

SMALL AND MEDIUM ENTERPRISES AND ICT

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Introduction

It is commonplace for governments to have policies to encourage the growth of local small and medium enterprises (SMEs) as they can help to directly alleviate poverty by increasing income levels and creating jobs. However, as the global economy becomes increasingly reliant on information and communications technology (ICT) to receive, process, and send out information, the small businesses within the Asia-Pacific region – which form a significant portion of their developing economies – have yet to reap these benefits evenly. This is because obtaining such opportunities rests largely upon the ability of SMEs to engage in the regional and global economic business networks which, in turn, demand provision of a prerequisite level of access to and use of ICT. Unless these prerequisites are in place, these SMEs are set to lose out on opportunities to integrate into the global supply chain, bid for outsourcing businesses, and increase their internal productivity and efficiency.

SMEs can benefit either as producers of ICT or as users of ICT for purposes such as increased productivity, faster communications and reaching new clients. However, it must be noted at the outset that not all SMEs need to adopt ICT tools to the same degree of sophistication. The most basic ICT tool is having communication capabilities through fixed lines or mobile phones, whichever is more cost effective. SMEs may then use a personal computer (PC) with basic software for simple information processing needs such as producing text or keeping track of accounting items. Internet access enables SMEs to have advanced communication capabilities such as email, web browsing and launching a website. SMEs in manufacturing can benefit from more advanced ICT tools such as Enterprise Resource Planning (ERP) or inventory management.

While ICT can benefit SMEs in multiple ways, SMEs within the Asia-Pacific region have been slow to adopt ICT as they face major constraints such as poor telecommunications infrastructure, limited ICT literacy, inability to integrate ICT into business processes, high costs of ICT equipment, incomplete government regulations for e-commerce, and a poor understanding of the dynamics of the knowledge economy. To remove these constraints, governments need to do more than merely improving ICT national policy and promoting SMEs in the ICT sector. Instead, governments should embed ICT components into overall SME policy in a comprehensive and focused manner. However, this does not mean that SME policy should be the same for all industries. SMEs in different sectors use ICT differently and will adopt them at a different pace. Additionally, SMEs need help in translating the benefits of ICT to their core business.

The willingness of SMEs to integrate e-business practices depends on how much it can directly improve their core business and how much the potential benefits outweigh

the definite costs. For example, a tour operator may be more likely to purchase computers and Internet connectivity in order to service its clients than a grocery store owner will be willing to convert its cash register system into point-of-sale (POS) technology to better manage inventory. By recognizing these differences and focusing their efforts on removing the constraints, governments can play an important role in encouraging SMEs to become more effective users of ICT. This can have wider impact on national economies since SMEs are the engines of economic growth. This e-Primer will show why SMEs should adopt ICT, explore the possible uses of ICT, survey past ICT policies and programmes for SMEs, and recommend possible policies for governments to consider.

What are SMEs?

SMEs are usually enterprises that employ no more than 250 employees. The technical definition varies from country to country in the Asia-Pacific region but is usually based on employment, assets, or a combination of the two. Some countries have different definitions for SMEs in the manufacturing and services sector and may exempt firms from specialized industries or firms that have shareholdings by parent companies. Table 1 illustrates the range of SME definitions in the Asia-Pacific region.

Table 1: Sample of SME Definition in the Asia-Pacific Region

Country	Definition of SME	Measurement
China	Varies with industry, usually less than 100 employees	Employment
Hong Kong	Manufacturing - 100 or fewer employees Other - 50 or fewer employees	Employment
Indonesia	Less than 100 employees	Employment
Japan	Wholesale - less than 100 employees or JPY 100 million assets Services - less than 100 employees or JPY 50 million assets Retail - less than 50 employees or JPY 50 million assets Other - less than 300 employees or JPY 300 million assets	Employment and Assets
Malaysia	Manufacturing - less than MYR 25 million or 150 employees Services - less than MYR 5 million or 50 employees Different for Bumiputra enterprises	Shareholders, Funds and Employment
Philippines	Less than 200 employees or PHP 60 million assets	Employment and Assets
Republic of Korea	Manufacturing - less than 300 employees, or KRW 8 billion assets Wholesale - less than 100 employees or KRW 10 billion annual sales revenue	Employment, Assets and Sales Revenue
Singapore	Manufacturing - fixed assets worth SGD 15 million or less Services - less than 200 employees	Employment and Assets
Taiwan	Manufacturing - less than TWD 80 million of paid-in capital or less than 200 employees Other - less than TWD 100 million annual sales revenue or less than 50 employees	Sales Revenue and Employment
Thailand	Manufacturing and services - less than 200 employees or THB 200 million assets Wholesale - less than 50 employees or THB 100 million assets Retail - less than 30 employees or THB 60 million assets	Employment and Assets

Source: White Paper on Small and Medium Enterprises in Taiwan, 2006
<http://www.moeasmea.gov.tw/eng/2006white.asp>

Why are SMEs important?

SMEs are important because on average, they comprise over 95 percent of the economy. Figure 2 illustrates the importance of SMEs to the national economy in a sample of countries from the Asia-Pacific region. The contributions of SMEs to employment and the countries' gross domestic product (GDP) are by no means trivial. As of July 2006, close to 140 million SMEs in 130 countries employed 65 percent of the total labour force.²

Table 2: Comparison of the Composition of SMEs in the Asia-Pacific Region³

Country	SMEs as % of all enterprises	SME employees as % of the total employed population
Hong Kong	98.0	60.0
Japan	98.9	69.2
Malaysia	96.1	45.0 (manufacturing)
Philippines	99.6	70.0
Republic of Korea	99.8	86.7
Singapore	99.7	57.0
Taiwan	97.7	68.8
Thailand	99.7	60.0

