18% a year ago. This signified that more companies were tapping on online channels for their business dealings. In fact, the survey also showed that 93% of these companies, who were conducting business transactions online, planned to continue their online business activities in the future.

<Figure 1> Mission and Focus Areas of SPRING



Source: The "About Us" section of [www.spring.gov.sg].

As we can see in the chart above, SPRING Singapore focuses on three areas: productivity and innovation, standards and metrology, and small and medium-sized enterprises and domestic sector. The third area required particular attention because it is closely related to SMEs. SPRING Singapore is the leading agency responsible for building up the capabilities of SMEs and creating a vibrant and resilient domestic sector. It maps out strategic directions and implements best practices for enterprise development, assisting fast-growing SMEs in areas such as business development and technology enhancement. It also serves as the first stop for SMEs that need information and assistance for upgrading. To support the development of SMEs and the domestic sector, SPRING Singapore administers the Local Enterprise Finance Scheme and the Local Enterprise Technical Assistance Scheme.

SME 21 is a 10-year strategic plan devised under SPRING Singapore that is aimed at building up the capabilities of SMEs so as to enhance their contribution to Singapore's competitiveness and economic growth.

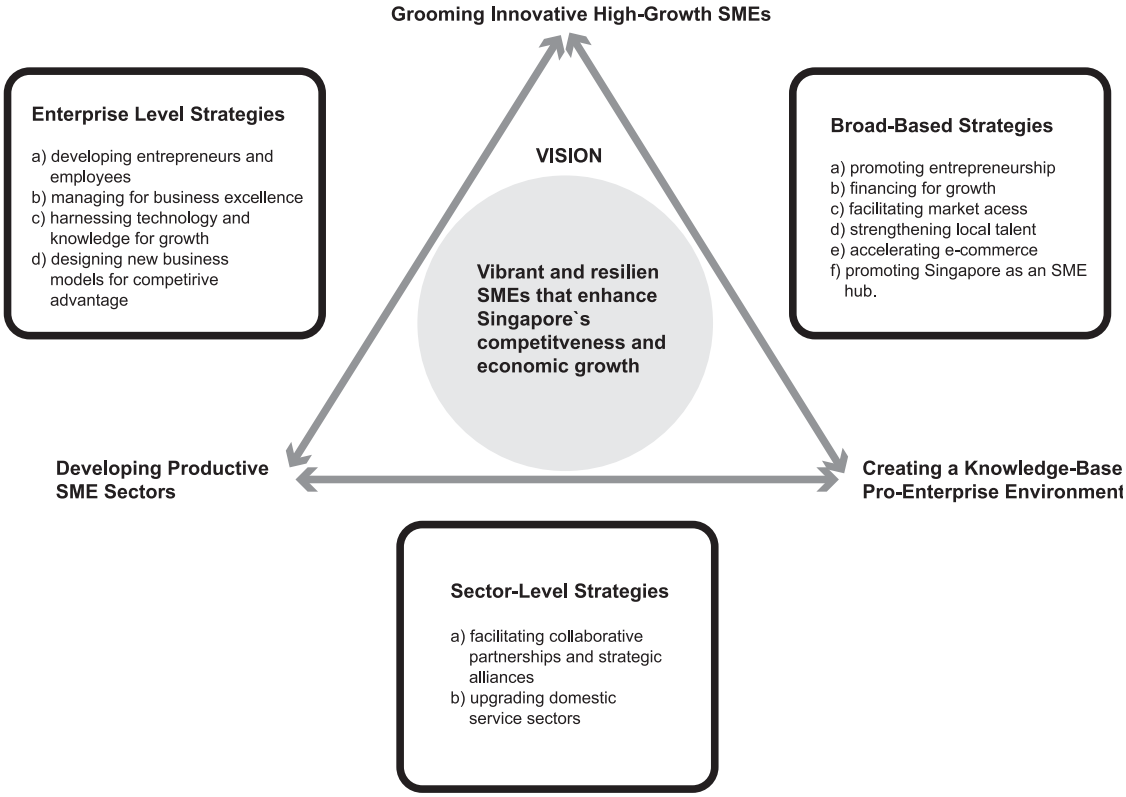
Three major outcomes of SME 21 for the year 2010 are:

- The doubling of productivity of the retail sector;
- The trebling of the number of local SMEs with sales turnover of S$10 million and above to 6000; and
- The quadrupling of the number of local SMEs with e-commerce transactions to 32,000.

The first goal is grooming Innovative High-Growth SMEs, that is, developing SMEsthat can compete globally on a sustainable basis so that over time a steady stream of SMEs can reach world-class status. These SMEs will produce innovative products and services, use information and technology to add value to new products and services, develop and use brands to increase the knowledge component of their products and construct superior distribution channels.

The second goal is developing productive SME sectors. This goal aims to enhance the productivity of SMEs in domestic service sectors by restructuring, revitalizing and upgrading these sectors. Besides higher productivity, the utilization of resources, particularly land and labor, will also be improved. The retail sector is one of the major domestic service sectors that will receive attention.

<Figure 2> Three-Pronged Approach to SME Development



The third goal is creating a knowledge-based, pro-enterprise environment. It aims to create an environment where a positivemindset in business is entrenched, where entrepreneurship and innovation are encouraged, and where barriers to organizational growth are eliminated. As a result, the creative capacity of SMEs will be improved. The most enabling factor is e-commerce, which will open up vast opportunities and remove the traditional barriers to SME growth. The target is to quadruple the number of local SMEs with e-commerce transactions from 8,000 to 32,000 by 2010. Achieving this means that one-third of local SMEs will have overcome the limitations of the small domestic market by plugging into the world economy.

A three-pronged holistic approach was taken in SME 21 to achieve the three goals listed above. This comprises enterprise-level, sector-level and broad-based strategies, as shown in Figure 2.

4. Governmental Organizations for SME Informatization

As mentioned above, SPRING Singapore and the Infocomm Development Authority of Singapore (IDA) have been at the forefront of SME Informatization in Singapore. Both operate as statutory boards of the Singapore government under the Ministry of Trade and Industry, and the Ministry of Information, Communication and the Arts respectively.

The vision of the Ministry of Trade and Industry is to transform Singapore into a globalised, entrepreneurial and diversified economy, a leading global city for talent, enterprise and innovation. One of its strategies to accomplish this is by supporting entrepreneurship and Singapore companies. In view of this, it oversees SPRING in its role as the lead agency responsible for building up thecapabilities of SMEs and creating a vibrant and resilient domestic sector, so as to enhance their contribution to Singapore's competitiveness and economic growth. SPRING maps out strategic directions and implements best practices for enterprise development, and assists fast-growing SMEs in areas such as business development and technology enhancement.

The mission of the Ministry of Information, Communication and the Arts (MITA), on the other hand, is to develop Singapore as a global ICT city so as to build a creative economy. MITA's vision has two fundamental elements:

- propelling the creative economy; and
- fostering a connected society.

The first vision can be achieved by developing and promoting creative industries and the information technology sector to create new economic value and jobs. Fostering a connected society for Singapore means to forge a strong sense of community, national identity, rootedness and inclusion among Singaporeans by enriching their art and cultural resource, ensuring quality media content and empowering individuals through infocomm literacy and access for all. It also requires fostering better understanding between the government, the public and international stockholders through effective public communications.[1)]

The Infocomm Development Authority of Singapore (IDA) was formed in December 1999 as a result of a merger between the Telecommunications Authority of Singapore and National Computer Board. Among the IDA's main responsibilities are fostering a competitive world-class infocomm industry in Singapore and operating the government's IT infrastructure.[2)]

5. Overall Assessment of SME Informatization

Singapore is a highly populated and closely inhabited city economy. To some extent, this is a favorable condition for informatizing an entire economy with a single broadband network.

Based on the high quality of broadband network, Singapore went forward to enhance the competitiveness of its industry and the standard of living by enforcing SPRING Singapore. SME 21, which is under Singapore 21, is a 10-year strategic plan aimed at building up the capabilities of SMEs so as to enhance their contribution to Singapore's competitiveness and economic growth. Most SMEs are participating in e-commerce for international as well as local trade.

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1) Refer to the Ministry of Information, Communication, and the Arts Web site for details [www.mita.gov.sg].
2) Refer to the Infocomm Development Authority Web site for details [www.ida.gov.sg].

Appendix B.18. Chinese Taipei

1. Trends of Informatization

The level of informatization achieved in Chinese Taipei is higher than the APEC average, with 88 out of 100 people using mobile phones (more than 200 percent of the APEC average). The level of Internet users increased markedly from 9.2 percent in 1999 to 41.82 percent in 2002, which in turn contributed to the growth of e-commerce. The figures above may suggest that Chinese Taipei's informatization policy is being implemented smoothly as a consequence of conscious policy decisions to put the relevant framework strategies on track.

<Table 1> Informatization of Chinese Taipei (as of 2002)

(Unit: Persons, %)

	Chinese Taipei	APEC average
Mobile telephones in use per 1,000 people	881	434.02
Telephone mainlines in use per 1,000 people	588	372.71
Computers (PCs, mainframes, etc) per 1,000people	314	310.59
Internet users, as % of population (1999)	9.2	15.13
Internet users, as % of population (2002)	41.82	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.7	0.46

Source: APEC. 2003. *KBE Indicators*.

2. Definition of an SME

In Chinese Taipei, SMEs are classified as all enterprises that have legally completed company registration or commercial registration and meet the following requirements:

Industry	Description of SME		Description of micro enterprises
	By revenue	By employee	By employee
Manufacturing, Construction, Mining, Quarrying	Paid-in capital shall not exceed NT$80 million	Not exceed 200 people	Not exceed 20 people
Agriculture, Forestry, Fishing, Animal raising, Plumbing, Electrical power, Gas and fuel-oil supply, Commerce, Transportation, Warehouse, Communications, Finance, Insurance, Real estate, Industrial service, Commercial service, Social service, Personal service	Its total operating revenue in the preceding year shall not exceed NT$100 million	Not exceed 50 perople	Not exceed 5 people

There were a total of 1,104,706 SMEs in Chinese Taipei in 2002 (26,544 more than in 2001) and SMEs continue to account for 97.7 percent of all enterprises. Approximately 40 percent of SMEs had been in existence for 10 years or more in 2002 (the figure for 2001 was around 43 percent) and the number of new SMEs (those in existence for less than one year) had fallen by 3.6 percent as compared to a fall of 2.0 percent in 2001.There were 9,454,000 people employed by all enterprises in 2002, with 7,361,000 of these being employed by SMEs, representing a 1.0-percent increase on 2001[1)]

3. Strategy and Progress of SME Informatization

The government's policy focus was to build a comprehensive digital infrastructure for SMEs including basic computer literacy, information searching and e-commerce. Various projects were launched, such as e-Service Teams, cultivation of e-business talents for SMEs, building industrial databases, EC system project and a project to establish and implement industrial e-marketplaces. Towards the realization of these projects, the government emphasized building the information infrastructure and promoting basic digital skills at SMEs.

By adopting concrete, available strategies and making use of the strengths of academic institutions, consultancies, IT solution providers and related industry associations, the governmenthelps SMEs in e-business operations. Through e-service teams, the government can help SMEs create their own digital ability so as to take advantage of digital opportunities in the future.

As proposed by the Small and Medium Enterprise Administration (SMEA),[2)] the "Improvement Plan of informatization for SMEs" is the major project for SME informatization. This five-year plan was implemented in 2002 with four sub-projects: e-Service Teams; the cultivation of e-business talents

1) Source: 2003 SME White Paper in Chinese Taipei.

for SMEs building industrial databases; the EC system project; and the project of establishment and implementation in the industry e-marketplace. For SME informatization, SMEA released its "Digital Taiwan Plan and Developing SME KM[3] (Knowledge Management) plan E-business plan."

"E-service and e-Business" is the executive plan for "e-Taiwan e-Government Plan" according to "Challenging 2008: Major Country Development Plan," and towards this, promotions have been carried out since 2003. It represents policies for application and implementation of Chinese Taipei's SME informatization. This plan expects to reach the following targets and visions within the next five years:[4]

- build up "Single Sign-On"for business management;
- use most effective methods to provide instant and useful value-added services for information technology
- narrow the digital divide; and
- become the leading role in IT industry in Asia-Pacific economies.

In order to achieve the target goal, this plan builds up 'Single Sign-On' within five years. 'Single Sign On' has three strategies:

- build the 'e-service and e-business' system;
- gather and compile SME-related information; and
- categorize and build the database and input the data.

'Single Sign On' builds up infrastructure for informatization, effective Internet networks and convenient, useful and instant value-added information services (through telephone, fax, email and Internet) for SME - and become the best supportive force for business operation.

4. Governmental Organizations for SME Informatization

The Small and Medium Enterprise Administration (SMEA) under the Ministry of Economic Affairs (MOEA) builds basic policies and projects for SME informatization. In carrying out these projects, SMEA usually works with related associations or IT solution providers. In addition, one of main obligations of Commerce Department of MOEA includes the establishment and implementation of rules on SME business. The Commerce Department of MOEA and the Industrial Development Bureau of MOEA also carry out some SME informatization projects that have been classified by industrial field.

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2) [www.moeasmea.gov.tw/eng]
3) Promotion of the application of SME KM: Developing SME KM support SMEsto set up the strategy of KM support SMEs to develop KM through information technology collect industry domain know-how to create SME added-value collect and research the knowledge paragons and issues of SME establish the knowledge-base to service SME and increase the efficiency of execution in government. Source by SMEA.
4) SMEA.

4.1. Information Service Industry Association

The Information Service Industry Association (CISA)is an organization established to appeal to the government for favorable policies, to promote information technology applications, expand the information service markets, facilitate international cooperation and improve the competitiveness of the industrial and commercial sectors.

Nature	**Appeal to the government for favorable policies** ▶ Promote information technology applications ▶ Expand the information service markets ▶ Facilitate international cooperation ▶ Improve competitiveness of the industrial and commercial sectors **Form member consensus and line up common interests**
Major projects	**Cultivation of e-business talents for SMEs** ▶Cultivation of entry-level of e-business talents for SMEs ▶Cultivation of manager-level of e-business talents for SMEs ▶The training courses for e-business practice **Building industrial databases and EC system project** ▶Help SMEs association members doing business over Internet via association portal. ▶Enhance association capabilities and develop industrial database. ▶Develop a solidsolid business modelmodel as a base of future e-marketplace. ▶Drive association as the main force of going eCommercee-commerce for SMEs.

4.2. InfoBank Technology Corp

InfoBank Technology offers banking solutions that enable custom design and development for controlling financial transactions with Chinese Taipei dollars, foreign exchange, loans and deposits as well as e-business solutions (including project-based solutions for e-government services (PKI, e-marketplace, ASP service and e-purse)). Its projects for establishing and implementing industry e-marketplace is designed to complete the cycle of industrial supply chains and to help SMEs as well as traditional companies leverage IT, thus increasing global competitiveness.

Nature	▶ Banking solutions: Custom design and development for controlling financial transactions with Chinese Taipei dollar, foreign exchange, loans and deposits. ▶ E-business: Project-based solutions for e-government service included PKI, E-marketplace, ASP service and E-purse.
Major projects	**Establishing and implementing the industry e-marketplace** ▶ Designed to complete the cycle of industrial supply chains, and to help SMEs as well as traditional companies leverage the power of Information TechnologyIT, thus increasing global competitiveness. ▶ The project is expected to fulfill the following objectives: - Build an industrial virtual e-marketplace system infrastructure and application integration management capabilities. - Build an online industrial virtual trading network. - Design and plan a suitable Application Service Provider (ASP) business model, thus providing continuous operation and services. - Various data generated by the e-marketplace system can share its data with existing Enterprise Resource Planning (ERP), Supply Chain Management (SCM), Customer Relationship Management (CRM), or Knowledge Management (KM), thus providing a complete e-business flow.

4.3. National Association of Small & Medium Enterprises, Republic of China

The National Association of Small & Medium Enterprises Republic of China (NASME) sets itself the following missions and goals:

Nature	**The NASME sets itself the following missions and goals:** ▶ to play the role of the bridge between the government and SMEs and build the bilateral communication channels; ▶ to promote SME managerial talents; ▶ to promote and organize cooperation and exchange activities between SMEs (across industries); ▶ to research the mid- and long -term development plan for SMEs; ▶ to encourage SME exchanges and to build SMEdevelopment models; and ▶ to assist SME attendance of international exhibitions and conferences, and arrange exchanges to enlarge the business opportunityies.
Major projects	**Promote Remote Learning** ▶ "Distance Lecturing" facilitates SME access to learning materials through online media, applying ICT to promote SME real-time learning without the necessity of being face-to-face interactions;. ▶ "e-focus trend forum" and "e-business practices" are the topics to be pursued this year with chapters on knowledge economy, international economy, trends, integral resources of small businesses, management of real-time economies and industrial movements, and e-business between the Strait; and ▶ in response to the needs of SMEs for international communicatio and the bottleneck of industry in realizing computerized operation in order to become more competitive in the global market.

4.4. Mitac Inc.

Nature	**A well-known large-scale system integration company.** ▶ It incorporates advanced technology and management knowledge, providing customers with comprehensive, dynamic solutions to improve productivity and working efficiency, to better compete in the marketplace.
Major projects	**Business Operation Plan for e-Service and e-Business** ▶ Build up Single Sign- On for business management. ▶ Provide instant and useful Valuevalue-Added added Service service for IT. ▶ Narrow the gap on Ddigital- Dividedivide. ▶ Leading role in IT industry in Asia-Pacific seconomies.

4.5. National Information and Communication Initiative[5)]

In March 2001, the government established the National Information and Communication Initiative (NICI) by combining the NII Steering Committee, the Government IT Promotion Committee and the iAeB Steering Committee. The purposes of NICI is to help the Executive Yuan to:

- promote the upgrading of IT, telecommunication, e-business and related industries;
- increasethe efficiency of the government and of its services for the people;
- universalize Internet applications; and

· enhance the overall competitiveness of Taiwan.

e-Government	▶ Enhancing the Internet usage in all government agencies. ▶ Establishing a one-stop Wweb site for all public services. ▶ Establishing local information services and applications to improve community development. ▶ Improving the government IT system out-sourcing. ▶ Educating government employees through e-learning.
e-Industry	▶ Establishing business-to-business (B2B) common services and a standard platform in order to build a well-developed e-Bbusiness infrastructure. ▶ Performing B2B pilot systems and projects to facilitate industry development levels. ▶ Providing incentives to encourage various industries to improve their computerization levels. ▶ Coordinating the public and private sectors to provide a guidance and assistance mechanism.
e-Society	▶ Establishing digital data and filing programs for libraries, science and art articles in museums to enrich digital content. ▶ Transforming digital divides into digital opportunities with bywell establishing kiosks in remote districts. ▶ Promoting life-long learning concepts with Internet applications, environment and e-learning programs. ▶ Promoting health care IC cards in order to provide personalized health information services to the general public.

4.6. Industrial Technology Research Institute (ITRI)

Headquartered in the Hsinchu Science-based Industrial Park area with branch offices throughout Chinese Taipei, the Industrial Technology Research Institute (ITRI)[6] is the largest non-profit research organization in Chinese Taipei, with a total workforce of 6,000 and a budget of US$450 million in 2001.

