

THE GROWTH OF ASIAN E-COMMERCE: SOCIOPOLITICAL, ECONOMIC, AND INTELLECTUAL PROPERTY TRENDS

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Abstract

The Internet has been pervading all aspects of Asia's culture and economy at an astonishing pace. A multitude of Asian nations have realized the huge potential for financial, social, and technical gain possible through web commerce, and have begun clamoring for the coveted status of being the preeminent leader in Asian e-commerce.

This paper examines four of the largest competitors: Japan, China, Hong Kong, and Singapore, and analyzes the advantages and hurdles each nation or region faces in constructing a successful e-commerce market. It is found that, while each country possess a unique advantage in this tight race, each also faces a variety of socio-political, economic, technical, and legislative hurdles. A particular emphasis is placed on the evaluation of current intellectual property, copyright and domain name registry laws in each country or region. In the end, no single country stood out as a definite, foreseeable victor. Indeed, only time will tell us which will become the next "Asian Internet Superpower".

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1 Introduction

The recent development of the Internet has created a technological and commercial revolution throughout the world. By essentially shortening the distance between companies and consumers, the Internet has created a competitive global market unlike any other. Many countries are fighting hard to become major players in this potentially lucrative venue. Over the past five years, Western nations have had a considerable advantage in this race, since the concept of the Internet originated from the Western Hemisphere. Yet many Asian countries have a huge market potential for on-line businesses, and have been steadily catching up to the West and are currently within striking distance of the West's lead.

In fact, the Yankee Group estimated that there would be 374 million users accessing the Internet in Asia Pacific by the year 2005. (1) The world has been increasingly interested in the market potential of the Asian Internet, especially the various Asian nations themselves. In the past three years, a veritable battle has broken out amongst a handful of Asian nations that are all vying for the coveted position of becoming the "Asian Internet Superpower."

This paper discusses the roles of four major e-commerce players: Japan, China, Hong Kong, and Singapore. Each country/region has unique strengths to aid them in the e-commerce race. For example, Japan has one of largest economies in the world, which means that it has the money and resources to create reliable infrastructures for the development of e-commerce.

China is also likely to become the e-commerce epicenter of Asia with its rapidly growing economy, fast building infrastructure and immense human population. Furthermore, Hong Kong, a capitalist territory of China, is currently one of the strongest international finance and trading centers in the world. With its well-developed economic and technical infrastructure, it also has the potential to become the next e-commerce leader. Lastly, Singapore has one of the highest percentages of computer literacy among workers and some of the best telecommunication networks in the world. E-commerce and Internet development has become an integral component of the government's strategy to turn Singapore into the e-commerce hub of Asia.

Given each of these countries' different advantages, who is going to be the next Asian Internet Superpower? This paper examines each country's historical trends, socio-political developments, current IP, domain name, and copyright regulations in e-commerce, and how these various factors will affect the development of their Internet markets.

2 Japan

2.1 Overview

As the second largest economy in the world after the United States, and by far the biggest economy in Asia, Japan certainly possesses impressive economic and political

clout. Japan alone represents well over 60% of all of Asia's economy. (2) Indeed, despite its deep recession in the 1990's and its continuing economic struggles today, Japan continues to maintain a strong position in the global economy as well as a prominent role in the high technology industry. A critical development that Japan was missing up until five years ago, however, was the Internet.

Only in the past few years has the Japanese government realized the importance of the Internet and how far behind their country was in developing and implementing web-based technologies. Disliking the idea of becoming second-rate in any technology and quickly realizing the Internet's enormous potential for financial and social gain, the Japanese government began creating initiatives and laws to accelerate the growth of the Web.

Since then, Japan's technical infrastructure and web presence has blossomed. Between 10%-20% of the world's Internet markets are now based in Japan. (3) The number of Japanese web users is also steadily increasing and diversifying across gender and generations. There is, in fact, a strong and very relevant parallel between the expansion of the Internet and the ongoing shift in the nation's sociopolitical atmosphere from an ultra-conservative "Old Japan" regime to a more liberal "New Japan."

The question now is whether or not Japan can construct an Internet and e-commerce infrastructure fast enough to win the singular title of "Asian Internet Superpower." Of course, the uphill road leading towards this coveted status will also require a collection of strong but not overly restrictive intellectual property, copyright, and domain name registry laws. The following sections will provide a deeper analysis of the "Old Japan," just before the nation's jump-start into the Internet, as well as the ongoing transition into a "New Japan," in which completely new economic and social mentalities are being adopted. Finally, this paper examines the creation of new intellectual property and domain name laws from the specific perspective of e-commerce.

2.2 An Ultraconservative "Old Japan"

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Until very recently, Japan has always maintained a safe distance between itself and the rest of the world, both economically and politically. Run by an ultra-conservative government, Japan chose to remain isolated from much of the globe while focusing on its internal development. Yet this decision was only partly a product of the large conservative majority in the Japanese Diet, "the highest organ of state power and ... sole law-making organ of the State." (4) A more fundamental cause for Japan's separation was simply the nature of the Japanese people. The extreme pragmatism and veiled nature of Japanese culture propagated throughout Japan's private and public sector.

This conservative, protective mentality was visibly reflected in Japan's methods of conducting business. Foreign companies were almost never allowed to set up shop in the country, and international trade was very closely monitored. Heavy trade tariffs were imposed on foreign imports to ensure the success of Japanese goods and international trade partners were always watched with a wary eye. Needless to say, Japan was

extremely cautious regarding any foreigners, especially when it involved business and finance.

Japan's isolationistic policy certainly did not mean that the government pampered all domestic companies. Instead, only a small handful of extremely large and powerful corporations were favored by the government and received influential, though discreet, backing by members of the government. The remainder of Japanese businesses, especially small firms, were left to fend for themselves. Even more importantly, the conservative Japanese government was very reluctant to allocate funding to new companies. As a result, Japanese entrepreneurs had great difficulty in raising capital for Internet and e-commerce ventures.

A lack of social diversity also resulted from Japan's conservative atmosphere. Businesses were run by an elite class of male executives who were extremely good friends with the powerful politicians of Japan's government. Though less true in recent years, these close relationships resulted in a very fuzzy line between business and politics. Women were excluded from most of Japan's industry, and encouraged to stay at home as housekeepers. Foreigners were even more disliked than women and excluded from all forms of Japanese business. This austere sociopolitical atmosphere is what defined the "Old Japan" before the 1990's. (5)

2.3 Why the "Old Japan" Went Out of Style

Keep in mind that the concept of a truly integrated, global economy is an invention of only the past decade or two. While it would probably be economic and technical suicide to segregate oneself from the world today, isolationism was not so dangerous twenty years ago. Indeed, Japan was certainly successful enough to build itself into one of the most aggressive, powerful economies in the world; and, with manufacturing giants like Sony, Panasonic, and Hitachi, Japan was certainly not lacking in technical prowess either. By the late 1980's, Japan's economy had soared to unbelievable heights.

This was not fated to continue. As the early 1990's rolled around, Japan's economy collapsed while the rest of the world experienced an unprecedented economic boom. From 1991 through 1996, Japan's real GDP growth averaged 1.3%, as compared to a real GDP growth of 1.9% for the G7 countries and an astonishing 8.7% for all Asian countries. (6)

The social framework of Japanese society was proving to be inadequate. A survey by the Prime Minister's Secretariat showed that approximately 40% of the populace felt that not only did they not have sufficient leisure time, but that 17% expected their daily lives to get worse. (7) Japan's institutions were also not geared to provide support for the elderly, the disabled and people with children or other responsibilities.

These social conditions pointed to an urgent need to change the manner in which the Japanese economy was being run. It required the rethinking of not only the economic infrastructure, but of the culture that was responsible for the economic climate

prevalent in Japan as well. In a *Visions 21 Report* by officials at the Japanese Ministry of Posts and Telecommunications, it was stated that:

There is thus an urgent need for the reform of six major parts of Japan's socioeconomic system, the administration, public finance, social security, the economy, the financial system and education. It is to be hoped that reform of these six areas will lead to reform and renew the rest of the socioeconomic system. (8)

It was hoped that these changes could be brought about through an increased commitment to the growth of info-communications systems, as this would allow Japan's entrance to the global market:

Japan's socioeconomic system is today a lumbering giant. At the same time, countries such as the United States, which is currently in the middle of a boom period, and some countries in Asia, which are enjoying rapid economic growth, attribute much of the success they have had in revitalizing their socioeconomic structures to the increasing sophistication of their info-communications. (9)

This realization prompted the Japanese government to consider seriously some aggressive Internet and e-business initiatives.

2.4 Transition to a "New Japan"

Since its debilitating recession in the early 1990's, Japan has been steadily rebuilding its economy and public infrastructure from ground zero. In the past 12 months alone, the Japanese government has poured more than \$830 billion into economic revival projects, and that money is certainly creating a significant impact. New public works projects and office buildings are sprouting up left and right, while generous business loans rescue companies from the brink of closure. The government has even passed out nearly \$6 billion in shopping coupons to encourage consumers to spend more and rekindle national consumption.

