

# **KSC: A BILLION-BAHT ENTREPRENEURIAL COMPANY FROM ASSUMPTION UNIVERSITY<sup>1</sup>**

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## **1. INTRODUCTION**

With examples from the University of North Carolina serving as incubators for many high-tech companies in the US, the senior author, in his capacity of Vice President for Planning and Development, proposed to Rev.Bro.Dr.Prathip Martin Komolmas, the President of Assumption University (AU), that AU served as the incubator for an Internet Service Provider in Thailand. The President kindly agreed and actively supported the idea. With the second author who was the first author's Ph.D. student, they registered their company named Internet KSC on June 7, 1994 and drafted their proposal to invite the Communications Authority of Thailand (CAT) to participate in the joint venture. They had to lobby over 100 people concerned. On October 31, 1994, while visiting Vietnam as the Internet Advisors to the Vietnamese Post and Telegraph Office, the authors called CAT and learned to their delights that CAT Board of Directors meeting that day approved their proposal for CAT to join the joint venture with Internet KSC. Rather than moving into a plush and expensive office in Bangkok business district, the co-founders decided to start in a room at AU. At first, the company consisted of the senior author as the Chairman, the junior author as the President and only a few staff members. The registered capital was 15 million baht but only the 25% or 3.75 million baht was invested. The co-founders worked very, very hard, putting in 16-17 hours a day and 7 days a week. On weekends, they organized and lectured at seminars telling people what the Internet was and what it could do. At that time, the Internet provided only text and no world wide web was available. However, from every seminar, they got several new customers to use the primitive text version of the Internet like email, talk, telnet, hytelnet, FTP, Archie, Gopher, Veronica, WAIS, and newsgroups. By October 1999, the first commercial ISP named KSC became the largest Internet Service Provider (ISP) in Thailand with 42.5 Mbps connection to the US, compared to Internet Thailand which is the second with 16 Mbps to the US. KSC is the only major ISP in the world with profit from the very first year of operation. KSC has been profitable every year. Within the year 2000, KSC expects to have branches in all 76 provinces of Thailand and expects to have one million individual customers as well as 5,000 corporate customers. In addition to Internet connections, KSC provides all Internet-related services like e-commerce, web hosting, co-location, facility management, systems integration, training, e-education, edutainment, etc. It would not be too difficult to have KSC listed in NASDAQ. So, from the initial investment of 3.75 million baht in October 1994, KSC has been valued by international financial advisors to be worth 40-90 million US\$ or 1.6 – 3.6 billion baht in October 1999. Unfortunately, the valuation is just a valuation, i.e. it is

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<sup>1</sup> Invited keynote presented to ITEMS'99 : The Information Technology and Engineering Management Symposium 1999 to Celebrate the 10<sup>th</sup> Anniversary of the Graduate School of Information Systems and the Graduate School of Computer and Engineering Management and the Inauguration of the Graduate School of Internet and E-Commerce of Assumption University. Hilton International Hotel, Bangkok, Thailand, November 20, 1999.

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not real money and nobody would pay for it in real money. What an investor would offer is probably share swap, i.e. swapping KSC shares with shares in other companies belonging to the investor. As example, earlier the largest finance company in Thailand proposed swapping KSC shares with shares in that company. After the financial crisis in Thailand, the value of the shares in that finance company became zero. Had the authors accepted the swap, the value of the share would have now been exactly zero. This paper presents a brief history of Internet in Thailand, Internet service providers in Thailand, autonomous system numbers for Thai ISPs, Internet Societies in Thailand, the bandwidth of Thai ISP to the USA, domain names used in Thailand, Internet users in Thailand, the history, philosophy, achievement and future prospects of KSC, the billion-baht entrepreneurial company incubated at Assumption University.

## 2. BRIEF HISTORY OF INTERNET IN THAILAND

Many papers have been published and/presented concerning Internet and related topics in Thailand [1-27].

A citizen of Thailand got to use the Internet when it first started in the United State in 1969. At that time, the US Department of Defense (DOD) Advanced Research Project Agency (ARPA) established ARPANET as an experimental network to support research. From 1968 to 1973, Prof.Dr.Srisakdi Charmonman was Director of Graduate Studies in Computer Science at the University of Missouri, Columbia, Missouri, USA and also Directors of a few research projects supported by the US National Science Foundation. Therefore, he became the first Thai to use the Internet. Figure 1 shows a group of Computer Science Department Heads from universities in the USA joining a teach-the-teacher conference organized by Dr.Srisakdi Charmonman in his capacity as the NSF-funded project director. All NSF-funded research project directors were encouraged to use the Internet which was also funded by NSF after its birth from DOD.



**FIGURE 1. US COMPUTER DEPARTMENT HEADS AT NSF-FUNDED CONFERENCE DIRECTED BY DR.SRISAKDI.**

In 1987, the Asian Institute of Technology (AIT) in Thailand entered into an agreement with the Department of Computer Science at the University of Melbourne in Australia to operate Internet email service on a regular basis. The Australian node would call AIT three times a day to send and collect emails. Dr.Srisakdi Charmonman was the President of AIT Alumni Association and got to use the Internet in Thailand also when it was started.

In 1987, AIT charged 200 baht (about US \$8 at that time) per month for upto 15,000 characters transferred (counting characters both in and out combined) plus one baht for every additional 50 characters. One of the problems was the inability to control any incoming mail, especially the lengthy Calls for Papers, list of reference, etc. which were not asked for, and had to be paid for because they had automatically entered the mailbox. This problem was later solved when the rate was changed to a fix amount per month rather than varying with the number of characters. Another problem was that during the connection to Australia, usually three times a day at 02:30, 15:30 and 19:30, users were requested not to call the only dial-in number with the only modem available at that time.

In 1988, Prince of Songkhla University in the southern part of Thailand established an Internet node connected to Melbourne University a few times a day. Two dial-in telephone numbers were made available from 09:00 in the morning till 19:00 in the evening.

In 1991, Digital Equipment Corporation (DEC Thailand) acquired an Internet address for internal and research-related usage. No dial-in number was made available and users had to use the machine at the company. As of the year 1999, DEC has been purchased by Compaq and is not in existent any more.

A major breakthrough occurred in 1991 when Chulalongkorn University (Chula) became the first international Internet gateway in Thailand. After sufficient testing, full operation was started in July 1992 with a 9600 baud leased line to Virginia, U.S.A. and later upgraded to 64 K line. In 1992, the fees for the leased line with 25% educational discount from the Communications Authority of Thailand (CAT) were about 5.2 million baht per year (about US\$ 208,000 at 25 baht/\$). Initially, only one telephone line was made available but by 1993, twenty lines were accessible. The all day, all night and full Internet service at Chula were obviously much better than the email-only at AIT. Instead of waiting a day or so for the message to be routed through Australia, one could communicate as many times a day as necessary and desirable. One could use the "talk" command to enter into interactive communication. When calls for papers were received from the network, one could ask for and obtain clarification right way. So, as an associated faculty at Chula, Dr.Srisakdi got another email address there.

In January 1992, the National Electronics and Computer Technology Center (NECTEC) established the NECTEC e-mail Working Group (NWG). In February 1992, NWG established a network named ThaiSarn (Thai Social/scientific, Academic and Research Network) with a machine donated by IBM, and two dial-in telephone lines available 24 hours a day for NWG connections. UUCP (UNIX-UNIX Copy) was made hourly with Thammasat University and Prince of Songkhla University, and international connection with Australia through AIT three times a day. The service was later upgraded to included six dial-in telephone lines and 24 hours per day international connection through Chula. Then in September 1993, NECTEC became the second international Internet gateway from Thailand and it was also connected to Virginia, U.S.A. (the same place Chula connected to) by a 64 K leased line. Dr.Srisakdi also get an e-mail address from NECTEC.

In January 1992, Thammasat University (TU) Information Processing Institute for Education and Development (IPIED) also registered as an Internet node. One dial-in telephone number was made available 24 hours a day.

The Faculty of Engineering at King Mongkut's Institute of Technology Ladkrabang started experimenting with Internet in mid 1992 connected to Thammasat. At the beginning, only about 40 users were approved. Later the Computer Research and Service Center which serves all the faculties established a central node for Ladkrabang. By October 1993, about 500 Internet addresses had been given.

Digital Equipment joined ThaiSarn in January 1992 but was later disconnected because commercial organization was not allowed to use educational Internet in Thailand. Prince of Songkla University and AIT joined ThaiSarn in 1992 but AIT later installed a direct leased line to Chula.

After several years of usage of Internet in Thailand through AIT and Chula, Dr.Srisakdi was convinced that the system should be made available to the whole university. Therefore, in August

1993, he proposed to AU Board of Trustees and got approval to implement the Internet project by setting up an Internet network called AuNet. The purposes of AuNet include the followings :

1. To educate the students, faculty and staff member on the concepts of local and international networking.
2. To prepare the students to enter into information society where networking will be the norm rather than the exception.
3. To provide full Internet access to all students, faculty and staff members for their personal and educational usage.

On the financial side, the Board of Trustees of Assumption University approved the proposal to let the students pay for the project. The Board decreed that Internet knowledge and experience become a requirement for graduation in any and all educational programs at AU. Each undergraduate student is charged 100 baht (US \$4 at 25 baht/\$ at that time) per month and graduate student US \$8 per month. The rate for undergraduate was increased to 200 baht per month later. All the income is earmarked for the development and maintenance of the project. In June 1994, Rev. Bro. Dr. Prathip Martin Komolmas, President of Assumption University signed an agreement with Dr. Srisakdi who is the Board Chairman and Kanokwan who is the President of Internet KSC for Assumption University to serve as "Incubator" for KSC Group.

As shown in Figure 2, on January 19, 1995, Her Royal Highness Princess Maha Chakri Sirindhorn graciously presided over the opening ceremony of the International Internet Gateway at Assumption University paid for by KSC, also 64 Kbps linked to UUNET in Virginia, USA. This international Internet gateway may be considered the third international Internet gateway from Thailand or the first private-sector international Internet gateway from Thailand. The two earlier gateways were in the government sector.

