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# The Internet and E-Commerce in Greater South China (Taiwan, Hong Kong, Fujian, and Guangdong)

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## 1. Introduction

Greater South China is one of the most economically dynamic regions of the world and one that has significant potential for integrating the Internet in ways that will revolutionize production and distribution. Greater South China includes the Republic of China (Taiwan), Hong Kong, and China's southern provinces of Guangdong and Fujian. It is useful to analyze Internet diffusion in these four neighboring geographic entities, which are bound together by major economic and cultural ties. Though all four share a Chinese heritage, their similarities diverge in terms of public policies, degree of interaction with the West, and economic capacity. For each of these entities, these similarities and differences help determine the characteristics and the potential of the Internet. The Internet, in turn, has the potential to change the character of each economy and the South China economic network that links them together, tying them into the global marketplace.

The only way to grasp the unique characteristics of the Greater South China Internet is to look individually at Internet diffusion in the two provinces: the Special Administered Region (SAR) and the Republic. Given the fact that the Internet allows people to communicate in many ways, there is no one indicator that adequately represents the Internet capacity of a nation or province. This study uses a framework that describes the state of the Internet diffusion in a nation in terms of six dimensions: pervasiveness, geographic dispersion, sectoral absorption, connectivity infrastructure,

organizational infrastructure, and sophistication of use. This framework was first presented in *The Global Diffusion of the Internet Project: An Initial Inductive Study in 1997-1998*.<sup>[1]</sup> Variants of this framework have been applied to over 36 countries. This study represents the first attempt to apply the framework at the subnational level.

## 2. Hong Kong

Currently, Hong Kong plays a pivotal role as the central intermediary between China and the West, and to some extent between Taiwan and the south China provinces. It remains to be seen whether the business intermediary role Hong Kong plays will become less important as the Internet enables China's provinces to participate directly in the global economy. The Internet in Hong Kong is booming (see table 1). The Internet access business is highly competitive, with more than 100 providers and at least 10 viable ones. Broadband access is less competitive with Asynchronous Digital Subscriber Loop (ADSL) access available only through Hong Kong Telecom IMS and cable access stifled. The city is trying through its "Digital 21" policy initiative, its citywide broadband implementation, and the new Cyberport to lead Hong Kong into the information age. Hong Kong's status as a SAR of the People's Republic of China (PRC) both raises questions about its long-term stability and opens opportunities for providing the leadership necessary to integrate China fully into the global economy.

Over 90 percent of Hong Kong's businesses are small businesses. Almost all are family owned. Although there used to be a significant amount of manufacturing in Hong Kong, most manufacturing is now done in neighboring Guangdong province or throughout Asia because of space and cost considerations. Hong Kong businesses are masters at building highly flexible supply networks that allow them to produce goods better, faster, and cheaper than anyone else in the world. Though information technology such as the phone, fax, and e-mail are indispensable to these networks, many Hong Kong businesses have been slow to invest in more advanced technologies, such as EDI and ERP.

**Table 1: Dimensions of Internet diffusion in Hong Kong**

Dimension	Level	Explanation
Pervasiveness	(4) Pervasive	With the number of dial-up Internet accounts more than 1 in 10, the number of users approaches 2 in 10. There are 98,183 hosts in the '.HK' top-level domain.
Geographic dispersion	(4) SAR-wide	Internet access is available throughout the SAR. ISDN access is available in most places.
Organizational infrastructure	(3) Competitive	It is a difficult call as to whether to place Hong Kong at the competitive or the robust level. With 133 licensed ISPs, Internet market is competitive, though HK Telecom is the dominant force. HK Telecom's monopoly over international circuits is being opened.
Connectivity infrastructure	(3)	SAR's backbone consists of T3 connections to the HKIX. International connectivity does not rank at level 4. ADSL is just getting rolled out.
Sectoral absorption	(4) Widely used	Internet use is strong in all sectors, with universities and the public sector leading the way.
Sophistication of use	(3) Transforming	Hong Kong's leaders are committed to transforming the economy through the Internet. The SME community has been slow to invest in inter-Enterprise information technology.

## 2.1 Determinants of Internet diffusion in Hong Kong

Unlike its parent neighbor China, Hong Kong has a far more transparent government and a history of open competition with low taxes or fees on commerce. In the hope of building on Hong Kong's present position as a trade and finance hub for Asia, Hong Kong's leaders are trying to lay the groundwork for Hong Kong to become a next generation E-Commerce hub.

