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Research Report

Hong Kong: Asia's World City with a Vibrant Digital Life

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I. Background

1. A vibrant "digital city life" through wider deployment of information and communications technology (hereafter ICT) applications can exemplify Hong Kong as Asia's World City/a city of events.

2. The economic potential of Hong Kong's ICT infrastructure should be better leveraged.

3. Building on the "NyLonKong" (New York – London – Hong Kong) designation and in light of the globalization and informatization trends characterized by knowledge sharing, Open Source Software, etc., the local ICT sector and the HKSAR Government (hereafter the Government) have a great opportunity to join hands to steer local knowledge-based economy to a new direction.

II. Basic Principles of Our Recommendations

1. **Encouraging new wave of ICT development to make Hong Kong a genuine world city with a vibrant digital city life should be incorporated as a key component of the vision of Hong Kong.**

2. **A cross-sectoral approach should be adopted to help bring a win-win situation among the local ICT industries and other sectors which would energize the development of Hong Kong as a whole.**

3. **Greater importance should be accorded to the development of ICT as a foundation platform for Hong Kong's knowledge-based economy. In particular, knowledge sharing and the development of an information society should also be incorporated as another major component of the vision of Hong Kong.**

III. ICT Industrial Policy in Hong Kong

A. Present Situation

1. Digitalization of different services is one of the major impacts the ICT developments have bring. Strict control by government on public information and data set dampens the potentials of digitalization and subsequently business opportunities.

2. ICT applications not only enhance productivity but help modernizing traditional industries. It is obvious that the economic potential that ICT could bring is not fully recognized. By the end of 2006, there were still 36.2% of local enterprises which did not have a computer in their offices, and out of the 63.8% who has computers in their offices, 40.2% of them still did not have Internet connection.[1]

3. The Government has failed to adopt a collaborative approach to facilitate the integrated development of the ICT industries and other sectors in Hong Kong.

4. The Government did not look ahead for the development of a more advanced broadband Internet connection which is much higher in speed than the existing broadband services. In the newly published Digital 21 Strategy, there has not been a single word related to this strategic issue in the section concerning the "promotion of advanced technology and innovation". On the other hand, the Singaporean Government has already introduced the studies of a "Next Generation National Broadband Network" in March 2006, and the new broadband network is scheduled to be completed by 2015. Should the Government does not address the development of such network as soon as possible, Hong Kong might lose it edge as the regional hub of telecommunications.

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[1]   Census and Statistics Department, *Annual Survey on Information Technology Usage and Penetration in the Business Sector*, (Hong Kong: Census and Statistics Department, December 2007).

In March 2006, the Singaporean Government launched the study for the creation of the "Next Generation National Broadband Network". The Network has two components: A wired broadband network that will deliver ultra-high broadband speeds (at least 1000 MBPS) to all homes, offices and schools, and a city-wide wireless broadband network.[2] The Network would be conducted under a "private-public partnership" model, in which the Singaporean Government has earmarked S$750 million (HK$4.06 billion) to subsidize the private businesses which has won the bid to build the necessary infrastructure for the network.[3]

B. Solutions

1. General policies

a. **Opening up of government data to the public and commercial uses (for example, weather information, traffic information, raw data from the Census and Statistics Department, information in the Public Records Office) will provide enormous opportunities for development of useful applications which has positive impact to businesses. Such a move can help boost a more knowledge-based business model which will be conducive to the development of SMEs in Hong Kong**. For the opening of statistics information through electronic means, the Census and Statistics Department has done a good job and allowed free download of its publications, as well as providing user-generated statistical tables in Excel format.   The Department is also launched an online "Interactive Data Dissemination System" (IDDS), which opens the raw data in the 2006 Population By-Census for public use. Users of the site can build their own tables by selecting the variables they are interested. The tables built can be edited with functions provided in the IDDS and can be downloaded in different formats, including self-generated graphs and thematic maps.[4]   If our understanding is correct, the statistics carried in those reports shall be provided in a form that would support easy manipulation and processing for different purposes by the general public.

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[2]   "Singapore to Have Next Generation Broadband Networks,"
<http://www.ida.gov.sg/News%20and%20Events/20050705113929.aspx?getPagetype=20>
[3]   狄高，〈香港難保電訊樞紐中心地位〉,《信報》 (*Hong Kong Economic Journal)*, 17 December 2007, p. 41.
[4]   The "Interactive Data Dissemination System" website from the Census and Statistics Department, <http://idds.censtatd.gov.hk>.

