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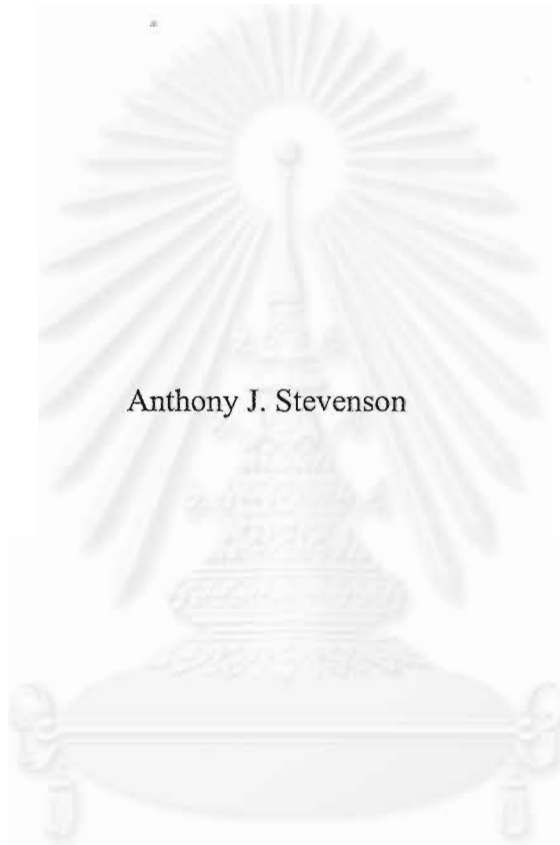
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THE ROLE OF E-COMMERCE IN THE DEVELOPMENT OF THE
ECONOMY IN THAILAND: BRIDGING THE DIGITAL DIVIDE



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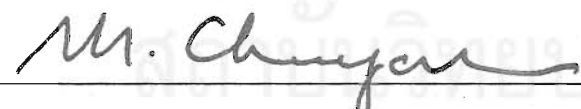
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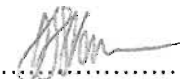
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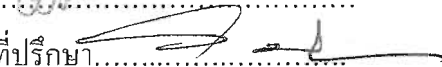
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ในสังคมปัจจุบันมีการพัฒนาทางเทคโนโลยีอย่างกว้างขวาง ทำให้มีการใช้อินเทอร์เน็ตเพิ่มมากขึ้น ซึ่งถือเป็นการเชื่อมโยงการสื่อสารทั่วโลกอย่างแรกอินเทอร์เน็ตทำให้มีการสื่อสารกันอย่างแพร่หลายจนกระทั่งคำว่า “โลกาภิวัตน์” เป็นคำที่กล่าวขวัญกันในสภาวะแวดล้อมใหม่นี้ แต่อย่างไร โลกจะเป็น “โลกาภิวัตน์”

วิทยานิพนธ์นี้มีจุดประสงค์เพื่อแสดงและอภิปรายถึงการพัฒนาเทคโนโลยีสารสนเทศว่ามีผลกระทบต่อประเทศไทยอย่างไร ประเทศไทยมีความก้าวหน้าหลายด้าน แต่จะนำความก้าวหน้านั้นมาทำให้เกิดประโยชน์แก่ประเทศได้อย่างไร และผลลัพธ์คืออะไร วิทยานิพนธ์นี้ศึกษาความเปลี่ยนแปลงทางเศรษฐกิจ และอิทธิพลในระดับท้องถิ่นและระดับโลกที่มีต่อสังคมไทย

จากอินเทอร์เน็ต และสถิติแบบง่ายต่อการรวบรวม ทำให้มองเห็นจุดบกพร่องที่สำคัญบางจุด วิทยานิพนธ์ได้ศึกษาจุดบกพร่องนี้อย่างละเอียด และจากการศึกษานี้ทำให้เห็นว่าโลกในยุค “โลกาภิวัตน์” ดูเหมือนจะให้ความสำคัญบางเรื่องและไม่ให้ความสำคัญบางเรื่อง จุดบกพร่องหลักที่เห็นเด่นชัด คือ ดิจิทัล ดิวย (Digital Divide) ซึ่งเป็นช่องว่างระหว่าง “การมีเทคโนโลยีสารสนเทศ” และ “การไม่มีเทคโนโลยีสารสนเทศ” ดิจิทัล ดิวย มีผลกระทบต่อประเทศไทยใน 2 ประการ ประการแรก คือ ระหว่างประเทศ และโลก อุตสาหกรรม ประการที่สอง คือ ระหว่างประชากรเมืองหลวง และประชากรชนบทที่อยู่ในประเทศไทย วิทยานิพนธ์นี้นำเสนอข้อโต้แย้งที่ว่า ดิจิทัล ดิวย เป็นเพียงการขยายช่องว่างระหว่างคนรวย และคนจน โดยการวัดช่องว่างในเชิงธุรกิจแบบขยาย เพื่อจะลดความแตกแยกในระดับนานาชาติ และระดับท้องถิ่น จุดสนใจควรอยู่ที่พาณิชย์อิเล็กทรอนิกส์ (E-Commerce) เพื่อนำไปสู่อินเทอร์เน็ต มีการตรวจ สอบเพื่อค้นหาบทบาทปัจจุบันของพาณิชย์อิเล็กทรอนิกส์ และทุกส่วนของสังคมว่าทำงานร่วมกันอย่างไร เพื่อจะดูว่าประเทศไทยจะตอบสนองอย่างไรต่อการท้าทายในยุค “โลกาภิวัตน์” มีการสำรวจเกี่ยวกับการพัฒนาพาณิชย์อิเล็กทรอนิกส์ของประเทศไทยอย่างใกล้ชิดยิ่งขึ้น เพื่อดูว่าพาณิชย์อิเล็กทรอนิกส์ส่วนใด จะประสบความสำเร็จมากที่สุดในประเทศไทย จากวิทยานิพนธ์นี้ จะเห็นได้ชัดเจนว่าประเทศไทยต้องส่งเสริมพาณิชย์อิเล็กทรอนิกส์ต่อไป ถ้าประเทศไทยต้องการจะพัฒนาไปพร้อมกับโลกที่พัฒนาไปอย่างไม่หยุดยั้ง

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Modern society has recently seen a great leap in technology which has led us into the proliferation of the Internet, the world's first global communications link-up. The Internet has opened up communications to such an extent that the term 'Globalisation' has become the catchphrase in this newly emerging environment. But how global is this 'Globalisation'?


The purpose of this thesis is to show and discuss how modern Information Technology (IT) developments have affected Thailand. There have been major advances but how have these been utilised in Thailand and what has been the result. This thesis attempts to examine the changing economy and looks at the influences both locally and globally on Thai society.

It can be seen that through the Internet and its highly accountable and easily compiled statistics that certain flaws have come to light. This thesis probes these flaws in closer detail and from this it can be seen that 'Globalisation' seems to favour some more than others. The main flaw highlighted has become known as the Digital Divide, the gap between the 'IT haves' and the 'IT have-nots'. This 'Digital Divide' can be seen to affect Thailand in two ways. The first way is between Thailand and the industrialised world and the second is between the urban and rural populations within Thailand. This thesis puts forward the argument that the Digital Divide is only an extension of the gap with between the rich and the poor. By measuring this gap in these rough economic terms, in order to reduce this divide both internationally and locally the focus must be on E-Commerce, trade through the Internet. The current role of E-Commerce and how all sectors of society are working together are investigated in order to see just how Thailand is responding to this 'Globalisation' challenge. Thailand's current E-Commerce developments are scrutinised a little more closely to see in which areas of E-Commerce would be most successful for Thailand. From this thesis it becomes clear that Thailand must continue to push forward E-Commerce initiatives if it wishes to keep up with global developments.

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CHAPTER 1

INTRODUCTION

Rationale

One of the most important social changes in recent history in Thailand is the introduction of modern technology especially Information Technology (IT) and ways of using this newly introduced technology. As such, one of the interesting areas to study is how their modern society has been changing through the introduction of the Internet and E-Commerce.¹ Particularly the widening schism between the ‘haves’ and ‘have-nots’ in the global and local societies.

There have been few studies made, and little has been written in English, on the introduction of E-Commerce in Thailand. Though some scholars are noted for their contributions such as Somkiat Tangkitvanich and Thaweesak Koanantakul, the extent of research that has been carried out has been only of a very limited nature. Therefore, it is of my interest to look into the very dynamics of Internet and E-Commerce development in Thailand and examine the changes its introduction can possibly bring to Thai society.

Throughout its history Thailand has depended on agriculture as the mainstay of its economy. Even now around half of Thailand’s workforce is dependant on agriculture, even more so since the Asian economic crash of 1997.² So how relevant is the introduction of E-Commerce to a country such as Thailand and how can E-Commerce help Thailand’s economy recover from the crash of ’97. The distinguishing feature of the introduction of the Internet and E-Commerce is the way it has exposed a major flaw in the development of international and national society worldwide. Throughout history there has been a difference between the “haves” and “have-nots”, but for the most part this struggle has been hidden under the other traditional factors such as

¹ E-Commerce is the term used for trade through the Internet.

² For an in depth look into the economic crisis it is advisable to read Kirida’s account *Thailand’s road to Economic Crisis* (Kirida, 1997) or that of Pasuk and Cooper, *Thailandis Crisis*, (Pasuk and Cooper, 2000).

religious and ideological belief. The Internet and E-Commerce have exposed a new dimension in the struggle under the guise of the 'Digital Divide'. It is hoped that by embracing the Internet and E-Commerce Thailand can benefit in the modern globalization of the world's economic system.

Objectives

This thesis will attempt to examine Thai society through its external and internal factors which have gained more attention since the introduction of the Internet and E-Commerce. We are led to believe that with the invention of the entity called the Internet, the world is fast becoming a global village, where people are able to communicate instantly with anybody in any part of this planet, but how true is that for most Thai people. There is no doubt that some more than others have benefitted from the technological advances, with some being left behind. An examination is made to determine where Thailand's position is in this so-called "Digital Divide".

The modern global economy is characterised by ever-increasing supply capabilities, ever-increasing global competition, and ever-increasing market expectations. The advances in Information Technology (IT) have revolutionized the global economy in recent years, notably with the internet and the subsequent E-Commerce. This thesis will focus on E-Commerce development in Thailand, whilst looking at how real the 'so-called' Digital Divide is in Thailand. It will also examine how society and the government have reacted in face of these modern challenges and the measures they have taken.

Therefore, this thesis will examine how E-Commerce is developing in Thailand and the dynamics involved since the Internet started to take off in this country in correlation to the social, economical and cultural environment of Thailand. It will also examine how E-Commerce can help to bridge Thailand's Digital Divide. This study will also add a new dimension and understanding of Thai society from a modern perspective. In addition, this research is intended to reflect how globalization of the world's economy through technological advances affects Thailand.

Theoretical Framework

This thesis will focus on E-Commerce development in Thailand, whilst looking at how real the 'so-called' Digital Divide is in Thailand. In order to do so it concentrates on the macro-economics involved. By concentrating on the macro-economical aspects other factors such as political and social ones have only lightly been touched upon. The reason for this is that many of the political and social problems are economical at their roots. As such it will also examine how society and the government have reacted in face of these modern challenges and the measures they have taken to promote E-Commerce within this economical framework.

The point being made is that the Digital Divide is just an extension of the divide between the rich and the poor, basically an economic divide that can be measured in monetary terms. As such with the development of E-Commerce and the projections as to its growth, this has to be the main path in bridging the Digital Divide. It must be said that with globalization, a continuing process, Thailand needs to at least keep pace with developments.

In order to keep pace with these technological developments Thailand needs to try to tackle the Digital Divide. But how can this best be done. This thesis argues that by trying to bring E-Commerce developments to both the rural sector and into industry itself Thailand will be laying the foundations for bridging the Digital Divide both locally and internationally. This thesis does not argue that immediate benefits will automatically boost the economy. It demonstrates that by bringing in advancements that develop E-Commerce the other IT developments must also come along hand in hand. Along with this there will be an assessment as to the current status and whether enough is being done to enhance development.

Based upon the recent technological innovations that are affecting culture and traditions on a daily basis I shall draw upon the most recent and up-to-date information in order to present and argue the factors which are believed to be influencing the changes of the modern economy.

Therefore, this thesis will examine how E-Commerce is developing in Thailand and the macro-economic dynamics involved since the Internet started to take off in this

country in correlation to the social, economical and cultural environment of Thailand. This study will also add a new dimension and understanding of Thai society from a modern perspective. In addition, this research is intended to reflect how globalization of the world's economy through technological advances affects Thailand.

Scope of Study

This thesis will begin with examining how the introduction of the Internet and E-Commerce have created a global IT network. Then by looking more closely at this network the reader will be able to see just how 'global' this global network really is. By examining and studying the Internet and by gathering evidence of its history both globally and locally the reader will gain a better understanding of a major pattern, which has come to light. This is the difference between those at the forefront of these advances in technology and those being left behind, the term that describes this is called the Digital Divide.

With an understanding of the background and usage of the Internet and E-Commerce in Thailand, the important factors in its development are inspected in closer detail. This part will include information on how this split known as the Digital Divide has come to light on a global scale. This chapter then looks at the two ways that this 'Digital Divide' affects Thailand, the first being external, between Thailand and the industrialised world, and the next internal, for the most part between the urban and rural sectors of society. This is followed by an examination of how Thailand has become galvanised to try and solve this problem.

The third part of the thesis will examine E-Commerce itself and how E-Commerce frameworks can be and are used in Thailand. It begins by looking at the history of E-Commerce and how it emerged as a potent development from the Internet itself and became the fastest growing global economical sector in history. Then the impact of E-Commerce on the global and local economies along with the scope of E-Commerce and how it relates to Thailand are probed in greater detail. The chapter continues with an investigation into how the promotion of E-Commerce can help to bridge the Digital Divide, with finally a look at E-Commerce projects that were started within the last year.

The fourth chapter investigates the part played by the National Electronics and Computer Technology Center (NECTEC) in E-Commerce and IT development. It shows how the beginning of the Thai government IT policy was formulated in the mid 1980's with the development of NECTEC. A brief synopsis of its history gives the reader a background into its development. Then there is an examination into some of its various projects, including the Thai E-Commerce Resource Centre (ECRC).

Finally the role of e-commerce in Thailand and how it has matured and grown, along with factors which are holding it back and factors which should facilitate its growth its growth is discussed. This will include a look into e-commerce transactions between businesses (B2B) and transactions between businesses and consumers/customer (B2C).

Sources

Due to the nature of this thesis I have tried gather most of the data and information used from the Internet itself. I have tried to make this an e-thesis, and apart from one or two exceptions this has been done. As the IT industry and the Internet are for the most part English language based, English texts on this subject have been easy to find. As to the ongoing nature of E-Commerce it has been important to keep updating the relevant information as much as possible, because of the fact that this subject is so new it has been difficult to actually find up-to-date publications other than those available over the Internet.

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CHAPTER 2

THE INTERNET

What is the Internet?

The Internet is used by millions of people every day. For these people life without the Internet would be unimaginable. Both figure 1 (below) and Table 1 (page 6) show just how many people were using the Internet worldwide by January 2000. But what are the underlying factors behind the global patterns of Internet usage? In order to gain a full understanding of these factors it is important to look into the background of the Internet and how it began.



Figure 1: The Global Internet Population: Jan 2000.

<http://www.commerce.net/research/stats/wwstats.html>

The internet is an *international communications network*, hence the shortened name *Internet*. It has communication lines crisscrossing each other like the spindles of a

spiders web, and because of this it has also become known as the *World Wide Web* (WWW), or to some just the *Web*.

Many believe the Internet is a new concept, but it actually originated in the 1960s as the Advanced Research Projects Agency Network (ARPANet), funded by the US Department of Defense. ARPANet enabled a global network of government personnel scientists, and researchers to collaborate and exchange critical information with each other

The Internet was designed in part to provide a communications network that would work even if some of the sites were destroyed by nuclear attack. If the most direct route was not available, routers would direct traffic around the network via alternate routes.

<i>January 2000</i>	<i>Total: Millions</i>
<i>Africa</i>	21.0
<i>Asia/Pacific</i>	40.0
<i>Europe</i>	70.0
<i>Middle East</i>	1.9
<i>Canada & USA</i>	120.0
<i>South America</i>	8.0
World Total	242.0

Table 1: Internet population: Jan 2000.

<http://www.commerce.net/research/stats/wstats.html>

The early Internet was used by computer experts, engineers, scientists, and librarians. There was nothing friendly about it. There were no home or office personal computers in those days, and anyone who used it, whether a computer professional or an engineer or scientist or librarian, had to learn to use a very complex system.

E-mail is one of the main global communication paths in the modern world. Its inception was a foresight into the future of the Internet and how global telecommunication systems can be used. E-mail, at the beginning, was adapted for ARPANET by Ray Tomlinson of BBN in 1972. He picked the @ symbol from the available symbols on his teletype to link the username and address. The telnet protocol, enabling logging on to a remote computer, was published as a Request for Comments (RFC) in 1972. RFC's are a means of sharing developmental work throughout community. The ftp protocol, enabling file transfers between Internet sites, was published as an RFC in 1973, and from then on RFC's were available electronically to anyone who had use of the ftp protocol.

The Internet matured in the 70's as a result of the TCP/IP architecture first proposed by Bob Kahn at BBN and further developed by Kahn and Vint Cerf at Stanford and others throughout the 70's. It was adopted by the Defense Department in 1980 replacing the earlier Network Control Protocol (NCP) and universally adopted by 1983.

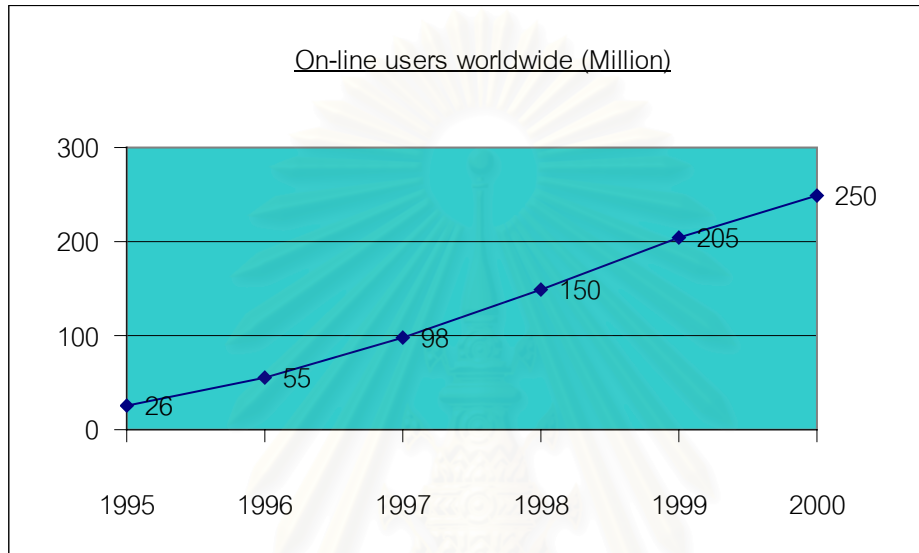
As the commands for e-mail, FTP, and telnet (communication networks) were standardized, it became a lot easier for non-technical people to learn to use the nets. It was not easy by today's standards by any means, but it did open up use of the Internet to many more people, at that time in universities in particular. Other departments besides the libraries, computer, physics, and engineering departments found ways to make good use of the nets—to communicate with colleagues around the world and to share files and resources.

Since the Internet was initially funded by the government, it was originally limited to research, education, and government uses. Commercial uses were prohibited unless they directly served the goals of research and education. This policy continued until the early 90's, when independent commercial networks began to grow. It then became possible to route traffic across the country from one commercial site to another without passing through the government funded NSFNet Internet backbone. This development is significant, because by paving the way for commercial use it would lead to the possibility of trading over the Internet.

