

Telecoms Infotech Forum - Conference

Briefing paper

Putting Service into Broadband

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Telecoms InfoTechnology Forum

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TIF aims to track and understand the economic implications of commercial and technological developments in the information and communications technologies (ICT) sectors and stimulate informed interest in the policy, regulatory and welfare implications.

For further details of TIF and TIF membership, please contact:

Jenny Wan at the *Telecommunications Research Project*: tel: 2859-1919; fax: 2857-9434
or Email: Trproj@hkucc.hku.hk

Putting Service into Broadband

Introduction

TIF briefing papers are usually devoted to one subject area but this time because the conference has one theme covering six sectors of the economy – travel and leisure, network services, broadband content, logistics, citizen and public services, and financial services – the paper has something to say about each. However our coverage is not even, and we have placed more emphasis upon logistics, partly because of the DTTN proposal. Nevertheless we hope the paper will prove a useful background to some of the debates at the conference. We would also draw your attention to the ITU’s latest and fourth report on the Internet, *Birth of Broadband: ITU Internet Reports*.

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Brief One: Travel and Leisure (Session 2.1)

Hotels

Hotels worldwide are seriously beginning to adopt broadband.¹ Benchmark Hospitality, a management company, announced in January 2003 ten major trends observed from their hotels and resorts in North America and Japan. Of the ten, the first and the ninth refer to technology. Trend One is that ‘Technology Rules’ and the provision of fixed and wireless broadband facilities is essential. Trend Nine is that the ‘Demand for Video-conferencing is Nearly Non-Existent’ despite the immediate aftermath of 9/11.² Gradually the standards are changing, hotel rooms are no longer so dimly lit, plugs and sockets and wireless access for computers and handhelds are being provided, IP telephony is beginning to appear, broadband entertainment is reaching the hotel guest, and Wi-Fi is being made available throughout the hotel. The following Box 1.1 describes a hotel which has it all in Silicon Valley. Interesting to note is how the Wi-Fi availability reaches beyond the hotel. Also interesting to note are the telephone charges. And a word of caution, during the

¹ See, for example, *Battling with Broadband: How Hotels are using High-Speed Access to Compete for Guests*, http://www.gii.co.jp/english/cg15660_battling_broadband_toc.html

² <http://www.benchmarkhospitality.com/company/press/010203b.html>

power cut across North East USA earlier this year, electronic faucets and flush toilets stopped working. This stuff comes at a price.

Box 1.1

High-tech Hotel Valencia, San Jose, Silicon Valley

Don't rush to the front desk when you arrive at Hotel Valencia. Just step out of your car and let the doorman swipe your credit card through an electronic reader. Using a handheld computer dangling from his belt, he will confirm your reservation and make a magnetic room key for you on the spot. As you enter your room, the Internet Protocol phone will show you the latest stock quotes and your colleagues' flight delays. In the lobby and conference spaces, wireless Internet access, or Wi-Fi, allows you to send e-mail or surf the Web from your laptop. Later on, the IP phone's dining directory will help you find a great restaurant.

Developers say Hotel Valencia is one of the most technologically advanced hotels in the world... With the help of Silicon Valley tech giants Cisco Systems Inc. and Hewlett-Packard Co., Hotel Valencia guests have access to wired Internet connections up to 100 megabytes per second in their rooms and Wi-Fi access anywhere within the 17-hectare Santana Row neighbourhood. All rooms have IP phones and high-speed Internet connections, which are free of charge except for long distance telephone calls. Guests can enjoy video-on-demand movies and broadband entertainment programs by Los Angeles-based NXTV Inc. for an additional US\$12.95 a day.

HP has helped a dozen hotels provide high-speed Internet access, but HP spokeswoman Tracy DeDore says Hotel Valencia, which spent nearly US\$500,000 on technology infrastructure and equipment, is unique. 'This breadth of technology does not exist in any other hotel in the country,' Ms DeDore said.

Source: National Post, San Jose, California, 30 August 2003

Own-website promotions to bolster branding seem to be a trend. For example, the InterContinental Hotel Group claims to have been the first to introduce Internet booking in 1995, and revenues from Internet bookings 2002-2003 shot up 80 per cent, helped by the introduction of a Lowest Internet Rate Guarantee in May 2002 that offers discounts to anyone finding a cheaper rate. Apparently challenges to the rate guarantee averaged only 0.1 per cent of bookings.³ According to *The Australian*, 29 August, 2003, top hotels in Australia are offering similar rate deals for own-site Web-bookings. For example, the Hyatt offers a 20 per cent discount on any cheaper rate found.

³ http://www.traveldailynews.com/new.asp?newID=12117&subcategory_id=59

Restaurants

According to *Caterer & Hotelkeeper* (29 August 2003) a survey by American Express Establishment Services highlighted several areas respondents felt were important, a full food menu, directions to the restaurant, independent reviews and online booking. In the UK, Amex offers restaurants the opportunity to register on the company's own website at <http://www.livebookings.co.uk/amex/> which is a way to combine customer interest in Amex with the use of the card on discounts at many of the restaurants listed.

Airlines

The Boeing Corporation's Connexion service offers permanent two-way connections between an antenna installed on the plane and a broadband transponder on a satellite, offering broadband Internet to passengers during flight. In Europe Lufthansa and Scandinavian Airlines Systems (SAS) will start the service in 2004 following a successful trial period with British Airways in 2003. The first Asian service will be introduced by All Nippon Airways (ANA) and Japan Airlines on long-haul flights using transponders from the Tokyo-based Space Communications Corporation (SCC) SUPERBIRD-C satellite located at 144 degrees east. See <http://www.boeing.com/connexion/flash.html> for details. Many airlines are not yet convinced the time or the cost is right or the technology stable enough, but if air travel becomes more and more a working environment the advent of broadband may also see a redesign of aircraft space. Less dramatic but equally functional, Qantas and SITA in 2003 were offering a free SMS service to passengers.

Wi-Fi

Wireless LAN or Wi-Fi is becoming widespread in many cities around the world, especially in high density areas such as hotels, fast food chains, college campuses, multi-occupancy residential and business buildings, shopping malls, airports, etc. There may be a few technology questions still to be answered in terms of bandwidth and spectrum allocation, ubiquitous coverage in buildings with thick concrete or steel casing around lift shafts, security issues and the like, but the real issues are economic. What is the business case? The answers so far seem to be (a) it's good for business because it draws in customers, (b) our competitors offer it so must we, (c) somewhere down the line we can revenue share with the service provider that provides the connections, and (d) we can add our own local branding or web content and promotions to the access points. From the operators' viewpoint, offering Wi-Fi is a step towards becoming an all-service provider embracing both fixed-mobile convergence and voice-data-content convergence.

Travel

Despite SARS and 9/11 that hit the numbers actually traveling, the use of Websites to check out locations, make reservations and purchase tickets is clearly here to stay. According to EyeForTravel⁴ GetThere's 2003 Global Survey indicates that for the first time more business travel is booked online than by phone, while a My AvantGo survey found that personal travelers were more likely to purchase online than business travelers, by 74% to 41%.⁵ One estimate of North American households that use travel Web sites

⁴ <http://www.eyefortravel.com/index.asp?news=36836>

⁵ http://cyberatlas.internet.com/markets/travel/article/0,,6071_2211341,00.html

suggests nearly 30 per cent used the Web in 2001 to make their bookings, and over 40 per cent in 2002.⁶ By contrast only 1-3% of total travel bookings in Asia were made online in 2002.⁷ According to ACN's NetValue in May 2002 the most visited Website for travel in Hong Kong was Priceline. Wing On Travel, on the other hand, has the largest physical presence in Hong Kong and an active Website, although their 'About Us' page still dates to 2001.

For travel agents with Web sites the use of electronic brochures is the next step. Technologies already exist to allow customers to select the pages that interest them from an operators brochure, then have the pages emailed in pdf format. There is a push within the industry to adopt XML for brochure, event and content documents distribution that permits customers and agents alike to search and examine information.⁸

Clearly 9/11 followed by SARS put a major dent into travel, so projections made before SARS that the online travel market in Asia-Pacific could reach over US\$13 billion by 2004 are probably optimistic. The fact remains that online booking is the way ahead, and one question is whether the Global Distribution Systems (GDS) run by giants of the industry like Amadeus, Travelocity (Sabre), Expedia and Hotels.com (Interactive) and Galileo will also dominate the Asia Pacific market or will more local companies appear. The answer in the airlines business is likely to be determined by the decisions of the airlines themselves. According to *Travelmole*, September 2003, SITA, a provider of communications and logistics support to the airlines, points out that in Europe while most tickets are purchased through travel agents supported by GDS, around 10% of airlines are also selling no-frills tickets directly to the public.

Digital Cinema

One technology that may be coming to Asia is digital cinema – or maybe digital hotels, bars, clubs and restaurants – where content can be streamed in by wireless data-streaming, cable or satellite, but a lack of standards between servers that feed the projectors is holding this development back.⁹ Re-equipment of half empty theatres probably does not sound an attractive investment when existing equipment works 'just fine'. But newly built entertainment complexes providing a flexible range of digital content and events centred around that content could keep the venues open 24 hours a day by offering services to a variety of clients, for example, becoming a company training centre during the mornings and a night club after midnight. Streaming content is an approach also being adopted in the USA by the Walt Disney Co. using a service known as MovieBeam. It utilizes unused broadcast spectrum to by-pass cable and telecommunications companies, piping in up to 100 movies to be stored in a TV set-top box. Viewers are charged only when they watch movies that are stored on the box, play and pay. When broadcasting goes digital in Hong Kong there will be a lot of bandwidth available for such services.