b. By a similar rationale, **government and telecommunication operators can also open the location data of the GovWiFi and commercial Wi-Fi access points to the public. Such data are useful for research and development of location based applications which may generate a new class of business services.** Since Hong Kong is a crowded city with skyscrapers along the main roads, there are blind spots for GPS receivers. **Wi-Fi location based service can complement this weakness of GPS and provide an even higher precision.** There are many potential applications. **Businesses can provide targeted information to clients based on the location of the connected wireless devices, like directions, nearby shops and restaurants.** This information is also useful for people-tracking service, in which kids and the elderly who are carrying a specific cell phone or mobile device can be located using a combination of GPS, GSM and Wi-Fi positioning technologies. Lastly, the data is also useful for tracking attackers abusing the use of the Wi-Fi network.

c. **The Government can commercialize the intellectual property rights of some government application systems to sell to the businesses which can purchase the source code to work on in their future projects.** This provides more incentive to the business sector to develop high quality and scalable system as the code will have to be usable and extensible for different environments.

d. The Government should play a more pro-active role in promoting the ICT business in overseas. **Besides putting more effort in leading delegation in exhibitions overseas concerning the ICT sectors, overseas Economic and Trade Offices can proactively monitor the ICT tenders in overseas countries, and disseminate business opportunities information to match with the relevant businesses in Hong Kong.**

e. **The Government should launch the studies of the Next Generation Hi-speed Broadband Network as soon as possible**, probably before the next review of the Digital 21 Strategy to design the way forward of the construction of such network.

f. It would be of utmost importance to realize the potential not only for the uses of ICT in different sectors but increase the knowledge intensity of respective industries in parallel. The strength of ICT application together with a more knowledge-based business model is well illustrated in the tourist sector in the following section on "Digital Tourist City – ICT in Tourism".

IV. The Creation of a "Wireless City"

A. Present Situation

1. Slow progress in installation of commercial Wi-Fi system

a.   Despite that building Hong Kong into a "wireless city" has been listed as one of the policy goals for years, the installation of wireless broadband network is far from satisfactory, even though substantial achievement has been made in the areas of mobile phone and fixed broadband network penetration.   The Government has launched a trial scheme for free GovWiFi services in the premises of the Government in mid 2007 and planned to install about 3000 Wi-Fi access points at some 350 government premises by the second quarter of 2009.[5]   Given that the longstanding position of the Government of non-interference into the market, the provision of territory-wide coverage of Wi-Fi system is subject to commercial decision of the market.   Even though the Government has committed to play a proactive role in assisting operators in setting up hotspots and government facilities (such as lamp posts) in public streets are being made available to enable operators to set up hotspots and base stations at nominal rents,[6] it took quite a long time to sort out related formalities.   Substantial progress had only been made last year.   There were about 6 400 hotspots for wireless Internet access across the territories in end-2007,[7] increasing from 1 071 hotpots in February 2007.[8]

Ten cities in the Mainland, namely: Beijing, Tianjin, Qingdao, Wuhan, Shanghai, Nanjing, Hangzhou, Guangzhou, Shenzhen and Yangzhou have already plans for the creation of the "wireless city" system. Beijing has the most extensive wireless network system in the Mainland. It has covered 100 square kilometers, covering Second Ring Road, Third Ring Road, CBD Circle, Finance Street, Zhongguancun

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[5]   "LCQ15: Delivery of e-government services", Press Releases, 24 October 2007, Annex A, <http://gia.info.gov.hk/general/200710/24/P200710240157_0157_32795.doc>.

[6]   "LCQ7: Developing city-wide wireless broadband service", Press Release, 24 January 2007, <http://www.info.gov.hk/gia/general/200701/24/P200701240132.htm>.

[7]   "Growth of wireless communication services makes HK one of world's most advanced wireless cities," Press Release, 30 January, 2008, <http://www.info.gov.hk/gia/general/200801/30/P200801300128.htm>.

[8]   "LCQ15: Computer network facilities in Hong Kong," Press Release, 7 February, 2007, <http://www.info.gov.hk/gia/general/200702/07/P200702070116.htm>.

> (a technology hub in Haidian District), and would cover an area of 625 square kilometers within the Fifth Ring Road by the end of next year. The wireless broadband network would cover the countryside area as well by the end of 2010.[9]

b. **It is unlikely to see a rapid growth of Wi-Fi hotspots in the near future as there is no extra electricity supply for other devices at each lamp post.   Individual Wi-Fi operators are required to arrange for separate electricity supply for the Wi-Fi installations on lamp posts.**[10]   Despite the Government has repeatedly its commitment to facilitate for a better business environment as well as its intention to steer Hong Kong to be a most advanced wireless city, its hands-off attitude on electricity supply will create substantial barriers for market entry and eventually fewer Wi-Fi operators would be willing to enter the market.