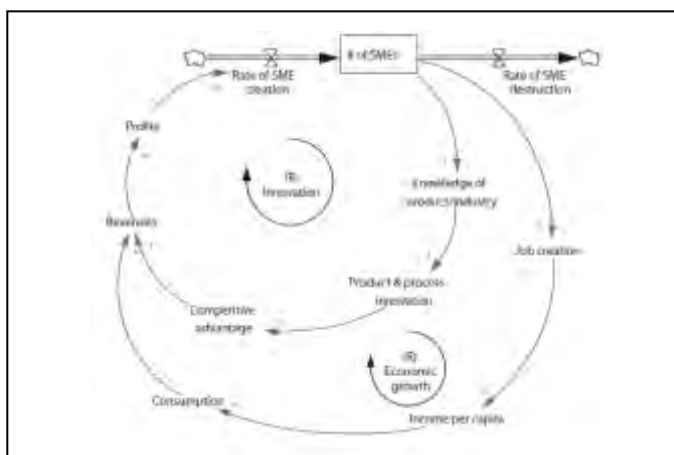
Source: White Paper on Small and Medium Enterprises in Taiwan, 2006.
<http://www.maeasmea.gov.tw/eng/2006whitepaper/2006white.asp>

Moreover, SMEs are the driver of economic growth and innovation. Figure 1 describes both reinforcing dynamics. The total number of SMEs in the economy depends on the rate of SME creation and rate of SME destruction. Profitable market opportunities increase the rate of SME creation. This increases the total number of SMEs in the country, which increases job creation and income per capita. As people become wealthier, they will increase their consumption, which in turn will open up new market opportunities that will entice the creation of more SMEs. Contrary to multinational corporations, the growth of SMEs directly benefits the country because most SMEs are domestic firms.

This reinforcing dynamic generates economic growth. The reinforcing loop of innovation also drives economic growth. As the number of SMEs increases, their knowledge of their product and industry increases. Their knowledge allows them to innovate on the product or process, which helps them form a competitive advantage to generate more profits. Again, market opportunity as captured by the profitability of SMEs will encourage more people to establish their own SMEs to capture the opportunity. In addition, the development of SMEs can also help to achieve other

development goals. SMEs can either provide goods and services in areas critical to development, such as health and education, or provide a source of income to disadvantaged people. For example, efforts to develop women entrepreneurs help increase gender equality by providing women with a source of income.

Figure 1: SMEs are a Driver of Economic Growth and Innovation



How Has the Knowledge-Based Economy Impacted SMEs?

Countries in the world are moving from an industrial economy to a knowledge economy in which economic growth is dependent on a country's ability to create, accumulate and disseminate knowledge. Computers and the Internet catalyzed the growth of the knowledge economy by enabling people to codify knowledge into a digital form easily transmitted to anywhere around the world. People who have access to this new wave of ICT – broadly defined as technology that can be used for transmitting and/or processing information – are part of an information society connected to a virtual network that constantly creates and disseminates new information. ICT has sped up the pace of globalization and increased the complexity of business practices because firms not only need to be familiar with their local context but also with global developments. Thus, to compete in the knowledge economy, countries need a strong ICT-literate skills base that can innovate and adapt quickly to change. More value is placed on the knowledge worker than ever before.

Knowledge, change and globalization are the driving forces of the new economy. The knowledge economy has impacted SMEs both positively and negatively. On the positive side, because the knowledge economy relies heavily on ICT, it has led to the rapid growth of ICT sectors. Many countries such as India, the Republic of Korea and Taiwan have created enabling environments to ensure that SMEs are well positioned to capture these emerging business opportunities. India, for example, offered relief from import duties for IT hardware, tax deductions for income earned from software exports, and tax holidays, and developed infrastructure in Software Technology Parks.⁴ India's

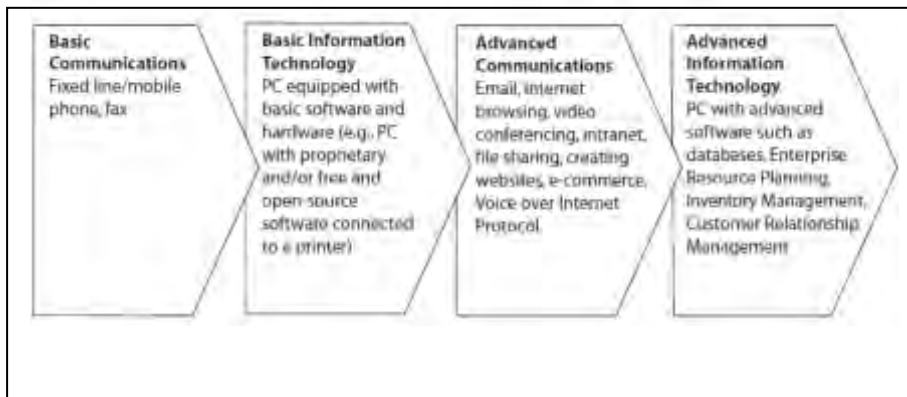
thriving ICT sector has in turn propelled the country's economic growth. SMEs outside the ICT sector have also benefited by adopting ICT in their own operations, enabling them to communicate quickly, increase productivity, develop new business opportunities, and connect to global networks. Conversely, the reliance on ICT in the knowledge economy means that those SMEs who have not yet adopted ICT will have trouble surviving. For example, 60 percent of Intel's material orders are now done electronically. With e-procurement becoming main stream in developed countries, SMEs that do not have that capability will not be chosen as business partners. Additionally, SMEs that have not adapted to the faster pace and increasing complexity of the way businesses are conducted will lose out to the increasing competition brought about by globalization.

How Do SMEs Use ICT?

SME usage of ICT ranges from basic technology such as radio and fixed lines to more advanced technology such as email, e-commerce, and information processing systems (Figure 2). Using advanced ICT to improve business processes falls into the category of e-business. However, not all SMEs need to use ICT to the same degree of complexity. The first ICT tool that most SMEs adopt is having basic communications with a fixed line or mobile phone, whichever is more economical or most convenient for their business. This allows the SME to communicate with its suppliers and customers without having to pay a personal visit.

After acquiring basic communication capabilities, the next ICT upgrade is usually a PC with basic software. Even without Internet connectivity, SMEs can use PCs for basic word processing, accounting, and other business practices. With the Internet, SMEs are able to use more advanced communications capabilities such as email, file sharing, creating websites, and e-commerce. This may be sufficient for most SMEs, especially those in service industries such as tourism. SMEs in manufacturing may adopt more complex IT tools such as ERP software or inventory management software. SMEs may adopt the tools progressively or jump immediately to advanced ICT capabilities.