Delphi was the first national commercial online service to offer Internet access to its subscribers. It opened up an email connection in July 1992 and full Internet service in November 1992. So, technically this was the beginning of electronic commerce (E-Commerce) as we now know it. Thus by Delphi, a commercial company, selling their on-line services they were involved with commerce over the Internet. All pretenses of limitations on commercial use disappeared in May 1995 when the National Science Foundation ended its sponsorship of the Internet backbone, and all traffic relied on commercial networks. Some of the first internet innovators such as AOL, Prodigy, and CompuServe came online. Since commercial usage was so widespread by this time and

educational institutions had been paying their own way for some time, the loss of NSF funding had no appreciable effect on costs.

Figure 2: Worldwide Internet growth statistics 1995-2000.
<http://www.commerce.net/research/stats/stats.html>



The Internet has since developed into the huge web of intertwining connections between computers that we know today. From its beginnings in scientific labs it can now be accessed in people's own living rooms. As it stands now, the Internet is an international network connecting hundreds of millions of people around the world. Governments, universities, private citizens and, of course, businesses use the Net every day for communication, education, entertainment, and business. The growth since then can be seen in table 2 above, showing online users worldwide from 1995 to 2000. The figures are impressive, but certain underlying factors have led to a global imbalance in the actual usage of the Internet.

From looking at figure 1 (page 5), it can be seen that the figures for the global Internet population do not co-relate to the actual global population. For example, Asia, the world's most populous region with over half the global population, has less Internet population than that of either Europe and America. Why is this? The fact is that the Internet grew from the ARPANet, which was developed in America. The ARPANet

was essentially a network using English language as its base means of communication. This was an extremely significant factor in the development and growth of the Internet. English became the dominant medium of language over the Internet, but by using the English alphabet, languages such as French and German could also be used. The dominance of English on the Internet also meant that many other languages, thus many people, were automatically excluded from joining this new 'elite club'. Just being literate in your own language was not enough. Another factor in this imbalance is that the vast majority of the 'groundbreaking' developments such as, TCP/IP architecture, standardization of communication networks, even the @ in e-mail addresses were initiated in America, subsequently their network was the first to incorporate these improvements. The last main factor was that America was also the first country to commercialize the Internet, which opened the network to the general American population before any other country. These factors combined have resulted in both the English language becoming the language of the Internet and America having, by far, the highest Internet population.

With America being at the forefront of Internet innovation many other countries and many underprivileged people within America itself have been left behind. This resulting imbalance between the so-called "IT haves" and "IT have-nots" is now popularly known as the 'Digital Divide'. According to L. Meyer the term "Digital Divide," was first coined by the U.S. Department of Commerce report 'Falling Through the Net.' (Meyer, 2002)

History of the Internet in Thailand

Dr Srisakdi Charmonman was at the forefront of Thai internet innovation, and it is widely acknowledged that he was the catalyst that sparked the internet revolution in Thailand. How is this so? For him it all started in 1969 when he was the Director of Graduate Studies in Computer Science at the University of Missouri, as well as director of a few research projects for the US National Science Foundation. At this time, the Internet was just being set up and he used it as part of his job. While he was probably the first Thai to use the Internet, it wasn't love at first sight. His first reaction was that it was a waste of time. In fact he said "I ridiculed it, I thought it was useless." (Gillotte, 2000) But he changed his mind once he started to see its potential. In those

days, Dr Srisakdi used a teletypewriter and a telephone handset that plugged into a modem device. All computer power was based in a central computer at a remote location. He typed in his messages and the output was automatically printed out on the teletypewriter, this was a primitive method indeed.

In 1987, the Australian government gave a grant to the Asian Institute of Technology to set up the first Internet service in Thailand. At that time, there was only one telephone line for users, and Dr Srisakdi used it to check email. Not long after, Dr Srisakdi convinced Assumption University to buy a PC and modem and to pay 250 baht a month to get Internet access. But it wasn't until Chulalongkorn University decided in 1990 to give their students access that the Internet really started to become a reality in Thailand. By 1991, Chula became the first international Internet gateway for five universities using a 64K line. A year later, the first Internet "war" in Thailand began when the National Electronics and Computer Technology Centre (see page 12 for a fuller synopsis of the history of NECTEC) received a donation and help from DEC to open its own Internet gateway.³ (Trin 1994) Chula objected and cut them off because DEC was a commercial company. Chula felt that the Internet should only be a tool for students and researchers. As a result, NECTEC started a second international gateway and the Internet revolution was underway. In 1993, Dr Srisakdi proposed to Assumption University that each student and teacher pay 100 baht a month to use the Internet. After much discussion, the university agreed and 20,000 students signed up.

It was around this time that Dr Kanokwan got an Internet connection in her home. She didn't use it at first, but once she tried it out she was soon hooked. Then Dr Srisakdi proposed that they set up a company and offer commercial Internet services. By October 1994, they had visited many government offices to get approval for their project. Then one day they were told they had 24 hours to prepare their final proposal and submit it. It was a close run race, but the two managed to overcome all the stiff conditions and have their proposal ready on time. On October 31, 1994 Dr Srisakdi and Dr Kanokwan were in Vietnam advising the government there how to set up Internet services when they heard that the CAT (Communications Authority of Thailand) board had approved their application. But before they were finally allowed

³ This was engineered by a DEC employee, Trin Tansethi, another of the early internet innovators of Thailand. He subsequently became the president of Internet Thailand.

to go ahead, the CAT insisted on its now infamous demand for a cut of 32% of each ISP's business. They had no choice and KSC, the first commercial Internet company in Thailand, was born.

KSC, the first Internet service provider, offered its service through Assumption University. Some of the first customers later went on to become ISPs as well. Dr Srisakdi said that the company started making money from the first day. All looked like it was going to go well until CAT called one day threatening to cut off access because no official contract had been signed. After hasty meetings, everything was settled and KSC went on to succeed. (Holt, Marc, 2000) The Internet in Thailand had begun.⁴

Year Month	Total International Bandwidth (Mbps)		Total Domestic Bandwidth (Mbps)
	To Thailand	From Thailand	
1992 (Sept)	0.01	0.01	No figure available
1993 (June)	0.13	0.13	No figure available
1995 (Sept)	2.56	2.56	No figure available
1996 (Feb)	5.00	5.00	No figure available
1997 (Aug)	20.94	20.94	222.56
1998 (Aug)	35.75	35.75	333.81
1999 (Aug)	73.50	53.50	340.06
2000 (Aug)	228.25	161.25	573.69
2001 (Aug)	546.00	418.25	881.00
2002 (Mar)	691.26	576.26	1173.26

Table 2: Growth of International and Domestic Bandwidth of Internet in Thailand.

Source: <http://ntl.nectec.or.th/internet/int-bandwidth.html>.

Since that time Internet usage in Thailand has been growing at an amazing rate. The number of Internet users in Thailand as of October 2000 was about 2.3 million, more than double the total a year earlier. But now the figure for January 2002 is just over 3.5 million Thai Internet users. (National Statistical Office and NITC, <http://ntl.nectec.or.th/internet/>) By looking at the chart below, which shows Internet traffic between Thailand and rest of the world (shown in bandwidth, which is measured in Mega-bytes per second Mbps), it can be seen how rapidly the international usage to and from

⁴ For a chronological history of the internet in Thailand go to <http://www.nectec.or.th/users/htk/milestones.html>

Thailand has increased. In September 1992 traffic over the Internet to and from Thailand totalled only 0.02 Mpbs. By August 1999 it had increased to 73.5 to Thailand and 53.5 from Thailand. But in only two years this had increased 546.00 and 418.25 respectively. The increase has been phenomenal over the last three years with the current figures for March 2002 being 691.26 and 576.26 respectively. (see table 2, page 11) The increase in Domestic bandwidth is no less impressive, even though figures only begin in 1997.

There are now 18 commercial Internet service providers⁵ (of which Internet Thailand is the most widely used) and 4 non-commercial Internet hubs.⁶ The usage fee has been driven down dramatically by competition. A typical subscription is pay-per-use, without any monthly fee, at a typical rate of about 10-15 baht per hour. Though it is now possible with some to purchase unlimited Internet time on a monthly or three monthly basis. This is a vast improvement from the early days of the Internet when prices were much higher.



Figure 3: Inside NB Internet, a typical Internet café.
(<http://www.khaosanroad.com/cafes.html>)

The rate of increase of the number of Internet cafes around the country is unprecedented. An Internet cafe is like a shop where people can use the Internet. (see figure 2 on the left) Inside there are just rows of computers. They first started to spring up around 1997-8 and were mostly confined to tourist areas and areas near Universities. In the past two years, new Internet Cafes have sprung up in almost every neighborhood. By The year 2000

any visitor to Thailand would have found a Café within a five-minute walk from their hotel in Bangkok and main provinces. Now in 2002 Internet cafes and shops can be

⁵The 18 commercial Internet service providers are A-net, AsiaAccess, AsiaInfonet, CS-Coms, CWN, Cable&Wireless, Dataline Thai, Far East, Internet Thailand, The Idea, Jasmine Internet, KSC, Loxinfo, Samart, SiamGlobal, WorldNet, Roynet.

⁶ The 4 non-commercial providers are PubNet, SchoolNet, ThaiSarn and UniNet.

found in virtually every reasonable sized village, though it must be said that many of the customers are there to play their interactive PC games. The typical service rate is between 15 baht to 60 per hour, depending on the location of the Café and its clientel. Though the rates charged in the business centres of hotels, tend to be a lot higher. The streetwise tourists tend to either keep their on-line time short or shop around to find the cheapest local Internet café.

Since the Internet was introduced to Chula students in 1990 it seems that it has gone on to thrive in Thailand, especially after the commercialization of the Internet in 1994 opened it up to the general population giving access to all. The recent appearance of Internet cafes, now seen on nearly every street corner, appears back up the figures showing that there has been a great increase in the number of Thai Internet users and showing a large increase in the amount of bandwidth used in Thailand. But these figures need to be scrutinized a little more closely. As with the usage of the Internet internationally, Internet usage in Thailand is also imbalanced.

According to a study by the National Electronics and Computer Technology Center (NECTEC), there is a gap between the 'IT haves' and the 'IT have-nots' in Thailand. Their study showed that people in Bangkok and its neighbouring areas make up over 70.9% of users, with total urban users making up 91%. (see Chart 6, page 21) This report is an indication that Internet growth in Thailand has been fueled by the city dwelling upper echelon of society and confirms the existence of a 'Digital Divide' throughout the whole of Thai society. In reality this report only confirmed what should be common knowledge to most people.

This divide between rural and urban communities and the rich and the poor has always been there, but for the most part it has just been accepted. With no obvious figures to highlight the problem most people just ignored it. The Internet has been instrumental in bringing this gap to everyone's attention. With the facts and figures just a few touches of the keyboard away the Digital Divide can be blatantly seen. But what really is the 'Digital Divide'? and how significant is it?

CHAPTER 3

THE DIGITAL DIVIDE

The Global Digital Divide

As mankind makes progress, the main worry for every country, as well as international organisations throughout the whole world, is the disparity of income or the income gap between the rich and the poor, or to a wider extent, between the developed and developing countries. One thing that the Internet and E-Commerce has done is to highlight these differences between the 'haves' and the 'have-nots' within the current global digital revolution. This has led to the new term called 'The Digital Divide'.

In just about every country, a certain percentage of people have the best information technology that society has to offer. These people have the most powerful computers, the best telephone service and fastest Internet service, as well as a wealth of content and training relevant to their lives.

There is another group of people. They are the people who for one reason or another don't have access to the newest or best computers, the most reliable telephone service or the fastest or most convenient Internet services. The difference between these two groups of people is what has been called the "Digital Divide."

To be on the less fortunate side of the divide means that there is less opportunity to take part in our new information-based economy, in which many more jobs will be related to computers. It also means that there is less opportunity to take part in the education, training, shopping, entertainment and communications opportunities that are available on line.

The Internet, we were told, heralded the shrinking of the world and the creation of the global village. Jane Black enhances that opinion when she tells us that '...from

Manhattan to Madrid, the Internet has fundamentally changed work, recreation, even love.’(Black, 1999) It is true we have access to information on a scale unparalleled in history. However, far from having an intercultural resource reflecting our diverse cultures, we have replicated the world power structure. If anything, the growth of the Internet has had the effect of a widening of an already vast knowledge divide, thus contributing to the growing Digital Divide.

Today, there are 360 million people worldwide who access the Internet. Everyday, almost 100,000 new users log on, most of them based in the developed world. Nearly 80% of Internet users have their home there. In contrast, only 3 million people are online in Africa, out of a population of 800 million. Meanwhile, in South Asia, home of the subcontinent’s new ‘digirati’, teledensity - phones per 100 people, rarely exceeds 2 percent. Millions will live their lives without ever using a telephone, let alone log onto the Internet. According to Jane Black, as recently as 1999, more than 80% of people in the world have never heard a dial tone, let alone sent an email or downloaded information from the World Wide Web. (Black, 1999) Larry Irving, former US assistant secretary of commerce put it more bluntly when he said:

“Think how powerful the Internet is. Then remind yourself that fewer than 2% of people are actually connected.” (Black, 1999)

For example, Africa is rapidly expanding its web pages, and they are being used widely by newspapers, hospitals and NGOs. Yet as a share of the world total the continent has fallen from .25% to .22% of total global Web sites. Telephone penetration is growing, but in some developing countries more slowly than population growth, so per capita telephone use is declining. Half the world's people still have never heard a dial tone. The Internet is widely diffused in North America, but 98% of Latin Americans, 99.5% of Africans and about 98% of Asians are not connected to the Internet. In terms of wealth, the richest three men in the world (two of whom gained their money through the digital economy) have a net wealth greater than the Gross Domestic Product (GDP) of the poorest 47 nations in the world combined. In many of those poor nations, where ethnic conflict is rife, the tools of modern communications have been used to quash rumors and reduce the risk of war, as well as to incite genocide. (Wilson, 2002)

The stark reality is that phone lines, the basis of the Internet connectivity, are still sadly lacking in many third world countries. The United Nations shows in a report in 2001, industrialised countries, with only 15% of the world's population, are home to 88% of all Internet users. South Asia, has around 20% of the world's population, yet only around 1% of these people have ever used the Internet. (U.N., 2001)

The next contributing factor is the fact that American-based sites dominate the web. Yahoo, Geocities, AOL and MSN are among the most accessed sites in the world. All of the most popular portal sites are either US or British based. News sites, directories and hotlists favour Western sites and their authors' value systems. In Fact around 80% of Internet content is in English. (Black 1999) But only one person in ten is able to understand English. This means that even if telecommunications systems were in place, most of the world's poor would still be excluded from the information revolution because of illiteracy and a lack of basic computer skills. So in the African country of Benin, for example, more than 60% of the population is illiterate, and the remaining literate 40% are not literate in English.

We can see that there is a global Digital Divide between the rich industrialized nations and the rest of the world. But how is this related to Thailand? At a seminar in Bangkok the delegates said that the widening digital divide was the gravest concern of Asian countries. The comments from the seminar really summed up the situation in Thailand. On the information technology gap Ryokichi Hirono, Prof Emeritus of Seikei University in Japan, said that "we are particularly concerned about the digital divide between developing and developed countries, and among the poor in our region. ...The divide is generally found not only between regional poor people but also urban and rural people, male and female". (Charoen, 2001)

The fact is that the Digital Divide affects Thailand both nationally and internationally. For Thailand the Digital Divide is growing and it seems to be following the pattern explained in the previous paragraph by Mr Hirono. That the Digital Divide affects Thailand both internally and externally, is explained by Jayasankar Shivakumart, country manager of the World Bank in Thailand:

"A number of indicators have illustrated two forms of digital divide in Thailand: a growing gap between Thailand and regional counterparts in the application of information technology in commerce, academia and society, as well as a gap between rural and urban areas in use of IT," (Charoen, 2000b)

It can be seen from this that Thailand is affected by the 'Digital Divide' in two ways. Firstly, the external or Global Digital Divide, this concerns the gap between Thailand and the rest of the world. Secondly, the internal or National Digital Divide, this is the gap between certain sectors of society within Thailand.

Thailand and the Global Digital Divide

Thailand was a little late in joining the 'Internet revolution', as were many other countries, this has left Thailand lagging behind the leading countries. America is at the pinnacle of the 'Digital Divide', followed by other industrialised countries such as The United Kingdom and Japan. Thailand's position in the 'Global Digital Divide' is below the Industrialised countries at the pinnacle but above many of the under-developed third world countries at the bottom. This seems to indicate that Thailand's position is not necessarily a hopeless one. The main two ways of measuring a country's position are by looking at the figures for Internet usage and personal computer (PC) ownership as a percentage of the countries total population.

Internationally, Thailand, whilst not as far behind as many countries, is also on the wrong side of the digital divide. Kowit Sanandang whilst commenting on the Digital Divide in Thailand, pointed out that the global Digital Divide tends to occur synchronously with the income gap, that is, the digital gap will occur between the rich and the poor and, in most cases, the rich nations and the poor nations. (Kowit, 2001) Most facts and figures back this up. Kowit then looks at Thailand a little more closely commenting that:

“Gauging from what is happening around the world and in the Asian region, the impression is that Thailand is a long way behind in the area of information technology development. Singapore, Malaysia, India, Japan and Korea are ahead of Thailand. The percentage of Internet population in Thailand, for example, is smaller than that of those countries and of course this problem will have to be addressed and measures taken in order that Thailand, both the government and private sector, can improve its information technology society in the future.” (Kowit, 2001)

By looking at table 5 showing Internet users as a percentage of the total population Thailand’s position within the region becomes clearer. In this regional chart it can be seen that Internet penetration in Thailand is comparatively low. The industrialised nations, Australia, Singapore and New Zealand are at the pinnacle of the regional Digital Divide. Thailand is at the lower end of the middle band of nations. The gap between Thailand and its regional neighbours is significant. Roughly 3.6% of Thais, or about 2.3 million citizens, were using the Internet, in the year 2000 compared with

Table 3: Internet Users as a percentage of the population: 1999-2000

Number	Country	1999	2000
1	Australia	27.5%	36.00%
2	Singapore	22.2%	31.2%
3	New Zealand	22.8%	30.0%
4	Hong Kong	14.8%	19.2%
5	Taiwan	9.0%	12.3%
6	Korea	7.1%	10.7%
7	Malaysia	5.6%	8.9%
8	Thailand	1.8%	3.6%
9	Philippines	0.8%	1.1%
10	P R China	0.3%	0.6%
11	Indonesia	0.4%	0.5%
12	India	0.1%	0.2%
13	Vietnam	0.1%	0.2%

Table 3: Source IDC (Thailand)

a global average of 5%, and penetration rates greater than 30% in developed countries in Asia. Thailand’s closest neighbor both physically and in this table, Malaysia, is substantially ahead. Using the latest figure for Internet users provided by NECTEC (<http://ntl.nectec.or.th/internet/>) and population projections for 2002 from the Office of the National Economic and Social Development board, (<http://www.nso.go>.

th/eng/stat/subject/toc1.xls) it can be established that 5.62% of the population were on-line by March 2002.