2.4.1 Building a Technical Infrastructure

Amid this intense bustle of activity, the Japanese government has also adopted an aggressive stance on building a comprehensive technical infrastructure. The Internet is commonly perceived as the tool of reform in Japan. The deep recession of the 1990's prevented many Japanese industries from investing in high technology hardware like network cabling, routers, switches and hubs. As a result, Japan is seriously suffering from a lack of a technical infrastructure that can support the network-intensive activities of the 21st century, and severely lagging behind its counterparts in Asia and in the West. Recognizing their plight, the Japanese government announced two major initiatives to promote the acceleration of technical growth. In 1995, the Ministry of International Trade and Industry (MITI) presented a fundamental *Plan to Promote Development of an Information Infrastructure* and a *Policy Toward Promoting*

Advanced Information and Telecommunications Society. The highlight of these plans is the complete installation of a national fiber-optic network by the year 2010. (10)

In August 1994, the Advanced Information and Telecommunications Promotion Society, a body chaired by the Prime Minister himself, was organized. This society was created to implement Japan's comprehensive info-communications policies while simultaneously helping to foster the growth of the global info-communications community. "The movement towards the new society, where any organization or person can send out and receive information easily on a global scale, is expected to change many things including the conventional concept of values, the socioeconomic system and the legal frameworks from the standpoints of culture, society and economy." (11) This direct response to an increasingly global society becomes very significant in how Japan designs its intellectual property and copyright laws. This relation is discussed in the next section.

The Japanese government further outlined three main goals last year. These are:

1. Building a foundation for growth in the 21st century. That foundation must include greater spread and use of information technology and telecommunications, such as the Internet, at work, at home and in government administration.
2. Creating new industries and jobs. Venture businesses in info-communications must be promoted, as well as R&D, aimed at the creation of new industries and employment opportunities.
3. Enabling all citizens to participate in the information-based society. The level of information literacy must be improved, so as to create a society in which everyone (including elderly and disabled citizens) can participate and benefit from info-communication technologies. (11)

A safe and reliable "Next Generation Internet", which would be over 1000 times faster than the current one is slated to be developed by the end of 2001. This network will then be further improved in 2010 by the aforementioned fiber-optic network, whose capacity will be more than 30,000 times larger than the current one. An ultra high-speed multimedia mobile communication system, over 15 times faster than the current system, will also be completed by the end of 2002. Satellite mobile communication technology with transmission speeds of more than 800 times the current speed is to be implemented experimentally by the end of 2005.

2.4.2 Economic Reconstruction

To encourage foreign investment, the Japanese economy has been deregulated. The rules for interconnection have been established and the Nippon Telephone & Telegraph Corporation (NTT), Japan's erstwhile telephone service monopoly, has been restructured into three separate companies so as to allow cheaper and easier access to network services. The development of a low-cost and secure Internet environment is under way, into which electronic signature and authentication systems will be

incorporated. Part of this has involved the testing of a system of electronic money that allows the user to make transactions on the Internet safely without needing to worry about his privacy being compromised.

The government has also stopped playing favorites with businesses. Instead of focusing on just a few corporate giants, the government is now lending a hand to venture initiatives and smaller businesses. Low interest loans have been doled out to many companies, enabling them to acquire the equipment required to join the world of cyber-business. Not only is support now directly available from public bodies, but private investors are being encouraged to invest in startups through a proposal to revamp the tax laws so that losses from the sale of shares could be included in calculating individual incomes for tax purposes.” (13)

2.4.3 Social Changes

The exclusivity of the traditional Japanese culture is also dissolving. Women are now more welcomed in the workplace, as are more and more foreigners. In respect to the Internet, Japanese women are also making a mark. 40% of all new Japanese Internet users in 1998 were female, constituting 21 % of the 6 million Japanese web users. (14) Older generations are also experimenting with the web, as indicated by the gradual rise in the average age of the Japanese Internet population. (15) The web has clearly spread across gender and generational borders. This change also parallels Japan's departure from a society revolving around a middle-aged, male elite.

2.5 New Laws and Regulations in E-commerce

One of the main thrusts of Japan's activity is towards the development of e-commerce. It is widely believed that e-commerce will be the driving force behind economic growth in Japan this century. The ability to sell to a worldwide market will certainly increase the potency of smaller businesses. E-commerce is a popular choice for larger, more established companies as well. If nothing else, the recession of the early 1990's has shown these corporations that they need to downsize and improve efficiency. Computerization is a necessary step in this reengineering.

Commerce, however, always means competition and where there is competition, conflicts are liable to occur. Electronic commerce is no exception. This new channel of commerce has, for some time, been regarded as a "wild west", where almost anything can and does happen. Electronic commerce will realize its potential, however, only if some scope of protection and recourse against acts of unfair competition is provided. Protection against unfair competition can be achieved through a thorough set of intellectual property and copyright laws. Without such protection, companies would be reluctant to engage in electronic commerce, thus stifling innovation.

Japan has taken an important step by becoming actively involved in the promulgation of guidelines that will help protect e-business while minimizing unnecessary governmental regulations. The result of these policies has been increased self-regulation in the private sector.

2.5.1 Intellectual Property Laws

Adhering to its ongoing transition to a "New Japan" regime, the Japanese has chosen to be relatively laissez-faire in regards to e-commerce regulation. There is, in fact, a striking similarity between the new e-commerce intellectual property laws in Japan and the existing United States IP laws. After observing the successful boom of e-commerce in the United States, Japan decided it would be best to model its own policies after a proven paradigm. The Japanese government has thus drafted a code of conduct by which companies can regulate themselves. These guidelines are designed to be clear, transparent, and predictable to make self-regulation as easy as possible. What is more interesting is that the majority of these new regulations were established with the direct input of the United States and formulated in the *US-Japan Joint Statement on Electronic Commerce* presented on May 15, 1998.

Japan is currently using a first-to-file system, in which intellectual property rights are granted to those individuals who file for a patent first. This policy is also used by the United States and levels the playing field between large corporations and individual entrepreneurs. No particular advantage is given to a large company, thus empowering business startups with the ability to safely protect their unique ideas. This was an important step for the Japanese, since their electronic commerce market is expected to grow to \$130 billion within 5 years, and \$460 billion in 5 to 10 years. (16) It is thus to the advantage of the Japanese government to protect the rights and interests of the startups and small ventures which constitute a large majority of the e-commerce markets. Japan has also taken steps to address the protection of expressions and ideas distributed over networks and web software. The 1998 US-Japan Joint Statement on Electronic Commerce noted that such issues are not personal to any individual nation, but are instead a global concern. Thus to protect the base technologies of electronic commerce, Japan decided to pursue a global solution. The Japanese Patent Office has outlined the following three directions of action:

- 1) The U.S., Canada, the Republic of Korea and Japan need to work together through discussions within a framework including [for]... the WIPO Patent Law Treaty to clarify that software media is patentable.
- 2) It is needed to study the international patent protections for computer software-related inventions with an eye to the rise of the networked society.
- 3) With regard to patent protections for computer software-related inventions, industrialized nations need to harmonize examinations.
- 4) Court and legal jurisdiction for industrial property rights infringements on the Internet

These particular steps illustrate Japan's willingness to create a set of guidelines for software and Internet regulation, but one that resides in the international domain. This mindset makes sense, since Japan is slightly behind many other Asian nations and the West in creating its own IP laws. Thus, it would be easiest for Japan to collaborate with and borrow good ideas from those countries that have had significantly more experience in addressing the needs of the Internet.

2.5.2 Copyright Laws and Domain Name Registries

The Japanese government has also become a strong advocate of the global regulation of Internet copyrights and domain name registries. In fact, the Japanese Patent Office (JPO) recently identified the "need for harmonization of intellectual property right systems geared towards a global economy."⁷ The Japanese government has effectively deferred many important domain name and Internet copyright regulations to the World Intellectual Property Organization (WIPO), an intergovernmental organization within the United Nations. With over 170 member nations, the WIPO has become the foremost international authority on global copyright and trademark issues. In May 2000, the WIPO published the first Primer on Electronic Commerce and Intellectual Property. This document thoroughly outlines how copyright and domain name infringements will be identified and resolved. Aside from possible instances where direct enforcement is needed by a local government, the WIPO intends to handle all Internet copyright issues on its own with its own board of adjudicators. The Japanese fully supports this global i regulation as illustrated in this excerpt from the US-Japan Joint Statement on Electronic Commerce: in order to reach its full potential, the system for registering, allocating and governing domain names should be global, fair and market-based and reflect the geographically and functionally diverse nature of the Internet. The said system should also give business the confidence that trademark rights are to be protected by establishing a self-regulatory regime on a global basis. (18)

Currently, the Japanese government is pressing other nations for the "prompt ratification and implementation of the WIPO Copyright Treaty and the WIPO Performances and Phonograms Treaty, (19) which will give the WIPO additional power in copyright and domain name regulation.

One of the biggest concerns regarding Internet domain names today is cybersquatting, the abusive registration of domain names that violate trademark rights for intended financial gain. The practice of cybersquatting was outright condemned by the WIPO as "an indefensible activity that should be suppressed. (20) Any instances of cybersquatting, or any other domain name or Internet copyright infringements would be judged based on the WIPO Uniform Domain Name *Dispute Resolution Procedure* (UDRP). (21) Currently, punishments resulting from this procedure would be limited to orders for the cancellation or transfer of domain name registrations to the appropriate parties. Decisions would be enforced directly by the WIPO without the need for a court order or by the domain name registration authorities of the local government. As of December 1999, the WIPO had issued more the 85 decisions and was administering more than 300 pending cases.

Delegating authority to a global organization like the WIPO greatly benefits the Japanese government, for now it does not need to invest large amounts of its own resources in developing a comprehensive collection of cyber laws. Globalization of intellectual property and copyright laws, along with domain name registries also allows Japan to benefit from the experience of other countries.