Figure 2: Progression of ICT Adoption



What Types of Advanced ICT Products are SMEs Starting to Use?

Like any firm, an SME decides which type of ICT products to adopt based on the concrete benefits they can bring to its core business, the ICT capacity of its employees, and the financial resources available. Most people are familiar with basic ICT such as fixed phone lines, mobile phones, fax, computers, and basic document processing software – like Microsoft Office. Advanced communication technology, however, is more complex. Advanced communication technology relies primarily on the Internet and the intranet, which allow people within the firm to share files with each other over the same network. Having Internet connectivity enables firms to do faster research, set up websites, conduct e-commerce, and set up video conferences.

One of the most revolutionizing developments in advanced communication technology is Voice over Internet Protocol (VoIP). VoIP includes all types of voice communication transmitted through the Internet, whether it is between computer and computer or in hybrid form between computer and regular phone. It competes directly

Table 3: Major Products of Advanced Information Technology

<p>Enterprise Resource Planning (ERP)</p> <p>ERP offers a single repository for information on all business functions - human resources, manufacturing, inventory, marketing, sales, accounting, and tax. It allows all levels of a business to obtain real-time management information for their area of responsibility.</p>
<p>Customer Relationship Management (CRM)</p> <p>CRM software integrates people and technology to maximize external relationships. Functionality includes: sales contact management, activity history, order entry, customer service and support, field service, lead generation, data mining, etc.</p>
<p>Supply Chain Management (SCM)</p> <p>SCM software helps streamline the procurement of raw materials and delivering of finished products. It helps to decrease error rates, delays, and to increase efficiency. e-Procurement is often a part of SCM.</p>
<p>Enterprise Application Integration (EAI)</p> <p>EAI integrates different types of ERP and other software systems through a common problem in order to synchronize the processing, storing, and transmitting of information.</p>
<p>Rapid Prototyping and Manufacturing (RPM)</p> <p>Over the next 20 years, RPM will have a profound effect upon the global manufacturing technology. RPM can reduce the new product design phase from 90 days to just three days. It is still an infant industry based upon newly invented technologies, but it is apparent that RPM will dramatically reduce the cost and time required to convert a new product design to a practical manufacturing process.</p>
<p>Knowledge Management (KM)</p> <p>KM systems help a firm to better organize and share the knowledge of its employees. They help the firm take better advantage of its human resources.</p>

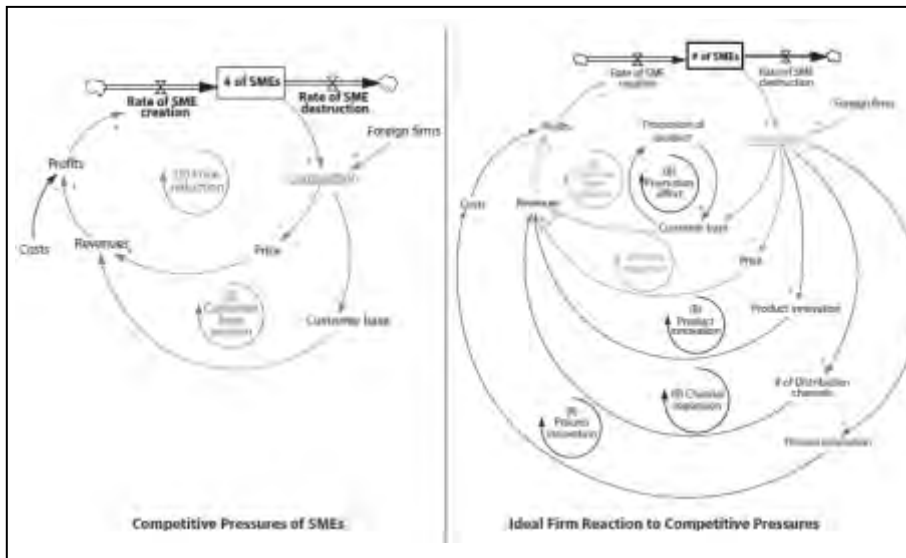
with traditional fixed line and mobile phone operators. Users only pay for their dial-up, broadband, or wireless Internet connection. iSuppli, a market-research firm, estimates the number of VoIP residential users worldwide will reach 197 million by 2010.¹⁰ Most complex of all is advanced IT. It is often very expensive, sophisticated and takes more time to implement by a firm. SMEs can sign up for one or all available services. In order to reduce costs, some firms opt to outsource this component or use an application service provider (ASP) that provides functional software capabilities over the Internet. Table 3 lists the major types of products.

SME ADOPTION OF ICT

Why Should SMEs Adopt ICT?

SMEs are often the main driver for a country's economic growth. However, as the number of SMEs increases, competition increases, which then results in a decrease in prices, customer base, or both. This in turn will erode existing profits, creating less incentive for people to start SMEs. This dynamic is captured by balancing feedback loops where the greater the number of SMEs, the greater the competition, resulting in a slower rate of growth for SMEs (Figure 3a). To counter the increasing competition, firms can lower prices, increase promotion of their product, improve their product, add new distribution channels, and/or improve their internal processes (Figure 3b). The challenge is to counter competition when the firm still has the financial resources to do so. Otherwise, once the pressure of competition sufficiently erodes the SME's profits, it will no longer have resources to counter the competition and will have to exit the market.

Figure 3a & 3b: A Systems Dynamics View of Firm Response to Competitive Pressures



Foreign firms in both the import and export markets further add to competitive pressures, especially if they react faster to improve their product, process, promotion, or distribution channels. This is the problem of the Digital Divide. When firms in developed countries adopt ICT, firms in developing countries will lose out on the competition. This in turn can slow the growth rate of SMEs and hurt the economy as a whole. ICT can thus play a very important role because it can help SMEs both create business opportunities and combat pressures from competition. Appropriate ICT can help SMEs cut costs by improving their internal processes, improving their product through faster communication with their customers, and better promoting and distributing their products through online presence. In fact, ICT has the potential to improve the core business of SMEs in every step of the business process. Figure 4 uses Porter's value chain to summarize various ways that ICT can benefit a firm.