As of May 1995, Assumption University (AU) and KSC Commercial Internet Co., Ltd. (KSC) have the largest Internet system in Thailand, including three SunSparc 1000 computers with 640 Mb of main memory and 123 Gb of disk space, 56 sets of Sun Sparc Classic and several hundred sets of micro-computers. The computers are connected through campus network with the speed of 100 million bits per second. For faculty, staff and students at home, 360 telephone lines were available for dial-in at that time. By October 1999, the ABAC-KSC system is still the largest in Thailand.



**FIGURE 2. HER ROYAL HIGHNESS PRINCESS MAHA CHAKRI SIRINDHORN GRACIOUSLY PRESIDED OVER THE OPENING CEREMONY OF THE FIRST PRIVATE-SECTOR INTERNATIONAL INTERNET GATEWAY**

### 3. INTERNET SERVICE PROVIDERS IN THAILAND

From 1987 to 1994, Internet was available in Thailand only for educational and research purposes. A breakthrough for commercial Internet in Thailand occurred at the end of 1994 when the Communications Authority of Thailand (CAT) Board of Directors approved the proposals for CAT to have joint venture agreements with two organizations, namely, NECTEC and Internet Knowledge Service Center Co., Ltd. (KSC), to offer commercial Internet in Thailand for the first time. For flexibility in operation, it was agreed that each joint venture be made a private company in order to avoid the red tape and bureaucracy associated with government agencies. However, the joint venture with NECTEC was supposed to become a private company named Internet Thailand Co., Ltd. in 1995 but the Ministry of Commerce refused registration on the ground that government agencies cannot register a private company without special approval from the Cabinet of Thailand. NECTEC requested the special Cabinet approval but the Cabinet at that time did not give approval. So, NECTEC was allowed to operate commercial Internet on a trial basis until another Cabinet gave approval for it to register as a private company on May 13, 1997, becoming the 16<sup>th</sup> private company in Thailand to offer commercial Internet as shown in Table 1.

TABLE 1. ISPS IN THAILAND SORTED BY THE DATE REGISTRATION APPROVED BY THE MINISTRY OF COMMERCE

Registration Approved by Ministry Of Commerce	Registration No.	Name of Company	Capital, Shares and Major Shareholders
1. Jun 7, 1994	(2)2414/2537	Internet KSC Co., Ltd.	Capital 100 MBht, 10 Million Shares Dr. Kanokwan Wongwatanasin 45% Prof.Dr. Srisakdi Charmonman 30% Jasmine International Co., Ltd. 25%
2. July 20, 1994	(1)1816/2537	C.S. Communication Co., Ltd. (CS Internet)	Capital 10 MBht, 1 Million Shares Shinawatra Satellite Public Co. 51% CAT 49%
3. Dec 21, 1994	(2)5675/2537	KSC Commercial Internet Co., Ltd.	Capital 15 MBht, 1.5 Million Shares Internet KSC 65% CAT 32% 450 CAT Employees 3%
4. Jan 19, 1995	(3)0202/2538	Info News Co., Ltd.	Capital 15 MBht, 1.5 Million Shares Vatachak (Public) Co., Ltd. 65% CAT 32% 450 CAT Employees 3%
5. Nov 9, 1995	(1)2867/2538	Chomanan WorldNet Co., Ltd. (Chomanan WorldNet, CMN)	Capital 15 MBht, 1.5 Million Shares Chomanan Group Co., Ltd. 65% CAT 32% 450 CAT Employees 3%
6. Dec 8, 1995	(3)2716/2538	A-Net Co., Ltd. (Anew)	Capital 15 MBht, 1.5 Million Shares A-News Corporation 53.4% CAT 32.0% 450 CAT Employees 3.0% 5 Universities 11.6%
7. Jan 29, 1996	(3)243/2539	Info Access Co., Ltd. (Infonews)	Capital 15 MBht, 1.5 Million Shares Vatachak (Public) Co., Ltd. 65% CAT 32% 450 CAT Employees 3%

TABLE 1. ISPS IN THAILAND SORTED BY THE DATE REGISTRATION APPROVED (CONTINUED)

Registration Approved by Ministry Of Commerce	Registration No.	Name of Company	Capital, Shares and Major Shareholders
8. Feb 19, 1996	459/2539	Loxley Information Services Co., Ltd. (LoxInfo)	Capital 15 MBht, 1.5 Million Shares Loxley Information Holding 65% CAT 32% 450 CAT Employees 3%
9. March 7, 1996	(2)1141/2539	Asia Infonet Co., Ltd. (AsiaNet by CP and TA) (AsiaNet)	Capital 15 MBht, 1.5 Million Shares Telecom Holdings Co., Ltd. 65% CAT 32% 450 CAT Employees 3%
10. Mar 12, 1996	(1)661/2539	I Net (Thailand) Co., Ltd. (Asia Access)	Capital 15 MBht, 1.5 Million Shares Asia Access (Thailand) 60% CAT 32% The M Group Public Co. 5% 450 CAT Employees 3%
11. Apr 1, 1996	๑1๓๔๒.๒458	Samart Infonet Co., Ltd. (Samart Cybemet)	Capital 15 MBht, 1.5 Million Shares Samart Corporation Co., Ltd. 65% CAT 32% 450 CAT Employees 3%
12. Apr 10, 1996	(1)939/2539	World Net & Services Co., Ltd. (World Net)	Capital 15 MBht, 1.5 Million Shares Multimedia & Services Co., Ltd. 65% CAT 32% 450 CAT Employees 3%
13. May 13, 1996	(2)2188/2539	Data Line Thai Co., Ltd. (Line Thai)	Capital 15 MBht, 1.5 Million Shares Datamat (Public) Co. 65% CAT 32% 450 CAT Employees 3%
14. Sep 2, 1996	1904/2539	Idea Net Co., Ltd. (Idea Net)	Capital 15 MBht, 1.5 Million Shares The Idea Corporation 65% CAT 32% 450 CAT Employees 3%
15. Sep 13, 1996	(2)3748/2539	Siam Global Access Co., Ltd.	Capital 15 MBht, 1.5 Million Shares Siam Media & Communication 65% CAT 32% 450 CAT Employees 3%
16. May 13, 1997	(1)430/2540	Internet Thailand Co., Ltd. (Internet Thailand)	Capital 16 MBht, 1.6 Million Shares National S&T Development Agency (NSTDA) 34% TOT 33% CAT 33%

TABLE 2. THAI ISPS BY DATE OF SERVICE SOFT LAUNCH

Rank	Soft Launch	Formal Launch	ISP Name
1	Nov 94	May 95	Internet KSC
2	Mar 95	Mar 95	Internet Thailand
3	Feb 96	May 96	LoxInfo
4	Feb 96	Mar 96	Samart Cybernet
5	May 96	Jun 96	Asia Access
6	Jun 96	Jul 96	A-Net
7	Sep 96	Oct 96	Line Thai
8	Nov 96	Dec 96	Idea Net
9	Feb 97	Mar 97	Asia Net
10	May 97	Jun 97	World Net
11	May 97	Jul 97	Far East Internet
12	Sep 97	Oct 97	Siam Global Access
13	Sep 97	Oct 97	CS Internet
14	Feb 98	Mar 98	Chomanan World Net

A list of Thai ISPs sorted by the date of soft launch of service is given in Table 2. Almost all ISPs waited until a month or so prior to the time that all the paperwork were completely settled to start the service. KSC and Internet Thailand were exception. Internet Thailand ran into unexpected difficulty at the Ministry of Commerce and could not be registered until May 13, 1997.

Right after the Communications Authority of Thailand (CAT) gave approval for CAT to enter into joint venture with Internet KSC on October 31, 1994, KSC started soft launching of the service. Many individuals not full-time members of educational institutions were given e-mail addresses at <ksc.au.ac.th> in 1994 using the international link at Chulalongkorn University (Chula). A complaint was lodged with CAT that KSC should not start providing commercial Internet service. CAT asked Chula to investigate by seeking information from KSC. Chula threatened to disconnect KSC from the Internet. So, KSC requested negotiations with Chula and CAT. KSC argued that CAT Board of Directors had approved the joint venture with KSC in October 1994. The Ministry of Commerce approved the registration of KSC Commercial Internet Co., Ltd. on the December 21, 1994, to become the joint venture company with CAT. In KSC point of view, the remaining paperwork was just formality. To be successful, business should act very fast. While negotiations were going on, KSC continued to provide the commercial Internet service. KSC also argued that with Assumption University as the incubator, KSC must comply by the special law governing the university which states that one of the 4 functions of a university is to provide services to the community and, so KSC must provide service to the community by offering Internet services. Thus, in effect, KSC started the Soft Launch of commercial Internet service in Thailand in 1994 and continued uninterrupted until the Formal Launch in May 1995. The conflict between Chula and KSC was resolved on January 19, 1995 when KSC switched from the 64Kbps link with Chula to its own 64 Kbps international Internet Gateway at Assumption University, the opening ceremony of which was graciously presided over by HRH Princess Maha Chakri Siridhorn, as shown in Figure 2.

#### 4. AUTONOMOUS SYSTEM NUMBERS FOR THAI ISPS

Another evidence to show the order of establishment of ISPs in Thailand is the Autonomous System (AS) numbers. The number has to be obtained before an ISP could be independently routed and identified by other Internet systems. Table 3 shows Thai ISPs sorted by AS Numbers.

