

APPENDIX 4

A key component of the New Economy and APEC report is the distillation of common themes from case studies. Sixteen case studies from twelve APEC members were prepared especially for this Report. Nominally following a “template” (reproduced below) these mini case studies come from both official APEC sources as well as independent researchers and address how businesses, civil society, and governments are being transformed by the technologies of the New Economy—or are being held back from that transformation by the state of the domestic and international policy environments. The case studies are very short (thus the term “mini”-case studies) and represent only a sketch of the situation and response of the specific entity reviewed

Template

Short overview of the client.

This section should tell us about the firm, civil group, or government agency that is being reviewed. This section should be no *more than one-quarter* of the total length of the study.

- Sector (e.g. type of business activity, or focus of civil activity, or agency of government)
- Size (e.g. earnings, employees, number of separate business offices or entities if a conglomerate)
- Age
- Type of governance
 - Business: (e.g. privately headed and controlled, stock-holder control, separate governing board)
 - Civil groups: (e.g. single head, consensus group)
 - Government agency: (e.g. independent agency, reports to some other government body)

“New economy” narrative

This section should tell us about how the client is being affected by new economy forces—to change the way it does business, interacts with its civil or social objectives, or the manner in which it interacts with the public. The specific focus here is on whether and how the client uses information technologies, broadly defined, in the conduct of its activities. These technologies can be taken to include any networked two-way information and data communication device (such as computers, mobile phones, personal digital assistants) as well as the software that runs and networks them. The client could be a user or creator or both of these technologies.

- How did the client come to use these technologies?
For example,
 - Did the client itself initiate the use or creation of information technologies
 - Was there an outside force (such as a multinational firm or international agency) that precipitated the use of the new technologies?

- Has APEC played a role (such as through the e-IAP process or through the readiness assessments, or e-government pilot projects for example?)
- How have the technologies changed what the client does or the way it does it?
For example:
 - These information technologies and the new economy environment have: Reduced costs, sped-up operation times, expanded the set of suppliers or buyers, created new business ideas and operations, generated more transparency, achieved greater reach to civil society....
 - Specific anecdotes would be helpful, such as these: “We were able to find a new buyer for our product through the Internet.” (Vietnam) “We were able to reach rural health clinics and improve information exchange using mobile phones.” (Bangladesh) “We have reduced the cost of procurement by 10 percent using information technologies.” (US) “We were able to improve the daily process of pricing and transport of the product by moving from fax to Internet.” (Thailand) “We are using networked information technologies to improve tax administration.” (Morocco) “With the same budget, we were able to tell more people about what is going on in the legislative process.” (Chile)

New Economy and policy

The objective of this section is to explore the extent to which policies and or the policy environment stand in the way or have aided the client in its uptake of new economy technologies.

- *Macroeconomic policy and environment:*

How has the client’s experience with new economy technologies and activities been affected by the macroeconomic environment, including:

- Inflation and interest rates (level and volatility),
- Exchange rate volatility,
- Economic growth generally (level and volatility).

For all clients, these factors will be relevant, but the key issue to explore is the impact of these macro factors on the development and uptake of new economy technologies.

- *Services infrastructures, policy and environment.*

How has the client’s experience with new economy technologies and activities been affected by the:

- Cost, quality, density of communications infrastructures:
- Cost, timeliness, and overall performance of financial intermediaries, including international financial exchange;
- Cost, speed, mode-integration (air-land-sea) of various distribution capabilities, including cross-border capabilities.

- *Micro business and labor environment including rule of law.*

How has the client's experience with the new economy technologies and activities been affected by the:

- Regulatory environment for engaging in new activities
- Labor market environment for both hiring and separation
- Rule-making environment, including rules for electronic contracting, verification.

How services infrastructure and the business environment affect a client will differ substantially depending on the type of client. What we would like the researcher to explore is whether the client thinks that policy changes to improve performance and/or the environment (such as, for example, through changing ownership, more competition, increased amount of or access to infrastructure, appropriate regulation, eased licensing, more flexible labor market, improved body of cyber laws) would affect how they produce or use new economy technologies.

- *Human resource capability*

How has the client's experience with the new economy technologies and activities been affected by the quality and availability of workers to:

- Produce new economy products or services
- Use new economy technologies
- Has there been any policy focus on the issue of human resource development, e.g. through pilot projects, awareness, education programs or curriculum changes, community focused access and uptake?

Summing-up and looking-forward:

This section should be one paragraph or so and should sum-up what the new economy means to the client, what the client plans to do in the future, and what three specific policies changes it would recommend to the policy authorities.

AN AUSTRALIAN BANK ADAPTS TO DEREGULATION AND INFORMATION TECHNOLOGY

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Introduction

There was a dramatic deregulation of Australian banking in the early 1980s, which included the opening of the market to foreign competition. The interplay of this with the parallel widespread adoption of information technology makes an interesting case study of a service industry in the new economy. Table 1 summarises the history of these parallel streams in Australian banking.

Table 1. Chronology of developments in policy and ICT in Australian banking

Date	Policy framework	Technology development
1981	Campbell report on Australia's financial system recommends opening to foreign competition	
1982		First public ATMs
1983	Australian dollar floated	
1984	ANZ purchase Grindlays' Bank, giving it representation in 45 countries	EFTPOS systems started
1985	16 foreign banks granted banking licences. Competition encourages "loose" lending.	
1987-91	Stock market crash and recession, many loans defaulted	
1990	ANZ proposal to merge with National Mutual Life vetoed by Government	National (inter-bank) EFTPOS system in operation
1997	Wallis report on financial services recommends regulatory regime based on functions (rather than institutions or products)	Phone banking introduced
1999	<i>Electronic Transaction Act</i> facilitates e-commerce	Internet banking introduced
2000	Sale of Grindlays' Bank—ANZ no longer so international as a group	ANZ strongly involved in e-commerce, setting up a B2B portal and other facilities

¹ The opinions expressed in this paper are the sole responsibility of the author and do not necessarily reflect those of the Department of Industry Science and Resources or of the Australian Government.

To make the case study more specific, we have focussed on one particular bank, namely ANZ Bank². ANZ is one of the “big four” Australian banks. In 1999, it had assets of A\$149 billion (approx US\$97 bn)³ of which 69% was in Australia, 13% in New Zealand, and 18% elsewhere. The bank employed 23000 staff in Australia and New Zealand and 8000 elsewhere in the region. Part of the special interest of ANZ is its efforts to expand internationally as one of its responses to foreign competition in its home market. (See [Figure 1](#) for the history of these figures.)

We pay special attention to more recent developments relating to electronic commerce and the use of the internet and the recent policy framework, as they are the focus of the IIE report for the APEC Economic Committee.

The Policy Framework

Banks have been an important part of the Australian landscape since the early days of European settlement. In particular, strong bank involvement in the development of an export-oriented Australian agriculture through the nineteenth century and the gold rushes of the 1850s left almost every Australian country town dominated by the imposing buildings of several rival banks. With consequent expansion into the suburbs of the growing cities, most Australian Banks including ANZ possessed an extensive national network of branches. All were companies owned by a wide range of shareholders, rather than family owned as is more common in some other countries.

From the 1950s to the 1980s, the entrenched banking oligopoly was protected from foreign and new domestic competition by a policy of not granting new banking licenses. The Reserve Bank applied strict regulation, but also effectively guaranteed bank deposits. A parallel non-bank sector grew up that was subject to far less regulation, and which therefore often made riskier loans than the banks but at higher interest. ANZ (and the other major Australian banks) set up subsidiary finance companies to operate in this market.

By the late 1970s, technological change and greater integration of world financial markets led to widespread acceptance, including by the banks themselves, of the need for broad ranging financial deregulation in Australia. In anticipation of this, the larger Australian banks embarked on some key mergers, so that by the early 1980s there were four major Australian banks, of which ANZ was one.

² The full name of the company is Australia and New Zealand Banking Group Limited; ANZ is the trading name. The name correctly implies that the bank has substantial operations in New Zealand, which it has done since 1839 (under various earlier names).

³ Unless noted all financial figures are given in Australian dollars. Over the period, the A\$ varied from US\$1.14 (1980) to US\$0.56 (2000).