The basic situation in Thailand as of mid-2001 was as follows, Thailand had 7.75 million fixed lines, a teledensity of 9.71 per cent, 4 million mobile phones, and PC penetration of 2.4 percent. Internet access was started in Thailand in 1991 as a research network funded by NECTEC (National Electronics and Computer Technology Centre). There are 18 commercial ISPs and 4 non-commercial ISPs. The Internet user base is just over 3.5 million users (or 5.6 per cent of the total population). International bandwidth is about 570 Mbps. (Madanmohan Rao, 2001)

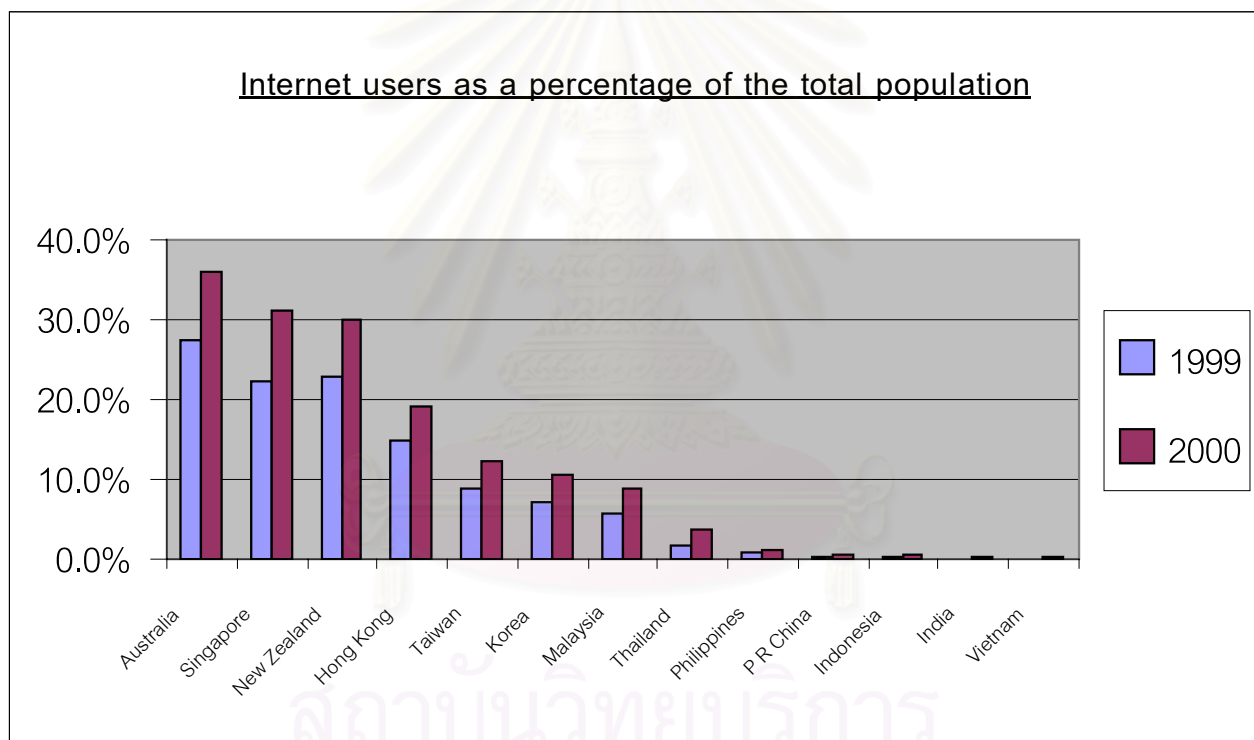


Figure 4: Regional Internet Users as a Percentage of the Whole Population. (Source IDC Thailand)

Arnat Leemakdej says that one of the methods used to indicate accessibility to information is to count the Internet connectivity rate. He further said that more than 120 million people in the United States have direct access to the Internet, 25 million in Japan and 15 million in South Korea. Now take a look at the number of people who have direct access to the Internet in Thailand (800,000), Malaysia (1.5 million) and Indonesia (less than one million). He then asked if the reader could see the difference, pointing out that this is a symptom of the digital divide. (Arnat, 2000) Whilst Arnat

was correct in pointing out these obvious anomalies, and when taking these figures as percentages of the population the gap seems even more daunting for many countries.

Though the situation in Thailand could be better, it does seem that the United Nations is optimistic about Thailand's progress. The United Nations Development Programme placed Thailand in the middle of the pack for countries hooking up to new technologies for accomplishment, the agency said in a report released in November 2001. (Saritdet, 2001)

Thailand was grouped with "dynamic adopters" in a newly-created technology achievement index, which gauged the creation and use of new innovations in 72 countries for national development. The country was ranked 40, ahead of the Philippines and Indonesia, partners in the Association of Southeast Asian Nations (ASEAN), which were in the same group. Finland was the world leader in the top group, which also included Singapore. Malaysia was called one of the potential leaders.

Dynamic adopters are defined as countries which "have high-technology industries and technology hubs" but "the diffusion of old inventions is slow and incomplete". The index was revealed in the UNDP's annual Human Development Report.

Supranee Srichatrapimuk, director of the Human Resources Institute at Thammasat University, attributed the higher ranking to the country's better economic health over the previous year. Although the report praised Thailand for effective use of education in rural development, and for opening up access to information technology to new and disadvantaged users, it also warned of a possible widening of the knowledge gap due to unequal access to new technology. (Saritdet, 2001) This is a direct reference to the situation within Thailand, but what is that situation?

Thailand's National Digital Divide

The Global Digital Divide has left Thailand with a lot of work to do to keep pace with the leading nations, however the situation inside Thailand is no less daunting. One thing about the Internet is that it is easy to collect statistics, NECTEC has been doing that in Thailand. These statistics have brought to light the patterns of the Digital

Divide in Thailand. Though the outcome is not all that surprising, the fact that these statistics are there for everyone to see makes the impact that much deeper. Chart 6, below, highlights the major symptom of the National Digital Divide, namely the gap between the rural and urban population related to Internet usage.

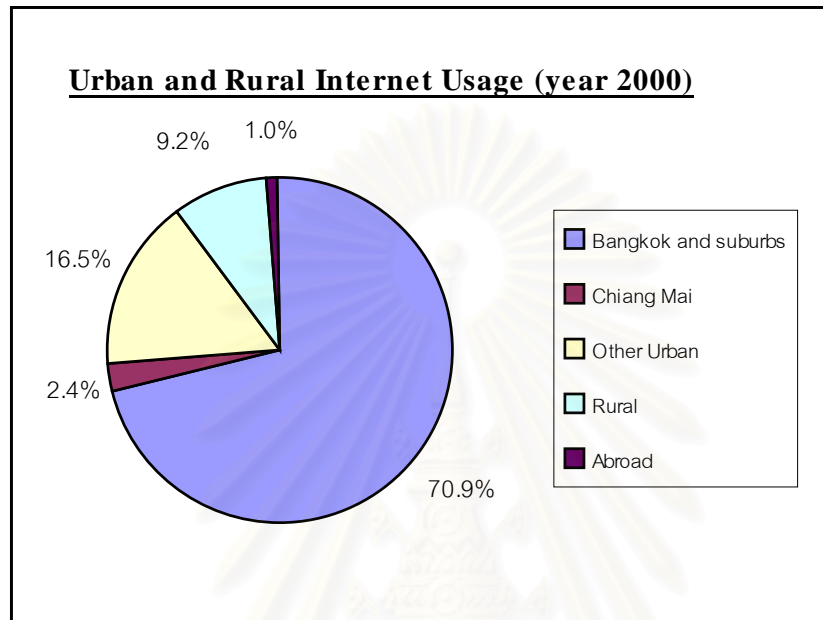


Figure 5: Urban and Rural Internet Usage. (NECTEC, 2001)

For example, people who live in Bangkok or other big cities in Thailand have better access to information than do people elsewhere in Thailand. According to the NECTEC study, the digital divide in Thailand remained unaddressed. People in Bangkok and its neighbouring areas make up over 70.9% of total users. (Charoen, 2001a) A World Bank report went further in saying that in Thailand 90% of users were urban people, (as seen in chart 6, above) who account for only one-fifth of the country's estimated 60 million-strong population. (Saridet, 2001) But it goes much deeper than that. To really get a grasp of the rural versus urban divide there are a number of factors to consider. These factors include education, poverty, number of phone lines, language, and how the people perceive the Internet. Though at present the basic infrastructure seems to be the most important factor. As explained by Sombat Boonngama-nong, webmaster of Bannok.com:

"The most important thing is to give all these provincial communities access to telephone lines. The installation of telephone lines in remote regions is a myth, and people living there do not have access to a telephone system. Without it they will never be able to benefit from using the Internet. Without telephone lines no government project concerning the Internet would ever truly reach all the people." (Nation, 2001a)

Dr Somkiat Tangkitvanich, though agreeing with Sombat, tells us not to forget that the infrastructure is only one part of the Digital Divide.

"Inadequate infrastructure is just the tip of the iceberg, there are more problems that are not so apparent. Since the basic infrastructure has not been completed, there is an unequal balance among people nationwide as far as accessing the network is concerned." (Nation 2001a)

Though the hardware and infrastructure are important it must also be remembered that the digital divide isn't just about having hardware, software and Internet access, but also about knowing how to use these basic tools. Arthit Ourairat makes the point that human resources were the critical element in the future of 'e-Thailand'. (Waltham & Sasiwimong, 2000) Mr Shivakumar then goes on to corroborate Arthit's comment when he says:

"The divide we are concerned with is not just about computer technology. Trends would seem to indicate that technology will become more accessible, more prevalent, and less expensive. The World Bank is also aware that the machines people use to access information, the disk drives, monitors, are often made by Thai companies, but while Thais export this technology, are Thais themselves using it to solve problems, create opportunities and build communities to come to terms with the new constitution which makes information access a right of all citizens?" (Charoen, 2000b)

According to Somkiat the gap between people in big cities, like Bangkok, and those in remote or rural areas can at present be divided into four categories; access divide, income divide, knowledge divide and perception divide. But what does he actually mean.

Firstly the access divide, this is to do with both the number of phone lines available along with the chance to be able to use a computer. In teledensity or phone lines per 100 persons, Dr Thaweesak Koanantakool, noted that based on 1998 figures, much of the concentration of lines was in the metropolitan areas, about 54.16 telephone lines

compared to about 12.12 and 5.79 in the provinces. (Thaweesak, 2000) So without the physical lines it is not possible for many to even have the chance to use a phone let alone the Internet. This is coupled with the fact that estimates of PC penetration in Thailand, that is PC ownership, in the year 2000 are around 3%, with most of those being in Bangkok. (Aran Hansuedsai, 2001) Another problem in providing the phone lines needed was the lack of available infrastructure or “roads” to get the Internet links to people in some provinces were yet to be completed. (Nation, 2001b)

The second point, income divide, highlights the differences between the rich and the poor. Geof Long tells us that, this is thought of as “an obvious one between the rich and poor”. (Long, 2002) As mankind makes progress, the main concern for every country as well as international organisations throughout the whole world is income disparity or income gap between the rich and the poor. Kowitz tells us that;

“Unfortunately, the digital divide tends to occur synchronously with the income gap, that is, the digital gap will occur between the rich and the poor for many the cost of getting connected to the telephone is beyond their means.” (2001)

The difference in income between the urban and rural sectors generally means that for most people outside of urban centres the chance of ever owning a computer are remote.

Thirdly there is the knowledge divide, this in turn can be split into two sectors. One is knowledge of how to use the computer and the other education, a basic knowledge of the English language. Prati Santiprabhop, dean of the Faculty of Science and Technology at Assumption University, said what was needed was to offer people, especially in rural areas, the knowledge of how to use the technology properly. "It is not enough to give them just hardware, software or 'Netware'. We have to create the right perception on their part too of how to beneficially use the Net. What we need to create is 'brainware'." he said. (Nation, 2001b) Knowledge is also part of the problem, since most websites are in English. As Kowitz says, “among other things attributed to the digital divide is English-language ability, the lack of which would make the gap bigger among the layers of all societies.”(2001) According to a survey of Thai websites there were 66% that used English Only and 34% that used Thai language

(and most of these used English also). So knowledge of the English language helps, but as Naranart Phungkanok says, If Thailand wishes to be prepared for the new economy, it will have to invest substantially in human resource development. This requires substantial investment in education and research and development. About 80 percent of the labor force has received at most a primary education. And 5.5 million 6 to 19 year olds are not receiving any formal education. (Naranart, 2000)

Finally the perception divide, people need to see how the Internet can be beneficial for them. Somkiat says that “the perception divide is about how people define the benefits of the Internet. Some see the net as a non-beneficial tool, while other say it is huge.” (Nation, 2001a) Natee Vichitsorasatra goes on that the digital divide is not just a matter of money and material. It is as much one of culture and education and that adults grumble at the frivolous use of computers when many do not know how to start up a computer program. (Natee, 2001)

Recognising the Problem

So judging by what we have read the internal Digital Divide in Thailand is quite a large problem. But what is being done about it? Jane Black, in her report for the BBC in November 1999 was quite clear on the first steps to solving the problem. She said that,

“As the famous Alcoholics Anonymous saying goes: Admitting you have a problem is the first step to recover.”(1999)

For Thailand, though people mentioned the Digital Divide before the year 2000, it seems that the first year of the new millenium was when people started to recognise that there was a problem. In January, Dr. Pichet Durongkaverroj, advisor to Nectec, said that Thailand must utilise the Internet's strength to support the agricultural sector, which has been left behind in the world of technology. He said that if Thailand's agricultural sector did not become aware of the importance of E-Commerce this year, it would ultimately lose its competitiveness in the international market. (Achara, 2000) It was during this period that Thaweesak Koanantakool, the former Director of NECTEC, gave many presentations and speeches bringing to our attention the Digital Divide in Thailand. The Highlight of which was his presentation at the German

Foundation for International Development (DSE) International Policy Dialogue on the Digital Inclusion, in Berlin, Jan 2001. “Digital Divide, Digital Opportunities, and Digital Inclusion Issues.” (<http://www.nectec.or.th/users/htk/publish/>)

Arnat Leemakdej in November 2000 told us that the digital divide was the centre of world attention. Developed nations were moving toward an information-based economy and, on the way, they were going to generate tremendous opportunities as well as adding value to their already advanced economies. The way they are doing this is through what is known as electronic commerce (E-Commerce). That is using the Internet to trade, but unfortunately a similar trend was not taking place in developing nations including Thailand. (2000) E-Commerce was by far the most significant economic development of the late 20th century. E-Commerce is also another factor in the Digital Divide, as it expands the trading opportunities of those countries with a high user base. It is also for this reason that E-Commerce has to be the main focus for decreasing Thailand’s Global and National Digital Divide. But what exactly is E-Commerce? Where did it come from? And how is it going to help Thailand?



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CHAPTER 4

E-COMMERCE

What is E-Commerce?

The Digital Divide is affecting Thailand right now, as the previous chapters have shown. But is this a new phenomenon or just a recurrence of an old one? In Thailand it is doubtful whether many people would be surprised about its occurrence. The difference in the gaps between Thailand and the industrialised world, along with between Thailand's rural and urban communities are already known. There have already been many comparisons between the Digital Divide and the gap between the rich and the poor nations and communities. This tends to point to it being an extension of the age-old poverty gap. Though this is a simple analogy, for the most part it holds true. Thus an economical gap of this kind really needs an economical solution which logically means that to reduce the gap the concentration should be on E-Commerce. Though it is unlikely that the impact will be immediate. But what is E-Commerce?

Electronic commerce was originally any kind of trade by use of electronic means such as facsimile machine or telephone. One possible definition of electronic commerce would have been:

"any form of business transaction in which the parties interact electronically rather than by physical means" (European Commission - Information Society Directorate-General, 1999)

But since then it has become associated with computers and the Internet. This is emphasized by the US Department of Commerce, which defines it as:

"...a means of conducting transactions that, *prior to the evolution of the internet as a business tool in 1995*, would have been completed in more traditional ways, by telephone, mail, facsimile, proprietary electronic data interchange systems, or face to face contact." (US Dept of Commerce, 2001)

The use by the US Dept. of Commerce of the phrase *prior to the evolution of the Internet as a business tool in 1995* gives the impression that the EC's definition is flawed. To emphasize this the best example would be ordering a pizza home delivery. If one was to use one's mobile phone to order a pizza to be delivered to one's home this would not be classified as E-Commerce. But if on the other hand the pizza was ordered through the pizza company's web site this would be classed as E-Commerce. The definition of E-Commerce has metamorphasized over the years, but most would agree that at present E-Commerce, as looked at in the framework of this thesis, should be defined as:

A means of enabling and supporting economic transactions *on a global and national scale* through the Internet.

Though many would still question this definition. In theory it enables companies to be more efficient and flexible in their internal operations, to work more closely with their suppliers, and to be more responsive to the needs and expectations of their customers. It allows companies to select the best suppliers regardless of their geographical location and to sell to a global market.

E-commerce is technology for change. Companies that choose to regard it only as an "add on" to their existing ways of doing business will gain only limited benefit. The major benefits will accrue to those companies that are willing to change their organizations and business processes to fully exploit the opportunities offered by E-Commerce. (European Commission - Information Society Directorate-General, 1999) This leads on to the question as to how E-Commerce began.

E-Commerce: The Beginning

There is not a long history of using the Internet for marketing purposes about seven years only. There were a few enterprising minds who began posting the equivalent of chain letters and "make money fast" pyramid schemes on the Usenet⁷, but it wasn't until 1994 that many people tried to exploit the power of the Internet for financial gain. It actually began in quite a contraversial way, which upset many of the then quite exclusive internet community.

⁷ Usenet was just an early form of electronic message board.

In April of 1994, a husband and wife legal team posted an advertisement on nearly every one of the 8,000+ Usenet groups that were active at that time. At this time the environment on the Internet was very elitist with an elitist community, and the action of these two lawyers shook that community to the core. Even after universities began providing students with access, there was still an air of separatism amongst the Internet users, known then as 'netters'. Nearly everyone involved in the community was a hard-core computer geek.⁸ The geeks who made use of the Internet felt that it was their own exclusive environment. They not only used it for professional and educational purposes, but as a social forum. The best example of this is on the Usenet, where thousands of bulletin boards (newsgroups) existed that not only discussed scientific matters, but things like Star Trek and dirty jokes. For many of these people, the Internet was their main form of social interaction, and they were very threatened by the idea that more and more people were joining their private club without any invitation.

Again, the Internet was seen by many of the early users as a "private club." They didn't want to see cyberspace soiled by the filthily lucre of commercialism. In reaction to the posting, the lawyers received death threats, their server was repeatedly sabotaged by hackers, and they were portrayed online and in computer magazines as greedy, slimy parasites. They also brought in more than \$100,000 in business within a few weeks. The result was that suddenly, the business world was looking at the Internet with great interest.

What the lawyers did, posting the same message to many newsgroups, created a new English word as it is now called *spamming* (as in to spam, he spams, she spammed), and it is not something to practice in if you want to keep a good name. This is because it's somewhat like putting flyers on every car windshield in a giant parking lot; it's a nuisance. While spamming will certainly get you a lot of attention, it is likely to make you more infamous than famous. Luckily, April of 1994 was also about the time that the World Wide Web became a viable commercial reality. With E-Commerce having its roots in America it seems only natural that they would be at the forefront. It must

⁸ A Computer Geek is someone who knows a lot about computers.

be mentioned that at present America is as dominant in E-Commerce as it is in Internet usage (see figure 1) and will be for the near future as seen in chart 2.

The Impact

Electronic commerce is not some futuristic dream. It's happening now, with many well-established success stories. It's happening world-wide - while the USA, Japan and Europe are leading the way, E-Commerce is essentially global in both concept and realisation. Thailand needs to be at the forefront of E-Commerce development if it is to compete in this era of globalisation. It's happening fast. With the rapid growth of the Internet and the World Wide Web, it's accelerating. Estimates for global E-Commerce growth vary with Emarketer predicting 3,202 billion dollars by 2004, (chart 2, p.33) and Forrester research inc predicting 6,789 billion dollars by 2004, (table 3, p35) but both show that a huge new market is forming.