⁶ <http://www.internetnews.com/ec-news/article.php/1488211>

⁷ <http://www.visitearth.com/views/20020903.htm>

⁸ <http://www.travelmole.com/cgi-bin/item.cgi?id=97627&d=101&h=303&f=304&dateformat=%o-%B>

⁹ See *Digital Cinema Technology* at http://www.mkpe.com/cinema/dc_technology1.htm

e-Sports/e-Games/e-Gaming/eBooks/e-Libraries

The use of broadband to deliver leisure to the public has many facets as this sub-heading suggests. Organizations like the Hong Kong Jockey Club already make extensive use of IT and telecommunications and a shift to broadband will offer them advantages at both ends of the business, making for faster connections between race courses, betting offices, backend data bases, etc. and allowing punters to watch the race on their mobile or handheld screens from various pre-determined angles. Everyday broadband access to sports facilities and concerts halls around Hong Kong could bring these events directly to people not yet involved or enthused. No doubt the 2008 Olympic Games will be a big stimulus to demand. Other kinds of games are those played at home on PlayStations, the Xbox and through home entertainment multi-media centres and these too are going online. New worlds of accessibility are also opened up by e-books and e-libraries and these can lead to creative e-communities linking schools, colleges, offices and homes. Many steps have already been taken in these directions, but the greater availability and affordability of broadband will allow them to become a very natural part of everyday life for the majority of the population.

Brief Two: Network Services (Session 2.2)

In the face of fierce competition in the fixed-line sector and the general economic downturn, pressure is mounting on HK operators to minimize cost and provide service differentiation. In response, they are in the process of overhauling and upgrading to Next-Generation IP-centric Networks (NGNs) that offer long-term cost advantages. NGNs also make the fabled “triple play” option viable, one which bundles TV (multimedia), broadband Internet access, and voice telephony into a single service stream and converges everything on one network. Content on top of an NGN is digital so it can be obtained in any media, any time, anywhere, and over any facility. The network uses routers and soft switches to prioritize and stream end to end, all IP compressed video, data, and voice traffic where last mile broadband access can be DSL, fiber, Ethernet, or even wireless – see Figure 2.1. Operators are installing new-fangled pieces of equipment like Broadband Remote Access Servers (pronounced ‘Bee-Razz’). All this upgrading has enabled an operator like PCCW recently to introduce a 22 channel TV offering that is a customized pay-per-channel product as opposed to the flat rate all-you-can-eat broadband service packages of the past.

The move to next-generation networking is coupled with HK operators’ growing reliance on the IT world and use of software products to isolate and reduce complexity – “the drive for simplicity.” Increasingly, HK carriers are deploying sophisticated systems to manage traffic (peer to peer, music file sharing, instant messaging, burstable “liquid” bandwidth on demand), security (to shield against Internet viruses, email spam), service installation, billing, customer retention and acquisition, enterprise resources, and data warehousing for cost, product, and customer information. Operators are mixing and matching different databases to better understand their customer base and to drive risk, as best as they can, out of their business.

Bringing these two developments together is the way of the future for telecom operators who wish to take full advantage of operational and services flexibility – see Table 2.1. In addition, they will have to demonstrate considerable business acumen in forging win-win relationships with content providers of rich media (be it games or business applications) that tackle thorny issues like settlement, billing, and who maintains service levels.

Issues

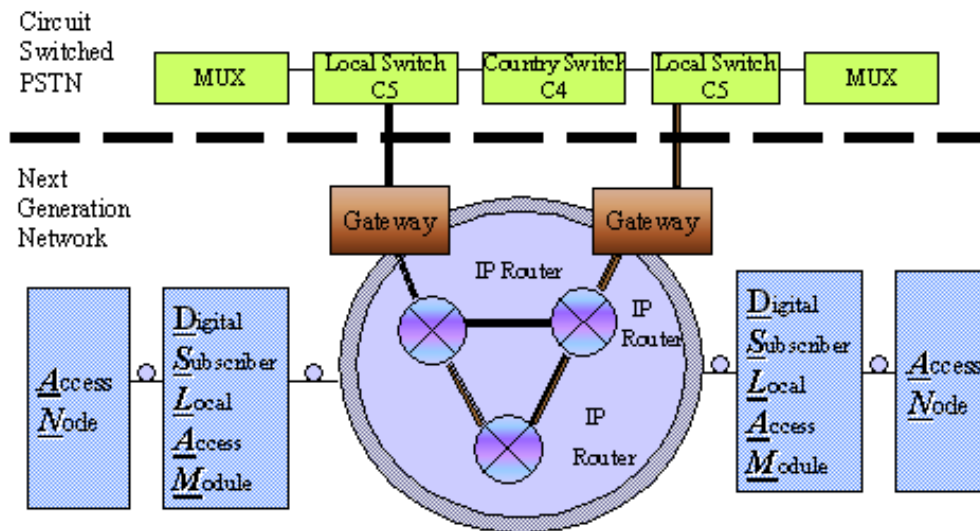
For operators, the following are some of the key issues. One, figuring out what their customers want is related to the type of services emerging. In the consumer market, demand for broadband broadcasting and IP videostreaming is the new frontier. In the enterprise market, there is a need for VPN (even for Do-It-Yourself DIY VPN service), business-class IP telephony, and advanced network features (classes of service, monitoring, security, reporting, application performance management) to run business applications like ERP. Enterprise customers have become much more discriminating in their purchasing decisions, and cost conscious. Of course, knowing what people and companies actually will want, and understanding how they adopt and adapt to new broadband technologies and services (the adoption and diffusion S-curve), continues to baffle the brightest of marketing minds.

Two, in increasingly competitive markets, operators have become “lean and mean machines.” Maintaining margins requires cost minimization (“taking opex out of the network”) and increased organizational flexibility. Here, the application of transaction cost theory is useful.¹⁰ In a telco’s day to day operations there is a huge amount of information-rich transactions – information that is continuously generated by dynamic bandwidth assignment, billing events, customer requirements, etc. This implies scale economies will triumph over highly segmented markets, leaving little space for smaller operators specializing in integrated services, especially for information-rich activities such as the management of long-term relationships with enterprise customers and of ongoing long-term contract partnerships with content providers. But that does not preclude some of these areas from being outsourced in the future by operators intent on minimizing their costs. Because of increased complexity in technology, business processes, and regulation, some information-rich transactions will be outsourced to large companies, like IBM, which are capable of shouldering long-term outsourcing contracts.

Lastly, success or failure in this industry, more so than in other industries, will be driven by the expected marriage of telecoms and IT and an operator’s skill at managing costs (“saving your way to success”) and markets (like e-government, e-learning, e-health, and e-business). In this respect, the HK-China connection plays to HK companies’ strong suit. Lacking market scale, HK operators’ proven ability to do business in China – to be enhanced by CEPA – will be very important.

Figure 2.1 – What does an NGN look like?

¹⁰ Transaction cost theory distinguishes transactions that involve long-term assets and relationships and ongoing coordination between transactors which are information-rich, in which case transactions are best done *within* the firm. Those which do not have these characteristics and have only simple information requirements are well suited for transactions *between* firms, which implies a liberal market regime.



NGN

In a circuit-switched system, different streams of voice traffic are spliced and merged together by the MUX (multiplexer) in order to fit more traffic down a pipe. The country (or tandem) switch links all other switches together. At the local switch level, many carriers have put in expensive ATM switches which can handle different types of traffic – X.25, Frame Relay, or IP. In an NGN system, switching and multiplexing is made simpler because of the nature of IP; a string of data is now turned into numerous small packets dispersed across the network and reassembled at the terminating point. NGN is called a connectionless network because no one circuit is kept open permanently between 2 people speaking, as is the case with a circuit-switched call where the circuit isn't broken until someone hangs up. Thus the network can be used more efficiently. IP edge routers are also connected to databases which contain customer billing information and to servers which host and cache content.

Table 2.1: Pieces of the Puzzle
Some Triple Play Standards

Video compression: Next-gen codecs	MPEG2, MPEG4, proprietary Microsoft Windows Media 9, even talk of MPEG 21
Session Initiation Protocol (SIP): part of standardization of signaling protocols for NGN	Dominant aspect of the architecture of IP voice, conferencing, enhanced service systems, Instant Messaging, and other converged applications
VoIP	IP-based voice; Skype is a new peer-to-peer (P2P) voice over IP service created by developers of Kazaa
IPSec – IP security	A more robust but complicated security protocol for VPN
Category 6 cabling	In building high performance wiring – Category 6 has twice the noise immunity from external interference compared to Category 5e. Better cabling can alleviate problems due to equipment variations or excessive noise in the environment.
Reach Extended (RE) ADSL – ADSL2 Plus; VDSL	Adds 750 meters of reach to existing ADSL services; FTTB/DSLAM architecture with VDSL modems enabling mass-market wide area symmetric services at 11-25 Mbps per user, will enable HDTV service
MPLS	Protocol for prioritizing traffic, for addressing router IP header; MPLS technology will help combine voice and data traffic on a single IP network