Figure 4: Benefits of ICT Tolls Categorized under Porter's Value Chain

Inbound Logistics <ul style="list-style-type: none"> • Cheaper and faster communication with suppliers through Supply Chain Management 	Operations/ Manufacturing <ul style="list-style-type: none"> • Improve Inventory Management systems • Enterprise Resource Planning software • Rapid Prototyping and Manufacturing programmes 	Outbound Logistics <ul style="list-style-type: none"> • Easier to link to global supply chains and outsourcing opportunities 	Marketing and Sales <ul style="list-style-type: none"> • e-Commerce • e-Marketing through websites 	After-sale Service <ul style="list-style-type: none"> • Customer Relationship Management software 	
Firm Infrastructure (Finance, Planning) <ul style="list-style-type: none"> • Better accounting and financial management practices • Improved communication between different departments through the intranet • Better grasp of business trends and market prices through easier access to information • Use models to enhance business planning capabilities 					Margins
Human Resource Management <ul style="list-style-type: none"> • e-Learning for employee training 					
Technology Development <ul style="list-style-type: none"> • Better Knowledge Management within the firm • Integrate different software platforms through Enterprise Application Integration 					
Procurement <ul style="list-style-type: none"> • Use e-procurement for cheaper and faster communication with suppliers 					

Why Have So Few SMEs Adopted ICT?

Given the benefits that ICT can bring to SMEs, SMEs in most developing countries in the Asia-Pacific region still have been slow to adopt it. For example, 90 percent of Thai SMEs still use basic communication technology such as fixed phone line and fax, and only 1 percent use CRM software. Meanwhile, their counterparts in developed countries are using advanced ITs. One cause of limited adoption is the lack of dynamism between ICT firms and SMEs outside of the ICT sector. ICT firms have not provided goods and services tailored to SMEs in the past because demand from SMEs has been low. However, their demand is low in part because ICT products available in the market are too complex and expensive. The result is a vicious cycle of limited supply and limited demand that ultimately excludes SMEs from the benefits of ICT. Other factors also contribute to the limited supply and demand of ICT for SMEs:

Supply Side

1. Poor communications infrastructure results in limited access and higher costs.

Many developing countries still have poor communications infrastructure. Outdated equipment and state-owned monopolies often result in expensive charges and limited coverage, especially in rural areas. This discourages SMEs from adopting even the basic ICT of fixed lines or mobile phones.

2. Most advanced ICT products are designed for larger firms and not SMEs.

ICT firms used to target large enterprises because they had a larger budget and were willing to pay for more complex ICT services. Their products are often too expensive and too complex for SME users. However, competition in this market is making firms – both large and small – turn their attention towards the untapped SME market. Rosetta, for example, is pushing to capture SME customers by lowering prices by 50 percent and increasing awareness.

Examples of ICT Firms Entering the SME Market

In India, SAP launched pre-packaged, cost effective, and ready-to-plug-in 'mySAP all-in-one solutions' for SMEs in mid-2003. Two months later, Oracle launched a special edition of its e-business suite for the segment in India. This pre-configured package of business applications is designed specifically for Indian companies that have a turnover in the range of USD 5 million to USD 80 million. The new Oracle solutions can be implemented rapidly within 10 to 40 days and save 60 to 70 percent on the cost when compared to traditional implementations. The special edition was priced at USD 32,000 for a financial solution complete with installation, hardware, maintenance, and software licenses for 10 users. An enhanced bundle of products including financial, distributing, manufacturing, and purchasing solutions was priced at USD 52,000.

The lower total cost of ownership was achieved through reduced complexity in the solution implementation, eliminating the need for extra administration resources, and lower entry pricing so that investments can scale-up with business growth. In terms of smaller firms, TBelmah Strategies, a Malaysian firm, created an ICT-aided

manufacturing solution that integrates quality, productivity, and cost improvements. The software is cost effective, has 70 applications, and can be used by the electrical and electronics, moulding, rubber, and metal fabrication sectors. The firm is going into other countries such as Indonesia. HK Comp Technology developed NIIX, a software that saves SMEs time by sorting through thousands of pages to gain ISO status. It improves recordkeeping to meet new disclosure requirements and auditing practices, and harmonizes national financial reporting methods with international standards. In Thailand, TRUE launched an 'all-in-one solution' that offers services for SMEs in communications, marketing, business processes, and office management.

Demand Side

1. Limited ICT literacy of SME owners hinders their ability to choose the appropriate technology and understand the concrete benefits it can bring to their business.

Many SME owners are unfamiliar with operating a computer, are skeptical of the concrete benefits to its core business, and have the stereotype that ICT is only for larger companies. Even if they have the will and financial resources to integrate ICT into their core business, SME owners are often at a loss when needing to choose the most appropriate and cost-efficient product.

2. Limited ICT literacy of employees in SMEs hinders ICT adoption.

Even if SME owners have a strategic understanding of why they should adopt ICT, their staff is often untrained. Training costs both time and money – resources that SMEs usually lack.

3. Adopting ICT is an adaptive challenge, not a technical challenge.

Adopting ICT is a difficult task for companies of all sizes, whether they are in developed or developing countries. In fact, a lot of management literature focuses on the organizational changes that firms must go through in order to effectively adopt ICT because they change the way firms do business. While the changes may be beneficial in the long run, they often hurt one department and strengthen another. For example, Zhang Hongwei, senior consultant with D'Long International Strategic Investment, comments that "in order to make ERP's cost-saving and efficiency-building features work, managers must be willing to take measures that can be anathema in the state-owned sector, such as selling businesses, laying off workers, and changing longstanding vendor relationships. All of this can be tough to do." Thus, SME owners are often reluctant to bring their firm through a learning curve that may be difficult and costly.

4. Lack of financing options limits SME ability to purchase ICT.

Lack of financing and appropriate technology is clearly a major handicap to developing country producers and exporters, and it inhibits developing countries from deriving full benefits from their trade rights.

Rubens Ricupero, Secretary General of UNCTAD, 18 February 2002, Geneva
SMEs usually have limited ability to make larger investments in their firm due to the

lack of financing options. Given the financial squeeze, IT budgets are usually small or nonexistent. In addition, adopting ICT is not a one-time cost because there are ongoing costs of maintenance, upgrading, and human capacity building.