**TABLE 3. THAI ISP SORTED BY AS NUMBERS\***

No.	AS Number	ISP Name
1	AS4274	Internet KSC Co., Ltd. (KSC)
2	AS4618	Internet Thailand Co., Ltd. (Inet)
3	AS4741	Samart Infonet Co., Ltd. (Samart Cybernet)
4	AS4750	Loxley Information Services Co., Ltd. (LoxInfo)
5	AS4776	A-Net Co., Ltd. (A-Net)
6	AS4765	World Net & Services Co., Ltd. (Wnet)
7	AS4803	Inet (Thailand) Co., Ltd. (Asia Access)
8	AS7470	Asia Infonet Co., Ltd. (AsiaNet by CP and TA)
9	AS7487	Idea Net Co., Ltd. (IDN)
10	AS7568	C.S. Communication Co., Ltd. (CS)
11	AS7613	Data Line Thai Co., Ltd. (Linethai)
12	AS7616	Info Access Co., Ltd. (Info News)
13	AS7636	Far East Internet Co., Ltd. (Far East)
14	AS7654	Siam Global Access Co., Ltd. (SGA)
15	AS9313	Chomanan WorldNet (Chomanan WorldNet, CMN)

**Notes:** The Autonomous System (AS) Numbers had to be obtained when the ISPs started operation. Thus, the AS number is an indication of the order of establishment of ISPs.

## 5. INTERNET SOCIETIES IN THAILAND

The international Internet Society came into existence in January, 1992 by a worldwide cross-section of individuals and organizations who recognized that the Society was a critical component necessary to evolve and globalize the Internet and Internet technologies and applications, and to enhance their availability and use on the widest possible scale. Assumption University of Thailand is the only Founding Member from Southeast Asia. As a founding member, Assumption University sends Dr.Srisakdi Charmonman to be a member of the Advisory Council and Dr.Kanokwan Wongwatanasin his alternate. The goals and purposes of the Internet Society include:

- Development, maintenance, evolution, and dissemination of standards for the Internet and its internetworking technologies and applications;
- Growth and evolution of the Internet architecture;
- Maintenance and evolution of effective administrative processes necessary for operation of the global Internet and internets;
- Education and research related to the Internet and internetworking;
- Harmonization of actions and activities at international levels to facilitate the development and availability of the Internet;
- Collection and dissemination of information related to the Internet and internetworking, including histories and archives;
- Assisting technologically developing countries; areas, and people in implementing and evolving their Internet infrastructure and use;



- Liaison with other organization, governments, and the general public for coordination, collaboration, and education in effecting the above purposes.

In June 1996, the Internet Society approved the establishment of Thailand Chapter of the Internet Society with Dr.Srisakdi Charmonman as the Founding President. Figure 3 shows some of the members of the Board.



**FIGURE 3. EXECUTIVE BOARD OF THAILAND CHAPTER OF THE INTERNET SOCIETY WITH BRO.MARTIN AS HONORARY PRESIDENT AND DR.SRISAKDI AS PRESIDENT (SEATED MIDDLE).**

Thailand Chapter of the Internet Society has about 300 members, each paying 35 US\$. Due to economic crisis in Thailand, a lot more Thai would like to be a member but cannot afford to pay. Therefore, a local Internet Association in Thailand was registered with the National Cultural Council of Thailand June 15, 1998, with Dr.Srisakdi Charmonman as the Founding President, about 20,000 individual members (which may be decreasing due to economic crisis) and 94 organizational members from over 34 provinces of Thailand. The registered purposes of the local Internet Society are:

- To promote education, research and applications of Internet and related technologies.
- To disseminate Internet knowledge to staff members and executives of government agencies, government enterprises and private organizations, as well as to students and instructors of academic institutions and members of other societies.
- To exchange Internet knowledge and experience with other organizations and societies both in Thailand and abroad.

In June 1999, Dr.Srisakdi became the first Thai to be elected one of the 15 members of the Board of Trustees of the Internet Society.

## **6. THE BANDWIDTH OF THAI ISP TO THE USA**

The largest cost for all ISPs in Thailand is for the bandwidth to the USA, accounting for 35-50% of the operating costs. When Chula started the first international gateway in July 1992, the bandwidth was only 9,600 per second and later upgraded to 64 Kbps. In September 1993, the second

international Internet gateway was established at NECTEC and it was also 64 Kbps. In January 1995, the third international Internet gateway in Thailand or the first private-sector gateway was established at Assumption University and KSC and it was also 64 Kbps.

Each international link for ISPs has to be leased in two parts, i.e. half circuit from Bangkok to the US leased from CAT, and half circuit from the US to Thailand leased from an international carrier such as AT&T, Global One, KDD, MCI, TeleGlobe, etc.

The combined bandwidth from all ISPs in Thailand to the US from 1992 to 1999 are shown in Table 4, and a graphical representation (either <[www.nectec.or.th/Internet/map](http://www.nectec.or.th/Internet/map)> or <[www.cat.net.th/Services/THIX/map/body\\_map.html](http://www.cat.net.th/Services/THIX/map/body_map.html)>) shown in Figure 4.

TABLE 4. COMBINED INTERNATIONAL BANDWIDTH TO THE US IN MBPS

1992	1993	1994	1995	1996	1997	1998	1999/10
0.064	0.13	2.77	4.77	10.25	32.5	37	109.875

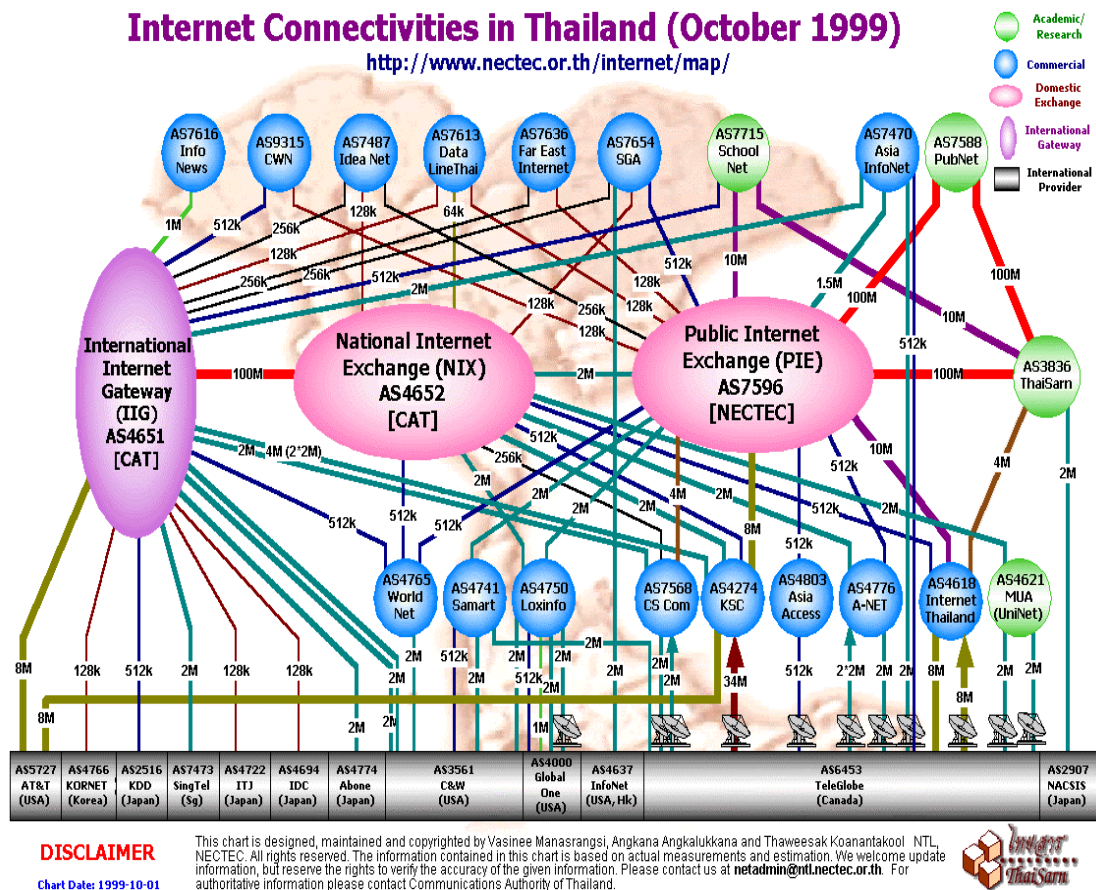


FIGURE 4. INTERNET MAP OF THAILAND.

The details of the bandwidth to the USA in October 1999 for each of the 15 ISPs plus UNINET (4 Mbps) which is the ISP for education operated by the Ministry of University Affairs as other organizations such as CAT IIG (International Internet Gateway) as shown in Table 5.

All Thai ISPs have indicated that they will be increasing their bandwidth to the USA. For example, KSC announced that its bandwidth to the USA will be increased to 87-90 Mbps in the year 2000, and probably 180 Mbps by 2001.

**TABLE 5. THAI ISP CONNECTIVITY TO USA, SORTED BY BANDWIDTH (OCTOBER 99)**

<b>No.</b>	<b>Company Name</b>	<b>Bandwidth to USA</b>
1	Internet KSC Co., Ltd. (KSC)	46 Mbps
2	Internet Thailand Co., Ltd. (Inet)	16 Mbps
3	Loxley Information Services Co., Ltd. (LoxInfo)	7.5 Mbps
4	A-Net Co., Ltd. (A-Net)	6 Mbps
5	C.S. Communication Co., Ltd. (CS)	6 Mbps
6	Samart Infonet Co., Ltd. (Samart Cybernet)	4.5 Mbps
7	Asia Infonet Co., Ltd. (AsiaNet by CP and TA)	4.5 Mbps
8	World Net & Services Co., Ltd. (Wnet)	4.5 Mbps
9	Siam Global Access Co., Ltd. (SGA)	2.25 Mbps
10	Info Access Co., Ltd. (Info News)	1 Mbps
11	Asia Access (Thailand) Co., Ltd. (Asia Access)	0.5 Mbps
12	Chomanan WorldNet (Chomanan WorldNet, CMN)	0.5 Mbps
13	Idea Net Co., Ltd. (IDN)	0.25 Mbps
14	Far East Internet Co., Ltd. (Far East)	0.25 Mbps
15	Data Line Thai Co., Ltd. (Linethai)	0.125 Mbps
16	UNINET, Thaisarn, SchoolNet, and IIG	10 Mbps
	<b>Total</b>	<b>109.875 Mbps</b>

## **7. DOMAIN NAMES USED IN THAILAND**

As of July 1999, there are over 53 million Internet hosts connected in 250 countries. In order to be able to identify any of those hosts, Internet Protocol (IP) Address must be assigned. For example, one of the host computers at KSC has the IP address '203.155.33.38'. It can be noted that an IP address is in the form "n1.n2.n3.n4", i.e. four integers separated by dots. It is more convenient to names rather than number. Therefore, a host computer should also be assigned a "domain name". In the case of the host with the IP "203.155.33.38", the domain name is "ksc.th.com".

