The development of e-commerce in Singapore

The impact of government initiatives

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Abstract With the advent of Internet technology and its rapid growth during the last few years,
electronic commerce has become an increasing reality. While e-commerce still constitutes a small
part of many countries' economies, it is seen by many as an opportunity to reduce cost and
improve productivity. This is true, as many economies are transferring themselves into
knowledge-based economies, where information and innovation are the competitive instruments.
Singapore as a small country with limited natural resources realized the importance of the new
economy and the need to position itself as an information and knowledge hub in Asia. The
government has taken an active role in the establishment of an e-commerce infrastructure. The
government's vision is to build a premier service hub in the region with global orientation, and
focusing on new high growth hub services. This paper reviews the development of e-commerce in
Singapore and studies its impact on the development of the information society in Singapore.

Introduction
The Web and the Internet make tremendous impacts on society, particularly its
effect on the way companies conduct their business and activities. In the
knowledge-based economy, many organizations are forced to re-think their
business strategies and move away from the traditional approach to organizing
and measuring their economic activities. They are forced to adopt new and
more innovative ways of maximizing the use of information technology and the
Internet in their business activities. Improving productivity, reducing cost and
enhancing customer support are some of the key competitive factors in any
successful enterprise. Geographical locations and size of operations are no
longer important factors, as small companies are now able to sell their products
on the Internet and penetrate new markets in a very short time.

Singapore is a small country with a population of about four million. It has a
small market and limited natural resources that made it almost impossible to
depend on these resources for its growth. Prompted by the advances in the
Internet and the Web, Singapore is entering the information age, where
knowledge has become recognized as being the major force behind its
competitive success. The Singapore Government has recognized the importance
of knowledge assets in the new economy and the need to invest in its people to
remain competitive. As a result, the government encourages organizations to
make use of the available infrastructure to increase productivity and efficiency
in their operations. With Singapore positioned as an information gateway in the
region, the country’s aspiration to become a global hub is attractive to many organizations with global operations. The Singapore Government has initiated the e-commerce plan to promote e-commerce and to encourage business to take advantage of the existing e-commerce infrastructure. The Government in cooperation with the National Computer Board, now known as the Infocomm Development Authority of Singapore (IDA), has facilitated the e-commerce infrastructure and operation in Singapore (www.ec.gov.sg).

E-commerce is the use of inter-networked computers to create and transform business relationships. A broad definition of e-commerce is that it is dependent on the digital communication and information technology (Kardaun, 1999). E-commerce is expected to lead to a simpler and more efficient way to conclude a business transaction. It is commonly associated with the buying and selling of information, products and services through the Internet. This business definition of e-commerce can be broader or narrower. The broader terms used are usually e-business, or e-commerce in a narrower sense. Key to the narrower definition is the transactional aspect (Colecchia, 1999). E-commerce is defined as including any form of commercial transactions of goods and services of any kind, conducted over computer networks, whether they are open or closed networks (Wong and Lam, 1999).

**Government initiatives on e-commerce**

The Singapore Government has taken an active role in the establishment of the e-commerce infrastructure. It played the role of catalyst to initiate and encourage the private sector to take part in developing e-commerce. As the Singapore Government recognizes the potential of e-commerce and its impact on the economy, it is taking the leading role in implementing and using e-commerce.

The rapid deployment of the Internet in Singapore is the result of a concerted planning effort by the Government to develop a National Information Infrastructure (NII) and promote the use of information technology in all sectors of society (Chaudhry and Al-Hawamdeh, 1998). The Singapore Government has used information technology to stimulate economic growth and achieve national competitiveness. A comprehensive information technology plan called “IT 2000” was launched in 1991 as a framework to guide Singapore IT development into the twenty-first century (National Computer Board, 1992). This plan seeks to transform Singapore into an intelligent island. In line with the vision of the “IT 2000” plan, an advanced National Information Infrastructure (NII) has been developed to link computers and other information appliances in homes, offices, schools and factories across the country. To support the services envisioned in the national IT plan, a unique project called “Singapore ONE” has been undertaken for the development of a nation-wide broadband infrastructure that will deliver multimedia services to end-users at high speed (www.s-one.com.sg). This network is expected to provide excellent communication support to exploit electronic information in the country. Recently a plan has been introduced for e-commerce and business applications of the Internet (Figure 1).
Electronic commerce hotbed