2. Distorted price structure in mobile data transmission

a. At present, there are four third-generation (3G) mobile service networks in Hong Kong providing high-speed data transmission and wireless Internet access service across the territory.   However, these **3G mobile phone operators have been charging their subscribers a rate much higher than via a Wi-Fi system for the use of data transmissions.**   Three out of four operators are currently charging at least HK$488 per month for unlimited use of data transmissions through the 3G system,[11] while in contrast, another mobile phone operator providing similar services through the Wi-Fi network is charging HK$98 only.[12]   High data transmission cost will definitely discourage the penetration rate of wireless broadband connectivity.   This pricing structure could be considered as an anti-competitive practice.   We anticipated that, through the solution mentioned below, this pricing structure could be rectified.

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9 〈北京等十城市將建無線城市 奧運後北京 80 元包月〉 (in Chinese only), *China News,* 〈http://big5.chinanews.com.cn:89/gate/big5/it.chinanews.cn/it/hlwxw/news/2008/07-31/1330731.s html〉。

10 "LCQ15: Install Wi-Fi equipment on facilities in public streets," Press Release, 16 April 2008, <http://www.info.gov.hk/gia/general/200804/16/P200804160144.htm>.

11 See <http://www.smartone-vodafone.com/jsp/mobile/prices/GPRS_price_plan/english/3g_packet_charge s.jsp>; < http://www.pccwmobile.com/portal/services_pricing/gprs.jsp?fldr_id=5999#section4>; <http://www.three.com.hk/website/template?pageid=35260&lang=eng>.

12 See <http://www.pccwmobile.com/portal/common/multi_section.jsp?fldr_id=6002>.

B. Solutions and respective benefits

1. Hong Kong should not be complacent on ICT development despite of its advancement in wired communication services. There is much room for improvement particularly in the coverage of Wi-Fi access. **The installation of a territory-wide Wi-Fi network should be positioned as a strategic measure to ensure Hong Kong's position as "one of the world's most advanced wireless cities".**[13] Moreover, Hong Kong has long been an important testbed of digital devices of modern city life. **The installation of an extensive wireless Internet network will help extend our longstanding role in real market testing of wireless data processors.**

2. In addition to the wireless infrastructure that would be in place in the near future, **the provision of free Wi-Fi access for a certain bandwidth and/or for a specific amount of time across the territories can be developed into a new selling point for Hong Kong.** In Singapore, the service operator offers three-year basic wireless Internet access service at a maximum speed of 512 kbps to the public free of charge and consumers are required to pay for greater speed and better quality of service.[14] It is worthwhile to explore the impact on city life and also the benefits that the new means of communication can bring.

3. **The Government should collaborate with electricity companies to address the power supply issue in one-go and provide electricity supply to any operators wishing to install Wi-Fi equipment in public places.** Such a move will be helpful to create a fair competitive environment for all potential Wi-Fi operators, and help reduce charge of the Wi-Fi services in public streets. It is likely that extensive Wi-Fi networks covering the entire territory and at a generally low rate will help reduce the price for wireless broadband communications, which could in turn create new demands and wider uses of mobile wireless applications.

4. It is expected that the government will issue three WiMAX (Wireless Broadband Network) operation licenses in the fourth quarter of 2008. This move is likely

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[13]   "Growth of wireless communication services make HK one of world's most advanced wireless cities", Press Releases, 30 January 2008,
<http://www.info.gov.hk/gia/general/200801/30/P200801300128.htm>.
[14]   "Construction of Territory-wide Wi-Fi Network", Press Release, 24 January 2007,
<http://www.info.gov.hk/gia/general/200701/24/P200701240132.htm>.

to attract the world's leading telecom service providers to enter into the market. It will impose direct competition on existing 3G mobile phone operators and is expected to rationalize the respective cost structure as well, and would ultimately bring in customers to use the data transmission services through mobile phones and PDAs.

V. Digital Tourist city-- ICT in Tourism

A. ***Turning web visitors to inbound visitors – One-stop tourist website***: At present, the Hong Kong Tourism Board (HKTB) website is playing the role of Hong Kong's official tourist guide which provides a wide spectrum of text information ranging from food, attractions, heritage, and events etc. together with an interactive gallery containing photos, video clips and sound tracks of Hong Kong. The HKTB also provides a downloadable guide for the viewing in a PDA, and a guide service through pre-recorded messages to the mobile phones[15] but it is merely electronic versions of its paper pamphlets which are unable to provide further information in an interactive format. Although the HKTB is revamping its website[16], it does not plan to provide further interactive features in the site, such as the provision of interactive map and guide that allow the tourists to control what to see in his/her PDA. We are of the view that there is much room for enhancement to make it not only a web portal, but a one-stop guide that provides real-time guidance and information for tourists to enrich their travel experience. In sum, **the HKTB websites can be revamped in following ways:**

1. ***Richer Content***: The website can serve as a genuine tourist guide that provides basic information that can meet the need of inbound tourists. The website of the Antique and Monuments Office (http://www.amo.gov.hk/en/main.php) can serve as a useful example, which provided **a short description of those monuments, its maps, transportation information, photos and even a virtual tour of the sites**.