New Toys

<i>Hardware</i>	<i>Vendor</i>
VoIP	Acme Packet, Ai-Logix, Brooktrout Technology, Intel, NMS, Pika Technologies, TeleSynergy, Centile, Inc., Centrepoint Technologies, Cisco, Jasomi Networks
Broadband Remote Access Server (Bee-Razz): Connection made at Layer 3 so DSL connection can be connected to Internet, VPN, or to specific web application such as videoconferencing	Copper Mountain, Juniper, Redback Networks, Alcatel, Cisco, Laurel Networks, NET.com, Nortel
DSLAM	Pedestal Networks, Net To Net Technologies, Advanced Fibre Communications
Ethernet broadband, Gigabit Ethernet	Extreme Networks, ZyXEL Communications, Broadcom Corporation, Neopolitan Networks
IP VPN & firewall & IP service & multiservice edge switches: edge routers designed to aggregate traffic, maintain subscriber management, and perform some VAS – also known as “god boxes”	CoSine Communications, Shasta Networks (acquired by Nortel), Cisco, Juniper Networks, WaveSmith Networks (acquired by CIENA), Laurel Networks, Vivace Networks, Quarry Technologies, Sycamore Networks, Foundry Networks, 3Com
Do It Yourself (DIY) WAN	Virtela Communication
DSL and Frame Relay access for IP VPN	New Edge Networks
Gateways	Clarent, Cognitronics, Garuda Networks, MetaSwitch, Tekelec
SIP-based IP Media Servers	Convedia, Pactolus
Digital TV headend platform	VideoTele.com, Tut Systems
IP PBX	Nortel Meridian, Alcatel, Avaya, Mitel, NEC, Shoreline Communications, Siemens, Sylantro, Microsoft (VoIP server)
<i>Software</i>	<i>Vendor</i>
Traffic & Network Management	Alcatel IN platform, Tellabs, Dune Networks, Azanda Network Devices, Internap (P-NAP: Private Network Access Points), ADTRAN, P-Cube (P2P specialist), Motive, Micromuse, NetSolve
Security	Nokia Message Protector (spam, viruses), NetScreen Technologies (intrusion prevention), Network Associates, SonicWALL, SecureLogix Corporation, SnapGear (VPN firewalls), D-Link AirSpot Gateway (user authentication), Syntegra (identity and access management), Novell, TruLogica, RSA Security
Policy Based Network Management (PBNM)	Cisco, HP, Mercury Interactive, Tivoli, iPine Networks, Eurekify
Data warehousing	NCR (Teradata)
Customer relationship management & Workforce management & Knowledge management	SupportSoft, PeopleSoft, ACCPAC International, AMCAT, eOn Communications, Expanets, Stratasoft, Beeline, Siebel, Witness Systems, Centra Software
Billing	Agilent, Info Group, ISI, SAI, Strategic Data and Telecom, Veramark, Portal Software, CSG Systems, EDB Telesciences
Operations Support Systems OSS	IBM, Team Telecom International (TTI)

Brief Three: Broadband Content (Session 3.1)

Content and Consumer Demand

It is common for goods and services based upon new technologies to experience several false dawns before they finally succeed. The conditions of success depend upon numerous factors including a suitable complementary environment. For example, video conferencing was not so popular in the 1980s when it required special equipment in a studio, but as soon as it moved to the desktop computer with a broadband connection it became affordable and convenient. Today it is even becoming something for teenagers with broadband mobile phones. Video-on-demand and interactive TV are no doubt other examples soon to prove they can be popular in revised formats using an upgraded media. Plug-and-play digital technologies and affordable devices for access and viewing – such as TV/PCs, media centres, LCD flat screens, handheld and notebook computers, mobile phones, etc. – are rapidly emerging based upon the availability of a broadband infrastructure. The old idea of ‘build it and they will come’ is being replaced with a more hopeful ‘we will come to them and they will buy it’. HKBN, iCable, PCCW Broadband NOW, Yes TV over Hutchison’s network all are to some extent building upon customers who have already chosen to be connected to broadband networks that can supply digital programming and content. As Ricky Wong of HKBN recently put it ‘content may be king, but the network is queen.’

Content Chain

The content chain that is well established within the industry is based upon traditional modes of content delivery and payment. For example, Hollywood majors dominate the movie business and strictly control the film distribution channels and more recently sales channels for related products such as the book-of-the-film, the T-shirts, the soft toys, the cartoon version, etc. Cinemas work with traditional projection equipment and show a fixed fare of films for one or more weeks with little flexibility in either content of shows, times of shows, location of shows or in the use of the cinema facilities at other times of the day or night. TV stations work quite separately paying premium prices for high-value content, the smaller stations relying upon syndicated content. Subscription TV and pay-per-view models have mixed and fluctuating fortunes, while telecom networks have yet to find the right formula to make video-on-demand or iTV work. They also find the Hollywood majors inflexible when it comes to spreading the risk by accepting revenue sharing rather than upfront payments. At best, Hong Kong companies tend to get stuck with discounts that include a bundle of very second rate content. The cheapest content is live content, just as the cheapest music discs are live concert performances, hence a lot of chat shows, live sports, live concerts, etc. dominate the airwaves. Hong Kong is a small market so it is to be expected that keeping costs down rather than the quality of TV programming high or the range of movies innovative and varied is the priority.

But is that about to change? Until the 1990s it was widely thought that there was little room for more TV beyond ATV and TVB, and only one of them made a profit. Then Wharf Cable made a business and has 600,000 subscribers, and increasingly has

converted to broadband as iCable. After a couple of false dawns PCCW has re-entered the market with NOW Broadband claiming around 40,000 subscribers by September, and already in the market is the Hong Kong Broadband Network, soon to be followed by Galaxy Satellite. These are all broadband networks, and to work they have to change the traditional model of content creation and delivery and payment because market scale is not on their side. They have to grow the market to encourage a new form of usage and with it new types of content. For example, the youth market in Hong Kong seems particularly partial to music so the integration of TV, online chat, even online downloads of the music video on TV, and mobile SMS may prove especially appealing. The same inter-active principles could apply to many different segments of viewers. Why should trends in this direction work in the 2000s when they had a false dawn in the late 1990s? The answer, when it comes, is likely to be found on the demand side of the market rather than on the supply side as previously. In the 1990s content was packaged and pushed to consumers who were underwhelmed by it all, but at the same time peer-to-peer content and communications entered a new age. People, young people especially, designed their own modes of consumption and sharing content through portals such as Napster. Music file sharing became a world wide phenomenon. The reaction of the music and movie industries was antagonistic, for example forcing Napster to close, and now in the USA the industry is even going after individual consumers who share without permission or payment. Yet this is probably self-defeating, and if industries are losing sales and revenues because of it then maybe it's time to change the model and use the technologies to respond rather than react. Maybe the market is actually telling the industry something.

Content Protection

As the *Financial Times* (9th April 2003, p.18) put it after interviewing Michael Eisner, chairman and CEO of Walt Disney Corporation, Hollywood 'spent enormous sums encouraging people to watch its films and then spent even more devising ways to "control and limit" how people saw them.' Intellectual property rights sound like an extension of ordinary property rights, but they are not parallel concepts. Creative ideas are rarely uniquely attributable, and their reproduction usually involves few resources even if the development, design and production of their tangible results as goods and services may do so. For these reasons patents and even copyright often do not reside with the true creative originators but with those who put up the money. IPRs are principally justified where they can be judged to function as an incentive to innovation, but there is a thin line to cross. When a consortium of businesses asks for exclusive franchises or tariff barriers or other barriers to entry they are seen as being rent seekers and against effective competition. When they ask for extended IPRs are they not really after the same thing? If any one of the Hollywood majors went bankrupt would the market stop making movies, or would new entrants exploit new media and new means to make movie-like content?

These are controversial issues. For example, under pressure Hong Kong adopted a ban on parallel imports of video tapes and software, an extraordinary breach of free market principles. Some retreat has now taken place, but a similar pressure from the industry to use public law to ban or outlaw consumers exploiting new technologies to by-pass the tariffs private companies try to impose raises difficult questions. For example, callback using equipment beyond the control of Hongkong Telecom was encouraged by the regulator as a way to by-pass the IDD tariffs in the 1990s, yet in 2003 the Government is

proposing to ban a similar use of technology beyond the control of iCable to by-pass the cable TV tariff. Is the common law not sufficient in this case, or does common law offer a different perspective? And would the resources of Hong Kong not be better put into R&D for digital rights management (DRM) software solutions and applications?

There are basically two approaches to protection of content from unauthorized use. For many years conditional access systems (CAS) have been used to encode content, but the key and the content are packaged together and can be decoded together. CAS systems also cost around US\$10 per subscriber to install and operate,¹¹ which is high. DRM systems, on the other hand, aim to tag the key attributes of the content, such as category, ownership, origin, how and when it can be used, pricing, etc. These tags are read by the access devices seeking permission to use the content. Numerous proprietary systems are available, but there is no agreed international standard. The use of meta-tags opens the way for wider applications using XML, and a more successful area of standards setting has come from the Moving Picture Expert group (MPEG). MPEG 1 and MPEG 2 are being followed by MPEG 4 for fixed and mobile web-based multimedia content and MPEG 7 for multimedia searching, and MPEG 21 that will bring together all elements of search and delivery. It is to be written in XML-based eXtensible rights Markup Language (XrML).

Trends

The technological trends seem clear. Digital rights management, new standards for content search and delivery, and new devices for access and viewing will combine to drive both demand and the enabling technology for new forms of high definition digital content that can be managed simultaneously across many different delivery platforms. So content and delivery platforms and actual delivery to customers are the key elements that need to respond. On content, the key question is whether new media allows new entrants or whether economies of scale and scope will continue to dominate. If the latter, progress may be far slower than it should be, which is why the Hong Kong Government's apparent interest in promoting a 'Channel Four' solution to encourage local creative talent to flourish is interesting.¹²

Delivery systems and delivery platforms are where some of the most interesting developments are taking place. In the USA and in several EU countries, including the UK, cable has been an important delivery system, but upgrading to digital is a long tortuous process, largely because competition from ADSL and VDSL and IPTV has been slow to come about. In Asia and especially in Hong Kong the opposite is true. But until Asia starts a mass market for digital content the prospects for growth are limited. One driver will be the adoption of digital terrestrial transmission and the issuing of multiplexing licences to multicasters. Hong Kong is basically waiting the outcome of China's decision before deciding on the standard or standards to adopt. See Box 3.1.