The Information Technology and Broadcasting Bureau (ITBB) in conjunction with the Information Infrastructure Advisory Committee (IIAC) has formed a package of initiatives called *Digital 21* to position Hong Kong as the leader in the digital world of tomorrow. K. C. Kwong, secretary for ITBB, stated, "We have set out our vision, initiatives and targets of how Government, business, industry and the academia can work together to make Hong Kong a leading digital city in a globally connected world." The proposals include strategies for using a series of top-down initiatives to spur informatization while encouraging market forces to drive bottom-up development. The other major government body that has a major impact on the Internet in Hong Kong is the Office of the Telecommunications Authority (OFTA). OFTA, established in 1993, is responsible for regulating the rapidly developing and increasingly competitive telecommunications industry in Hong Kong.

As Muller points out, the Hong Kong government's tradition of licensing technology has not only become more complicated with digital convergence, but this practice hinders the development of digital media. One area where these complications have arisen is in the provision of Internet services through cable modems. Even though there are four companies licensed to provide fixed line services, these very same licenses have stifled competition for broadband services. In 1992 Wharf Cable, for example, received a license to offer cable services but was restricted from offering cable modems in order to protect the interests of the other fixed line license holders. Video On Demand (VOD) also created a quandary when Hong Kong Telecom conducted VOD trials in 1995, because it impinged on the benefits that Wharf argued it had purchased with its cable license. Currently ISPs need PNET licenses, which require them to pay HK\$0.042 per minute for each call they terminate. They have not been required, as Muller feared, to purchase a new license for each service they offer. However, except for IMS, ISPs do not have competitive access to broadband services. OFTA faces challenges in opening up the broadband market to competition without strangling it through a licensing regime.

The Cyberport, a private public venture masterminded by Richard Li of the Pacific Century Group, has caught the imagination of Hong Kong as a strategy for helping Hong Kong leverage its capabilities as a transportation and financial center into becoming a center for the development of cyberspace. The Cyberport's goal is to provide the office and residential space for high tech ventures and their employees, creating a synergistic environment. The government has provided one of the last undeveloped parcels of land on the Hong Kong island for the Cyberport in return for a share in the venture. Major high tech companies such as IBM have expressed an interest in relocating to the Cyberport. Though some have dismissed the venture as primarily a property deal, there are others who believe that the Cyberport will stimulate the development of a new generation of electronic intermediaries in Hong Kong. For almost any global business there are logistical and operational reasons for having an Asian electronic "hub." The question is whether that hub should be in Tokyo, Sydney, or Singapore or in one of the new emerging centers, such as Malaysia's Multimedia Super Corridor or Shanghai's Pudong District. With its redundant broadband infrastructure connected to key exchange points on the planet, the Cyberport will be an attractive, if expensive, center for running servers to support electronic services. The Cyberport will provide a relatively easy way for westerners to live and work in Asia and will give them and their Asian coworkers a sense of space not always found in crowded Hong Kong.

With low barriers to entry and free competition, the Ex-British-based economy is poised to be one of the leaders in Asia in terms of investment in information technology. The lack of government barriers encourages innovation. This environment has created the prosperity to support this investment and has attracted capital from around the world.

Hong Kong is a leader in telecommunications with a strong market infrastructure. With 56 lines per 100 people, Hong Kong has the highest teledensity in Asia, except for Japan. All exchanges are

digital. It is second to Japan worldwide in its rate of use of fax (8.7 fax lines per 100 telephones). It has the world's highest density of pagers, with one out of every six people carrying one in 1996. The percentage has decreased with the incredible popularity of mobile phones. Currently 3.358 million people have cellular phones, one of the highest densities in the world, with that number still growing by 46 percent a year. The volume of international calls, which had been rising steadily for years, dropped in 1998 by .047 percent. It is a tough call whether this is a result of the substitution of e-mail for phone calls or a reflection of Hong Kong and Asia's economic downturn.

With strong ties to its British heritage, Hong Kong is a bilingual (English and Chinese) society. English can be used to communicate digitally to most of the world. Conversing with neighboring communities in Chinese can bridge the language gap between China and the rest of the world. Hong Kong's openness to foreigners and different cultures allows the merging of the best of both technologies and knowledge.