2.6 Conclusion

Even with the amazing rate of growth that Japan has experienced in the past few years, it is hard to see the country being anointed as the Asian Internet Superpower. Other Asian countries have continued to grow in stature while Japan still struggles to implement a solid technical infrastructure. It was not until 1997 that a single coherent set of plans had been drawn up for the long-term development of an info-communications infrastructure in Japan. Even the construction of the national fiber-optic network, though ambitious, will not be completed until 2010. Until then, Japan's current network services only 16% of its population. Even though all the right steps are being taken, they are still merely preliminary and will only help Japan catch up, not move ahead.

As we will soon see, other Asian countries are actively pursuing concrete goals in e-commerce, and many are leaps and bounds ahead of Japan. Foreign interest is also necessary to spark growth in Japan. Despite deregulation of the economy, the basic factor inputs needed to start a business in Japan is still very costly, and there are many other Asian countries attracting the eye of foreign investors.

An inspection of the Japan's current intellectual property, copyright, and domain name laws is also very revealing. Japan has elected to shift the majority of its laws and regulations to international adjudicators like the WIPO, leaving itself with minimal direct control. This decision does greatly benefit Japan, though, since it is now collaborating with many countries that have a significant lead in the e-commerce market and have had substantial experience in drafting laws that can effectively govern but not stifle competition. Again, Japan is doing its best to make up for its late start on e-commerce and catch up to its Asian and Western counterparts.

All of this is accompanied by the inherent conservatism of Japan. Much of the gradual shift in culture that has been accomplished over the past five years has been arranged through the offices of far-seeing politicians. Yet while initiatives from politicians and business executives may alter the sociopolitical atmosphere at the surface, it cannot transform the people themselves. It takes considerably less time to open the doors of industry to women and foreigners than it does to convert the way people think. It is unlikely that enough trust will be generated within Japan to make e-commerce hugely successful in the short run. Instead, Japan must wait until its youngest generation, one that was raised in the Internet Age, grows up and begins leading their country. Only then can a new school of thought and behavior take hold in Japan. And while all this is going on, other Asian countries that are more flexible and adaptable will continue to flourish and vie for the distinction of being the Asian Internet Superpower.

3 China

3.1 Introduction

China is unique for its large population of 1.4 billion and for its five thousand year-old history. For ages, China had been governed by emperors who, one after the other, tried their best to feed their people. Then, in the early 1900s, the Western ideas of socialism and communism were introduced to China and thus ended the era of feudalism. After a long battle between socialism and communism, the Communists finally came out victorious and have been ruling China since.

At first, the country was in chaos. Since the communist government believed that the wealth of the country should be shared equally by the people, it claimed ownership of all the land, leading to the same lives of poverty and starvation experienced in the feudalist era. It wasn't until the late 1970s that the government realized that their communist ideals were not helping the economy. As a result, the communist party increased its efforts to reform China's economy by increasing per capita income and consumption through new economic management systems. . Even though China is still a developing country, its economy has boomed and has become one of the major economic powers in the world. Through the years, the government has shifted its focus from agricultural development to expanding industry in cities. Presently, Internet technology has become a central focus of the country. To remain competitive in the global market, China has incorporated the Internet into its economy in the hope that e-commerce can become the new major source of revenue for the country.

The Internet is still relatively new in China compared to developed countries like the United States, but the number of Internet users is growing rapidly. In one year, the number of Internet users tripled in China. As of 1998, there were 2.1 million users, and by the end of 1999, that figure increased to 8.9 million. (22) With this phenomenal growth, can China become the next Internet super power in Asia? This question can be evaluated from a variety of angles. Development of Chinese e-commerce depends on the regulations that are enforced by the government and the growth rate of the economy. In the next section, the development of Intellectual Property (IP) laws and their importance to e-commerce will be discussed. In the following section, factors promoting Chinese e-commerce and obstacles faced will be examined.

3.2 Intellectual Property Laws

Commercial piracy has been a problem since China opened its economy to foreign investors. Piracy on video, CD, and software continues to increase annually as more foreign companies invest in China. In 1995, according to the Business Software Alliance report on commercial piracy, even though 30 CD-ROM pirating software plants were confiscated, \$527 million is still lost on pirated software originating from China. (23) Intellectual Property Right (IPR) piracy in China effectively destroys the creative initiative of Chinese inventors and scientists and damages international relations with other investor countries. In order to protect an individual's intellectual property, the Chinese government has made significant progress in IPR protection since early 1963. (24) Table 1 charts the development of IP laws in China since 1963. (25) In the past twenty years, China has attended a series of international conventions, acceded

agreements regarding intellectual property right protection, and established a legal system on IPR protection to provide effective legal protection to all intellectual property rights. These IP laws not only help prevent piracy on CDs and software, but also set a good foundation for the regulations on the Internet. In order to run a successful e-business in China, it is important to have a good understanding of the country's regulations and laws. In the following section, the relevant copyright and domain name laws will be discussed.

April 1963	Trademark Control Act Supplanted the People's Republic of China's Provisional Trade Mark Registration of 1950. The act was repealed in 1982.
July 1979	US-China Agreement on Trade Relations Marked the beginning of current PRC intellectual property protection regime. Both sides stipulated that each will offer the other reciprocal protection of patents and copyrights.
June 1980	China acceded to the World Intellectual Property Organization(WIPO)
August 1982	Trademark Law of The People's Republic of China Detailed implementing regulations in 1983, 1988. Replaced the 1963 Act. Based on first-to-file system. registration is valid for 10 years after approval, with a 10-yea renewal option. 1988 revisions introduced protection for service marks.
March 1984	Patent Law of the People's Republic of China Mandated registration of consumer products and licensing contracts. Infringement penalties can be twice the profit earned though violations based on <i>first-to-file system</i> .
March 1985	China acceded to the Paris Convention for the Protection of Industrial Property.
May 1989	US-China Memorandum of Understanding (MOU) on Enactment and Scope of PRC Copyright Law Stipulated that copyright legislation will include computer programs as a specific category. Expanded patent protection without specifying industries or time limits.
October 1989	China acceded to the Madrid Agreement for International Registration

	of Trademarks.
June 1991	Computer Software Protection Regulations Extended protection to computer software, and to literary, artistic, and scientific works. Protected published software registered after the enactment date, leaving all existing software in China in the public domain.
January 1992	U.S.-China Memorandum of Understanding (MOU) on Intellectual Property Rights Pledged to extend copyright protection to foreign owners of software, books, films, sound recordings, and other mediums previously unprotected.
September 1992	Regulations for the Implementation of International Copyright Treaty Provisions Provided further amendments to the Copyright Law. Extended protection to "applied art" (jewelry, watches, toys, furniture, etc.), which were subject to registration requirements.
October 1992	China acceded to the Berne Convention for the Protection of Literary and Artistic Works. China acceded to the Universal Copyright Convention.
February 1993	Supplementary Provisions Concerning the Punishment of Crimes of Counterfeit Registered Trademarks
June 1993	China acceded to the Convention for the Protection of Producers of Phonograms Against Unauthorized Duplication of their Phonograms Geneva Convention
December 1993	Unfair Competition Law Protected unregistered trademarks, packaging, and trade dress. Prohibited unfair competition by monopolies/cartels in controlling prices.
January 1994	China acceded to the Patent Cooperation Treaty
July 1994	Copyright Implementing Regulations Made copyright infringement a criminal offense. Violators would be sentenced to prison for a to seven years or executed in severe cases.
February	U.S.-China IPR Enforcement

1995	Promised to markedly reduce piracy, to improve enforcement at the border, and to open its markets for U.S. computer software, sound recordings and movies.
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Table 1: Timetable of IP law history in China

3.3 Trademark Law and Domain Name Regulations

The *Trademark Law* of China, the first IP law passed in China, was promulgated on August 23, 1982 and went into effect on March 1, 1983. Before then, no written legal protection of an individual's Intellectual Property existed. (26) The Trademark Law was substantially revised in 1993 to include criminal prosecution for trademark infringement and to provide for the registration of service marks. On September 2, 1993, the *Anti-Unfair Competition Law* was adopted. Recently a law was passed regulating the determination of well-known marks. These regulations protect the legitimate rights of the registrants of well-known trademarks and control infringement in the economy. This regulation becomes critical in cybersquatting disputes.

In China, a trademark is granted to the first person or company who files for the request. No evidence of prior use or ownership is required. In addition to this system in China, the *Well-Known Marks Law* can be extremely useful to many foreign businesses since trademarks can be granted to them even if they had no prior registration in China.

Ever since the new wave of e-commerce in China started, the government has been working hard to reinforce trademark protection on the Internet. The trademark office has been working with the China Internet Network Information Center (CNNIC), China's domain name registration authority, to resolve conflicts involving domain names and online trademarks. The CNNIC and Trademark Office have both registered domain names for well-known trademarks that were determined by the Trademark Office and recognized by the Bureau. This method effectively controlled the vicious race to grab domain names of famous trademarks. Besides working with the Trademark Office, CNNIC has also setup regulations to control the distribution of domain names to individuals allowing registered companies alone to have a domain name.

3.4 Patent Law

China's Patent Law was promulgated in 1985 and major improvements were made in the following years. Chinese Patent Law protects one's registered products for twenty years. Any unauthorized sale, importation or manufacture of patented products can result in penalties of up to twice of the profit earned through the violation. At the outset, this law only protected Chinese people's rights, but after the signing of the

Memorandum of Understanding on Intellectual Property Protection in 1992, China agreed to extend intellectual property protection to foreigners. Today, foreign patents registered in China can enjoy IP protection.