> The Antique and Monuments Office provides a "Virtual Heritage Explorer" in its website, which offers 360-degree panoramic views of 62 local historic sites and two heritage trails. Users can receive a wide range of multi-media information, including photos, background information, 3D floor plans, and 360 degree panoramas of the interior and exterior of locations. Users can also view the monument in multiple angels and zoom in and out in the website.[17]

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[15] For the details on the service, please see
<http://www.discoverhongkong.com/mobilehost/tc/audio_index_pth.html>.
[16] See <http://www.beta.discoverhongkong.com/tc/index.html>.
[17] "Web offers new views of old sites." *Hong Kong Standard*, 17 December 2007, p. 12.

2. *Multi-media Content:* **The website can be developed into a showcase to demonstrate how tourist information can be provided in a format suitable for PDAs and mobile phone (such as creating 3D virtual maps and audio guide in multiple languages of sightseeing spots and museums).** Audio guides and video content in addition to written introductions can keep the tourists better informed about the tourist spots in the course of their tours.

> A recent exhibition on Hong Kong's architecture held in the former Central Police Station has featured a "virtual tour" and a "virtual floor plan" of the exhibits in its website.[18]

3. *A gateway with extensive web links:* **The website can provide hyperlink with tourist-related websites**, for example: Antique and Monuments Office (archaeology, built heritage, declared monuments, heritage trails, HK Heritage Discovery Centre), Leisure and Cultural Services Department (leisure and cultural activities), Agriculture, Fisheries and Conservation Department (country parks, marine parks, hiking trails, etc.), Sai Kung District Council (Travel in Sai Kung), The University of Hong Kong (Museums), Po Lin Monastery,…. etc.

B. *"Invisible" tour guide – Global Positioning System tourist map:* With the availability of affordable Global Positioning System (GPS)/GSM technology, and ubiquitous Wi-Fi networks in the city, tourists will be able to enjoy Internet tour guide services in all major business and tourist areas, with mobile devices like PDAs and mobile phones. Digitalized tourist maps for PDAs and mobile phones are commercially available. **The on-line digital maps can provide more comprehensive information of the tourist spots rather than merely transport means and directions. It could also links with dedicated tourist websites that provide features, history, and virtual tours of the tourist spots, plus shopping tips, food, schedules of cultural events and performances and even a guestbook.** The integration of position technology and the territory-wide street map in Hong Kong would be very helpful for the use of tourists, particularly the tourists visiting Hong Kong on an individual basis. The local ICT sector has also created a trial to "revitalize" a heritage site through the application of ICT

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[18]   See <http://www.hkszbiennale.asia>.

and help enhance the visiting experiences of the visitors. [19]   It is likely that electronic maps with positioning capability could have enormous market potential for the several existing leisure and travel guidebooks and magazines for tourists and locals alike, as they could provide subscription based electronic versions of the information on restaurants, places of interests and shops on their digitalized maps.   Subscribers of the electronic map services could then locate the exact locations as recommended by these leisure and travel guides, through the assistance of the mobile phones or PDAs with positioning capabilities.

> The exhibition held in the former Central Police Station also allows visitors with Bluetooth-enabled mobile phone to read the details of the exhibits on the screens of their mobile phone, with the assistance of Bluetooth-based transmitters around the exhibits.

C. *Audio tour guide*: **"Low-tech" audio devices should also be employed to provide added value services for the convenience of tourists, such as providing audio version of site description similar to the audio tour in the museums and sightseeing spots (and providing positioning system for locating a particular item in the museum for free) for tourists through their mobile phone, PDAs or Wi-Fi enabled computers.** For example, when visitors at the two sides of the Victoria Harbour in the evenings enjoying the "A Symphony of Lights" turn on their mobile device to connect to the network.   The network has that intelligence about their location and direct them to the web site that broadcasts the background music and the audio of the show, delivering a true 3D and surround sound enjoyment to the visitors.   At present, the Government provides an audio-guided service to the public at only two museums.   The service is being planned to extend to all government premises, through the use of the Wi-Fi hotspots and positioning technologies.[20]   As the Government only pledged to provide such services in Government premises, tourists visiting tourist sites would not be able to reap the benefits of an electronic guided-tour.   We considered that this latest initiatives is not enough, **an electronic audio-guide shall be provided in all sites frequented by tourists**,

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[19]   莫乃光 (Charles Mok),〈資訊科技助活化古蹟〉,《信報》 (*Hong Kong Economic Journal*), 14 January 2008, p. 39.
[20]   "LCQ15: Spatial Data Infrastructure", Press Release, 14 May 2008, <http://www.info.gov.hk/gia/general/200805/14/P200805140138.htm>.