¹¹ Medialive 'Content, Security & Digital Rights Management' White Paper v.3-02

¹² Attributed to Mr Ngai Wing-chit, PAS, Home Affairs, *South China Morning Post*, 25 September 2003, C.3. Also see [http://www.info.gov.hk/cpu/english/papers/baseline%20study\(eng\).pdf](http://www.info.gov.hk/cpu/english/papers/baseline%20study(eng).pdf) for the CPU (2003) *Baseline Study on Hong Kong's Creative Industries* which estimates around 4% of GDP comes from this sector.

Box 3.1

China and Digital Terrestrial Transmission (DTT)

China has decided to use the European-dominated standard for its digital television (DTV) cable broadcasting as a transitional one as it pushes ahead with its campaign to develop DTV in China. "Our national standard has not been decided, so we will adopt the digital video broadcasting-cable (DVB-C) standard temporarily," said Bai Weimin, chief of the broadcasting and television division under the Ministry of Information Industry. She said as the need to start DTV broadcasting becomes more urgent, China will first switch to the European standard. A home-grown DTV-C standard, which was expected to come out this month, was delayed mainly due to the immature state of technology. However, Bai said China will eventually adopt its own standard, which will be compatible with the DVB-C standard.

South Korea, which adopted the US-developed ATSC (advanced television system committee) standard, is said to pay US\$30-\$40 in royalties for every TV set. If the same fee was applied to China's 100 million cable television users, the Chinese people could face a royalty bill of more than 30 billion yuan (US\$3.6 billion). However, the industry cannot wait until the domestic standard is developed because of the need to start digital broadcasting soon.

According to the 10th Five-Year Plan for broadcasting, film and television (2001-05), 30 million households are expected to receive digital TV programmes transmitted via satellites, with another 30 million receiving their signal via cable, by 2005. "It is already the third year of the 10th Five-Year Plan," said Zhang Haitao, vice-minister of the State Administration of Radio, Film and Television (SARFT). "Time is pressing and the task is demanding, so we should accelerate the pace of change." He said the SARFT had picked 30 cities including Beijing, plus the provinces of Fujian, Jiangxi and Shaanxi, for trial broadcasts. The State-level China Central Television will be responsible for building a central programme platform, including paid TV programmes and paid film TV channels, which is expected to transmit digital TV programmes this month.

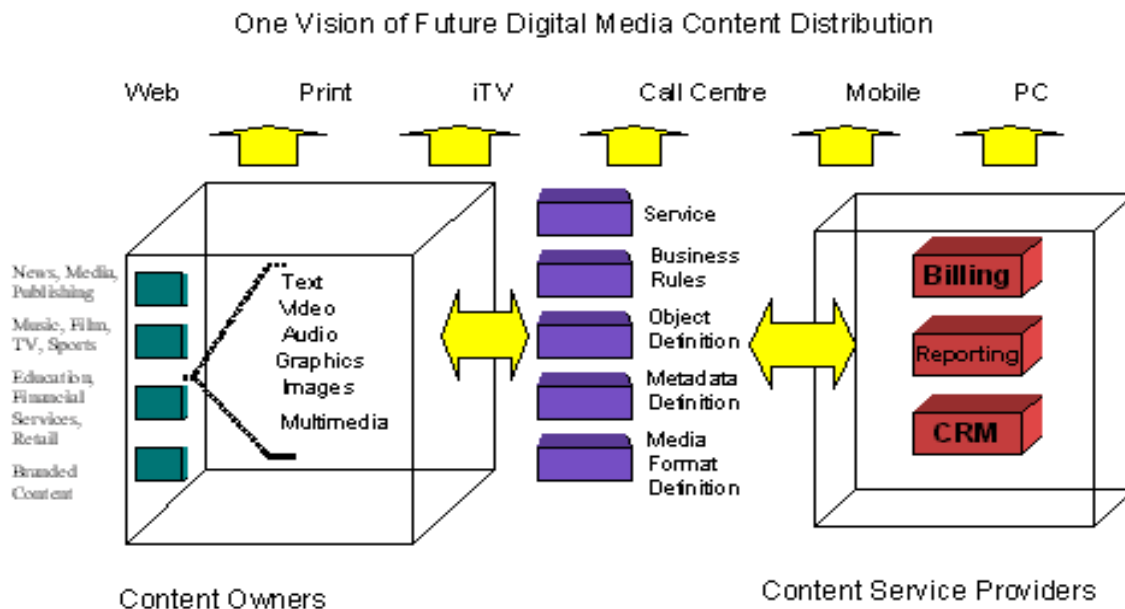
The SARFT aims to introduce 1 million TV households to digital broadcasting this year. Digital TV broadcasting, with its high picture quality, large transmission capacity and value-added services, is meant to cover the whole of China by 2010, when the country will stop using the current system of analogue TV broadcasts. Zhang estimates up to 1 trillion yuan (US\$120 billion) will be spent on upgrading current broadcasting systems and buying digital TV sets in the switch to digital

TV broadcasting, creating 500,000 jobs in China.
 Source: China Daily, 22 July 2003

Digital Platforms

The central piece of the jigsaw will be platforms that offer fully integrated digital management of the entire content value chain, akin to the direction of IP-based Next Generation Networks (NGN) in the telecommunications domain. Realizing this concept will be as lengthy as any other technologically-inspired vision of the future for two reasons. First, the world and the people in it are not technologically determined, although they may be

Figure 3.1



Source: AssetHouse, Content Object Architecture

increasingly influenced by the ‘new technologies.’ Second, innovations never progress evenly along a technological frontier, rather they create temporary gluts and bottlenecks in different parts of the system, and then economics kicks in and directs R&D resources to the bottlenecks where there is profit for those who can relieve them. There is a continual technological leapfrogging, in which some technologies are more pervasive and generate more widespread knock-on effects than others. But for the ideal fully-integrated system we can end with a glimpse at just one example, this from AssetHouse who have progressed as far as anyone in this area. See Figure 3.1.

Brief Four: Logistics (Session 3.2)

Over the past decade, Hong Kong's logistics companies have proven themselves to be tremendously efficient and adept in responding to, and benefiting from, a changing business environment, and the vast opportunities, or "low lying fruit to be picked," on Hong Kong's doorstep, a.k.a. the Pearl River Delta. They have succeeded despite accusations of astronomically high cargo handling charges (*SCMP*, 22 September 2003) and a reliance, more or less, on traditional means of exchanging information through telephone, fax, or email. To date, Hong Kong's logistics companies have made Hong Kong's airport and seaports among the world's busiest and most modern facilities, and the trucking cross-border point at Lok Ma Chau one of the world's most congested. But the pace of change in Hong Kong's logistics sector is set to pick up significantly. Some of the key drivers of change are listed below.

- China's WTO implementation only 2 years down the road
- The recently announced Closer Economic Partnership Agreement (CEPA) between Hong Kong and China – see Table 4.2
- A push on the part of large European and American buyers to automate work processes and to "e-enable" information flows
- More manufacturers opting for the Just-In-Time practice
- The US government's Container Security Initiative (CSI) in response to the 9-11 event¹³

These changes open up new possibilities for economic growth but also pose new challenges as Hong Kong seeks to retain, and enhance, its position as the region's premier logistics hub. A quick glance at Hong Kong's logistics sector reveals an astonishing diversity in the sheer number and size of companies involved, in the number and variety of documents and transactions handled, and in the degree of sophistication present or absent in company IT systems.

Mapping out the steps in a freight forwarder's documentation flow illustrates the extent to which diversity is a fact of life in logistics – see Figure 4.1. The extensive paper trail is being rendered electronically, as much of the data [content, weight amount, destination, etc.] is repeated. Tradelink in Hong Kong is a platform for the electronic submission of trade declarations (just one of the many documents in the documentation flow). It has a user base of around 53,000 "trading" companies. This figure is made up of the different types of companies involved in the logistics business in HK, either as a "cargo owner" – i.e. the consignee, the shipper, the import-export firm, the manufacturer, the retailer – or as a service provider – i.e. the freight forwarder, the carrier, the shipping line, the third-party logistics firm, the trucking company, the terminal operator, the air cargo

¹³ In the Container Security Initiative (CSI), US Customs and Border Protection officers assist local officials in HK and Singapore in screening suspect shipments before they are loaded aboard a ship to the US. Shippers must file a manifest with US Customs 24 hours before loading commences. This can be done electronically through the US Customs's Automated Manifest System (AMS).

handler. Many of these companies are SMEs – “two guys and a truck” – engaged in some aspect of the logistics industry in HK – see Table 4.1.

Table 4.1
Number of Logistics Companies in HK

Sector	Number of Companies
Stevedore	100
Sea Freight Transport	205
Ship Management and Chartering	92
Cargo Handling Terminals	8
Trucking and Container Haulage	9,354
Warehouse and Cold Storage	298
Airfreight Transport – Airline Companies	40
Air Cargo Terminal Operators	2
Forwarding Agents (Air and Sea)	1,902
International Couriers	17
Other Transport Logistics Service Providers	47
SMEs	Tens of thousands

Source: Interviews, Vocational Training Center 2002 Study

The SMEs handle approximately about half of HK’s total trade, and a large number of them aren’t doing electronic submissions to Tradelink. This raises the point that all these different players have radically different levels of IT capabilities and requirements. Figures 4.2A and 4.2B outline the surprising hodgepodge of information systems, networks, and services currently in use in HK’s logistics sector.