In addition, the Chinese government has opened the China Trademark & Patent Law Office in Beijing to provide better assistance to the people who wish to get registered.

3.5 Regulation for the Protection of Computer Software and Copyrights

In 1991, the Chinese legislature promulgated China's Copyright Law and the "China Copyright Law Implementing Regulations". The "Computer Software Protection Regulations" bill was also passed to further protect the individual's intellectual property. (27) This bill was created to protect the rights and the interests of creators of computer software and was intended to encourage the development and circulation of computer software applications. The Protection of Computer Software follows the guidelines of the Copyright Law of the People's Republic of China, which means that protection is provided during the life of the author and extends fifty years beyond his/her death. In the case where the copyright of the work belongs to a company, the protection extends for a period of fifty years from the first publication of the work.

In recent years, Chinese citizens have learnt to use these laws to effectively protect their interests and inventions. In 1999, the China Software Registration Center received 1,577 applications, an increase of 63.3% compare to the number in 1998. However, the copyright protection is limited only to works that do not violate public interest or national laws.

3.6 Discussion

The laws and regulations that have been discussed in the previous section are there as a deliberate attempt to promote the growth of Internet use and e-commerce in China. Quite apart from the legal realm however, are a whole host of other factors that have a significant influence on e-commerce growth. What are some of these issues and what obstacles, if any, does China face in E-commerce development.

3.6.1 E-commerce Promoting Factors

China is the largest country in the world and 30% of its population resides in its major industrial cities, which are located along the coast. As of 1999, 8.9 million people have access to the Internet, which is only one percent of the total Chinese population. The young and educated constitute a major part of these Internet users. They are more likely to accept new ideas and more willing to spend money than the older folk, who are generally more thrifty and bound to tradition (which for them, never included the Internet). This quite naturally makes the young ones the largest market for Internet usage in the country. The sheer number of them (and the potential for many more to rise) bodes well for the e-commerce scene, which needs a base of customers to be profitable.

Besides looking at potential customers, investors are also interested in the infrastructure available for the development of e-commerce. The Internet is a new technology in China and basic infrastructure was constructed only very recently. This late start, however, has given rise to a very recent rapid (and somewhat urgent) advancement in growth. Some of the emerging technologies certainly look promising.

Network companies are now using fiber optic cables to obtain the initial connections and are developing new products that can reduce the cost for subscribers. Instead of using phone dialup connections, families have adopted TV cable lines to create the "Living Room Series", which is a product that is a "Home Easy" computer for general households and a "Stock Easy" computer for home investors. (28)

Besides infrastructure development, the government has also been enforcing regulations and laws to promote and protect on-line companies. Firstly, the government reduced Internet connection fee by half to serve as an incentive for Internet usage. The connection fee had been a major reason for scarce Internet use in China, as it had been a significant portion of the average person's income. Now that the fee has been reduced, more people can afford to log on and become potential consumers.

The Chinese government also protects on-line users by declaring laws and regulations pertaining to trademark protection and computer software piracy. Domain Name registration is tightly controlled by the CNNIC, so that only registered companies have the right to obtain i domain names. This right is usually granted to companies under the "Well-Known" Law, which is similar to the famousness test. This system significantly reduces disputes among companies who fight for popular trade names.

In general, China is developing a pro-business environment. Despite all these factors i which facilitate e-commerce today, there are still many hurdles and obstacles that e-companies have to overcome before China can become a major power in the global market.

3.6.2 E-commerce Road Blocks

China has a great advantage of being the country with the largest population, but quantity is not the only factor that contributes to the success of e-commerce. Even though China has a lot of potential consumers, the general population is still very poor. Most people still can not afford their own personal computers or pay the connection fee. Even if people have the money to purchase computers, there is a shortage of PCs in the market.

Lack of money and equipment can be a major stumbling block, but an even bigger problem that China is facing is the still lack of infrastructure. Most of the large cities are networked, but many smaller cities don't have connections yet - this limits the number of people that can use the Internet. The banking system is also too antiquated for e-commerce to progress fast in China. Most people still do not have personal credit cards or personal checks. This problem limits the ways in which people can pay on-line. Finally, the undependable, slow postal service can not be relied on to deliver products

that people order on-line, which definitely hinders the potential for growth of e-commerce.

Above all, regulations enforced by the government are the biggest problem that e-commerce has to face. (29) First, foreign investment is not allowed in China, which reduces many possible sources of income and hence, the growth of e-commerce. However, this situation might change if China is permitted to join the World Trade Organization (WTO). China and U.S. have also made a trade agreement that allows foreign ownership of half of the Chinese providers by the year 2002, and 49% of Chinese ISPs by the year 2006.

The Chinese government tries to control the Internet system in China as it controls every aspect of the running of the country. For example, the Chinese government is systematically regulates the content on Internet web sites based in China. The communist party has already issued regulations that prohibit China-based web sites from using news from web sites outside of Mainland China. This same regulation applies for broadcast and print media too. (30)

This affects many e-companies that carry news on their web sites. In order to adjust to the political environment, many e-companies have changed their business strategies. For example, Sinanet.com, China's biggest commercial site and one well-known for its news center, announced that it has decided to give up its news content and to completely focus on e-business. It is hard to imagine that this change of strategy is not going to affect the number of hits per site.

The Chinese government has also setup strict rules on e-trading. (31) While Americans can buy and sell their stocks on-line, the Chinese people still do not enjoy the same convenience. Currently, people can only check stock price information, historical statistics and research reports on-line. This situation might change in the future, but presently, the government still bans nonbrokerage firms from engaging in online securities trading, which means that the outlook for IT companies that deal with securities web sites is not positive. (32)

3.7 Conclusion

China has many hurdles and obstacles to overcome before e-commerce can be shaped into a market like the booming U.S. industry, but there are also advantages that e-companies have by investing in China. Hopefully in the future, the Chinese economy will still be growing at a rapid rate, so that the people's income level will be high enough to afford a computer and pay the connection fee. At the same time, much of the development still depends on the government's willingness to give more freedom to the e-companies, in terms of what they have to offer and how they attract investments.

Evaluating the pros and cons while keeping in mind China's gargantuan population, this country definitely has the critical mass to create a huge potential market for e-commerce and more fundamentally, Internet usage. How it progresses in the next few years will depend heavily on internal regulatory policy and China's entry into the WTO. The

government would also do well to stay out of political trouble. For example, a high-intensity military conflict with Taiwan would almost certainly divert national resources away from network development.

4 Hong Kong

4.1 Overview

Many experts believe full-blown e-commerce is just waiting to happen in Hong Kong. At a round table discussion during the 1998 NetAsia Internet Commerce Expo, panelists agreed that Hong Kong had the infrastructure, financial environment, and, most importantly, the right mentality for e-commerce to take root. In fact, e-commerce statistics show that in 1998, over 61,000 users were buying goods and services over the Internet, helping to create a year-end commerce revenue of \$31.7 million US dollars. The same source predicts almost 583,000 users buying goods over the Web in 2001, and a year-end commerce revenue of over \$1,042 million US dollars for Hong Kong. (33)

Like many Asian countries, Hong Kong is striving to become an e-commerce hub of the world, a center that everyone everywhere will connect to for the goods and services that they need. However, unlike many countries in Asia, Hong Kong is already one of the strongest international finance and trading centers in the world. In this section, we will analyze why Hong Kong is seen as such a promising leader of the e-commerce world, taking a look at its history of capitalism, current intellectual property legislature, and the competitive actions of both government and industry. In addition, we will look at what problems have emerged in the battle to dominate the e-commerce industry, and consider what actions Hong Kong must take next to continue its journey to the top.

4.2 One Country, Two Systems

As a colony of the British until July 1997, a socio-political analysis of Hong Kong reveals a society very similar to that of its parent country. Hong Kong's government traditionally demonstrates a laissez-faire approach to the economy, with little regulation and mediation. The result has been a remarkably free and enterprising capitalistic economy that has especially flourished in financial and trading departments.

However, on July 1, 1997, Hong Kong ceased to be a British colony and became a Special Administrative Region of the People's Republic of China (SAR). Many analysts worried about the influence China would have on the capitalistic ex-British territory, because of the strict, regulatory communist environment of the Chinese. But in fact, both the Sino-British Joint Declaration of 1984 and the Basic Law of Hong Kong, which was adopted by the National People's Congress of China in 1990, have emphasized that the legal system of Hong Kong is separate from that of China. (34) Both documents agree that the system in force in Hong Kong in 1997 will remain unchanged for 50 years thereafter. Therefore, in essence, Hong Kong and China would interact as one country with two separate systems.

Hong Kong has long been a service center, with industries like banking and software development, thus requiring a great amount of expressive freedom. However, Communist China has always been more of a manufacturing base, highly regulated and production-oriented. Therefore, this conversion from Britain to China rule first seemed as a bad idea to most people, because of the fundamental differences in the socio-political atmosphere. In recent years though, many have begun to believe that the two pieces could complement each other. Centralized China has a strong manufacturing system, optimized to transport resources effectively and produce goods demanded by the rest of the world. As a result, China has the potential to be a strong B2B commerce department for tangible goods. Hong Kong, on the other hand, has the service traditions and resources to become a front-end for China, an information hub to interact between China and the countries that demand its goods. Hong Kong has the capabilities to attract web talent and produce e-commerce sites for Chinese businesses. Plus, China would be able to contain its freedom of information within Hong Kong itself, and not worry about changes occurring within the mainland itself. As one on-line Asian newspaper describes, it is "a perfect relationship", where "the communist produces the goods and the capitalist sells the goods to the world and both benefit from the relationship with less tension". (35)

4.3 The Intellectual Property System

In the years before the exchange of Hong Kong from Britain to China, there was a rush to propose and amend laws in all areas, including all aspects of intellectual property law. Much of this urgency was based on the declaration that the Hong Kong legal system of 1997 would be enforced for 50 years after the exchange. As a result, Hong Kong enacted the Intellectual Property Ordinance in May 1996, which took effect in December the same year, only 7 months before Hong Kong would become a Chinese territory. The Ordinance amends various trademark and copyright laws. Recognizing the importance of intellectual property protection, Hong Kong's mini-constitution, the Basic Law, specifically states in Articles 139 and 140 that the Hong Kong SAR should independently develop appropriate polices and afford legal protection for intellectual property rights.