The Campbell Report of 1981 on the Australian financial system⁴ spurred Australia to embark on a relatively rapid transformation from one of the most regulated financial sectors in the world to one of the more liberal. Key steps included

- floating the Australian dollar in December 1983,
- granting 40 new foreign exchange licences in June 1984,
- granting banking licences to 16 foreign banks in February 1985,
- removal of interest rate ceilings (1985-86) and restrictions on the range of activities in which banks can engage,
- Liberalisation of reserve requirements (1985, 1988).

Consequently, from the 1980s, the Australian banking system has transformed from one consisting of a small number of major banks, four State banks, and a very small number of minor ones, to a system with open entry where though the four major Australian banks still dominate, they are open to competition from subsidiaries of foreign banks⁵ and from small and regional banks (and other deposit-taking institutions, such as building societies⁶).

Most of the new local banks were formed by consolidation of existing financial institutions such as building societies and “savings banks”. Very few of the foreign-owned banks attempted to compete with the established local banks by setting up or acquiring a large branch network. Instead they went for niches such as merchant banking or personal banking to very rich customers. (The introduction of ATM networks in the early 1980s by the major local banks can be seen as an attempt to discourage competitors in the “retail” market.)

The major exception to this was the National Mutual Royal Bank, formed by National Mutual (one of the largest local insurance companies) and Royal Bank of Canada. This rapidly built up a retail network of nearly 200 branches across Australia by acquiring local building societies. In 1990, ANZ perceived that “deregulation” offered scope for synergy between traditional banking and the previously segregated life insurance and superannuation business, which looked likely to become a more favoured savings medium than traditional savings banks, as government encouraged (indeed compelled by legislation from 1992) workers to save for their retirements. ANZ therefore proposed a merger with National Mutual, but the Government refused to allow it, citing “national interest grounds”—essentially, too great a concentration of financial institutions within Australia was seen as anti-competitive.

This raises the question: about what “market” should competition policy be concerned? [Table 2](#) shows a matrix of possibilities. Competition policy in Australia has been largely concerned with the bottom left quadrant, as indicated by the very title of the main regulator, the Australian Competition and Consumer Council, set up in 1975. But the management of ANZ and the big local banks are most strategically concerned with the top right quadrant: their concern is whether ANZ is big enough to fight off foreign companies who wish either to

⁴ *Final Report of the Committee of Inquiry into the Australian Financial System*, Australian Government Publishing Service, Canberra, 1981.

⁵ In strict legal terms, there are no “foreign” banks in Australia- rather, foreign-owned banks operate through subsidiary companies.

⁶ Roughly equivalent to the “savings and loans” institutions in USA.

compete across the spread of ANZ’s domestic market or even to attempt a take-over (a prospect which looks more tempting with the fall of the A\$ since 1980).

Table 2. Matrix of concerns for competition policy

	Domestic	International
Producers		
Consumers		

In this case, though the cross-sectoral merger was blocked, ANZ was allowed to take-over the banking subsidiary (in late 1990), with the upshot that no foreign bank currently has a branch network in Australia remotely comparable in size to ANZ.

One response by the bigger Australian banks to increased competition at home—including from foreign banks—was to themselves expand overseas. In particular in 1984 ANZ acquired Grindlay’s bank, and thus became overnight the most international of Australian banks, with branches in 45 countries. (Grindlays’ was a British-owned bank, with a substantial network in India, and branches in many other Asian and African countries.)

In the late 1980s, competition and deregulation made banks much more willing to lend than before. As interest rates rose and recession set in the early 1990s, the level of non-performing loans soared. Some of the newer banks went out of business. In 1992 ANZ made its only recorded loss for decades, largely because of provision for \$1600m of bad debt. The bank acknowledged that “there was some imprudent lending in the boom of the late 1980s, particularly to small and medium enterprises where market share was most contested following deregulation”. This “imprudence” reflected the change in the role of a bank manager from allocating scarce credit under regulation to actively seeking loans business and consequently having to assess more dubious risks—many old-style managers lacked the skills to adapt to this new environment. The problems in the financial sector were a major factor in the introduction of a new set of prudential requirements on banks, based on capital adequacy requirements, that continue today largely unchanged.

That ANZ did not make more extensive overall losses in the late 1980s and early 1990s was due to steady profits from its overseas operations, which in all except one year offset its domestic losses. However, the bank was beginning to rationalise its overseas operations, to better fit a strategic concentration on those parts of the Asia-Pacific region where its Australian customers aimed to do business. In 1992, it sold the Grindlays’ operations in Africa.

By 2000 ANZ, having steadily built up its business banking operations in East Asia, North America and Europe, sold off what had once been its overseas “flagship”, the Grindlays’ business in India where it was the largest foreign bank. This left ANZ without a substantial retail operation outside Australia and New Zealand, though it still has substantial assets (14%) overseas, and is supposedly “contemplating acquisitions in East Asia”.

Technological Developments and Their Implications

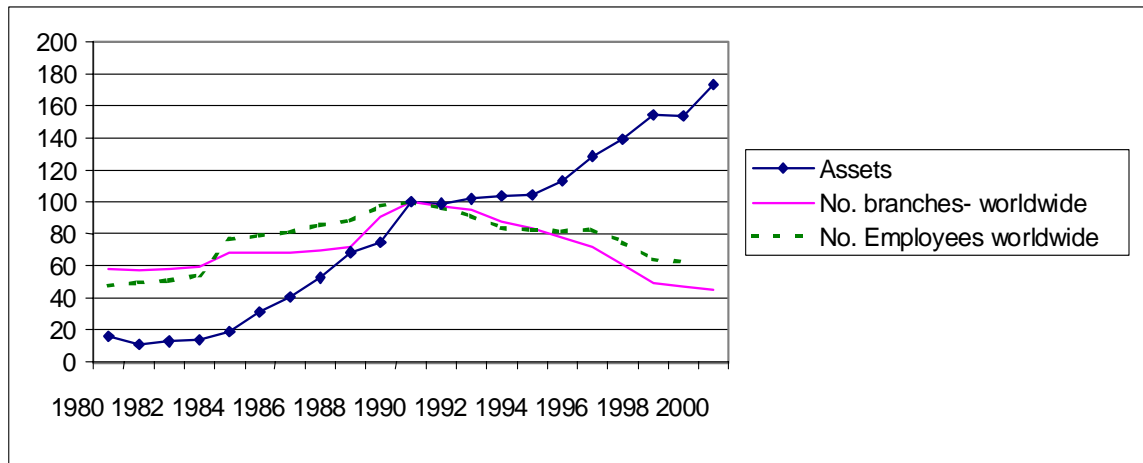
The 1980s and 1990s featured a remarkable and steady increase in the technological sophistication of the bank's operations. Notable steps included:

- Back office computerisation—even by 1980 more than 90% of branches had their accounts processed by a centralised computer sections, even though the raw data was sent on paper by courier.
- Computer-linked teller terminals (from 1985)
- Improved telecommunications between branches and the corporate centres, including the international outposts. By 1985, the group had a private packaged worldwide telecommunications network, which has been steadily upgraded technologically. Moreover liberalisation of telecommunications policy in Australia in the 1990s and consequent increased competition enabled the bank to negotiate cheaper contracts, with savings of tens of millions of dollars p.a.
- Automatic Teller Machines (ATMs)—first introduced in 1980, by 2000 on the outside of every branch and also independent of the (decreased) number of branches in places like shopping malls and airports; altogether Australian banks have over 9000 installed ATMs.
- Electronic Payment at Point of Sale (EFTPOS—special terminals in shops, service stations etc, first introduced in 1984 and rapidly expanded. By 2000 there are over 300 000 “cash access points” in Australia.
- Telephone transaction banking (from 1996)
- Internet banking (introduced in 1999, with 100 000 customers registering in the first year)
- Use of expert systems software to assess lending risks (from 1989)
- A common computer banking system throughout the banks international system (phased in from 1996)
- In the late 1990s the bank also became a significant supporter of and player in e-commerce (see below).