Table 4.2
Present Timeframe for Establishing Wholly-owned Enterprises in Logistics Services

	WTO commitments	Under CEPA
Freight forwarding	Jan 2006	Jan 2004
Storage and warehousing	Jan 2005	Jan 2004
Freight transport by road	Jan 2005	Jan 2004
Freight transport by rail	Jan 2008	
Courier services	Jan 2006	
Maritime transport		Jan 2004
Logistics Services		Jan 2004

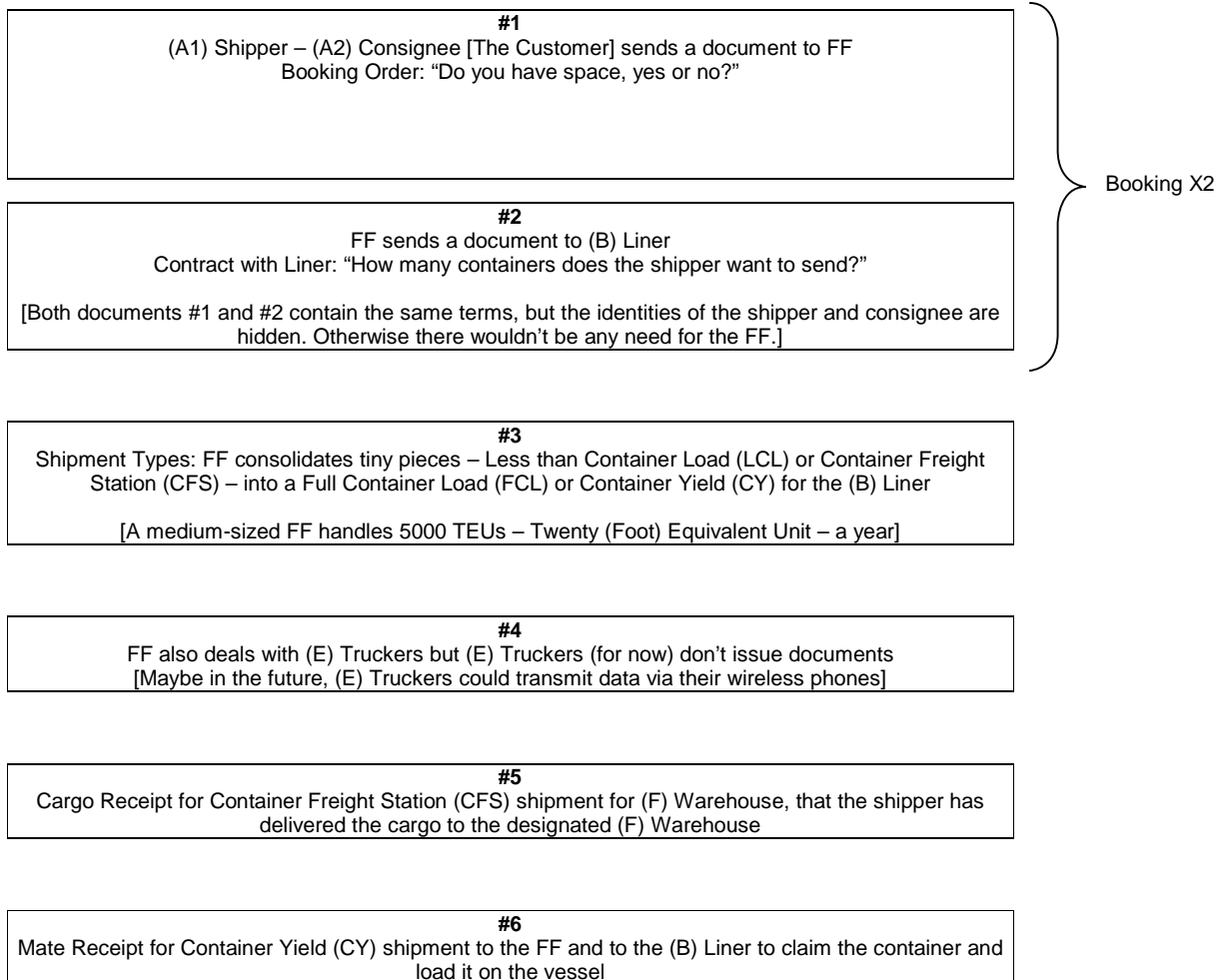
Source: “CEPA: A Tentative Analysis of Its Impact on Hong Kong,” HK Trade Development Council Research Department, July 2003

Figure 4.1: Diversity Alive

Parties that a Freight Forwarder (FF) Deals With

(A1) Shipper – (A2) Consignee (B) Liners (C) Customs (D) Ports (E) Truckers (F) Warehouse

FF Documentation Flow



#7

Bill of Lading (or Airway Bill if shipped by Air)
(A2) Consignee is say in the US, the (A1) Shipper in HK
The Bill of Lading serves as a "baggage tag" (proof) so that the person at the final destination can claim
the cargo

#8

Cargo Manifest to (C) Customs and to Agent (company overseas that deals with FF to make sure
delivery is made to factory or retailer)

#9

Bill of Lading information included in special manifest to (B) Liner

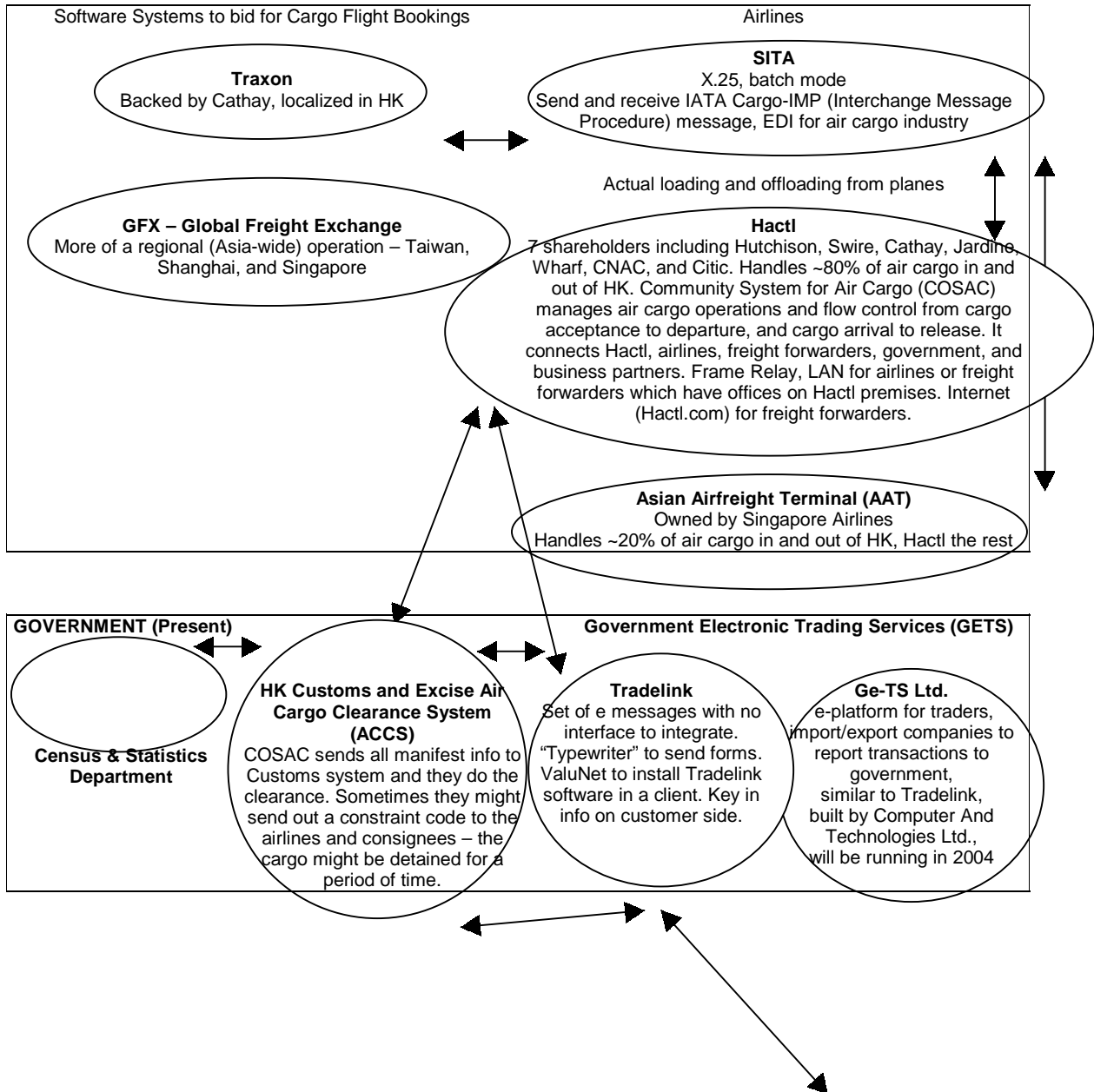
#10

Other (C) Customs documentation in HK and at destination
In HK Tradelink, in the US Automated Manifest System (AMS)

Figure 4.2A: PORTS AND TERMINAL OPERATORS

IT Smorgasbord, Profusion of Information "Clouds" for Air, Sea, and Land Transportation: Some Examples in HK