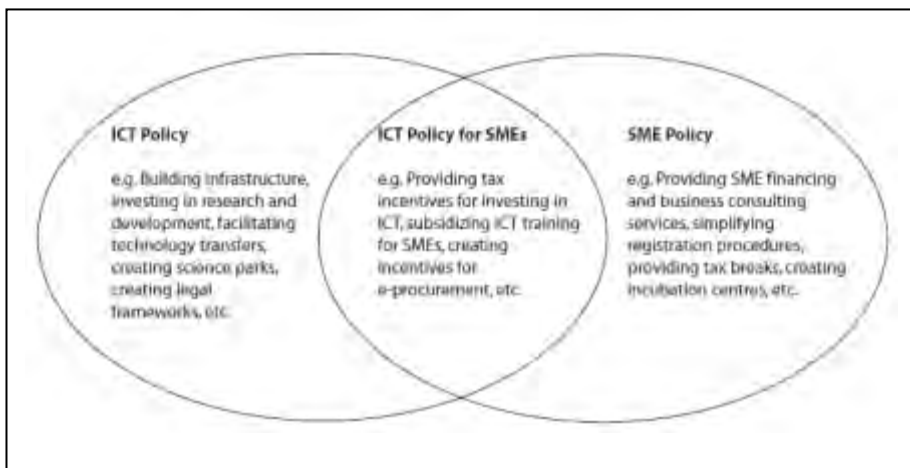
5. Lack of financial and legal infrastructure.

SMEs may still be hesitant to engage in e-commerce due to undeveloped legal policy for electronic payment and security issues. Many Asian banks, a key link in the e-commerce chain, have not even adopted online banking in their own systems. In the end, the definite costs of identifying the right goods and/or service, finding staff to manage it, taking the company up the learning curve, and obtaining financial resources are not perceived to justify benefits.

Why Have Past Government Interventions Been Met with Limited Success?

Many governments have not explicitly focused on ICT adoption by SMEs in the non-ICT sector. They have either focused on growing the ICT sector or supporting the growth of SMEs, but they have not focused on integrating the two areas to implement broad-based policies (Figure 7). Since most SMEs who can benefit from the use of ICT are not in the ICT sector, they have not been able to receive the benefits.

Figure 7: Breakdown of Types of Government Interventions

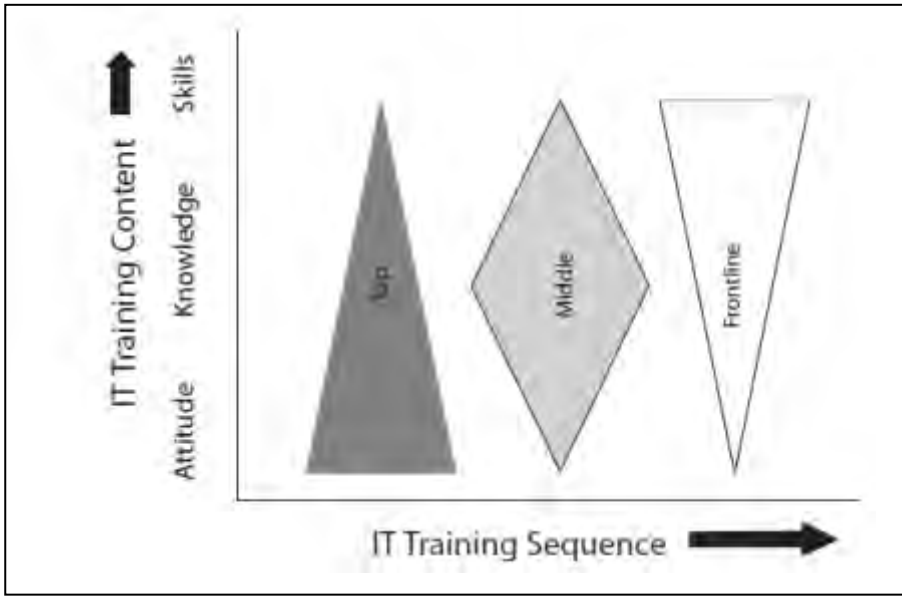


In addition, workshops and training seminars, the most common way for governments to encourage ICT adoption by SMEs, often did not tailor the content to the type of audience and did not focus enough on the concrete benefits. To encourage SMEs to adopt ICT, efforts first need to concentrate on convincing top management that implementing ICT can improve their business, whether through cost savings or enabling expansion to new markets.

This is because these managers determine the overall strategy of the firm, and they make the decision whether or not to adopt ICT. Middle management are usually the

ones to implement the ICT project and thus need to have a deeper knowledge of how to implement it, so their training should include a mix of strategy and implementation skills. Frontline employees are the ones who will use ICT on a daily basis. It is therefore more important to concentrate their training on the actual skills required than on the strategic benefits of ICT. The difference in training based on the roles of people in the firm is characterized in (Figure 8).

Figure 8: ICT Training by Management Level²¹



This framework is supported by ICT consultants in the field. Zhang Hongwei comments that, “top management and the quality assurance function in its broad sense are best positioned to be directly involved in pushing for ERP implementation, and the number two of a company should be the project leader.”

What are Basic Questions to Consider before Designing Policies and Programmes?

In order to better design programmes to increase ICT adoption, it is useful to review the current related policies, which industries to target, what barriers to target, and how to best reach the SMEs. The following questions provide a basic guideline.

Existing policies and programmes

1. What are existing ICT policies?
2. What policies/programmes does the country currently have for SMEs?
3. What are existing policies/programmes that encourage SMEs to adopt ICT?

Who to target

4. In which industries do revenues from SMEs comprise over 50 percent of total revenues?
5. How do the top five export industries in the non-ICT sector use ICT?

What barriers to target

6. What percentage of the population is connected via fixed lines, mobile phone lines and/or the Internet?
7. How expensive are ICT connection charges compared to neighbouring countries?
8. What is the level of ICT literacy?
9. What options do SMEs have for accessing financing? How difficult is it?
10. How do SMEs currently use ICT?
11. Are firms in the ICT sector starting to target SMEs? If so, how?
12. What percentage of firms have started to use e-commerce, both B2B and business-to-customer (B2C)?
13. How developed is the legal infrastructure for online transactions?