In summary, the Domain Name System (DNS) is a system whose principal function is to locate the host IP addresses based on host names. It consists of a hierarchical sequence of names (from the most specific to the most general) separated by dots, for example "ksc.th.com". In this case, the host "ksc" belongs to the domain "th.com". The last part of the domain which is "com" is referred to as the top-level domain name.

As shown in Figure 5, the top-level domain names include "com" for company, "net" for network, "org" for organization, "edu" for education, and then there are the country codes such as "au" for Australia, "th" for Thailand, and "uk" for United Kingdom.

From the top-level domain name of "th", there are second-level domain name such as "co" for company, "net" for network, "or" for organization, and "ac" for academic.

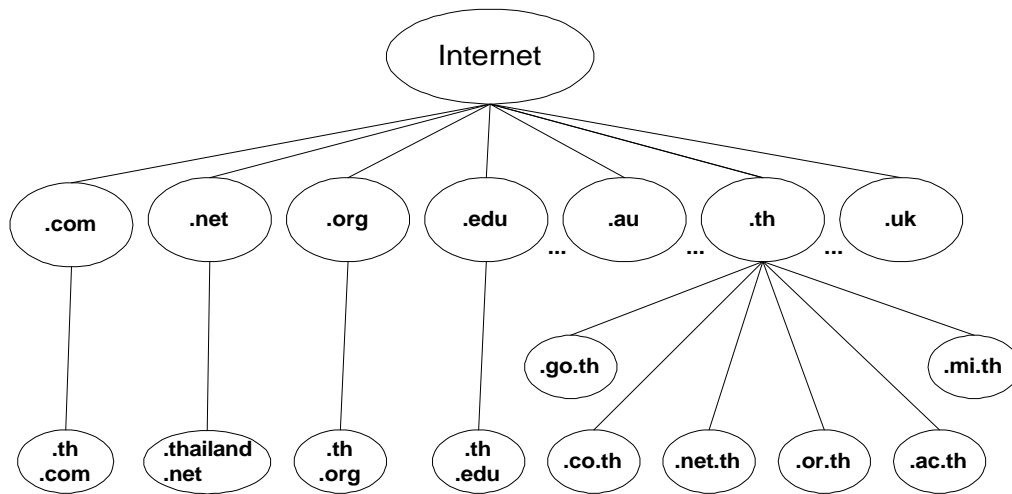


FIGURE 5. INTERNET DOMAIN NAMES IN THAILAND



FIGURE 6. THE LATE DR. JOHN POSTEL (RIGHT) IN CHARGE OF IP AND DNS.

The top-level domain of “th” for Thailand was given to a group of persons at Asian Institute of Technology (AIT) because AIT was the very first organization in Thailand to be connected to the Internet. At that time, Dr. John Postel of the University of Southern California was in charge of IP addresses and domain names. Dr. Postel and his associates used the principle of “First come, first serve”, i.e. whoever asks for it first would get it first. The group at AIT later set up what is called “ThNIC” standing for “Thailand network information center” similar to “InterNIC” for “International” and “APNIC” for “Asia Pacific”. Figure 6 shows Dr. Postel with Dr. Srisakdi who attended the ITU meeting in Geneva, Switzerland in his capacity as an elected member of the Board of Directors of APNIC. .

To register a domain name under “th”, a user has to pay ThNIC a certain amount of money every year. To avoid such payment and still has a domain name to use in Thailand, KSC has registered “.th.com“, “.th.org“, “.th.edu” as shown on the lower left hand side of Figure 5.

The registration of “.com”, “.net”, and “.org” has been assigned by the US National Science Foundation (NSF) to a private company for which a founder is an American mathematics professor, Dr. Donald Telage. The company name is Network Solution Inc. (NetSol) which runs InterNIC. Figure 6 shows Dr. Telage of Network Solution at the signing ceremony for KSC to represent NetSol in Thailand.



**FIGURE 7. DR. TELAGE OF NETSOL (MIDDLE) IN CHARGE OF “.COM”, “.NET” AND “.ORG”**

## 8. INTERNET USERS IN THAILAND

On July 13, 1998, the National Economic and Social Development Committee announced in the Mass Communication and Information Technology Development Plan for Human Resource and Social Development (1999-2008) in Paragraph 2.2 (5), Chapter 4, Visions, Objectives, and Goal:

*“To facilitate computer communication in all tambon, and Internet usage by 20 percent of the whole population”*

By the year 2008, the government plans to have approximately 14 million Thais using the Internet.

By the year 2006, when telecommunication is completely liberalized in Thailand, there should be about 12 million Internet users. Customers of all ISPs should be greatly increased by then. For example, KSC plans to increase the number of customers of about 0.25 million in 1998 to about 3.6 million customers in 2006. The rough estimate of the numbers of Internet users in Thailand and of KSC for 1998 and 2006 are given as an example of ISPs is shown in Table 6.

**TABLE 6. ROUGH ESTIMATE OF NUMBER OF INTERNET USERS IN THAILAND\* AND KSC**

		1998		2006	
		Thailand	KSC	Thailand	KSC
1.	Universities	275,000	100,000	1,500,000	450,000
2.	Commercial and Technical Colleges	110,000	53,000	800,000	240,000
3.	Elementary and High Schools	110,000	42,000	800,000	240,000
4.	Individual Users from government,	105,000	60,000	8,900,000	2,682,000
	<b>Total</b>	<b>600,000</b>	<b>255,000</b>	<b>12,000,000</b>	<b>3,612,000</b>

**Notes:** “Thailand” stands for the country and not “Internet Thailand” which is just a company registered in 1997 as the 16<sup>th</sup> ISP in Thailand as shown in Table 1. The approximate numbers of Thai national using Internet from 1969-2009 are given in Table 7.

**TABLE 7. APPROXIMATE NUMBERS OF THAI INTERNET USERS**

<b>Year</b>	<b>1969</b>	...	<b>1987</b>	<b>1988</b>	<b>1989</b>	<b>1990</b>	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>
<b>#users</b>	1	...	100	200	300	400	500	1,000	1,500	3,000
<b>Year</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>		<b>2006</b>	<b>2007</b>	<b>2008</b>	
<b>#users</b>	50,000*	150,000	350,000	600,000	800,000	...	12,000,000	13,000,000	14,000,000	

\*Notes: Assumption University got in with 25,000 users.

For comparison, the approximate numbers of Internet users in 16 countries in Asia Pacific are given in Table 8, with Thailand ranking six. The numbers are estimated from conversations with representatives of the various countries at many international conferences.

**TABLE 8. ROUGH ESTIMATE OF THE NUMBER OF INTERNET USERS IN 16 ASIA PACIFIC COUNTRIES IN 1998**

<b>Rank</b>	<b>Country</b>	<b># of Users</b>	<b>Rank</b>	<b>Country</b>	<b># of Users</b>
1	Japan	11,000,000	9	New Zealand	400,000
2	Taiwan	2,100,000	10	Malaysia	400,000
3	Australia	1,800,000	11	India	150,000
4	Korea	1,500,000	12	Philippines	100,000
5	China	1,000,000	13	Indonesia	60,000
6	Thailand	600,000	14	Vietnam	10,000
7	Hong Kong	600,000	15	Brunei	2,000
8	Singapore	450,000	16	Cambodia	1,000

Information concerning corporate users with ISPs in Thailand have been guarded as commercial secret because each ISP may be afraid that another ISP may try to take away the corporate customers. As an example, KSC has about 380 corporate customers in 1999, and altogether, the total number of corporates in Thailand connected to all the ISPs may be about 1,000.

## **9. HISTORY OF INTERNET KSC**

Since the KSC group of companies is the first and largest Internet Service Provider in Thailand and the CAT-KSC contract serves as the model contract for most other ISPs, history of KSC will be presented in this section of the paper.

From Table 1, Internet Knowledge Service Center Co., Ltd. (Internet KSC) was granted registration on June 7, 1994 by the Ministry of Commerce for the purposes which include offering Internet services. The co-founders are Dr.Kanokwan Wongwatanasin and Prof.Dr.Srisakdi Charmonman as shown in Figure 8. Srisakdi is the first Thai citizen to earn Ph.D. in computer-related area from the USA (Georgia Institute of Technology in 1964) and Kanokwan is the first person to earn a Ph.D. in Internet-related area from Thailand (Ph.D. on Encryption from Assumption University in 1996 under the supervision of Dr.Srisakdi).