D. **E-marketing**: A GPS map can also be a platform for online advertising and promotion, a value-added function that the HKTB website would not provide. Hong Kong has been positioned as paradises of gourmet, shopping, and a capital of events…..etc. but the HKTB website is not in the position to provide detailed information or introduction of specific shops and restaurants to dispel the allegations of favoritism towards commercial operations. That leaves a huge gap for business-oriented websites to fill. Similar to online marketing through the HKTB website, the crux of success lies on content building. **Different GPS maps can be designed to link up with different list of online directories targeting the needs of different groups of visitors, such as pleasure seekers and business visitors. Greater intensity in e-marketing can add momentum for the vibrancy of Hong Kong's city life**.

> Google Hong Kong provides a web-based informational map of Hong Kong. It provides the locations and information on the tourist spots, restaurants, shopping and leisure facilities, for example the films shown in the cinema of the day, together with the photos of the tourist spots. Users of the website could use the webpage to map out the routes to the places they wish to go. [21]

E. **Thematic tourist websites**: Following the example of the "Virtual Heritage Explorer" from the Antiquities and Monuments Office", for tourists who want to focus on a specific aspect of tourist activities, **it would be important to create some thematic websites for a specific kind of tourist attractions across the territories.** For example, a "Modern Buildings surrounding the Victoria Harbour" web site can target at skyscraper and building enthusiasts as well as ordinary tourists interested in sightseeing and the harbourfront. Getting basic information of specific buildings or even 3D virtual tours via the Internet will make the harbourfront tour more meaningful and enjoyable. Other examples for thematic website may include: sites on religious establishments, country park trails, art galleries, cultural centres, etc.

F. **New business opportunities – Wi-Fi Pass**: **When the territory-wide Wi-Fi system and well-to-do tourist-related websites are in place, it can be expected that a substantial amount of inbound tourists to Hong Kong would switch on**

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[21] Please refer to <http://maps.google.com.hk/>.

their PDAs or Wi-Fi enabled devices to logon. The Government, by facilitating the creation of a "Wi-Fi" City, would create businesses opportunities for daily or weekly pass for Wi-Fi access to tourists, and even bundled services of Wi-Fi enabled cell phone with value added services package (e.g. Skype). **The Government should extend the provision of free Gov Wi-Fi facilities to scenic spots frequented by tourists to facilitate the use of Wi-Fi pass.**

G. *Provision of business opportunities for ICT industries*: **The infrastructure building of a metropolitan positioning system integrating GPS, GSM and Wi-Fi system will definitely require heavy investment and involvement of the ICT industries. It is likely that the development of web-based information services would also provide enormous business opportunities, for instance, construction of digital maps, digitalization of information on tourist spots, commercial information (such as shopping centres and restaurants guides), e-promotion, e-coupons, etc.**

VI. Data centres

A. Present situation

1. To enable a sustainable growth of the local economy, an adequate capacity of the ICT infrastructure should be available to facilitate high-speed and secure storage and transmission in telecommunications and data. It is obvious that the provision of data centre is of vital importance in the development of ICT infrastructure. Market information shows that there is a growing demand for data centre in Hong Kong, in particular from the financial sector. For example, the rapid increase in the number of trading desks, and increased reliability levels required by banks has been one of the major drivers for data centre space demand.

2. However, only limited supply of new floor area for data centre will be available in the foreseeable future. It is partly attributed to the peculiar requirement of data centres relating to ample head room, heavy power supply, intensive cooling system, excellent network connection, etc. The two-hour on-site service commitment is another crucial factor affecting the location of data centre.[22]

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[22] "Hong Kong Datacenter shortage: Critical?" *Computerworld Hong Kong*, 7 April 2008.

3. Moreover, some multinational companies need to have business continuity centre to cater for cases like the breakdown of Manhattan during the traumatic events on September 11, 2001. They need spaces to allocate the computers and people in case their office in Central is not accessible. Currently the business continuity centre is overbooked, crowded and costly.

4. In fact, Hong Kong has been one of the major hubs for the South Asian countries to route traffic to the Mainland because we have many low cost land cables to the Mainland. So businesses in Asian countries have to rely on the Mainland or Hong Kong to provide communication links in case of cable breaks.

5. However, the data centres in the Mainland have a weakness in their management while the data centres in Hong Kong are pricey and scarce.

B. Solutions

1. We propose that **the Government should facilitate the development of data centres in a bid to ensure a stable supply of suitable venue in the future**.

2. **Lower land costs in the New Territories can enable the provision of low cost data centre, and to free up the land bearing high costs in the metro core.** As most of the clients do not go up to the data centres but access remotely, the "one time" cost is to build cables from the marine communication cable landing points to these data centres. This involves much lower cost than the land cost.