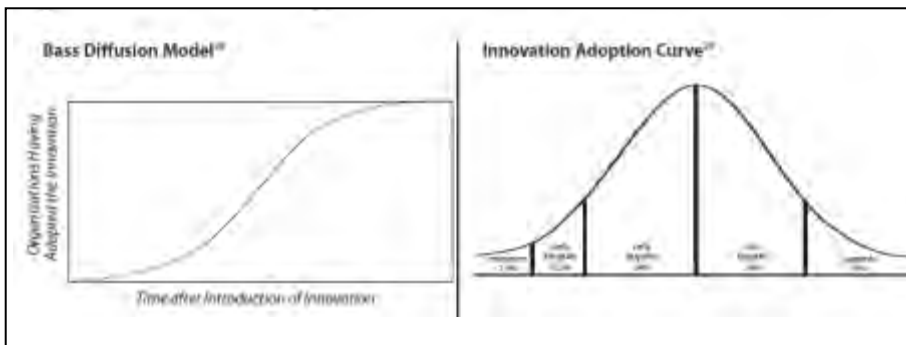
How to target

14. What government support agencies are there for SMEs?
15. What other support agencies/programmes exist for SMEs? How strong is their institutional capacity?
16. How and from whom do SMEs receive industry information?

What is an Effective Strategy for Designing Policies and Programmes?**1. Target entire industries that are most likely to benefit immediately from ICT.**

Targeting entire supply chains will allow the efforts to be more focused, specific and concrete. In terms of ICT adoption by SMEs, most countries are still at the beginning stages of the S-shaped technology diffusion curve. In order to induce mass adoption of ICT and be on the steeper slope of the S-curve, government efforts should target SMEs characterized as innovators and early adopters (Figure 9). Beyond being risk takers, these SMEs should be firms that have the most contact with foreign suppliers and clients, which usually are the tourism/ hospitality and export industries. Effective usage of ICT requires both parties to have compatible technology, and since their suppliers/clients most likely have already adopted ICT, GENERAL POLICY FRAMEWORK FOR ICT ADOPTION BY SMEs. SMEs can reap the benefits of ICT very quickly. Targeting supply chains and specific industries quickly increases the rate of adoption, which increases the total number of SMEs that use ICT. This will increase the overall awareness of the benefits of ICT and encourage adoption by other industries.

Figure 9: Models of Technology Adoption



ICT adoption in tourism industries usually involves using advanced communication technologies such as email and the Internet. Having an online presence creates an important new marketing channel for the SMEs. In 2004, over 30 percent of US adults used the Internet for travel research or bookings. The tourism board can play the role of creating a portal that leads to individual websites in order to help increase site traffic. It can also establish an e-commerce platform that SMEs can sign up for without having to adopt it themselves. ICT adoption in export industries often involves encouraging ICT adoption over an entire supply chain. Firms are more likely to adopt ICT if their peers, suppliers, and clients are adopting ICT as well.

This can help increase the competitiveness of the industry as a whole. Datuk Kalsom Abdul Rahman, Chairman of Small and Medium Industries Development Corporation, Malaysia commented, “if one of the largest global suppliers has seen the value of adopting technology into their operation, our plastics manufacturing sector should consider moving in the same direction.” ICT adoption can also involve building an industry or export portal. For example, Taiwan's Council of Agriculture³² launched several websites to provide another marketing channel for Taiwan's agriculture producers. The government portal itself received over 1,343,236 visits between January 2005 and mid-August 2005. AgExporter Web is a B2B website that connects importers to Taiwanese producers.

Similarly, the Korean government created the Korean Marketplace Website³³ to showcase products of Korean SMEs to global buyers. Local SMEs can easily connect to the global network by posting offers to buy or sell products. The site currently hosts over 20,000 homepages of SMEs and e-catalogues of over 120,000 products.

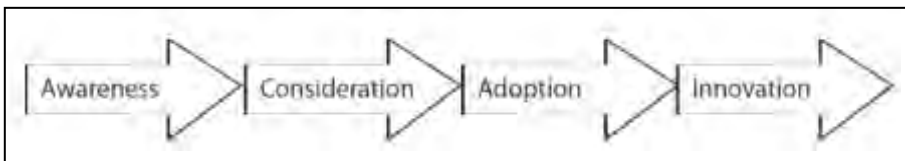
2. Efforts to increase awareness should focus on concrete benefits, be industry specific, and target the right audience.

Governments need to understand where SMEs are in their decision-making process in order to conduct more focused workshops. Since adopting ICT requires investment in both time and financial resources, SMEs generally go through distinct stages of careful analysis (Figure 10). Initially, the SMEs become aware of the benefits that ICT can bring to their core business through channels such as word of mouth, media, and

workshops. If they believe that ICT indeed has the potential to improve their business, they proceed to the next stage, where they consider whether or not to adopt ICT. In this stage, SMEs try to find out the exact costs and benefits of implementing ICT by obtaining price quotes and seeking advice from supporting agencies or other SMEs.

The best way to describe the benefits of ICT is to use terms that the owners are familiar with, such as rate of sales growth, market share, and return on investments, cost reduction, and development of new products or markets. This way, SME owners can connect abstract ICT benefits with how ICT can concretely affect their core business. They need to internalize the benefits before they are willing to make an investment. When SMEs become convinced that the benefits do in fact outweigh the costs, they will begin to adopt ICT into their business practice. If the experience proves to be positive, SMEs may either increase their investment or move towards the final stage of using ICT to innovate in their business practices. SMEs generally prefer products and services that are easy to use, easy to implement, and low cost.

Figure 10: Stages of ICT Adoption



The Hong Kong Productivity Council, for example, sponsors various sector-specific programmes that help businesses increase productivity through better utilization of ICT resources. Their ERP Centre provides training, consulting, and a software platform for its subscribers. In addition, the Institute of Professional Education and Knowledge of Hong Kong provides e-learning courses by sector.