**FIGURE 8. THE CO-FOUNDERS OF INTERNET KSC GROUP OF COMPANIES**

A brief history of KSC dated back to 1964 and in chronological order is given below:

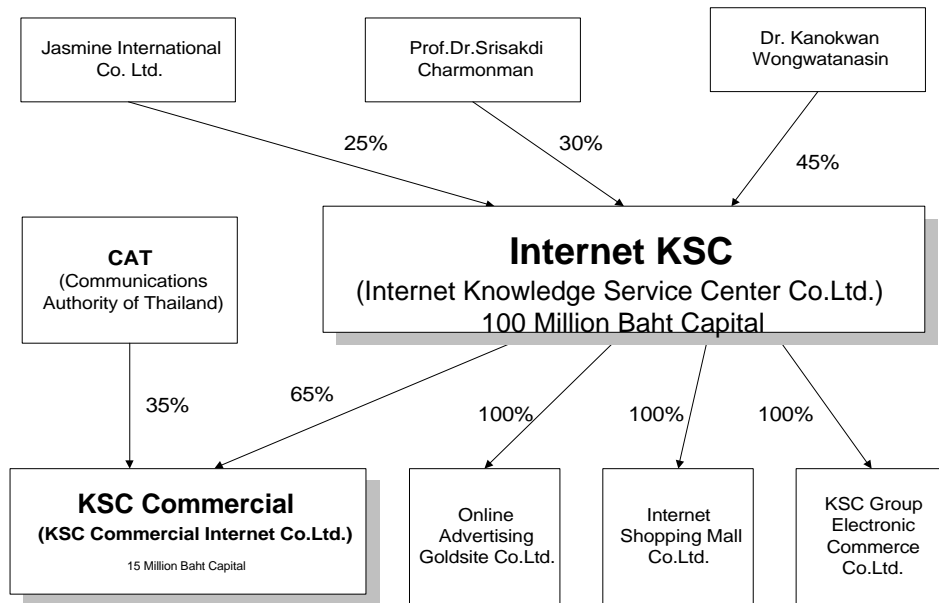
- 1964 For the first time, a Thai citizen earned a Ph.D. in computer-related area. (Srisakdi Charmonman was awarded Ph.D. in Computations from Georgia Institute of Technology, USA, through a scholarship from the US Government)
- 1969 Dr. Srisakdi appointed Director of Graduate Studies in Computer Science at the University of Missouri in Columbia, USA. He later became Director of a few research projects sponsored by the US National Science Foundation and got to start experimentation with what is now the Internet. (1969 was the year the Internet was born.)
- 1973 Dr. Srisakdi became the first Thai citizen to be appointed a Full Professor by a university in the USA (Professor of Computing Science at the State University of New York) and continued experimenting with the Internet for education and research.
- 1978 The National Institute of Development Administration (NIDA) for the first time proposed a candidate for royal command to become a Full Professor at NIDA (Dr. Srisakdi appointed Professor of Applied Statistics).
- 1981 Asia Computer Magazine in Hong Kong selected Asian Computer Man of the Year for the first time (Dr. Srisakdi became the first Asian Computer Man of the Year).
- 1987 Internet brought into Thailand for the first time by Asian Institute of Technology (AIT). In his capacity as President of the AIT Alumni Association, Dr. Srisakdi got an Internet account at AIT paid for by Assumption University.
- 1988 Dr. Srisakdi became the first engineering professor in Thailand to be promoted to the Civil Service Position Classification level 11 (C-11 equivalent to Permanent Secretary of Ministry or one level above the level of provincial governors).
- 31 Dec. 93 Assumption University became a Founding Member of Internet Society (International Internet Group based in the USA). Dr. Srisakdi Charmonman and Kanokwan Wongwatanasin became members of the Advisory Council of the Internet Society.
- 19 April 94 Dr. Srisakdi Charmonman and Kanokwan Wongwatanasin submitted a proposal to the Communications Authority of Thailand (CAT) to request permission to offer Internet services for education and commerce.
- 30 April 94 Rev. Bro. Dr. Prathip Martin Komolmas, President of Assumption University approved the Proposal from Dr. Srisakdi to establish the Internet Knowledge Service Center (KSC). Dr. Srisakdi became the Chairman and Kanokwan the Director of KSC of Assumption University.
- 7 June 94 The Thai Ministry of Commerce approved the registration of Internet Knowledge Service Center Co., Ltd. (Internet KSC).
- 1 Sep 94 H.E. the Minister of University Affairs (Suthep Attakara) appointed Dr. Srisakdi and Kanokwan as Internet Advisors to the Minister.

- 31 Oct 94 The Board of Directors of the Communications Authority of Thailand gave the approval for CAT to enter into joint venture with Internet KSC Co., Ltd. to establish KSC Commercial Internet Co., Ltd. to offer commercial Internet.
- 21 Dec 94 The Thai Ministry of Commerce approved the registration of KSC Commercial Internet Co., Ltd. Therefore, KSC Commercial Internet Co., Ltd. became the first company in Thailand to be legally registered by the Thai Ministry of Commerce to offer commercial Internet.
- 19 Jan 95 HRH Princess Maha Chakri Sirindhorn graciously presided over the opening ceremony of the first private-sector International Internet Gateway connecting to the USA at San Jose, CA. at 64 Kbps. The cost of rental of the Gateway was paid for by Internet KSC Co., Ltd.
- 29 Mar 95 Internet Shopping Mall Co., Ltd. registered with the Ministry of Commerce.
- 16 Mar 95 HRH Princess Maha Chakri Sirindhorn kindly gave her royal permission for Dr. Srisakdi and associates to present computer and telecommunication equipment to establish an Internet Node in the royal palace (Now 2 Mbps leased lines connected to KSC NOC).
- 4 Apr 95 KSC launched the first Internet Shopping Mall in Thailand at a seminar organized by the American Chamber of Commerce in Thailand. On the same day, Byrd and Heart, the two popular Thai singers allowed KSC to install their new CD in KSC Internet Shopping Mall where sample song clips from Thai composers can be heard for the first time through the Internet in Thailand.
- 21 Apr 95 The Office of the Commission for the Management of Road Traffic, Office of the Prime Minister, established a joint project with Assumption University with the support of KSC to use Internet to display traffic conditions in Bangkok. The Committee appointed by OCMRT included Dr. Srisakdi as the Chairman and Dr.Kanokwan as the Secretary.
- 1 July 95 KSC and Assumption University promoted National Election in Thailand by allowing all political parties and candidates to have homepages free of charge in Thai language. The Prime Minister now has his homepage at <chuan.th.org>, where the authority of <th.org>, <th.com>, <th.net>, <thailand.net>, etc. is under Dr.Kanokwan and Dr.Srisakdi.
- 27 July 95 Jasmine International PLC signed an agreement with KSC for Jasmine to take 25% of Internet KSC with the remaining belong to Dr. Srisakdi 30% and Dr. Kanokwan 45%.
- 5 Oct 95 KSC signed an agreement with Sun Microsystems from the USA for KSC to be the Sun agent in Thailand (in addition to the existing two) and the only one for Internet purposes.
- 21 Dec 95 KSC joined Dusit Thani Hotel and AVS to establish the first CyberPub in Thailand. There were 11 Internet terminals with SmartCards installed at the CyberPub.
- 14 Feb 96 KSC demonstrated the Prime Minister Homepage at the Office of the Prime Minister. The Thai Priminister got on the Internet for the first time.
- 1 Mar 96 KSC joined with Exact to create the first Thai Drama Homepage on the Internet.
- 18 Mar 96 Sun Service, Au and KSC organized the first Java training in Thailand. Java is new language allowing homepages on WWW to include movement and interaction with viewers.
- 30 Nov 96 Kanokwan Wongwatanasin earned her Ph.D. from Assumption University with the dissertation on Encryption supervised by Prof.Dr.Srisakdi Charmonman.
- 4 Jan 97 Prof.Dr.Srisakdi and Dr. Kanokwan were invited to host "Internet IT Talk" at Radio of Thailand FM 97 every Saturday at 8 AM.
- 10 Mar 97 HRH Princess Maha Chakri Sirindhorn kindly gave her royal permission for Dr. Srisakdi to conduct a short course on Internet for her.
- 17 Jul 97 KSC introduced International Roaming via GRiC and iPass covering more than 1,500 locations in more than 150 countries.
- 17 Jul 97 KSC is the first ISP in Thailand to provide 56 Kbps modem in both X2 and Flex standards, starting with 420 ports to be expanded to 10,000 and more later.



29 Jul 97	KSC signed an agreement with Microsoft to provide radio and television broadcasting through the Internet.
8 Oct 97	KSC started <www.thaicast.ksc.net> or <www.thicast.com> broadcasting 6 radio stations and a TV station.
9 Feb 98	Prof.Dr.Srisakdi and Dr.Kanokwan were appointed by Thailand Chief of Police to be advisors to the Internet Police Project to train about 200 persons per month to cooperate with the police in crime suppression.
2 April 98	KSC and Assumption University organized Internet training free of charge for the Association of the Deaf in Thailand.
10 Jun 98	The Federation of Thai Industries appointed Prof.Dr.Srisakdi Charmonman to be an Economic Advisor.
19 Jun 98	The Ministry of University Affairs appointed Prof.Dr.Srisakdi Charmonman to be Chairman of the Curriculum Committee on Computer and Telecommunications.
22 Jun 98	H.E. Supachai Panichapak, Deputy Prime Minister and Minister of Commerce appointed Prof.Dr.Srisakdi Charmonman to be Ecommerce Specialist.
11 Jul 98	KSC and the Department of Industrial Promotion of the Ministry of Industries organized a Seminar on "Internet for Industrial Promotion" attended by over 700 participants at the Ministry of Industries.
13 Jul 98	The Ministry of Commerce appointed Prof.Dr.Srisakdi Charmonman to be Project Manager for Ecommerce Pilot Project for Export Promotion.
10 Aug 98	Burapha University appointed Prof.Dr.Srisakdi Charmonman to be Chairman of the Search Committee for the Director of Academic Services.
20 Aug 98	KSC announced two new services "KSC Hot Net Delivery" and "KSC EZ Net" at Grand Hyatt Erawan Hotel.
8 Sep 98	KSC introduced a new service "KSC Instant Web Service".
21 Oct 98	KSC and TV Channel 7 started up the Homepage for the TV Channel 7's programs.
26 Oct 98	KSC signed an agreement with Siam University to give a "turn-key" service for the university.
25 Nov 98	KSC started providing 8 Mbps to the USA.
31 Dec 98	Internet KSC and KSC Commercial Internet made the total profit for the year 1998 of approximately 1 million US\$.
8 Apr 99	KSC and Krung Thai Bank launched "KrungThai – KSC Ecommerce".
19 May 99	KSC started providing 12 Mbps to the USA, becoming the biggest link to USA of all ISPs in Thailand.
6 Aug 99	KSC Bandwidth to the US increased to 16 Mbps
2 Oct 99	KSC Bandwidth to the US increased to 46 Mbps and later reduced to 42.5 Mbps. KSC also installed CISCO 7013 router which is the largest in Thailand.
	KSC is valued by international financial advisors at 40-90 million US\$.
Within 2000	KSC plans to provide 87-90 Mbps to USA.
End of 2000	KSC plans to have branches in all 76 provinces of Thailand. KSC plans to have one million individual customers plus 5,000 corporate customers.
By 2006	KSC plans to have 3.6 million customers (out of 61 millions Thai but 3.6 million is more than the whole population of Singapore).