Several government departments in Hong Kong work together to ensure the protection of IP rights. The Intellectual Property Department (IPD) was established by the government on July 2, 1990 to underline its commitment to IP protection. This department is responsible for advising the Secretary for Trade and Industry on policies and legislation on IP. Furthermore, the IPD maintains the Hong Kong SAR's Trademarks, Patents, and Registered Design Registries, and promotes IP protection through public education. A different government agency, the Customs and Excise Department, is responsible for enforcing IP laws, from a criminal activity perspective. The department has extensive search and seizure powers, working internationally with other enforcement agencies to investigate alleged trademark and copyright infringements. The customs department also aids in enforcing an individual's IP rights through border enforcement measures, in accordance with the World Trade Organization Agreement on Trade Related Aspects of Intellectual Property Rights (WTO-TRIPS Agreement).

Because of Hong Kong's close association with the Western Hemisphere, many key intellectual property concepts are strikingly similar. Similar to Hong Kong's IPD, the United States has the Patents and Trademark Office (PTO) which administers patent and trademark laws and advises the Secretary of Commerce and President of the United States on intellectual property issues. The PTO examines both patent and trademark applications and disseminates patent and trademark information. Copyrights, on the other hand, are automatically given to the owner of the work through creation, thus requiring little governmental supervision. The PTO's goal is to "promote the progress of science and the useful arts by securing for limited times to inventors the exclusive right to their respective discoveries". (36) However, unlike Hong Kong, the United States settles most of its IP infringement problems via civil action. Individuals are allowed to take civil action against the violator, but no specific governmental department oversees the process.

4.4 Current IP Legislation

With its history of laissez faire and capitalism, it is no surprise that Hong Kong's IP legislature is remarkably similar to that of the United States. In fact; much of Hong Kong's legislation was modeled after that of the United States, which already possesses the Internet oriented environment that Hong Kong hopes to create. In this section, we outline the most important characteristics of IP law, with a brief examination of trademark, patent, and copyright law. The recent amendments to these laws clearly show the role these different laws will play in the emergence of an Internet-driven e-commerce society in Hong Kong.

4.4.1 Trademark Law

Hong Kong's trademark registration system is separate from other systems operating in China, and only registered trademarks can be protected by the government under the Trade Marks Ordinance. A trademark is defined "a mark or logo used by businesses to identify the goods in which they trade or the services they provide in the course of business" .3' The owner of the trademark has the exclusive right to use the mark on his goods or services, and can take legal action to prevent anyone else from using the mark without his consent. It is unlawful for an unauthorized party to use someone else's registered trademark for identical goods and services, as well as any goods and services where such use would result in a likelihood of confusion. Recently, the definition of the trademark has been expanded to allow geographical names, 3-D shapes, sounds, and colors to be registered. The emergence of these new considerations emphasizes Hong Kong's continuing commercial growth. The necessity for geographical trademarks, and similar items, have only recently become necessary with the development of the Internet and the e-commerce potential involved.

4.4.2 Patent Law

Similar to trademarks, patents granted in the Hong Kong SAR will only be recognized in the territory itself. At the same time, patents granted by the Chinese Patent Office will not automatically be protected in Hong Kong. The new Ordinance of 1997, however,

does allow Chinese patents to apply for patent registration in Hong Kong and allows continued registration of United Kingdom patents. Like the US, Hong Kong shares the idea that a patent gives the inventor the exclusive right to make, use, or put the invention on the market. In exchange, the inventor is required to make the invention public. There are two different types of patents available in the HK, the standard patent and the short-term patent. Standard patents have a 20-year protection period, while short-term patents have 8 years of protection. Short-term patents generally have a quicker examination time, and are used for inventions with a short commercial viability. Hong Kong's implementation of this new patent type clearly shows a careful preparation for the same phenomenal growth that the US is experiencing today.

4.4.3 Copyright Law

Hong Kong's copyright law protects recognized categories of literary, dramatic, musical, and artistic works, as well as films, television broadcasts, cable transmissions, and Internet-available works. Seen as one of the most valued types of intellectual property, copyright protects two moral rights of integrity, according to the Hong Kong government, the right to be identified as an author and the right to object to derogatory treatment of one's work. (38) Customs also has the strongest powers for copyright infringement, taking a very active role in pursuing criminals. Customs agents can provide copyright owners with information and samples of seized items, rely on presumptions for prosecution purposes, and confiscate seized goods.

With the rise of the Internet, the copyright laws have recently been revised, to account for the interests of owners whose works are online. While users are permitted to download copyrighted works and make transient copies for viewing, long term storage of the item, including printing hard copies, would require the copyright owner's approval. Currently, computer software is also a copyrighted literary work. Therefore, unlike in the United States, software patenting is not yet an issue. To facilitate the development of information technology, the government is also considering narrowing software protections. For example, the government proposes to allow copying software for proper use and de-compiling software in order to create a new program.

4.5 The HK Government

As mentioned before, the Hong Kong government has always maintained a rather laissez-faire environment, using little regulation and promoting much free enterprise. However, with the advent of the e-commerce age, the government is slowly changing its image to become a more helpful governing body. As seen with the changing IP laws, the government has entered a flurry of activity in the past few years, much of its concerns regarding the change of ownership from Britain to China. However, the government is clearly becoming more responsive to the intellectual property needs of the community, in an effort to promote more commercial growth.

Until recently, the government had been waiting for the banking and commerce industries themselves to take the lead in providing online services for the public. However, as a result, industry adopted a more conservative position, waiting for

consumer demand to drive the ecommerce force. Consumers, therefore, had very little reason to change their behavior, since they had little exposure to the new service available. Thus, the growth of information technology (IT) was virtually at a standstill, until the government decided to become more actively involved in the effort to make Hong Kong an international e-commerce and trading hub.

4.5.1 The ITBB

One of the first steps of the Hong Kong government was to re-think their own organization and respond to the economic and social needs of the community. In this regard, Hong Kong has been one of the front-most leaders internationally, by creating the Information Technology and Broadcasting Bureau (ITBB) in 1998. This organization brings together telecommunications policy, the broadcast media, and the government's own IT responsibilities. While this organization brings together three major areas, many other agencies also need to converge, such as the IT industrial sector, the distribution of research funds, and the encouragement of businesses to adopt e-commerce. Coordination is difficult, but extremely important, a problem which Hong Kong is currently trying to accomplish. Analysts are extremely interested in seeing how the solution unfolds.

4.5.2 Electronic Services Delivery (ESD)

The government plans to place its own procedures and services online to the public through the Electronic Services Delivery (ESD) initiative. Through ESD, the public will be able to obtain these services 24 hrs a day, 7 days a week, beginning in mid-2000. Furthermore, the service will be implemented over an open, common information infrastructure for use by the private sector to conduct electronic transactions, at a later time. This secondary usage of the ESD will help facilitate the development of electronic commerce within the Hong Kong territory.

4.5.3 Public Key Infrastructure (PKI)

Yet another government initiative is the decision to establish HongKongPost as a trusted third-party certification authority which will operate a public key infrastructure of electronic certificates over the Internet. These certificates will be used to verify digital signatures and cryptographic key pairs over the web, to improve Hong Kong's online security system. In this way, the government hopes to promote Internet use for commerce, banking, and trading by illustrating the safeness of any transaction. However, in order for the PKI to operate successfully, the private sector will also have to establish standards of acceptability for a dedicated certification authority. In particular, experts address the importance of banks and credit card companies becoming closely involved. One major concern is the lack of merchant protection offered by Hong Kong banks against credit card fraud.

4.5.4 Electronic Transactions Bill

Furthermore, the government has introduced the Electronic Transactions Bill, which provides a clear legal basis for the conduct of electronic commerce and the use of digital signatures. First, the bill removes any legal impediments to the conduct of electronic transactions, and encourages trust and confidence of the public in these transactions. However, the bill is careful to remain neutral in the case of technology, in order to cope with rapid technological changes. And, lastly, the bill adopts a minimalist regulatory approach, in order not to constrain the development of e-commerce in the private sector.

4.5.5 Government Funding

In addition to these initiatives, the Hong Kong government is also encouraging the development of a common Chinese language interface, to facilitate the conduct of e-commerce in Chinese. In order to aid the industry in building the e-commerce infrastructure it envisions, the government has put aside a great deal of money to fund IT companies. In 1997, the government began by setting aside \$80 million (US) for technology start-ups and spent a great deal of effort distributing the money to worthy ventures. However, this effort took several months just to review applications. Thus, in recent years, the government has handed over Applied Research Technology Fund to private venture capitalists, including Asia Tech Ventures, Walden, and HSBC, to distribute as they saw fit.