Founded in 1973 by the Ministry of Economic Affairs, ITRI has since become both a technical center for industry and an important organization for the government's industrial policies. ITRI receives about half of its funding from the government and half from industrial sources. ITRI's research projects include: communications and optoelectronics (including optoelectronics, display and communications), materials and chemical engineering, precision machinery and MEMS (including metrology and aerospace), sustainable development (including energy, environment and industrial safety), biotechnology and medicine, and nanotechnology (including nanomaterials, nanoelectronics and nanobiotech). ITRI enhances innovative and advanced research to develop leading technologies and improve competitiveness. ITRI is also involved in telecommunications, pharmaceuticals and biotechnology, genomic medicine, Si-Soft, nanotechnology and e-learning national research programs. Its main functions are:

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5) [www.nici.nat.gov.tw]
NICI has the following goal: increased government efficiency; increased industry competitiveness; promote an information society; universal applications of IT and telecommunication technologies with high penetration infrastructure improving legal systems to build a sound e-commerce environment accelerating network construction to make broadband connectivity available to every household enhancing Internet security to establish excellent information security mechanism advancing the education and e-learning environment participating in international organizations to synchronize the most updated IT technologies strengthening R&D as well as innovation to enrich knowledge and content.
6) [www.itri.org.tw]

- to engage in applied research and technical services to accelerate the industrial development of Chinese Taipei;
- to develop key, compatible, forward-looking technologies to meet industrial needs and strengthen industrial competitiveness;
- to disseminate research results to the industrial sector in a timely and appropriate manner in accordance with the principles of fairness and openness; and
- to foster the technological development of SMEs and cultivate industrial technology human resources for the benefit of the nation.

5. Efforts for SME Informatization from the Private Sector

In Chinese Taipei, there are various non-government organizations related to IT. These organizations support the implementation of government policy for SME informatization and provide customized services to SMEs to narrow the digital divide and to help SMEs survive in such a competitive global atmosphere.

5.1. Taipei Computer Association

The Taipei Computer Association (TCA) was established to help promote Chinese Taipei'sIT industry. Enhancing the efficiency of operations and creating value-added business models for SMEs is the major target of the e-business service office project. In the TCA, nine e-Service Teams offers on-site diagnosis and guidance services for SMEs while providing procedures and examples of e-business for different industries. These teams, comprised of specialists from business, politics and academia, design an industrial e-business assessment form to evaluate the extent of e-business operations in the industry and assist in extending the operation to industry as a whole.

Major projects	**e-Commerce Service Teams** ▶ Offer on-site diagnosis and guidance services for SMEs and provide procedures and ▶ examples of e-business for different industries ▶ Set up 9 e-Service teams ▶ Comprise of specialists from business, political and academic fields ▶ Design an industrial e-business assessment form to evaluate the extent of e-business ▶ operations in the industry and assist in extending the operation to the entire industry

5.2.Institute for Information Industry

The Institute for Information Industry (III) was formed as a non-profit organizationby the Ministry of Economic Affairs and several private enterprises. III aims to improve the productivity and competitiveness of all industries through the use of IT. III assists the government in developing the local information industry, serves as a think-tank for the government in fostering the development IT industry and promoting a KBE, provides strategic and technical support to the government in forming and improving Chinese Taipei's information technology infrastructure, promotes IT applications and training, and develops and transfers innovative and advanced IT to generate opportunities for the creation of new industries and the development of new products.

5.3.Taiwan Fixed Network Co. Ltd

Taiwan Fixed Network Co. Ltd provides world-class quality fiber-optic broadband services, including voice, Internet access and Internet data center services.

Nature	**Provide world-class quality fiber-optic broadband services, including:** ▶ Voice Sservices ▶ Internet Access access Servicesservices ▶ Internet Data data Center center Servicesservices ▶ Value-added Data data Servicesservices
Major projects	**Broadband Services to SMEs** ▶ To help SMEs equipped with basic broadband services to enhance their e-business capabilities. ▶ To increase 10% broadband access rate to Internet for SMEs, enhance competitiveness. ▶ To enhance e-business 'clustering effect' and competitiveness.

6. Overall Assessment of SME Informatization

Chinese Taipei takes a step-by-step approach in encouraging use of ICT in SMEs. It has laid the foundation for informatization by improving ICT infrastructure and establishing an industrial database. Based on the progress, it is now engaged in a number of projects.

As with other APEC members, the government of Chinese Taipei is in charge of overall plans to "informatize" SMEs. The government suggests the big picture for SME informatization and related organizations take charge of detailed policies and projects.

In the study, it is notable that government organizations are very active in SME informatization. Many government agencies and public organizations lead the implementation of specific projects that are customized to the needs of businesses. In addition, private sectors actively participate in SME informatization.

There are a great number of organizations related to IT, including industry organizations that help facilitate adoption of IT (InfoBank Technology Corp., TAC) and IT research centers (ITRI). They seek to bring about synergy effects in SME informatization by offering various services and supporting the adoption of ICT in industry.

The Chinese Taipei government sets up strategies based on detailed plans and commissions studies on IT solutions so that related associations and government organizations can help SMEs to introduce e-business operations. Its e-Service Teams encourage SMEs to strengthen and take advantage of their "digital ability." By doing so, the government tries to provide SMEs with opportunities to enhance their competitiveness and ultimately expand their businesses by themselves.

Appendix B.19. Thailand

1. Trends of Informatization

Thailand is in the initial stage of informatization, and informatization in general is assessed to be underdeveloped compared to that of other APEC members. As its industrial structure is not fully developed, its socio-economic policy is focused on industrialization and development of the manufacturing sector and strengthening the agricultural industry. However, the global wave of transformation into the knowledge-based economy and use of ICT has significantly affected Thailand as well. In particular, recognizing the economic benefits of ICT, the Thailand government has set up and implemented various policies to narrow the ICT gap among economies and regions. As a result, informatization in Thailand is fast reaching a higher level.[1)]

<Table 1> Informatization of Thailand (as of 2002)

(Unit: Persons, %)

	Thailand	APEC Average
Mobile telephones in use per 1,000 people	286.2	434.02
Telephone mainlines in use per 1,000 people	96	372.71
Computers (PCs, mainframes, etc) per 1,000 people	43	310.59
Internet users, as % of population (1999)	2.4	15.13
Internet users, as % of population (2000)	7.92	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.11	0.46

Source: APEC. 2003. *KBE Indicators*.

According toAPEC Knowledge-Based Economy Indicators, in most ICT indicators, the level of informatization in Thailand is assessed to be lower than the APEC average. In Thailand, 286.2 per 1,000 people use mobile phones, 66 percent of the APEC average of 434.02 people, and telephone mainline subscription was 96 out of 1,000 people, which is 26 percent of the APEC average of 372.71. The number of computers per 1,000 people is 43, far behind of the APEC average of 310.59. According to the IDC, 70 percentof computers in Thailand are used by enterprises. On the other hand the share of Internet users per population has tripled from 2.4 percent to 7. 92 percent in 1999, but still it is far lower than the APEC average of 32.24 percent. According to the ITU, most of the Internet users have low-speed modems, and there were only 8.400 ISDN users in 2001.[2)] In Thailand, there are total 18 ISP (Internet Service Provider). Internet usage is not common, so most providers experience losses. There were approximately 70,000 Internet hosts in 2001.E-commerce transaction takes up 0.11 percent of total commercial transactions, the second lowest among APEC members following Indonesia (0.08 percent).[3)] E-commerce in Thailand is not yet active due to the low diffusion rate of computers, expensive service rates, low Internet speed and the absence of e-

1) The first policy framework for informatization of Thailand was the IT 2000 Plan, which launched in 1996.
2) Refer to the ITU. 2003. *World Telecommunication Indicators 2003*.

commerce laws. However, a series of policies is now encouraging e-commerce, mainly throughNECTEC. According to the NECTEC, as of 1999, e-commerce in Thailand was approximately US$4.5 million. B2C, a consumer-oriented service, is still in it basic stages and is primarily operated in the computer, telecommunications, tourism and hotel sectors.

2. Definition of an SME

The definition of SMEs according to the regulations of the Ministry of Industry enacted on the 11th of September 2002 assesses employee numbers and the value of total fixed assets (not including land)and uses the lower of the two. Business activities can be classified into four categories.

In the manufacturing sector, businesses where there are no more than 50 employees or fixed assets (excluding land) do not exceed THB 50 million are considered to be small enterprises. Medium enterprises have between 51-200 employees or fixed assets of between THB 50 million and THB 200 million.

In the wholesale sector, small enterprises have 25 or fewer employees or fixed assets of up to THB 50 million, and medium enterprises have between 26-50 employees or between THB 50 million and THB 100 million in fixed assets.

In the retail sector, small enterprises have 15 or fewer employees or fixed assets of up to THB 30 million, and medium enterprises have between 16-30 employees or between THB 30 million and THB 60 million in fixed assets.

In the service sector, small enterprises have 50 or fewer employees or fixed assets of up to THB 50 million, and medium enterprises have between 51-200 employees or between THB 50 million and THB 200 million in fixed assets.

The classification of SMEs in Thailand is summarized as following.

<Table 2> SME Classification in Thailand

	Small Enterprises		Medium Enterprises	
Types of Business	Employment	Fixed assets(million baht)	Employment	Fixed assets(million baht)
Production	Not more than 50	Not more than 50	51-200	Not more than 200
Services	Not more than 50	Not more than 50	51-200	More than 50 but less than 200
Wholesale	Not more than 25	Not more than 50	26-50	More than 50 but less than 100
Retail	Not more than 15	Not more than 50	16-30	More than 30 but less than 60

Source: Ministry of Industry (2002.9).

In the year 2002, there were 1,645,530 enterprises in Thailand, a dramatic increase from the 842,329 of 2001. The average growth rate is 10.23 percentper year. Amongst this, the number of SMEs was

3) The Department of Commerce in Thailand is operating B2B Web site [http://www.thaiecommerce.net]. Other B2B Web sites concerning agricultural and marine products, household electronic appliances and computers are being operated.

1,639,427 or 99.63percent of the total enterprises. This number has grown by 840,394 from 1997 (which was only 799,033). In 2002, there were 6,103 large enterprises or 0.37 percent of the total number of enterprises in the economy, a growth from the 4,168 of 2001.

In 2002, SMEs under the retail sector has the maximum number which totals 732,593 or 44.69 percent of the total SMEs. Second are the SMEs under the service sector. There are total 500,970 or 30.56 percent of the total. The manufacturing and the wholesale sector have 356,806 and 49,058, whichis 21.76 and 2.99 percent respectively.

<Table 3> Overview of SMEs (2003)

Number of SMEs		1,639,427	Units
		(99.63% of total establishments)	
Distribution of SMEs	Manufacturing	22.8%	
	Wholesale	3.0%	
	Retail	44.7%	
	Services	30.6%	
Total GDP of SMEs		2,112,934	Million Baht
		(38.9% of total GDP)	
Employment		4,999,217	Persons
		(68.98% of total employment)	
Value of Export		1,209,303	Million Baht
		(38.2% of total export of manufacturing product)	

Source: OSMEP. 2003. *Thailand's SME Policy and Analysis*.

Sole proprietorship is the main form of registration under the SMEs (93.33 percent of total SMEs), followed by private company limited and public company limited (3.82 percent). Partnership limited and partnership unlimited has 1.91 percent and others are 0.81 percent.

SMEs play a very important role in the Thai economy. They provide an important linkage with large enterprises and most of the supply chain for large enterprises is composed of SMEs. SMEs introduce new product innovation and adapt to the global environment better than large enterprises, providing income distribution for national economy. For these reasons, SME support policies are important in Thailand.

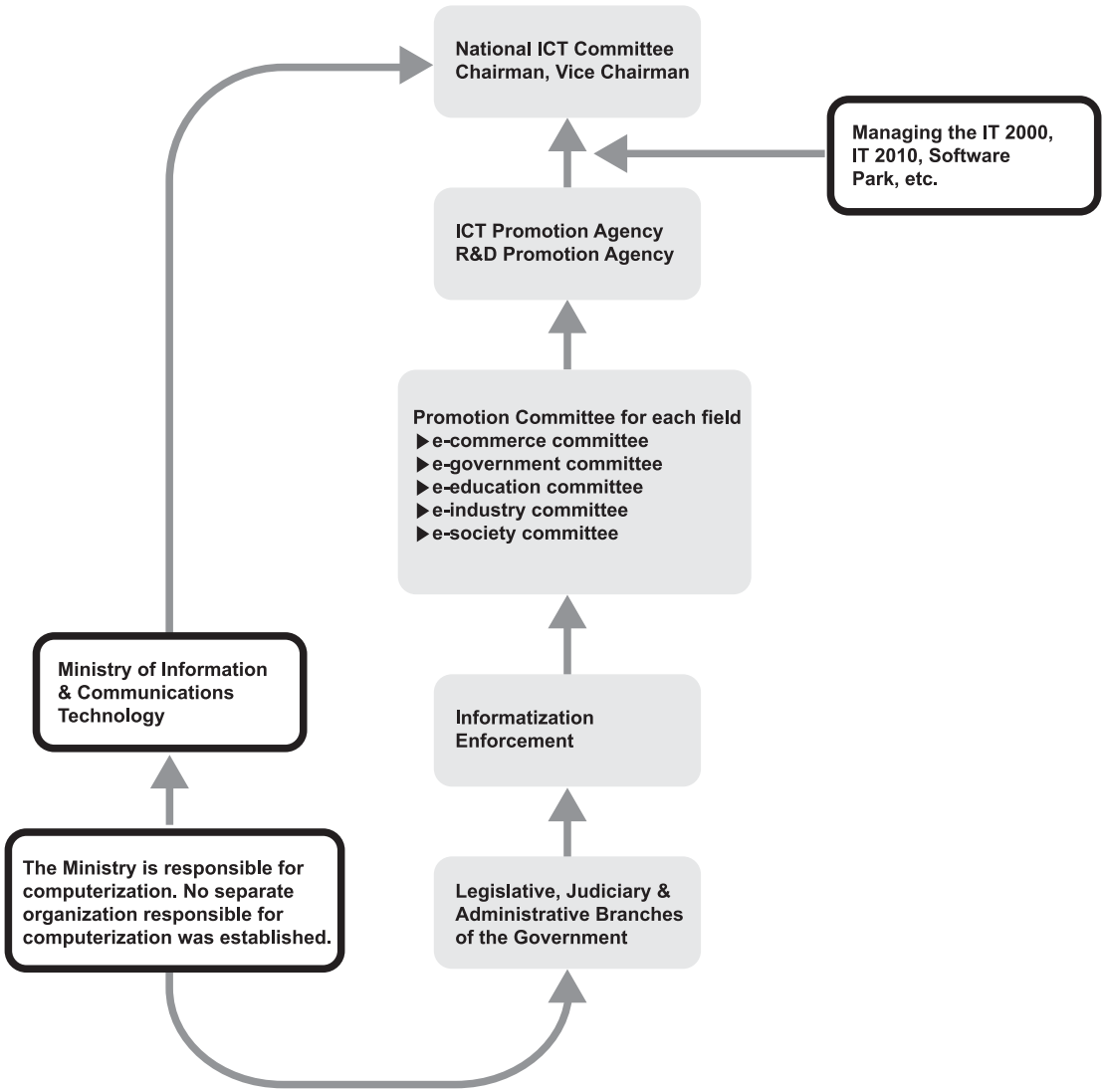
3. Strategy and Progress of SME Informatization

3.1. National Informatization Policies

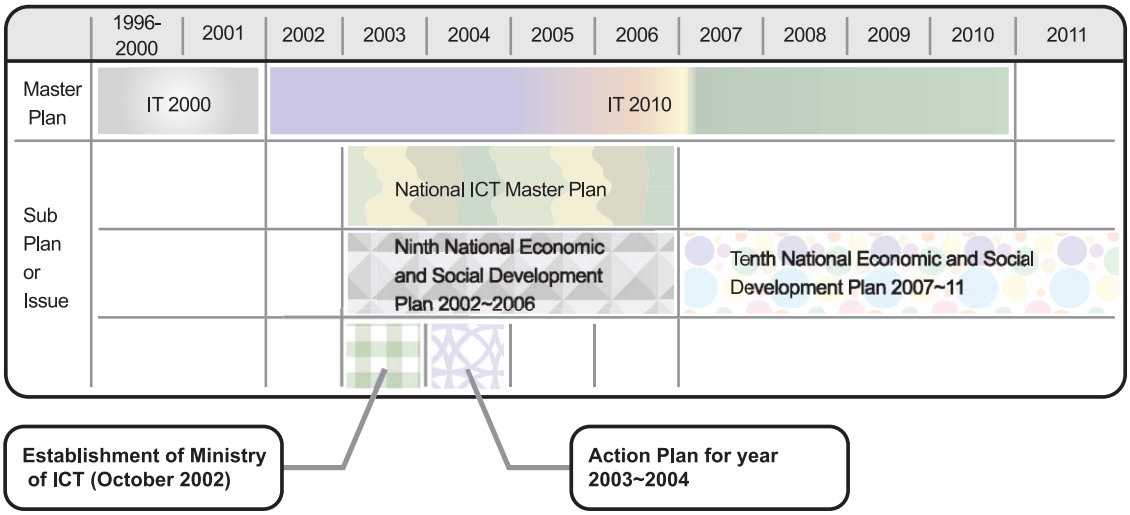
Thailand has implemented various ICT policies with the IT 2000 Plan of 1996-2000 as a starting point. The government has led the national informatization policy of Thailand. Until 2002, the National Information Technology Committee (NITC), National Electronic and Computer Technology Center (NECTEC) were under the supervision of the Ministry of Science, Technology and Environment (MSTE).

However, as the government system was reorganized in 2002, most of the responsibilities concerning informatization havetransferred from MSTE and its sub organization to the Ministry of Information and Communications Technology (MICT). However, in MICT, the responsibilities are not clearly defined since its history is relatively short and many functions of MSTE were distributed to various organizations such as MICT, the Ministry of Science and Technology, and the Ministry of Natural Resources and Environment. Moreover, the IT policy and other policies are overlapping each other, so it is found that the ministries of the Thai government havemade only partial contribution to national informatization. The organizational structure for national informatizationof Thailand is explained in Figure 1 and key informatization policies are shown in Figure 2.

<Figure 1> Organizational Structure for National Informatization of Thailand



<Figure 2> Key Informatization Policies of Thailand



The IT 2000 Plan is the first national informatization policy of Thailand. This initiative aims at abolishing restrictions on the telecommunications market and the privatization of Communications Authority of Thailand (CAT) as a national agenda for the development of Thailand's IT industry. Under this plan, three goals have been identified and pursued: building the environment for national information infrastructure, human resources and good governance. Three objectives of the IT 2000 Plan are indicated in Table 4.

As the IT 2000 Plan neared completion, the Thai government launched the IT 2010 Plan as a new national informatization plan. Thailand's national information technology master plan has as its ultimate goal, the transformation of societyinto one of knowledge, wisdom and life-long learning. While that may be some way off, between 2001 and 2010, three key fundamental changes will have been implemented.

The three key fundamental changes are: (1) investment in IT human resources (2) promotion of innovative technologies for global competitiveness; and (3) investment and promotion of an information system infrastructure and the industries and organizations that spring forth from this.

<Table 4> IT 2000 Plan

National Information Infrastructure	Human Resource Development	Good Governance
▶ IT Law ▶ Constitution Act.78 ▶ IT City: Phuket ▶ Public Awareness: IT Year ▶ Telecom Master Plan ▶ Standards	▶ HRH Sirindhorn IT Project ▶ KPNet ▶ SchoolNet ▶ Multimedia Promotion ▶ IT for Education ▶ IT for Rural Development: Mae Hongsorn, Chiang Rai	▶ Government Facilitation: ECRC, Software Park. Electronic Industry and R&D Tax Incentive, Thailand EDI Council, Tradesiam ▶ Government Computerization: Training, Basic Equipment, IT for Good Governance (CIO, IT Master Plan, Y2K, IT Procurement), GINet

Notes: 1) SchoolNet is a project representing the e-education policy. The project is designed to connect all Thai schools via the high-speed Internet network. There are approximately 20,000 schools in Thailand, and about 5,000 of them are connected to SchoolNet. Currently, the SchoolNet policy is managed by the Ministry of education and will be complete in 2003.