The main driver of these developments, all of which involved substantial up-front costs, was competitive pressure from other banks and financial institutions. These forced ANZ and the other major banks to seek efficiencies and productivity gains wherever they could. ANZ sought “to optimise use of our electronic as well as our traditional branch delivery channels, to serve customers better and to provide ANZ with a permanently lower cost base” (1994). Plus it could not afford to look old-fashioned compared to its competitors, as information technology rapidly evolved.

The readiness of most Australian consumers to accept new technology, the technical skills base available to the bank (including its subsidiary software company in India!), the quality of ICT infrastructure and early adjustment of some regulation all contributed to Australia being among the first countries to adopt the technologies listed above.

Figure 1: ANZ performance over period 1980-2000 (indexed to 1990=100). Since 1990, Business (assets) have increased but staff and branches have decreased. In 1990 ANZ had 2700 branches world-wide (of which 1300 were in Australia), 48000 staff worldwide (30000 in Australia), and assets of A\$99bn.



As in many other industries, new technology and “productivity improvements” can mean that either the same number of staff have greater output or that the same output is achieved with fewer staff. Both of these applied in ANZ at different times (see Figure 1). Staff numbers grew continually through the 1980s (from 23000 in 1980 to 48000 in 1990) as the bank grew by acquisitions at home and abroad. But as regulatory prudential restrictions on lending were eased, many existing and new customers also did greater volumes of business with the bank. However, in the 1990s, numbers of both staff and branches decreased by around 50%, even as business increased (assets rose over 70%). The decline in rural branches, which paralleled the decline in rural earnings, attracted much public and political criticism.

While an over-the-counter banking transaction today costs about \$1 to process, an ATM transaction costs around 10c, and an online transaction costs 1 cent. By shifting existing customers into electronic banking, banks can consequently benefit from substantial cost reductions. While many customers have moved in this direction because of the convenience to them, ANZ, like other banks in Australia, has re-inforced the trend by charging higher fees for across the counter transactions. Consequently, not only are most transactions now electronic in some form, but some 15% of customers already use internet banking—one of the higher rates in the world.

Modern E-Commerce

Banks have been leaders in the uptake of electronic commerce in Australia. They have used e-commerce to streamline their operations and been heavily promoting business-to-business (B2B) e-commerce. Through e-commerce banks have cut operational costs such as transaction processing, distribution and procurement.

To boost its strength in e-commerce, the ANZ embarked on several acquisitions and eagerly sought alliances during 2000. These included 10% of the Hong Kong, China online broker Boom.com and a joint investment with the Overseas Chinese Banking Corporation in an online bank for Asia. ANZ has owned 10% of online broker E*Trade Australia since early 1999.

ANZ describes itself as “a new breed of bank” for the e-commerce environment. ANZ provides e-commerce solutions from production development and conception through product rollout to on-site implementation. ANZ eGate is a secure Internet-based payments gateway offering deferred trade terms settlement, comprehensive reporting and reconciliation for both buyer and seller, and the convenience of online authorisations for any major credit card, charge card or ‘on account’ purchase.

ANZ's internet-based procurement service, anzebiz.com, brings together buyers and suppliers in a virtual marketplace and provides access to a broad-based catalogue listing a range of indirect supplies. It is a supply chain solution designed to provide cost savings, increased flexibility and greater market reach. One high profile procurement project is the bank's membership of the CorProcure buyers' portal, which includes some of Australia's largest companies.

Successful implementation of e-commerce is to a large extent dependent on the security and efficiency of incorporated payment systems. According to several surveys, security rates as the major obstacle for e-commerce uptake by SMEs, followed by privacy concerns. Banks can bring their strong reputations for security to B2B exchanges, thus encouraging B2B uptake. Their credibility enables markets to function more efficiently and provides greater confidence to SMEs. Entry by banks into B2B exchanges may also help to encourage the development of interoperable systems for B2B. The major Australian banks have recently begun to implement a joint digital signature certificate framework that is interoperable with worldwide banking systems, and has been accepted by the Australian government for dealings with it.

The development of e-commerce is greatly assisted by an appropriate extension of the regulatory framework to cover the “virtual economy”. In particular, *the Electronic Transaction Act* (1999) facilitates the development of e-commerce in Australia by broadly removing existing legal impediments that may prevent a person using electronic communications to satisfy obligations under Commonwealth law. It is complemented by privacy legislation and various codes of conduct designed to enhance consumer confidence in e-commerce and electronic communications without placing unnecessary burdens on business.

Other important roles of government that have facilitated e-commerce include encouraging competition in telecommunications (and thus innovation and lower costs) and a strong education and training system to give the necessary technical and commercial skills base.

International harmonisation of regulation, such as through the APEC paperless transactions agenda and the APEC Finance Ministers’ initiative on electronic financial transaction systems, should further facilitate electronic commerce in the region.

Conclusions

Banking in Australia is an example of a service industry in which new technology and policy liberalisation have exposed the incumbents to substantial competitive pressure. However, through acquisitions at home and abroad, and through greater operating efficiencies from the adoption of new technology, ANZ and the other 3 banks who dominated the Australian market when it was “deregulated” in the early 1980s still do so. The reluctance of customers to move their accounts, unless strongly provoked to do so, has given the incumbents a major advantage. However the advantages of incumbency are being rapidly eroded by the technological and business developments of the “new economy”, as summarised by the CEO of ANZ in Table 3.

Table 3. Old protections from competition are being neutralised in the new economy

Incumbent’s historic advantages	...Neutralised in some (most) cases
Government regulation limits competition , especially foreign competition	Liberalised (“deregulated”) market allows open competition
Privileged access to customers, technology, labour and capital—hard for others to compete	Access available for everyone—easier for new competitors to enter and for customers to compare and switch
Familiarity with local ways of doing business needed	Regional (or global) standards and protocols become common—local familiarity becoming less important
Vertical integration the best model	No real need for integration within the company—can be accomplished with external parties
Protection from capital market pressure	Capital market rewards the strong and punishes the weak

Source: J McFarlane, CEO of ANZ Bank, “The Australian Banking scene—competing in a globalising world”, October 2000 [on the web at //www.anz.com.au/]

Those banks (especially some overseas ones new to the Australian market) who chased market share through rash loans to business speculators lost out badly when the business climate soured in the late 1980s and early 1990s; several such banks failed, which further consolidated the position of the incumbents.

As part of its response to this competition, ANZ itself expanded overseas. Its ventures overseas have been reasonably successful in financial terms, but the most publicised of them—Grindlays’ Bank—has recently been sold, as ANZ, under competitive pressure , has

been forced to tighten its strategic focus to countries where its domestic customer base looks for banking support.

Looking to the future, ANZ sees e-commerce as perhaps the greatest challenge and opportunity for business today, and especially for the banking business. E-commerce will bring competition—from online banking and financial services firms which are now beginning to enter traditional bank markets, but without the overheads of a traditional branch network. Already, the Dutch bank ING has established a “virtual” bank in Australia with 50,000 customers but only one physical branch.

ANZ believe that globalisation, the Internet, and changing customer expectations will accelerate the disaggregation of traditional integrated financial services companies into a set of loosely linked specialist businesses. At a strategy seminar in July 2000 the CEO of ANZ said “These forces will impact financial services at different rates in different countries, but their long-term impact is inevitable”. In response, “ANZ would use technology to transform its existing businesses and focus on creating new growth opportunities”. It aims to become “an e-bank with a human face”.

Acknowledgments

I thank my colleagues Dimitri Markotsis, Albert Dessi, Stephen Joske, Rob McKeon, and Andrew McCredie for helpful contributions to this paper.

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THE IMPACT OF E-BUSINESS AND E-COMMERCE ON THE CANADIAN GENERAL MERCHANDISING RETAIL SECTOR*

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Introduction

Businesses today are under increasing pressure to make tangible productivity gains and to hold costs in check, just to remain competitive. The evolution of a variety of hardware and software technologies is fundamentally changing the economics for technology investment. The integration of e-commerce into business models will have an increasingly positive impact on productivity growth, better manufacturing-distribution co-ordination, reduced time to market, improved or “just-in-time” manufacturing, improved inventory management, lower procurement costs, reduced processing errors, extended business reach and better customer service.