4.6 The Industry

As the e-commerce revolution continues to grow, the industry must also make changes if Hong Kong is to lead Asia as the IT hub. One of the major difficulties in telecommunications development, according to some analysts, is the legacy problem. (39) Even though telecommunication has long been a basic support structure for Hong Kong's information-based economy, industries must spend hundreds of millions of dollars to upgrade systems to meet e-commerce necessities. As technology continues to grow, new data retrieval technologies, client server architectures, and interactive media services all demand new investments and risks. Furthermore, residential areas also need similar technology upgrades for adequate e-commerce servicing. Hence, industry standards must not only continue to improve to keep up with other countries, but must also take into consideration the complexity of the consumer's own technology.

Another major industry concern is the security issue, making it safer for consumers to buy goods and services via the Internet. Recently, in late April 2000, three of Hong Kong's major mobile telecommunications carriers started an initiative to secure mobile e-commerce, allowing consumers to safely purchase goods through their cell phones. The system uses M-cent, a mobile digital certificate that can soon be used within the government's PKI infrastructure described above. As one of the first countries to introduce this system, Hong Kong hopes to obtain a leading position in developing global standards for the mobile e-commerce industry.

The mobile phone industry is an excellent example of Hong Kong's government and industry working together to lead the world in the e-commerce revolution. Both sides focused on a weakness within Hong Kong's commercial infrastructure, in this case e-commerce security, and worked together to make it into a leading technical advantage. Furthermore, Hong Kong has a generally tech-savvy population that can provide an excellent indication of how successful or unsuccessful an innovation may be. Currently, Hong Kong has a population of 6 million, with approximately 3 million mobile phone users. The mobile phone carrier executives predict that, by 2003, mobile e-commerce will account for about half of the business-to-consumer e-commerce market in Hong Kong, approximately \$900 million (US). (40) However, the same executives also report that they are continuing to look for a better solution to the e-commerce security problem, illustrating that Hong Kong is continually trying to maintain its lead in the mobile e-commerce industry.

Like many other countries, e-commerce fever in Hong Kong has spread quickly to small businesses and start-ups. However, because software cannot currently be patented in Hong Kong, simply copyrighted as a literary work, much work in the start-up environment is strictly secret. In fact, the start-up process has been referred to as the "start-up tango" as start-ups and venture capitalists dance around looking for potential partners. (41) Like the tango, the exchange is very secretive, as no one is willing to let out too much information, for fear his or her idea will be stolen. Instead, vague exchanges are made between the two parties about company ideas and possible monetary arrangements.

Unfortunately, because of the necessary precautions, very little progress can be made at a time. Thus, in order to encourage small business ventures, one solution is to amend current legislature to allow for more protection for start-ups. Without some form of protection, the creation of start-ups is inherently discouraged. In effect, Hong Kong will not benefit from the competition and innovation introduced by weaker voices in the industry.

4.7 Some Problems

While the Hong Kong government seems to be doing exceptionally well in the e-commerce race, responding well to industry needs, some weaknesses still exist within the system. In addition to needing more small business needs, Hong Kong also needs to address trademark and copyright issues that have emerged with the rise of the Internet age.

4.7.1 The Domain Name Game

Seeking to avoid the same cyber-squatting issues the United States and the UK are facing today, Hong Kong sought to enforce a very strict domain name registration scheme. Currently, if someone wants a .hk domain name, they must have a registered business. Furthermore, if that company already has one domain name, there must be an extremely good reason for the company to request another one. In most cases, that

request is denied. Also, no personal domain names are given out. Someone who simply wants a domain name to put up a family web page is out of luck.

Ng Nam, the director of the Joint University Computer Center (JUCC), which regulates the domain name game, states that "the rules are set in order to avoid people trying to grab names". (42) However, others argue that the strict rules create hardships for companies emerging in the Internet sector, and constrain commercial growth. Thus, the JUCC has come under an enormous amount of pressure to change the rules. The JtJCC itself is a small 15-person government committee, which will consider whether a more representative body should assign domain names, and speculate upon how domain name rules should be set in the future.

However, in the meantime, competition has started to appear. Most recently, a private company named SARNic has begun selling names under the .hk.com domain, which it owns. They have placed no limit on the amount of domain names a company can register. Also, Chinese-character URL's have appeared, administered by Hong Kong's HKNet and Singapore's 3rd Generation Network Centre. This system, called i-DNS, is obviously very attractive to businesses, many which are striving to obtain the Chinese equivalent of a popular domain name, such as toys.com or auction.com. If the JUCC does not loosen restrictions soon many predict that the .hk domain will simply become obsolete, and other domains will be used instead.

Furthermore, while these organizations are taking precautions to prevent cyber-squatting, no law currently exists to protect a company's name from being grabbed as someone else's domain name, as it does in the United States. To avoid cyber-squatting, companies such as HKNet do not allow the registration of major business names, government agencies, or famous people except those entities themselves. However, such policies are not full-proof, and a business cannot completely protect its trademark until the Hong Kong courts decide to resolve a domain name dispute. Hong Kong's domain registration authority, HKNIC, has a policy of putting domain names on hold if a trademark owner can prove prior use of the name. However, HKNIC has no statutory authority and its decisions have yet to be challenged in court.

4.7.2 Cyber-Piracy

With the rapid growth of the Internet, copyright infringement in the entertainment industry has grown to be one of Hong Kong's most problematic situations. Pirated music, a problem that has long invaded Hong Kong's commerce has emerged even stronger over the Internet. However, unlike the domain name problem, little can be done about such flagrant copyright infringement. As long as the public is content with cheap, pirated music, the industry I will flourish.

Therefore, much of the government's actions have involved educating the public about intellectual property rights. In fact, the Intellectual Property Department web page is filled with cartoons and pamphlets denouncing piracy from every perspective. Some cartoons attempt to build sympathy for the rock stars who are losing money from the infringements. Others depict I computer programmers laid off because software piracy

prevented the company from staying in business. Another tactic of the government is to instill pride in the consumer for buying non-pirated goods or counterfeit products, using the No Fakes Pledge. This pledge, introduced in November 1998, is conspicuously located on every e-commerce web page that promises no pirated goods or counterfeit products are sold on their page. In this way, consumers can identify those companies that can be trusted, and purchase the goods accordingly.

While the government is trying to educate the public, stressing the harmfulness of copyright violations, the Customs office is continuing to work hard to catch the criminals. However, copyright infringement has immersed itself deeply into the Hong Kong economy, and will take continue to be a serious problem until major initiatives are taken.

4.8 What's Next for Hong Kong

Although some problems are apparent in the Hong Kong economy, the Chinese territory is well on its way to becoming the e-commerce hub it strives to become. The government is beginning to take an active part in fulfilling Hong Kong's needs, and appears to complement the growing e-commerce industry well. However, despite the promising infrastructure Hong Kong exhibits, the IT battle has not yet been won.

First, Hong Kong must continue to increase intellectual property rights, to encourage innovation within the territory. The government should improve legislation such that the smaller companies have a better chance of survival among the large corporations. With encouragement through stronger patent laws, their presence will enrich the already competitive and innovative environment. Furthermore, a strong IP system would encourage outside businesses to register and own their intellectual property within Hong Kong. This way, Hong Kong could attract eagerly desired businesses to the territory to solidify their e-commerce lead.

Unfortunately, however, the courts seem either disinterested or afraid to address many of the intellectual property issues needed in today's fast-paced e-commerce society. Thus, much of the burden has been placed on the government itself, which has established numerous committees, such as the ITBB and JUCC, to resolve these matters. Whether from the courts, government, or industry, Hong Kong's economy clearly needs leadership in the area of software patentability, cyber-squatting, and other key Internet concerns.

Another major concern of the government is the need to attract outside workers and companies to the territory, to aid their race to dominate the IT industry. It has been stated before that a strong IP system would help attract businesses to Hong Kong. In addition, according to Felix Lee, Chairman of Armitage Computer Systems in Hong Kong, the territory needs to build "market intelligence" by attracting people from the US to Hong Kong. (43) To attract these knowledgeable and valuable people, he says, Hong Kong needs to give them free housing and tax benefits, because Hong Kong has "nothing else to attract them - the culture is bad for foreigners". With a similar viewpoint, the US Consul General Richard Boucher emphasizes Hong Kong's need to "address its high

costs and worsening physical environment". (44) According to Boucher, the high costs affect business and investment decisions, and reduce Hong Kong's competitiveness. Both workers and companies will compare Hong Kong's environment with the quality of life elsewhere, and will choose Hong Kong only if their needs can be met.

If these issues are addressed, Hong Kong is easily capable of becoming the dominant e-commerce player in Asia. Hong Kong already possesses a well-established infrastructure, where businesses have long enjoyed capitalism, fair markets, and the free flow of information. And today, Hong Kong is one of the leading finance and trading centers of the world. Furthermore, Hong Kong has one of the world's lowest and simplest tax regimes, with 16% tax on profits and no concessions, and recently has become closely associated with the world's largest emerging economy, China. Along with this solid foundation, the government is also becoming a leading user of IT and e-commerce itself. The government has helped stimulate the IT industry with numerous government projects, such as the Electronic Service Delivery initiative, setting up the public key infrastructure, and enacting the Electronic Transactions Bill. In addition with the industry's steady stream of innovation, and the continually improving intellectual property system, Hong Kong is quickly becoming an e-commerce environment that is irresistible to the public, workers, and overseas businesses.

5 Singapore (45)

5.1 Introduction

What is perhaps most interesting about the state of e-commerce and IP laws in Singapore is the vast influence the government has had on them. The country's burgeoning e-commerce industry and high Internet connectivity is in no small measure due to massive and aggressive government leadership and direction.