2) NECTEC is managing and promoting projects to build up the Government Information Network (GINet) and Government Information Technology Service (GITS) based on the Government Information Technology service program. GINet project is central to the governmental network that all of Thailand through high-speed telecommunication network. GITS is a national information service project promoted by the government. The Thai government is making a contribution to informatization in Thailand by implementing GINet and GITS.

3) oftware Park was established as a government institute to encourage the development of the software industry. It provides proper environment and research facilities for software start-up companies, educational services of related field to improve IT technology, and encourages interchanges among domestic and international companies. Software Park has a headquarters in Bangkok.

4) Tradesiam is a project that provides Thai companies with EDI service. The Ministry of Commerce undertakes it.

Source: MITC, NITC, NECTEC Web site

Along with the IT 2010 Plan[4], the Thailand government recently planned and launched the ICT Master Plan. The ICT Master Plan (2002-2006) aims to make Thailand the center of the region in ICT development and business, in particular software business. The plan was approved by the Parliament in September 2002, and the 2002-2006 ICT Master Plan is led by MICT. By implementing the ICT Master Plan (2002-2006). Thailand is to have a strong and competitive economy as well as knowledge-based society given that entrepreneursand majority of people can access information. The ICT Master Plan (2002-2006) has four policy objectives and seven strategies and activities) as shown in Table 5.[5]

4) The Development Goals for the Year 2010 is designed to enable better use of technology as a driving force for development of the economy. The aim is to shift Thailand from being what is termed a dynamic adopter, albeit a leading one, to that of a potential leader, and a leading one at that too. Whether this happens or not is to be measured using a UNDP yardstick termed the technology achievement index. According to the Goals, Thailand will increase the number of educated, skilled workers from the current 12 percent to around 30 percent, a figure that is in line with other OECD economies. Both figures are 2001 figures from the International Labor Organization (ILO). The Goals are also committed to development of the national economy. Technology and information based industries are to account for at least 50 percent of GDP.

5) Refer to the MICT Web site [http://202.47.227.59/tiki-custom_home.php] for details of seven strategies.

<Table 5> ICT Master Plan (2002-2006)

Objectives	▶ To apply ICT to boost economic competitiveness of the countryeconomy. ▶ To apply ICT to develop knowledge-based society, which will enhance quality of life for people in the society. ▶ To apply ICT for sustainable development through the diffusion of ICT services, which are equitable and accessible to all. ▶ To strengthen ICT business and industry.
Strategies	▶ Development of the domestic ICT industry into that of a regional leader. ▶ Use of ICT to elevate the quality of life of the Thai people and society. ▶ Restructuring and increasing the potential of ICT research and development. ▶ Building potential in all sectors of society for increased future competitiveness. ▶ Development of the potential of export-oriented entrepreneurs. ▶ Promotion of ICT among SMEs. ▶ Adoption of ICT for use in government administration and services.

Sourec: MICT Web site

With government plans such as the IT 2000 Plan, the IT 2010 Planand the ICT Master Plan (2002-2006), the Thai government tries to transform Thailand into a information society marked by e-Government, e-Commerce, e-Industry, e-Education and e-Society (see Table 6).

In addition, Thailand has made efforts to foster the legal framework of an informatized society during the IT2000 period. In 1998, NITC and NECTEC drafted the Electronic Transaction Act, Electronic Signature Law, Electronic Funds Transfer Law, Computer Crime/Computer-Related Crime Law, Data Protection Law and Universal Access Law. Among these, the Electronic Transaction Act and Electronic Signature Law were passed in Parliament at the end of 2001 and ratified. The Thai government revised the Electronic Transaction Act and Electronic Signature Law into the Electronic Transactions Bill, with this law coming into effect in April 2002.

<Table 6> The 5 "Es"

	Goals	Strategies
e-Government	▶ Back Office: Documents, stock,human resources, financing and budgeting are to be fully computerized by 2004. ▶ Front Office: Details will depend on the nature of operations specific to each unit. However, 70% of services are to be available electronically by 2005 and the rest by 2010.	▶ Develop plans and acquire budgeting. Reorganise organizational structure. ▶ Develop the human resources in the public sector. ▶ Develop public sector management. Implement government wide ICT standards. ▶ Develop government services. Increase ease of access to the public. Establish an e-Government portal. Establish Ministry Operation Centres for each Ministry. Coordinate ICT projects with the private sector.
e-Commerce	▶ Enhance the competitiveness of Thai businesses though the use of ICT as a tool. Emphasis is to be placed on the export-oriented businesses and services as well as domestic consumption while keeping in mind the economy's best interests at all times.	▶ Develop an aggressive export strategy. ▶ Create awareness in e-Commerce and e-business. ▶ Accelerate the revision of existing laws and the introduction of new laws. ▶ Create a safe and secure electronic payment system. ▶ Establish an information network. Update and coordinate related work. ▶ Support SMEs in their adoption of portal sites, paperless trading and acquisition of venture capital. ▶ Develop human resources for the new knowledge based economy. ▶ Conduct research and development on the basic infrastructure needed for e-commerce.
e-Industry	▶ Support and promote the use and production of ICT in the private sector by 2010, under the framework of a step-by-step approach as part of the transition towards a knowledge- based economy.	▶ Establish the Thailand Exchange; an exchange board for industrial products. ▶ Support the development of ICT related industries. ▶ Conduct market surveys and gather market intelligence. ▶ Promote the domestic ICT industry, especially software, telecommunications, information and the electronics industry. ▶ Develop human resources and achieve a skilled workforce in ICT. ▶ Promote industries that rely on research and development. ▶ Promote the use of ICT among SMEs. ▶ Promote the use of ICT for development of, and use in, the agricultural sector.
e-Education	▶ Develop and prepare the nation's human resources for the changes and advances that accompany the transition into the knowledge- based society.	▶ Improve effectiveness and efficiency in management. ▶ Develop a basic education information network. ▶ Promote the development of human resources at every level. ▶ Develop knowledge content available. ▶ Bridge the digital divide in terms of access to information and access to knowledge.
e-Society	▶ Bridge the digital divide in this information age. ▶ Enhance quality of life. ▶ Transform society into one of knowledge and learning	▶ Develop the national information network infrastructure so as to allow equal access for all. ▶ Develop human resources in ICT. ▶ Increase the ability of learning institutions in at all levels of society. ▶ Increase opportunities and reduce inequality in access to information and knowledge. ▶ Create learning networks at the community level. ▶ Enhance quality of life though ICT and e-Commerce. ▶ Create a sense of caring through all sections of society, both urban and rural.

Source: MICT Web site.

3.2. Organizational Structure for Informatization of SMEs

There is no specific organization system in Thailand to support SMEs, but currently, small enterprise-related policy including informatization is all under the control of OSMEP, and the government-affiliated organization, DIP, is in charge of practical funds support and management.

3.3. Strategies for Informatization of SMEs

It is important to note that SME ICT adoption is one of the major strategies in the ICT Master Plan (2002-2006) to help SMEs enhance their competitiveness and boost exports. The Thaigovernment contributes to facilitating informatization of micro-enterprises by promoting ICT adoption. It supports infrastructure for use of ICT, human resources and e-government through the IT 2000 Plan and the IT 2010 Plan, and helps informatize society, industry and the nation as a whole.

In the national informatization policy of Thailand, a policy to facilitate informatization of SMEs is just one of the strategies set out in the ICT Master Plan (2002-2006) but no concrete measures have been prepared. In 2001, the Office of Small and Medium Enterprises Promotion (OSMEP) was established, but it has not formed a policy to promote SME informatization, focusing instead on SME-related policies.

As stated above, although Thailand does not have a direct policy for SME informatization, there are various channels of indirect support for SME informatization, and the indirect policy can be divided into two channels. The first channel is SME requests for support from the government. The Department of Industrial Promotion (DIP), which was the main organization in charge of SME policy, and other departments have offered financial support to SMEs after reviewing their requests. The second channel is IT training programs that the government provides to SMEs. The IT training programs offered by the government include SME production, promotion, transactions supporting OSMEP programs and an SME support program for the DEP.

However, recently, direct informatization policies have been planned and implemented. The DIP helps companies to open their Web site, provide an e-commerce training program online and offer consulting service to SMEs over the Internet. OSMEP also prepares portal services on its Website and plans to build a national SME database.

According to the ICT Master Plan (2002-2006), one of the strategies to transform Thailand into a knowledge-based society is ICT promotion among SMEs. The plan aims at encouraging encourage SMEs to adopt ICT in developing their businesses and increasing their competitiveness, especially in the areas of management, production management and links with large industries. This will ready the sector for increased competition from the new wave of economic globalization while at the same time minimizing adverse effects from economic uncertainty. Detailed activities under the SME informatizationstrategy are as follows:

- Devise mechanisms for technology transfer to and technology absorption by SMEs;
- Motivate SMEs to cooperate and form SME alliances;
- Develop environments conducive to accelerating the development of e-business;
- Apply ICT to business, particularly in supply chain management;
- Create public awareness to use locally developed hardware and software;
- Develop an industrial database to collect and disseminate useful information for SMEs;
- Develop SMEs portal; and
- Encourage entrepreneurship.

4. Government Organizations for SME Informatization

The MICT, set up in October 2002 under the Bureaucratic Reform Act B.E.2545 (2002), has been given the task of planning, promoting and coordinating the development of Information and Communication Technology within Thailand.[6] Seven strategies were developed based on the IT 2010 Plan and the ICT Master Plan (2002-2006):

- Development of the domestic ICT industry into that of a regional leader;
- Use of ICT to elevate the quality of life of the Thai people and society;
- Restructuring and increasing the potential of ICT research and development;
- Building potential in all sectors of society for increased future competitiveness;
- Development of the potential of export-oriented entrepreneurs;
- Promotion of ICT among SMEs;
- Adoption of ICT for use in government administration and services.

It also set targets and prepares strategiesto achieve the 5 “Es”.

The NITC was established in 1992 to oversee the policy aspects of IT development and deployment in Thailand.[7] NITC was a committee governed by the MSTE. The committee’s responsibilities are inclusive, from providing policy recommendations and devising development plans in human resources and IT development, telecommunications infrastructure development, and regulatory and legal amendments, to IT promotion, R&D services, and providing solutions for problems in the national IT development. As of 2003, responsibility for overseeing the NITC is not clearly defined since the MSTE was disbandedand the responsibilities of the MSTE were passed on to new or existing ministries such as MICT, Ministry of Science and Technology and Ministry of Natural Resources and Environment, Ministry ofEnergy. Major plans of the NITC include the IT 2000 Plan (completed), the IT 2010 Plan (prepared)and the ICT Master Plan (2002-2006) (prepared).

The NITC steers various IT development through various subcommittees. The number of NITC subcommittees grew from eight in 1995 to 18 in early 2001, seven of which involve development of IT-related laws (data protection, computer crime, electronic transaction, digital signature, electronic fund transfer, universal accessand intellectual property). Other committees concern IT policy planning, human resource development, IT legal infrastructure, IT research and development, IT utilization in the public sector, IT for the disabled and disadvantaged, IT public awareness, electronic data exchange (EDI), later called Thailand EDI Council, and promotion of the software and information industry.

Among the more recently formed subcommittees are the subcommittees on e-Thailand development, globe project and Thailand’s Internet Policy Taskforce. Members of each subcommittee are representatives from public and private agencies, with representatives from NECTEC appointed as secretary or assistant secretary.

NECTEC was established in September 1986 as a project underthe MSTE.[8] In December, NECTEC was transformed into a statutory government organization under the National Science and TechnologyDevelopment Agency following the enactment of the National Science and Technology Development Act(1991). Until the MICT was established in 2002, NECTEC was leading informatization policy of Thailand along with NICT. NECTEC planned and implemented national

6) Refer to the MICT Web site [http://202.47.227.59/tiki-custom_home.php] for details.
7) Refer to the NITC Web site [http://www.nitc.go.th] for details.
8) Refer to the NECTEC Web site [http://www.nectec.or.th] for details.

ICT policies such as the IT 2000 Plan, IT 2010 Plan, Software Park, SchoolNet, and GINet before its major functions were taken over.

After the MSTE was disbanded in 2002, NECTEC became a sub-organization of the Ministryof Science and Technology. MECTEC no longer sets up policies. Instead, it concentrates on R&D in the IT industry, software development, e-commerce and e-library. The change in NECTEC's nature is witnessed by the adoption of its vision in 2002, "a leading innovative organization in R&D on electronic, computing, telecommunication and information (ECTI) technologies through the basis of knowledge, practices and experiences to enhance the national competitiveness capability and sustainable development." However, some special projects are still carried out by the NECTEC, contributing to the construction of the national IT infrastructure. Detailed activities in the NECTEC special projects are as follows: Government Information Technology Services (GITS), Thailand Microelectronic Center (TMEC), Thai Social/Scientific Academic and Research Network (ThaiSARN). NECTEC, governed by the Ministry of Industry, which implements industrial policies, participated in the APEC SME Meeting and implemented SME policies before establishment of OSMEP in 2001.

Many divisions of the DIP have implemented SME policies.[9] In particular, DIP helps SMEs strengthen competitiveness. In terms of SME policies, OSMEP is a decision-making body and DIP is an implementing body. DIP gives investors opportunities to invest in Thai SMEs, helps SMEs build Web sites, an offers e-commerce education and consulting servicesthrough the Internet. DIP provides financial support to Thai SMEs after reviewing their application for support. A considerable part of the financial support for SMEs is related to informatization.

OSMEP was established in May 2001 to support all aspects of the Small and Medium Enterprises Promotion Act 2000 as a legal entityand is a government body that operates as an independent agency not as a public office.[10] Before OSMEP, there were approximately 100 organizations supporting SMEs, and most of them were operated under the supervision of the Department of Industrial Promotion. However, the Thai informatization policy failed due to overlapping policies, lack of consistency in policymaking, and trial and errors. The Thai government learned a lesson from itsfailure and established OSMEP in May 2001 to support all aspects such as markets and industries. OSMEP's founding capital at the time of establishment was THB 5 billion and it falls under the supervision of the 25-member Board of Small and Medium Enterprises Promotion, chaired by the Prime Minister. The board has the task to generate the policies and action plans that provide the required components of comprehensive assistance to SMEs. Furthermore, a 15-member executive board chaired by the Permanent Secretary of the Ministry of Industry has been tasked to supervise the operations of the OSMEP. OSMEP focuses its support for informatization on SMEs in the manufacturing industry.

OSMEP is focusing on combining various SME support programs of other organizations and systemizing structure. It is now implementing a program that integrates SME production and promotion as well as DIP transactions under the supervision of the Ministry of Industry and SME support programs from DIP, offering an integrated program to SMEs. Although OSMEP did not have an SME informatization support program at first, it reviewed and accepted requests for informatization support from SMEs, extending support to these SMEs through banks. Before long, OSMEP recognized the need for the specific and systematic informatization support for SME in the informatization society. As a result, OSMEP undertook a software development project and the SME Information Database project.

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9) Refer to the DIP Web site [http://www.dip.go.th] for details.
10) Refer to the OSMEP Web site [http://www.sme.go.th] for details.

The SME Development Center was established by the Industrial Finance Corporation of Thailand (IFCT) to support SMEs. IFCT is a finance-developing institution whose main operation is to support Thailand's industrial sector. The SME Development Center provides business consulting services, setting up and analyzing guidelinesfor the adoption of a system, IT specialist services, and educational services for business support and hosting seminars for SMEs.

5. Major Policies and Projects for Enhancing SME Informatization

5.1. Industrial and Regional Sectors in SME Informatization Promotion and Business Support

Recognizing the importance of ICT, the government plans and implements policy to informatize the Thai economy. SME informatization is pursued as part of several industrial policies. OSMEP coordinates the implementation of SME informatization policies in a number of industries.

Therefore, to understand Thailand's SME informatization policy, it would be more effective to identify the policies of each region and industry that support SMEs in general rather than looking for specific SME informatization policies. Based on the approach, Thailand concentrates on five industries or groups, and it is found that priority is not given to any particular region for investment to ensure equal opportunity. OSMEP focuses on five areas for its support policy:

- Export-oriented enterpriseswith ready potential will be further promoted so that they become capable of producing higher quality and higher value-added products. There are: processed food industry, agricultural industry and fashion industry such as garments, leather products, and jewelry.
- Cluster of supporting industries such as manufactures of automotive parts, electrical and electronic parts. Development should focus on production process, management, product delivery to chain industries in order to increase value-added of domestic products and reduce imports.
- Enterprises in the servicesindustry that are already well established such as tourism and related businesses, health services, educational services, design and construction.
- Promising service-based enterprises, namely those that provide professional services such as engineering, architecture, accounting, law, entertainment and conference organizations.
- Enterprises that need to be regulated in order to promote fair competition and increased business efficiency (wholesale and retail trade, transportation and finance).

5.2. Major Policies and Projects for Enhancing SME Informatization

As above-mentioned, before the MICT was established in 2002, NECTEC was leading informatization policy of Thailand along with NICT, NECTEC planned and implemented national ICT policies such as the IT 2000 Plan, IT 2010 Plan, Software Park, SchoolNet and GINet. After the MSTE was disbanded in 2002, some special projects continued to be undertaken by the NECTEC, contributing to the building of national IT infrastructure. The NECTEC special projects are:Government Information Technology Services (GITS), Thailand Microelectronic Center (TMEC) and the Thai Social/Scientific Academic and Research Network (ThaiSARN). The NECTEC projects support SME informatization in Thailand both directly and indirectly.

DIP provides investor opportunities in Thai SMEs, helps SMEs to build Web sites, and offerse-

commerce education and consulting services through the Internet. DIP directly provides financial support to Thai SMEs, and a considerable amount of this support is related to informatization: THB 600 million is allocated to DIP projectsfor 2003, and THB18 million is allocated to IT-related projects. Most of the IT project budget goes to hardware, software, education and maintenance.

OSMEP didn't support SME informatization directly, but it has been operating a variety of projects as interest in SME informatization grows. Major projects related to OSMEP's informatization include the SME Information Databaseproject and the SME portal site support program. In particular, OSMEP is trying to come up with the SME Information Database, which includes information on SMEs in various sectors. This database would contain information on Thai SMEs that are registered with OSMEP, breaking down employment figures and location by sector category. This database is slated for completion within two years. SMEs can then use this information to help them make decisions in term of marketing, production and management. This information will be especially useful for SMEs when they are assessing the viability of locations for production bases and the marketability of their products. The SME portal site also helps SMEs to register and promote themselves on the Web site. Government and government agencies do not support SME homepage building and management, since private service providers build and manage corporate Web sites at low costs.

6. Efforts for SME Informatization from Private Sector

Since SME informatization in Thailand is led by the government, there are not many private organizations responsible for SME informatization. One of the major private organizations supporting SME informatization is the Association of Thai Computer Industry (ACTI).[11] ACTI, temporarily established to organize the trade exhibition by Thai computer businesses in 1983, was registered as an official association in 1989 and has approximately 70 Thai computer enterprises as its members. ATCI's mission is to represent its member's interests and to act as an advocate for the information technology industry in Thailand through its activities. ATCI promotes and facilitates the industry's excellence through trade and cooperation. It also acts as an agent to build the national economy and society. ATCI's objectives are as follows:

- to promote and assist infrastructure and human resource development to grow IT industry in Thailand;
- to stimulate the exchange of knowledge, experiences, trade and research among members, interested parties and the public;
- to act as an advisory, consulting and coordinating body for industry;
- to encourage and promote cooperation among associations and professional organizations whose objectives are consistent with those of ATCI; and
- to provide and disseminate information and views on information technology to the public, policymakers and government.