All sectors of the economy, both old and new, can gain considerably from more extensive use of information and communication technologies (ICTs). To realize these gains, however, firms must ensure that all components of their value chain operate smoothly and seamlessly.

This study focuses on the impact of electronic business and electronic commerce on the retail operations and logistics systems for the Canadian general merchandising retail sector.

Approach of the study

The information contained in this study is based on extensive interviews with a number of key firms in the merchandising retail sector regarding the use of e-commerce and information technology. Three prominent Canadian department stores are featured in this study. For confidentiality purposes, we renamed these companies as company A, B and C. Each organization participated in an extensive interview where they discussed their experience with electronic commerce and Internet-based technologies in considerable detail. The interviews took place during the summer and fall of 2000. In addition to the primary interviews, a number of discussions took place with various players in e-commerce, the Internet and logistics.

The study was developed in the context of an ongoing OECD project called “Electronic Commerce Business Impact Project (EBIP), which involves participation from ten countries including Canada⁷.

* This study does not necessarily reflect the view of Industry Canada or of the Canadian Government.

⁷. The industry consultations follow an interview guide developed by the OECD regarding the impact of electronic commerce on specific industries in a number of countries.

Overview of the Canadian Retail and Merchandising Industry

Canada's retail trade industry is a dynamic and vital component of the services economy. In 1999, the sector employed over 1.7 million persons, representing approximately 12 percent of Canadian employment and generating \$48 billion (1992 constant dollars) or 6 percent of the Canadian GDP⁸. Major constituents of the retail industry sector include food and beverages, drugs and patent medicines, apparel, household furniture, appliances and furnishings, automotive and parts, and general merchandising.

Canada's retail trade industry is highly competitive. At the same time, the industry is undergoing deep-rooted changes with the onslaught of "Big Box" stores and fierce competition. Retail sector is under constant pressure to increase productivity, reduce costs and improve the quality of service.

New Technologies and The Retail Industry

The retailing industry has made strong capital investments in machinery and equipment, e-commerce and new technologies designed to improve business efficiency. Competition is especially fierce in the discount department store market where larger retailers are placing a great deal of pressure on less efficient and independent retailers. The number of department store firms has steadily declined over the past two decades⁹.

The highly competitive nature of retailing sector and pressure to cut costs and gain efficiencies in product flow should continue to drive new investments in hardware and software technologies¹⁰, in spite of high initial costs, as electronic data interchange (EDI) systems, either proprietary or Internet-based, provide the glue or information infrastructure to hold the value chain together.

With the emergence of electronic commerce and integrated logistics management concepts, supply chain management and logistics, is becoming an integral part of this fast paced and changing new economy¹¹. The explosion in ICTs is driving the integration of operations with

⁸. Statistics Canada, *Gross Domestic Product*, CANSIM, Matrix No. 4677 and Statistics Canada, *Labour Force Survey*, CANSIM Matrix No. 3472.

⁹. In 1979 there were 28 firms in the department store business. In 1990 there were 14 firms. In 1997 there were 6 firms. Similarly, department store sales as a percentage of total retail sales have steadily declined. In 1979, department store sales represented 11.2 percent of total retail sales. In 1990, this share was 7.3 percent. In 1997, it was 6.8 percent. Strategic continental approaches are being developed by retailers, wholesalers and manufacturers in order to manage the key links of their chains of supply such as sourcing and marketing.

¹⁰. Note that the Canadian general merchandising industry shows a low return on capital employed, thus it is strategic reasons not cost of capital issues which are driving these large investments.

¹¹. Industry Canada, *Logistics and Supply Chain Management: Sector Competitiveness Framework*, 2000.

suppliers and customers. The availability of very powerful information systems, based upon personal computer networks utilizing local networks, Extranets and the Internet, provide distribution firms of all sizes with the ability to streamline their business processes, especially in their logistics systems. In the 1980s and 1990s, there was a substantial growth in logistics information systems in such areas as electronic data interchange (EDI) with transportation carriers, EDI with vendors, radio frequency applications, inventory control and warehouse management systems. Today, these proprietary systems are beginning to use web-based technologies, which offer considerable cost savings over proprietary EDI systems. Internet-based technology solutions are used to link carriers, suppliers and retailers to a central logistic centre⁶.

Computer and Internet Usage

According to the 2000 Survey of Electronic Commerce and Technology conducted by Statistics Canada, 75.5 percent of retailing firms used personal computers when conducting their business operations.

However, 47.7 percent used e-mail and 52.7 percent used the Internet. In spite of these relatively low figures regarding e-mail and Internet usage, the general merchandising industry, especially the larger department stores, are extensive users of proprietary EDI technology. Many chain stores are developing electronic systems using Internet technology with leading software vendors including Oracle, IBM and Microsoft.

An even smaller set of percentages described the retailing industry web presence and usage. For example, 22.9 percent of firms had a web site in 2000. Only 13.5 percent of retailing enterprises used the Internet to purchase goods and services. A smaller percentage (8.7 percent) used the Internet to sell goods and services. In 2000, the retail sector generated \$889.9 million of Internet sales, which represented only 0.4 percent of total revenues (Statistics Canada, April 2001).

Case Study Presentations

The three department stores selected for this study each have sales of about \$5 billion (CDN), with employees ranging between 30,000 and 50,000 and hundreds of retail locations, suppliers and customers. Two of these companies are publicly traded on the Toronto Stock Exchange while the third one is not publicly traded in Canada, its US based parent company is traded on the New York Stock. Two of them have been in business for many years, while the third one has just entered the Canadian market in recent years.

⁶. Logistics is a very important function for the retail trade sector. Logistics related activities include: transportation services, postal and courier services, storage and warehousing, packaging materials, gasoline and diesel fuel, business travel for purchasing supplies, business services costs, and inventory carrying costs etc.

Company A

Company A is one of Canada's largest retailers focuses primarily in hardline categories such as automotive parts and accessories, hardware, home improvements, housewares, sports and leisure, and lawn and garden. These products can be shipped directly from suppliers to stores, or through distribution centres operated across Canada.

Electronic commerce is a critical enabler for many processes across Company A. E-commerce plays a role in: business to consumer (B2C) initiatives such as Company A online and electronic flyers; business to business (B2B) with each of its stores for such activities as replenishment, product information, store planning, promotional planning, point of sale, shipping and billing; and B2B with its suppliers for activities such as purchasing orders, planned order forecasts, inbound planning, invoices and point of sale data.

Company A continues to invest aggressively into a variety of electronic commerce technologies, and is migrating more and more to Internet-based solutions. Three examples of how company A takes advantages of these technologies are: (1) sharing retail level data, over an Extranet, with suppliers; (2) collaborating on replenishment for promotions, in addition to sharing a six-month view of future orders with suppliers; and (3) e-learning to train and educate employees in stores with respect to product and application knowledge, and customer service.

A proprietary EDI transaction processing connection links Company A to its stores. In addition, Company A continues to leverage traditional EDI technology to process transactions with suppliers.

In all areas of application, Company A continues to invest in e-commerce to improve productivity by reducing costs, improving cycle times and contributing to improved customer service levels.

Company B

Company B is a major department store which generates over 6 billion dollars in revenues and employs over 40,000 people. It receives more than one thousand orders on its web site per day. In 1999, Internet sales exceeded \$ 22 million.

It has largely replaced its paper-based systems with e-commerce solutions. The firm uses a proprietary EDI network to place orders, pay suppliers and track the shipment of goods. The firm also communicates with suppliers through the Internet and e-mail. These collaborative information systems provide suppliers and its retail operations with key information on markets and completed transactions. Suppliers must do one of the following: buy and/or build their own solution and integrate it with existing system; use a value-added network (VAN/) or third party service provider; or buy a package solution. Company B also publishes comprehensive general merchandise catalogue and has a comprehensive B2C web site that provides product information to consumers and facilitates orders via the Internet.

As a result of a major restructuring initiative of all its procurement practices, Company B has streamlined its wide range of supplier payment processes into four categories. Company B has provided suppliers with password-protected access to a secure on-line server that they use to share two-way interactive specification sheets, big-ticket forecasts; inventory by store; and catalogue. Company B has also consolidated a considerable number of its warehouses (distribution centres) over the past few years.