Hong Kong is the major intermediary between Taiwan and the Mainland in terms of trade and investment. No direct trade or other direct forms of commercial or official contact have been allowed between Taiwan and the Mainland since the Communist victory in 1949. Though Taipei allowed the resumption of direct trade in the 1980s, no direct shipping is allowed. Over 3,000 Taiwan-controlled companies operate in Hong Kong, and an estimated 50,000 Taiwan nationals work in Hong Kong. These companies account for the bulk of the estimated U.S.\$25 billion that Taiwan invests in mainland China and are the principal conduit for U.S.\$20 billion in trade. As Taiwan integrates Internet-enabled inter-enterprise information technology, the technology may diffuse through some of these companies to Hong Kong firms.

### 3. Guangdong

Guangdong has the highest number of Internet users of any province in China (see table 2). Though only 6 percent of China's population resides in Guangdong, a recent CNNIC study reported that 11.7 percent of users surveyed in its national Internet study came from Guangdong. The popularity of the Internet in Guangdong, relative to the rest of the country, may be explained by a number of factors, including the economic prosperity of the province, the high number of emigrants, and the proximity of Hong Kong. China Telecom's Guangdong Data Communications Bureau (GDCB) dominates the commercial Internet market, providing more than 90 percent of the users. Through its ChinaNET "163" Network and Multimedia "169" Network services, China Telecom provides dial-up Internet access throughout the province at rates that are distance insensitive. The GDCB is building out its ATM network and is aggressively promoting electronic commerce. It developed its own certificate authority but has been forbidden to use it by central authorities pending decisions by the People's Bank and other organizations on a national strategy.

**Table 2: Internet dimensions for Guangdong**

Dimension	Level	Explanation
Pervasiveness	(3) Common	1.11 users for every 100 people.
Geographic dispersion	(4) Provincewide	"163" and "169" networks available in 23 cities. There is no distance charge from rural areas.
Organizational infrastructure	(2) Controlled	China Telecom is the primary provider of Internet access and controls international circuits. There are many Internet content providers, some of whom provide access. Golden Bridge network and CERNET provide commercial and educational access.
Connectivity infrastructure	(3)	ATM backbone is being constructed. Supports Frame Relay and IP. There is an Internet Exchange and connectivity to Hong Kong and the world.

Sectoral absorption	(2) Moderate	Internet leased line connectivity is available in most universities but not secondary schools. State Information Office runs Web site that provides access to information from various sections of the government.
Sophistication of use	(2) Conventional	Internet is primarily being used as a substitute for voice and fax. E-mail is very popular. There are some top-down efforts to change business processes, such as the Golden Projects.

### 3.1 Determinants

The dimensions of Internet diffusion in Guangdong are created through the interaction of governmental (top-down) policies with the dynamism that has been created by economic opportunity.

The government is an integral part of technology development. As Lovelock points out, the development of the Internet and e-commerce in China is primarily a top-down effort on the part of the Chinese government because it believes that not only will the Internet boost the economy, but it will greatly enhance the central government's ability to control the country's economy.<sup>[2]</sup> In the interests of productivity, the government wants to decentralize decision making to the provinces and the markets, but wants to make sure that it is able to keep track of those decisions. Informatization, the process of introducing information technology into the society, has long been seen as a tool for improving the efficiency of the Central Government.

China Telecom is committed to building a nationwide Internet Protocol (IP) backbone and rolling out both the "163" ChinaNET and the "169" Multimedia Network. Though China Telecom continues to lose money on its IP services, it makes it up in the per-minute local telephone charges for accessing the networks. China Telecom, as a matter of both national and organizational interest, is plowing the huge cash flow generated by Internet services back into the network.

China Telecom's provincial arm, the GDCB, is taking the initiative in rolling out a provincial ATM backbone and developing new value added-services such as IP-telephone and electronic commerce. In the interests of providing the tools to support e-commerce, the GDCB developed its own certificate authority for authenticating servers well ahead of the development of national policy. In the case of the certificate authority, the People's Bank has put a hold on its rollout by the GDCB.

The central government's investment in a nationwide education network (CERNET) has given almost all university students exposure to the Internet and has been one of the most effective ways through which the government has pushed Internet diffusion.