The impact of E-Commerce will be pervasive, both on companies and on society as a whole. For those companies that fully exploit its potential, electronic commerce offers the possibility of *breakpoint* changes - changes that so radically alter customer expectations that they re-define the market or create entirely new markets. All other companies, including those that try to ignore the new technologies, will then be impacted by these changes in markets and customer expectations. Equally, individual members of society will be presented with entirely new ways of purchasing goods, accessing information and services, and interacting with branches of government. Choice will be greatly extended, and restrictions of geography and time eliminated. The overall impact on lifestyle could well be comparable to that of the growth in car ownership or the spread of the telephone. (May, 2000)

The Scope

As Internet technology advances, more and more companies are using Internet as a marketing and distribution channel. According to R A Pitts and D Lei (2000), the Internet enables the companies to build a better link with the customers and to customize their products and services to fulfil individual needs. Companies such as Altaways Thailand, which specializes in developing websites, have seen rapid growth over the last few years. Today, many web applications that cater for electronic

commerce have been developed and adopted by many companies. Thailand is no exception, with many companies now realising the need to address this market.

For Thailand it is most likely that for the near future B2C E-Commerce will not be a big factor. “The current Internet user base in Thailand does not yet have much buying power,” says Somkiat Tangkitvanich, research fellow at the Thailand Development Research Institute. Most Thai users are in the age group of 20-29 years, so there is potential for increased buying power only further down the road. (Madanmohan Rao, 2001) But this is the situation not only within Thailand but for most of Asia. There is not much doubt that in the Asian region the main focus for E-Commerce will be in the B2B sector. This factor can be seen in table 4, as can the projected growth of e-commerce in the region with Business to Business E-Commerce (B2B, appendix 1) predicted to have sales of around 300 billion US dollars, compared with Business to Consumer E-Commerce (B2C, Appendix 1) predictions of around 38 billion US dollars in 2004. Though not shown on the chart it is expected that both Japan and China will dominate the Asian E-Commerce market. Unless there are sufficiently high online usage and online spending, domestic E-Commerce may not be a viable proposition for many developing nations.

Figure 6: E-Commerce revenues 2001 and 2004. (eMarketer, 2001)

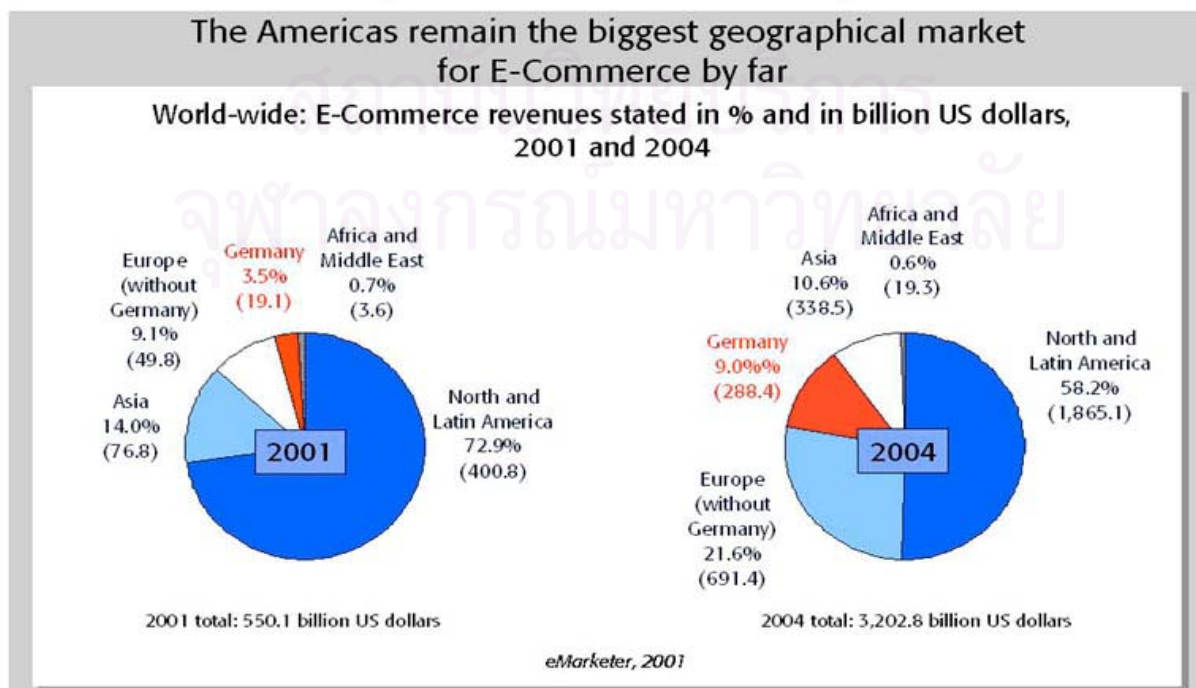


Table 4: Worldwide E-Commerce growth.

Worldwide e-commerce growth						
unit : billions US\$						
	2000	2001	2002	2003	2004	% of total Sales in 2004
North America	509.3	908.6	1,485.2	2,338.0	3,456.4	12.8
United States	488.7	864.1	1,411.3	2,187.2	3,189.0	13.3
Canada	17.4	38.0	68.0	109.6	160.3	9.2
Mexico	3.2	6.6	15.9	42.3	107.0	8.4
Asia Pacific	53.7	117.2	286.6	724.2	1,649.8	8.0
Japan	31.9	64.4	146.8	363.6	880.3	8.4
Australia	5.6	14.0	36.9	96.7	207.6	16.4
Korea	5.6	14.1	39.3	100.5	205.7	16.4
Taiwan	4.1	10.7	30.0	80.6	175.8	16.4
All others	6.5	14.0	60.6	130.5	197.1	2.7
Western Europe	87.4	194.8	422.1	853.3	1,533.2	6.0
Germany	20.6	46.4	102.0	211.1	386.5	6.5
United Kingdom	17.2	38.5	83.2	165.6	288.8	7.1
France	9.9	22.1	49.1	104.8	206.4	5.0
Italy	7.2	15.6	33.8	71.4	142.4	4.3
Netherlands	6.5	14.4	30.7	59.5	98.3	9.2
All others	25.9	57.7	123.4	240.8	410.8	6.0
Latin America	3.6	6.8	13.7	31.8	81.8	2.4
Rest of world	3.2	6.2	13.5	31.5	68.6	2.4
Total	657.0	1,233.6	2,231.2	3,979.7	6,789.8	8.6

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

Source : Forrester Research, Inc.

In Thailand, with such a low internet user base, the scope of E-Commerce will be slightly different. If Thai companies want to tap the B2C market they have various tactics that they should employ. Because of this limited scope in the home market, customers need to be targetted. Both Chulabook.com and Pantip.com have been successful doing this. On the other hand, if Thai companies were to go for the global market they would have an inherant advantage in that there is a wide customer base outside Thailand. This would help cut down the Digital Divide internationally, because Thai companies could trade abroad, but foreign companies would not find enough customers to justify targetting trade in Thailand.

Asia/Pacific: E-Commerce revenues in billions of US dollars, 2000-2004

	2000	2001	2002	2003	2004
Korea	1.90	3.69	5.85	10.83	15.57
B2B	1.75	3.39	5.26	9.86	14.17
B2C	0.15	0.30	0.58	0.98	1.40
Singapore	0.56	1.08	2.58	5.42	7.45
B2B	0.49	0.96	2.20	4.82	6.63
B2C	0.07	0.12	0.39	0.60	0.82
Taiwan	2.29	4.46	8.57	14.22	20.65
B2B	2.13	4.10	7.79	12.80	18.59
B2C	0.16	0.36	0.77	1.42	2.07
Rest of Region	3.08	5.99	10.06	19.41	23.36
B2B	2.93	5.39	9.16	17.66	20.79
B2C	0.15	0.60	0.91	1.75	2.57
B2B	36.22	68.63	121.16	199.26	300.55
B2C	3.17	8.18	15.61	26.43	37.97
Total	39.39	76.81	136.77	225.68	338.53

eMarketer, 2001

Table 5: E-Commerce Revenues for the Asia-Pacific Region 2000-2004. (emarketer, 2001)

The Benefits

E-Commerce is very important to Business Strategy. One of the principal benefits of E-Commerce is that it should be able to provide improved communication with potential customers without having negotiations with a 'middle-man'. Potentially, producers will be able to sell their goods direct to the customers, which would enable them to make more profit, thus improve their standard of living. There will also be other benefits of E-Commerce which would be Improved customer service and improved productivity

E-Commerce has had its 'ups and downs' in the relatively short time since its inception in 1994. It reached its peak in 1999, then suddenly there was an about turn, an E-Commerce crash. Many thought that E-Commerce was doomed when many of the Internet companies suffered huge losses with some actually going out of business. Three years ago Internet stock was rated a good investment on the stock exchange. Following that just two years ago year people were speculating that the E-Commerce bubble had burst, with many on-line companies (dotcom companies) going out of business or having to lay off staff and cut costs. Two of the most notable failures were those of Etoys.com and Excite.com. The struggles of one of the E-Commerce innovators Amazon.com⁹ to actually make a profit were well known. Mueller points out that to open an E-Commerce company has pitfalls, and that it takes time to generate customers. (Mueller, 1999) Ping Na Thalang was asking if "2000 was the year of electronic commerce", (2000) only to see it crumble by the end of the year with confidence at an all time low. The demise of companies such as Etoys.com and excite.com left all in the industry low in confidence.

This seems to show that in the modern society both *bricks and mortar*¹⁰ companies and *Dotcom* companies must innovate to survive. The shop on the high street or the web site alone are not enough in the modern economic society. Only after a long period of prolonged losses when a customer base can be built will a dotcom company be able to survive, as Amazon.com has shown, but even now its future is not certain.

⁹ Amazon.com sells books and other goods over the net.

¹⁰ *Bricks and mortar* company refers to traditional high street shops.

To have most chance of success *Dotcom* companies and *bricks and mortar* companies should really be linked together, hence the new term *clicks and mortar* companies. This is a combination of the physical shop and the dotcom shop, which strengthens the organization. "Online initiatives need access to a traditional customer base in order to penetrate it; others require the use of a retail distribution network in order to steal sales from it." (Lebreton & Desmarais, 2000) They also need to keep their operation streamlined.

But more recently confidence in E-Commerce has once again risen with Mahoney saying "E-Commerce: Back and Bigger the Ever." (Mahoney, 2002) The first real major indicator was the rejuvenation of Amazon.com. Dignan tells us that "In a fourth quarter marked by strong international sales and cost cutting, Amazon.com on Tuesday reported its first-ever net profit, on record sales, delivering on its promises to Wall Street." (2002) He goes on further, "Amazon's first profit shows that not all e-tailers will share the same fate as Webvan and Peapod¹¹. The company's fulfillment, marketing, and technology and content expenses were lower in the fourth quarter compared with the year-earlier period. Amazon has shifted many of its systems to the Linux operating system and hasn't had to market as heavily since many rivals such as eToys.com have disappeared."(2002)

Mahoney of the E-Commerce Times relates more about the recent E-Commerce recovery. "The past several months of E-Commerce news has been enough to make any E-Commerce prognosticator dizzy. An industry dominated over the last six months by doom-and-gloom messages is suddenly awash with profitable earnings reports and growth numbers." (Mahoney, 2002)

"And the profitability news does not stop with large e-tailers like Amazon. Healthy earnings reports have also been released by smaller niche companies, such as EBags and jewelry e-tailer Ice.com," according to Jupiter Media Metrix analyst Ken Cassar. The E-Commerce sector is in a good place relative to six months ago, but that's not saying much -- the sector was as popular as O.J. Simpson six months ago," (Mahoney, 2002)

The Digital Divide

The Digital Divide is very significant for E-Commerce in Thailand as it changes the whole way that E-Commerce is conducted. The route for E-Commerce in the US and Europe is both B2C and B2B, with both businesses and consumers/customers on the receiving end. It is for this reason that companies have been able to target virtually the whole Internet community. It is fact that there has to be a customer base before any business can hope to start selling what it has to offer. America has over 120 million people using the Internet, many of these will have their own credit card, thus they have their ready-made customer base. This enables the US to develop a healthy B2C market for E-Commerce. As we have seen already there is not that market in Thailand, thus the whole nature of E-Commerce will be different.

Thailand's and most of Asia's E-Commerce will have to be B2B, as it is unlikely that the domestic Asian Markets would be able to sufficiently support B2C. This can be seen in Table 4 on page 32. But this does leave Thailand with an advantage also, they can compete in global B2C markets without worrying about competition at home. This means that with products that have an international appeal Thai companies have a ready-made market in Europe and America. Thaigem.com has been successful in targetting this global market.

Going for home market can be successful but you need to sell to the kind of people who would be on the Internet, thus two B2C focused companies in Thailand have been able to do this. The companies www.chulabook.com and www.ar4u.com are both having a measure of success. The Chula site obviously sells mainly books whilst ar4u sells both books and computer software. It is quite likely that their target customers would be on the Internet. The fact that they have targetted their customers has led to their success.

Until such time as the Digital Divide can be bridged to some noticeable level then B2C, except for niche markets, as shown, will be limited to international sales only for Thai companies. This means that the B2B market must be concentrated on if Thailand

¹¹ Webvan and Peapod were two of Americas early e-retailers, both went bankrupt.

hopes to keep some parity with competing nations in the E-Commerce market at all. With this in mind Thai companies should be encouraged more than ever to get on-line.

Though Thailand's E-Commerce market appears to be relatively small this should not deter people from implementing infrastructural improvements. The fact is that by implementing ways of developing E-Commerce the whole IT infrastructure will also be upgraded at the same time. This will leave Thailand in a state of readiness. Thai companies going on-line and becoming involved in E-Commerce will be able to have an impact on Thailand's Global Divide. Whilst on the other hand if the rural communities can be helped to see the benefits of E-Commerce the National Divide will decrease. The year 2001 was the year when this came to fruition, the new government of Thaksin Shinawatr and the Thai Rak Thai party seemed to realise the importance of Internet trade. With the active promotion of this government many different projects were initiated during the whole of the year. The projects came from all different sources including international and national organisations. The whole of Thailand should feel the benefit as long as the level of activity stays the same as or increases from that seen in the year 2001.

The Year of E-Commerce Action

It seems that after the wake up call in the year 2000, the following year was the time for action. Suddenly the expression "Digital Divide" became the trendy 'catchphrase' and many initiatives were begun. In March Charoen Kittikanya reported that a South Asian Association of Regional Co-operation (SAARC) seminar in Bangkok agreed to set up an Information and Communication Technology Council to promote awareness of ICT as a tool for national development. This would include ways to promote high bandwidth connections to the Internet, and low cost, regional communication backbones linked to global networks, would come before the agency, which would run under Saarc's chambers of commerce and industry. (Charoen, 2001)

Thaksin Shinawatr, the current Thai Prime Minister, has probably done than any other Prime Minister to help the poor. For example bringing in a scheme, where people would only be charged 30 baht each time they had to visit the hospital. He has also

initiated the first rural E-Commerce scheme, ThaiTambon.com. The web site came on-line on 24th June 2001. (<http://www.thaitambon.com/English/AboutTTB.htm>) This website also became involved with the “one tambon one product” project that Thaksin’s government initiated. By having this website villages can gain the necessary promotion without having to pay advertising costs and with no middle man to slice into their profits.

Kowitz tells us about the "one tambon one product" project in April, under which each tambon will get one million baht as financing. So far, 400 tambons have already got the Internet.

“In short, this can be a marketing tool for villagers, but may I suggest that if it is to provide more access for overseas market, the website should be bi-lingual. If the "one tambon one product" scheme really works, it would change the picture of the country a great deal because while people get more income and enjoy a better standard of living, migration from provinces to major cities like Bangkok will reduce over time, helping in turn to solve urban problems. For the villagers, the tambon Internet will on the other hand provide them with the opportunity to reach out for useful information and knowledge worldwide and this will more or less help solve the so-called digital divide problem, hopefully.”(Kowitz, 2001)

Kowitz may be a little over optimistic here but there is no doubt that this project should have some effect. The villages concentrate on their strengths with, handicrafts proving to be the most popular products both for the villagers to produce and for sales. Handicrafts are also good because most western countries such as the UK do not put any import tax on Handicrafts, and there are no import limits. By 2003 this scheme will be much wider as more and more villages come on-line. This scheme tackles both the National and Global Divide and should prove to be a great benefit to the whole nation.

In June there was a unique collaboration between the Government of Thailand, private sector and civil society groups and the World Bank. This was Thailand Innovation Day, an initiative to foster new and innovative partnerships and products for poverty reduction, with a range of activities to inspire rural communities. It aimed to make the most of new opportunities offered by the information and communications revolution. Thailand Innovation Day was one of three country pilots – in addition to

Peru and the Ukraine – of the global Development Marketplace, a World Bank program exploring new ways to do development differently, and reduce the Digital Divide. (World Bank, 2001) In actuality the World Bank have become involved in various ways to help encourage E-Commerce growth in Thailand.

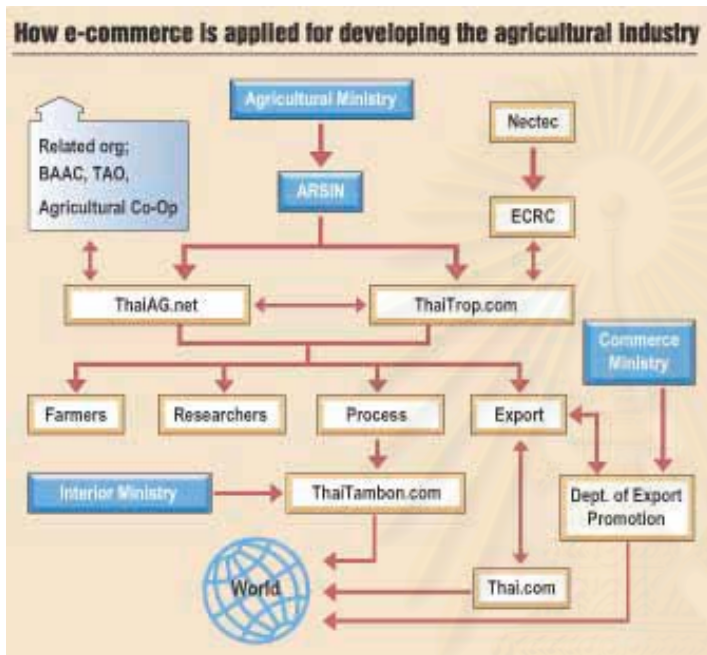


Figure 7: E-Commerce for Agriculture

Computer Technology Centre (NECTEC) to develop ThaiAG.Net and ThaiTrop.com (see figure 2, left). ThaiAG.net is a database of agricultural production and will be managed by the Agricultural Resource System Information Network (ARSIN) of the Ministry of Agricultural and Cooperative. Part of the funding was provided by the World Bank. ThaiTrop.com is a planned database of agricultural technology which will be run through Nectec's E-Commerce Resource Centre (ECRC). Both database systems are under development and scheduled to be launched for public use by the first quarter of the year 2002. (Karnjana, 2001b) With agriculture being the mainstay of the Thai economy this project should also help to tackle the Divide at its roots. All E-Commerce initiatives in agriculture should logically lessen the gaps as agriculture is the mainstay of the Thai economy and most of the richest men in Thailand are the

Then in July the Department of Agriculture (DOA) highlighted its own plan for bridging the digital divide in E-Commerce for farmers. DOA Director of Information Services Centre, Pisuth Paiboonrat, outlined the scheme at a seminar on "E-Commerce for Developing Rural Areas," organised by the National Science and Technology Development Agency (NSTDA). "It will be a new era for our farmers," he suggested. As a first step, the DOA has teamed up with the National Electronics and

middlemen buying and selling agricultural produce. Projects such as this should help redistribute wealth.

Meanwhile the Ministry of Agricultural and Cooperatives will help improve the skills of farmers by setting up a Tambon Technology Transfer Centre (TTTC) in 800 Amphurs. The initiative aims to transfer technology as well as to provide farmers and village headmen with computer literacy and Internet skills, Mr Pisuth said. Around 100 centers will be set up by the end of the year 2001 and equipped with PCs, Internet access and a printer, although the budget has not yet been officially allocated. To build awareness, DOA has organised E-Commerce for agriculture seminars in six provinces and plans to develop intensive courses in the future. (Karnjana, 2001b) This is yet another good development, but its scope needs to be much wider if it is to any sort of impact. By showing rural communities how the Internet can help them will be a boost right now, but it will be an even bigger boost in the future as the younger generation will be encouraged to make more use of computers.