Electronic commerce is a critical enabler for many processes across Company B. For example, Company B maintains an electronic database of its retail store and catalogue products and electronically provides product information and prices on each product. All of these new initiatives focus on collaboration and visibility through the whole supply chain execution.

Company C

Company C, a part of the foreign-owned chain, is a large department store which employs roughly 40,000 people across Canada. Company C value chain is based largely on dealing with Canadian suppliers (manufacturers). It also deals with wholesalers. While the basic relationship with suppliers has not fundamentally changed in terms of price and service, there is a significant priority on quick response and flow. Flow management is an integral part of the value chain. Internet-based systems provide market and other information to suppliers regarding how well and how fast their products are selling. Company C's philosophy is to drive information fast; speed and quick response rates are critical.

Application of e-commerce technology is key to Company C's management practices, as it has helped save logistics costs considerably. While just-in-time shipments have resulted in increased trucking costs, these are more than offset by reduced inventory and other logistics costs. All transportation logistics are outsourced to a company Z, which is part of a chain of logistics companies operated by third party logistics group. Contracting out logistics services to the company Z has allowed Company C to focus on its main strength, which is retailing. Company Z is tied to Company C's electronic system that communicates data with each of the stores.

Company C switched to an Internet-based e-commerce system in the late 1990s to communicate orders and exchange critical information on product flow and inventories with its suppliers. Company C uses its network to place orders, submit invoice, track shipments of goods and pay its suppliers. Its collaborative information systems provide suppliers and its retail operations with key information on markets and completed transactions and facilitate better decisions on product flow.

The firm has an information program, which is used to supply critical information to suppliers, that vendors or suppliers can use to see how their products are selling. It shows performance indicators for inventory and market share status, thereby taking the guesswork out of analysis. Suppliers pay no upfront costs to use the information program software. All they need is access to the Internet, a browser and a computer. Product flow is timed very closely to the time of sale at the store level. Company C keeps a low inventory in its distribution centres, with only up to three to four weeks of supplies on hand. Orders go directly to the manufacturer and data is sent to the stores for replenishment.

Towards a New Economy—How Have the New Technologies Changed What These Companies Do or The Way They Do It?

Implementation of Technologies

The participating general merchandise firms have embraced e-commerce for their B2B operations for both EDI and Internet technologies. Each organization began its e-commerce system based on proprietary EDI technology and to some extent is migrating to Internet-based systems (Table 1). These players are using the Internet to exchange critical product information between suppliers and/or consumers. Suppliers and retailers are able to collaborate on product forecasts and product flow decisions.

Inventory Management

Inventory management is a critical part of the logistics systems for each of the participants. The emphasis is on product flow rather than on price when ordering supplies to be sold in stores. Internet-based systems communicate information to suppliers in order that the best production and inventory decisions are made. These collaborative systems, based largely on Internet technology, allow suppliers and retailers to share in the risks and opportunities regarding product flow and inventory management. Critical decisions and costs are being passed down the supply chain. The end result is improved efficiency, better flow and lower costs. These major retailers keep inventory levels to a minimum (e.g., 3 weeks supply) as many products become rapidly obsolete, in addition to inventory carrying costs and administrative expenses.

Each participating organization reported that their inventory turns have improved substantially over the past several years. Similar gains in efficiency are expected to occur in the future.

In addition to reducing costs, e-commerce solutions permit customers to custom order products based on individual needs and preferences. Retailers are able to allow customers to mass customize orders based on virtually thousands of choices. Internet-based systems are more efficient in communicating customized product information to suppliers.

Table 1: Electronic Commerce and Supply Chain Management Processes

Company	Paper	EDI	Internet Collaborative Systems	E-mail	Web site	Online Sales
Company A	P	E	E	E	E	E
Company B	P	E	E	E	E	E
Company C	P	E	E	E	F	F

P= Past Effect; E= Present Effect; F= Future Effect

Relationships Between Retailers and Suppliers

Each of the participating firms stated that e-commerce and Internet solutions have strengthened existing relationships with their suppliers. E-commerce improves the flow of information between the parties. The entire value chain makes better decisions collaboratively with the end result being vastly improved performance throughout the entire chain.

The next step will be to implement collaborative tools with end-to-end solutions that will integrate forecasting, planning and execution capabilities with complete visibility across the supply chain. The objective essentially consists in accelerating processes through better planning and execution among partners. The main challenge to achieving seamless integration is one of cost, as significant investments will be needed both within the major firms and at the supplier level.

Investment Decisions

Investment in machinery and equipment and other infrastructure has been growing rapidly. The emergence of “Big-Box” stores and other players on to the retail market has driven firms to make large investments in technology in order to maintain or strengthen their competitive advantage. Some existing players are concerned that the retailing industry will experience more consolidations, mergers or exits from the marketplace.

Not only is competition fierce, but firms are also becoming more uncertain of their competitors’ identity. In the retail sector, the traditional value chain of supplier, distributor, retail and customer is changing rapidly. The Internet adds to this insecurity, as prominent manufacturers now sell their products directly over the web—bypassing whole sellers, distributors and retailers. As a result, retail organizations are often faced with the difficult situation of competing among both other retailers and their own suppliers in certain cases.

Logistics Services

Internet-based technologies are changing logistics from being a packaging and moving function into an information business. Electronic business integrates carriers with shippers via electronic ordering, inventory decisions and product flow. Electronic systems have been instrumental in streamlining the supply chain and logistics operations of the retail sector. Inventory costs are being passed down the supply chain, as manufacturers are able to make better decisions on product flow, based on collaborative Internet-based networks between suppliers and retailers.

Logistics managers are placing greater emphasis on external functions and demand-pull systems that are customer-oriented. In the past, they concentrated exclusively on internal logistics functions such as warehousing and transportation.

E-Tailing

Of the participating general merchandise firms, one organization has a large established e-tailing site, another has just launched a comprehensive consumer web site and another has not identified any immediate activity in this area.

For those players using an e-tailing (B2C) site, it was believed that a B2C and a B2B presence were interdependent

Advantages of the Internet Over EDI Systems

The firms participating in the study are migrating from EDI to Internet-based systems. Internet technologies are used to collaborate information between suppliers, retailers and other players. It is not practical to exchange substantial product flow and other demand-driven data between various players using proprietary EDI networks. The Internet is extremely well suited for this type of information exchange, and thus, it is being heavily used for this purpose. It is expected that these collaborative exchanges of information will continue to accelerate in the future.

It is likely that the Internet will continue to gain favor amongst retailers. The up front costs are lower for suppliers (a computer and a web browser are all that is needed) and data can be exchanged amongst a number of players more quickly in real time⁷. The problem retailers are facing in migrating from EDI to Internet systems is that large investments by both suppliers and retailers have already been made in EDI technologies. As Internet-based systems also involve large capital investments, major improvements in efficiency and costs over the longer term need to be demonstrated. Some companies may be reluctant to invest in new technologies until the original investment in EDI technologies has been fully depreciated. Furthermore, retailers may wish to protect investments their suppliers have already made in older EDI technologies. The substantial competitive nature of the retailing sector and the pressure to cut costs and gain

⁷. B2B Internet systems also involve large up-front costs for the retailer. The main cost advantage is for suppliers that do not have to purchase costly EDI hardware and software.

efficiencies in product flow should continue to drive massive new investments in Internet technologies, in spite of high initial costs.

Web-Based Auctions

While the firms interviewed were generally not in favor of web-based auctions to source goods for their retailing operations, everyone interviewed agreed that the use of the Internet to lower costs will become more prevalent in the future. Relationships with suppliers will continue to be important. Market forecasts and inventory decisions are made more efficiently and effectively in a collaborative environment. Global Internet systems that are able to strengthen relationships and offer a comprehensive suite of services, in addition to lowering costs, will likely have the best chance of succeeding.

Mapping the Effects of E-commerce

Significant innovations have been accomplished by the participating firms that use the Internet. These areas include:

Transaction Preparation—for advertising, catalogues, and information services and for negotiating with suppliers. These innovations have taken place for both B2B and B2C processes and have encouraged greater customization of products as well as geographical expansion and market segmentation.