ATCI closely monitors trends in the global IT industry to help members spot opportunities and to alert them to challenges. ATCI has identified several trends that will be decisive in the development of Thailand's IT industry. The main activities of ATCI are to decide the direction of software industry development in association with the government and to participate in establishing IT

11) Refer to the Association of Thai Computer Industry Web site [http://www.atci.or.th].

policies such as e-government and IC laws along while collating opinions and drawing up statistics related to Thai IT market trends.

7. Overall Assessment of SME Informatization

The Thai government seeks to informatize the Thai industry and society as a whole with a step-by-step approach. It set up policy goals of IT infrastructure, human resources and e-government. With those goals as a basis, it has promoted e-commerce and ICT adoption in the Thai industry through the IT 2010 Plan and the ICT Master Plan (2002-2006).

Nevertheless, despite the effortsof the Thai government, the ICT infrastructure of Thailand is still weak. In Thailand, it is hard for companies and citizens to access the Internet and the computer usage rate is lower than the APEC average. Therefore, industry is not able to actively utilize ICT and e-commerce remains in its initial stage.

In Thailand, the government leads efforts to informatize the economy but it does not have a system to support SME informatization, and several organizations (including OSMEP and DIP) are responsible these efforts.[12)]

OSMEP and DIP are in charge of providing financial support for SMEs. OSMEP not only offer financial support, but also review and improve laws and regulations and provide technical support, database services and portal service. DIP's activities cover financial, training and technical support for SMEs.

Currently, Thai policies to support SMEs concentrate on key areas without distinction between manufacturing and non-manufacturing sectors.

Thailand shows its ambition to transform into a highly developed information society in the IT 2010 and the ICT Master Plan (2002-2006). However, the IT sector is underdeveloped and the ICT infrastructure is not well prepared. Therefore, for the time being, efforts of the Thai government are expected to focus on the ICT infrastructure. So far, Thailand has not prepared a policy to facilitate SME informatization.[13)] However, it is high likely that in the near future, government organizations and agencies are under increasing pressure to plan policies in regard to SME informatization as SMEs will choose investment in ICT as a way to respond to fast changing technology, business environment, demand for higher productivity and efficiency, and fiercer competition in the international market.% of total export of manufacturing product)

12) Of course, no priority is given to investment in ICT among many kinds of support in OSMEP and DIP.
13) Organizations supporting SMEs such as OSMEP do have interest in informatization, but informatization is not a major policy objective since industrialization is an urgent task in Thailand.

Appendix B.20. United States

1. Trends of Informatization

The U.S. government works with the private sector to pursue a high-tech agenda that fosters advances in science and technology through the promotion of innovation, support for entrepreneurship, improvement of infrastructure, and empowerment of people. The United States'informatization policy is based on a commitment to private sector leadership in the high technology space and to a digital economy environment that is free of unnecessary barriers.

As a result of these efforts, the level of informatization of the United States is much higher than that of other economies. As of June 2001, the United States ranked fourth in terms of global broadband access per 100 people. According to the APEC KBE indicators, as of 2000, 74 percent of all people in the United Statespossessed computers, and about 56 percent of Americans were using the Internet.

<Table 1> Informatization of the United States (as of 2000)

(Unit: Persons, %)

	U. S.	APEC Average
Mobile telephones in use per 1,000 people	497	434.02
Telephone mainlines in use per 1,000 people	701	372.71
Computers (PCs, mainframes, etc) per 1,000 people	739	310.59
Internet users, as % of population (1999)	38.4	15.13
Internet users, as % of population (2000)	55.84	32.24
Internet commerce (B2B +B2C) as % of total commerce	0.77	0.46

Source: APEC. 2003. *KBE Indicators*.

2. Definition of an SME

Small businesses, which play a central role in the U.S. economy, represent more than 99.7 percent of all employers, generate 60-80 percent of net new jobs annually, employ more than half of all private sector workers, and also represent nearly all of the self-employed. Small businesses also pay 44.5 percent of the total U.S. private payroll, provide over 50 percent of non-farmingprivate GDP, represent 96 percent of all exporters of goods and obtain 22.8 percent of Federal prime contract dollars.

In the United States, the Small Business Administration (SBA) uses the following criteria to establish which companies can be considered SMEs:

- Wholesale: not more than 100 employees;
- Retail or service: average sales (three years) not to exceed annual sales or receipts of more than $4.0 to $30.0 million; and

· Manufacturing: not more than $12 million to $28.5 million, depending on the specific business type.

In order to qualify for SBA lending and government contracting programs, a small business must meet the specified SBA-designated definition of a small business. In addition, state and local governments may use different criteria in determining whether a firm qualifies as an SME.

3. Strategy and Progress of SME Informatization

3.1. Strategy of SME Informatization

The private sector provides the major impetus for businesses to connect to the Internet. Applications such as virtual markets, specialized malls and search engines are making it easier to adapt one's business to e-business. Private firms are developing e-business models, software firms are developing programs and tools, and application service providers (ASP) are helping small companies create Web pages and perform their practices electronically.

Where private industry cannoteffectively provide necessary assistance, the SBA tries to build awareness among small businesses of the benefits and pitfalls of e-commerce through online tutorials as well as focused assistance through business resource partners. The SBA also promotesthe creation of infrastructure such as broadband, security and privacy, and standards, providing information, education, training and counseling on the importance of technology and e-commerce.

3.2 Progress of SME Informatization

In the United States, 70 percent of small companies use computers in their business and 67 percent use the Internet. Approximately 37 percent of small businesses use the Internet for e-mail and information, 19 percent have Web sites and 11 percent utilize e-business. Computers account for 25 percent of capital expenditure, and the return on these investments has proven to be high. The 2002 data from the SBA's Office of Advocacy indicates that small businesses in the United Statescontinue to increase their use of Internet technology, and they spend part of their increased revenue on operating Web sites. Even though less than 10 percent of small businesses depend on business-to-business (B2B) transactions, the "smallest firms" with less than 10 employees make the biggest profits from B2B.

4. Government Organization for SME Informatization

The development and administration of the U.S. Government's electronic commerce policy is a collaborative effort involving many agencies. The U.S. Department of Commerce deals with policies related to e-commerce policy and statistics, and telecommunications and IT policy.The SBA supports SME e-commerce through Small Business Development Centers (SBDC), and the Department of the Treasury is responsible of policies related to financial services for e-commerce and electronic payment systems. The FTC addresses privacy, Internet fraud and consumer protection issues.

The Federal Communications Commission (FCC) focuses on U.S. telecommunications policy from a regulatory standpoint. The National Telecommunications and Information Administration (NTIA), which has both telecommunications-related and digital divide responsibilities, has operated the Telecommunications and Information Infrastructure Assistance Program (TIIAP) since 1994. TIIAP is aimed at building high-quality ICT infrastructure that would link the whole economy, playing an important role in realizing the vision of becoming an information society by assessing and supporting ICT projects.

The Office of Management and Budget leads e-government and e-business initiatives implemented in some 30 government agencies and provides customized services, such as theFirst.gov portal.

The SBA works closely with other agencies such as the Export-lmport Bank and the U.S. Department of Commerce, Commerce Department, as well as the Trade and Development Agency to assist SMEs in this area.

5. Major Policies and Projects for Enhancing SME Informatization

The SBA takes the lead within the U.S. Government on supporting SME development. This agency offers training and counseling to SMEs through a small business training network. The SBA also advocates for the interests of small business within the federal government.

The SBA offers an SME support program that ensures that 23 percent of federal government procurement will be covered by SMEs. In particular, the SBA Technical Assist Programs provide one-on-one counseling free of charge to permanent residents and citizens of the United Statesinterested in starting a small business. They also provide training and/or workshops on a wide variety of business-related subjects at minimal cost to nascent entrepreneurs and established small businesses in over 1,580 locations throughout the United States and US territories. Major assistance programs for SMEs offered by the SBA are in the following.

The NTIA also provides the Technology Opportunities Program to develop Web-based services for the disabled and offerscontent to the underprivileged.

<Table 2> SBA Assistance Programs

Access to Capital	Loan Guaranty Program, Certified Development Companies (CDC) Loan Program, Micro-loan Program, Small Business Investment Company (SBIC) Program, Disaster Loan Program
Entrepreneurial Development	Small Business Development Centers (SBDCs), Counselors to America's Small Business (SCORE), Women's Business Centers (WBCs), E-Business Institute, U.S. Export Assistance Centers (USEACs), SBA Web site, Online Library, Articles and Research Papers
Government Contracting	Government Contracting (Federal Procurement), Small Business Innovation & Small Business Technology Transfer Programs (SBIR/STTR0, Office of Technology
Advocacy	Statistics on Small Businesses

5.1. Small Business Investment Company (SBIC) Program (www.sba.gov/INV)

This is the agency's premier vehicle for providing venture capital to small, growing companies. The SBA licenses professional venture capitalists who form SBICs, either in the form of limited partnerships or limited liability companies. The SBA then leverages the SBIC's private funds through loan guarantees. SBICs make equity or debt/equity investments in small businesses and help the business grow. Once the businesses "exit" successfully, the SBICs repay with profits. The funding period usually lasts from seven to 10 years.

5.2.SBDCs: Small Business Development Centers (www.sba.gov/sbdc)

There are more than 1,000 centers, most of which are located in universities throughout the economy and US territories. SBDCs provide services through cooperative effort between the SBA, the academic community, the private sector; and state and local governments. They tailor services to the unique needs of local economies (from rural to urban, marine services to international trade, government contracting to home-based businesses), and provide management and technical assistance.

5.3. SCORE: Counselors to America's Small Business (www.score.org)

SCORE is composed of 10,500 retired and active senior executives and small business owner volunteers in 389 locations. With their real-life, hands-on experience in starting, owning and operating businesses, they provide expert marketing advice, business-plan preparation and pre-business planning. Sometimes they develop and conduct training workshops. By way of email counseling through SCORE Web sites, 1,200 experienced businesspeople handle approximately 10,000 cases per month and 389 SCORE chapters deliver hands-on counseling.

5.4. WBCs: Women's Business Centers (www.sba.gov/financing/special/women.html)

Women-owned businesses in the United States employ more than 9 million people and contribute nearly $1.15 trillion to the economy. Between 1997 and 2002, women-owned businesses outpaced the economy as a whole. Their numbers increased by 14 percent nationwide twice the rate of all firms while employment increased by 30 percent 1.5 times the national rate. Sales grew by 40 percent, equaling the national rate. WBCs provide counseling and training for women nationwide, host a Web site (http://www.onlinewbc.gov/) in eight languages and offer mentor programs for women running small businesses.

5.5. E-Business Institute (http://www.sba.gov/training)

E-Business Institute is a virtual campus housing free training courses, workshops and knowledge resources. It was designed to assist entrepreneurs and other students of enterprises in an Internet-

based learning environment and offers online courses, workshops, publications, information resources, learning tools and direct access to electronic counseling, and other forms of technical assistance.

5.6. PRO-Net (http://www.pro-net.sba.gov)

Pro-Net is an electronic gateway of government procurement information and a search engine for contracting officers, a marketing tool for small firms and a link to procurement opportunities and important information. It is designed to be a "virtual" one-stop procurement shop. PRO-Net is generally a self-certifying database that is the result of a cooperative effort among SBA's offices of Government Contracting, Minority Enterprise Development, Women's Business Ownership, Field Operations, Marketing & Customer Service, the Chief Information Officer and the National Women's Business Council.

5.7. OWBO: The SBA's Office of Women's Business Ownership (www.onlinewbc.gov/)

OWBO promotes the growth of women-owned businesses through programs that address business training and technical assistance, and provide access to credit and capital, federal contracts and international trade opportunities. OWBO is helpingwomen start and build businesses by using the FastTrac training curriculum and inviting experienced speakers on a variety of topics. Monthly and quarterly mentoring groups are in the formative stage and there are quarterly networking programs.

5.8. Business Advisor

The Business Advisor (http://www.business.gov/) was developed as an element of e-government under the SBA and the National Performance Review. Itprovides business with one-stop access to federal government information, services and transactions. Its goal is to make the relationship between business and government more productive. It gives businesses anytime/anyplaceaccess to accurate, current and consistent information and services at an affordable price while leveling the playing field for small businesses, making them more competitive by providing accurate information more quickly and economically. It also offers electronic transactions on the Internet - making it possible for businesses to pay taxes, file for permits, receiveexemption certificates or bid on government contracts. It is an information and transaction-oriented system.

6. Efforts for SME Informatization from the Private Sector

The private sector provides services for the informatization of SMEs on a commercial basis. The private sector provides an impetus for businesses to use the Internet. Applications like virtual markets, specialized malls and search engines are making it easier to adapt to e-business. Private firms are developing e-business models, software firms are developing programs and tools, and application service providers are helping small companies create Web pages and perform business

practices electronically. A variety of ICT corporations provide services for the informatization of SMEs while the government builds awareness among small businesses ofthe benefits and pitfalls of e-commerce through e-commerce summits, on-line tutorials and focused assistance through business resource partners. At the same time, the government promotes the creation of infrastructure such as broadband, security and privacy, and standards. Providing information, education, training and counseling on the importance of technology and how to do e-commerce is a further function of the government.

7. Overall Assessment of SME informatization

The United States has recorded rapid economic growth in its advance into the new economy. It leads the world's e-business, and is integrated all government servicesinto an e-government portal.

In addition, the U.S. government is also working to build the national information infrastructure and seekingto reduce the digital divide by cutting Internet user fees for school networks with the 'e-rate' program.The U.S. government has also made efforts to raise the awareness of SMEs on the benefits of ICT and to facilitate access to information on laws and regulations necessary for e-business operations.

Finally, organizations under the SBA offer multi-faceted assistance to SMEs with consulting services customized to each sector, such as personnel management, production, logistics, and marketing, through which the Internet is fully utilized by SMEs. In short, the United States has fully applied its resources to the task of SME informatization.

Appendix B.21. Vietnam

1. Trends of Informatization

As indicators for Vietnam's informatization were not availablein the APEC Knowledge-Based Economy Indicators (KBE Indicators), the level of informatization of Vietnam was studied with comparable indicators drawn from the ITU source on which the fiveKBE Indicators were based. The level of informatization in Vietnam is lower than other APEC member economies.

First of all, telecommunication penetration rates were low (see Table 1). The number of mobile phone users per 1,000 people was 23.4, just 5 percent of the APEC average of 68.5, and only 68.5 people hadtelephone mainlines out of 1,000, 18 percent of the APEC average. The number of personal computers was 9.8 per 1,000 people, which is approximately 3 percent of the APEC average of 310.59. Even though the share of Internet users per population was minimal (1.85 percent) when comparedto the APEC average of 32.24 percent, the figure is a 14-fold increase from three years prior, suggesting that more Vietnamese are becoming interested in ICT. The share of e-commerce in the economy was excluded due to a lack of data.

<Table 1> Informatization in Vietnam (as of 2002)

(Unit: Persons, %)

	Vietnam	APEC Average
Mobile telephones in use per 1,000 people	23.4	434.02
Telephone mainlines in use per 1,000 people	68.5	372.71
Computers (PCs, mainframes, etc) per 1,000 people	9.8	310.59
Internet users, as % of population (1999)	0.13	15.13
Internet users, as % of population (2002)	1.85	32.24
Internet commerce (B2B +B2C) as % of total commerce	n/a	0.46

Note: ITU data that was adjusted based on standards of the KBE Indicators.
Source: ITU. 2003. *World Telecommunication Indicators 2003.*

On the other hand, recent statistics fromthe Vietnamese government suggest that as of June 2003, the number of Internet users in Vietnam was 460,000, or 2.38 percent of the total population. This is approximately 20-percent growth compared to figures from 2002. In Vietnam, six Internet service providers are operating, and the computer industry is expected to grow by 25 percent to 30 percent by 2010. The annual growth in the telecommunications and Internet sector was 32.5 percent from 1995-2002.

Vietnam's information technology industry has enjoyed 25-percentannual growth over the past several years, despite recession throughout the industry elsewhere in the world. This is partly because the economy's IT sector is still small, estimated at just US$484 million, according to the IT Department of the Ministry of Post and Telematics. Development is imbalanced, with hardware production still accounting for a dominant share of the IT market. Vietnam envisages that by 2005, 4-5 percent of its population will have access to the Internet and aims, through a national project, to connect rural areas to the Internet by 2008.

2. Definition of an SME

The private sector in Vietnam is now composed of approximately 100,000 enterprises officially registered under the Enterprise Law, 15,000 cooperatives, 24,000 cooperative groups and 2.4 million registered household businesses in service and industry sector, 10 million household businesses engaged in agriculture production and 13,000 agriculture farms (excluding more than 3,000 foreign-invested enterprises). Though the enterprise community has witnessed substantial growth since 1991 when the first law on private enterprise was introduced, the incidence of enterprise remains low at one enterprise per 1,000 people (2003). Most of these businesses are very small in size (in terms of labor and capital).

These enterprises are making up an increasinglyvibrant and dynamic sector in Vietnam. They are contributing significantly to economic growth and poverty reduction efforts through job creation and income generation. Statistics show that the private sector in Vietnam is contributing to 42 percent of GDP (as compared with 39 percent from state-owned enterprises). Private enterprises are providing 56.3 percent of the economy's regular job supply and absorbing the majority of the 1.2 million people entering the labor market each year. It is leading industrial growth rates at 19.5 percent in 2002 and contributing to half of the economy's exports. In addition, 28.8 percent of total investment came from the private sector a share that has beenincreasing steadily over the last few years.

The government provides a formal definition of SMEs in 2001 in Decree No.91/2001/CP-ND. According to this decree, SMEs "are independent business entities, which have registered their business in accordance with prevailing laws, with registered capital of not more than VND 10 billion or the annual average number of labor of not more than 300 people." The decree encompasses enterprises registered under the Enterprise Law, State-owned Enterprise Law, cooperatives registered under the Cooperative Laws and household businesses if they meet these requirements.

SMEs are being increasingly recognized as an important factor for economic growth and poverty reduction in Vietnam. The Vietnamese government has created an SME Web site (http://sme.com.vn) in order to make a contribution to the development of SMEs in Vietnam.

3. Strategy and Progress of SME Informatization

Despite the relatively low level of informatization in Vietnam, the government has planned and implemented various policies since the Vietnamese government formed the vision to move toward becoming an information society in the 1990s with its plan to establish infrastructure.

The "1993-2000 Decree 49/CP," adopted in 1993, has beenassessed as a comprehensive policy to promote the ICT industry. The main objective of the policy was to create an environment and infrastructure conducive to ICT and based on this foundation, facilitate technology transfer. To this end, the government improved productivity and efficiency by introducing ITC to the public sector and connecting the Vietnamese network to the international ICT network, making particular efforts to modernize major manufacturing sectors, service and defense through ICT.[1)]

However, as the 1993-2000 ITC industry promotion plan (Decree 49/CP) failed to produce positive results, the government prepared a new informatization plan, suggesting a national ITC vision in 2000 as part of the long-term plan for the 2002-2010 national industrialization policy. Using thisplan, the Vietnamese government set up a detailed program with four objectives: infrastructure for communications and the Internet to develop the ICT industry and boost exports development of IT professionals development of the software industry and development of the hardware industry.