3. **Another way forward for the development of data centres in Hong Kong is the development of a regional data centre.** The Hong Kong Computer Society also suggested that "Hong Kong should aim to be the Centre in the region for hosting large and data centres, particularly for mission-critical system…..and as an incentive to attract international clients".[23] In 2007, all but one the marine cables for South Asia Internet and IDD traffic broken due to Taiwan earthquake. It exposed the vulnerabilities of the Internet and international telecom connections in East Asia as a whole. At that time, Mainland had help routing the South Asia traffic through North China (Shanghai) to join the cables in Japan to the United States.

4. With the problem in costs relatively resolved through the provision of low-cost data centres, it would also facilitate the development of regional data centre clusters for Asian businesses to be hosted in Hong Kong, especially those with businesses between Hong Kong and the Mainland.

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[23] Response from HKCS on Public Consultation on Digital 21 Strategy, October 2006, <http://www.hkcs.org.hk/doc_journal/HKCS%20Response%20on%20DG21_2007.pdf>.

5. In our Research Report entitled "Restructuring Urbanscape: Development Strategies of the 'HK Secondary City Centre' and the HK Section of Hi-speed National Rail Network" issued in March 2008, **the Professional Commons have proposed a "regional economy" perspective of the spatial development of Hong Kong of which the focal point is the creation of a number of "Secondary City Centres" in the New Territories. To this end, we also suggested the Government to formulate a regional economic policy including the provision of regional based taxation system (e.g. different tax credits and concessions for firms investing in the specific areas; reduction of rates and Government rents, etc.). Our proposed "Secondary City Centres" would be geographically feasible to develop into transport hubs, and therefore would be suitable for a data centers to be established there. We believe that the development of data centre cluster can add vitality to these Secondary City Centres.** Moreover, the relocation of those centres stationing in the metro core can help release the land in which the current data centres were located.   The Government may also consider designating some land sites in the New Territories for specifically the use of data centres, similar to the policy measure of providing 10 sites "restricted to hotel use" throughout Hong Kong as announced in the 2008-09 Budget.[24]

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[24]   The 2008-09 Budget, <http://www.budget.gov.hk/2008/eng/budget31.html>.

VII.Knowledge Sharing as a Driver for the Development of Knowledge-based Economy

A. Present Situation

1. In the book "Wikinomics", the authors gathered the findings from three discrete studies from year 2000 to year 2006 on the force of web and collaborative technology changes business and competitive dynamics.[25]   They concluded that the new communications technologies are democratizing the creation of value. Mass collaboration empowers a growing cohort of connected individuals and organizations to create extraordinary wealth and reach unprecedented heights in learning and scientific discovery.   The good examples of their claims are the success of the Wiki and the flourishing of the Open Source Software Movement. The "Opencourse Opensourse Prototype System" initiated by Lucifer Chu is another good example in the Chinese society.[26]

2. According to the European Commission study on the impact of Free, Libre, and Open Source Software (Floss) on the European ICT sector, the Floss-related share of the economy was estimated to reach 4% of European GDP by 2010.[27]   The report called for "correcting current policies and practices that implicitly or explicitly favor proprietary software" by offering fairer R&D incentives, supporting standardization, avoiding vendor lock-in in education settings, equitable tax treatment for open source contributors, and encouraging partnerships between businesses and the open source community.[28]

3. In Hong Kong, the financial services industry is the main pillar of the economy. However, over 90% of the business entities are small and medium enterprises (SMEs). Clearly the key to the survival of Hong Kong against economic downturns is to rely on booming the SMEs so as to diversify our economy.   The highly educated and adaptive workforce, and the excellent technological

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[25]   Don Tapscott and Anthony D. Williams, *Wikinomics: How Mass Collaboration Changes Everything*, (New York: Portfolio Publishing, 2006).
[26]   <http://www.myoops.org>. The project employs the principles of open source knowledge and translate the Physics courseware of MIT and Computer Science courseware of the Open Yale Courses (open.yale.edu)
[27]   <http://ec.europa.eu/enterprise/ict/policy/doc/2006-11-20-flossimpact.pdf>.
[28]   <http://ec.europa.eu/enterprise/ict/policy/doc/2006-11-20-flossimpact.pdf>.

infrastructure should provide Hong Kong a great potential to develop her knowledge based economy.   Open Source Software means mass collaboration among small and intelligent players.   It is a platform for skill development and service packaging.

4. Hong Kong's knowledge sharing is under-developed.   The ICT sector is more short-sighted. Solution providers are more focused on customizing current available technologies than to develop new systems.   They are not active in joining globalized projects in Open Source Software development.   Secondly, the mindset of government and business on innovative technology is biased more towards protection of intellectual properties as a sole means to promote innovation.   There is a general neglect of open and free sharing of knowledge as an initiative to bring about innovation.   These constraint will eventually hinder not only knowledge sharing and but dry up the ingredient for innovation.