Transaction Completion—the participating firms that use the Internet for placing orders, billing and payment, finance and delivery of orders placed have made significant innovations. These innovations have taken place for both B2B and B2C processes and have encouraged increased customization, improved logistics, better co-ordination, integration, geographical expansion, market segmentation, trust and loyalty.

Product Support—significant innovations have been accomplished by the participating firms by providing support for the Internet transactions for information capture, information management, and market analysis as well as for market development. These innovations have encouraged increased customization, improved logistics, better co-ordination and integration, geographical expansion, market segmentation, trust and loyalty.

Future Innovations—future innovations in the transaction structure are expected to occur in the customization, diversification and bundling of retail products. These innovations are being driven by the increased use of the Internet as a collaborative tool to exchange information between the value chain players.

Policy considerations

Key messages from the Canadian retail and merchandising industry in general are that government should allow markets to work efficiently without over regulation. However, government has a role to play in continuing to raise awareness of e-commerce benefits, as success will engender more success. The firms also believe that there is also a major role for the government education system to develop adequately trained personnel and programs to support firms' capacity to engage in electronic commerce.

Successful national strategies for the new economy depend very much on rapid adoption and use of networks and e-services within all sectors of the Canadian economy. Supply change transformation, e-marketplaces and globalization have become significant determinants of competitive positioning for all firms. Government can indeed play a strong role in making the business community aware of these unprecedented changes, including the enormous advantages of using electronic commerce. The competitiveness of industry will increasingly depend on the ability to undertake targeted, strategic investments in the promotion of sectoral e-market initiatives. As electronic marketplaces begin to determine the competitive positioning of firms, the challenge is to ensure that firms have access to key Internet markets on a global basis and are able to realize significant benefits in marketing efficiencies and improvements in supply chain productivity. Measures are thus needed to assist in creating electronic platforms that will enable transformation and competitiveness of industry supply chains.

Creating and maintaining a high level of expertise in, and understanding of, the networked economy is critical to spurring innovation and to obtaining brand recognition internationally. Not only does advanced research provide the technologies and insights that underlie the grow the networked economy, it also produces the highly qualified personnel needed to propel international recognition and leadership.

In addition to providing training, education, e-awareness and communications infrastructure, it is important that the government provide a sound fiscal framework, low inflation regarding stable price as well as stable interest rates. It is especially true for retail sector as the large merchandising firms must be convinced that the economic environment is conducive to sustaining economic growth before they make large capital investments.

Acknowledgements

This study was prepared jointly by Philippe Richer, Service Industries Branch (Industry Sector) and Raymond Lepage, Electronic Commerce Branch (SITT Sector). Surendra Gera provided helpful contributions to the paper. Thanks are also due to Someshwar Rao, Bev Mahoney and Larry Murphy for their insightful comments.

MINI-CASE STUDY: CHINA

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Overview

China has 1.25 million kilometers of optical fiber cable, 39% of urban areas are served by telephones (national average is 20.1%), the rate of mobile phone users is about 6.7%, and cable TV has reached 100 million viewers. Although there were some 9 million host computers connected to the Internet and 26 million Internet users in Mainland China as of March 2001, that accounted for less than 2% of its 1.3 billion population. The number of users in all sectors is growing rapidly, although in national terms, percentages remain low. Nevertheless, outside of Japan, China's Internet users in 2000 represented 26.3% of all of Asia's. By 2005, that figure is expected to reach 41.9%. After the US and Japan, China's base of Internet users will be the third largest in the world.

For Chinese policy makers, there is a serious digital divide that needs urgent correction. For example, user disparities between regions are stark—37.87% of the users are in Beijing, Shanghai and Guangzhou, whilst users in 10 backward provinces in central and western China accounted for only 4.35% of the total. The divide can also be seen in terms of gender, age and education attainment. According to UNDP, China's Internet user profile shows that 69.6% are men and 30.4% women; 75% of them are under 30 years old; and 70% of the users have university degrees.

China has over 300 Internet Service Providers (ISPs) and more than 600 Internet Content Providers (ICPs). There are now more than 123,000 domain names registered and over 265,000 websites, of which 370 are estimated to be B2B and 677 B2C sites. As in other countries, most Chinese surf the Internet from home, while others log on-line at work, or in Internet cafes. The main services used are e-mail (95%), search engines (67%), software downloading (51%), news (45%), and chat lines (37%). Just under a third of the users had purchased anything on-line—mostly books or software, paid by means of cash and carry or postal money orders. Credit cards and direct debit cards in China are not widespread.

Bank of China, the largest bank in the country, has issued about 10% of the bankcards in use. So far, the bank has issued about 4 million Great Wall Renminbi credit cards and 19.4 million Great Wall electronic debit cards. Over 20 online portals (such as sina.com, sohu.com, 8848.net) and a number of large e-commerce companies (like Zhongtian, Jitong, and CYTS on-line) accept on-line payment from these cards.

Official figures show that in the year 2000, e-commerce was valued at US\$9.32 billion, of which B-to-C transactions reached US\$47.1 million and B-to-B US\$9.28 billion.

Foreign and domestic manufacturers of multimedia PCs, servers, network products and Internet accessing devices see big opportunities in equipping the Chinese web. Content providers of value-added e-commerce services are also keen to jump in. Decreased costs of purchasing computers and telecommunication links to go on-line will spur demand. The exponential growth in Chinese-language content and the government's own use of the medium will further fuel expansion.

Still, the urban penetration of home PCs is only about 3.3% at this point. But unlike the global outlook for PC market growth, forecast to go below 12.5% in 2001, China is expected to sustain average growth rates of 30% per year for the foreseeable future. The growing demand for PCs in China is due to increased personal usage, popularity of the Internet, and lower costs. Last year, 6.45 million PCs were sold, an increase of 42.4% over 1999. In 2001, a further increase of 32.6% is expected, to 8.55 million PCs.

Government Policy

The Chinese government has created the word “informatization” to express the process to develop an IT infrastructure, industry, and applications in the country's quest for modernization. It has identified the Internet as a crucial part of the development. However, for a country that still feels it has to regulate information tightly, the Internet presents both opportunities and threats.

On the one hand, the government knows that access to all types of information by its citizens is crucial to the country's development. The Internet also provides an excellent tool to disseminate laws, government information, policies and propaganda. The government's site—(<http://www.gov.cn/>)—has a vast amount of information. More and more government agencies are posting useful and timely information on-line. Even chat rooms serve a useful purpose—they help the government to gauge popular feelings and provide the public with a safe channel to vent their frustrations.

On the other hand, the government deems certain types of information to be undesirable. The Ministry of Information Industry (MII) regulates access to the Internet, while the Ministries of Public Security (MPS) and State Security (MSS) monitor its use. In order to control information, the government issued regulations governing ownership, content, and other aspects of Internet use. For example, the *Internet Information Services Regulations* bans the dissemination of any information that might harm reunification of the country, endanger national security, or subvert the government. Promoting “evil cults” is banned, as is providing information that “disturbs social order or undermines social stability”. There are regulations requiring chat rooms service providers to monitor content and restrict controversial topics, and for Internet café patrons to register with “software managers” and produce a valid ID card to log on.

Yet another example is that from May 2001 in Beijing, there is a requirement that all Internet banner advertisements must be submitted to the Beijing Administration for

Industry and Commerce (BAIC) —www.hd315.gov.cn—for approval before being placed on commercial sites. The “hd” of the website refers to the *hong dun* (red shield) of consumer protection and the “315” refers to March 15, which is Consumer Protection Day. This move has aroused concerns among advertisers and content providers about being able to continue responding quickly to market demands—the Internet’s inherent strength.

As commercial ventures, China’s Internet businesses face major difficulties. Network connections, increasing costs, regulatory uncertainty, and competition from the telephone monopolies are often a problem. Despite the risks and difficulties, China’s Internet businesses are growing rapidly and gaining attention from overseas companies with the technological and financial resources to bring to the local market.

Case Study: TCL Holdings Corporation Ltd. (TCL)

TCL, a leading manufacturer and marketer of branded household electronics products, is a good example of a Mainland Chinese conglomerate in the process of being transformed by the new economy. It has used its successful brand on the Mainland to form aggressive alliances with international players to strengthen its new IT-related products and services to meet new needs.