AIR CARGO



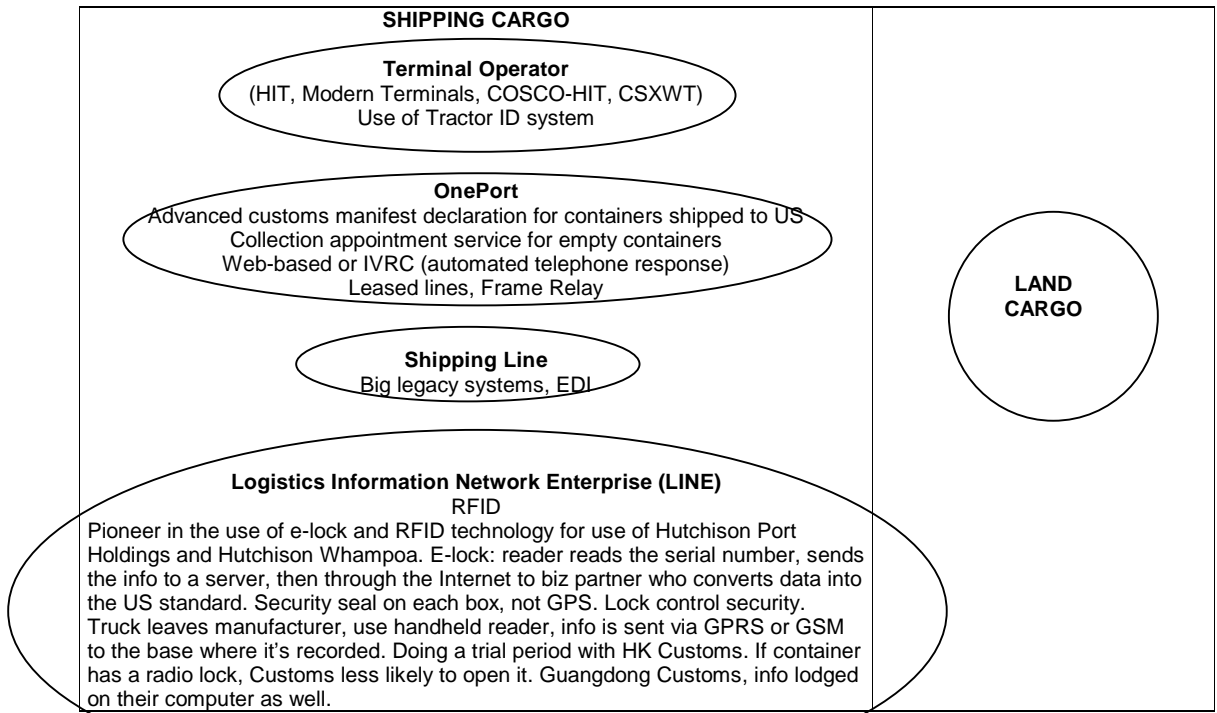


Figure 4.2B: LOGISTICS SERVICE PROVIDERS AND USERS

Land/Sea/Air

**Third Party Logistics Providers
3PL to 4PL**

(Outsourcing Movement)
Accommodate many different data formats

Kerry

Tracking via GPS, view status on Web browser, do inhouse software development
FR, will move to MetroLink, a local carrier's high bandwidth offering, DDN leased lines in China, VPN to Australia office

3PL: Retailer sends clothes to warehouse. Put in the labels and the bar codes, sort and pack clothes according to different colors, sizes, and ship them to different stores. Run them through Warehouse Management System (WMS) and shipping system – and they're off to Australia or New Zealand. Retailer sends us a purchase order and we send them back a confirmation. Some use SAP, others JD Edwards. Generate a file which we can feed into our own system, then generate a confirmation in a defined format that complies with the systems run by our customers. They don't touch the integrity of the data – nor do we touch the integrity of their data.

4PL: Vendor Management Inventory for mainland PC maker who wants to cut costs and reduce inventory, handle all suppliers, system to system, machine to machine integration, seamless, don't need to rekey info

Exel

EDI, American standard (ANSI) and European (Edifact), WAN, FTP, DDN leased lines in China, FR Dongguan Hub

i-Exel: permits (SMEs) to do shipper letter of instruction via the Internet

3PL: VAS: Dell in Xiamen – "reverse logistics." Do repair maintenance agreement for them – ship back (faulty) PC and get replacement.

**Software Startups – Aggregators – ASPs
Aimed at SMEs**

DigiLogistics

Just provide the IT platform, the documentation, not the actual execution; an aggregate view by collecting info from different service providers. This way the user (shipper) doesn't have to go to different websites to view shipment status. They view all their shipments (with different "service providers") on our website. At the same time, they can check out schedules, do [online] booking, negotiate prices [through a module we've built], confirm or create shipping orders. Orders are sent to the service providers who in turn generate a bill of lading > *visibility*, management, track & trace. Perceived neutrality. For SMEs who don't have resources like a Kerry or Exel and aren't willing to invest in building such a platform themselves.

Truck Driver

Wireless notification (SMS)

Government (FUTURE)

Digital Trade and Transportation Network (DTTN)
Integrated logistics IT platform for HK SMEs. Company like Exel can get the "pieces" from SMEs more easily when they're part of DTTN.
Overcoming the "digital gap in the supply chain"

SEE APPENDIX

Cargo Owner Community

**Retailer Point of View: Distribution
Supermarket Chain**

From ISDN to MetroLink
Efficient Customer Response (ECR) system, ERP

Trying to reduce direct deliveries from suppliers to stores, consolidate distribution, work closely with small local suppliers, try to raise their IT level
Inventory Management, Stock Replenishment
Lots of mistakes are made when store staff scan items – need to better train staff and routinize procedures
Want to do global sourcing and buying as embark on international expansion, quickly bring new stores online

**RosettaNet (Intel)
XML**

B2B standard in support of IT, EC, semiconductor industries. Facilitate ERP to ERP, server to server communication – reducing the # of keystrokes even further.
Partner Interface Process (PIP)

Li & Fung

Microsoft BizTalk Server
SME supply chain software

EDI engine & translator for whatever input/output format one's got to deal with; exchange "shop" info at the server level

As a result of the key drivers mentioned earlier, the logistics business is making more demands on a company's IT capability. Table 4.3 below summarizes the major technology and service trends in logistics, keeping in mind what the implications are for HK SMEs.

- What is the cost to HK SMEs for not upgrading their IT capabilities?
- Do they risk losing business to more IT capable organizations located elsewhere in the region?
- What motivates SMEs to adopt new IT systems?
- Are large companies and government the only ones who benefit from IT? Will SMEs be sucked up to plug and play into a unifying system?
- Will IT, like it or not, truly transform the industry? Or are IT gains overstated?
- Is change more of an incremental market development that will sort itself out over the long run?

Table 4.3: False Gods?

Concluding Remarks

Below are some questions to bear in mind. The TRP plans to run a TIF forum during 2004 that will be devoted entirely to the logistics sector, to explore these issues in greater depth.

On the government's side

- What progress is being made on cross-border coordination online?
- What is the relationship between HK Customs and HK logistics companies in so far as adoption of new technologies like RFID is concerned?

On the industry's side

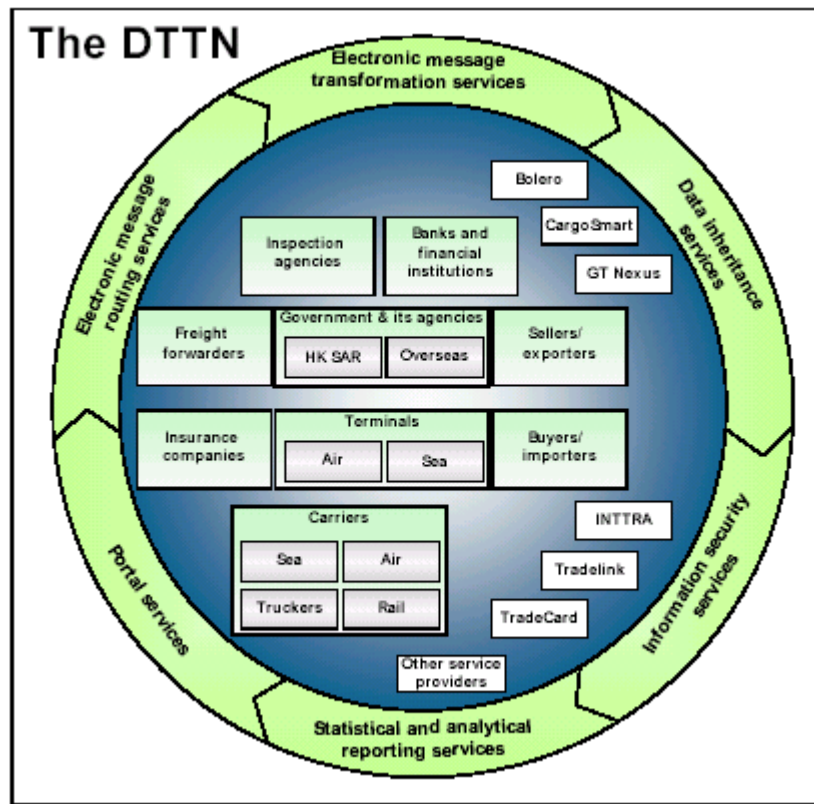
- What can large players realistically offer to SMEs in terms of making the case for greater use of IT?
- How far can the Logistics Council (and organizations like the HK Article Numbering Federation, the Hong Kong Association of Freight Forwarding and Logistics, the Hong Kong Logistics Association, the Chartered Institute of Logistics and Transport in Hong Kong, the Hong Kong Sea Transport and Logistics Association, the Hong Kong Shippers' Council, and the Institute of Purchasing and Supply of HK) get the entire industry to move in the same direction?

On both sides

- How best to take advantage of CEPA?

APPENDIX

Functional Blueprint of DTTN, DTTN Final Report, Port, Maritime and Logistics Development Unit, Economic Development and Labor Bureau, HK SAR, November



Issues
bandwidth fails, mission critical data
Users don't like to commit commercial information in electronic form
Not available in certain districts of HK

EDI	Tried and tested legacy system	Not real time, not Web-browser enabled, need for middleware which requires customization and inhouse development, numerous different standards, manual bookings then inputted into system so still lots of manual labor required
XML	Unifying standard, harmonization	Still under development, many major users perfectly content with EDI legacy systems (inertia) – airlines and shipping lines
RosettaNet Intel Business Link	Near to complete automation of process, system-to-system integration, increase number of transactions done, cut down on mistakes Benefits from a dominant market player like Intel pushing the standard on its customers	Pricy, market acceptance still missing, IT “silos” within companies, trust issue: letting a potential competitor inside your system
DTTN	Open, transparent platform which makes sharing of information easier, raise SMEs IT levels without SMEs “breaking the bank”	Vague idea in community of what DTTN stands for, no great expectation, still more concept than reality, reinventing the wheel? needs strong backing and push by HK government to cultivate the market, compulsory participation on part of HK SMEs? How comprehensive the deployment? How easy to integrate with other platforms? How to come up with one standard for an industry as diverse as logistics?