Furthermore, to successfully proceed with the national informatization policy, relevant administrative bodies and organizations formed the IT Steering Committee.[2] In 2002, the IT Steering Committee introduced the National IT Master Plan 2002-2005 and administrativebodies have planned and implemented the IT Master Plan for E-Commerce, the Master Plan for Education and Training, the Master Plan for Telecommunications and the IT Master Plan for Agriculture and Rural Development. The IT Steering Committee focusedon improving the institutional framework for the information society, but the framework has not been firmly established yet.[3]

The ambitious IT Vision 2020, as laid out in the strategy, aims to make Vietnam a promising IT market: one of the top three economies in ASEAN in terms of IT and its telecommunications infrastructure. Vietnam aims to expand the domestic ICT market and estimates that the market will reach US$5.5 billion in 2010, accounting for 9 percent of GDP. Today, the ICT industry accounts for 1.5 percent of Vietnam's GDP. The Minister of Post and Telematics is in charge of the general informatization policy in Vietnam. It also oversees many sub-organizations: both public organizations and state-owned telecommunication companies.

The Vietnam Internet Network Information Center (VNNIC) is a not-for-profit affiliate of the Ministry of Posts and Telematics (MPT), established in February 2000 to carry out the functions of managing, allocating, supervising and promoting the use of Internet domain names, addresses and autonomous system numbers (ASNs) as well as providing Internet-related guidance and joining international activities on the Internet.

The Ho Chi Minh and Hanoi city governments are also in charge of ICT development in the region. Ho Chi Minh City will build a Main Area Network (MAN) using broadband technology to fully exploit applications under the city's geographic information system (SagoGIS) to provide public administrative services (CityWeb), link libraries and develop e-commerce.

The Vietnam Chamber of Commerce and Industry (VCCI) is committed to assisting and financing SMEs in Vietnam. VCCI set up the Business Information Centre (BIZIC) for supporting the information needs of SMEs in Vietnam. BIZIC took control of the business information portal SMEnet (http://www.smenet.com.vn) in July 2003after its management by the German Technological Cooperation Organization (GTZ) for nearly six years. SMEnet has become increasingly important to the development of SMEs in Vietnam.

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1) To successfully implement the policy, the Vietnamese government established the Supervisory Committee for the National Program of IS/IT in 1994. The committee overtook a comprehensive range of responsibilities including budget planning, execution, assessment, and regulations, design of long-term programs.

2) The major role of the IT Steering Committee is revision of related laws, regulations and policies, and coordinates and monitors activities of government agencies and organizations.

3) Examples for the institutional framework include the Guidelines for the Computerization of Government Operations: Decree #112), Re-engineering and Modernization of Public Administration Systems: Decision #136 on Public Administrative Reform, Incentives to Support the IT industry: Decisions #128 and 19, Liberalisation of ISP Service Delivery and of IT Market: Decree #55.

4. Government Organizations for SME Informatization

To successfully pursue the 1993-2000 ICT promotion policy, the Central Communist Party established the Supervisory Committee for the National Program of IS/IT in 1994, and the committee has undertaken overall responsibilities related to ICT such as budgeting, budget executing, assessment, regulations and long-term plans. However, as time passed, the function of committee became unclear.

The IT Steering Committee was established when the 2000-2010 national industrialization policy (Policy Directive #58) was planned. The committee revises laws and regulations while coordinating and monitoring activities to promote the adoption of ICT. It built the National IT Master Plan 2002-2005 in 2002.

The Department General of Post and Telecommunications plays a key role in implementing ICT policies as well as providing postal services. It is in charge of coordination in regard to all ICT-related policy, law and regulation, approval and permit, communications tax and market competition.

5. Major Policies and Projects for Enhancing SME Informatization

There is no apparent governmental organization in charge of SME ICT policy in Vietnam. However, some ministriessuch as the Ministry of Posts and Telematics and the Foreign Trade and Investment Development Council are involved indirectly with SME informatization. The VCCI provides information on business opportunities, business partners, markets and technologies depending on client demands.

VCCI established the SME Promotion Center, which cooperates with other VCCI departments and SME promotion programs in Vietnam to provide reliable services to SMEs. The main activities of the SME Promotion Center are advising VCCI and government agencies, consultancy services, information services and assistance with information, marketing and training.

In regard to advising VCCI and government agencies, the SME Promotion Center carries out a number of functions. On the basis of SME feedback and through its own surveys, the SME Promotion Center gives recommendations to the Vietnam Chamber of Commerce and Industry and through the chamber, strategic orientation and policy on SME development to the government. The promotion center also submits proposals and solutions for creating a more favorable business and investment environment for SMEs so that SMEs can develop their strength and contribute more to the socio-economic development of Vietnam.

The SME Promotion Center provides or recommends consultancy service on business, law and technology to SMEs. It helps SMEs access financing sources and assists SMEs in writing business plans conforming to the standards of international organizations(therefore improving their chances of receiving international financing). It also recommends international experts.

The SME Promotion Centerprovides information to SMEs at a preferential fee that covers part of direct costsfor collecting information. SMEs receive information from the SME Promotion Center on business opportunities, business partners, markets and technologies depending on the demands of the clients.Information is collected from the following sources: a database of Vietnamese enterprises updated regularly by the SME supporting network; SMELINK; records of development of different industries in Vietnam; and theInternet.

The SME Promotion Center supports SMEs by advertising their products on its Web site and provides SMEs with marketing planning services. It also supports SMEs through facilitating regular

displays of their products in showrooms and sponsoring industrial SMEs forrental fees and assistingSMEs in organizing common stands at large trade fairs.

The SME Promotion Center engages in training SMEs in management skills through providing knowledge and necessary methods of management and training in technologies. It organizes workshops on new government laws, decrees and policies and their implementation. It supports part of the fees for participants of technical and skills training workshops at high quality training centers.

The SME Promotion Center also co-operates with other VCCI departments, related agencies and international institutions to provide SMEs with information on different world markets.

VCCI has established a network of SME Promotion Centers to sponsor SMEs activities throughout Vietnam, with offices in Hanoi, Ho Chi Minh City, Da Nang, Can Tho, Hai Phong, Vung Tau and Vinh. In addition to their own staff, Vietnamese and foreign experts in various fields assist these centers.

For the development of SMEs in Vietnam, the Business Information Centre (BIZIC), the Vietnam Chamber of Commerce and Industry and German Technical Cooperation jointly established and developed a Web site, SMEnet. This site was constructed to improve the competitive edge held by Vietnamese SMEs, and according to an agreement between BIZIC, VCCI and GTZ, SMEnet was to be transferred to BIZIC in July 17, 2003.

SMEnet has seen considerable success in supplying information services toenhance the competitiveness of SMEs in Vietnam. SMEnet received 400,000 hits in one year. Its newsletters have a distribution of 2,500 domestic and foreign enterprises, of which 59 percent receive the newsletters in Vietnamese, 8 percent in English and the remainder in both. The most-wanted information services are updated business and market information, online legal consultancy, export-import guides and useful links.

VCCI is committed to assisting and financing SMEnet's maintenance and development for the sake of SMEsin Vietnam, while GTZ is likely to support some selected innovative services and capacity building.

6. Efforts for SME Informatization from the Private Sector

Private organizations supporting SME informatization include the Vietnam Software Association and the Vietnam Electronics Communication Technology Development Co. Ltd.The Vietnam Software Association seeks to help develop the software industry, commercialize software products, boost exports, develop professionalsand promote international cooperation. At the same time, the association serves as a mediator between the government and the private sector to protect the interests of member corporations. Vietnam Electronics Communication Technology Development Co. Ltd. was established to expand the electronics, communications and software industries, and support international standardization. It has expanded the market with new technologies, offered communications equipment and operated an R&D center.

7. Overall Assessment of SME Informatization

Vietnam takes a step-by-step approach to informatization through the 1993-2000 ICT industry promotion policy (Decree 49/CP), the 2000-2010 national industrialization policy (Policy Directive #58) and improvement in laws and regulations related to ICT. However, as the 19932000 ICT industry promotion policy was not very successful, the future of informatization in Vietnam is expected to depend on the role of the revived IT Steering Committee and results of the National IT Master Plan 2002-2005.

It was only after the mid-1990s that Vietnam, a socialist economy, started to take interest in informatization of its society. For this reason, the ICT infrastructure is not fully developed, and businesses and individuals do not have easy access to the Internet and use of personal computers is not common in the Vietnamese society. However, it is notable that the government's commitment to informatization is now leading to rapid improvement of this situation.

The government is leading the process of national informatization, but infrastructure for SME informatization has yet to be completed. As the Vietnamese economy develops and transforms into an information society, SME informatization will take more importance and relevant organizations will be established in the near future.

Appendix C
Questionnaire for the Case Study

Questionnaire for the Case Study

Nationality:

Respondent:

Name:
Position:
Telephone:
Fax:
E-mail:

Company:

Please write the name of your company:

If your company has a web site, please write the Internet address?

Please list the main products and/or services your company offers:

How many people does your company currently employ?

Please write total sales of your company:

ICT Organization

1. Does your company have the department to develop or support Information and Communication Technology (ICT) such as computer, Internet, and information systems? Yes or No
   - If you are yes,
   - what is the budget of the ICT department in your company?
   - what is the position of the manager of the ICT department in your firm?
   - how many ICT people are in your company?

Adoption and Use of ICT

2. Please indicate the number of computers/PCs operating in your business.
3. What types of computer does your company currently own?
4. Are your computers networked?
5. Where do you store the following items of business information? (Check one box for each category)

	Mainly in My Head	Mainly on Paper / Cards	Mainly on Computer	Not Applicable
Inventories / Stock Control				
Production Records				
Sales and Invoicing				
Marketing and Distribution				
After Sales Service / Follow up				
Company Accounts				
Staff Records / Wages / Salaries				
Suppliers				
Customer Records				

6. How often do you use the following computer-based activities in your business?

	Very Often	Quite Often	Not Very Often	Not At All
Word Processing				
Spreadsheet-Based Analysis				
Desk Top Publishing				
Project / Production Planning				
Accessing the Internet				
Computer Aided Design				
Computer Aided Manufacturing				
Using E-mail				
Other (Please Specify)				

7. Does your company make e-commerce purchases?
8. Does your company make e-commerce sales?

Benefit of the Use of ICT

9. Do you feel the use of ICT could improve the business performance? Please indicate it considering the following examples.
   - Improving the efficiency of the operations.
   - Improving the speed of the business operations.
   - Improving the control of the business operations.
   - Improving the flexibility of your operations.
   - Improving the service you provide to customers.
   - Improving the relationship with your partners.

Motivation of the Adoption of ICT

10. What are the three main reasons (in order of their importance) why your company should adopt ICT? Please indicate it considering following examples.
   - Any of your trading partners (suppliers or buyers)suggested or requested that your company adopt ICT.
   - Any other organization, association, or other agency influencedyour decision to adopt ICT.
   - Because more competitors started using ICT, your company had to use it too.

Inhibitor of the Adoption of ICT

11. What are the three main problems or concerns (in order of their importance) that inhibited your company from adopting ICT? Please indicate it considering following examples.

- Your company didn’t have the necessary financial resources to acquire ICT.
- Your company didn’t own the necessary expertise and know-how to acquire the technology.
- The resourcesand/or the intension that the management was willing to allocate on the ICT were not adequate.
- Lack of the telecommunication infrastructure
- Lack of suitable computer software

Appendix D
The Results of the Case Study

Case studies were made in the following 10 member economies: Australia, China, Indonesia, Japan, Korea, Malaysia, Mexico, Chinese Taipei, Thailand, and the United States. Two cases (companies) were studied in each member economy (except for Australia and Korea), with information on 18 case study enterprises collected and analyzed.

In the case studies, the following issues were examined:

- Business environment: buyers, vendors, large firms, alliances, and industry characteristics;
- ICT Mindset: CEO mindset and ICT organization;
- ICT introduction status: hardware, software, and networks;
- Benefits of ICT introduction;
- Facilitating and inhibiting factors, especially the role of intermediaries for supporting SME informatization: funds, training and education, experiences, knowledge, and technology consulting, and;
- Gender consideration in SME informatization;

Each case study has following standardized list of contents:

(1) Company Introduction
(2) Status of ICT Adoption
    - Organization
    - Hardware
    - Software
    - Internet
    - Benefits of ICT
(3) Influential Factors for ICT Adoption.

1. Snowgum Sydney (Australia)

1) Company Introduction

Foundation	2003. 5. 1.
Main products	Specialty outdoor and travel equipment, adventure travel gear and clothing
Sales revenue	$1.2 million
Employees	9

Snowgum is a specialty outdoor and travel equipment retailer composed of Snowgum headquarters and franchisees. Snowgum headquarters designs products, tests product quality and selects new suppliers from the all over the world. Snowgum franchisees sell Snowgum-branded products as well as those from different suppliers. Snowgum Sydney started business as a Snowgum franchisee in June 2003.

The main consumers of Snowgum Sydney products are individuals. Its suppliers, managed by Snowgum headquarters, are quality manufacturers or large retailers, but Snowgum Sydney is not associated with large companies. Competition among companies in this industry is very fierce, and entry barriers are low. The brand image of Snowgum is relatively high so its sales are better than other retailers in Sydney.

Snowgum Sydney is a member of ARA, Australian Retailers Association, which represents the diverse interests of retailers and provides its members with quality information and services in the following areas:[1)]

- Employee relations
- Business information
- Government affairs
- Electronic commerce and the Internet
- Loss prevention
- Tenancy issues
- Regular news
- Media releases
- Up-to-date retail statistics
- Special member offers

The ARA has formed an E-commerce Committee to shape its ICT policy and direction. The following is a list of the current issues of concern to the committee:

- E-commerce regulation
- Virtual private networks and connectivity
- Point of sale and retail systems feature development

1) Source: [http://www.ara.com.au/]

· ARA's role in setting standards
· Interoperability and federal projects/policy
· ARTS in Australia, EbXML, UDDI
· Government authentication (OBI andPKI)
· Electronic payments andmerchant liability

2) Status of ICT Adoption

(1) Status of ICT Adoption in Retail

According to a survey concerning ICT usage in retail that was conducted in 2002-2003,[2] 52 percent of retail businesses had 1-4 employees and 35 percent had 5-19 employees.

<Table 1> Use of Technology in Retail

(Units: %)

No Computer	Computer	Internet	Web Site	Web Site for Sales	Intranet	Extranet	Sample
20	80	66	34	13	8	4	1095 business

Of the retailers surveyed, 80 percent owned a computer and 66 percent were connected to the Internet. Consequently, 34 percent of retailers are excluded from the communication and research benefits that are available through the Internet. Some 34 percent of retailers have Web sites, with 13 percent selling online and 4 percent maintaining or using extranet.

(2) Status of ICT Adoption at Snowgum Sydney

Organization

Snowgum Sydney does not have an independent ICT department, and one employee, the CEO, processes ICT-related tasks.

Hardware

Snowgum Sydney uses three networked Pentium-4 PCs. It spent $6,200 on three PCs ($1,600 each), a laser printer, a scanner and Microsoft Office software. On average, wages are $1,900 a month in the small retail industry, therefore, the cost of a PC is about one month's wages.

2) John Sheridan. 2003. The Retailers e-Business Handbook. Digital Business Insights.

Software

Snowgum Sydney processes business information such as inventory, sales, invoicing, accounting, wage and suppliers using computers, but it does not process marketing and distribution information by computer.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O	2003.6.	Daily
Supply Chain Management			
Inventory Management	O	2003.6.	Not Frequently
Production Management			
Sales Management	O	2003.6.	Daily
Customer Management			
Financial and Accounting Management	O	2003.6.	Frequently
Cost Management	O	2003.6	Daily
Document Management	O	2003.6	Daily
Human Resource Management			
ERP			

It uses a POS systems package composed of procurement management, inventory management, sales management, cost management and more. The POS system enablesit to better control and maintain its inventory. For example, the inventory control system in the POS systems package will automatically generate orders for stock control. It pays $400 every month for the use of the POS software package to the ICT department at its headquarters.

The franchise communicates with related stores in other cities using broadband. The transfer of information required by their software relies upon a fast connection, but their ICT provider is not always reliable and Snowgum Sydney has experienced occasional breakdowns in the provider's system. Because of Snowgum's reliance upon software and its broadband provider, it is unable to complete simple functions in the event of system failure.

Financial and accounting management software is used independently of the POS systems package. There is no software in use for customer management because of a lack of customer data, but Snowgum Sydney intends to use the software for Customer Relationship Management.

Internet

Snowgum Sydney uses the Internet for research purposes; through the Internet, Snowgum Sydney can observe what is happening in other markets that cannot be visited in person. It looks at other outdoor retailer's Web sites (for example, companies in America and England where the market is much larger) to see what kind of products they are selling, what kind of marketing strategy they are using, what kind of offers they have and how they communicate with their customers.

Snowgum Sydney relies heavily on e-mail for communication. The first reason it uses e-mail is cost,

as calling its headquarters in Victoria, with which it communicates 10-20 times per day, is very expensive due to long-distance telephone charges. For a small business, it is much cheaper to use e-mail. The second reason for using e-mail is the facility for keeping records of all communication;therefore, if something were to happen, Snowgum Sydney's employees can refer to their e-mail record of events.

The high cost of producing a paper catalogue and the constantly changing market environment encourages the promotion of products using its Web site, which is operated by its headquarters. The Web site allows Snowgum to constantly update its product catalogue and the quality of its display. In addition, because of the interactive nature and accessibility of the Web site, Snowgum is able to provide more comprehensive promotion that includes stories, tips and pictures related to outdoor life.

Snowgum Sydney is not a regular user of e-commerce. On only one occasion did it purchase a product through the Internet (at a cost of $16). The main reason given for the low use of e-commerce is the lack of information for purchasing. Its headquarters, however, regularly buys products through the Internet.

Benefits of ICT

Just one month ago, Snowgum Sydney started to use e-mail instead of fax for transactions with a business partner in New Zealand, making its business process more efficient. Snowgum Sydney has paper records of its invoices, which are scanned into the computer electronically and sent to the store in New Zealand by e-mail. The New Zealand store prints them out, looks at the invoice and makes a payment to the supplier using Internet banking. As a result of using e-mail, Snowgum Sydney has seen a number of benefits, such as error reduction, cost reduction and saving time. For example, the use of e-mail allows the store to reduce telephone and fax costs.

3) Influential factors for ICT adoption

Besides cost, a major obstacle to the implementation of ICT is retailer resistance to new technology. Retailers are often unaware because they lack information on the benefits that a new technology can provide.

The Australian government provides grants to small businesses in the retail industry in order to promote the use of e-commerce. However, according to Snowgum Sydney's CEO, it has not received any tax benefits, reductions or incentives directly related to e-business products and tools from the government. He does mention that the information provided by the government to small retailers is difficult tofind. In other words, communication between government and small retailers is inadequate. Thus, even if incentives do exist, the small retailer may not know about them, and even if government help exists, small business owners often do not know how to access that help.

The role of the retail association is to act as an intermediary between the government and small businesses. The association lobbiesthe government on behalf of small retailers on a variety of issues such as fraud, taxation, representation, e-Business and legislation. However, Snowgum Sydney has no relationship with the retail association in terms of ICT implementation.

Snowgum Sydney's CEO cites a need for the government or the retail association to be more proactive in disseminating information. In general, the information on government support flows: government→association→Snowgum headquarters→Snowgum Sydney. Snowgum Sydney would prefer to receive information directly from the government or the association because information that is passed down from other sources is often lost or corrupted before it is received.

2. HengFu Kitchen (China)

1) Company Introduction

Foundation	1989.
Main products	Kitchen equipment
Sales revenue	$2.5 million
Employees	50

HengFu is a company that manufactures and installs kitchen equipment for hotels and large restaurants, thus its main customers are hotels or restaurants in China. It does not export its own products as yet but is planning to export to the Indian market in the future. It is currently importingproduction facilities and parts from Italy. HengFu is a member of the association for kitchen products and the association for independent enterprises (the latter is not active yet). The competition among the companies in the kitchen equipment industry is very fierce and entry barriers are quite low.