The mood to bridge the Digital Divide even infected students. In August 2001 a group of enthusiastic Thammasat University students were hopeful that by simply bringing more information to rural Thai communities, they could help bring the areas meaningful improvements and greater economic earnings. "We strongly believe that with information and communication technology, sustainable community development can become a reality," said Sunit Shrestha, a third-year student in the university's international economics programme, and leader of the Thai RuralNet project. Sunit and Kritaya Sreesunpagit, a fresh graduate from the same faculty, first proposed the project in the Innovation Day student exhibition held in June 2001. Under the theme of "Using Information Technology to Improve the Quality of Life in Rural Thailand", Thai RuralNet made impressive enough a performance to secure \$US9,000 in funding from the World Bank. Their project was first inspired from class research on the "new economy", which made them realise that country development as a whole needed a bottom-up information methodology. (Montakan, 2001)¹² Though this was not a large project it has to be mentioned as there were many other similar projects set up last year. Projects such as this show how students are becoming more involved in efforts to lessen this national division.

¹² For more information on the Thai RuralNet project, visit www.thairuralnet.org, or e-mail info@thairuralnet.org.

In October the Loxley Group, supported by the Canadian International Development Agency (Cida) announced that they were to set up telecentres. They said that to accelerate the pace of bridging the digital divide, they had set up a "Rural Telecentre" project to offer people in rural areas a chance to access the electronic network. To put the whole infrastructure in place, Loxley has negotiated with the Telephone Organisation of Thailand and Thai Telephone and Telecommunications to get the two organisations to lay telephone lines in particular areas. Once implemented, it is expected that the life of people living in villages around the centres, and those living in remote places, will become easier as they will be able to contact relatives and be able to get news from the outside world. It is interesting that it is not just the hardware and infrastructure being offered:

"Apart from the hardware and the infrastructure, we will also offer training courses so that the locals will have both knowledge and the know-how for using the technology. The courses will focus on training the future trainers. This way people will be able to understand and know how to use the technology in the most effective way," Jingjai said

Jingjai then explained that the telecentres in the long-term future could be turned into E-Commerce or e-learning centres for those who want to expand their business internationally, or for people who want to further their studies online. (Suchalee, 2001a) With the help of Loxley group supported by the Canadian Government an important aspect of both the local and international divide will be addressed with this project. With industry and a foreign government working together the national infrastructure should be greatly improved. But also the people will be trained to use the technology. Unlike reports in previous years of computers being sent to schools but no one there knew how to use them.

The final example is from November 2001, and involved an international non-profit organisation World Computer Exchange (WCE) that arrived in Thailand to collect old computers and recycle them free to local schools. To offer students in rural areas the chance to use the Internet as a bridge to access new information, WCE a US-based non-profit organisation, is moving here to provide free second-hand PCs to schools throughout the country. Formed after discussions between the Kennedy School of Government and the School of Education students from Harvard University in 1999,

WCE's objective is to collect used PCs from industrialised nations and recycle them to schools in developing countries in Africa, Latin America and Asia.

To help their work here, WCE is working with local partners, including financial supporters, computer and equipment donors, as well as non-governmental organisations (NGOs), to distribute donated machines to schools in provinces nationwide. "What we are doing here is coordinating with NGOs, relevant organisations and companies, to offer Internet-ready computers donated by industrialised nations to Thai educational institutions," said Brett Renfrew, 25, a graduate student from Harvard and a programme director for the WCE in Thailand.

To provide proper support, WCE is working to set up a branch office in the country. Once established, it will also be used as a regional office for Southeast Asia to source computers from countries like Singapore and Hong Kong and distribute them to developing countries in the region. To date, WCE has signed up over 780 schools in 24 countries, including Thailand. With WCE support, schools will be encouraged to develop and share websites that portray their own history and culture. Students participating in the programme will then be able to make international friends, practise different languages and learn about different cultures.

The projects chosen here were to show the diversity of sources, displaying that many sectors of society are working to bridge the Digital Divide in Thailand. In these examples regional help is coming from the SAARC. Global and local help is coming from The World Bank, Thai Government, along with the private sector and civil society groups. National help in the third project is coming from the Ministry of Agricultural and Cooperatives. Student help is coming from Thammasat University. Industrial help and help from an industrialised country comes from the Loxley group supported by the Canadian Government organisation CIDA. Then finally help is coming from an International NGO in the form of the WCE. Though there are many projects being conducted it will be many years before the real benefits will be reaped.

CHAPTER 5

THAI GOVERNMENT POLICY:NECTEC

The Beginning

“Thailand must outline a clear schedule for embracing the new economy in order to compete with neighboring countries,” said Somkiat Tangkitvanich, a computer scientist at the Thailand Development Research Institute (TDRI). (Naranart, 2000) Has this been the case?

As early as 1986 the Thai government realized that advances in computer and Information Technology (IT) demanded its attention and promotion. Thus the National Electronics and Computer Technology Center (NECTEC) was founded in 1986 as a research and development agency for electronic and computer-based technologies under the office of the Permanent Secretary, Ministry of Science, Technology and Environment (MOSTE). It was governed by the two committees: “The Policy Board” and “The Executive Board”, both comprise members from the government and private sectors, and chaired by the Minister of MOSTE.

NECTEC was created to act as a coordinating agency among the government sector, universities and private sectors in the quest to create innovations in electronic and computer technology in Thailand. In playing this significant role, a number of research and development sub-committees were set up to provide technical analysis and advice as well as strengthening ties with the private sector in these fields. (Thaweesak, 1999).

Even after the creation of NECTEC the Thai government still did not realize the importance of the role that NECTEC should be playing until 1989. Borisuthiboun paints a clearer picture of the Thai government policy during this period when he says that until 1989

“...the [Thai] government paid no interest in the [IT] industry and NECTEC was still a very small organization and was the only agency dealing with high technology issues.”
(Borisuthiboun, 2000)

NECTEC's original mission was to bolster up Thailand's manufacturing of electronics and computer technologies and industries. Its two goals were firstly to develop the capability of research and development institutions in electronic and computer-based technologies. Secondly, to provide efficient technical services and effective disseminations of electronics and computer technologies. (Atkins ed., 1992:37)

In 1991 NECTEC was attached to NSTDA, their missions then became linked. They are to support RD&E in the public and private sectors, as well as to make its own investment in carrying RD&E to commercialization. The new missions were as follows:

- a) government and private sectors to stimulate and serve the manufacturing industries.
- b) To support RD&E through computer and telecommunications networks in order to provide To accelerate RD&E in electronics and computer technology in Thailand both in the information services and linkages among R&D institutes in these fields.
- c) To disseminate and transfer electronics and computer technology from R&D projects and from techno-economic databases of both domestic and foreign sources to the users in the public and private sectors.
- d) To establish the central R&D laboratories which provide favorable environment and facilities to the researchers in cooperative R&D projects.
- e) To build up more capable manpower for knowledge generation and technology diffusion.
- f) To use the computer and telecommunications system as a tool to develop learning and working skills.(Atkins ed. 1992:39)

From these beginnings NECTEC became the main hub for almost all government related IT developments with many projects being initiated. But a new development in 1992 was to lead to a major change. This was because NECTEC's focus was changed when "in 1992, NECTEC was assigned by the government to perform the role of secretariat to NITC".¹³ (Thaweesak, 1999) This effectively led to NECTEC's programs becoming more geared to serve the local electronic and computer industries.

¹³ The National Information Technology Committee was established in 1992 to oversee the policy aspects of information technology development and deployment in Thailand. It now has a number of subcommittees steering various IT developments, including three that directly affect e-commerce development: The Electronic Data Interchange (EDI) subcommittee, six IT-law subcommittees, and the Electronic Commerce Task Force which is now part of the national e-commerce policy committee.

Electronic commerce in Thailand has been on the agenda of the National Information Technology Committee since its formation in 1992. At that time, the Electronic Data Interchange (EDI) for international trade project was started and is now in operation. National-level bodies such as the National Electronics and Computer Technology Centre (NECTEC), the National Information Technology Committee (NITC), the Ministry of Commerce (MOC), the Bank of Thailand (BOT), the Federation of Thai Industry (FTI), the Chamber of Commerce and the Association of Computer Industry of Thailand are now joining forces to develop electronic commerce. A national level committee for e-commerce policy was appointed by the cabinet to oversee this development process.

Since 1998, the Thai government has shown its further commitment to developing electronic commerce in Thailand by its decision to draft IT laws as well as to establish the Electronic Commerce Resource Centre. NECTEC has been working on issues relating to electronic commerce in three main areas: developing the electronic commerce framework for Thailand, drafting six IT laws, and drafting technical specifications and recommendations. (Jirapan, 1999a)

NITC, whose main responsibility is to oversee information technology development in Thailand, has assigned NECTEC to develop an electronic commerce framework suggesting the roles and responsibilities of government agencies. One of the objectives of the plan is to facilitate private sector involvement in evolving domestic and international electronic commerce arenas.

In another dimension, NECTEC has called for voluntary participation of government agencies, the private sector, educational institutes and independent research centres to draft IT technical recommendations and standards. For instance, the development of the coded character set for Thai language, TIS620, to be used for Thai characters and the registration of the character set with the Internet Assigned Number Authority (IANA) enables web browsers to display the Thai language properly. NECTEC has also played a major role in setting up the national EDI service provider.

Recently, NECTEC has led a group of volunteers, namely the Thailand Smart Card Working Group, in developing recommendations for smart card and Public Key

Infrastructure (PKI) implementations in Thailand. The recommendations will help stimulate the widespread use of smart card and public key technology, which are the key technologies enabling trust among electronic commerce players. (Thaweesak, 2001)

So on the face of it NECTEC has been doing a sterling job to promote E-Commerce in Thailand. It cannot be argued against the fact that NECTEC has been and still is a useful tool to bring Thailand into the world of E-Commerce. Thus it seems that the Thai government is doing its all to bring Thailand into the world of E-Commerce but is that really so. (Karnjana, 2000a) NECTEC now has a nice website (<http://www.nectec.or.th/>) that is also quite user friendly. But for most of its life the NECTEC website neglected an important web aspect, namely that English is the language of the web. This fact means that though many of the visitors would be Thai many foreign companies looking to trade with Thailand would have been put off. But this oversight has been recently taken care of, but even so, questions are still being asked about how committed in reality is the Thai government, and how has the recent change of government affected things?

E-Commerce law

E-Commerce is only as good as the suppliers, but when dealing over the Internet people need feel secure before they trade. Without any laws then money could just be stolen or faulty goods sent. People could get involved with illegal activities and know they could not be prosecuted as there were no laws against what they were doing. Personal information could be traded without the subjects permission. Unfortunately Thailand has been without any laws of Internet usage and trade, even though work on creating the laws began a number of years ago.

Since 1998 NECTEC-under the mandate of NITC-has been working on drafting six IT laws: the Data Protection Law, Computer Crime Law, Electronic Data Interchange Law, Digital Signature Law, Electronic Funds Transfer Law and Universal Access Law. The six laws will serve as the infrastructure for doing electronic commerce and enhance confidence among the members of the electronic transaction playground while providing rules and etiquette for fair play. This is obviously very important for

E-Commerce in Thailand, and the laws should have been in place by 1999. (Sasiwimon, 2000d)

The IT laws will serve as an infrastructure for doing E-Commerce and will enhance confidence among the members of the electronic transaction playground while providing rules and etiquette for fair play and they will enhance Thailand's competitiveness. One researcher went as far to say that for Thailand to be competitive it should not tax E-Commerce, but this is a little too hopeful. (Sasiwimon, 2000c) Through the universal access mandate demanded by the new constitution (Section 78), a law is required to diminish the Digital Divide.

Since Nectec began working on the laws there has been a change with the first two below, the Electronic Transaction Law and the Electronic Signature Law, having been amalgamated into the Electronic Transactions Bill. The original six laws were:

1. Electronic Transaction Law: To set the effective legal framework to support successful electronic contracts.
2. Electronic Signature Law: To provide the security of electronic commerce transactions by using asymmetric-key cryptography.
3. Computer Crime/Computer-related Crime Law: To criminalise the new type of the offences in the borderless virtual world.
4. Data Protection Law: To protect rights of privacy in the Information Society.
5. Electronic Funds Transfer Law: To promote consumer protection and allocate the liability incurred from the technological risks.
6. Universal Access law (By-law of Section 78 of the Constitution): To create equitable Information Society by promoting universal access in the National Information Infrastructure (NII).

It would seem that all is okay, unfortunately by the year 2001 the laws had yet to be passed by parliament. This has been also noted by Dr Srisakdi a year earlier on the Assumption University website he also commented on the subsequent effect on E-Commerce in Thailand if these laws were not implemented.

“... The Thai Parliament has failed to pass the so-called “E-Commerce Law” by the end of the year 2000 as earlier expected by all concerned and the lack of the law has a negative effect on E-Commerce development in Thailand.” (Srisakdi, 2001)

Unfortunately it has taken until April 2002 before the laws have only been partially passed. It is not just Dr Srisakdi who can see the negative effects, Sasiwimon Boonruang has also been reporting the unrest in the Thai E-Commerce community. She wrote that the Association of Thai Computer Industry (ATCI) have been pushing the Government to hasten the endorsement of privacy laws aimed at bolstering people's trust in e-commerce. The privacy law is one of six E-Commerce-related laws above that the Government had planned to endorse last year, along with the electronic-commerce transaction law, electronic signature law, computer crime law, electronic funds transfer law and universal access law. (Sasiwimon, 2000)

ATCI is concerned about the country's readiness for E-Commerce, as awareness among private companies is still low, said Mr Manoo (ATCI Chairman). Both buyers and sellers need to realise the significance of E-Commerce, he added, suggesting that the business sector, particularly small and medium enterprises (SMEs), still has very little understanding of it. Mr Manoo said further that ‘the largest opportunity is in business-to-business services and Thailand must drive business in areas such as MRO, or maintenance, repair and operations. By selling such products on the Internet, both buyers and sellers benefit.’ (Sasiwimon, 2000d) He went on to comment that if Thailand is late, it will lose a valuable opportunity, he also added that E-Commerce and the Internet could not grow if people have no trust in the privacy law. Mr Manoo pointed to so-called "cookies," which can be used to keep records on a consumer's use of the Internet and purchasing. By having a privacy law, consumers could have the right to access personal records kept by companies and request that incorrect information is changed. (Sasiwimon, 2000d)

In the Asia Pacific region, it is estimated that bandwidth will continue to grow at a rapid rate, meaning that the number of transactions from E-Commerce will also be growing rapidly. The six IT laws have been prepared in order to pave the way for electronic commerce in Thailand and this draft legislation dates back to early 1998

when the National IT Committee (NITC) empowered six subcommittees to study and draft these laws. This whole debacle brought into question the previous Thai government's commitment to E-Commerce.

Though it must also be noted that the newly elected government of Thaksin Shinawatra does seem to be more committed to E-Commerce development. This fact has also been noted by leading experts in E-Commerce, with Dr Ram Piyaket going so far as say that the Thaksin administration is the only choice when it comes to E-Commerce development. Chadamas Thuvasthakul, current director of NECTEC, also remarked that since taking office Thaksin has shown more interest in IT and the activities of NECTEC. He even attends the monthly meetings in person. But even so the wait for the new E-Commerce law has still dragged on, and has yet to be implemented. Implementation of essential E-Commerce laws has also been frustratingly slow. In June 2001 we were told by Charoen that "The first electronic commerce law on transactions and signatures, which was two separate draft laws before being combined by the Council of State prior to being proposed to Parliament, is still pending in the Senate."(Charoen, 2001c)

But the end is in sight, or so we are led to believe. The Electronic Transactions Bill and the Digital Signature bill have been combined and named the Electronic Transactions Bill. The Bill passed through the cabinet and is now awaiting the final approval from the Senate. The draft of three other E-Commerce related laws are being worked on by NECTEC. They are Computer Crime, Electronic Funds Transfer and Privacy Laws. Charoen confirmed this when he told us that the draft Universal Access Law to create an equitable information society by promoting universal access to IT was under consideration by the Council of State. But that the other laws relating to data protection, computer crime and electronic funds transfer were still in the drafting stage. (Charoen, 2001c) The Universal Access Bill is on its final stage. The Bill will address the issue of digital divide. ATCI is part of the drafting committee. The long awaited implementation of the first E-Commerce law is expected to come into force on April 3 2002, despite some speakers at the recent "Year 2002 and the Enforcement of the Electronic Transaction Law" seminar, suggesting that there would be problems. Dr Pinai Nanakorn, assistant dean for international affairs at Thammasat University's

Faculty of Law, said the law is hard to understand because there are a lot of technical terms.

"It will lead to a problem of interpretation. With some articles it is difficult to read between the lines even for an attorney." (Karnjana Karnjanatawe, 2002)

He said this may be because it deals with technology or because it is an almost direct translation of a United Nations Commission on International Trade Law (Uncitral) and some phrases did not translate properly.

Speaking at another seminar last week, "E-Transactions for Government," National Electronics and Computer Technology Centre (NECTEC) legal researcher Surangkana Kaewjumng said that the center is drafting details of the Royal Decree to cover five areas. The first area is the limitation of the enforcement, while the second is a secure standard methodology for electronic transactions. The third item covers procedures for setting up the Electronic Transaction Committee, and the fourth to outline e-services which need to be reported, registered and licensed. She said these would include certification authority (CA) service providers. The last issue is to give an outline for reliable electronic signatures. (Karnjana, 2002)

NECTEC will also work on drafting a standard for government agencies to prepare for e-services, such as methods of data back up and e-service standards, Surangkanang said. The Royal Decree should be announced before enforcement of the law, according to Dr Pinai of Thammasat University, who said that otherwise people may do things that are later prohibited under the decree. (Karnjana Karnjanatawe, 2002)¹⁴

The Thai E-Commerce Resource Center (ECRC)

Thai E-Commerce Resource Center (ECRC) was set up by a Cabinet resolution in December 1998 as a unit within NECTEC/NSTDA. The ministry of commerce gave around Bt5 million into setting up the ECRC to help local entrepreneurs. (Jirapan,

¹⁴ More information about the current state of the laws can be found here;
<http://www.nitc.go.th/itlaws/>

1999a) It can be found on the net at <http://www.ecommerce.or.th/index.html>. The center has drafted the Electronic Commerce Policy Framework which outlines strategies and measures that Thailand should adopt to promote E-Commerce as a tool to compete and survive in the new economy. This has actually been one of NECTEC's most successful projects which led on to the creation of *Thaiecommerce.net*. It has also been forefront of E-Commerce educational development. (Karnjana, 2000b)

The ECRC was set up to advance Electronic Commerce development in Thailand to be internationally competitive, which continuously creates the foundation of the development for readiness and strength in Electronic Commerce. (Pongpen, 1998)

Initially, the ECRC's objectives were as follows:

1. To create public awareness and understanding in Electronic Commerce. In addition, to create the cooperation among public and private organizations; to initiate new form of business to public from policy level to entrepreneurs and consumers as well as to have involvement with government and private sectors.
2. To be the center of collecting and publicizing information resource and monitoring Electronic Commerce development of both the government and private sectors.
3. To create capacity building in terms of human resources ranging from training to educational programs, which enhances capability of human resources in various fields involving in Electronic Commerce activities.

The Secretariat of Electronic Commerce Policy Subcommittee of Thailand consist of the Department of Business Economics, Ministry of Commerce and the Payment System Department, Bank of Thailand and ECRC. In addition, ECRC also coordinates the work of the APEC Electronic Commerce Training Center.