5. The Government is highly sensitive about possible critics of favourism arising from the release of public information for commercial use and has reservation to open up general information, such as weather and traffic information that have been commonly broadcasted through commercial radio and television stations, for other business sector to develop value-added services.   It is obvious that the present information dissemination mechanism has failed to maximize the economic value of government-owned data and information.

6. Knowledge sharing has been the most prevailing trend in global development. The development of Open Source Software in the ICT sector is one of the outstanding examples.   Another striking case is the Wikimedia website (www.wikimedia.org) from the Wikipedia Foundation, which provides a wide array of information, including the now-acclaimed Wikipedia and dedicated websites on biological species, books, news, travelling information and quotation in the public domain.   Being a knowledge-based economy as such, it would be important for Hong Kong to follow suit and nurture the free sharing culture in a bid to add momentum for continuous growth of the knowledge-based economy.

7. The Government has started to invest her effort in Open Source Software promotion.   The Hong Kong Open Source Software Centre has been established under the Hong Kong Productivity Council since September 2007.   However, this little centre is far from sufficient to incubate the Open Source Software industry, as it primarily serves the function of testing the Open Source Software for business use, and the dissemination of information of the software concerned, and not the facilitation of research and development of locally-developed Open

Source Software.[29]   We need the Government to demonstrate her commitment to knowledge sharing by setting a model, and clear policy and objectives to achieve.

B. Solutions

1. Encouraging the culture of sharing

a. *Opening up government information:* **The Government should take the lead in opening up government information for public use.**   Given that the Government has owned a wealth of data, information, intellectual property, public assets on behalf of the public, it will be important to liberate the economic potential of these valuable resources to boost the growth of the local economy. **To pave the way towards a genuine knowledge-based economy, such a move would be crucial to enhance the knowledge content of the local service industries.   Government data and information can serve as ingredient for high quality service industries.** For instance, it would be advisable to open up the geo-spatial information platform on government facilities, which is still under construction, for the ICT sector to provide value-added services.[30]   By doing so, **it can help upgrade local service industries to a new stage and provide enormous market potential for the development of local small and median enterprises.**

b. *Repackaging for easy reference:* In addition to opening up government data and information, **it would be of equal importance that these information should be allowed to be repackaged for easy reference for potential clients.   The private sector can play a crucial part in tailor-making appropriate databank for private consumption.**   For instance, it is just a matter of repackaging to transform public parks and museums into tourist resources.

c. *Sharing of knowledge in the public domain:* Many education institutes worldwide, such as the well-known "Open Courseware" website from the MIT (ocw.mit.edu), has provided information of its courses (including course outline, reading lists, lecture notes and even the video of its lectures) for access in the

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[29]   <http://www.hkpc.org/html/eng/centres_of_excellence/hkossc/index.jsp>.
[30]   The Government recently suggested that it would provide geo-spatial information services through the platform of a geo-spatial information hub, which would provide geo-spatial information on Government facilities. See <http://www.info.gov.hk/gia/general/200805/14/P200805140138.htm>.

public domain for free and open access. **It would be advisable for the Government to fund the startup of a website similar to the MIT website to enable free upload of educational materials for registered educational institutes to put their course outline, reading lists, lecture notes and even the video and seminars of an educational nature for public reference. These materials, similar to the ones posted in the websites of the Wiki Foundation, will in the long-term serve as a databank for life-long learning.**

d. *Community-wide contribution and sharing:* In the light of general awareness on corporate social responsibility, **the Government can join hand with business chambers, educational institutes and social services organizations to encourage voluntary contributions to the day-to-day operations of the websites, particularly those with knowledge content.** It can serve as another move that help demonstrate government's willingness in boosting free sharing of knowledge to facilitate a paradigm shift across the community.

e. *Open Source Software:* **The Government should incubate locally-developed Open Source Software through the following measures: establishing of a dedicated research fund, providing free legal advice to developers, etc. It could also promote the use of Open Source software in Government departments.**

2. New legal framework conducive to knowledge sharing

a. **The Government should facilitate changes in the existing copyright regime, in which they are abided by the principle of "all rights reserved"**, which automatically granted the producers of full range of copyrights, including the use, reproduction, creation of derivative works, selling and transmitting the creative works involved. For the facilitation of creativity, an innovative copyright regime called "Creative Commons" (CC) should be introduced through legislative means, in parallel with the existing "all rights reserved" copyright regime. **Rather than automatically granting the "all rights reserved" to the producers of creative works, the "Creative Commons" regime allows creative workers to adopt the principles of "some rights reserved" or even "no rights reserved".**[31] Under the proposed regime, the "some rights reserved" principle facilitates the copyright owners to choose the type of copyright they want to reserve while allowing some rights of their creative works can be used in the public domain. "No rights reserved" allows the creative works to be put under