3. Decrease the barriers to ICT adoption.

Even if SMEs are aware of the benefits of ICT, they will only adopt ICT if they can overcome the barriers to its adoption. The lack of affordable and accessible ICT infrastructure is the first obstacle that SMEs need to overcome, whether they are adopting basic ICT such as phones or more advanced ICT such as e-commerce (Figure 11). The next obstacle is human capacity. Users must understand how to use ICT and how it will change the way they do business. This obstacle is more prominent for advanced ICT such as e-commerce and ERP software than for basic ICT such as phone lines and fax. The third obstacle to overcome is financing. This is a problem for both basic and advanced ICT. Having the appropriate legal framework is the last obstacle to overcome because it mainly applies to online transactions. SMEs can still adopt phone lines, email, and many e-applications without a well-defined legal structure.

4. Create locally relevant resources online.

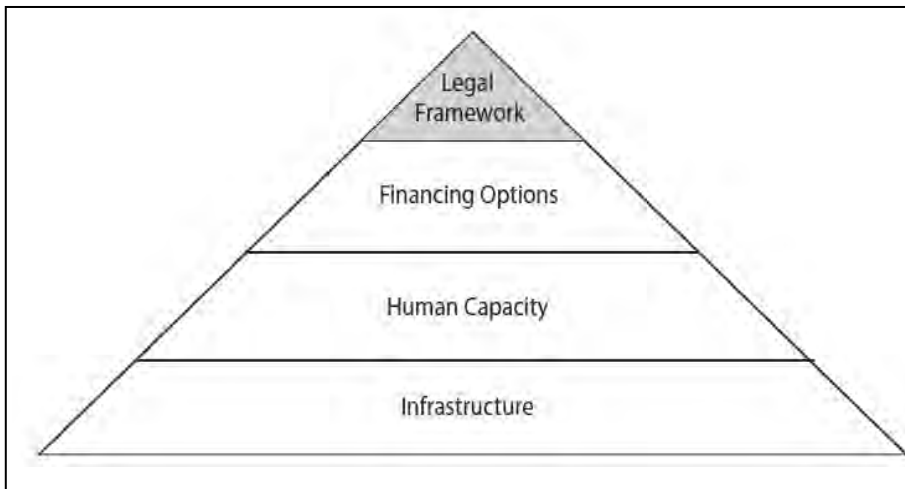
In a study commissioned by the Asia Foundation on ICT use among SMEs in Indonesia, Philippines and Thailand, results showed that SMEs use the Internet

primarily for email and research, but only browse websites for promotions rather than for e-commerce due to security concerns. one problem with web browsing in developing countries, however, is the lack of locally relevant content. In addition, most web content is in English, which could cause a language barrier. Governments can help overcome this barrier by creating resource centres.

5. Partner with other organizations.

Governments should partner with international organizations, industry associations, chambers of commerce, and local NGO/SME support agencies in order to obtain technical expertise, financial support, and local knowledge.

Figure 11: Barriers to ICT Adoption



Governments can and have addressed these barriers to adoption in several ways.

Infrastructure

Governments can help SMEs reduce ICT connection costs and increase coverage by further expanding its infrastructure, offering subsidies, encouraging ICT providers to have special discounts for SMEs, equipping incubators with ICT at a reduced cost, or allowing alternative methods of communication such as VoIP. The Philippines National Economic and Development Authority (NEDA) has taken a drastic step to push for the full deregulation of VoIP. In most parts of the world, governments are more inclined to ban VoIP because it is in direct competition with state-owned telecommunication companies and will decrease government revenues from incoming international call tariffs. NEDA however, firmly believes that VoIP can help spur 'growth, investment, and jobs' because it can reduce charges for international calls by 75 percent.

Human capacity

Ways that governments can help increase ICT adoption among SMEs include hosting training workshops that are flexible and tailored to specific industries, employees' position and role, or software/hardware applications; providing subsidies for ICT training; and creating opportunities for firms to try the technologies hands on. Singapore, for example, launched an Infocomm Competency Programme from November 2003 to March 2005 to increase the computer literacy of its workforce. The programme subsidized SGD 5.00 per trainee per hour for SMEs on broad-based ICT courses such as Microsoft Office applications, desktop publishing, workgroup applications and webpage design.

Financing options

Governments can increase the affordability of ICT through grants, credits, leasing options, and tax incentives. To encourage SMEs to use ICT equipment to increase productivity, the Japanese government allows corporations to deduct up to 6 percent of total lease payment on brand-new machines from annual income tax payments. The government also subsidizes up to 25 percent (with a cap at JPY 2.5 million) lease payments for corporations in agribusiness management, lumber supply, and aquaculture. The government can also rent software. For example, the ICT Ministry of Thailand created the Eua Athon Software Project that allows registered SMEs with around THB 300,000 to rent software for a monthly rental fee of THB 500. SMEs interested in renting software can download a freeware version at <http://www.smese.net>. The Ministry is also expanding the available software from 160 programmes to 1,000. Additionally, governments can also encourage the private sector to lend to SMEs and/or innovate on-payment options. For example, pay-as-you-go models are better suited for SMEs than a high one-time payment.

Legal framework

The government needs to take the initiative to establish the legal framework. Singapore, for example, passed the Electronic Transaction Act 44 and Electronic Transactions Regulations 45 between 1998 and 1999 to legitimize electronic signatures in the legal framework. This provided a foundation for key public and private sector leaders, including the Monetary Authority of Singapore, Cisco Systems, and Visa International, to develop more secure e-payment services over a public key infrastructure.

International organizations

International organizations can offer regional knowledge-sharing and training workshops, provide funding support, help build local capacity, and organize technical cooperation arrangements between countries within the region. For example, UNESCAP created the Asian and Pacific Centre for the Transfer of Technology (APCTT) to promote the transfer of technology to and from SMEs in the Asia-Pacific region. The Association of Southeast Asian Nations (ASEAN) has hosted the e-ASEAN Public Key Infrastructure Forum, the Cyber laws seminar, and e-commerce

programmes to create business environments that support e-commerce development in the region and SMEs in international trade. It has also published a framework to assist countries with the development of e-commerce legislation. The International Network for SMEs (INSME) is an international association with a mission to stimulate transnational cooperation, and public and private partnership in the field of innovation and technology transfer to SMEs.

Local industry associations

Local industry associations can leverage their existing membership base to diffuse information and create programmes. Their specific know-how of the industry can help create workshops that are more relevant to the needs of SMEs and can highlight industry-specific benefits. They are a key local partner in encouraging ICT adoption by industry.