The ECRC was involved in setting up *Thaiecommerce.net*, which is a positive initiative of the Thai government to promote qualified manufacturers to use new technology to expose their products to customers abroad. It was set up as part of the Thai government-sponsored E-Commerce pilot project. The objectives of the pilot project are:

1. To facilitate Thai merchants to leverage E-Commerce as means of distributing their products to customers abroad.
2. To create the business model suitable to Thai merchants and regulators to ensure fair practices among buyers, sellers, and related supported business such as banks and couriers.
3. To formulate policy and position of Thai governments towards E-Commerce development in various fora.

In order to achieve three objectives mentioned above, ThaiEcommerce.Net web site is set up as a test-bed of Thai government to encourage Thai merchants to offer their products via Internet technology. The then deputy Prime Minister and Commerce Minister, under the previous government, H.E. Dr. Supachai Panichapakdi who is also the next director general of the World Trade Organization (WTO), officially launched the site on October 1998. ThaiEcommerce.net encourages qualified manufacturers to use the Internet as a means of distributing their products to potential customers abroad. The web site provides their patrons with a convenient E-Commerce system that allows them to send orders and make payment over a secure channel. The government monitors the delivery of all products sold via this service and provides the customers with warranties.

The ECRC also try to create more awareness by organising and promoting various activities. One example is a workshop on electronic commerce policy and regional cooperation. “Digital Economy for Communities and SMEs Development” 19 – 21 June, 2002 : Bangkok, Thailand. This is mainly an Asia-Pacific Economic Cooperation (APEC), but the Thai ECRC is also involved.¹⁵

Educational Projects

As to NECTEC and ECRC’s commitment to training, in the early months of the new millennium the ECRC announced that it would work with the country’s educational

¹⁵ More details of this workshop can be found at <http://www.ecommerce.or.th/APECWorkshop2002/index.htm>

institutions to develop human resources for E-Commerce. The forward thinking of the NECTEC advisor, Dr Pichet Durongkaveroj, must be noted when at this time he said

“Human resource development is crucial for E-Commerce and the education sector can play a vital role”. (Sasiwan, 2000a)

Dr Arthit, the then Minister for Science Technology and the Environment, backed up Dr Pichet. He said that there was no alternative for the country than to compete globally. He went on to say that in order to do so, we needed to depend on human resources, rather than natural resources, and as such, we needed to make sure that more than the existing 10 percent go through university. He also said that now, every year, some 1.2 million Thais enter compulsory primary education, but that just 120,000 would go on to some form of open or state university education. (Waltham & Sasiwan, 2000) He went on to say that this was woefully inadequate, and he pointed out that Thailand's software business alone was at worth some US\$4-5 million annually. While this was already a lot, when compared to the value of agricultural exports, he said, it was still a very small part of the \$3,000 million global software business each year. He cited another problem in that only 30 percent of university students here went on to study in a science field and he indicated that a severe shortfall in the number of qualified teachers was partly to blame for this. He finally said that “...human resources are the critical element in the future of *E-Thailand*.” (Waltham & Sasiwan, 2000)

The ECRC has since began helping universities in Thailand to develop E-Commerce curriculums and to act as centres for E-Commerce consulting to local small and medium size enterprises (SMEs). The ECRC now also provides support in areas such as training for trainers. This once again shows the positive achievements of the ECRC.

The schoolnet project is another encouraging ongoing project of NECTEC. The SchoolNet¹⁶ in Thailand was a project begun in 1995 to provide free Internet access to public secondary schools throughout the country. Fifty schools were included in the pilot project, but an initial problem arose due to the fact that when a school wanted to

¹⁶The website can be found at <http://www.school.net.th/index.php3>.

gain access, they had to pay for the long distance call to Bangkok to log onto the Internet, a crippling expense.

The SchoolNet Project was supplemented in 1996 by a project christened Kanchanapisek, a website containing information about His Majesty the King of Thailand in commemoration of His Majesty's 50th anniversary of accession to the throne. The Kanchanapisek project was then merged with the SchoolNet project, enabling schools to log on to the Internet by dialing 1509, without having to pay for long distance calls or pay an Internet service provider. Hence from 1996, the SchoolNet project has flourished, with 4,274 schools now enjoying free Internet access and local access connection fees as of March 2002. It aims to achieve an online figure of 5,000 schools by the middle of 2002.

Members of SchoolNet are not just concentrated in Bangkok, but are widely spread around the country, helping to diffuse Internet throughout the country and lessen the problem of digital divide according to location. However, NECTEC realizes that providing free access alone does not solve all problems, because the content of the SchoolNet project is still problematic, due to the fact that much Internet content is available only in English. This issue has led to the Content Development Project to create a digital library in the Thai language. In addition, there is an annual Internet training camp for secondary school children, where children are taught how to create websites and place information on the Internet, rather than just using and consuming information provided on the Internet.

In order to give schoolnet a boost SchoolNet Day was created. The first event was on March 16-18 2001 at Ratjabhat Institute on Changwattana Road. To encourage more schools to participate, NECTEC even extended the deadline for schools to join the SchoolNet@1509 Awards to January 25 2001. The awards are part of the SchoolNet Day activities and aim to promote Internet use in schools nationwide. There were both nationwide and regional prizes in various categories including school homepages, story writing, Internet activity, best teacher and best promotion. In addition, NECTEC also ran another contest to help create an image database for schools. The competition is known as "Digital Archive" and has awards valued at 950,000 baht. The project even has its own website at www.school.net.th. (Karnjana, 2000a)

Meanwhile, NECTEC published and distributed 10,000 copies of its "IT-Calendar" to secondary schools as well as those involved in its projects in 2001. It contained pictures and illustrations on relating to various aspects of IT. A special illustration was dedicated to His Majesty King Mongkut, known as the father of Thai Science. The picture shows his calculation notes and astronomy tools used in viewing the total solar eclipse on August 18, 1868. "It has always been my dream to have colourful posters in all schools, telling students what science and technology is all about," said NECTEC director Dr Thaweesak Koanantakool. He said the calendar is part of a strategy to produce more information for schools. Further to this NECTEC and ECRC have instigated projects to help the education sector create its own local content. They co-ordinated with Kasetsart University lecturers to produce electronic information for high schools covering some 1,200 topics.

Chief of the General Education Department's information group, Suwat Suktrisul, said the ministry would make use of NECTEC's SchoolNet infrastructure to reach schools. Starting with 400 high-schools nationwide, it will start pilot testing in the second quarter of this year. Participants in the project must develop CAI (Computer Added Instruction) programs and share their knowledge among the group. Meanwhile, Nectec is co-ordinating with a team of lecturers to develop educational content for its SchoolNet project. Called the Digital Library www.school.net.th/library, it contains seven science-related categories for high-school students: computers, biology, physics, science, mathematics, environment and basic engineering. According to Nectec director Dr Thaweesak Koanantakool there were around 1,300 schools participating in the SchoolNet project in the year 2000, but Nectec aimed for 5,000 schools by the middle of 2002. Around 84 million baht was reserved for the expansion as well as for building up content, he noted. As previously mentioned, by March 2002 there were 4,274 Schools are online with SchoolNet Thailand, SchoolNet (NECTEC). The SchoolNet project offers Internet access as well as basic Internet and web site development skills. With the Digital Library, Nectec aims to encourage more schools to be aware of technology for learning. (Karnjana, 2000a) The Schoolnet project is good, but with over 30,000 schools in Thailand a lot more work needs to be done. If Thailand really wishes to compete with other countries then the schoolnet project

needs to be sped up and enlarged, or Thailand will not have the man power to compete.

Phuket Cyber Island Project

Not all NECTEC's projects and proposals have been popular. A dream to turn Phuket into an intelligent island was conceived at least four years ago but is still a long way from becoming reality because of a lack of funds, also questions were asked about who was going to profit from this project.

The Greater Phuket Digital Paradise project-"PhD" for short-now needs government funding or foreign investment, according to the NECTEC Phuket branch director Somyos Sundaravibhat. The estimated cost of implementing the PhD project was four billion baht, which would be used to build a high-speed network, to establish international education campuses and facilities for the IT community and for e-government.

The *intelligent island* idea was initiated by Gen Chavalit Yongchaiyudh's Cabinet before the baht was floated in mid-1997. The National Social and Economic Development Board was assigned to draft the policy and planning, while NECTEC was invited to help with IT direction and implementation. The project was first called "Phuket IT City" and later renamed "Phuket CyberPort and International City," before being changed again to the PhD project in October 2000. The reason for the change was to expand the intelligent island concept to cover not only Phuket, but also Phang-nga, Krabi, Trang and Satun provinces on the southwestern coastal seaboard. Many people now question the wisdom of this project. Charoen Kittikanya sees the proposal to spend tens of billions of baht on turning Phuket island into a cyber city as "too visionary" in the current economic climate. He then quotes Amnard Poltecha of the National Economic and Social Development Board, a senior policy and planning analyst. Amnard questions the ambitious scale of the cyber city proposal by the government and NECTEC:

"The idea is rather like a dream,"(Charoen, 2000b)

he said of the plan, which would make Phuket an international cyberport along the lines of similar ventures in Hong Kong and Malaysia. He also explained that the plan also went beyond goals stated in the national economic and social development plan that ends in October next year.

"It is mentioned only that Phuket will be designated as the pilot project for an information technology city, where the whole community is brought up online and the city-wide management is run on IT," (Charoen, 2000b)

An IT city, as envisioned in the national plan, would require investment of one billion baht, not the 40 billion baht stated for the cyberport plan. Nectec's proposal was much larger than an IT city and would need investment in E-Commerce, as well as a software park and gateway, despite the fact that Phuket still lacked the basic infrastructure and personnel required.(Karnjana, 2000d)

"In our (NESDB's) definition, a cyber city should be like a multi-media super-corridor which links online all provinces in the country," (Charoen, 2000b)

He went to explain that he thought that the development should not be confined to Phuket, which was already becoming an IT city to some extent. Several hotels in Phuket were equipped with IT while local Internet service providers were preparing networks. He then went on to say that E-Commerce and a software park may be things which NECTEC and the government want to expand. But such things need time and money, and that he thought that a cyber city was too visionary. It has to be said that given the economic climate and massive public debt, any huge investment at the government's expense may not be appropriate.

A source at the Thailand Development Research Institute said that although cyber development had been mentioned in the NESDB's plan, the much enlarged cyber city project might be politically motivated. He said "certain politicians" had vested interests in the island.

However, Paul Renaud, a Phuket-based former analyst with Morgan Stanley, who is now a web master for thaistocks.com, disagreed. Everything in the country was

politically motivated, he said, adding that he is very much in favour of the expanded plan.

"The island is a creative place to work; the airport's new four-lane highway is excellent; the new schools and shopping facilities and hospitals make it a retirement and a creative haven. The number one priority, for which we need government help, is to get faster and better phone connections, and therefore more Internet connections."(Charoen, 2000b)

This project seems to be a blot on NECTEC's copy book. The idea may be sound but the location has to be questioned. The fact that the initial proposal stemmed from the Chavalit government of 1997 alone leads to serious questions. This government has been severely tainted from the handling of the Asian economic crisis, and it was also not recognised as the least corrupt in Thailand's recent history. One significant indicator is that both Amnard, who is against the project, and Renaud who is for the project, both consider it politically motivated. This project needs a very large investment, but who will be the ultimate benefitter of this. Reynaud is based in Phuket so for him this would be a personal benefit. There really should be an assessment of the viability of the project and also whether this location would be the best.

Other Projects

Though four main projects, and their subsequent offshoots have been highlighted here, it must be said that there are also many more projects not mentioned. Here are a few others briefly mentioned, to mention every project is well beyond the scope of this paper.

One of these is the Government Information project (GiNet). This has been planned as a key infrastructure to serve the public sector. It will offer a dial-up telecommunication service to government agencies. Different organizations can dial up to the nearest GiNet node to establish a connection with another agency remotely. GiNet project is aimed at serving all government organizations by providing a network for them to link and talk together. It's hoped the network linkage will eventually help encourage government organizations to increase their co-ordination, share and pool information, and improve the overall services to the public. (Pongpen, 1999b)

The service organization for GiNet is the Government Information Technology Service (GITS) Office. The main network service is typically a type of one large-bandwidth link between the customer's headquarters (i.e. government agencies in Bangkok) and their multiple branches in Bangkok as well as in other provinces. Branch offices are connected to GITS points of presence (POP) by dial-up circuits. A virtual private network (VPN) value-added-service is provided for all users. The initial bandwidth of the backbone of the network is 128kbps to every provincial POP, with immediate upgrade to E1 (2Mbps) wherever needed. The ultimate backbone speed of the project was planned to be STM-1 (155 Mbps) or STM-4 (622 Mbps). In addition to the network connection service, GITS has initiated many other services for its customers such as daily news clipping, government directory service, and secure electronic mail (using digital ID), certification authority (CA) and cooperate with a partner. Through secure email, GITS demonstrates the importance of digital signature and PKI. A pilot CA has been set up to support the use of digital signature and made available to all GITS staff members and staff in the customer's organization.

Another less publicised project is the attempt to bring down the costs of PCs. NECTEC could see that there would be benefits for consumers, thus they set up a team to research the current state of technology and industry trends as well as ways of reducing the cost of hardware. (Sasiwan, 2000b) Though it must be noted that despite the tariff removal PC prices have been slow to drop. (Karnaja, 2000e)

NECTEC has also begun to educate and encourage the private sector to adopt international standards such as ISO 9000 and CISPR22. They also talked with a German body in order to certify NECTEC's own electrical and electronics testing center (PTEC) as a certification authority on technology standardization. This would then allow PTEC to act as an auditor and standards authority for locally manufactured PCs. (Sasiwan, 2000b)

More recently NECTEC has announced plans to begin testing IT workers against international standards. This is in response to growing market demand for qualified IT professionals. This marks the first step towards measuring IT standards in this country against IT standards in Japan. One of the objectives is to help international

organizations employ qualified IT engineers from other Asian nations by adopting common testing standards. (Sairoong, 2001)

Software Park Thailand is a bureau under the National Science and Technology Development Agency (NSTDA), the Ministry of Science, Technology and the Environment. It was initiated by NECTEC/NITC and with the backing of the Board of Investment, Software Park is the first and only infrastructure Thailand has ever built for this new industry. It was established in order to support development of the software industry in Thailand with the focus on having an actual place as a center for software manufacturers and developer companies. This will encourage cooperation and will be a center for technology transfer services, research and development, professional development, and Thai software organization advancement, as well as formarketing, business partners, capital support coordination and other activities benefiting entrepreneurs and Thai software development.

As we can see NECTEC is involved in many many projects. This paper only highlights a few, but there have been thousands of projects worked on by NECTEC since it came into being in 1986. There are many other projects of NECTEC and its derivatives still being worked on and implemented. There have been criticisms of NECTEC that it has too many meetings and not enough actually gets done. This may be true to an extent, but by examining NECTEC's work record we can see that an awful lot does actually get done.

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CHAPTER 6

THAILAND'S E-COMMERCE DEVELOPMENTS

The Early Focus

Thailand is still in the early stages of tapping the full potential of the information technology revolution. While Thailand has made a start over the past three years to enter the world of E-Commerce, analysts say the local technology penetration is still around two years behind that of the United States. Over the next three to four years, the US is expected to lead the world to a more advanced stage of E-Commerce, further developing online market exchanges and information sharing which synchronise and maximise end-to-end business processes.

According to a survey conducted at the end of 1999 by the business economics department at Thammasat University, in the business-to-business segment (B2B), Thai small and medium-sized enterprises, which represent the majority of Thai businesses, are still reluctant to capitalise on Internet commerce. The survey, which canvassed 175 local SMEs, also found that most SMEs in Thailand had little E-Commerce experience. High costs, lack of knowledge and understanding and the fear of losing trade secrets are cited as the main reasons for the low E-Commerce penetration. (Charoen, 2000a)

Though Suphprasert Wongsuwan, senior business manager of Informix Software (Thailand) Ltd, a leading US-based software house for database management and Web-site development, disagrees. He went on to say at an E-Commerce conference at Sasin in June 1999 that "E-commerce has had a big impact in Thailand, and many firms are trying to catch up with this new opportunity. There is a huge demand from local companies to have their own Web sites created." (Kwanchai, 1999)

But awareness of the value of E-Commerce is high among Thai businesses, particularly large enterprises in the construction, auto vehicle, farm products and electric appliances industries.

Industrial sector	%
The computer industry (including Internet, hardware, software and web-hosting firms).	17
The service sector (including consulting, information providers and research companies).	16
The tourism and hotel industry.	12
The food, health and hospital industries.	7
The construction, furniture and interior design industry.	6
The wholesale and retail industry.	5
The entertainment industry.	5
The electrical and electronics industry.	5
Others.	27

Table 6: The percentage of the industrial sectors adopting E-Commerce in Thailand: Dec 1999. Source: <http://www.tradeport.org/ts/countries/thailand/mrr/mark0019.html>

E-Commerce development has been utilised by most industrial sectors in Thailand. But some sectors seem to have been more active than others. Table 6 (above), shows the percentage of E-Commerce adoption at the beginning of the new millenium, but in IT terms that would be considered to be a long time ago. It does this by looking at E-Commerce web sites in Thailand rather than the income generated. Even though these figures are over two years old, we can see a certain pattern occurring, with most Thai industries having an equal share in the percentage of E-Commerce adoption, at around 6%. It is interesting to note that the computer industry was well ahead in this initial phase of E-Commerce development in Thailand. It would be logical to assume that companies involved in this industry would be the first to adopt E-Commerce initiatives, though it is likely that their percentage share of the E-Commerce web sites would decrease as more Thai companies adopt E-Commerce measures.

Following on from the computer industry in E-Commerce adoption are the service sector (16%), and the tourism and hotel industry (12%). Both of these industries can be linked and point to an excellent adoption of E-Commerce. This is because their target is mainly directed to the large internet user base in Western and Japanese countries. With tourism being one of the largest earners of foreign currency for the country, and with many potential customers being Internet users, it is logical to go for this market. By doing so hotels can sell their services directly to their potential clients and thus cut out the problems of both dealing with foreign travel agents and the loss of income through their handling fee. In fact it has now become difficult to find any hotel

without its own internet web-site. The Internet has become an integral part of the tourism industry with even small guest houses having their own web-sites. It can be seen that in this initial phase of E-Commerce in Thailand it is better to target the large customer base of America, Europe and Japan, but what about the development of B2C E-Commerce within Thailand.