In summary, the two co-founders submitted their proposal to the Communications Authority of Thailand (CAT) on April 19, 1994. CAT Board approved the request on October 31, 1994. KSC Commercial Internet Co., Ltd. (KSC) was registered on December 21, 1994 as the first joint venture company with CAT to provide Internet services. According to Thai law, CAT is in charge of all international telecommunications to and from Thailand. Therefore, CAT is the government agency in charge of Internet. CAT drafted the contract for KSC to sign and that contract became the standard contract for all ISPs to sign with CAT. In that contract, CAT gets 32% shares from each joint venture company free of charge. The other 3% shares are sold to CAT employees, and 65% goes to the private investors. In case of Internet KSC Co., Ltd., Assumption University agreed to serve as the incubator for KSC for a period of not more than two years. The KSC Group of companies is shown in Figure 9.



**FIGURE 9. KSC GROUP OF COMPANIES**

On January 19, 1995, HRH Princess Maha Chakri Sirindhorn graciously presided over the opening ceremony of the first privated-sector Internation Internet Gateway at Assumption University connecting to the USA at San Jose, California at 64 Kpbs. The cost of rental of the Gateway was paid for by Internet KSC Co., Ltd. This link is later upgraded to 4 Mbps in 1997, 8 Mpbs in 1998, 12 Mbps at the beginning of 1999, 16 Mbps and then 42.5 Mbps in October 1999.



**FIGURE 10. HRH PRINCESS MAHA CHAKRI SIRINDHORN KINDLY GAVE HER ROYAL PERMISSION FOR DR. SRISAKDI AND ASSOCIATES TO PRESENT COMPUTER AND TELECOMMUNICATION EQUIPMENT TO ESTABLISH AN INTERNET NODE IN THE ROYAL PALACE WHICH IS NOW 2 MBPS.**

As shown in Figure 10, on March 16, 1995, HRH Princess Maha Chakri Sirindhorn kindly gave her royal permission for Dr. Srisakdi and associates to present computer and telecommunication equipment to establish an Internet Node in the royal palace which is later upgraded to 2 Mbps connection.

On April 4, 1995, KSC launched the first Internet Shopping Mall in Thailand at a seminar organized by the American Chamber of Commerce in Thailand. Therefore, it may be said that KSC is the first ISP in Thailand to provide E-commerce services. On July 1, 1995, KSC and Assumption University promoted National Election in Thailand by allowing all political parties and candidates to have homepages free of charge. On July 29, 1995, KSC signed an agreement with Business Day newspaper to be the first online newspaper on the Internet in Thailand. On December 21, 1995, KSC joined Dusit Thani Hotel and AVS to establish the first CyberPub in Thailand. There were 11 Internet terminals with SmartCards installed at the CyberPub.

On February 1, 1996, KSC proposed to the Prime Minister that he became the first prime minister of Thailand to be on the Internet and he accepted the proposal. On February 28, 1996, KSC established a public-service Web page to combat Don't-Buy-Thai campaign from a group in the USA. Any organization trying to solve child prostitution and child labor in Thailand would be given a free Homepage and E-mail address by KSC.

On March 1, 1996, KSC joined with Exact to create the first Thai Drama Homepage on the Internet. On March 18, 1996, Sun Service, Au and KSC organized the first Java training in Thailand. On January 4, 1997, the author was invited to host "Internet IT Talk" at Radio of Thailand FM 97 every Saturday at 8 AM.

As shown in Figure 11, on March 10, 1997, HRH Prince Maha Chakri Sirindhorn kindly gave her royal permission for Dr. Srisakdi to conduct a short course on Internet for her.



**FIGURE 11. HRH PRINCE MAHA CHAKRI SIRINDHORN KINDLY GAVE HER ROYAL PERMISSION FOR DR. SRISAKDI TO CONDUCE A SHORT COURSE ON INTERNET FOR HER.**

On July 17, 1997, KSC introduced International Roaming via GRiC and iPass covering more than 1,500 locations in more than 150 countries. On July 17, 1997, KSC is the first ISP in Thailand to provided 56 Kbps modem in both X2 and Flex standards, starting with 420 ports, and later expanding at about 960 ports every six months. On July 29, 1997, KSC signed an agreement with Microsoft to provide radio and television broadcasting through the Internet. On October 8, 1997,

KSC started www.thaicast.ksc.net broadcasting 6 radio stations and a TV station. On February 9, 1998, the authors were appointed by Thailand Chief of Police to be advisors to the Internet Police Project to train 600-700 Internauts to cooperate with the police in crime suppression. On April 2, 1998, KSC and Assumption University organized Internet training free of charge for the Association of the Deaf in Thailand.

On June 10, 1998, the Federation of Thai Industries appointed Dr.Srisakdi to be an Economic Advisor. On June 19, 1998, the Ministry of University Affairs appointed Dr.Srisakdi to be Chairman of the Curriculum Committee on Computer and Telecommunications.

On June 22, 1998, H.E. Supachai Panichapak, Deputy Prime Minister and Minister of Commerce appointed Dr.Srisakdi to be Ecommerce Specialist. On July 11, 1998, KSC and the Department of Industrial Promotion of the Ministry of Industries organized a Seminar on "Internet for Industrial Promotion" attended by over 700 participants at the Ministry of Industries. On July 13, 1998, the Ministry of Commerce appointed Dr.Srisakdi to be Project Manager for Ecommerce Pilot Project for Export Promotion. On August 20, 1998, KSC announced two new services "KSC Hot Net Delivery" and "KSC EZ Net" at Grand Hyatt Erawan Hotel. On September 8, 1998, KSC introduced a new service "KSC Instant Web Service".

On October 21, 1998, KSC and TV Channel 7 started up the Homepage for the TV Channel 7's programs. On October 26, 1998, KSC signed an agreement with Siam University to give a "turn-key" service for the university. On November 25, 1998, KSC started providing 8 Mbps to the USA. On December 31, 1998, Internet KSC and KSC Commercial Internet made the total profit for the year 1998 of approximately 1 million US\$. On April 8, 1999, KSC and Krung Thai Bank launched "KrungThai – KSC Ecommerce". By October 1999, KSC link to the US was upgrade to 42.5 Mbps which is the largest and much larger than the second which is Internet Thailand at 16 Mbps.

## **10. KSC BASIC PHILOSOPHY**

The success of KSC depends on the staff members starting from the co-founders, the directors, the department managers, the section chiefs, and all the other members of the company.

The co-founders of Internet KSC have background which complement each other effectively to lead KSC to be the only major ISP in the world profitable from the first day of operation. Some of the underlining philosophical points of KSC will be presented in this section of the paper.

### **10.1 NO BORROWING UNLESS COMPLETELY NECESSARY.**

The first founder of KSC, Dr.Srisakdi has been an academician who has reached the highest rank of "Distinguished Professor" or Position Classification level 11 which is the highest for Government Officials in Thailand (one level higher than the Provincial Governors). Although his business experiences include the position of General Manager of Bangkok Data Center Co., Ltd. for 3 years and full-time Advisor to the President of Bangkok Bank for another 3 years, he stated when KSC was started that "KSC should not borrow any money unless absolutely necessary". At first, that philosophy was not accepted because usually most business establishments have to borrow money from some sources such as local and foreign banks or finance companies. Many Thai companies have borrowed from the United States and got badly bruised when the rate of exchange of about 25 baht per US\$ became about 50 baht per US\$ and later settled to about 38-40 baht to US\$. Had KSC borrowed from the United States, KSC would have been in bad shape by now. As a matter of fact, KSC has not borrowed from any source and as of 1999, KSC has about 100 million baht cash on hand.

The co-founder of KSC, Dr. Kanokwan has served as Director of Kanchanaburi Sugar Mill, Director of Thai Sugar Trading, Co., Ltd., and Director of the Trade Association of Sugar Producers. As such, she has tremendous business experience to contribute to the success of KSC. On the academic side, Dr. Kanokwan has also served as Deputy Dean of the Graduate School of Computer and Engineering Management of the Assumption University, and Director of Internet Knowledge Service Center of the Internet Institute of Assumption University.

### **10.2 ASSUMPTION UNIVERSITY AS INCUBATOR.**

At the beginning of KSC, a decision has to be made whether to start by renting a place in a business district or renting a room at the university. From the co-founders' travel to the University of

North Carolina in the United States, it was found that many benefits could be obtained from starting at the university rather than in a business district. Rev. Bro. Dr. Prathip Martin Komolmas, the President of Assumption University, agreed to the principles of serving as incubator adopted by the University of North Carolina. He kindly allowed Assumption University to serve as the incubator for Internet KSC. Thus, KSC could rely on students, staff, and faculty members of Assumption University to serve part-time at KSC. As a matter of fact, KSC can mobilize any number of highly qualified manpower from the university to serve KSC customers urgently. As an example, the organizer of Asian Games required 120 homepages designed and implemented within 3 days and no other ISP could do it except KSC.

### **10.3 HARDWORKING.**

Internet Technology and competitions are very dynamic. The co-founders and other members of KSC have found that 8 hours a day of working would not be sufficient. As a matter of fact, the co-founders of KSC have been working about 16 hours a day, 7 days a week. Several contacts could be concluded and several important publicities achieved because of the hard work.

From the beginning of the establishment of KSC and up until the end of 1999, the co-founders hold 75% of KSC and can, therefore, make any important decision right away, if necessary and desirable, and then report to the Board of Directors later for ratification.