In cooperation with the National Computer Board, the Government has launched the Electronic Commerce Hotbed (ECH) program, which provides a Web site hosting comprehensive information on e-commerce in Singapore (Figure 2). It is an initiative to address pressing issues related to e-commerce promotion and implementation. The approach used is to pool the resources of the major stakeholders of electronic commerce, such as technology companies, merchants, infrastructure providers, policy makers and researchers. Together
with the industry partners such as IT companies and financial institutions, the
government has developed infrastructure to support e-commerce, such as online
banking, online payment systems and other intermediary e-commerce services.

The electronic commerce hotbed focused on seven major areas (Electronic
Commerce Promotion Group, 2000). These areas include:

1. **Deploy show-case applications.** These show-case e-commerce
   applications are being deployed through partnership efforts.

2. **Address policy concerns.** Enabling e-commerce raises many legal,
   regulatory, trade, financial and economic issues. A Policy Committee
   has been established to address these issues. The committee is chaired
   by the Monetary Authority of Singapore (MAS).

3. **Resolve uncertainties.** A technical framework for emerging solutions and
   services is being created. These will serve as tools to help organizations
   plan for electronic commerce. Pilots are used to evaluate key
   technologies and to prepare the industry for international competition.
   Technical standards in electronic commerce are also being established
   through the National Information Infrastructure (NII) Standards
   Program.

4. **Institute into infrastructure.** This is where directory, identification,
   security and payment services are being set up to support and speed up
   the adoption of e-commerce.

5. **Educate and train.** Education and training programs include high-level
   envisioning and strategic planning workshops for senior business
   executives, technical sessions for the IT industry and awareness
   programs for the public. Courses are also being offered under the Critical
   IT Resource Program (CITREP).

6. **Provide incentive schemes for innovation.** Risk- and cost-sharing
   schemes are in place to help the local industry embark on innovative
   e-commerce projects.

7. **Establish international linkages.** To position Singapore as an e-commerce
   hub, strategic alliances with international counterparts are being
   established.

The program aimed at helping companies and other organizations in the
following ways:

- Developers can now locate and obtain toolkits and software support for
  infrastructure technologies easily. This means that businesses and
  technology companies can focus on developing their services.
- Businesses, technology companies and infrastructure providers can use
  the ECH pilots to establish the feasibility of e-commerce technologies.
- All players in e-commerce now have a platform and channel for raising
  and solving policy issues.
Singapore e-commerce master-plan

This e-commerce master-plan was launched in September 1998, to drive the pervasive use of electronic commerce in Singapore, and to strengthen Singapore’s position as an international e-commerce hub. The target is to have S$4 billion worth of products and services transacted electronically through Singapore, and 50 per cent of businesses to use some form of e-commerce by the year 2003 (IDA, 1997).

There are five main thrusts in the e-commerce master-plan. The five main thrusts are:

1. To develop an internationally linked e-commerce infrastructure. This thrust aims to strengthen Singapore’s position as an e-commerce hub. It focused on the role of financial and logistics sectors in driving this thrust. The role of the financial sector is to provide efficient electronic transactions between businesses. And the role of the logistics sector is to put a well-connected logistics infrastructure in place to support the requirements for delivery of physical goods. This will position Singapore as a center of e-commerce infrastructure development, where international infrastructure players in areas such as trading platforms, trust management and rights management systems will hub to develop and deploy services here.

2. To jump-start Singapore as an e-commerce hub. This initiative will focus on the sectors in which Singapore has an inherent advantage as a hub, especially in business-to-business services. These advantages include a stable and excellent financial infrastructure, a transport and logistics infrastructure that is well-known for its efficiency, and strong telecommunications connectivity and e-commerce infrastructures. Incentive schemes and other support programs will be used to attract international and local companies to base their e-commerce hub activities in Singapore.