5.2 Overview

"The World Competitiveness report", published annually by *BERI* (Business I Environment Risk Intelligence), has consistently placed Singapore amongst world leaders in the exploitation of IT by companies, computer literacy of workers and telecommunications infrastructure. Singapore by no means appears to be behind in the Internet race.

The significance and role of Internet and e-commerce trends in Singapore can be largely attributed to the Government's strategic vision for the country as a whole. Limited natural resources have been the driving force behind a deliberate movement to make Internet usage a way of life. Large amounts of money have been invested in creating IT infrastructure and promoting an "IT-culture" amongst Singaporeans, young and old. Words like "technopreneur", "start-up" and "dot-com" are plastered all over the press, an obvious reflection of the national culture the government has in mind. (46) Singapore was one of the first countries in Asia to understand what the Internet and the innovative use of it could do for an economy.

5.3 History

Singapore is a small city-state of approximately 3.6 million people situated at the southern tip of the Malaysian Peninsula. It was part of the Malayan Federation from 1959 to 1963, after which it gained independence.

It did not take the new government long to realize that, unlike many of its South-East Asian neighbors, it had very few natural resources such as oil or rubber. Its only true resource was people and this spurred the government to develop a technologically advanced, knowledge-based, internationalized city. This is why there is such a huge emphasis placed on information technology.

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This focus has carried Singapore far over the last 3 decades of independence. Its rapid economic and social growth is disproportionate to its small size (approximately 646 sq km). Its port is the world's second busiest and its airport has been voted the world's best for the past 10 years. It is one of the world's major oil refining and distribution centers, a major supplier of electronic components (such as hard drives) and a major center for shipbuilding and repairing. It is also an important communications and financial center for Asia, with more than 140 banks.

Singapore's current vision is to be a global hub for IT, e-commerce, and high-value services (i.e. financial services). Unlike the situation in many other Asian countries, the government has played and continues to play a very active role in providing the impetus for IT and e-commerce growth.

5.4 Computerizing Singapore - the early efforts

Like most things the Singapore government endeavors to do, efforts and schemes to introduce a technologically driven way of life were methodical and top down.

The first concerted effort to "computerize" Singapore was made in the early 1980s with the impetus coming from the government. This was the "Civil Service Computerization" program. Its target groups were mainly government departments and its goals were to raise productivity and improve service. A secondary objective was to establish a core group of computer professionals within the government.

The National Computer Board (NCB) was established during this time as the National IT Authority. Its mission was to "drive Singapore to excel in the information age by exploiting IT extensively" to enhance its "economic competitiveness and quality of life". (47)

The second phase of this effort was born as the "National IT Plan". This took place primarily between the years of 1986 and 1990. The plan had two goals. The first was to "develop a strong export-oriented IT industry" and the second, to "improve business productivity through IT application". (48) The most obvious change in the effort was a shift in focus from the Public Sector to private enterprises. By the early 90s, Singapore had a thriving IT industry with an increasing number of indigenous IT firms exporting to the region. Perhaps the most notable of these was, and still is, *Creative Technologies Inc.*, which manufactures the world-famous "Soundblaster™". It was founded by a non-college-graduate, Sim Wong Hoo, who the government has spared no effort in making a national icon. Government funded research centers such as the Defense Science Organization were established and advanced technologies were developed for both industry and state-owned enterprises.

5.5 The Internet Age and IT2000

The current state of e-commerce in Singapore was probably most directly affected by a huge government scheme launched in 1992. It was called *IT2000 - A Vision of an Intelligent Island*, otherwise simply known as IT2000. This initiative was aimed at transforming Singapore into a place where the "use of IT was pervasive in every aspect of its society". (49) This meant every home, business and school being connected by a large nationwide network.

IT2000 was carefully planned and systematically implemented. There are 5 strategic thrusts to the IT2000 plan, which is still being implemented till this day.

5.5.1 Developing a Global Hub

Keeping in mind the earlier assertion that Singapore did not have her own natural resources, it is important that Singapore is tightly plugged into global networks. It is hoped that IT2000 will help turn Singapore into a highly efficient switching center for goods, services, capital, information and people, as well as a hub for business, services and transportation.

5.5.2 Improving the Quality of Life

A major challenge of IT2000 is to use IT to make the availability and transfer of information more efficient via the Internet. The most prominent manifestation of this would be the great increase in the usage of online transactions and email accounts. There is also a drive to equip every two students in schools with one computer by the year 2000 and to give grants to teachers to purchase their own computer.

5.5.3 Boosting the Economic Engine

As the processing of information becomes a critical performance factor in many industries, the innovative use of IT can aid Singapore in developing high-value secondary and tertiary industries in conjunction with lower-cost primary industries in the region.

5.5.4 Linking Communities Locally and Globally

The idea behind this thrust is keeping communities close and efficiently linked. This concept calls for a "community telecomputing network to support civic and social networking" at the local community level. Planners hope that the island's IT infrastructure will allow people to maintain close links with each other for business or social purposes. It is also a way of making information regarding events of common interest readily available to everyone in the community. It also serves as a portal through which Singaporeans can be part of a larger worldwide online community, and through which overseas Singaporeans can keep in touch with the latest happenings at home.

5.5.5. Enhancing the potential of Individuals

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The main qualities of interest here are learning and creativity. These are deemed to be essential elements of an intelligent island. Given today's rapidly changing workplace, many people have to be re-trained over many times in their working lives. The new IT infrastructure will enable them to do it at their own pace and in accordance with their own schedules as it allows them to choose the time and place of instruction. Students and others alike will be able to partake in distance-learning programs at home (at least 2 premier high schools have already experimented with this idea), eliminating the need to travel distances to learn. Computer-based learning will be enhanced by a variety of instructional media such as animation, sound, video etc. IT will also enhance the

capabilities of the physically handicapped - For example, it allows deaf people to "talk" via video conferencing.

All the above visions, while ambitious, are only a small part of the efforts the government has undertaken to promote a technologically oriented society. There have been and still are a large number of legal, social and economic measures to obtain its goal.

A new Science Park has been built in Buona Vista in the western part of the country where intensive work is being carried out to develop the countrywide network. In addition Singapore has developed a USD \$1 billion fund to help companies set up shop in Singapore and "develop its own brand of e-commerce companies". (50) It has also encouraged these local firms to tie-up with US companies to advance their global presence. This is well in line with the objective of being a technology hub.

5.6 E-Commerce today in Singapore

The field of e-commerce has greatly benefited from the drive to promote Internet awareness and usage over the last decade or so. It is basically defined as the buying or selling of goods and services over the Internet. The convenience and efficiency it brings to the home or office is well known. It eliminates the need for intercontinental travel to do business and has made many transactions a lot easier to carry out. A bustling e-commerce scene fits in nicely with and is crucial to Singapore's vision of an intelligent, Internet-savvy island. The government has spent a great deal of effort in the development of this area.

5.7 E-commerce Promotion efforts

In 1996, as part of IT2000, the NCB launched *the Electronic Commerce Hotbed* (ECH) (51) to jump-start the pervasive use of e-commerce and position Singapore as a global e-commerce hub. The ECH is a well laid out, trendy-looking government website highlighting e-commerce applications, training policies, opportunities, funding and trends. This is mainly directed at encouraging Singaporeans to engage in e-commerce activities. Parties looking to start ecommerce outfits or who are simply looking to harness the benefits of e-commerce in conjunction with another business will find this site particularly useful. The most recent update contains information about a S\$9 million fund aimed at giving budding e-commerce entrepreneurs a financial kick-start. This is basically government-funded Venture Capital!

The ECH also contains a good amount of promotional material intended to attract foreign parties. Link headings include phrases like, "*The strengths that make Singapore and ideal center of international e-commerce activity*" and "*Find out why MNCs* (52) *choose Singapore as their regional EC HQ*". (53)

Just as the government had five strategic themes for implementing IT2000, it also has a plan for promoting e-commerce. This was announced at the opening of COMDEX/ASIA in 1998. The "Electronic-Commerce Masterplan" (ECM) has the following aim:

" ... [The target is] to have S\$4 billion worth of products and services transacted electronically through Singapore, and 50% of businesses to use some form of e-commerce by the year 2003."

And just as IT2000 had 5 strategic thrusts, it comes to no surprise that the government has thought of 5 themes for ECP too. These are:

1. Develop an internationally linked e-commerce infrastructure
2. Jump-start Singapore as an e-commerce hub
3. Encourage businesses to use e-commerce strategically
4. Promote the usage of e-commerce by the public and businesses
5. Harmonize cross-border e-commerce laws and policies.

These thrusts sound very similar to the ones listed under the IT2000 plan. It is evident that the underlying themes of globalization, international linkage, awareness and infrastructure development are foremost on policymakers' minds once again.