2002

RFID	Tracking via RF tagging. Can replace barcoding. Can be affixed to anything from large crates to individual items. Can hold many different types of info [expiry dates, dues, etc.]. More than just electronic locks. e-lock/e-seal "Without CSI, we wouldn't be doing this."	How is cross-border coordination of radio tags supposed to be achieved? So many different partners to work with, especially slow moving government bureaucracies Who owns the scanning machine at port (local Port Authority)? Cost: only more expensive items like plasma TV screens and not for individual oranges. Who bears responsibility and cost for e-lock? Manufacturer, HK Customs, US Customs, airline, shipping line, freight forwarder? Privacy concern: inform consumers when RFID tags are present, offer them the ability to turn off tags, and offer control over how information collected from RFID tags is used
GPS	Better tracking	Integration with RFID?
SMS	Could become a popular way of sending data to truck drivers	They still prefer voice
Wireless PDA for internal use	In use now by companies like UPS and FedEx for employees to access database	Too expensive for SMEs?
Web-based portals like OnePort or Digilogistics	Accommodate dynamic relationships	Neutral? Overlapping? Incentivization?
Better Service: Improved Customer Service and Satisfaction Levels		
Track and trace status of shipment through Website	Total visibility, ability to respond to customer requirements (pressure) more quickly	Front-end & back-end integration has to be worked out
New information flows are generated	"Many of our customers don't know how much stock they have and all the stocks' movements. [Now they can make] better informed business decisions, when to manufacture clothes, when to stop a production line."	A lot of financial services for the logistics sector remain offline (no online letter of credit clearance)
Outsourcing: more service-oriented	4PL move to VAS like Vendor/Warehouse Management and Distribution Center Hubs, "one-stop, one-shop, end-to-end" logistics solutions; higher margins; work with customers to do sales promotions (packing together 2 bottles of soy sauce for the price of one) Concentrate on "core competency"	3PL still involves lots of manual labor despite having advanced IT systems: "Mountain of unsorted clothing... we have 30-40 people sort it out with a barcode system." Need to accommodate all different formats from customers, legal responsibilities for inventory sometimes unclear, underestimate difficulty of getting different systems to "talk" to one another on a system-to-system basis, customers stubborn, politics (fear of job loss), resistance to change, all customers have very different needs from cold storage for orange juice to handling chemical stuff. IT knowledge has to be diffused throughout organization not just concentrated in IT department, more tightly linked to business understanding
Flexibility, Efficiency	Ability to add new customers to system quickly [new reporting scheme, new RF scanning scheme, etc.], make adjustments to billing system more efficiently, cost reductions (devote more resources to sales and marketing, less needed on operational part)	Need good project management skills to install new IT systems, clearly defined milestones, costs are often byproduct of market structure (cartel, collusion), areas where IT can do little. Mistakes inputting data into system are still made
CEPA	No longer require JV for license in China, big for customers of logistics companies like manufacturers so expect increase in business demand for logistics services	Increase in road traffic so physical connectivity projects have to keep pace (HK-Guangdong bridge project), manual labor in China still so cheap that IT isn't really needed, more of an impact in banking and legal sectors?

Brief Five: Citizens and Public Services (Session 4.1)

e-Government

Hong Kong has been making important strides towards placing Government online for citizens and business, especially since the Digital 21 strategy document was first issued in November 1998. Now all bureaux and departments have interactive websites, joined up with each other and with websites outside Government, accessible through many different fixed line and wireless devices. This is being activity promoted under the Interoperability Framework that heralds the adoption of XML (eXtensible Markup Language).¹⁴ Some 90% of Government services should be online by end 2003.¹⁵

e-Citizens

Citizens can access Government websites directly¹⁶ or through the ESDLife portal. A 2003 survey commissioned by the ITSD of over 3,000 respondents found that 69 per cent had used e-Government services, and 63 per cent were aware of ESDLife, a steady rise from previous years.¹⁷ In 2002 Census & Statistics found 18.1% of 10,000 respondents had used e-Government, 74.1% by direct access, 10.6% via ESD and 15.3% using both means. A TRP survey¹⁸ in December 2002 found that 12.5% of its 526 respondents used the EDSLlife portal to access Government sites. The ITSD 2003 survey supports the view that indirect access is popular as the following table 5.1 indicates. 72 per cent connect directly to e-Government sites access from home, 23 per cent from the office and 2 per cent from school, and of those accessing e-Government sites through ESDLife 66 per cent do so from home, 20 per cent from the office, and 11 per cent from kiosks.

Table 5.1

¹⁴ See http://www.info.gov.hk/digital21/e-gov/eng/press/doc/ITBPaper_IF_20021209_e.pdf

¹⁵ <http://www.info.gov.hk/digital21/e-gov/eng/press/doc/itb0708cb1-2192-1e.pdf>

¹⁶ <http://www.info.gov.hk> had over 1 billion page hits in 2002.

¹⁷ A steady rise from 28.7% in 2000, 32.4% in 2001, and 39.7% in 2002. See Census & Statistics (2002) Thematic Household Survey, Report No.10, p.138

¹⁸ http://www.trp.hku.hk/papers/2003/m-commerce_hk_210103.pdf

EDSLife website – Government Services	Awareness	Usage
Online booking of facilities or services	26%	6%
Browse information and enquiries	23%	8%
Online financial management	23%	
Online appointments for bookings/licences/certificates	21%	4%
Online library services	21%	6%
Download Government forms	21%	8%
Online job search and recruitment	18%	4%
Online registration services	15%	
Online submission of information to Government	14%	
Online business registration	12%	
Online change of person particulars	11%	
Online purchase of Government publications	11%	
Commercial services including E-Shop	9%	
Banquet venue enquiry service	4%	

Source: ACNielsen ‘Survey on Public Opinions on E-Government Services – Executive Summary’, ITSD (2003)

PC Penetration and Electronic Commerce

However it is measured, PC penetration of households in Hong Kong is very high. Census & Statistics use large sample (10,000) personal interviewing, while the TRP uses small sample (500) telephone interviews, so any bias in the data is systematic, and both sets of data show the same order of magnitude of growth. See table 5.2.

Table 5.2
Percentage of Households with At Least One Computer

Year	Census & Statistics	TRP
1998	34.5%	48.8%
2000	49.7%	64.2%
2002	62.1%	77.3%

Source: Census & Statistics (2002) Thematic Household Survey, Report No.10; TRP http://www.trp.hku.hk/papers/2003/m-commerce_hk_210103.pdf

Of these households the TRP survey found 71.5% had broadband, which implies an overall broadband penetration rate of 39.3 of all households. Census & Statistics found that 8.6% respondents in 2002 had made online transactions, while the TRP found 11% had made online ordering or purchasing.

e-Business

During the 1990s the scope of the ITSD’s responsibility was widened to promote and facilitate the adoption of IT and electronic commerce cross the Hong Kong economy, building upon Hong Kong’s excellent telecommunications infrastructure. The following table 5.3 shows that from a sample size of 4,635 business establishments in 2002 only half used PCs and recent growth has been slow; also only 1.5 per cent used electronic commerce to sell goods, services or information, but growth here was high albeit from an

almost non-existent base. The growing adoption of web-pages also indicates that despite the dot.com bomb electronic commerce is here to stay.

Table 5.3

Percentage of Establishments in Sample using IT and Electronic Commerce

Number of Establishments	2000	2001	2002
Use a PC	51.5%	49.7%	54.5%
Internet Connection	37.3%	37.2%	44.2%
With a Webpage	7.3%	10.7%	17.8%
Electronic Commerce			
Ordered or purchased goods, services or information	4.9%	6.2%	7.1%
Received goods, services or information	35.3%	40.0%	45.2%
Sold goods, services or information	0.3%	1.1%	1.5%
Delivered goods, services or information	8.1%	12.4%	12.1%

Source: Census & Statistics *Report on 2002 Annual Survey on IT Usage and Penetration of the Business Sector*, Summary of Results; *Hong Kong as an Information Society, 2002 edition*

This summary table 5.4 shows the transport, storage and communications sector, which makes up a large part of the logistics supply chain, is the lowest percentage user of PCs, and that small companies which dominate the data are least likely to use a PC.

Table 5.4

Percentage of Establishments in Sample using Personal Computers

By industry	2000	2001	2002
Manufacturing, electricity and gas	48.6%	39.6%	40.7%
Construction	45.3%	45.8%	44.8%
Wholesale, retail, import/export trades, restaurants & hotels	53.1%	49.5%	58.1%
Transport, storage and communications	27.6%	29.2%	30.6%
Finance, insurance, real estate and business services	74.5%	76.1%	77.7%
Community, social and personal services	43.5%	43.4%	41.4%
Total	51.5%	49.7%	54.5%
By Employment Size			
Large	92.0%	93.4%	94.6%
Medium	78.2%	79.2%	76.6%
Small	47.9%	45.7%	50.7%
Total	51.5%	49.7%	54.5%

Source: Census & Statistics *Report on 2002 Annual Survey on IT Usage and Penetration of the Business Sector*, Table 1.1

This summary table 5.5 shows that the use of electronic commerce to sell goods, services or information is dominated by the finance, insurance, real estate and business services sector, and by large establishments, although small companies were the only growth area

in 2002.