3. To encourage businesses to use e-commerce strategically. This thrust aims to help businesses exploit e-commerce to enhance their productivity and competitiveness. These will be achieved through many education and other support programs. Simple and easy-to-use trading platforms are being provided, and a usage promotion drive will be launched to bring about widespread participation of SMEs.

4. To promote usage of e-commerce by the public and businesses. This thrust will enable Singapore citizens and businesses to enjoy the benefits that e-commerce can bring and, at the same time, create an e-commerce-savvy culture. Mass education efforts will be used, in which e-commerce will be taught in business and professional courses in tertiary education institutions.

5. To harmonise cross-border e-commerce laws and policies. This thrust is key to enable businesses to trade confidently with overseas partners.
Besides putting in place legislation that is internationally consistent, Singapore will work with its major trading partners to align one another’s e-commerce laws.

These five thrusts will be implemented through specific programs and projects. A key supporting program is Singapore’s efforts to become a leader in the emerging and dynamic e-commerce scene. In particular, the Department of Statistics is leading an initiative to measure the growth of the e-commerce services sector, the contribution of e-commerce to growth in GDP and the volume of goods transacted through e-commerce. In addition, research for e-commerce would be expanded to include policy research as well as market research. Partnerships with academia and industry to jointly sponsor and contribute to research would be sought.

Local enterprise e-commerce program
To encourage adoption of e-commerce by industry, the government provides various assistance schemes and also proactively builds greater awareness and deeper understanding on the use of e-commerce. In conjunction with the rapid growth of e-commerce in Singapore, the government launched the Local Enterprise E-Commerce Program in November 1998 to build up e-commerce applications and encourage local companies to implement e-commerce in their business operations. A total budget of S$9 million was set aside to assist those companies. The program provides 50 per cent funding of cost incurred by the companies that implement e-commerce in their business operations.

To strengthen its support for e-commerce development in Singapore, a four-pronged approach has been taken by the government to bring about pervasive and strategic adoption by industry (Chen, 1999). This approach is:

1. To encourage academia, consultants and businesses to take up thought leadership projects on Singapore and the region. The government has established a research agenda, and will provide seed funding for work in these areas.

2. Government will build up research capability by encouraging leading e-commerce research companies to be based in Singapore. It will also encourage local establishments to link up with international research centers in order to learn from others and to share expertise.

3. To facilitate and generate forums for discussion on the latest thinking on the e-commerce concept and its implementation.

4. To assume greater leadership at international policy forums on e-commerce.

The role played by government should be able to create an environment for successful competition and to encourage but not necessarily force investment. It must abolish many possible restrictions on market entry and ensure that the market is fair for all operators and services providers. In other words, it is necessary to have a regulatory framework that will promote investment in
innovative technology and adoption of e-commerce, and to foster the creation of new products and services.

Approved cyber-trader scheme
In order to realize the goal of becoming an international e-commerce hub, the Singapore Government introduced the Approved Cyber-Trader Scheme (ACT), to encourage local and foreign companies based in Singapore to use the Internet for their offshore trading and to base these trading activities in Singapore. The objective of the ACT scheme is to promote Singapore as the region's e-commerce hub by anchoring e-commerce core players in Singapore and helping local companies to regionalize.

Approved companies will enjoy concessionary tax incentives on offshore income derived from transactions through the Internet. To qualify, companies are expected to invest in and use Singapore as the base for electronic commerce activities. In this case, e-commerce is more than simply setting up a Web site and getting orders through e-mails. The infrastructure to fulfill orders, market the products, provide for online after-sales assistance, secure transacting etc. must be in place to qualify for this scheme.

Singapore electronic transaction (SET) project
The Singapore electronic transaction (SET) pilot, jointly sponsored by Citibank, IDA and Visa and MasterCard, was launched in September 1996 to help secure the use of credit cards in electronic payment in Singapore (Kanagasundram, 1998). The SET project formed an important part of the ECH Program, to speed up the realization of e-commerce.