As for the business-to-consumer side (B2C), the survey said there are some obstacles that may initially slow the growth of E-Commerce's advance in Thailand, but in the medium term, Internet services will begin to make inroads into traditional commerce. (Charoen, 1999) There are factors also affecting B2C E-Commerce in Thailand, such as "Can't see and feel products" which was the major reason given by respondents to a NECTEC survey for their decision to avoid online purchases. Other significant factors, the respondents said, were: "Don't want to reveal credit card number", "don't trust merchandisers", "not interested", and "no credit cards." (NECTEC 2001:64) Speed and response time on the Internet also remained a concern among respondents. (Charoen, 2001)

Lehman Brothers, one of the world's leading investment bankers, points out short-term challenges for Thailand in developing E-Commerce include comparatively low credit card penetration, primitive infrastructure and distribution systems which may restrict the dispatch of products purchased over the Internet and curb efficient inventory. In developed markets, credit cards are the most common way of completing B2C transactions. But in Thailand, there are currently only about 1.9 million card-holders, or just 3% of the population. Recent surveys have found that the majority of Net users, estimated at 1 million, were students who had no credit cards. To go online, a monthly income of at least 20,000 baht is required of applicants. But the survey found that the number of respondents who had made Internet-based purchases grew only slightly, to 19.1% in 2001 from 18.4% in 2000. (NECTEC, 2001:73)

Dr Srisadki said the 5% transaction fee imposed on credit card use also limits the ability of Thais to pay on their credit cards. US banks, by comparison, charge only 1.5% for credit-card transactions made online. Some analysts argue the local reluctance to go online is not just about technology but a lack of "trust" from consumers. This is especially true after hackers were able to steal credit cards details

from Loxley. According to PricewaterhouseCoopers, security is the top concern of consumers in Thailand and worldwide, as they are wary about scams and the business practices and reliability of online traders. (Epaynews.com, 2000)

Research shows that trust in e-business on each transaction is dictated primarily by the buyer's previous experience, the reputation of the seller and product brand, the buyer's experience in navigating the Net and the quality of the web site's presentation and technology. (Charoen, 2000a)

B2B¹⁷ in Thailand

Business to business E-Commerce is the use of computer networks or the Internet to communicate, deal and perform business transactions electronically. This new medium will allow companies, even in different parts of the world, to contact each other and continue dealing at any time. Each company can link with their suppliers through a computer network and place orders online when they want products. This reduces the need for companies to stock products for long periods, thus reducing inventory costs and helping companies have better cash flow. (Pongpen, 1999a)

Pongpen explains how B2B is going to be more important for Thailand and Asia than B2C. He tells us that “most businesses think of the new electronic trading system in terms of business-to-consumer, but in this region, the emergence of E-commerce will come from business-to-business activity.” He goes on to show how Asians prefer to go to real shopping malls “Customers' behaviour is another concern. Asian people still prefer to shop in actual shopping malls. This behaviour is different from that in the US. According to a recent survey, only three per cent of Net users in Singapore buy things on the Net. In the US, 20 per cent of Net users enjoy online shopping.” (Pongpen 1999a)

Thailand's first business-to-business Internet exchange for the packaged and processed food industry was launched on 15th Sept 2000, when Deputy Prime Minister and Commerce Minister Supachai Panitchpakdi formally opened the FoodMarketExchange.com web site at the Queen Sirikit National Convention Centre.

With registered capital of 300 million baht, half of which is paid-up, Biz Dimension is introducing the B2B exchange, with some 30 Thai exporters of food products already signed up. (Sirivish, 2000)

It planned to attract another 100 producers before the end of the year 2000. Shareholders include Union Frozen Products, a shrimp exporter, Asian Seafood, a squid and fish exporter, Thai Union Group and RS Cannery, both tuna exporters, Hua Chuan and STC Group, both rice exporters, along with Dr Nit Chantramonkolsri, vice president of the Thailand Development Research Institute, and Asset Plus Securities.

The service is an attempt to establish an e-marketplace of producers and exporters—a traditional strength of Thailand. The community of users would include associated packaging industries as well as the banking and finance industries, according to Biz Dimension CEO Thirapong Chansiri. He said that FoodMarketExchange.com would prepare the industry to take orders online, to improve their efficiency, expand revenues and markets and to provide them with up-to-date information. Such exchanges were becoming commonplace in the US and were increasing in Europe but they tended to be buyer-centric, he said, noting that Biz Dimension aimed to help food producers make contact with buyers worldwide.

This was the first B2B play in this sector and also the first in the region, Mr Thirapong claimed, noting that once established, the company would look at the possibility of expanding to encompass the Southeast Asian region—the major source of food products to the world. FoodMarketExchange.com uses Ariba software while Hewlett-Packard was the systems integrator. It also relies on Cisco networking and security products while data is stored in an Oracle database. Sun Microsystems hardware and Netscape software was used for the web site, with the technology investment standing at 100 million baht, he said.

The exchange would also support auctions and reverse auctions. Once it achieves 100 suppliers the exchange plans to add another 300 to 400 food-producing companies next year. The company is also building a data centre for the food industry here, since access to good data was a weakness for Thailand, Mr Thirapong said.

¹⁷ For categories of e-commerce see appendix 1

The company plans to provide trade information, information about pricing and demand and also offer analysis as well as technical information. This would include laws and regulations for importing countries and standards, he added, noting that there would also be an "export clinic" to respond to questions. The concept for the exchange goes back to October 1999, while the company was established in March. Since then it has been working on customising the site, which was initially in English only, but has now added Thai-language capabilities.

"In the US, such exchanges are simple commodity exchanges, but FoodMarketExchange will be more complex. The aim is to increase efficiency by working closely with the suppliers," noted Mr Thirapong. Biz Dimension charges participating companies a one-time set up fee of 50,000 baht, a monthly membership fee of 5,000 baht and a transaction fee of between 0.5 and 2 %. This transaction fee is lower than the equivalent in the US for such exchanges, where it was set at a minimum of 2%.

"Our concept is to provide transparency and to be a facilitator. We don't get involved in the transaction and we don't hide the buyer from the seller, so we are not a middleman in the traditional sense of the word," he said. Mr Thirapong, who as president of Thai Union Frozen Products has extensive experience in the seafood export industry, noted that the Internet presented an opportunity for farmers to have access to information about world markets and that this would help them manage production.

The aim of foodmarketexchange.com was to set up a seller-centric model. While Internet commodity exchanges are a new idea here, this is not the case in the US, where at a recent trade show there were nine seafood exchanges exhibiting. However, these sites were initiated by the buyers rather than the sellers. FoodMarketExchange.com has an advisory board with 26 leading food corporations here and also works with Verisign on security and privacy issues.

The company is working with the Department of Export Promotion and with the ministries of agriculture and health. But Mr Thirapong said that the biggest problem

remains a lack of urgency and the low level of understanding of the Internet. People don't see a need to change, he pointed out, and this is a problem since now all businesses in the US are restructuring putting their business processes online.

This will soon reach a point where they will not deal with off-line companies, and hence it was important that Thailand quickly get its agricultural exports online, he said. Marketing to buyers would be done through trade magazines, trade shows and through PR firms, while the company already has an office in the US, the single biggest customer for Thai food exports. However, with this online presence, he was hoping that Thai food exporters could address non-traditional markets such as those in the Caribbean, in South America and in the former Soviet Union. (Waltham Tony 2000)

FoodMarketExchange.com has since proved to be successful. One of its successes is its launch of the first Web-based shrimp auction venue in Thailand. Biz Dimension Co., operator of FoodMarketExchange.com, hopes the digital market will increase the volume and quality of local shrimp trading. Thirapong Chansiri, chief executive officer of Biz Dimension, projects shrimp trading via his company's digital channel will account for 10 percent of total trading in the country. Rough FoodMarketExchange.com, traders are assured of fresh, high-quality shrimp because farmers sell their wares directly to cold-storage facilities or shrimp plants. Brokers check the quality of the products to ensure the buyers get the best. Traditionally, shrimp auctions are held at Mahachai shrimp Surat Thani Province. In these markets, sellers are required to transfer their shrimp to the venues first, not direct to the buyers. By the time the auctions are finished, the shrimp have lost some of their freshness.

One more advantage of the online market is that it can serve traders on a 24-hour basis, or whenever buyers and traders are ready to conduct their transactions. Pornlerd Panasampon, president of the Surat Thani Prawn Producer's Club, expects FoodMarketExchange.com to become a major trading channel, like the shrimp auctions in Pakpanang and Mahachai. Shrimp prices quoted at Mahachai and Pakpanang are cited in the global shrimp market. FoodMarketExchange.com is confident its auction price will gradually become as accepted as the other two. Montri Dechopol, senior manager of Biz Dimension, said buyers, sellers and brokers must

sign up for membership in FoodMarketExchange.com to participate in trading. The digital market currently has 20 shrimp-trading members. The number is expected to expand after it joins the Fisheries Department's Shrimp Farming Club. Last October, FoodMarketExchange.com conducted a pilot online shrimp auction, selling shrimp from Surat Thani Prawn Producers Club ponds. (Usanee, 2001)

Another B2B development in Thailand is that of Winstore. After operating its business-to-business (B2B) e-commerce service early in the year 2000, Efficient Consumer Response (ECR) solution provider Winstore was confident of achieving 100,000 million baht in transactions in its first two years.

Winstore is a facilitator of e-business solutions. In an interview in June 2000, Winstore CEO Preecha Vejsupaporn said Winstore said that companies that believe that the Internet will affect their business should be moving into e-commerce now. At that time there were 600 convenience stores in petrol stations operating Winstore's e-business and trading solution over the Internet and around 100 manufacturers. More than 1,000 items or "stock keeps units" (SKUs) are sold online. At present there are around 1000 retail outlets, 256 manufacturers and 3,500 items. The company recently signed a contract with Saha Pathanapibul, a consumer goods distributor that is part of the giant Saha Group. Saha Pathanapibul has 200 affiliates and is expecting to generate around 2 billion baht from B2B ecommerce.

"After running some workshops with manufacturers, we decided to offer them more value-added service for the ECR solution," he said, adding that this would involve supply chain management from taking an order online to product distribution and financial services. He claimed that through IT, manufacturer's could reduce operation costs because paper-based billing and purchasing would be eliminated. Winstore sends the one-time order to manufacturers and distributes invoices to retailers. It will also act as a centre to collect payments. (Karnjana, 2000c)

In December 2001 Winstore announced that, "to help small retailers survive in an industry increasingly dominated by large store operators, the logistics specialist WinStore Co is planning to widen the base of product categories it delivers to 2,000 retailers." (Nondhanada, 2001)

WinStore now delivers only grocery products, but it would soon add pharmaceutical, books and magazines, CDs and tapes, car-care equipment and pet foods. Chief operating officer Preecha Vejsupaporn said that the move would help small stores compete with larger foreign-owned retailers, referring to hypermarkets. The company has also teamed with SmartPost Co to deliver information and samples of new products to WinStore members, whose numbers are projected to grow to 3,000 by the end of the year 2002.

The new WinStore Direct service would help manufacturers communicate messages about new products quickly, and also to reduce their operating costs, said Mr Preecha. At the same time, he said, retailers would be able to test products before placing orders. SmartPost will handle the logistics for product sampling and delivery to remote areas. WinStore will continue to use Davids Distribution to deliver items in Bangkok and major provinces. SmartPost Co is a joint venture between Samart Corp and the Communications Authority of Thailand. It provided logistics service through the CAT's postal network, covering 15 distribution centres and 1,600 sub-distribution channels, said Sunsakul Suwannat, general manager of SmartPost. WinStore provides supply-chain management to 1,000 chain convenience stores, as well as to another 1,000 family-run and co-operative outlets. Its convenience-store customers include Lemon Green, AM/PM, Select, Tiger Mart, Star Mart, Mobil Mart, V Shop, Everyday and Jiffy. So it can be seen that B2B can be successful both inside and outside Thailand, the important thing is to prepare well and know your market.

B2C¹⁸ in Thailand

Though it has been acknowledged that the main focus of E-Commerce in Thailand will be B2B, there are companies looking for the B2C market. The difference here is that unlike the USA, Europe and Japan, in Thailand credit card penetration is poor. There are two ways to counter this, but the first is a cash-on-delivery system. Various kinds of companies have gone into the E-Commerce market to sell their products over the Internet. Companies such as flower sellers, on-line groceries, electronic and

computer companies are all selling their goods over the Internet. The most obvious are the global companies such as KFC and Pizza hut, where you can order food to be delivered to your home via the internet. For the most part they trade on the cash-on-delivery basis. The second focus is to target global sales, in this way Thailand's underdevelopment could actually become an economic advantage. This is because Thailand's potential customer base is so low that it is unlikely for foreign companies to target a B2C market in Thailand. Bearing this in mind tourism has also been making an impact, with many hotels and travel agents going on-line. But this low customer base can affect Thai companies that go for the home market. They have to research their potential customers in the local market and the compatibility of their product to this market.

The prime example of not judging your market was Chowhuay.com. Chowhuay.com was an attempt to link traditional corner shops and independent retail stores in a new network, and offered home deliveries placed on its web site in Bangkok for cash-on-delivery payments. Customers could shop on the web at <http://www.chowhuay.com/> with a delivery within 24 hours free of charge, according to Chowhuay.com chairman Dr Anupap Tiralap. (Sasiwimon, 2000e) Chowhuay.com opened with plenty of publicity with articles in most newspapers and news web sites.

The plan was for customers to subscribe to Chowhuay.com, with annual membership being 750 baht a year, and also to pay a first-time access fee of 500 baht. Customers need not pay any delivery charge while the minimum value of goods purchased was 200 baht per order, with no more than 10 items for each delivery. Payment would be cash on delivery and customers who ordered products before 10 a.m. could have expected deliveries that afternoon. Orders placed after 10 a.m. would have been fulfilled the following day.

At that time there were some one million Internet users nationwide, half of them in Bangkok, and Chowhuay.com aimed to capture only one percent of users in Bangkok. (Sirivish, 2000) Dr Anupap said at the time that the web site would be an opportunity for small retail shops to survive in the Internet era, "We would like to let these shops see the productivity from using technology". (Waltham, 2000b) At that time he said

¹⁸ forcategories of e-commerce see appendix 1

that If the concept of Chowhuay worked, it would offer traditional Thai shopping culture on the Internet, and despite convenience stores, consumers would be able to purchase the same quality products more cheaply and more conveniently since they would not need to travel. (Sasiwimon 2000)

Unfortunately, Chowhuay.com did not work. The market in Thailand for B2C E-Commerce is very choosy, and to really succeed you need to target specific groups. Research has shown that Thai Internet shoppers want to see and feel their products. Though this is true of food products there is still a market for unperishable goods.

Goods such as books and computer software have proved to be marketable. As mentioned earlier companies such as Chulalongkorn University's Chulabook.com have been successful in promoting and selling their products over the Internet. Unlike Chowhuay.com books can be seen over the Internet and are not prone to change on arrival, books cannot be bruised or change shape. Of the reasons for Internet user not purchasing over the Internet the most chosen reason was that they could not see/feel the product. (NECTEC, 2001: 65) As for Chulabook.com they targetted a niche market, and one which would likely have a good Internet population. It is quite likely that someone who visits the Internet would also be a reader of books, also with the books being in Thai there would not be any foreign competition.

Another way to succeed is to follow the path of Thaigem.com. This has become the Web's biggest on-line Gem & Jewelry Store. It has gone for both the B2C market and B2B market. But without doubt its biggest market is B2C. It has done this by not targeting Thai customers, but going for a global market. It has become a true example of a global company and its web site can be seen in Spanish and Chinese as well as English. Though it is noticeable that there is no room for Thai language on its website, this reflects Thailand's position in the B2C market.

The web site GroovyBangkok.com tells us the details about how Thaigem.com succeeded. "Don Kogen, 34, chief executive of Nuntiya Care Stone, set up Thaigem.com, the world's largest online gem-trading portal, as well as several e-commerce web sites. Now Thaigem.com claims to handle at least 92% of the global online gem and jewelery trade."

“Mr Kogen, who settled in Chanthaburi 13 years ago, began his cyber venture with 100,000 baht as start-up capital. He has launched several charity projects such as free computer and English-language schooling for children, free Internet access, scholarships for children and free development of a homepage for police stations in Chanthaburi province.”

Nuntiya Care Stone now has 50 million baht registered capital, up from an initial two million. It has invested 200 million baht on Internet software and back-office technology, including leasing a high-capacity line from Loxley Information Service, one of the local Internet service providers.

Mr Kogen says the Internet has been "wonderful" for his business. It now has just over 350 staff and expects to have 900 by the end of this year. He now operates seven factories. One of these is located abroad, in Jaipur, India, where it produces beads and has 200 workers. "The Internet is one of the key factors. But the most important is to be prepared to "fight to the death", he says, recalling that he and his three founding staff members, whose ages averaged 21 years at the time, never slept for four consecutive days before launching the online site. "In doing business via the Internet, you have to be quick and dedicated to ensure maximum customer satisfaction, and the products must be offered at cheap prices."

Thaigem.com now lists 1.33 million individual gem and jewellery products for direct sale, as well as 250,000 for auction, spread over a dozen of the world's largest auction sites including e-Bay, Yahoo, Amazon.Com, Cityauction, Clickabid, MSN and Auction.com. Thaigem claims to account for about 95% of online gem trading via e-Bay, and 99% via Yahoo and Amazon. It says its prices are about 7-20% of those quoted in the regular retail market and products are delivered within 72 hours by Federal Express global delivery. All goods are on five days' approval. "As the products we sell are cheaper in price than in shops only 5% of products are returned," Mr Kogen says.

Thaigem has registered 900,000 database users of its site. Between 1.2 million and 1.5 million "hits", or visits to the site, are recorded each month.

There are more than 100 small and medium-sized companies advertising and selling on Web sites. Only 20 or 30 local firms actively use full E-Commerce functions in creating online shopping, from product display via online catalogues to online ordering and payment. Most are trading firms, but business-to-business E-Commerce has been done for years by local banks and financial firms. For a list of Thai companies encompassing the E-Commerce market see Appendix II



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Conclusion

Thailand is definitely on the wrong side of the Digital Divide, the statistics and figures are there for everyone to see. The introduction of the Internet has supplied a firstly a way to accurately measure imbalances. In the past these statistics would have been forgotten and would have hardly been news. Secondly, the Internet also supplies the forum where these statistics are permanently available. This has exposed the extent of Thailand's Digital Divides, the Global one, between Thailand and the rest of the world, and the National one between the rural and urban societies within Thailand. In truth these Digital Divides are just mirrors of the traditional differences between the 'haves' and 'have-nots', or more succinctly the 'rich' and the 'poor'. What the Internet has done is to bring this gap to the attention of a wider audience in the guise of the 'Digital Divide'. The result is positive as attention means that more action will be taken, but how should these divides be treated?

Another development from the Internet has resulted in the fastest growing economical phenomenon in history. This is trade over the Internet from computer to computer, this trade is known as Electronic Commerce, or E-Commerce. E-Commerce first emerged in 1994, one year before the term the Digital Divide was coined. This is no coincidence. E-Commerce is going to globalize trade in a way never seen before, and this newly emerging market created by E-Commerce will no doubt be important for trade. But as the statistics show E-Commerce has become an indicator of the Digital Divide. It has also become a factor in the widening of the Global Divide with the more advanced countries monopolising most of the global E-Commerce trade. Some countries are being left behind, but what does this mean for Thailand?

This means that developing countries such as Thailand have to modernize their trading systems to keep pace with the changes. If they fail to do this they will fall even further behind the so-called 'developed' countries. The Global Digital Divide has already left Thailand behind, if Thailand is to compete it needs to upgrade its internal network. By updating and improving its E-Commerce capabilities Thailand will also be putting in a framework to break the Digital Divide, as one must go with the other. Thailand has to be at the forefront of Asian commerce, though it will be still be years behind the major

industrialized countries. The present 'Thaksin' government seemed to realize this more than any other but after initial promise it too has delayed putting in the necessary measures to promote E-Commerce to its fullest. The delay in the E-Commerce laws is the most notable example of it dragging its feet. There are still problems with the infrastructure that have yet to be addressed.

Thailand has been too slow to recognise the significance of the Digital Divide but has now galvanised all sectors of society in trying to bridge this divide. In bridging this divide locally there will also be the chance to give underprivileged members of society a chance to improve their own position. Though there has always been this gap between the rich and the poor there have never been so many projects to address this gap as there are now. If this gap can be broken down then the divide between Thailand and the rest of the industrialized world will also be broken down. Thaksin's government has proved to be rising to this challenge more than other previous government. With both the creation of ThaiTambon.com and the "one tambon one product" project the Digital Divide is being tackled head-on, these projects should have an impact on both of Thailand's divides.

Thailand has to look at and to try to follow the examples of successful E-Commerce ventures such as Foodmarketexchange.com and Thaigem.com if they want to have a real impact. To concentrate your E-Commerce on just the Thai market might provide enough income to operate successfully, but as we have seen the Thai market is just not sufficiently large enough to really sustain any substantial growth. Thus the global B2C market can be tapped and most of the Internet users in the US and Europe also have enough credit card penetration to make it viable.