Established in 1980, TCL started out as a state-owned electronics enterprise in Huizhou, about 90 kilometers north of Hong Kong, China. Over the last 20 years, it has grown into China’s third largest electronics conglomerate. It has one of the strongest distribution and after-sale networks in the country—with 34 branches, 198 sales offices, 87 representative offices, over 3,000 service centers, and more than 20,000 distributors.

In 2000, TCL had total assets of US\$1.2 billion, over 30,000 staff, and turnover of US\$2.5 billion—with US\$500 million in exports. It’s compound annual growth rate of over 50% in the last 10 years places it as China’s fastest growing major electronics group. The TCL brand name—with nationwide recognition—was ranked 5th in China in 2000 by the Beijing Brand Name Asset Appraisal Firm, valued at US\$1.3 billion.

Initially, TCL was a traditional state-run electronics company, among the earliest to enter into a Hong Kong, China joint venture, contract-manufacturing cassettes at the outset. From there, TCL developed its first branded product (telephones) becoming the best-selling brand in the country within several years. But it was in 1992, when it introduced its first wide-screen color television that it became a major domestic player in household electronics. It was the first company in its field to list on the Shenzhen Stock Exchange in 1993, enabling TCL to raise capital and invest in other television manufacturers—the Henan Meile Electronic Group and Luk’s Industrial in Hong Kong, China. In 1999, TCL International Holdings Co. Ltd. raised US\$128 million with an IPO on the Hong Kong, China Stock Exchange. Today, TCL’s products include a range of household electronics, such as audiovisual equipment, air conditioners, refrigerators, and washing machines,

mobile phones. WAP-related products, personal digital assistants (PDAs), computers and IT related products).

Televisions remain the mainstay of its business today, and represented 79% of its total turnover in 2000. TCL color televisions now alternate with Sichuan Changhong as being the Number 1 and 2 brands in China, with TCL having about 18% market share. In 2000, TCL sold 5.8 million TVs, representing growth of 29% over the year before. TCL had export sales of US\$71.4 million in 2000, up 85% from the previous year. Over 50 new models were launched in 5 series of new concept TVs, targeted to the middle to high end of the market. In this segment—wide-screen, super-thin, high-resolution digital, rear projection, and Internet-accessible Home Information Display (HiD) TVs—TCL has cornered 95% of China 's domestic market.

According to China's Ministry of Information Industry, the total production of televisions in China decreased in 2000 by 2.8% over the previous year. There are signs that the market is becoming saturated. Whilst overall domestic sales are predicted to grow at about 8% in urban areas and 10% in rural areas over the next few years, sales for TCL had slowed and with margins also being eroded, a decision was made to diversify quickly. As early as 1998, a strategic move was made into Internet-related IT products and value-added services, which is expected to grow by 20% over the next 5 years in China.

The TCL IT Industrial Group was established in 1999 to spearhead all of TCL's computer and Internet related businesses. A substantial investment in capital and resources has been devoted to this effort. TCL's goal is to decrease dependence on television sales from the current 79% of total turnover down to 30% in the next few years. Although only 4% of its revenues came from IT-related sales in 2000, TCL hopes that by 2003, there will be substantial strides made. To achieve its goal, TCL has moved aggressively into IT products and services. TCL formed a series of strategic alliances with international players to enhance its market positions.

For example, in 1996, the TCL Group set up a research and development team in the US for developing digital television products. A cooperative relationship was established with Lotus Pacific, and then an equity joint venture company was set up in 1999, to engage in the design, development, and manufacture of cable set-top-boxes, cable modems, and routers for sale in China and abroad. TCL also established a new company—TCL-GVC Computer Technology Company—with Chinese Taipei's GVC to manufacture PCs. In an alliance with Intel, it became the first Mainland China company to launch the Pentium 4 computer. TCL also has cooperative agreements with Microsoft China and Oracle.

A further investment of US\$45 million was made into TCL Computer—now the third largest PC maker in China, having sold 260,000 units in 2000. The company is expected to achieve more than 60% revenue growth in 2001. The computer division has an annual production capacity of 600,000 units and is targeted to achieve 3 million units annual

production volume in three to five years. Internet-accessing PDAs are also designed and manufactured in this division.

The ejiajia Net Technology Company was created in May 2000, with an initial investment of US\$2.4 million, to develop information services platforms and an e-commerce model for TCL products. An e-commerce portal—www.ejiajia.com—was launched in October 2000 with information on various family lifestyle subjects and value-added customer services. It was designed to support TCL terminal products like Home Information Display (HiD) TVs, Internet computers, PDAs and mobile phones. A household electronic appliance “virtual shopping mall” for TCL products was added to complement TCL’s national network of dealers. Again, according to the China Internet Network Information Center (CNNIC) survey done in January 2001, a lot of people are interested in this concept of browsing and shopping on-line: computer appliances (46%), AV equipment (31%), delivery of gifts (29%), and household electrical appliances (19%).

In November 2000, a TCL Education Web joint venture teamed up with China Central Radio and Television University in Shanghai to develop interactive long distance learning programs in teacher training, graduate studies, and MBA degree courses. The university will provide education resources and will be responsible for planning and operation. Students are now being recruited. US\$8 million has so far been invested, with this Internet services initiative expected to breakeven in three years. Like other e-learning projects, the path to profit remains unclear. But based on the latest survey of web users done by the CNNIC, 33% of people are interested in receiving educational on-line services.

APEC’s Policy

The Internet is part of a wider trend of China’s embrace of communications technology and the information age. The Internet itself does not create a voice for the people but it provides a vehicle for people to communicate. Indeed, the Internet needs to be seen as part of a convergence package with telecommunications, wireless communications, cable television, and a software industry.

A sound mix of regulation and non-regulation is needed in order to promote the development of the Internet and wireless services, put it more within reach of the majority of the population and tap its economic potential. For developing countries, such as China, APEC’s policy should be to:

1. Assist in the construction of “informatization” overall;
2. Obtain assistance from developed countries to provide IT and IT management

- training in China;
3. Enable developing countries to share more information and knowledge resources;
 4. Lobby developed countries to provide public data for developing countries free of charge or at reasonable cost;
 5. Encourage the authorities to establish on-going dialogue with key stakeholders (ISPs, ICPs, foreign investors, telecommunications and wireless service providers, etc.) to help develop and promote policies and self-regulation.

In China, new laws and rules from the central, provincial and local governments seem to be announced every week, from e-commerce taxation to regulations on employment Web sites, to restrictions on news sites. And the national government is now formulating new regulations to clarify the licensing regime for ISPs and content providers. The resulting regulatory environment of these vague, uncoordinated, arbitrarily enforced rules is not helpful to development of the Internet. APEC can help share development experiences from across the region, and promote sounder policies.

CASE STUDY OF CIECC

China International Electronic Commerce Center of the Ministry of Foreign Trade and Economic Cooperation

China International Electronic Commerce Center (CIECC), founded in February 1996, is subordinate to the Ministry of Foreign Trade and Economic Cooperation, PRC. CIECC is to establish the electronic management framework for foreign trade, to realize online governmental administration on trade business under the principles of fairness, openness and efficiency, and to promote paperless trading development. Till now, it has branches in 97 cities throughout China, with over one thousand employees.

CIECC's foundation and development are in line with the development and improvement in China's macroeconomic environment, foreign trade and IT technology. As computer and Internet-based e-commerce development and EDI application in developed countries for decades have successfully established a series of international standards for electronic trade, trading companies in other countries are required to adopt these standards. Facing challenges from fast development of Internet, E-commerce and new economy, Chinese enterprises must take full advantage of information technology to promote efficiency, decrease cost and increase their portions in the international market.

One of the major tasks before APEC, the largest economical and cooperative organization in the Asia-Pacific area, is to realize the paperless trading among developed economies by 2005 and among developing economies by 2010. The date of fulfillment has thus been settled before APEC member economies. In order to catch up with other organizations in the world, Chinese government highlights the role of IT and E-commerce in national economy and start its State Golden Gate Project to enhance electronic administration and trading and accelerate China's accession to the international market.