SET addresses consumer, merchant and member concerns over the security of the Internet shopping and provides the infrastructure that will enable electronic commerce to grow. Under the SET project, thousands of Visa cardholders in Singapore will be able to safely purchase goods or services over the Internet from dozens of participating merchants.

Success factors
There are many major changes nowadays in the way organizations and businesses conduct their business activities in Singapore. Many organizations have their own Web site and sell products or provide services to customers through their Web site with the support of Internet technology. This has been the result of the implementation of the e-commerce concept in their business activities.

With the e-commerce initiatives, the result seen today is that many businesses in Singapore are tapping into existing e-commerce platforms to enable their online businesses. More and more small and medium-sized enterprises are making use of the e-commerce infrastructure. For example, in the book and stationery trade sector, they are now making use of the Internet to improve their business competitiveness using the Booknet trading platform (www.Booknet.com.sg). Retailers, distributors and publishers are already using the system, which is an integrated solution that includes software for the
point-of-sale, inventory management, order processing, purchase order, sales analysis, accounts payable, accounts receivable, general ledger and an e-commerce gateway. In grocery retail, shops and suppliers are making use of the ShopNet trading platform (www.ShopNet.com.sg). This system helps retailers and suppliers to improve productivity through electronic commerce over the Internet (Figure 3).

In 1999, an InfoComm Manpower Survey found that there is high demand for infocomm manpower in Singapore (www.ida.gov.sg). Averaging 10,000 jobs per year, jobs in the area of e-commerce development experienced the highest growth rate. This showed that more and more businesses in Singapore are implementing e-commerce. Another study by PricewaterhouseCooper found that most SMEs identify e-commerce as an important factor to improve customer services and exchange of information. This study also predicts that more SMEs will adopt e-commerce applications as a result of the government’s effort to encourage the private sector to adopt e-commerce (Shapiro, 1999). A survey on “ICT adoption by businesses in Singapore” found that most businesses in Singapore have been implementing IT in their business activities during the last few years. Over 80 per cent of the organizations surveyed have access to the WWW and over half of the organizations have implemented e-commerce in their businesses.

The Center for Management Innovation & Technopreneurship in the NUS survey on business-to-business e-commerce in Singapore found that over 73 per cent of the companies surveyed have corporate access to the Internet and over one-third of the companies have implemented business-to-business

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Figure 3.
ShopNet Web site
e-commerce (www.fba.nus.edu.sg/cmit). Companies that are already procuring via the Internet are fairly upbeat about the growth prospects of their e-commerce trading activity. Around 95 per cent of companies expected an increase in their e-commerce transaction value over the years. About 25 per cent expected procurement value to grow by more than 50 per cent. Companies that are already selling via the Internet showed optimism about the growth potential of their e-commerce sales transactions with their business partners. All of them expected an increase in their sales value over the years. About 19 per cent expected the sales value to grow by at least 50 per cent.

So far, the government e-commerce initiatives have showed significant positive results today, as more and more companies are implementing e-commerce business applications in Singapore. The government’s e-commerce objective to position Singapore as a global e-commerce hub will likely soon become reality with the advent of technology and the government’s efforts to promote e-commerce and encourage businesses to take part in it. With the e-commerce infrastructure available and already in place there will be more companies to adopt e-commerce in Singapore, as predicted by several studies mentioned earlier.

**Impact of e-commerce on the information society in Singapore**

E-commerce brings public administrations closer to society. It improves and extends services provided to the community and makes them accessible to everybody. An active public sector in the information society will provide better services to the community as well as offer the chance to develop new products and services, which could also be of advantage on the global market. This will have an impact on the economy, social welfare and cultural aspect.

The Singapore Government has undertaken a major review of the way they do things and how the public sector can harness infocomm technologies. This is reflected in the e-government action plan, which aims to better serve Singaporeans in the new knowledge-based economy. E-government is an important pillar of the InfoComm 21 plan to help Singapore make the transition to the new knowledge-based economy (www.ida.gov.sg).

