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Development of ICT Statistics –
The Experience of Hong Kong, China

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Introduction

      Hong Kong is at the forefront of adopting new information and communication technology (ICT) and has been regarded as a test-bed for the industry. There is also extensive technology diffusion in the community, with mobile subscriber penetration rate reaching 117% in end-2004. In 2004, 71% of households in Hong Kong had personal computers (PC) and 65% of all households in Hong Kong had their PCs at home connected to Internet. The PC penetration rate and Internet penetration rate among local companies were 58% and 50% respectively.

2.   The Census & Statistics Department (C&SD) of Hong Kong, China regularly compiles and develops various ICT statistics. The following is a brief description of C&SD's current statistical programme in this area.

Information Technology (IT) Usage and Penetration in the Business Sector

3.   C&SD conducts an *Annual Survey on Information Technology (IT) Usage and Penetration in the Business Sector* since 2000. The latest survey was conducted in mid-2004 covering some 4 700 establishments and the results were released in end-2004.

4.   Apart from the usual data items on PC usage, Internet usage, Web site usage, electronic business/electronic commerce and budget for IT, new topics were added to gauge the latest trend. For instance, questions on IT security were added in the 2000 survey. As for the 2004 survey, the following new questions on the usages of wireless and mobile services and technology were added to cater for the increasing market focus on wireless applications:

      (i)   wireless and mobile devices[1] in use (devices);

      (ii)   wireless and mobile transmission technology[2] employed (key technical aspect of networking, namely connectivity);

      (iii)   wireless and mobile services[3] employed from service provider (commercial network employed); and

      (iv)   wireless and mobile applications[4] involved (applications).

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[1] Examples include mobile phone/PC/PDA connected to a wireless data communication network, wireless LAN access point, Radio Frequency Identification (RFID) device, contactless smart card reader, etc.

[2] Examples include General Packet Radio Service (GPRS), Enhanced Data rates for Global Evolution (EDGE), Third Generation Wireless System (3-G), Wireless Application Protocol (WAP), wireless LAN, Bluetooth, RFID, etc.

[3] Examples include Short Message Service (SMS), Enhanced Messaging Service (EMS), Multimedia Messaging Service (MMS), Location Based Service (LBS), Global Positioning Service (GPS), etc.

[4] Examples include Geographic Information System (GIS), office automation, WAP site, fleet management, mobile point-of-sale, etc.

5.　　These four questions would provide a full picture of the way wireless and mobile solutions are adopted in enhancing business operations. Popular areas of wireless solution applications can be identified, and adoption of latest technology monitored. A fifth question on reasons for not using wireless and mobile services and technology provides information on barriers to entry into this new area of IT applications.

IT Usage and Penetration in the Household Sector

6.　　Similar to the business sector, C&SD also conducts an *Annual Household Survey on Penetration and Usage of IT*. The latest one was conducted in mid-2004 and the results were also released in end-2004. About 10 000 households were enumerated, within which all members aged 10 and above were interviewed. The survey collects data on the penetration of PC and Internet among households, and household members' IT usage at home, at work, at school and at other locations.

7.　　Specific data items collected included PC and Internet facilities in the household, usage of PC and Internet at different locations, knowledge and usage of Chinese input methods, usage of electronic business services, usage of online government services and awareness of information security.

8.　　Compared with the previous round, three new questions were added in the 2004 survey on the type of wireless technology used by mobile devices, whether had used Government services and views on online Government services.

Electronic Commerce

10.　　Hong Kong basically adopts the broad definition of e-commerce promulgated by the OECD[5]. Data on e-commerce are mainly collected via the above-mentioned survey on IT usage and penetration in the business sector. However, instead of defining e-commerce in the survey, data on the following activities are collected:

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[5]　The OECD has promulgated both narrow and broad definitions of e-commerce based on a transactional approach. The broad definition covers all electronic transactions conducted via computer-mediated networks, while the narrow definition covers only those conducted via the Internet. For both definitions, the payment and the ultimate delivery of the goods or services may be conducted on or off-line.

(i) Order or purchase of goods, services or information via electronic means[6],

(ii) Receipt of goods, services or information via electronic means[7],

(iii) Sales of goods, services or information via electronic means[8], and

(iv) Delivery of goods, services or information via electronic means[9].