<Figure 1> HengFu Products

2) Status of ICT Adoption

Organization

HengFu does not have an independent ICT department but it has one computer expert in charge of ICT. It has invested a considerable amount (about $4,000 each year) in ICT over the past two years.

Hardware

HengFu has 7 computers that are above the level of a Pentium-3. All computers are networked.

Software

HengFu saves inventory control data, production records, accounting data and staff wages on computers, but records for sales, marketing, customer service and suppliers are still kept by hand.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management			
Supply Chain Management			
Inventory Management	O	2001.	Frequently
Production Management			
Sales Management			
Customer Management			
Financial and Accounting Management	O	2002.	Frequently
Cost Management			
Document Management	O	2000.	Daily
Human Resource Management	O	2002.	Frequently
ERP	O	2002.	Daily

HengFu prefers to design products and present them to customers than to advertise its products on the Internet or through mass media. It finds visiting potential and established customers and persuading them to purchase its products a more effective sales technique. It designs and produces products using CAD/CAM.

The ex-mayor of Shanghai citysuggested that all companies in Shanghai adopt ERP within five years. The CEO of HengFu agrees with this suggestion; after research, HengFu adopted the ERP system in 2002. Its ERP was developed by a joint-stock company composed of Taiwanese and Chinese companies.

The components of this ERP are inventory, production, financial, customer, human resource and accounts management. HengFu its primarily using the inventory and accounting component of ERP and is planning to expand the scope of its usage. It also plans to purchase the necessary software before the end of 2004. CEO ChangRong Su stated: “We adopted ERP at cost of $50,000. This ERP was quite cheap. Our neighboringcompany adopted ERP at a cost of $300,000”.

Internet

HengFu has a Chinese language Internet homepage (www.sh-hengfu.com) that was created to improve corporate image. The company employs staff with English skills, and with their help, an English version of the Web site is expected to be up and running in the near future. HengFu has enrolled its address on two Internet search engines at a cost of $1,250. It receives infrequent orders from large hotels through its Web site.

HengFu also uses the Internet to search for information and order/purchase equipment.

Benefits of ICT

A major factor behind HengFu adopting ERP was its recognition of the importance of improving the efficiency of business processes. The early stages of ERP adoption, HengFu was confronted by complex problems. As a result of the ERP adoption, business standardization is underway and

business efficiency is being improved. The CEO stated: “I am satisfied with the integrated management of the business process through ERP. I can check and manage all the business processes through accessing the server computer, without the limitations of time and space.” HengFu has experienced many benefits since the adoption of ERP, so it will use almost all the components of ERP within three years.

3) Influential Factors for ICT Adoption

The CEO of HengFu has a strong intention to adopt and use ICT and so directs profits into purchasing new ICT and cultivating skilled staff.

In China, the main hindrance to ICT adoption is cost and the telecommunications infrastructure ERP is expensive and the general telecommunication infrastructure in China is poor. If the price of ERP goes down and the telecommunication infrastructure improves, HengFu is planning to accelerate ICT adoption.

In Shanghai, there is no support for ICT adoption, therefore most companies in Shanghai adopt ICT on their own. Generally speaking, the government of China mainly supports large companies for ICT and it is very difficult for small companies to borrow money from banks.

3. Yinping (China)

1) Company Introduction

Foundation	1992.
Main products	Filament Products
Sales revenue	$1,450,000
Employees	60

Yinping is a joint company (between China and Japan) that produces filament products using tungsten materials and exports them to Japan, Thailand, Chinese Taipei, Hong Kong and Korea. It also sells to companies in Southern China. Yinping is a subsidiary of the General Public Corporation in the northeast, which was founded in 1970. It is runindependently of the General Public Corporation and has different sales channels. However, it is supported with raw materials and technology from the General Public Corporation and shares part of its profit at the end of year. Yinping was established northeast of Shanghai in 1992 but moved to Fengxian in Shanghai because it can receive assistance from public servants in the development district in Fengxian as well as various benefits and investment incentives.

Generally, Yinping's main domestic customers are foreign-owned companies or joint stock companies. Its biggest client is from Chinese Taipei, but there are no large companies among its customers. Yinping is a member of a management association, but it does not receive any support from this association. The competition among the companies in the filament industry is not fierce and the entry barriers are high because the raw materials for this industry are rare and site-dependent.

2) Status of ICT adoption

Organization

Yinping does not have an independent ICT department or staff, and one of the office workers is in charge of both accounting and ICT. Yinping spends about $100 on ICT costs.

Hardware

Yinping has four PCs above the Pentium-3 level. All the computers are networked.

Software

Yinping regards computers as integral for processing business tasks, especially for financial work and marketing documents.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management			
Supply Chain Management			
Inventory Management			
Production Management			
Sales Management			
Customer Management			
Financial and Accounting Management	O	2001.	Frequently
Cost Management			
Document Management	O	2000.	Daily
Human Resource Management			
ERP			

Yinping processes various business chores manually but processes financial accounting and taxes using computers. A company in China can use one of three methods of paying tax. First, tax can be paid in person at the tax office by submitting tax-related documents such as receipts and documentary evidence. Second, the related documents can be sent by mail withoutvisiting a tax office in person. Third, tax-related documents can be sent to the tax office through the Internet and with documentary evidence submitted to the tax office by mail or in person. Generally, companies in cities such as Shanghai can pay tax via Internet, but companies in rural areas or outside larger cities that are without Internet access have to pay tax in person. Nevertheless, each company must process tax-related documents using a computer according to a pre-determined format because handwritten documents are not allowed.

Internet

Yinping exchanges transaction-related data with domestic companies by telephone or by fax but frequently communicates with foreign companies in Japan, Thailand and Chinese Taipei by e-mail. It is also preparing a Web page for marketing and promotion.

Benefits of ICT

After using the computer, employees at Yinping were able to process tasks more efficiently and by standardized method, and as a result, it is planning to use computers for sales, inventory control and order processing as it expands.

3) Influential factors for ICT adoption

Yinping had to buy PCs to follow government stipulations on computers being used for processing tax. In China, different districts can receive different kinds of support for SME informatization. In Shanghai, the office of district development has made efforts to support SME informatization, but as Yinping has not received support on informatization from the government, it does not know exactly what kind of support the government offers to SMEs. Regardless, there are ICT-related companies in Shanghai that offer services such as building Web sites and programming and support SME informatization. They support ICT services with or without charge, but Yinping does not consider itself ready to use these companies.Sinar Indah Garmindo (Indonesia)

4) Company Introduction

Main product	Children's wear
Sales revenue	$150,000
Employees	50

Sinar Indah Garmindo is a producer of children's wear for two-five-year-old children. It exported 100 percent of its products two years ago. Now, it exports 50 percent of its products and sells the rest in domestic markets. It is a member of P.T., a producer's cooperative association that is made up of about 10 companies exporting their products in close cooperation. During the past five years, the average growth rate of the children's wear market has been 25 percent. The competition among the companies is very fierce because entry barriers are low (it is easy to obtain a business license in Indonesia, so anyone can participate in business).

<Figure 2> Children's Wear at Sinar Indah Garmindo

5) Status of ICT adoption and Use

Organization

Sinar Indah Garmindo does not have an independent ICT department.

Hardware

Sinar Indah Garmindo has one Pentium-4 PC with 256M RAM. The CEO, who became interested in owning a PC through a recommendation from a friend, bought a PC and printer for $1,300, expecting to need the computer for business at a later date. Given that the average monthly wage in the clothing industry is $140, this was a relatively expensive outlay. Sinar Indah Garmindo usually spends a total $65.50 per month on using the computer and accessing the Internet. Breaking this expenditure down, average Internet usage rate (modem) was $38, printer paper cost was $2.50 and printer ink $25.

Software

Sinar Indah Garmindo processes almost all work manually: only the CEO and one other employee, the CEO's younger brother,use the computer and Internet. They mainly use the computer to draw up electronic documents using Microsoft Office and listen to music via MP3s. They are partially using NYOB software from Australia for accounting and wages. There are many institutes specializing in computer training near Sinar Indah Garmindo but its CEO is mostly self-taught (with occasional help from his younger brother, who has a degree in computer science).

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management			
Supply Chain Management			
Inventory Management			
Production Management			
Sales Management			
Customer Management			
Financial and Accounting Management			
Cost Management			
Document Management	O	2002.	Daily
Human Resource Management			
ERP			

Internet

While the computer is not useful in processing imports, it is used to facilitate exports through communication with foreign companies by e-mail. The CEO exchanges e-mails with buyers every day by accessing the Internet through a telephone modem. He mostly refers to markets for product designs but sometimes consults books, magazines and the Internet (running searches for new designs). Occasionally, based on downloaded designs, he develops new products and sells them through e-mail promotion.

Benefits of ICT

The CEOs of small companies in Jakarta mostly regard PCs as a sign of status. Although Sinar Indah Garmindohas not seen a substantial gain in benefits from using the computer, the PC has facilitated faster and easier transactions with trade partners.

6) Influential factors for ICT adoption

Computers and the Internet are just coming into use in Jakarta. Government and public officesuse computers and the Internet on a limited basis, as do a few small companies. The main problems in adopting ICT are high computer prices, ICT education, the lack of awareness regarding computers and the Internet, and a deficiency in portal sites. Computer prices are falling (Sinar Indah Garmindo bought a PC for $1,300 in 2002, but as of October 2003, this price had fallen to $650). Nevertheless, the cost of a single PC still represents a substantial proportion of wages. Sinar Indah Garmindo did not receive any ICT support from the Indonesian government, but Business Development Services helped it search for information regarding computers and the Internet.

4. Cipta Nusapradana (Indonesia)

1) Company Introduction

Main product	Furniture, coffee tables, ceramics
Sales revenue	$112,000
Employees	30

Cipta Nusapradana is a furniture producer and exporter. It exports 60 percent of its furniture to Japanand is a member of the furniture industry association. Competition among companies in this industry is fierce as entry barriers are very low and its products can easily be imitated. As a result, furniture producers do not display images of their products on the Internet for fear that their product designs will be replicated.

2) Status of ICT Adoption and Use

Organization

Cipta Nusapradana does not have an ICT department but has a $1,500 budget for purchasing ICT equipment (computers, software, etc). Three employees are assigned to data processing.

Hardware

Cipta Nusapradana owns two Pentium-2 PC and its computers are networked.

Software

Cipta Nusapradana uses its PCs for processing business information but limits computer use to functional programs such as word-processor and spreadsheet programs. Word processing and the Internet are used very often while spreadsheet-based analysis and computer-aided design are used quite often.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management			
Supply Chain Management			
Inventory Management			
Production Management			
Sales Management			
Customer Management			
Financial and Accounting Management			
Cost Management			
Document Management	O	2000.	Very often
Human Resource Management			
ERP			

Internet

Cipta Nusapradana uses e-mail very often for communicating with its trade partners but it does not use e-commerce in purchasing or sales.

Benefits of ICT adoption

Cipta Nusapradana has received the following benefits through ICT adoption.

- Reduced task completion time
- Reduced business operation costs
- Improved business operation controls
- Increased capability to adapt to changes in business environment
- Improved customer service
- Improved relationships with partners

3) Influential Factors for ICT Adoption

Cipta Nusapradana perceived ICT adoption as a tool to access international opportunities. Trading partners in the value chain suggested ICT adoption, and the industry association also influenced the adoption of ICT. Regardless, small companies in Jakarta do not have sufficient financial resources to acquire ICT, management does not have skilled workers to improve ICT and suitable computer software is scarce.

5. Sanohatsu (Japan)

1) Company Introduction

Foundation	1906.
Main products	Screws, Precision components
Sales revenue	$16 million
Employees	40

Sanohatsu produces precision components such as screws and its main buyer is Fuji Xerox. It is a member of Tokyo Fasteners Cooperative Association, which publishes a screw guidebook and gives information on employee welfare. The industry has been flat in growth due to globalization, escalated competition within industry and the low level of barriers to entry.

2) Status of ICT Adoption

Organization

Sanohatsu does not have an ICT department.

Hardware

Sanohatsu has 20 PCs that are connected to a network.

Software

Sanohatsu processes various types of business information both manually and using computers. Generally, in manually processes business information such as marketing, distribution, staff records and wages but processes business information such as inventory control, invoicing, accounting and customer records both manually and by computer.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O	2001.2	Frequently
Supply Chain Management			
Inventory Management	O	1998.4	Frequently
Production Management			
Sales Management	O	2001.2	Frequently
Customer Management			
Financial and Accounting Management	O	1998.4	Frequently
Cost Management			
Document Management	O	1998.4	Daily
Human Resource Management			
ERP			

Internet

Every employee has an individual e-mail address and chiefly uses e-mail for communication with trading partners. The company sends or receives written estimates by e-mail and receives orders by EDI

Benefits of ICT

Before ICT implementation, most of the business communication and work were based on individuals. Therefore, the organization saw substantial inefficiency when these individuals were not there. After adopting ICT, information sharing and communication were improved. The benefits of ICT for Sanohatsu can be summarized as follows:

- Faster task execution
- Increased revenue through customer growth
- Increased efficiency of task execution
- Expansion of business domains
- Improvements to employee ability to use information
- Active communication within the organization
- Rapid decision making
- Improved customer service in terms of complaints, communication and satisfaction

3) Influential Factors for ICT Adoption

Sanohatsuperceived that it had undertaken sufficient preparation toward hardware, software, networks and ICT staff for ICT implementation, and it judged itself to hold fair financial capability.

Government support was helpful for Sanohatsu's informatization. For example, Sanohatsu received tax benefits when purchasing PCs, thus relieving the financial burden of informatization. Industry efforts for standardization and buyer encouragement for ICT implementation were also beneficial for

informatization. The association also influenced its informatization by providing information on ICT.

The national infrastructure only had a marginal influence on ICT adoption at Sanohatsu, and IT specialist organizations had no influence.

6. Seihatu (Japan)

1) Company Introduction

Foundation	1952.2
Main products	Springs, presses, Molds
Sales revenue	$ 18million
Employees	120

Seihatu produces springs, presses and molds. Its main buyers are Fuji Xerox for precision instruments and Ichikoh, Mitsui and Nirasaki for automobile parts, and it is a member of the Japan Spring Association, which provides industrial information and offers training programs. This industry, which has low barriers to entry, has seen flat growth and fierce domestic competition.

2) Status of ICT adoption

Organization

Seihatu has an ICT department with three staff members. The ICT department, which has a budget of around $180,000, is overseen by a group leader.

Hardware

Seihatu has 20 PCs that are connected by a network.

Software

Seihatu electronically processes almost all of its business information, including inventory controls, production records, invoicing, marketing, customer service, accounting, wages and suppliers.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O	1994.	Daily
Supply Chain Management	O	1994.	Daily
Inventory Management	O	1994.	Daily
Production Management	O	1994.	Daily
Sales Management	O	1994.	Daily
Customer Management	O	1994.	Weekly
Financial and Accounting Management	O	2002.	Daily
Cost Management	O	2002.	Monthly
Document Management			
Human Resource Management	O	1995.	Monthly
ERP	O	1994.	Daily

Seihatu's informatization started in 1994, and since then, it has adopted various forms of ICT. Today, it is using software applications such as procurement management, SCM, ERP and HRM.

Internet

Every employee has an individual e-mail address and uses e-mail for accepting and placing orders, writing documents for internal and external organization, and exchanging trade information.

Benefits of ICT

Before ICT implementation, Seihatu manually processed all tasks as paper documents. As the workload increased, Seihatu was unable to keep up without computerization. After adopting ICT, Seihatu improved its ability to gain information, streamlined its business processes and increased business opportunities by using electronically processed data exchange with trading partners. The benefits of ICT can be summarized as follows:

- Improved task efficiency
- Expansion of business domains
- Reduced business operation costs.
- Reduced errors in task execution
- Greater CEOawareness of ICT
- Database for employee career management
- Standardization of documents and reports
- Better intra-company communication
- Improved communication with customers
- Increased customer satisfaction

3) Influential factors for ICT adoption

Seihatu perceived its preparedness for ICT infrastructure (hardware, software, networking and ICT staff) to be enough , but judged that its financial capability and standardization of business processes for ICT adoption was sufficient. The CEO and middle manager were well aware of ICT; in order to manage the organizationalchanges resulting from ICT adoption, Seihatu organized training for its ICT users and appointed an officer to take exclusive responsibility for ICT implementation.

Seihatu regards the national telecommunications infrastructure as essential to ICT implementation. Public administration organizations had no effect on its informatization but were very useful for providing information on ICT adoption. ICT providers providedSeihatu with education services on ICT usage. In addition, customer encouragement influenced Seihatu's decision to undertake informatization.

7. iCanTek (Korea)

1) Company Introduction

Foundation	July, 2000
Main products	Network Camera : ICANVIEW100A, ICANVIEW100AW, ICANVIEW100PT Audio / Video Server : ICANSERVER440, ICANSERVER440R
Capital	1.75 billion won
Sales revenue	$2 million (2002), $4 million (2003), $8 million (2004 projected sales revenue)
Employees	20

iCanTek (Internet Communication and Network Technology) is a technology-based venture company established in July 2000. Its main products are digital video security, smart home solutions, two-way communication network cameras and a four-channel video server.

<Figure 3> iCanTek's Main Products

iCanView 100/iCanView100A	iCanServer440
	

iCanTek is focused on foreign markets including those of Spain and China and has large trade partners, including Samsung Electronics and Posco Construction. There is no industry association for iCanTek's products (as they are new) but there have been recent moves toward making such an association. The average growth rate of the market over the past five years was 100 percent. The competition among companies in this industry is escalating - whereas there were only five competitors in 2001, there are now 100. Entry barriers are high due to the need for high technological capability.

2) Status of ICT adoption and Use

Organization

There is no separate organization for ICT in Korea because information systems are available through ASP.

Hardware

iCanTek has 20 PCs above the Pentium-III level. These computers are connected by LAN at T1 and ADSL speed.

Software

iCanTek uses computers to process business information such as inventory control, production records, sales/invoicing, marketing/distribution, after-sales service, company accounts, staff records/wages/salaries, suppliers and customer records.iCanTek makes to order with a small amount of stock sales, therefore SCM is not a major concern.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O	2002.5	Frequently
Supply Chain Management			
Inventory Management	O	2002.5	Not Frequently
Production Management	O	2002.5	Not Frequently
Sales Management	O	2002.5	Daily
Customer Management	O	2002.5	Frequently
Financial and Accounting Management	O	2002.5	Daily
Cost Management	O	2002.5	Not Frequently
Document Management	O	2002.5	Daily
Human Resource Management	O	2002.5	Not Frequently
ERP	O	2002.5	Daily

iCanTek introduced K.System, an ERP system from Sysware, for modules of purchasing, payroll, exports, sales, production, accounting, cost accounting and EIS. Not all of these modules are necessary at this point of time but were introduced for future usage. iCanTek implemented this system between April 2002 and June 2002. The company was able to mitigate the cost burden of adopting ICT through government support. iCanTek pays $1,300 a month for ASP service fees. iCanTek customized its own business processes to the ERP system, not vice versa. The company organized a task force to support the project and holds regular meetings between this team and the Sysware provider. Progress reports are presented every week to the CEO.

There was resistance to introducing ERP for a year, and for six months after the implementation, users did not successfully adapt to the system. Nevertheless, the CEO was determined to introduce the system, and users were quick to grow accustomed to the new systems (most users were researchers who already had a high knowledge of ICT, therefore they did not need much training and education).

Internet

E-mail and telephone are the major tools for maintaining relationship with iCanTek's suppliers. All consumer products are being purchased through e-commerce. Raw materials are purchased through the Internet, by telephone and via e-mail, and sales are made through the Internet.