Table 5.5
Percentage Selling Goods, Services or Information by Electronic Commerce

By industry	2000	2001	2002
Manufacturing, electricity and gas	0.3%	0.8%	1.8%
Construction	0.0%	0.0%	0.0%
Wholesale, retail, import/export trades, restaurants & hotels	0.3%	0.9%	1.2%
Transport, storage and communications	0.1%	0.6%	0.6%
Finance, insurance, real estate and business services	0.9%	2.6%	4.3%
Community, social and personal services	0.1%	1.2%	0.4%
Total	0.3%	1.1%	1.5%
By Employment Size			
Large	4.4%	8.5%	6.5%
Medium	0.5%	2.4%	1.9%
Small	0.2%	0.8%	1.3%
Total	0.3%	1.1%	1.5%

Source: Census & Statistics Report on 2002 Annual Survey on IT Usage and Penetration of the Business Sector, Table 1.1

e-Procurement

The Government Logistics Department (GLD) - previously Government Supplies Department - aims to have 80% of tender documents using the Electronic Tendering System (ETS) by end 2003, although higher-value 'Works Tenders' which have very large document requirements are still handled by CD-ROM. Government have now outsourced the running of ETS, a system that conforms to the WTO's Government Procurement Agreement (GPA) that keeps the tendering system open to the world.

Issues

- What are the costs and benefits to the different industrial sectors of a faster rate of adoption of IT and investment in electronic commerce? Is there an economic case for public incentives for private initiatives?
- What form if any should Government leadership take? Is the DTTN model the way ahead?
- Putting service into broadband is the meeting of the world of telecommunications, a public infrastructure, and the world of IT, a private marketplace. Public networks are interoperable but not all private systems are. How far are the issues of standardization and harmonization important as public and private issues?
- Is open source software the way to go for public and private sectors alike?
- How key is the security issue?
- What are the drivers of IT business adoption and diffusion in Hong Kong? How far will Hong Kong influence Mainland China and Mainland China influence Hong Kong? What advantages does CEPA offer the IT sector and what influence will it have?

Brief Six: Financial Services (Session 4.2)

¹⁹ Even SWIFT that operates the worldwide interbank financial telecommunications service only announced in September 2003 it was to move off its old X.25 network to a NGN in 2004. The financial and banking services sector has enjoyed mixed fortunes since the dot.com

crash, but this seems more demand-determined than supply-driven.¹⁹ For example, online stock trading was particularly badly hit by the market collapse post-2000. The Lowtax network website

During the high-tech boom in 1999 and 2000, four out of the top five US online brokers recognised Hong Kong as a major market; but online securities trading in Hong Kong was an early casualty of the dot-com meltdown and the international equity slump, with major US brokerages retreating from the SAR in 2001 almost as quickly as they had arrived in 1999 and 2000. By 2003, however, it seemed that on-line trading would finally have its day in Hong Kong, as a combination of better technology, burgeoning interest from mainland visitors and the impact of SARS has pushed on-line trading volumes to historic highs.²⁰

More resilient or less volatile than stocks trading, Internet banking also accelerated owing to SARS. As the table 6.1 shows, HSBC leads by a long way, and together with the Hang Seng Bank controls over 60 per cent market share of the top ten online banking sites in Hong Kong.²¹

Table 6.1

Internet Banking in Hong Kong during SARS			
Customers	Pre-SARS Feb-03	Full SARS Apr-03	Apr vs Feb
Total Internet Users	2.17m	2.44m	13%
Top 25 Bank Sites	0.48m	0.61m	27%
Active Reach	22.2%	25.1%	13%
Bank	Unique Internet Banking Audience		Change
HSBC	279k	374k	34%
Hang Seng	162k	229k	41%
BOC	43k	68k	58%
Standard Chartered	55k	61k	11%
Bank of East Asia	56k	60k	9%

Source: ACNielsen url: <http://www.acnielsen.com.hk/news.asp?newsID=93>

For several years many would have agreed with the statement that ‘Hong Kong banks have been slow to equip themselves with Internet payment processing systems. The banks initially claimed to be uncomfortable about processing payments received from outside Hong Kong via the Internet because of the additional credit risk. Banks in Hong Kong charge about 2.5% for credit card payments but charges for payments received on the Internet shoot up to 4-10%.’²² Growth of Internet banking is now speeding up as more homes have access to a PC and an ISP.

Table 6.2

²⁰ <http://www.lowtax.net/lowtax/html/hongkong/jhkecom.html>

²¹ <http://www.upstreamasia.com/clientnews/nielsenratings/00000477.html>

²² <http://www.lowtax.net/lowtax/html/hongkong/jhkefac.html#online>

Mid-Year	Users of Online Banking in Hong Kong
2002	522,000
2001	315,000
2000	137,000

Source: AC Nielsen

The trends are regional. ACNielsen research in May 2002 found that South Korea has the largest number of active Internet bankers (5.3 million), followed by China (2.6 million) and Taiwan (1.7 million). Being much smaller in population size, Hong Kong and Singapore have smaller online banking populations (600,000 and 400,000 respectively).

Box 6.1

Hong Kong and Singapore – Research Organizations Can't Quite Agree

But research organizations don't seem to agree on the intensity of usage, especially when comparing Hong Kong and Singapore. AC Nielsen²³ find that

levels of Internet banking activity are highest in Hong Kong and Singapore. While South Korea has more Internet users banking online, only about half of them are banking online monthly or more often (compared to 77 per cent for Hong Kong and 74 per cent for Singapore). Similarly, Hong Kong and Singapore have the highest percentages of Internet users who bank online daily or weekly (30 percent for Hong Kong and 24 per cent for Singapore, compared to 20 per cent for South Korea, 8 percent for Taiwan and 3 per cent for China).

On the contrary, an IDC study²⁴ in April 2003 finds

Hong Kong and Singapore offer an interesting contrast. Although Hong Kong boasts a slightly higher percentage of Internet users with an online banking account, only 64% of them admitted to using it in the last 3 months, as compared to 76% in Singapore. When total monthly bank interactions are taken into account, Hong Kong customers were far more likely to visit the branch than their Singaporean peers, but the frequency of Web interactions was almost identical. Going forward, the Web will grow in stature in both markets, commanding a larger share of total bank interactions.

Costs and Savings of Internet Banking

One estimation suggests it costs small and medium sized banks between HK\$50 – HK\$100 million to set up Internet banking, mostly in hardware and software costs, plus annual maintenance and upgrades of around HK\$25 million. The figures for larger banks are more to the tune of HK\$100- HK150 million and recurrent costs of HK\$30-HK\$50

²³ http://www.consult.com.au/press/press_2002_05_29.shtml

²⁴ http://www.idc.com.sg/Press/2003/AP-PR-Internet_banking.htm

million.²⁵ Source: May 2001 GC.comm.²⁶ According to Mr Ramaswami, the vice president for e-commerce at Citibank, speaking at the HK Chamber of Commerce in November 2000, the savings are potentially large as a transaction by cheque costs around \$8, and this reduces to 20 cents using Internet.²⁷

HK's opportunities in China

The opportunities for foreign banks in China are growing inexorably. First, the right to establish branches and serve foreign clients, then the right to take deposits and make loans in renminbi, then the right to serve local clients, and eventually the right to trade in the currency, are all on the cards. CEPA should give Hong Kong banks and financial institutions a valuable heads start in many parts of China, and already HSBC has a call centre in Guangdong as part of its strategy to enhance customer relations management for those doing phone banking. Even at this early stage China has 2.6 million users of online banking, and broadband DSL connections in China have jumped from 300,000 in 2001 to around 2.3 million by end 2002. At this rate of growth, and with the experience Hong Kong banks have developed with services over the Internet, they are well placed to market services in China. Table 6.3 indicates e-banking services currently available in China or planned.

Table 6.3
e-Banking Services in China

Consumers	Enterprises
Common Services	
Account balances	Account balances
Account transfer	Account transfer
Bill payment	Bill payment
Less usual services	
B2C payment	B2B payment
Stock trading	Foreign exchange
Card payment	Certification authority
Planned services	
Account management	International payment
Online loan application	Cash management
Certification authority	Online billing

Source: 'China Banking Report, 2002' Centre for the Future of China url: <http://www.china-future.org>

The Center for the Future of China's 2002 'China Banking Report' provides the following (edited) summary of e-banking directions in China.

Box 6.2

²⁵ http://www.ahk.org.hk/Archive/01_5_hk.pdf

²⁶ http://www.ahk.org.hk/Archive/01_5_hk.pdf

²⁷ http://www.chamber.org.hk/info/the_bulletin/nov_2000/addressing.asp

e-banking 'push' in China

- Many of the smaller banks are pursuing a policy of not wanting to extend national reach *per se* but to extend the bank's reach to whatever constitutes the maximum *profitable* reach. Smaller banks will also be capable of providing more effective e-banking if their plans for macro-centralization are realized, with all transactions being performed on a single platform.
- For many banks, fragmented IT, or the lack of "macro-centralization," will mean that customers will have to contend with fragmented e-banking services. A typical story comes from the China Construction Bank (CCB) has devised a temporary networking solution in B-to-C banking. The CCB has its "Center for Internet Banking" in Beijing. For all Internet-related transactions, the customers must first register with this center. Once the customer is comfortably e-banking, the center can ascertain their city location (through a "customer identifier" like their debit card number), and then transfer the related information to the appropriate local branch.
- For enterprise customers, there will be a migration from Extranet/EDI to Internet banking.
- A key driver in all of this is that Internet cost, security, and infrastructure in China are catching up.
- Banks will integrate their e-banking services with securities and insurance firms. Because banks can't offer securities trading services directly, ICBC (Industrial and Commercial Bank of China) is developing joint marketing approaches where the bank handles payments between consumers and brokers.

Source: edited summary from 'China Banking Report' (2002) url: <http://www.china-future.org>