Determining the economic and social impacts of e-commerce is a question of monitoring and measuring changes in society. There is a risk that the rapid incorporation of IT technology will, in the short term, result in job losses for certain qualified personnel and lead to structural unemployment. In the medium and long term, it will eventually contribute to job creation, particularly in new areas such as media creation and information services. The products and services of the IT industry are changing. With the emergence of multimedia services, many organizations nowadays implement e-commerce to provide faster and more efficient services in the new economy in order to survive in global competition.

As mentioned earlier, studies have showed that there will be higher demand for workers in the e-commerce area, in which employment is among the top five jobs in the future. Therefore, the impact of e-commerce on employment is that
individuals are being forced to enrich themselves with necessary IT skills as well as e-commerce understanding. People are willingly forcing themselves to learn more about IT and to become more Internet-savvy. Eventually, this will likely lead more and more people being trained in this IT sector, and will create a change from the industrial society to information society. Technological innovation will also cause fundamental changes in enterprise organizations. Future evolution will be based on the externalization of non-strategic activities to foster greater flexibility and development of economic intelligence in companies, which will enable them to anticipate market trends. With the emergence of the e-commerce and information technology, companies are being confronted with tougher competitive pressure on the local market, which is forcing them to adapt their advertising and commercial strategies as well as their customer strategy.

E-commerce offers the opportunity to small and medium-sized enterprises to take on and compete with larger enterprises. Small companies, despite their size, can also have a global presence through their Internet site, which is a cost-effective medium to expand the organization’s network and provide immediate awareness in the market. E-commerce serves as a catalyst for competition in the global marketplace. It is a key concept that will help business to be more competitive in the marketplace. New competitors will attempt to use e-commerce to carve a niche in the market. By capturing the lower transaction costs associated with e-commerce, companies are able to enhance competition through cheaper communication and information. Therefore, e-commerce will help businesses to increase efficiency in conducting their activities, and will also force them to adopt it in order to be able to remain competitive in the marketplace.

Information is increasingly recognized as the fundamental source of wealth in the knowledge economy. A major concern from the emergence of information technology and e-commerce is that market forces may lead to a concentration of investment in high bandwidth infrastructure. This area appears to be the most profitable sector in this new economy, offering value-added services to people in this area, which subsequently will be detrimental to those outside it. Therefore, technology changes may threaten cultural values in the society. In the Singapore context, people are more open to market forces. Therefore it is inevitable that Singapore will enter the new information age, and Singaporeans will have to be prepared for this information society.

As a result of e-commerce implementation and its wide implementation in Singapore, the government introduced the e-ambassador program (www.ida.gov.sg). E-ambassador refers to the involving of the early adopters of infocomm technology in order to help the late adopters and the uninitiated to become comfortable and adept at using technology. The program has created awareness of infocomm-savvy people to share their knowledge and volunteer in guiding those late adopters of infocomm technology. In relation to the development of an information society in Singapore, this has resulted in more
and more Singaporeans becoming familiar with information technology, as it moves toward the information era.

**Conclusion**
The Singapore Government has taken an active role in the establishment of e-commerce infrastructure. It played the role of catalyst to initiate and encourage the private sector to take part in developing e-commerce. With the e-commerce initiatives, the result seen today is that many businesses in Singapore are tapping into existing e-commerce platforms and infrastructure to enable their online businesses. Statistics and fact finding by various organizational bodies have shown that the trend to adopt e-commerce by private sectors is promisingly high and these organizations also have gained benefit from the government e-commerce plan. The government e-commerce’s objective to position Singapore as a global e-commerce hub is becoming reality with the advent of technology and the government’s efforts to promote e-commerce and encourage businesses to take part in it. The impact of the e-commerce initiatives has resulted in changes in society. The impact not only is in changing the way organizations conduct their business activities but also in having changed society’s mindset of information communication technology, which eventually facilitate shifting the trend from being an industrial to a knowledge- and information-based society in Singapore.

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