Benefits of ICT

Before introducing K.System, iCanTek used an accounting application system with inefficient data retrieval functions. For example, the company had to depend on an external accounting office to make a financial statement and could only receive the correct information at the end of the fiscal year. After introducing the K.System, the company was able to use information as effectively as a large enterprise would and it is able to monitor performance on a monthly basis.

iCanTek has not seen a reduction in labor costs due to ICT introduction (large enterprises often achieve labor cost savings by implementing ERP). iCanTak, as a small company with only 20 employees, has seen productivity rise as a tangible benefit of ICT as opposed to cost savings.

After adopting ICT, iCanTek was able to reduce errors in task execution. In terms of timing and content, errors were reduced substantially. Value-added tasks such as analysis, planning, forecasting and strategic policy were also greatly improved. Executive Information Systems assisted executives in making effective decisions by providing real time and relevant information. In addition, reporting and approval procedures were simplified.

3) Influential Factors for ICT Adoption and Usage

iCanTek has prepared resources for ICT infrastructure such as hardware, software, networking and IS integration plans. It had suitable financial resources and business process standardization as well as an adequate level of ICT knowledge held by the CEO and employees alike.

Korea has a very good national infrastructure of hardware, software and consulting organizations, all of which were very helpful for the adoption of ICT. Partners in the value chain did not have a substantial influence on iCanTek, and the CEO's strong leadership and commitment were the major drivers for the company's informatization. ICT support from the government helped the company's informatization.

8. APMR (Malaysia)

1) Company Introduction

Foundation	1992
Main products	Wire harnesses
Capital	$ 180,000
Sales revenue	$ 520,000
Employees	25

APMR produces wire harnesses. Its buyers are large global companies including Matsushida. The wire harness industry, which does not have an industrial association, saw average growth of some 20 percent over the past five years. Competition is relatively strong and barriers to entry are not high.

2) Status of ICT adoption and Use

Organization

APMR does not have an ICT department.

Hardware

APMR has eight PCs connected to a network by LAN.

Software

APMR uses a computer to process business information such as inventory controls, production records, sales/invoicing, marketing/distribution, after-sales service, company accounts, staff records/wages/salaries, suppliers and customer records. APMR has implemented an MRP system.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O	2003.3	Daily
Supply Chain Management			
Inventory Management	O	2003.3	Daily
Production Management	O	2003.3	Daily
Sales Management	O	2003.3	Daily
Customer Management	O	2003.3	Daily
Financial and Accounting Management	O	2003.3	Daily
Cost Management	O	2003.3	Daily
Document Management	O	2003.3	Daily
Human Resource Management	O	2003.3	Daily
ERP	O	2003.3	Daily

Internet

APMR uses e-mail to communicate both with internal and external organizations. It is not active in undertaking e-commerce transactions in purchasing or sales.

Benefits of ICT

APMR did not recognize any changes in business processes after ICT implementation but saw a number of outcomes. The benefits of ICT can be summarized as follows.

- Reduced labor costs for task execution
- Reduced task execution time
- Reduced errors in task execution
- Improved value-added tasks (analysis, planning, forecasting and strategic policy)
- Reduced non-value-added tasks
- Reduced customer waiting time
- Improved communication with customers
- Improved CEOawareness of ICT
- Standardization of documents and reports
- Simplification of reporting and approval procedures and hierarchy
- Reusability of documents and reports
- Database for employee career management

3) Influential Factors for ICT Adoption and Use

APMR was satisfied with the Malaysian telecommunications infrastructure, which facilitates easy access to the Internet, but its ICT implementation has not been influenced by public administration organizations or other ICT infrastructure. It had sufficient access to consulting firms for hardware and software implementation, and such availability made a positive influence on the company's ICT implementation. The influence of external consulting firms on the company's ICT implementation was substantial, but APMR did not regard its partners on the value chain as influential in the process of improving ICT.

It was satisfied with the level of government support available. However, the company did not recognize the help of other institutions such as public organizations, non-government organizations, international organizations and associations.

9. Bodibasis (Malaysia)

1) Company Introduction

Foundation	1995
Main products	Personal care products (skin care, hair care, body care, talcum, slimming and herbal products)
Capital	$320,000
Sales revenue	$3 million
Employees	70

Bodibasis produces personal care products such as shampoo and soap. Its main buyers are Pureen Sdn Bhd, Master Square Sdn Bhd, Jatech Sdn Bhd, Jetaine Corp Sdn Bhd and Pro Anchor Sdn Bhd. Its suppliers are Cognis (M) Sdn Bhd, Perusahaan Jaya Plastik Sdn Bhd, KC Chemicals Sdn Bhd and Chung Chemicals Sdn Bhd. It does not trade with large companies.

Bodibasis is a member of Federation of Malaysian Manufacturer (FMM) MATIC group and the Small and Medium Industries Association. FMM MATIC has the following roles:

- Representing industry problems and concerns to government (throughFMM representatives in bodies such as MIDA, SIRIM, Technology Park, Task Force on Small and Medium-size Industries) as well asissues such as industrial development, technology, trade promotion, quality controls and standards;
- Providing up-to-date information on government policies, incentives, legislations and procedures;
- Providing guidance on matters pertaining to trade and industry (customs regulations, fiscal and monetary incentives, economic perspectives, investment incentives, labor laws, environmental issues and work safety).

The Small and Medium Industries Association promotes the development of small and medium industries in the manufacturing sector by providing advisory services, fiscal and financial assistance, infrastructural facilities, market access and other support programs.

The average growth rate of the personal care market over the past five years was 5-7 percent. Competition in this industry is fierce and entry barriers are not high.

2) Status of ICT adoption and Use

Organization

Bodibasis has an ICT department with a budget of $5,200. The manager of the ICT department is an executive, but so far, the company has recruited only one ICT specialist.

Hardware

Bodibasis has 15 PCs that are connected to the network by LAN and WAN.

Software

Bodibasis processes all business information (inventory controls, production records, sales/invoicing, marketing/distribution, after-sales service, company accounts, staff records/wages/salaries, suppliers and customer records). It has implemented an ERP system, Impact Encore ERP System (effective in January 2003) to improve business systems and processes.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O	2002.9	Daily
Supply Chain Management	O	2002.9	Daily
Inventory Management	O	1997	Daily
Production Management	O	2002.9	Daily
Sales Management	O	1997	Daily
Customer Management	O	1997	Daily
Financial and Accounting Management	O	1997	Daily
Cost Management	O	2002.9	Daily
Document Management	O	2002.9	Daily
Human Resource Management	O	2000	Monthly
ERP	O	2002.9	Daily

Internet

Bodibasis does not make e-commerce purchased or sales.

Benefits of ICT

BeforeICT implementation, it executed its work by paper document, information was not fully shared with others, and lack of integration made it waiting time to obtain information. But, after ICT implementation, it could have better control of transactions, timely obtain information, and input data and gather information easily.

- Reduced task execution labor costs
- Reduced task execution time
- Reduced errors in task execution
- Simplification of reporting and approval procedures and hierarchy
- Reduction of non-value-added tasks
- Increased sales revenue
- Reduced customer waiting time
- Reduction of customers' complaints & improvement of complain resolution
- Improved communication with customers
- Satisfaction of customers with services
- Improved CEOawareness of ICT

- Standardization of documents and reports
- Communication within company and between departments
- Reusability of documents and reports
- Database for employee career management

3) Influential Factors for ICT Adoption

Bodibasis's ICT adoption was influenced by the telecommunications infrastructure (easy Internet access, electronic data interchange and provision of timely information). Although it was not influenced by public administration, Bodibasis had sufficient access to consulting firms for hardware and software implementation, which had a positive influence on the company's ICT implementation. Bodibasis considers that it's ICT improvement was not influenced by its partners on the value chain.

Bodibasis received ICT support from SMIDEC, a government organization that aims to enhance the competitiveness, efficiency and productivity of SMEs through offering advice and providing subsidies (grants of 50 percent of the total cost) and financial assistance. As a vendor, System RKK Sdn Bhd providedguidance, advice and support pertaining to software and hardware, while as a software supplier, Seven Rivers Sdn Bhd providedtechnical support. FMM, an industry association, provided up-to-date information,consultation and guidance.

10. Juama (Mexico)

1) Company Introduction

Foundation	1955
Main products	Contract measures
Capital	$ 30 million
Sales revenue	$ 90 million
Employees	100

Juama, founded in 1955, was a family business that made film; in 1978, its product base expanded to include medical products and consumer goods in order to adapt changes in the market. It has three business divisions, Altec, Medical and SPG, which deal in film, medical equipment and consumer products, respectively. Juama's film products include prepaid cards (telecom companies), film for newspapers and magazines, and medical films. Its main buyers are government and medical organizations, and its main suppliers are Ferrari (Italy) and Verve (France). This industry does not have an industry association.

Competition between companies in this industry is very strong but there are a few competitors. Cost competition is very high and entry barriers are high because the government, the major consumer, purchases through bidding and has strict requirements such as ratio of domestic capital per total capital.

2) Status of ICT Adoption

Organization

The company has an ICT department with two staff members.

Software

Juama processes all business information (inventory controls, production records, sales/invoicing, marketing/distribution, after-sales services, company accounts, staff records/wages/salaries, supplier and customer records) using ICT. The company introduced ERP in 2002 under the direction of the CEO and plans to complete its implementation by December 2003. The major expected benefits of ERP include cutting the time used to make decisions when integrating huge amounts of data.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O		Daily
Supply Chain Management	O		Daily
Inventory Management	O		Daily
Production Management	O		Daily
Sales Management	O		Daily
Customer Management	O		Daily
Financial and Accounting Management	O		Daily
Cost Management	O		Daily
Document Management	O		Daily
Human Resource Management	O		Daily
ERP	O	2002	Daily

Benefits of ICT

After adopting ERP, all applications such as human resources and accounting were compatible and the integration of information acquisition channels and speedy access to information were realized. The benefits of ICT can be summarized as follows:

- Reduced labor costs for task execution
- Reduced task execution time/efforts
- Reduced non-value-added tasks
- Increased employee satisfaction due to new task execution methods and processes
- Reduced customer waiting time
- Reduced customer complaints and improved complaint resolution
- Improved CEOawareness of ICT
- Standardization of documents and reports
- Improved inter-departmental and intra-company communication
- Increased reusability of documents and reports
- Introduction of database for employee career management

3) Influential Factors for ICT Adoption

Juama is a supplier for the government, and as companies that supply goods to the government are required to implement ERP according to industry customs, Juama had to adopt the ERP system. Juama did not have any serious problems with ICT infrastructure (hardware, software, networks and ICT staff) and had sufficient financial capability for ICT implementation. The company did not use external consulting, and the main decisions for ICT implementation were made by an internal team.

The value chain did not influence Juama's informatization. In implementing ERP, it did not have substantial support from government and other institutions (support from domestic banks was virtually absent), although it saw a 30-percent tax reduction for ERP implementation.

11. Microscopios (Mexico)

1) Company Introduction

Foundation	1976
Main products	Mechanic and optical instruments
Capital	$ 10 million
Sales revenue	$ 6.5 million
Employees	115

Microscopios is a manufacturer of microscopes. It exports its own products to 22 economies, including Spain, Malaysia and Latin American economies. Its main buyers are governments and its suppliers furnish raw materials such as optical glass and cables. Microscopios is a monopoly, therefore there is no industry association for microscope producers. Even though the Mexican economy has low growth, sales in the medical industry have been increasing by about 35 percent per year. However, foreign companies have recently become a severe threat to the industry, with Chinese companies offering lower prices and Japanese, German and European companies offering higher value-added products.

2) Status of ICT Adoption

Organization

Microscopios has an ICT department with one staff member.

Hardware

Microscopios has 40 Pentium-IV PCs networked through LAN that are upgraded every five years.

Software

Microscopios processes internal business information using ICT but deals with work outside the organization (supplier and customer interactions) manually. It adopted ICT in 1986 toreduce production costs, improve quality and acquire production capacity with CNC and automation.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O		Daily
Supply Chain Management	O		Daily
Inventory Management	O		Daily
Production Management	O		Daily
Sales Management	O		Daily
Customer Management	O		Daily
Financial and Accounting Management	O		Daily
Cost Management	O		Daily
Document Management	O		Daily
Human Resource Management	O		Daily
ERP			

Internet

Microscopios does not use e-commerce for purchases or sales.

Benefits of ICT

Before ICT implementation, Microscopios had to decide production costs, factors and opportunities using experience and intuition.However, after adopting ICT, it could make scientific decisions using ICT and thereby gain benefits such as reduced costs, streamlined business processes and increased customer satisfaction.

3) Influential Factors for ICT Adoption

Microscopios's decision to adopt ICT was influence by competitors, customer requirements for improved service and the example set by world-class manufacturing firms. Microscopios's CEO and employees were well aware of ICT. A national research center and Canacintra supported Microscopios in its adoption of ICT.

12. Hong Ya (Chinese Taipei)

1) Company Introduction

Foundation	1987
Main products	Breakfast foods
Sales revenue	n/a
Employees	65

Hong Ya is a franchise company that sells breakfast food to individual customers. It had some 700 franchises as of October 2003, and this figure is expected to rise to 1,000 in 2004. Hong Ya is second or third place in the industry and is a member of an industry association. This industry grows by some 100 percent each year, and competition is very fierce due to the low entry barriers to the market.

2) Status of ICT Adoption

Organization

Hong Ya has an independent ICT department with three staff members. The vice president of the company is in charge of the ICT department, which has an annual budget of $44,000

Hardware

Hong Ya has 28 Pentium-III computers. It runs Windows Server, Linux Server, Web Server and Mail Server and all computers are connected to the network.

Software

Hong Ya processes most of its business information (inventory, production, invoices, accounting, staff record/wages and supplier/customerinformation) both by computer and manually at the same time. Marketing and customer service information is only processed manually. In pursuit of more efficient business management, it plans to adopt ERP and supply chain management systems in the near future.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management			
Supply Chain Management			
Inventory Management	O		
Production Management	O		
Sales Management	O		
Customer Management	O		
Financial and Accounting Management	O		
Cost Management	O		
Document Management	O		
Human Resource Management	O		
ERP			

Internet

Hong Ya has an Internet homepage but does not buy or sell on the Internet.

Benefits of ICT Adoption

- Reduced labor costs for task execution by 30 percent
- Increased value-added
- Increased sales revenue
- Reduced customer waiting time (2 days to 0.5 days)
- Reduced communication time with customers (1.5 days to 1 day)
- Increased customer satisfaction with services (by 40 percent)
- Reduced time and effort for task execution (3 days to 0.5 days).
- Reduced errors in task execution (to 2 percent)
- Improved value-added tasks (analysis, planning, forecasting and strategic policy)
- Increase employee satisfaction with the new task execution methods and processes
- Standardization of reporting and approval procedures and hierarchy
- Improved organizational member awareness of ICT
- Standardization of documents and reports
- Improved intra-company and inter-departmental communication
- Increased reusability of documents and reports

3) Influential Factors for ICT Adoption and Usage

Hong Ya considered its ICT infrastructure (hardware, software, networking and ICT staff) to be well equipped. Its financial capability was sufficient for ICT adoption and the standardization of tasks and processes was well advanced (to 65 percent). In addition, the CEO, middle managers and ICT users were very well aware of ICT.

The extant national telecommunication infrastructure seems to have little influence on Hong Ya's ICT adoption, but support from the public administration and other ICT infrastructures influenced its ICT implementation. Hong Ya had sufficient access to consulting firms around in Chinese Taipei for hardware and software implementation, and these firms contributed to easier ICT implementation. Hong Ya is a member of the Association of Franchise Promotion. This association has been encouraging the adoption and the diffusion of ICT and had positive effects on the ICT adoption of Hong Ya.

In sum, industry-wide efforts to standardize tasks and processes, competitors'ICT adoption, encouragement from buyers and sellers of ICT and pressure from large companies influenced Hong Ya's ICT implementation.

13. ARBOR (Chinese Taipei)

1) Company Introduction

Foundation	
Main products	Slot computing, embedded computing, modular computing, panel computing
Sales revenue	$20 million
Employees	100

Arbor is an industrial PC designer and manufacturer. Arbor manufactures slot computing, embedded computing, modular computing and panel computing products.

2) Status of ICT Adoption

Organization

Arbor has an ICT department composed of four staff members. The vice president of the company is in charge of the ICT department, which has an annual budget of around $200,000.

Hardware

Arbor has over 100 Pentium-III computers, which are all connected to an Ethernet LAN network.

Software

Arbor uses computersfor the following business activities: word processing, spreadsheet-based analysis, desktop publishing, project/production planning, inventory controls, invoicing, accounting, personal management, computer-aided design, computer-aided manufacturing and e-mail. Arbor adopted DSC ERP(developed in Chinese Taipei) and has been adopting ERP over a period of one and a half years, converting its systems by running the existing system alongside the new ERP systems simultaneously for the latter six months.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O		Daily
Supply Chain Management	O		Daily
Inventory Management	O		Daily
Production Management	O		Daily
Sales Management	O		Daily
Customer Management	O		Frequently
Financial and Accounting Management	O		Frequently
Cost Management	O		Daily
Document Management	O		Daily
Human Resource Management	O		Not Frequently
ERP	O	Apr. 2002	Daily

Internet

Arbor does not engage in e-commerce because e-commerce is not deemed suitable for its business: many of Arbor's customers and distributors require customized designs.

Benefits of ICT

Arbor is an ISO 9001-registered company therefore, all documents are digitalized following the ISO 9001 standards. This means that company procedures such as Standard Operating Procedure, Standard Inspection Procedure and New Product Development Procedure are included in its ICT software. Arbor gained the following benefits from adopting ERP:

- Reduced task completion time (by about 60 percent).
- Reduced business operation costs (to about 30 percent)
- Expected increases in sales
- Improved employee performance evaluation through Key Performance Index
- Increased facility in offering customer service
- Increased ease in constructing business models for distributors
- Improved employee capability and knowledge management

3) Influential Factors for ICT Adoption

Arbor has experienced few problems in adopting ICT. However, change management was one of the key issues during the system conversion: the firm solved this problem through management support and employee education. As Arbor deals with international customers, introduction of ICT was seen as the only avenue to ensuring success in the global industrial PC business.Arbor regards ICT implementation as a continuous process and is evaluating future options (such as Enterprise Information Portal).

Arbor, with technical and financial support from the Taiwanese government, adopted ICT by itself. The CEO took a positive approach to adopting ERP and played an important role in its successful implementation.

14. Vassachoi (Thailand)

1) Company Introduction

Foundation	
Main products	Artificial flowers, silverware
Sales revenue	
Employees	10

Vassachoi is a manufacturer, exporter and wholesaler of fine sterling silver and producer of artificial flowers. All transactions for artificial flowers are made withorganizations retailers and wholesalers rather than individual customers, and artificial flowers are manufactured, packaged and sent through logistics companies upon the receipt of orders.

2) Status of ICT Adoption

Organization

Vassachoi does not have an ICT department.

Hardware

Vassachoi has one PC above the level of Pentium-III and they are connected to the Internet.

Software

Vassachoi mainly uses PC to manage business documents; it has not integrated its information system with those of partners in the value chain.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management			
Supply Chain Management			
Inventory Management			
Production Management			
Sales Management			
Customer Management			
Financial and Accounting Management			
Cost Management			
Document Management	O	2003	Daily
Human Resource Management			
ERP			

Internet

Vassachoi accesses the Internet through dial-up model. It currently runs the Web sites (www.tanutshahandicraft.com and www.saritasilver.wethai.com) through two Web agents respectively: We Thai and E-Combat Thailand. The Web site for artificial flowers is registered to Yahoo and Google. Vassachoi pays $530 for creation and maintenance fees per year, and pays $250 for contract renewal. The artificial flower Web site has an annual feel of $170.