IT Expenditure

11. Some data on IT expenditure in the business sector have been collected in a series of annual economic surveys since the reference year 1998. Data items collected included:

(i) expenditure on purchases of computer hardware (e.g. PCs, mainframes, notebook computers, storage devices and components) and peripherals (e.g. printers, scanners) for own use;

(ii) expenditure on purchases of computer programs, software and databases for own use, including both standard ones available in the market and those specifically designed/ developed by other firms;

(iii) payments for other IT-related services (e.g. system design and development, computer training, Internet page design, Internet connection, Website hosting, computer equipment leasing, repair and maintenance of computer products); and

(iv) cost of in-house development of computer programs and databases for own use (The total cost is taken to be the sum of labour costs and non-labour costs incurred).

12. Based on the survey results, a statistical series on IT expenditure in Hong Kong for 1998 – 2002 has been compiled and anlaysed.

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[6] An establishment is regarded to have ordered or purchased goods, services or information through electronic means if the confirmation of order or purchase is done completely via electronic means, regardless of whether the payment and the ultimate delivery of the goods, services or information are conducted via electronic means.

[7] Browsing of information on the Internet is regarded as receiving information via electronic means. Goods and services received through electronic means are only restricted to products which could be transmitted via electronic media, such as software packages and songs.

[8] A firm is considered to have sold their goods, services or information via electronic means if they offered and accepted orders or purchases that were placed completely via electronic means. Apart from the sales of goods, services or information through electronic means such as the Internet, telephone, it also includes cases where a firm, in accordance with an agreement with its client, automatically delivers certain product to the client for replenishment of stock when the firm learns, via electronic means, that the stock kept by the client falls to a certain level.

[9] Placing information about a firm or the products sold on the Internet is considered to have delivered their information via electronic means.

IT Manpower

13.　　*Manpower Survey of the IT Sector* continues to be conducted by C&SD on behalf of the Vocational Training Council on a bi-annual basis to collect data on the manpower demand and training situation of IT staff in various economic sectors and government bodies. The 2004 survey was conducted in March 2004 and the results released in October 2004.

14.　　The survey covered 9 broad categories of IT job, viz. IT management, IT/software development, telecommunications and networking, IT security, database, systems programming, field support, operation services and IT education and training.   The following data items were collected:

(i)　Number of IT employees for a number of major IT posts under each of the 9 types of IT jobs in the survey period and the forecast number for the coming 12 months.

(ii)　Preferred academic qualification, preferred relevant years of IT experience and average annual remuneration package of IT employees for a number of major IT posts under each of the 9 types of IT jobs.

(iii)　Number of IT employees recruited by sources of recruitment and promoted during the past 12 months.

(iv)　Major difficulties encountered in recruitment.

(v)　Rating of character and competence on average of recruited fresh graduates of Hong Kong institutions.

(vi)　Outsourcing and shifting all or some of the IT functions.

ICT Sector Statistics

15.　　The coverage of the information technology and telecommunications (IT&T) sector in Hong Kong is drawn up with reference to that of the ICT sector promulgated by the Organisation for Economic Cooperation and Development (OECD) with local adaptations.   The Hong Kong Standard Industrial Classification (HSIC) is used to demarcate the IT&T sector, which covers establishments engaged in the manufacturing, distribution, installation and maintenance of IT&T products and provision of IT&T services.

16.　　Statistics on the operating characteristics of IT&T sector have been collected in a series of annual economic surveys, including number of establishments, persons engaged, vacancies, business receipts and value added. These help reflect the contribution of the IT&T sector to the economy.

Telecommunication Indicators

17.   The development of ICT towards the information era is underpinned by technical and commercial infrastructural support. Hong Kong is the first metropolitan area to have the telephone network digitized in the early 90's, the first to adopt the CDMA standards in the world, the first in Asia to launch Multi-media Messaging Services (MMS) and one of the first to introduce General Packet Radio Services (GPRS).

18.   The telecommunication sector in Hong Kong is one of the most competitive and fully liberalized markets in the world with six mobile operators operating eleven 2G/2.5G networks, four 3G licensees with one 3G network already in operation, seven Mobile Virtual Network Operators (MVNO), 11 local Fixed Telecommunications Network Services (FTSN) operators, 22 external telecommunications facilities operators, over 200 IDD operators and close to 200 Internet Service Providers (ISP).

19.   Telecommunication statistics on this aspect could help reflect the infrastructural readiness of ICT development. Statistics on the supply of telecommunications services are compiled regularly by the Office of Telecommunications Authority (OFTA) based on administrative returns from the telecommunications operators.