This 5-pronged e-commerce strategy has been and is currently being put into operation by a whole host of social, legal and financial programs and projects. These are listed explicitly on the ECH webpage. (54) The ideas they follow are not unfamiliar to us. They focus on the same themes that were thought of during the IT2000 days. There is a lot of emphasis on infrastructure development and grooming promising individuals by training and giving them substantial financial assistance. It is also explicitly stated that "The mass media would be used to create awareness" and talks about mass-educating the public using hands-on training. (55) It almost sounds like some sort of compulsory training for the employees of a company! (56)

5.8 Legal infrastructure developments

Perhaps one of the more interesting areas of development thus far is the legal arena. Many people tend to view laws as not adapting fast enough to suit cyberspace, which is a lot more dynamic than the physical world. Singapore, viewed by many to be an authoritarian technocracy where the sale of chewing gum is prohibited, however, seems to be taking a very flexible approach to legal issues. It recognizes that pro-business and relevant laws and regulations are needed for the growth of e-commerce and there is an effort to "develop and periodically review legislation to make Singapore a 'trusted node' for EC (57), with a transparent and predictable environment". (58)

An Electronic Commerce Policy Committee was formed in early 1997 to ensure that the legal environment was conducive to e-commerce development. Some of the key decisions made were:

1. The Amendment of Evidence Act which allowed the use of electronic records as evidence in courts
2. Stiffer penalties on hackers. The penalty of committing such a crime could be jail of up to two years or a fine of US\$60,000

3. The introduction of the Electronic Transactions Act (ETA) in 1998. (59)

The latter was probably the most remarkable. This act made Singapore the first country in South-East Asia to formally define the legal setting for all parties involved in e-commerce. This is interesting as it comes from a country that has a "long-standing determination to control closely the information its citizens receive". (60) Flexibility is not usually a word that comes to mind when many think of the Singaporean Government.

However, the latter's flexibility and foresight are clearly illustrated in this paragraph on the ECH site. (61)

"The advent of e-commerce and the use of the digital medium as an alternative to the physical, have created some novel legal issues where there are no clear answers. In the physical world today, there are requirements for documents to be in writing and for handwritten signatures. Such requirements need to be translated into the electronic realm. For communication and transactions occurring over a faceless network, there is a need for reliable methods to authenticate a person's identity and to ensure the integrity of the electronically transmitted documents. The Electronic Transactions Act aims to address these important issues and to create the legal framework for e-commerce transactions in Singapore."

In describing the underlying guidelines in the enunciation of the Act itself, the ECH goes on to emphasize the need to avoid over-regulation and the "need to be flexible and technologically neutral to adapt quickly to a fluid global environment". (6z) In conclusion, it once again re-iterates its vision of being an "e-commerce hub". The government is obviously committed to implementing a good e-commerce framework for the country.

5.9 The Role of IP in the Grand Strategy

Along with the Internet and e-commerce comes the advent of the "tech-startup". A startup by definition is simply "a business or an undertaking that has recently begun operation". (63) . Its literal definition has no relation whatsoever to the Internet or any of the issues we have been discussing. However, because the Internet has given rise to such a huge number of business and product ideas (online shopping, network solutions, online trading etc.), the term "hi-tech startup" came into being. These days when someone mentions the word "startup", it is usually with reference to a venture that is technology (and largely Internet)-driven.

With the influx of startups and their ideas, the issue of Intellectual Property (IP) laws becomes significant. What kind of protection does one get for his ideas? Are Internet-based startups (64) subject to the same laws and regulations as other non-technology-driven endeavors? Technically IP laws are a means of protecting inventors' rights and encouraging people to innovate and bring these innovations into the public eye.

This is the case in Singapore - Their IP laws are very similar to those of America's (protection period, filing period, eligibility for protection etc.) but the attention placed on IP, interestingly, has increased enormously in recent years. The Government re-organized the Patents and Trademarks Office in 1999 and named it the Intellectual Property Office of Singapore (IPOS). IPOS now functions as the "national resource center and regulatory authority for Intellectual Property". Once again, the motivation behind this is the government's decade-long grand vision of an *Intelligent Island*. It states explicitly on the IPOS website:

"Intellectual Properties (IP) are fast becoming the key asset in today's technology driven knowledge-based economy. In order to reap the full benefits, proper IP management is necessary".

Quite apart from management, the government emphasizes promotion of IP culture too. To build up Singapore's IP framework, a number of initiatives have been identified. The IPOS for example, quite separated from processing applications, also serves as a "driver agency and coordinator of IP education and awareness programs". Plans to make application for IP rights easier are also well underway. The Patent Application Fund is currently being re-structured to provide better early-stage support. The government has even formalized training for its employees in fields such as "technology valuation, investment analysis, patent drafting, IP management, and TMI (65) capability development", (66) all with the basic tactical aim of creating the "next generation of technology savvy businessmen, inventors and innovators", according to a recent IPOS press release. (67) The strategic aim, of course comes to no surprise: to maintain Singapore's competitive edge in the new economy.

Thus, e-commerce in Singapore is not just an end in itself, it is the means to achieving a greater cause.

5.10 Progress and Problems

So given all the talk and excitement surrounding these grand plans the government has in place, just how successful has Singapore been in its promotional efforts? Some of the schemes certainly sound ambitious. Plans such as training large numbers of people, running a high-tech assistance fund and constructing an island-wide network require a lot of time, manpower and money. Is Singapore for real or is it all just rhetoric?

Many have given Singapore the thumbs up. As Choo points out, "Singapore has become one of the most highly computerized nations in the world, with a burgeoning IT industry and a track record of sophisticated, sometimes world-beating IT applications in business and government". (68)

Choo cites many more instances of praise in his paper. He first quotes Sisoida (1992) in an article for the Harvard business review, describing Singapore's "astonishing economic and technological achievement" as a nation-corporation can claim "what is already perhaps the most technologically advanced environment in the world". (69) He

also highlights a comment made by Davis and Davidson (1991) that asserts that Singapore is a nation "poised for success" in the "global information economy". They go on to say that "its position is built on a sophisticated information infrastructure that provides low cost, high quality, advanced information services". (70)

Nevertheless, there are still a substantial number of skeptics who point out that the government faces considerable problems materializing its grand strategy. Although various steps have been taken to make it easier to start an e-commerce company, the entry costs are still exorbitant. Labor, although highly skilled, comes at a relatively high price and real estate prices are one of the highest in the region. Although Singapore has a cheap network, the large amount of capital needed to start a business can also be quite daunting.

Then there is the question of inherent conflict between wanting to be the center of the most advanced information technology and tightly controlling the free flow of information. While private industry in other countries such as Hong Kong is much less regulated and bustling, it ironically seems that strong government participation has taken Singapore quite far. There are issues raised about how a "centralized, bureaucratic economic structure is antithetical to the qualities of innovation and risk-taking." (71)

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The government, instead of defending itself with as much aggression as it has put into promotion, is actually making an effort to change the mindset of the people. Risk-aversion is increasingly discouraged (72), within calculated reason of course, and articles in the Daily press frequently feature local entrepreneurs (such as Sim Wong Hoo of *Creative Technologies*) that made it big. On the other hand, it also feels that innovation specifically in technology, quite contrary to popular belief, can run parallel to a conservative socio-political situation where information is still regulated. (73)

5.11 Conclusion

The main outcome of this discussion is the enormous effort put into not just developing and promoting e-commerce as a viable venture, but encouraging general Internet usage and exploitation as well. No other country in Asia has made it as much of a national priority as Singapore has. From the media to law, from education to monetary incentives, it certainly seems that Singapore has "a nice program in place to aid future growth". (74) Whether or not it will achieve its ultimate goal of being an intelligent island is anyone's guess but it certainly is on its way. The feel one gets from working for the government is a restlessness to change, and to adapt to meet the technological challenges that Singapore will face in the new millennium. (75)

6 Overall Conclusion

All the countries discussed are using different strategies to enforce regulations and IP i laws to protect and ensure the growth of e-commerce. Japan is modeling theirs after those of the United States by minimizing government regulations and encouraging self-regulation in the private sector through codes of conduct. China has instituted more regulations by setting up stricter rules on e-commerce, so that the government has a

firm control over all developments and infractions. In Hong Kong, the government is helping the IT industry by enacting the Electronic Transactions Bill, reinforcing new rules on e-commerce digital certificates and building up public key infrastructure. Singapore's government has been playing an active role in pushing Internet technology forward by establishing different organizations to support the development.

As the Internet becomes more important with every passing day, governments are trying their best to promote the growth of e-commerce within their economy. Can one country stand out above all others? Presently, it seems that Japan is the leader in e-commerce in Asia because of its current e-commerce performance. As stated before, Japan maintains 10-20% of the world's Internet market, the most active Asian country in e-commerce. However, the government's ultraconservative and extremely cautious beliefs may be detrimental to its Internet leadership. Can the "New Japan" overcome the "Old Japan?"

As Japan is recovering from its recent economic slow-down, China has been undergoing rapid economic growth. The possibility of joining the WTO, the rapid development of Internet infrastructure, and the newly introduced foreign investments in the Chinese Internet market can speed up the e-commerce development even further. However, as a communist country, the strict controls on the e-companies may overpower China's advantages, in conjunction with their still underdeveloped economy. These can prove to be big stumbling blocks.

Hong Kong, on the other hand, has the advantage of being a large international trade center and having well developed infrastructures. Piracy problems continue to haunt Hong Kong though. To fight piracy, the government needs to intervene more in the IT industry by instituting more effective IP laws. Singapore has these effective laws and its government regulations have proven to be extremely successful in promoting an extremely profitable IT industry that still protects an individual's intellectual property rights. The government is spending a large amount of money on promoting "technopreneurs," "start-ups," and "dot-coms." Even though the government is backing up the e-commerce one hundred percent, much legal, social, and economic actions still need to be taken before it can become the e-commerce center of Asia.

As our in-depth analyses have shown, all four of these countries have the potential of becoming the next Asian Internet superpower, but the realization of this potential depends on which of them can overcome their weak points first. The battle is on. Who is going to be the Internet superpower in Asia? In a few years we shall all see.

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