Though the provincial government has easily adopted information technology, Guangdong's rapid absorption of the Internet relative to the other provinces can primarily be attributed to its economic growth as a result of the open door policy. In 1979, the State Council gave Guangdong permission to implement special economic policies. As a result, three cities from Guangdong -- Shenzhen, Zhuhai, and Shantou -- were designed as special economic zones. In 1988, the central government allowed Guangdong to experiment with economic reform province-wide. Guangdong has developed into an export-oriented economy and is regarded as China's frontier to the outside world. The relative prosperity of the province has allowed people to purchase Internet services. In addition, the Internet represents a significant opportunity for time and cost savings for those individuals and companies involved in international trade and, through the Web, opens up access to highly valuable information.

Guangdong's open door policy and the resulting economic boom have attracted entrepreneurial and technical talent from throughout China. Guangdong and its private companies are often the destination for the cream of China's youth who fail to land positions in Beijing and Shanghai. Many of these migrants have an aptitude for technology and have been early adopters of the Internet. In addition to attracting risk takers from throughout China, Cantonese culture has traditionally been



commerce friendly and has been a fertile ground for entrepreneurial Internet companies. Over 20 million people have emigrated out of Guangdong to Hong Kong and other countries. These overseas Chinese still have connections and influence with their family and friends who remained in Guangdong. E-mail is being extensively used to support those connections.

Multinational companies have been attracted to Guangdong as a gateway for both manufacturing and selling in China. The Institute for the Future recognizes Shenzhen as a key node in the Global Silicon Network.[3] As part of doing business with these high-tech multinational firms, Guangdong's businesses are exposed to the latest in information technology and are sometimes required to implement it as part of their trading agreements. Multinational companies also see Guangdong as a major market for their technologies and a gateway into the rest of China.

## 4. Republic of China (Taiwan)

The island of Taiwan has a significantly higher number of hosts per capita than Hong Kong (see table 3). There are other indications that though both governments are aggressively promoting information technology, e-commerce is being more rapidly adopted in Taiwan. One major difference from Hong Kong is that Taiwan has a vibrant manufacturing sector. The leadership of the electronic manufacturing industry, in particular, has actively embraced information technology, including recently the use of enterprise resource planning (ERP) software. The multinational corporations (MNCs) have driven some of this acceptance. Intel, for example, takes 80 percent of its orders in Taiwan from distributors placing orders through a Web-based system. The use of Web-based ordering, however, is not yet pervasive among Taiwanese distributors taking orders from end-user manufacturers.

**Table 3: Dimensions of Internet diffusion in Taiwan**

Dimension	Level	Explanation
Pervasiveness	(4) Pervasive	1.6 Internet users per hundred population. 676,623 hosts in either '.TW' or 'HINET.NET' domains.
Geographic dispersion	(4) Nationwide	No premium for accessing Internet from remote areas.
Organizational infrastructure	(3) Competitive	The three government-related ISPs dominate industry.
Connectivity infrastructure	(3)	Chuangua operates a 155 Mbs nationwide ATM backbone. There are 301.34 Mbs of international IP bandwidth. ADSL and Cable modems are being rolled out this year.
Sectoral diffusion	(3) Common	Sectoral dispersion is evolving towards the widely used level. Internet access is being rolled out to all classrooms and is available in all universities.
Sophistication of use	(3) Transforming	Being driven by their multinational partners, electronic companies are reworking business processes to leverage the Internet.

### 4.1 Determinants

The government has sought to drive information technology through the National Information Infrastructure (NII) project, a supra-ministry endeavor that has been able to drive investment and decision making through many different ministries. The NII Steering Committee facilitates NII development through deregulating telecommunications and improving related laws. It also aims to expedite network construction through the development of network exchanges, broadband networks,

and interconnection of the telecommunication and CATV networks. It aims to integrate computer and network education into all academic levels. The government is committed to extending the application of information technology, developing net-related industries, and enhancing research and development.

The information hardware industry in Taiwan reached U.S.\$30.4 billion in 1997. Taipei is a node in what the Institute of the Future calls the Global Silicon Network. Because many managers in this industry were educated in America or worked in Silicon Valley, these Taiwanese firms have strong investment ties with electronics firms in the United States and around the world. They are aware of the latest developments in hardware manufacturing, including the use of information technology to reengineer business processes. Not surprisingly, it is the information hardware manufacturing industry that is making the most sophisticated use of the Internet in Taiwan.

There is a significant amount of domestic content in Chinese in Taiwan. There are a relatively large number of hosts so many organizations are gotten on the Web. This in turn increases pervasiveness as users go on-line to access the Web.