### **10.4 WIN-WIN COOPERATION.**

In politics and business, neither foe nor friend remains permanent. Your foe will change to be your friend if you let him or her share your benefits. Your friend will change to be your foe if you do not let him share your benefits. Usually, it may be possible through negotiation to arrive at a win-win cooperation. KSC is said to be highly flexible in negotiating with any potential business partners. Even other competing ISPs in Thailand have signed win-win agreement with KSC from time to time.

## **11. KSC ACHIEVEMENTS**

As shown in Figure 9, Internet KSC Co., Ltd. has three shareholders, namely Jasmine International Co., Ltd. with 25%, Prof.Dr.Srisakdi Charmonman with 30% and Dr. Kanokwan Wongwatanasin with 45%. Internet KSC has a registered capital of 100 million baht (about 2.7 million US\$). In a sense, Internet KSC is a holding company but it is an operating holding company, i.e. it also provides all kinds of services related to Internet such as training, system integration, book publishing, selling computer and telecommunication equipment, as well as serving as sales agent for Internet connections.

Internet KSC owns 65% of KSC Commercial Internet Co., Ltd. which is a joint venture company with the Communications Authority of Thailand (CAT). CAT holds 32% of KSC Commercial without having to pay for it, and 450 CAT employees purchased a total of 3% of KSC Commercial. The registered capital of KSC Commercial is only 15 million baht.

Equity investment by strategic and/or financial investor should be done in Internet KSC rather than KSC Commercial.

### **11.1 KSC WITH NO DEBT BUT 100 MILLION BAHT CASH ON HAND.**

As earlier stated, KSC has not borrowed any money or has no debt. As a matter of fact, as of 1999, KSC Group has over 100 million baht (about 2.7 million US\$) cash on hand from advanced payments by customers who pay 3, 6, 12 months in advance and from other savings.

### **11.2 PROFITS OF INTERNET KSC.**

As shown in Table 9, the consolidated profits before tax of Internet KSC are about 1 million baht in 1995, 11 million baht in 1996, 7 million baht in 1997, and about 31 million baht in 1998. All figures for 1995, 1996, 1997, and 1998 are actual and have been audited.

In addition to Internet connections, KSC also provide all kinds of Internet-related services. However, for simplicity, sales and profits per individual customer and per corporate customer are computed and averaged to be used as indices for computation of the projected values for the worst

case. With the assumption that the sales and profits are distributed equally to individual type and corporate type of customers, the average sales per individual customer may be rounded to 400 baht/year, and profit 40 baht/year or the profit is 10% of sales. Similarly, the average sales per corporate is 400,000 baht/year and profit 40,000 baht/year or 10%.

**TABLE 9. ACTUAL SALES, PROFITS AND BANDWIDTH OF INTERNET KSC 1995-1999**

<b>Transaction</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>
Sales in Baht	15,400,000	91,700,000	141,500,000	180,800,000	370m
Profit before Tax in Baht	940,000	10,600,000	6,800,000	30,950,000	~60m
No. of Individual LAN Customers	20,000	80,000	170,000	195,000	200,000
No. of Dial-up Individual Customers	5,000	10,000	30,000	60,000	160,000
Total No. of Individual Customers	25,000	90,000	200,000	255,000	360,000
Sales per Individual in Bht/Yr	308	509	354	355	514
Profit per Individual in Bht/Yr	19	59	17	73	83
# WebHosting Corporate Customers	10	30	70	200	400
# Leased line Corporate Customers	15	40	100	180	300
Total No. of Corporate Customers	25	70	170	380	700
Sales per Corporate in Bht/Yr	308,000	655,000	416,176	237,895	264,286
Profit per Corporate in Bht/Yr	18,800	75,714	20,000	48,684	42,857
Bandwidth to USA in Mbps	0.5	2	4	8	42.5

**Assumptions:** (1) Actual sales are about 40% for individual, 40% for corporate, and 20% for others. However, to arrive at indices for computation, it is assumed that sales and profits are distributed equally to individual type and corporate type of customers. (2) Rounded, the average sales per individual customer is 400 baht/year, and profit 40 baht/year or 10%. (3) Rounded, the average sales per corporate is 400,000 Baht/year, and profit 40,000 baht/year or 10%. (4) Rounded, the average bandwidth to USA is 10 bps per individual, and 10 Kbps per corporate.

### **11.3 CUSTOMERS OF KSC.**

An Agency of the Thai government has announced that the number of Internet users in Thailand should increase to about 20% of the population in about 7 years, i.e. should be 12 million Internet users by the year 2006 which is the year Thailand has to liberalize telecommunication completely. The number of computers in Thailand in 1999 is about 2 million. Additional 200,000 – 300,000 computers per year could be expected. Thus, by the year 2006, the number of computers in Thailand could be 3-4 million. It is possible that the number of Internet users in Thailand could be 12 million with only 4 million computers, i.e. 3 persons could be using the same computer. Such a ratio is now not uncommon in Thailand. For example, a school with only 50 computers may require all 1,000 students to use the Internet, 30 minutes/day, 2 days/week, each.

From Table 10, the number of individual customers of KSC for the year 2006 is 2.579 million in the worst cases and 4.645 million in the best cases. The average is, therefore,  $(2.579+4.645)/2 = 3.612$  million.

**TABLE 10. WORST AND BEST CASES OF SALES AND PROFITS PROJECTION**

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1. #Individual Customers in million	0.025	0.1	0.2	0.255	-	-	-	-	-	-	-	-
Worst: % increase from last year	-	-	-	-	20	25	30	35	40	40	40	40
Worst: # individual customers in million					0.306	0.383	0.497	0.671	0.940	1.316	1.842	2.579
Best: % increase from last year					40	40	45	45	45	45	45	45
Best: # individual customers in million					0.357	0.500	0.725	1.051	1.524	2.209	3.204	4.645
2. Sales from Individual (Mbht)	7.7	45.85	70.75	90.4	-	-	-	-	-	-	-	-
Worst: Sales (using 400 Bht/ Person/Yr)	-	-	-	-	122	153	199	269	376	526	737	1,032
Best: Amount Bht/Person/Yr	-	-	-	-	400	800	1,200	1,600	2,000	2,400	2,400	2,400
Best: Sales inn Mbht	-	-	-	-	143	400	870	1,681	3,047	5,302	7,689	11,148
3. No. of Corporate Customers	25	70	170	380			-		-	-	-	-
Worst: % increase from last year					20	25	30	35	40	40	40	40
Worst: # corporate customers					456	570	741	1,000	1,400	1,961	2,745	3,843
Best: % increase from last year					40	40	45	45	45	45	45	45
Best: # corporate customers					532	745	1,080	1,566	2,271	3,292	4,774	6,922
4. Sales from Corporates	7.7	45.85	70.75	90.4	-	-	-	-	-	-	-	-
Worst: sale/corp/Yr	-	-	-	-	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Worst: sales in Mbht	-	-	-	-	182	228	296	400	560	784	1,098	1,537
Best: sales/Corp/Yr	-	-	-	-	0.400	0.425	0.450	0.475	0.500	0.525	0.525	0.525
Best: sales in Mbht	-	-	-	-	213	317	486	744	1,135	1,729	2,506	3,634
5. Total Sales (2 + 4)	15.4	91.7	141.5	180.8	-	-	-	-	-	-	-	-
Worst: Total sales in Mbht	-	-	-	-	305	381	495	669	936	1,311	1,835	2,569
Best: Total sales in Mbht	-	-	-	-	356	716	1,356	2,425	4,183	7,031	10,195	14,783
6. Profit before Tax (10% of 5)	0.9	10.6	6.8	30.9	-	-	-	-	-	-	-	-
Worst Profit: in Mbht	-	-	-	-	30	38	50	67	94	131	183	257
Best Profit: in Mbht	-	-	-	-	36	72	136	243	418	703	1,019	1,478

Table 9 shows the actual number of individual customers of KSC for 1995-1998 and the projected number for 1999. In the year 1998, there were about 195,000 individual users from academic institutions, and about 60,000 individual users who dial in to KSC from homes and offices. For academic individual users, KSC may provide the computer and all the telecommunication

equipment including the modems. The educational institutes sign contracts with KSC for 3-5 years, collect an amount of money from every student at the beginning of the term and pay 50-75% of that amount to KSC. KSC may provide all the technology and management for the Internet system. The actual and projected number of individual customers of KSC are shown as Item 1 of Table 10.

The actual number of corporate customers of KSC for 1995-1998 are shown in Table 9. In 1998, there were 180 corporate customers using leased line to connect to KSC and 200 corporate customers using the web hosting service. The actual and projected numbers of corporate customers of KSC are shown as Item 3 of Table 10.

A partial list of corporate customers of KSC is shown below:

- Bangkok Metropolitan Administration
- Department of General Education
- Education Science Center
- National Housing Authority of Thailand
- Royal Forestry Department
- Department of Agricultural Extension
- Office of the National Education Committee
- New Energy and Industrial Technology Development Organization
- American Embassy
- International Labour Organization
- Siam Cement Group
- Thai Shell
- K.R. Precision
- Hana Semiconductor
- Circuit Electronic Industries
- Hansol Electronics
- Yokogawa
- Mahidol University
- Ramkhamhaeng University
- Industrial Property Information Center
- Department of Environment Quality Promotion
- Department of Intellectual Property
- Office of the Commission for Road Traffic Control and Command Center
- AIT
- Express Data
- Siam Tripetch
- PacLink (Thailand)
- Krung Thai Bank
- Asahi Komag
- Fujikura
- Gamakatsu
- Honda
- Kawasaki Steel
- Nippon Express
- Takenaka
- Kasembandit University
- Rajabhat Petchburi
- Rajabhat Suansunanta
- International School of Business
- Chuo Senko (Thailand)
- Jasmine International
- NTTI (Thailand)
- New International School
- British American
- Assumption University, Assumption Sriracha, Assumption Thonburi, Assumption Samrong, Assumption Commercial College
- Klaikangwon Palace School
- Wimol Technical College
- Sriwatana Technical College
- Pattanee Technical College
- Sukhothai Business College
- Etc.