The government itself needs to act with more urgency as the E-Commerce laws have been waiting in the wings for too long. The new government of Thaksin started with promise but began to stutter. With NECTEC Thailand has in place an important body to help and advise both industry and academia. It is important that a body such as NECTEC does not become politicised as almost happened with the 'Phuket Cyber Island' project. The development of a host of educational programs and infrastructure projects will begin to bear fruit in the near future, thus giving Thailand a brighter E-Commerce outlook than many of its competing nations. But will the intensity and

focus stirred up with the recognition of the term 'Digital Divide' still be there in the future or will things return to how they have always been, with the rich and the poor, lets hope not.



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Appendices

Appendix 1

Categories of electronic commerce

Electronic commerce can be sub-divided into four distinct categories:

- business-business **B2B**
- business-consumer **B2C**
- business-government **B2G**
- consumer-government **C2G**

An example in the *business-business* (B2B) category would be a company that uses a network for ordering from its suppliers, receiving invoices and making payments. This category of electronic commerce has been well established for several years, particularly using Electronic Data Interchange (EDI) over private or value-added networks.

The *business-consumer* (B2C)¹⁹ category largely equates to electronic retailing. This category has expanded greatly with the advent of the World Wide Web. There are now shopping malls all over the Internet offering all manner of consumer goods, from cakes and wine to computers and motor cars.

The *business-government* (B2G) category covers all transactions between companies and government organisations. For example, in the USA the details of forthcoming government procurements are publicised over the Internet and companies can respond electronically. Currently this category is in its infancy, but it could expand quite rapidly as governments use their own operations to promote awareness and growth of electronic commerce. In addition to public procurement, administrations may also

¹⁹ Sometimes also known as Business to Customer

offer the option of electronic interchange for such transactions as VAT returns and the payment of corporate taxes.

The *consumer-government* (C2G) category has not yet emerged. However, in the wake of a growth of both the *business-consumer* and *business-administration* categories, governments may extend electronic interaction to such areas as welfare payments and self-assessed tax returns. (European Commission - Information Society Directorate-General, 1999)



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Appendix 2

Thai E-Commerce companies

Here are some local Thai products and services being offered online today.

MARKET EXCHANGES

Internet Thailand's Thai.com offers a virtual business trading community for individuals and organisations and the site also provides e-payment and delivery services.

Today In Thailand <today.in.th> was created by Anet Internet with the aim of creating a giant e-commerce community.

Property for sale can be found at <scb1.scb.co.th/property/default.htm>.

The Department of Export Promotion <www.depthai.go.th> offers useful links for exporters.

ThaiMarket.Net <www.thai market.net> offers various products ranging from toys to machinery.

ThaiTradeFair.com at <www.thai trade.com> offers an events and business opportunity service and a Thailand export directory.

ThaiEcommerce.net <www.thaiecom merce.net> is an e-commerce pilot project of the Ministry of Commerce where you can find various Thai products such as herbs.

Outdoor equipment or toys can be found at the site Thaimall.com <www.thaiemall. com> developed by the Community Development Department with an aim to help rural people to expand their businesses globally via the web.

StyleThai.com <www.stylethai.com> offers Thai handicraft products.

ThaiGem.com <www.thaigem.com> is the largest online Thai gemstone and jewelry site which also offers an auction service and delivery.

Point Asia initially developed three vertical e-marketplaces for specific types of business to take advantage of online trading.

These include PointAsiaOil.com <www.pointasiaoil.com> for the Oil industry, PointAsiaChemical.com <www.pointasia chemical.com> for the chemical industry and PointAsiaAuto.com <www.pointasiab2b.com> for automobile firms.

FoodMarketExchange.com <www.foodmarketexchange.com> offers a marketplace for the food industry. This is the first food market exchange site in the region that has more than 20 member companies signed up.

WeThai.com <www.wethai.com> offer a business-to-business marketplace for various types of industry including chemical and IT products. It aims to serve as a market exchange for end-to-end commerce solutions for Thai industries and businesses worldwide.

FLOWER AND GIFT DELIVERY

Misslily <www.misslily.com>; Flowers for Thailand <www.ecombot4.com/store641>; Flower FeedBack <www.flowerfeedback.com>; Laddawan Florist <www.laddawan.com>; Mrs Flowers Florist <www.mrsflowers.com>; Paradise Orchid <www.paradiseorchid.com>; Nita Florist <nitaflorist.hypermart.net>; Orchid Thai <www.orchidthai.com/>; Siam Florist <www.siamflorist.com>.

Safun, a manufacturer and a developer of unique sports toys, offers its product delivery service at SafeandFun.com <www.safeandfun.com>.

CYBER MALL

ShoppingThailand.com <www.shoppingthailand.com> was created by Loxinfo and offers not only online products, but also e-commerce service to help you develop and host your own site plus manage e-payment and delivery services.

An e-mall for music lovers developed by Grammy is at <eomegamall.eotoday.com>.

Also see eSHOP-Thailand <eshop.in.th>; ShoppingThai.com <www.shoppingthai.com>; Thaiemall.com <www.thaiemall.com>; Thaicybermall.com <www.thaicybermall.com>, belonging to KSC Internet; MeetingMall.com <www.meetingmall.com>; eNetGlobe <www.enetglobe.com>; Central Department store at <www.centralelective.com>; and JJShop.com <www.jjshop.com>.

ONLINE BOOKSTORES

CUbook.com <www.cubook.com>; Thaiamazon.com <www.thaiamazon.com>; ProBook <www.probook.co.th>; Pudín Book Store <www.pudin.chatbook.com>; BosBook <www.bosbook.com>.

FOOD AND BEVERAGE

PizzaHut is at <www.pizza.co.th>.

Thai food restaurant S&P is at <www.sandprestaurent.com>.

Planet Liquor at <www.planetliquor.com> offers various kinds of spirits, wine and liquor.

COMPUTERS

Discount Computer Outlet <dco.co.th>; Data IT Superstore online <www.edatait.com/ctrf.htm> or <www.doodee.com> offers a channel to buy PCs, notebooks, peripherals and office automation.

IBM's e-shop <www.pc.ibm.com/th/shopibm/> offers e-brochures of its PC and notebook computer families. Its dealers offer delivery service.

If your choice is not IBM, you can find more models at Compaq Computer at <www.compaq.co.th> or Dell <www.dell.com>.

ThaiLifeStyle.com <www.thailifestyle.com> offers a channel to buy products and services online such as computers from Compaq and Toshiba, products from PowerBuy, clothes and much more. You can also calculate your leasing programmes from GE Capital online.

Selectmore.com <www.selectmore.com> claims to offer over 1,000 IT items classified into six categories: hardware, software, games, computer textbooks, Internet packages and DVDs.

ThaiByte.com <www.thaibyte.com> invites you to engage in Internet commerce.

Services offered include web hosting, web design, web promotion, domain name registration and parking.

eCombot.com <www.ecombot.com> offers an e-commerce kit.

Winstore.net <www.winstore.net> offers a complete e-commerce solution for business to business commerce.

SECOND HAND ITEMS

ThaiSecondHand.com <www.thaisecondhand.com> offers many second hand items, including second-hand Palm Pilots.

UsedFair.com <www.usedfair.com> offers hundreds of products, ranging from fantasy clocks or lighter collections to electric tools and gifts.

Klongthom.com <klongthom.com> offers both used and new products.

Second-hand automobiles can be found at <www.sanook.com/shop/car>.

AUCTION SITES

Auction Thaicentral <www.auction.thaicentral.com> offers a free service containing various items ranging from books to accommodation.

ThaiBid <www.thaibid.com> offers a free auction service for its members and there is no membership fee at present.

Pramool.com <www.pramool.com> has more than 500 items up for bidding.

Appendix 3

The Internet sites

NECTEC

Thailand: the big picture 1998. WWW home page at NECTEC, Bangkok, Thai... Page 1 of

Long Live The King

<http://kanchanapisek.or.th/>

The first WWW server of Thailand

NECTEC News and Technology Update

Internet Information Research Center

Mirror site in U.S. [Click here.](#)

Weather

2002 04 10 11 UI

Full photo Weather Page

Time now

2002--NaN

NaN:NaN:Na

Thailand

Thai Baht

US\$1= 43.55000 THB

10/04/2002 08:37:42

Data from BOA

SET Index

372.67 +1.81

10/4/2002 16:49:01

Data from SET

Thailand directories

- ◆ Telephone Directory
- ◆ Information on Thailand
- ◆ Mass Media & Archives
- ◆ Public Information Servers
- ◆ Free Services
- ◆ About NECTEC
- ◆ NECTEC Archives (FTP)
- ◆ Feedback

เนื่องในโอกาสวันคล้ายวันประสูติ สมเด็จพระเทพรัตนราชสุดาฯ สยามมกุฎราชกุมารี

ทรงพระเจริญ

HAPPY BIRTHDAY to Her Royal Highness Princess Maha Chakri Sirindhorn

ประกาศย้ายที่ทำการใหม่

ตั้งแต่วันที่ 9 เมษายน พ.ศ. 2545 เป็นต้นไป สามารถติดต่อที่ทำการใหม่ได้ที่ ศูนย์เทคโนโลยีอิเล็กทรอนิกส์และคอมพิวเตอร์แห่งชาติ 112 ถนนพหลโยธิน ตำบลคลองหนึ่ง อำเภอคลองหลวง จังหวัดปทุมธานี 12120 โทรศัพท์ 0-2564-6900 โทรสาร 0-2564-6901-5 แผนที่

As from April 9, 2002, our new headquarters contact address is : National Electronics and Computer Technology Center 112 Paholyothin Rd., Klong 1 , Klong Luang , Pathumthani 12120 Thailand Tel 0-2564-6900 Fax 0-2564-6901-5

MAP

Search Thailand by BDG

Search

Search the world

From WWW

Show standard results

Search

Get the Thai fonts

โครงการคอมพิวเตอร์ราคาประหยัด ที่ทำให้ คนไทยทั่วประเทศ ได้มีโอกาสใช้งานคอมพิวเตอร์ คุณภาพดี ราคาถูก ซึ่งจะทำให้เกิดการใช้งาน เทคโนโลยีสารสนเทศอย่างเท่าเทียมและทั่วถึง

ข่าววันนี้

orange ทีโอ ออเร้นจ์ เปิดโปรแกรมอีอาร์เอส โซลูชั่น นำบริการ สื่อสารไร้ที่ติสู่กลุ่มลูกค้าองค์กร ด้วยรูปแบบการสื่อสาร เคลื่อนที่ ซึ่งออกแบบให้เน้นระบับความถี่ของการขอลูกค้า ระดับนี้ (กรุงเทพฯธุรกิจ) 10/04/02 อ่านต่อ

- คาดไตรมาสแรก ยอดขายมีแนวโน้มขยายตัวในภาค(mco) 10/04/02
- ซองมือถือไร้ใกล้ตัวเพื่อการสอนฟิลิปปินส์ปทุม (เดลินิวส์)

<http://www.nectec.or.th/>

10/04/02

Schoolnet



โครงการเครือข่าย SchoolNet@1509 ได้รับรางวัลม่อมจาก UNDP

ประกวดเว็บไซต์เพื่อการศึกษา เชิญเยี่ยมชมเว็บ

ข่าวดี! SchoolNetเพิ่มเวลาเป็น 80ชม.ต่อวัน :: 5มิถุนายนโรงเรียน

SCHOOLNET NEWS

- ข่าวดูข่าวสารที่เกี่ยวข้องกับโครงการ SchoolNet
- ประกาศ : SchoolNet ปิดให้บริการชั่วคราว วันที่ 31 มีนาคม 2545 10.00 -13.00 น.
- เปลี่ยนเบอร์โทรสำหรับติดต่อ Helpdesk ที่หน้าทางไกล 032
- ประกาศ : SchoolNet จะปรับปรุงระบบการป้องกันไวรัสไว้ให้

ข่าวย้อนหลัง..

MISCELLANEOUS ARTICLES

คอลัมน์น่าสนใจโดยน้อง ๆอาสาสมัคร

วิชาการ.คอม
วิชาการ.คอม เพื่อการศึกษาของไทย

schoolstalk:
เพื่อคุณๆ ผู้ชื่นชอบการท่องเที่ยว

คนไทยคู่แรกที่จะเดินทางรอบโลกด้วยจักรยาน

NECTEC's COURSEWARE
NECTEC's Web Based Learning

ThaiParents Net
เด่นได้อย่างไร ให้สนุกปลอดภัย และได้สาระ

Thai2Learn
โครงการ การเรียนรู้แบบออนไลน์

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HOT SPOTS

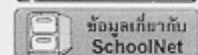
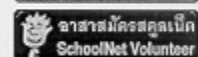
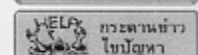
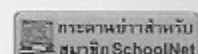
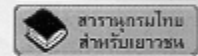
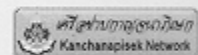
- ข่าวฝากประชาสัมพันธ์และเว็บไซต์น่าสนใจ
- เชิญเข้าร่วมประกวดเว็บไซต์ระดับจุฬาลงกรณ์
- แนะนำแอนเนทราฟ 45 โดย Inet-Eduzones
- ขอเชิญประกวดการออกแบบเว็บไซต์เทคโนโลยีการอนุรักษ์พลังงาน
- ขอเชิญนักเรียนสมัครเข้าค่าย "กินอาหารสวรรค์ที่ฉันมี"
- DUF e-learning โครงการจัดการศึกษาด้วยระบบทางไกลผ่านดาวเทียม
- เชิญอ่านบทความเรื่องใหม่ในเว็บไซต์ ThaiParentsNet
- การประกวดเว็บไซต์เพื่อการศึกษา
- สหกรณ์ประกวดเทคโนโลยีสารสนเทศและการสื่อสาร (ICT) แห่งประเทศไทย

ข่าวย้อนหลัง..

NECTEC LINUX-SIS

- LINUX-SIS และเว็บไซต์สำหรับคนรัก LINUX
- Linux SchoolNet Internet Server Version 4.2 is available now!
- Thai Linux working group
- ถามตอบปัญหา Linux
- โครงการแนะนำวิธีการติดตั้ง Linux สำหรับมือใหม่
- Linux-TLE: Thai Language Extension

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สมุดเยี่ยม

[หน้าหลัก] [หน้าการศึกษา] [บริการให้คำปรึกษา] [รายชื่อโรงเรียน]
[กิจกรรมในโครงการ] [ข้อมูลโครงการ] [คำถามเราตอบ]

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ThaiTambon Products


Total 853

- Agricultural Products/Mineral/Fuels(8)
- Automotive/Parts & Accessories/Machinery & Equipment(0)
- Building Material/Hardware Items(0)
- Textile, Garment & Fashion Accessories(0)
- Toys and Games(27)
- Gems and Jewelry(0)
- Gift, Decorative Items & Handicrafts(748)
- Office Supplies/Stationery/Others(0)
- Product Center(0)
- Food(3)
- Chemicals, Cosmetics, Toiletries, Medical Supplies, Hygiene(24)
- Electronics, Electrical Products & Parts(0)
- Furniture(0)
- Household Products(0)
- Leather, PVC, Footware, Travelling & Sporting Goods(43)
- Printing Service/Packaging(0)
- Services(0)
- Cultural Center/Group(0)

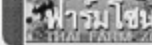
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จุฬาลงกรณ์มหาวิทยาลัย

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THE VERSION

AUCTION

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TRADE LEADS

NEWS HEADLINES

- Huge Vietnamese watermelon imports stuck at Chinese border
- Russia not convinced that U.S. has fulfilled conditions for lifting of poultry ban
- Commerce minister asks for 2 billion baht to support fruit prices
- Asian farm cooperatives join hands to boost exports

More News >>

Last Update: April 10, 2002

PRESS RELEASE

◀ICI privileges granted to an e-commerce operator Full story [March 14, 2002]

◀Online auction and website sparked enthusiasm in shrimp fair Full story [March 8, 2002]

◀New web service to promote global food trade Full story [March 4, 2002]

More Stories >>

CURRENCY RATES

	Value
THB	43.5953
EURO	1.13726
JPY	130.992

Last Update
10 Apr., 2002 # 8:30 a.m.
GMT+7

More Currencies >>

WELCOME TO SOUTHEAST ASIA'S FIRST B2B FOOD MARKETPLACE

HIGHLIGHTS

PRICE Market Report

The Indian government has raised rice export prices. Export supplies of Vietnamese rice will be more available as local stocking subsided. Pakistani rice exports declined by 23 per cent in the first eight months of 2001/2002. Caused by the government's price intervention program, Thai rice is not competitive amid weak demand. [Read more](#) [April 9, 2002]

FRUITS Market Report

Supplies of fresh pineapple remain low in all the producing areas, according to our source. However, it is expected that supply should improve again later this month because of the arrival of the summer crop. Our source reveals that it is still too soon to estimate the yield of this crop. [Read more](#) [April 9, 2002]

NEW SERVICE

TRADE LEADS Market Responses **GUARANTEED**


Trade Leads has attracted over 500 newly verified members from the food industry around the world since our launch on March 1st, 2002. We understand that market response to our members' postings are important to us. If for some reasons, your trade lead (applicable to paid packages only) does not get any inquiry within 30 days after first posting, you can replace it with a new one or simply extend the original one for another 30 days **absolutely free of charge!** All of our members need to be verified before being allowed to use the service. To visit Trade Leads Home, please click [here](#) To register with Trade Leads, please click [here](#)

THE LATEST TRADE LEADS

Request to	Product	Quantity	Country
BUY	Rice noodle (wet instant)	12 tons per month (400gm pack)	Malaysia
SELL	All Kinds of Thailand Rice	Min. 1 container	Thailand
SELL	Frozen Raw Headless Shell-On, Back Tiger Shrimp	Negotiable	Thailand
SELL	Shrimp Couston	Call for Detail	Thailand
SELL	A-Tip Coconut Milk	1600 Cartons (38,400 cans)	Thailand

More than 450 reliable Trade Leads under 134 categories. MORE TRADE LEADS >

COMPANY OF THE WEEK



T.C. Union Agrotech Co., Ltd.

T.C. Union Agrotech Co., Ltd. is a subsidiary of Thai Union Group, a world-class group of companies in Tuna canner industry. The company focuses on utilizing raw materials from the canner industry and developing them into nutritious products in various categories including Health Food and Food Supplements, Feed Ingredients and Additives, Biotechnological Products as well as Surimi Frozen Minced Fish. [Read more](#) [April 9, 2002] <See more suppliers>

FEATURES

LOW SODIUM

Industry Focus

FARM ZONE


How Shrimp Drains "Bad" Cholesterol from your blood?


New research has shown that most people can eat shrimp as part of a balanced diet. It even suggests that consuming shrimp may actually lower blood cholesterol. A recent article from the Thai Frozen Foods Association has the answer for you.


THE FAT OF THE LAMB


Check out our new Farm Zone (Thai-language), which provides information and data on the agriculture sector for farmers, producers and farming-related firms and organizations. Find out about the latest trends and developments, innovations and technologies in the shrimp sector in our Shrimp Zone. We will add to this with other productspecific sectors in the coming weeks.


PRODUCT PAGES



SHRIMP



TUNA



CHICKEN


FEEDSTUFF


RICE


FRUITS


VEGETABLES



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- No Risk Secure Third Party Payment Systems
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- 24-hour Email Response Customer Support
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91

Biography

Anthony Stevenson was born in Nottingham, England. He began his schooling in Manchester and finished it in Watford, North London. He worked for the Midland Bank from 1979 until 1986. In 1982 he completed a HNC in Business Studies. After deciding that he was not interested in a career in banking, he spent the years 1986 to 1989 travelling around the world. In 1989 he came to Thailand and found that the way of life there appealed to him, so he decided to stay there. In 1995 he began a four year Bachelors's degree at Hull University, England, in Southeast Asian Studies and Thai Language, which he completed in June 1999. After the completion of his Bachelors degree he began his studies in the Thai Studies Program at the Faculty of Arts, Chulalongkorn University in November 1999



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