Benefits of ICT

ICT has allowed Vassachoi to expand sales channels and reduce the time taken for transactions.

3) Influential factors for ICT adoption

Vassachoi mainly received support from a nearby university.

15. Vitesin (Thailand)

1) Company Introduction

Foundation	2000
Main products	Traditional Thai food processing
Sales revenue	
Employees	9

Vitesin (http://www.plarathailand.com) processes traditional Thai food and caters to organizations rather than individual customers.

2) Status of ICT Adoption

Organization

Vitesin does not have an ICT department.

Hardware

Vitesin has one PC above the level of Pentium-III that are connected to the Internet.

Software

Vitesin mainly uses PCs to manage business documents. It has not integrated its information system with those of partners on the value chain.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management			
Supply Chain Management			
Inventory Management			
Production Management			
Sales Management			
Customer Management			
Financial and Accounting Management			
Cost Management			
Document Management	O	2003	Daily
Human Resource Management			
ERP			

Internet

Vitesin accesses the Internet through dial-up model. It sells its own products through the Internet, but in terms of advertising media, TV commercials are seen as most effective followed by newspapers/magazines, radio and the Internet. Its trial of Internet selling is at an experimental stage. Vitesin uses the Internet to search for sales agents, receive orders and make payments. It pays $300 per year for the development and maintenance of a Web site registered to Welshopping.com.

Benefits of ICT

Vitesin has seen benefits such as the expansion of new sales channels to cyber space and the speedy execution of trading tasks.

3) Influential Factors for ICT Adoption

Rangst University has numerous MOUs for the sake of their image improvement. The university wants to establish an open image for active industry relationship.

16. PPI (United States)

1) Company Introduction

Foundation	1991
Main products	Prototype production, product development
Sales revenue	
Employees	45

PPI (Prototype Productions Inc.) (http://www.protoprod.com) is a product development and manufacturing group. Its products are used in aerospace, automotive, building, defense, medical, research and development, and technology industries. Its main buyer is the U.S. government, and it is a member of the Society for Information technology, an industry association that aims to provide its members with information and industrial direction.

2) Status of ICT Adoption

Organization

PPI does not have an independent ICT department, but almost all of its employees are accustomed to using ICT.

Hardware

PPI has more than 30 Pentium-IV computers that are networked to a network speed of T1 or T3.

Software

PPI processes business information (inventory controls, production records, sales/invoicing, marketing/distribution, after-sales service, company accounts, staff records/wages/salaries, suppliers and customer records) using ICT. PPI adopted ICT in 1993, with an influx of software in 1997, and finally adopted software for inventory management in 2000. As of 2003, PPI was using ERP, MRP, PRM and SCM. Initially, PPI decided to adopt ICT to monitor employee productivityand reduce costs.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O	1997	Daily
Supply Chain Management	O	1997	Daily
Inventory Management	O	2000	Daily
Production Management	O	1997	Daily
Sales Management	O	1997	Daily
Customer Management	O	1997	Daily
Financial and Accounting Management	O	1997	Daily
Cost Management	O	1997	Daily
Document Management	O	1993	Daily
Human Resource Management	O	1997	Daily
ERP	O	2000	Daily

Internet

PPI uses the Internet fully.

Benefits of ICT

- Reduced cost/expenditure
- Improved evaluation of employee productivity
- Reduced customer waiting time

3) Influential Factors for ICT Adoption

PPT's CEO and employees are highly aware of ICT, and it did not receive encouragement from any supporting organization to adopt ICT.

17. Gilford (United States)

1) Company Introduction

Foundation	1984
Main products	General Contracting and Construction Management, Demolition and Environmental Services, Information Technology and Network Services, and International Construction and Network Services.
Sales revenue	
Employees	120

Gilford Corporation (http://www.gilfordcorp.com) is a general contracting company that has four divisions: general contracting and construction management; demolition and environmental services; information technology and network services; and international construction and network services. Since 1995, Gilford has experienced significant growth and has completed over 350 projects with an aggregate value of over $180 million.Gilford is a member of BICSI, Telecommunication Association and RCBDE.

2) State of ICT Adoption

Organization

Gilford has an independent ICT department with two core staff members. However, if employees dispatched to other parts of the company wereincluded, the staff numbers of the ICT department would be significantly larger. In 2002, the ICT department was set up to efficiently manage business information, reduce costs and create new value.

Hardware

Gilford spends $12,000 a year on ICT equipping and $30,000 for maintenance. It integrated independent servers that had beenscattered throughout its divisions into a unified hub network.

Software

Gilford uses almost all of its application software except Supply Chain Management and Cost Management, which it does not regard as relevant to its business activities.

Applications	Adopted S/W	First Use	Usage Frequency
Procurement Management	O		Daily
Supply Chain Management			
Inventory Management	O		Daily
Production Management	O		Daily
Sales Management	O		Daily
Customer Management	O		Daily
Financial and Accounting Management	O		Daily
Cost Management			
Document Management	O		Daily
Human Resource Management			
ERP	O		Daily

Internet

Gilford uses Internet to a very high degree. Employees have access to laptops to access the Internet to send e-mails to customers and trade partners and undertake work out of the office.

Benefits of ICT

- Reduced task execution time/efforts
- Reduced task execution errors
- Improved value-added tasks (analysis, planning, forecasting and strategic policy)
- Reduced non-value-added tasks
- Reduced customer waiting time
- Improved communication with customers

3) Influential Factors for ICT Adoption

To overcome general employee resistance to introducing new technology, Gilford established an ICT Discussion Group with six staff members. Its main roles are to reduce fear of ICT and solve ICT-related problems. Neither the government nor external organizations aided Gilford in its adoption of ICT.

Appendix E
Survey of the ICT Status of SMEs

Ⅰ. ICT Strategy & Planning
Ⅱ. Environment for ICT Introduction
Ⅲ. Equipments & ICT resources
Ⅳ. ICT Usage and Benefits
Ⅴ. Status of e-commerce
Ⅵ. Inhibitors and suggestions in the adoption and usage of ICT

This project is a survey of the status of the ICT (Information & Communication Technology) of small companies in the APEC area. The major motivation for this survey is to identify the regional ICT gap and investigate the major differences and characteristics of this disparity. The Korea Information Management Institute (KIMI) for Small & Medium Enterprise launched this project under the supervision of the Small & Medium Business Administration of the Korean Government. The findings and results of this survey will be reported to the Korean government and used for future cooperation among APEC economies to reduce the ICT gap.

The profiles of respondents will only be used for analysis of this survey and will not be given or sold to any other parties. If you wish to receive the results of this survey, we will be glad to meet your request and invite your comments.

※ This questionnaire is to be filled out by the head of your organization's ICT (Information & Communication Technology) department. If there is no ICT department in your organization, the CEO should complete this questionnaire.

☞ Respondent Position: Name: E-mail :

TEL			
#Employees	(as of now)	FAX	
Sales Revenue	US$ (as of 2002)	Major Supplier	
Established		Major Customer	
Major Product			
Industry			

Ⅰ. ICT Strategy & Planning

1. Do you need to introduce more ICT? ( )

1. Yes (we need more ICT) ? Go to '1-1'
2. No (we don't need more ICT) ? Go to '1-2'

1-1. If you need to introduce more ICT, what is the reason? ( )

1. Transaction partners' push for ICT
2. For the sake of productivity
3. CEO support for ICT
4. For the sake of efficiency in task execution
5. To prepare for future uncertainties
6. Other ( )

1-2. If you don't need to introduce more ICT, what is the reason? ( )

1. Satisfied with current ICT
2. Burden of ICT implementation
3. Uncertainties over the benefits of ICT
4. Burden of maintenance & training
5. Security concerns (confidential information leaks)
6. Other ( )

2. Do you have a clear vision of aligning ICT with business strategy? ( )

1. Yes 2. In progress 3. Plan to do so soon 4. No plan

3. Do you have plans to implement the ICT vision in Question 2? ( )

1. Yes 2. In progress 3. Plan to do so soon 4. No plan

4. Have you conducted an analysis of the validity of ICT investment? ( )

1. Yes 2. In progress 3. Plan to do so soon 4. No plan

4-1. What is the scope of your validity analysis? ( )

1. ICT (H/W, S/W, N/W) 2. ICT + Business Process Reengineering
3. ICT + Business Process Reengineering +Human resource plan 4. No scope

4-2. Will it be a smooth introduction ofyour ICT strategy according to your validity analysis? ( )

1. Very smooth 2. Pretty smooth 3. Average 4. Hard 5. Very hard

5. What is the attitude shown toward ICT by your executives and CEO?

Description		Very high	High	Average	Low	Very low
CEO	Interested/ & intendtion to support ICT					
	Participationg in ICT investment decision making/ planning					
Executives	Interest in ICT					
	Efforts to acquire knowledge of ICT					

II. Environment for ICT Introduction

1. Do you have a specific department for ICT? ( )

1. Yes 2. In progress 3. Plan to do so soon 4. No plan

2. (If you answered 1 or 2 for Question 1) If you have a specified ICT department, are the employees...? ( )

1. Appointed only to the ICT department 2. Also appointed to other departments
3. Other ( )

3. Manpower for your ICT resources?

	Total	Planning & administration for ICT	ICT development	ICT maintenance
Currently employed				
# of extra employees needed				

4. What is your investment level for ICT?

	Budget for ICT (US$)	Investment for ICT (US$)
As of the end of 2002		
(estimated) 2003		

※ Investment for ICT includes all costs relating to equipment, development, human resources and maintenance.

5. Have you had any training for ICT/do you offer such programs in your organization?

1. Yes ? Go to '5-1' 2. No ? Go to 'Ⅲ'

5-1. What is your ICT training level?

As of 2002	Total	Internal training	External training
# of trainees (whole year)			
Training costs (whole year) (US$)			

5-2. What were the content training in 2002 and the positions of the trainees?

Training program	Content	Position of Trainee	# of trainees

5-3. Do you have internal training programs? ( )

1. Yes 2 . In progress 3. Plan to do so soon 4. No plan

5-4. What level of employee is the major target of your training program? (You may choose more than one option)

1. General clerks 2. ICT staffs 3. Executives 4. CEO

Ⅲ. Equipments & ICT resources

1. What is the level of your ICT maintenance and upgrade (Mark √)

	Very good	Good	Average	Mediocre	Terrible
Hardware					
Software					
Network					

1-1. What does your ICT development and maintenance depend on? ( )

1.Internal ICT staff 2.Outsourcing (ASP) companies
3. Both 1 and 2

2. What is the supporting level of your ICT? (Mark √)

	Enough	Marginal	Average	Rare	Very rare
Internal support					
Support for interactions with partner companies					

3. What is the type of ICT solution neededfor your tasks, and what is the level of use of your ICT solutions? * Note: Please indicate the level of your ICT usage in percentage values (0-100%).

Description	ICT description	Use	Level of ICT usage
Example	Office automation	O	85%
	ERP	X	0%
Office management	Office automation		
	Groupware		
Transaction management	EDI (VAN, Web)		
	Electronic commerce		
	Point-of-Sale (POS)		
Data management	Data Warehouse/DSS		
	Knowledge Management System		
Production/process management	Computer integrated manufacturing		
	Equipment management		
Design management	CAD/CAM		
	PDM		
Integrity management	ERP		
	SCM/PRM		
	CRM		
Others	Home page		
	( )		

4. What is the level of ICT equipments such as computer, printers for task execution? ( )

1.Sufficient 2.Quite sufficient 3.Average 4.Lacking 5.Insufficient

4-1. How many units of the following items do you have?

Description	Total	Below Pentium III	Above Pentium IV	Servers	Notebook	PDA	Others ( )
Number							

5. Have you implemented network for internal communication? ( )

1.1Yes 2.In progress 3. Plan to do so soon 4. No plan

5-1. How do you connect to external networks? ( )

1.Proprietary lines 2.Cable network 3. ADSL/VDSL 4. Satellite 5.Other ( )

5-2. What is your external connection speed? ( )

1. Below 1Mbps/sec 2. Below 10Mbps/sec
3. 10Mbps/sec~100Mbps/sec 4. Above 100Mbps/sec

6. Do you have a control mechanism for access to your network and ICT? ( )

1. Yes 2. No

6-1. (If the response to Question 6 was 'yes') What is your control mechanism? ( )

1. Access for ICT staff only 2. ID controls 3. Internal staff only
4. No controls 5. Others ( )

7. What do you think about information security? ( )

1.Mandatory 2. Necessary 3. Not necessary
4.Not sure 5. Others ( )

8.How often do you update your security system and programs? ( )

1. Regularly 2. Only when damaged 3. Never

9. What human resources are dedicated to information security? ( )

1. Specific department 2. Staff 3. External organization 4. None

10. Do you offer any training or education for information security? ( )

1. Internal program 2. External program
3. No 4. Others( )

11. Do you have any internal procedures for information security? ( )

1.Yes 2. No

Ⅳ. ICT Usage and Benefits

1. What is the level of application of ICT to your tasks?

	Very high	High	Average	Low	Very low
CEO					
Manager or employee					

2. The level of usage of your ICT resources.

2-1. Which tasks best utilize ICT? (Top two tasks: 1st: 2nd:)

1. Personal document editing 2. Data management & sharing
3. Sending/receiving documents (including E-mails) 4. Sales & marketing
5. Accounting, payroll, cost management 6. Other ( )

2-2. What are the top three tasks in utilizing internal networks (Intranet, Groupware etc.)? (Top three tasks: 1st: 2nd: 3rd:)

1. Information retrieval (technology, market) 2. Home page management & maintenance
3. Electronic approval & decision-making 4.Information sharing (design/manufacturing)
5. Materials & inventory management 6. External group discussion & scheduling
7. Other (_____)

2-3. What are the top three tasks in utilizing external networks (EDI, CALS, Electronic commerce, Home page etc.)? (Top two tasks : 1st: 2nd:)

1. B2C 2. B2B 3. Product information exchange 4. Production/process planning
5. Transactions with foreign companies 6. Other (_____)

3. If your ICT is not well utilized, what are the major reasons? (Please mark all the relevant items)

1. No need for tasks 2. Feel necessity, but not comfortable
3. Lack of training & education 4. Too busy 5. ICT is not well advanced
6. Concerns over information leaks 7. Well-utilized 8. Other ( )

4. What are the benefits of using ICT for personal tasks? (Please mark all the relevant items)

1. Automation of simple, redundant tasks
2. Simplified task procedures
3. Agreement/coordination between users
4. Faster information searches
5. Shorter meetings
6. Fewer unfulfilled orders
7. More executable tasks
8. Reduction of tasks execution time
9. Better problem solving
10. Expanded information retrieval sources
11. Reduction of approval
12. New technology and resources
13. Identification of customer preference and characteristics
14. Other (_____)

5. What could be the major benefits of company-wide ICT? (Please mark all the relevant items)

1. Increased sales 2. Reduced inventory 3. Lower raw material/logistics costs
4. Enhanced productivity 5. More partners 6. Reduced maintenance costs
7. Faster decision-making 8. Better closing the accounting books
9. Improved quality 10. Faster response to customers
11. Reduced product development/production time 12. Lower labor costs
13. New customers 14. Improved customer service/satisfaction
15. Improved company image Others (_____)

6. Has your ICT improved your labor costs, labor productivity and task execution? If so, what is the level of progress?

Description	Very much improved	Improved	Marginally improved	No change	Aggravated
Labor costs					
Labor productivity					
Task process					

Ⅴ. Status of e-commerce

1. Does your company use e-commerce? ( )

1. Yes 2. No

1-1. If no, what are the main reasons? ( )

1. Too early to participate in e-commerce
2. Lack of financial resources
3. Lack of expertise
4. Lack of the ICT infrastructure
5. Industry inadequacy
6. Other ( )

1-2. When is your company going to use e-commerce? ( )

1. Within one year 2. Within two years 3. Within three years 4. No plan

2. What kind of e-commerce does your company use? (Please mark all the relevant items)

□ Internet shopping mall
□ E-procurement
□ Electronic Data Interchange
□ E-catalog
□ E-marketplace
□ Other ( )

3. What were the e-commerce sales of your company in 2002?

($)

4. What was the percentage of e-commerce sales (e-commerce sales/total sales) of your company in 2002?

(%)

5. What is an urgent problem in e-commerce for your company? ( )

1. Security 2. E-payment 3. Insufficient law
4. Lack of ICT infrastructure 5. Distribution system 6. Others ( )

6. What kind of support does your company urgently need from government in e-commerce?

1. Financial support
2. Support for online shopping malls
3. Support for building a homepage
4. Support for technology and experts
5. Education support
6. Support for online community-building
7. Other ( )

Ⅵ. Inhibitors and suggestions in the adoption and usage of ICT

1. Please check the education or training necessary for the successful adoption and usage of ICT

- □ Improved awareness of ICT usage
- □ Maintenance and repair of ICT systems
- □ Examples of ICT usage
- □ Internet homepage building/ e-commerce
- □ Application operations
- □ System security
- □ Network implementation and operation
- □ Other ( )

2. Please check the desirable roles of your government in promoting the SME ICT usage level

- □ Financial support
- □ Tax reduction
- □ Software or technology support
- □ Expert support
- □ Education or training support
- □ Support to rent hardware
- □ Other ( )

3. Please rank (in order of importance) your expected benefits of ICT usage

( ) Stable procurement management
( ) Reduced inventory costs
( ) Reduced lead-time
( ) Linked sales and production strategies
( ) Providing rapid delivery information to a customer
( ) Reducing task execution time
( ) Providing rapid cost information
( ) Others ( )

4. What were the major facilitating and inhibiting factors for the implementation of the above ICT.

※ Please, mark the level that best suits your situation.

4-1. ICT Infrastructure (①very scant ②scant ③average ④enough ⑤more than enough)

- Preparedness of hardware ①--②--③--④--⑤
- Preparedness of software ①--②--③--④--⑤
- Preparedness of networks (LAN, Internet) ①--②--③--④--⑤
- Preparedness of ICT staffs ①--②--③--④--⑤
- Master plan for integration & control of ICT ①--②--③--④--⑤

4-2. Financial status

- Financial capability for ICT implementation ①--②--③--④--⑤
- Standardization of tasks/processes before ICT implementation ①--②--③--④--⑤

4-3. Organizational readiness

- The existence of ICT department ①--②--③--④--⑤
- The CEO's awareness of ICT ①--②--③--④--⑤
- The employees' awareness of ICT ①--②--③--④--⑤

4-4. Change management

- ICT regulation, organization and systems ①--②--③--④--⑤
- The ICT education/training of users ①--②--③--④--⑤
- The ICT maintenance and monitoring staff/organization ①--②--③--④--⑤

5. How strong was the influence of the following business needs on your ICT implementation? (①very scant ②strong ③average ④weak ⑤very weak)

5-1 Industry-wide efforts to standardize tasks and processes ①--②--③--④--⑤

5-2 Competitors'push for ICT ①--②--③--④--⑤

5-3 Encouragement from buyers/sellers for ICT ①--②--③--④--⑤

5-4 Influence of large companies (encouragement, pressure etc.) ①--②--③--④--⑤

6. The influence of national ICT infrastructure, H/W, S/W and consulting organizations

6-1. National ICT infrastructure

- What was the influence of telecommunication infrastructure on ICT implementation?

- What was the influence of public administration organizations andother ICT infrastructure on your ICT implementation?

6-2. IT partner organizations

- Did you have enough consulting firms for H/W and S/W implementation? Did such availability make a positive influence your ICT implementation?

- What was the influence of the capability of external consulting firmson your ICT implementation?

7. What were the supporting organizations for your ICT implementation? (financial support, technical support, PR, IT community building, etc.)?

7-1. Government Organizations

7-2. Public Organizations

7-3. Non-Governmental Organizations

7-4. International Organizations

7-5. Association