#### **11.4 INTERNATIONAL BANDWIDTH OF KSC.**

International bandwidth is one of the largest expense of ISP in Thailand. At the end of 1998, the bandwidth was 8 Mbps, and increased to 12 Mbps in April 1999, which makes KSC bandwidth to the USA the largest among all the ISPs in Thailand. KSC then increased the bandwidth to the USA to 16 Mbps in August 1999, 42.5 Mbps in October 99 which make KSC link by far the largest from Thailand, and expected to go to 87-90 Mbps in 2000.

#### **12. PROSPECTS OF KSC**

KSC intends to be the premier provider of all services directly and supplementary to Internet, including but not limited to Intranet, Edutainment, Exam Bank and Online Tutoring, Virtual Private Network, Video Conferencing, Electronic Commerce, Encryption, Firewall, Homepage, World Wide Web, Interactive Multimedia, Virtual Reality, Internet Fax, Internet Phone, Internet EDI, and Distance Education through the Internet.



To prepare to compete when Thai telecommunications market is opened, KSC is looking for strategic and/or financial partners from developed countries like USA and plans to be listed in at least one stock market in 2000.

The Internet is extremely dynamic and all kinds of potential opportunities show up all the time. Some of the prospects for KSC are presented in this Section of the paper.

### **12.1 KSC BRANCHES IN ALL PROVINCES OF THAILAND.**

By the end of the year 2000, KSC plans to have branches in all 76 provinces of Thailand.

### **12.2 KSC HOUSE CALL.**

KSC has been the only ISP in Thailand (and perhaps the world) to provide Internet house call similar to medical doctor's house call in the old days, that is, sending technician to the customer's house or office to install the modem, install the software and provide two hours of training on how to use the Internet. This service is called "Hot Net Delivery" which has been very popular in Bangkok and will be expanded upcountry.

### **12.3 KSC TO BECOME A PHONE COMPANY AFTER LIBERALIZATION.**

The Thai Government has announced that telecommunications in Thailand will be liberalized for Thai by October 2000, and for all by 2006 according to the agreement with the World Trade Organization. More and more people are using Internet Telephony because of its lower price than the regular telephone. KSC has been providing Voice over IP or Internet Telephony for KSC customers legally when they use Intranet connecting their headquarter and branches. However, general VoIP is not yet legal in Thailand. As soon as it is legal, KSC will become a telephone company providing Internet Telephone for all provinces of Thailand as well as overseas. Together with Assumption University, KSC has acquired and tested all the technology as a research project.

### **12.4 COMPLETE ECOMMERCE SERVICES.**

On April 8, 1999, KSC has launched "KrungThai-KSC Ecommerce" through research and development of KSC, KrungThai Bank, Assumption University, Microsoft Thailand, and Compaq. KrungThai is the largest bank in Thailand. "KrungThai-KSC Ecommerce" is said to be "The least expensive, the most secure, and the easiest to use". The starting price is 3,000 baht (about 75 US\$) one-time charge to set up the storefront, and 1,800 baht (about 45US\$) monthly fee. Such a low price would be easy for everybody to start Ecommerce. The security is based on SSL (Secure Socket Layer), Triple DES (Data Encryption Standard), and MD5 (Message Digest 5) as well as all of Microsoft security features. The ease of use is provided by software from Microsoft which allows the setting up of storefront as well as the administration of the store to be done conveniently through the web. It is expected that 1,000 corporate will be using "KrungThai-KSC Ecommerce" within the next 12 months (making the number of corporate customers for KSC higher than the figure of 500 used in Item 3 of Table 10 for the year 1999). The Graduate School of Internet and E-Commerce at Assumption University also require that all students each has to start his own E-Commerce shop and obtain at least 1 million baht sales before graduation.

### **12.5 KSC FREE EMAIL FOR MILLION USERS.**

Similar to all the popular free email services like Hotmail, KSC is offering free email to a million of users under <thailand.net>. The initial set of users can be conveniently taken from computerized record of students from educational institutions who have to use their ID Codes and prefer to use their names. So, a million email addresses is not difficult to realize.

### **12.6 FREE EDUCATION-ON-DEMAND.**

Offering courses through the Internet has not been very popular because many people do not like to pay for. So, instead of a "pay-per-lesson", free lessons through the Internet should be more successful. KSC has agreed in principle with an international lesson provider to offer free education-

on-demand and share advertising revenue. Some homepages like Yahoo has no guarantee that a user would read the advertisement. Usually, a user would not wait for the advertisement to come up on screen completely but click away to other pages. With free education-on-demand, the system is programmed such that a user has to wait until the ad has come up completely on the screen before he can proceed. So, the advertisers can be assured that their ads would be seen on the screen.

### **12.7 KSC OWN TELECOMMUNICATION NETWORKS.**

As soon as the Thai Government liberalizes telecommunications in Thailand (which is supposed to be as soon as October 2000), KSC will start setting up its own telecommunications network which will be less expensive than renting from TOT and CAT. For example, KSC could connect the headquarter with any office building through either its own landlines or radio links to offer Internet services to customers in that building. Then, connect that building to other buildings where there are customers. Wireless technology each being improved and may reach 300 Mbps fixed point in a few years and KSC is planning to use it.

### **12.8 HIGH-SPEED INTERNET CONNECTION.**

KSC has been investigating and will be ready to provide high-speed Internet connection for the customers, for example, through cable modem and other technology. So, additional investment would be required.

### **12.9 HARD-TO-REFUSE OFFER TO EDUCATIONAL INSTITUTIONS.**

KSC has been making offer to educational institutions to provide Internet services to students and earn some income. The institutions would have to collect fees from all students at the beginning of the term, keep a part of it, such as 20-50%, and give the remaining amount to KSC. KSC would deduct 10% and use the 90% to pay for the equipment and Internet connection. Usually, KSC would be profitable from such a deal after about one year. However, KSC would need money to pay upfront.

### **12.10 GROOMING KIDS TO BECOME CUSTOMERS.**

With deals like in Section 12.9 above and other promotions such as giving 50% discount to new graduates, KSC has been grooming kids to become KSC customers.

### **12.11 FREE INTERNET.**

KSC has announced 5-hours free Internet for 100,000 users in 1999 and 1 million users in the year 2000.

## **13. THAI ISP'S PROFITS AND LOSSES**

Financial statements of all companies in Thailand for any particular year are required to be submitted to the Ministry of Commerce by the end of May of the following year.

As shown in Table 11, KSC is the only ISP in Thailand profitable in the year 1997. As a matter of fact, KSC has been profitable from Day 1 of operation. For the year 1998, KSC each also the most profitable ISP in Thailand. Thus, it would not be too difficult to have KSC listed in Nasdaq.

TABLE 11. THAI ISP'S SALES PERFORMANCES

Mbaht

No.	Company Name	1997			1998		
		Sales	Profit (Loss)	Acc.Profit (Acc.Loss)	Sales	Profit (Loss)	Acc.Profit (Acc.Loss)
1	KSC Commercial	107.3	0.3	2.7	149.7	12.1	8.0
	Internet KSC	30.7	4.3	7.2	72.1	15.3	22.5
	Total KSC <sup>1</sup>	138.0	4.6	9.9	221.8	27.4	30.5
2	Internet Thailand <sup>2</sup>	NA <sup>3</sup>	(0.03)	(0.03)	140.1	24.6	24.6
3	Loxley Information	123.7	(45.0)	(55.2)	224.3	7.2	(47.9)
4	A-Net	39.2	(5.9)	(15.1)	56.4	4.9	(10.2)
5	C.S. Communication	90.1	(52.1)	(46.4)	211.7	7.4	(38.9)
6	Samart Infonet	29	(39.1)	(61.2)	55.8	(29.2)	(90.3)
7	Asia Infonet (CP and TA)	14.0	(56.2)	(59.2)	53.1	(29.8)	(88.9)
8	Siam Global Access	12.0	(3.5)	(4.3)	29	2.7	(1.6)
9	World Net	10.3	(32.6)	(32.6)	109.6	62.4 <sup>3</sup>	29.8 <sup>3</sup>
10	Info News	11.3	(13.1)	(22.2)	2.9	1.7	(39.2)
11	Inet (Thai.)(Asia Access)	19.5	(31.4)	(47.6)	29.7	(7.8)	(55.5)
12	Chomanan WorldNet (CMN)	0.61	(0.47)	(11.97)	1.7	(7.1)	(7.5)
13	Idea Net	3.3	(10.7)	(11.7)	9.1	0.9	(10.9)
14	Far East Internet	1.2	(2.4)	(2.4)	7.5	(1.6)	(3.9)
15	Data Line Thai	1.3	(6.9)	(9.8)	3.7	(2.8)	(12.6)

- Notes:**
- Both of KSC Commercial and Internet KSC were registered with the purposes of providing Internet services and, therefore, the figures for the two have to be combined to reflect KSC.
  - Internet Thailand did not submit any financial report to the Ministry of Commerce for 1997 but reported loss of 0.03 million baht to the Government Audit Agency.
  - The mother company of WorldNet waived WorldNet debt of 79 million baht in 1998.

#### 14. CONCLUDING REMARKS

Presented in this paper are brief history of Internet in Thailand, Internet service providers in Thailand, autonomous system numbers for Thai ISPs, Internet Societies in Thailand, the bandwidth of Thai ISP to the USA, domain names used in Thailand, Internet users in Thailand, the history, philosophy, achievement and future prospects of KSC. It is clear that KSC can be used as a world-class case study of success story of an entrepreneurial company started at the University. Comparing to any other universities in the world, Assumption University can claim to be one of the most successful incubator of Internet-related company. Bill Gates said "The profit for providing Internet connection can be effectively rounded to zero" and most Internet-related companies take several years to reach the break-even point. However, KSC is the only major ISP in the world with profit from day one. Rev.Bro.Dr.Prathip Martin Komolmas, the President of the Assumption University and the University have made significant contribution to the success of KSC. One of the reasons Assumption University does not own shares in KSC it not to compete with other ISPs which may be owned by AU graduates. However, AU has also benefited from the Internet experience. For example, the Internet helped in transforming AU from a business school to the top IT university of Thailand.

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