Because of Taiwan's ties to the Global Silicon Network, many Taiwanese have been exposed to the West. They have studied English in school and can utilize the English resources of the Web.

There is a desire on the part of Chunghwa, the national government, and even some businesses to make Taiwan a hub of the Internet. Some degree of national pride is involved, finding expression in the deployment of international IP circuits both to the United States and to other regional counties.

## 5. Fujian

Taiwanese businesses have invested heavily in manufacturing facilities in Fujian, the province that lies across the narrow Taiwanese straits. Common linguistic ties have allowed Taiwanese business in Fujian to build relationships with business and local government leaders. This has overcome many of the bureaucratic and logistical obstacles to doing business in China. Fujian's leadership, in the interests of supporting business development, is now creating an advanced communication infrastructure. In building a state-of-the-art ATM network, they are leapfrogging the existing X.25 network that presently connects the province (see table 4).

**Table 4: Internet dimensions of Fujian**

Dimension	Level	Explanation
Pervasiveness	(2) Established	More than one user per thousand population.
Geographical dispersion	(2) Moderately dispersed	X.25 is available throughout the province. New ATM network will have nodes in nine cities.
Organizational infrastructure	(2) Controlled	Fujian Telecom dominates Internet access market and international connectivity.
Connectivity infrastructure	(2)	Level will soon rise as Fujian Telecom is upgrading X.25 network to ATM network..
Sectoral dispersion	(2) Moderate	Internet is most integrated in research and academic communities.
Sophistication of use	(2) Conventional	Internet is being .

### 5.1 Determinants of Internet diffusion of Fujian

The provincial government plays a similar role in Fujian as it does in Guangdong. China Telecom acts at the provincial level through the Fujian Post and Telecommunication Administration and at the city level through city bureaus. As noted earlier, the Fujian Post and Telecommunication Administration has chosen to implement a province-wide ATM network and is using DWDM over optical fiber.

The booming export-oriented companies are both investing in the Internet themselves and are paying their employees the type of wages with which they can purchase a computer and Internet connectivity for themselves or their family or both. The economy, also in turn, allows the provincial and city branches of China Telecom to invest in connectivity and information infrastructure.

There are over 8 million overseas Chinese of Fujian origin. Many reside in Southeast Asia in countries such as Malaysia and have done very well, some extraordinarily so. There are over 800,000 Chinese of Fujian origin in Hong Kong and Maccao. Eighty percent of the residents of Taiwan have ancestors who come from Fujian. These overseas Chinese, however, have been willing to invest in their homeland. Though there is no evidence that Fujian's state-of-the-art communication network is being financed by overseas Chinese, it can be assumed that it is being built under the "build it and they will come" assumption. If a state-of-the-art network is deployed around the province, the businesses will spring up to use it. Fujian's leaders want to build a strong economic power like Guangdong, so the provincial government and the provincial arm of China Telecom are investing a lot of money to provide state-of-the-art communications infrastructure throughout the province based on DWDM, SDH, and ATM.

As with Guangdong, the central government sees information technology as an essential tool for keeping track of the Fujian government and its export-oriented businesses. The Fujian provincial government is responsible for tax collection and managing relationships with the many Taiwanese businesses that have invested in manufacturing facilities in Fujian. As Taiwan integrates more and more information technology into its manufacturing facilities in Taiwan, Taiwanese investors in Fujian will have to choose between the payoff of closer inter-enterprise integration through information technology and the risks that enterprise information systems, which enable that integration, could be used by the central government to collect more taxes and limit undocumented trade.

## 6. Conclusion

Hong Kong and Taiwan have significantly higher diffusion ratings than Guangdong and Fujian for all six dimensions. This is to be expected given the higher per capita GDP of Hong Kong and Taiwan and their higher degree of integration with the West (see table 5).