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[31] For more detailed information on the concept on "Creative Commons", please refer to the Creative Commons webpage at <http://creativecommons.org/about/>.

the public domain, in which the creator of the creative works declined all rights, and allowing the free use and reproduction from the user of the creative works.[32]

b. At present, the Creative Commons International has collaborated with research institutes worldwide, to initiate the localization process in a bid to accommodate local copyright and private law. As of February 2008, there are 43 jurisdiction-specific licenses, with another 8 jurisdictions in drafting process. The academic research units in relation with information technology, as well as ICT operators in both the Mainland and in Taiwan have formulated the localized version of the terms and conditions for the facilitation of the issuance of Creative Commons licenses in creative works.[33] **Hong Kong should not fall behind in the facilitation of localized legislation based upon the principles of Creative Commons.**[34]

c. It will provide room for free sharing and amendments of digital intellectual property. Together with the promotion of "Fair Use" arrangements as proposed by the Government in its consultation on the amendment of existing copyrights legislation, not only the ICT sector but even the creative industries can be benefited.

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[32] For more detailed information on the concept on "some rights reserved" and "no rights reserved", please refer to the Creative Commons webpage at <http://creativecommons.org/about/>.
[33] For details on the adoption of Creative Commons in the Mainland and in Taiwan, see the link below: <http://cn.creativecommons.org/> and <http://creativecommons.org.tw/>.
[34] <http://en.wikipedia.org/wiki/Creative_commons>.

VIII. Facilitating Dynamic Digital Education

A. Present Situation

1. Despite the Chief Executive has announced for the provision of a HK$1,000 subsidies for students in CSSA families and those who will receive student loans in the upcoming academic year[35], it is likely that the rapid increase in prices of textbooks and the frequent changes of editions of textbook publishers for the maximization of profits would still be in place a heavy financial burden to the parents, especially the underprivileged ones.

B. Solutions

2. The reliance of paper-based textbooks in teaching and learning does not conform with the principles of a vibrant digital city life. Hence, the Professional Commons proposes the following measures to incorporate additional ICT –related elements in teaching and learning:

a. As we have suggested in our previous report "e-Government and Better Governance in Hong Kong", a free computer should be provided for the underprivileged families with school-attending children through the expansion of the current "Computer Recycling Scheme";

b. Organize teachers, parents and other citizens into communities to gradually develop an "Open Source Courseware" database.[36] Adopt open source or "creative commons" open licensing schemes to distribute e-books, e-notes and multimedia teaching materials. e-courseware is an alternative to expensive reference books and it is more environmental friendly.

c. The Government should assist the development of courseware database by subsidizing the digitization of cultural or historical relics and talks, and open the content to public. More diversified multimedia teaching materials can reduce the reliance on paper-based textbooks.

d. The Government should subsidize schools to purchase e-books in the form of "site-license" for the whole school in case of expensive reference books and other learning materials.

3. Not only the provision of open source courseware would help alleviate parents' burden in purchasing of textbooks, it would also provide a wider range of study

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[35] "行政長官立法會答問大會談話全文（一）（只有中文）（附短片），" Press Release, 16 July 2008, <http://www.info.gov.hk/gia/general/200807/16/P200807160160.htm>.

[36] Please refer to <http://www.opensource.org/licenses/category>.

materials which will facilitate the students to explore in a more vibrant, dynamic means in learning. This would definitely motivate learning for the students. It would also providing teachers a more diversified set of teaching materials to facilitate teaching and to enhance the experiences in learning and teaching for the teachers and the students alike as well.

IX. Creatively Use New Digital Communication Technology

A. Present Situation

1. **It is expected that mobile phone and digital television will become core ICT tool in the near future. We have to break through the "traditional" thinking which centred on computers and Internet as the** ICT. Mobile phone and digital television will become basic households ICT device, connecting people to the outside world network. The commodization of ICT help materialize the e-connectivity of the deprived families.

B. Solutions

2. The Government should also formulate action plan to provide e-services through the newly-established digital TV platform. It should be noted that the Government has already suggested that the digital TV services could be developed into an "interactive" (two-way) service, which would enable viewers to send their response back to the broadcaster via the cable, and even subscribe government service directly. **The Government should start prepare for the adoption of the new mode of interactive services through the digital TV by establishing a dedicated government services channel now. Those services should be available as soon as possible and be fully accessible across the territory when the TV analogue signal is phased out in 2012. Citizens can use remote control device as a simple keyboard to search information and subscribe services. Multimedia and other interactive teaching materials could also be placed under the digital TV platform to address the deficiencies of traditional classroom teaching.**

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