Chambers of commerce

Similar to industry associations, governments can use their network and membership base to diffuse information and implement programmes. For example, the National Productivity Council (NPO) of Pakistan and the Karachi Chamber of Commerce and Industry (KCCI) are working together to provide SME consulting, financing, and training free of charge (and at times, training abroad) in order to boost the productivity of its industries. The role of KCCI is to mobilize its members to participate in the NPO workshops and provide in-depth industry information.

Local NGO/SME support agencies

Local NGOs and other SME support agencies can also help implement various programmes. For example, they can create portals, provide training programmes, help organize entrepreneurs at the grass-roots level, and provide low-cost or free ICT consulting services for SMEs. In conclusion, the overall strategy targets entire industries that are most likely to benefit immediately from ICT, increases awareness on industry-specific and concrete benefits, decreases barriers to ICT adoption, creates locally relevant resources online, and partners with other organizations.

It is in the interest of governments within the Asia-Pacific region to fully ensure the relevant adoption of ICT within their SME sectors to both increase their internal efficiency and productivity, as well as facilitate their entry into the global marketplace. The obvious benefits of increased job creation, public revenue, and a general rise in the standard of living provides enormous opportunities to narrow social and economic inequalities, thus helping to achieve broader national development goals.

To stimulate the adoption and utilization of ICT by SMEs, developing countries within the region have deployed a wide range of policies, and have launched many different actions and ad-hoc initiatives. However, more often than not, other policy areas where ICT plays an important and complimentary role – such as in trade and investment, education, infrastructure, law, and national security environment – have been neglected. What is currently required within the Asia-Pacific region is a coherent and comprehensive host of e-strategies that are both practical and relevant, and that

consist of actions, priorities, implementation, and resources that operate on a cross-sectoral basis. It is without a doubt that the harmonizing of these ICT and SME strategies and initiatives within a larger cross-sectoral economic development would perhaps be one of the biggest challenges governments will continue to face within an ever-evolving digital economy.

In line with this, there are three key essential recommendations for governments to take into consideration while developing their initiatives to encourage the adoption of ICT by SMEs:

Raise awareness of the benefits of ICT;

Strengthen ICT literacy and build capacity in the alignment of business and ICT strategies; and

Create enabling environments for the adoption and growth of ICT firms.

Raise awareness of the benefits of ICT.

One of the key problems facing the Asia-Pacific region has been the fact that many SMEs are not aware of the benefits and the direct financial gains to be attained by adopting ICT. A weak understanding of the potential integration of ICT solutions within business models also leads to a great degree of inefficiency. This scenario is compounded by the fact that there are a large number of competitive ICT products and services available on the market, which causes a great deal of confusion to companies with limited ICT literacy and capacities. In addition, the high cost of acquiring and maintaining ICT solutions further creates barriers to their adoption. Governments could assist in creating awareness and reducing the psychological barriers to ICT acquisition by showcasing SME success stories, best practices, and benefits gained through ICT adoption.

By clearly demonstrating the modern systems approaches to ICT/business integration, the failure rate of ICT adoption by SMEs can be reduced. For example, Enterprise-wide Business Process Management (EBPM), representing the third wave of Business Process Management, is a deliberate and collaborative approach to systematically manage all of a company's business processes. It facilitates seamless integration of ICT solutions into a business model. In addition, business approaches such as Business Technology Management (BTM), an emerging management science grounded in research and practice, demonstrate methods to unify decision-making from the boardroom to the ICT project team.

SPECIFIC POLICY RECOMMENDATIONS FOR GOVERNMENTS

Specific actions that governments could consider exploring are:

Providing financial or non-financial support to business organizations that promote best practices in the field of ICT/business integration;

Organizing annual Business-Technology Alignment Award programmes;

Generating and promoting SME success stories, emphasizing benefits gained from ICT adoption and integration; and

Providing financial and non-financial support to Software as a Service (SaaS) firms that give SMEs access to latest software without incurring high up-front capital costs.

Strengthen ICT literacy and build capacity in the alignment of business and ICT strategies.

The lack of ICT literacy is a major problem affecting all sectors of the economy in every part of the world. When business and technology are managed on two different tracks, companies spend a large part of their revenues on technology, and most of them are not satisfied with the return on their investment. Such expensive failures have led many observers to question whether ICT can ever produce a defensible long-term competitive advantage. While any business today should take full account of the impact of advances in ICT, the organization's ICT strategy should be dominated by its business vision and strategic direction. Business principles, from which ICT implications can be drawn, should form the basis of the organization's ICT policies and investment guidelines.

One commonly used methodology is the ICT/Business Alignment Cycle, which introduces a simple framework that the ICT organization can adopt to manage a broad range of activities. The four phases of the cycle are: plan, model, manage, and measure. Governments could assist by organizing capacity building workshops targeted to SMEs and focusing on the following:

Ensuring that ICT investments focus on the real needs of the business;

Enabling more effective communication between business and ICT functions at a strategic level;

Ensuring that the ICT function plays an appropriate role in creating value within the business; and

Establishing an Internet-based advisory or e-coaching service on advanced ICT solutions, ICT/business integration practices, establishment of virtual offices, and virtual business units.

Create enabling environments for the adoption and growth of ICT firms.

The third and final recommendation revolves around the role for governments to create enabling environments for the adoption and growth of ICT firms. Such firms would be able to develop and design customized software and services that respond to the localized needs, and downstream requirements of SMEs. As the marketplace is a highly competitive area, possible actions to reduce market-entry barriers for start-up ICT firms could include:

Establishing and supporting business incubators that specialize in growing ICT firms;

Establishing business parks for ICT firms;

Providing financial and non-financial incentives to start-up ICT firms; and

Providing tax incentives to SMEs that buy ICT products and services from local firms.

It can be concluded that developing countries in the Asia-Pacific region have a tremendous potential for rapid and sustainable economic and social development by leveraging the potential of ICT and applying it appropriately within the SME sector. However, governments must continue to play an active role in encouraging and promoting the use of ICT while ensuring that coherent enabling policies are in place, and that capacity building and skills development are fostered in order to attain national socio-economic goals, for the benefit of the wider population.

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