**Table 5: Comparison of Guangdong, Fujian, Hong Kong, and Taiwan**

	Popula- tion (in millions)	GDP per capita	Internet users per capita	Level of...					
				Perva- sive- ness	Geo- graphic dispersion	Sectoral absorption	Connectivity infra- structure	Organiza- tional infra- structure	Soph. of use
Guang- dong	71.43	\$U.S. 01,342	01.12%	3	4	2	3	2	2
Fujian	32.39	\$U.S. 01,254	00.46% est.	2	2	2	2	2	2
Hong Kong	06.71	\$U.S. 26,800	22.36%	4	4	4	3	3	3
Taiwan	21.90	\$U.S. 14,200	13.67%	4	4	3	3	3	3



Guangdong is ahead of Fujian because it was the first province in China to build a province-wide IP network. Fujian relied on its X.25 network longer. Now both are moving to provincial ATM backbones, which will quickly move them into Level 3 for connectivity infrastructure and for Fujian into a possible Level 4 for geographic dispersion. Fujian and Guangdong continue to use the Internet as a substitute for conventional communications and have yet to begin to substantially reengineer business processes to leverage it.

Hong Kong has a significantly higher number of users per capita than Taiwan, in keeping with its status as one of the most wired nations in the world. There has been more real competition in Hong Kong's ISP market than there has been in Taiwan. Hong Kong is further ahead of Taiwan in terms of opening up international links to competition. Also, the different sectors of Hong Kong are slightly ahead of Taiwan in terms of hooking up organizations, but not by much. Taiwan does have more hosts (424,209) under its top-level domain than does Hong Kong (98,183). Though this difference may at first be dismissed based on the popularity of registering under the ".com" domain, it may point to significantly greater interest in Taiwan on the part of SME's of having a Web presence.

Both Hong Kong and Taiwan are behind Singapore in the rollout of broadband services. Regulatory and political problems have delayed the introduction of cable modems in Hong Kong. The choice to deploy one-directional modems in Taiwan, though a short-term technical solution, may not be so popular in the long run. Hong Kong will have a real challenge making the broadband market as competitive as its dial Internet market. Even then, the evidence is still not in that broadband deployment will drive the informatization of a country.

The slow speed at which the SMEs in Hong Kong have embraced both EDI and ERP suggests that Hong Kong will also be slow to integrate into the next generation of inter-enterprise information systems. The power of Hong Kong businesses as packagers depends on their incredibly flexible business networks that extend throughout Asia and the world. But with a focus on short-term profits and very little manufacturing capability in Hong Kong, that country's businesses have been slow to invest in advanced information technology.

Taiwan, unlike Hong Kong, still has a manufacturing base. In the case of the electronics industry, Taiwan has been much quicker to adopt both electronic interchange and the enterprise systems to support that interchange. The managers of companies in this industry have often worked in Silicon Valley and have the willingness and the ability to reengineer their companies to leverage the power of the Internet and business-to-business e-commerce. Taiwan is not only a node in the Global Silicon Network, it has the potential of being one of the best and fastest nodes on the planet for producing complex electronic products. The use of inter-enterprise information technology combined with the power of their business networks will be the key to their success.

Both Guangdong and Fujian have been slow to enter enterprise and inter-enterprise resource planning technology. There are two different drivers of B2B e-commerce in China. One is the drive for the central government to informatize the economy. The second is the bottom-up desire to use e-commerce to open up new markets and improve the efficiency of doing businesses with old ones. These two drivers are not necessarily supporting one another. Given the present large "gray area" associated with operations of many sectors of the economy, businesses -- especially those financed by Taiwan -- are likely to resist efforts to make all their transactions transparent to the central government in Beijing. These businesses are under pressure from both the world economy and the Beijing government to move toward more advanced levels of information technology, but they are choosing to proceed slowly.

The challenge that the whole region faces is how to combine the speed and flexibility of Chinese business networks with the power of computer network technology. Taiwan businesses in their use of ERP, EDI, and Web-based ordering are taking the lead. Guangdong and Fujian will follow. It is up to Hong Kong to determine whether it is the best gateway for creating the new intermediaries and markets needed as East and West cocreate cyberspace.

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## Notes

[1] Seymour E. Goodman, Grey E. Burkhart, William A. Foster, Laurence I. Press, Zixiang (Alex) Tan, and Jonathan Woodard, *The Global Diffusion of the Internet Project: An Initial Inductive Study*, (Fairfax, VA: The MOSAIC Group, March 1998). The methodology behind the framework is available at <http://www.agsd.com/gdi97/gdi97.html>

[2] Peter Lovelock 'E-China: Why the Internet is unstoppable *China Economic Quarterly*, Vol.3, No.1, first quarter 1999, pp.19-35.

[3] The Outlook Project, *The Rise of the Global Silicon Network and the Growing Importance of Asia*, Institute for the Future, Menlo Park, CA.

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