Major Issues and Challenges

20.   The following are the major issues and challenges faced by C&SD in developing ICT statistics:

(i)   With the rapid developments in IT, questions on PC penetration need to keep in pace with such developments. For example, PC is currently defined to include desktop computer, laptop/notebook computer and Personal Data Assistant (PDA, including pocket PC, black berry devices and PDA phones) that are much more powerful than those available years earlier. This may make the penetration rates over the years not strictly comparable.

(ii) The above also applies to the measurement of Internet and website penetration. The speed and mode of Internet connection is changing rapidly. Thus, instead of just looking at the overall penetration rate, detailed analysis of Internet penetration by different modes of

connection is necessary. On the other hand, the evolving modes of web hosting also make the measurement on presence of website difficult sometimes.

(iii) On the measurement of e-commerce, some respondents found it difficult to breakdown their business receipts by electronic sales and customer group.

(iv) While there has been increasing demand for more comprehensive and timely ICT statistics, resources constraints of the business sector have also caused increasing reservation in providing raw data, not to mention in a timely manner.

Comments on the Proposed Core List of ICT Indicators[10] for International Comparison

21. The move of developing standardised framework for various categories of ICT indicators to facilitate international comparison of ICT statistics is welcome. Most of the proposed core ICT indicators could be compiled from the existing statistical systems in Hong Kong. To enable compilation of comparable ICT statistics, it would be useful if the following issues could be addressed:

(i) Definitional issue
A clear definition on the following core indicators is deemed necessary:
   - A-7 : *Broadband* Internet subscribers per 100 inhabitants
   - HH-11: Proportion of households with access to the Internet by type of access (response categories: *narrowband*; *broadband*)
   - B-11: Proportion of businesses accessing the Internet by modes of access (response categories: *narrowband*; *broadband*)

Indicators A-7, HH-11 and B-11 are broadband-related indicators. However, it seems that there is still no unified definition of broadband in the international context. Some definitions are general (e.g. a transmission facility having a bandwidth sufficient to carry multiple voice, video or data channels simultaneously) and some are specific (e.g. connection with data rates at or above 1.5 Megabits per second established over access networks). For clarity, an agreed definition on "broadband" and "narrowband" is needed. Moreover, it is

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[10] One of the outcomes of the 2003 World Summit on the Information Society held in December 2003 has been the formation of an international *Partnership on Measuring ICT for Development.* One of the objectives of the Partnership is to achieve a set of harmonized and internationally agreed core ICT indicators. OECD is one of the partners, with the others being: the ITU, UNCTAD, the UNESCO Institute for Statistics, the UN Regional Commissions (UNECLAC, UNESCWA, UNESCAP, UNECA); the UN ICT Task Force and the World Bank.

suggested that "mobile network" be added as a new response category, making it more forward-looking for emerging mobile Internet access.

Likewise, the exact meaning of indicator A-8 as shown below is not clear and a clear definition on "extranet" is required for B-13.

- A-8: International Internet bandwidth per inhabitant
- B-13: Proportion of businesses with an extranet

(ii) Reference period

A 3-month reference period on the use of ICT by households and individual is suggested for the core list as follows:

- HH-9 : Location of individual use of the Internet from all locations in the last 3 months (response categories: at home, at work, place of education,…)
- HH-10: Internet activities undertaken by individuals in the last 3 months (response categories: communication, information search,…)
- HH-12: Frequency of individual access to the Internet in the last 3 months from any location (response categories: at least once a day, at least once a week but not everyday,…)

It is suggested that a reference period of 12 months instead of 3 months be adopted to cater for possible seasonal variations. For HH-9, it may also be desirable to exclude occasional users of the Internet, i.e. the questions should only be answered by those who had used Internet service with frequency over certain threshold, say, at least once a week.

(iii) Practicality in data collection

Among the core list of ICT indicators, indicator B-10 is on "value of orders placed over the Internet (as a percentage of local value of orders)". According to our experience, this piece of information is difficult to obtain as the purchasers in the business sector might not necessarily keep separate accounts on this.

Way Forward

22. The collection and compilation of ICT statistics still pose a challenge to C&SD. While a framework on this area is in place, it needs to be reviewed regularly to reflect the latest ICT development. C&SD would continue to enhance its framework for measuring the information society, with a view to meeting the needs of Hong Kong and contributing to the international statistical community.