With five years construction and development, CIECC has established China International Electronic Commerce Network (CIECNet), the backbone network of the State Golden Gate Project, and made CIETNet an integrated platform of communication, information and data exchange platforms, and a starlike network with 97 nodes covering China. CIETNet has complements full link and data-sharing with trade management organizations at various levels, the General Administration of Customs, the State Administration of Foreign Exchange the State Bureau of Taxation as well as banks, and it is also connected with networks (such as Hong Kong, China Trade-Link Network) in other countries and regions. Enterprise can access the nearest nodes for necessary technical support and service.

On the safe network infrastructure, CIECC constructed the international e-commerce platform of government trade management and enterprise e-commerce application (incl. e-government affairs platform and e-commerce platform).

The e-government affairs platform consists of a series of governmental application systems on trade administration, such as the Quota License Management System (QLMS) and the Processing Trade Network Management System (PTNMS). It has realized dynamic governmental administration in various aspects: namely, online bidding for import and export commodities, online applying for import and export quotas, online approving of import and export certificates as well as online applying for and approval of processing trade contracts. This platform highly improves the quality and efficiency of the government work. Taking the processing trade system as an example. With over 300 units authorized by CIETNet as approval agencies and over 20,000 member enterprises, the system helps realize online inquiry and management at any time, gives a heavy strike to smuggling and the illegal activities in the foreign exchange, and protects the rights and the interests of the enterprises. It also makes the governmental administration on trade more efficient and more transparent, eradicates low efficiency arbitrary and bureaucracy and helps to build an administration-service system of standard, efficiency, justice and transparency. CIETNet enables the Chinese government to realize the online verification with customs of major quota-setting countries and regions, such as the United State, Canada, EU and so on. Consequently, no more trade frustration or argument caused by false license occurs between the United States and China since 1998.

Up to date, all major governmental affairs on foreign trade and economy administration of all levels have been made on-line accessible. In domestic, office automation has been fundamentally achieved, and all overseas economic and trade institutes have been web-linked. In 2000, about 40 billion U.S. dollars export transactions used CIETNet to transmit export documents. A global, advanced, safe and practical CIETNet will further improve the transparency and efficiency of the foreign trade administration on all levels, and it will greatly adapt to the requirements of the more open-up policy and to the rules of WTO.

The e-commerce Platform is a collaboration platform between enterprises, where numerous enterprises can work in coordination, share resources and manage their production and trade through network.

The platform integrated the management system of supply chain jointly developed by the CIECC and Sino-Foreign Transportation Group, adopted the EDI technology that is internationally standard and achieved the network-based management of logistics, e.g. the network-based management of important services including shipping space booking, transportation documents transmission, container management, ship management, goods tracking, finance and settlement.

The platform is highly extendable, compatible and reliable. Enterprises can integrate their internal ERP system with the Platform. By making use of the Platform, enterprises can optimize trade partners dynamically in the world, integrate and optimize the industrial supply chain including manufacturers, suppliers, purchasers and users, so that the link between enterprises in the supply chain can be more close and harmonious, and enterprises can focus on their own core advantages, create agile supply chain, promote their core competitiveness and enhance the speed of response to market and clients.

In order to promote e-commerce application in enterprises involved in foreign trade and to realize critical changes in trading methods, CIECC will strengthen cooperation with international organizations especially in the aspects of E-commerce policy, laws and standards. Its cooperation with e-commerce organizations in the Asia-Pacific area (like Singapore Network Service Ltd., Hong Kong, China Trade-Link Ltd., Taipei Van-Trade Network Co., and Korea Trade Network) focuses on extensive research and exchange of trading documents standards and information security technology to achieve joint promotion on multinational e-commerce.

MINI-CASE STUDY: HONG KONG, CHINA

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Chief Executive Officer
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Overview

The up-take of IT usage in Hong Kong, China in recent years has been impressive. The city has 6.8 million residents and 2.6 million registered Internet accounts, compared to around 600,000 in 1998. There are around 240 Internet Service Providers, with a wide range of services at competitive prices. The city has laid enough fiber optic cables to enable all commercial buildings and most homes to be wired for the Internet thus providing a solid platform for broadband services.

IT penetration among households is relatively high—as of March 2000, 50% of all households had PCs at home, and 73.3% of them had Internet connection. Moreover, 30.3% of all persons aged 10 and over had used the Internet at home that year.

Despite its size, Hong Kong, China is the 9th largest trading economy in the world. However, it is not yet using electronic means to do business in any substantial way. Although 51.5% of business establishments had PCs and 37.3% of them had Internet connection by March 2000, according to government information, only 7.3% of them had websites, and only 0.3% of them had made e-sales, although 35.3% of them had received e-products, services or information. In 1999, official information showed that business receipts from e-sales amounted to only US\$590 million. However, industry sources think e-commerce today could be around US\$2 billion—still modest for a substantial trading economy like Hong Kong, China. However, some industry optimists believe that the total value of transactions (both business-to-business and business-to-consumer) could grow to over US\$70 billion by 2004.

It should be noted that 79% of the population have mobile phones and Hong Kong, China phone services are among the cheapest in the world. Mobile phones and other handheld devices will become important tools to access the Internet. Furthermore, there are 7 million “smart” cards in use in the city mostly for making e-payments for public transport and a growing range of retail services.

Government Policy

The Hong Kong, China Special Administrative Region Government has made a significant push to promote IT since 1998 with the announcement of the *Digital 21 Strategy*. In April 1998, it established the Information Technology and Broadcasting Bureau—the equivalent of a ministry—to chart policies, whose function is supervised by the Financial Secretary, the equivalent of the finance minister. The bilingual

(English/Chinese) government site, www.info.gov.hk is up-to-date on the latest government information and press releases, and contains useful information about departmental structure, functions and policies.

The government is implementing a 5-year IT strategy in education involving significant capital and recurrent spending to equip schools with computers and programs to encourage teachers to learn IT skills. Furthermore, its *IT Hong Kong, China Campaign* aims to promote the wider use of IT at all levels of society. For example, the first round of an IT awareness program took place from October 2000 through March 2001 and provided about 18,000 places for different sectors of the community to attend 4-hour awareness course run by a private sector training agency.

The *Digital 21 Strategy* includes a range of initiatives for on-line government information and services. For example, a dedicated e-Government Coordination Office will be established to continue putting most public services and procurement tenders on-line. It also targets to provide an e-option for 90% of public services by end 2003 (65% of services now have an e-option). The government has passed the Electronic Transactions Ordinance to provide a clear legal framework for the conduct of electronic transactions. It plans to conduct the auction of 3G mobile licenses in September 2001.

To drive the use of new technologies, Hong Kong, China plans to be among the world's first in issuing mobile digital certificates to support secure mobile commerce, and earmarked over US\$385 million to roll out smart identity cards with multi-application capacity to the entire population. It will also establish linkage between local universities and the Internet2 network for conducting research in the next generation of Internet technologies over a high-speed network.

Case Study: Hong Kong Trade Development Council (TDC)

Although trade is Hong Kong, China's lifeblood and local traders are nimble and entrepreneurial, e-commerce is still more talk than reality among the 290,000 small and medium-sized enterprises (SMEs), who account for the bulk of Hong Kong, China's US\$479 billion trade in goods and services in 2000. Indeed, SMEs, who account for 98% of all business establishments in Hong Kong, China and employ 60% of the workforce, form the backbone of Hong Kong, China's trade network.

The TDC, a statutory body, provides a useful case study of the Internet challenge for Hong Kong, China business. The TDC was set up in 1966 to promote international trade for local companies, especially the export-oriented SMEs. The TDC's database is the largest of its kind in Asia with details of 100,000 companies in Hong Kong, China, 120,000 in Mainland China, and 380,000 overseas. It also contains over 18,000 brand names, and their agents, licensees, and owners in Hong Kong, China.

The TDC has a 19-member governing body, the members of which are appointed by the government. Membership is a mixture of government officials and business leaders. The TDC has a professional staff of around 900 people and 48 overseas offices. It has an

annual budget of approximately US\$180 million, of which approximately 22% is derived from declaration charges for imports and exports collected by the government. The balance comes mainly from organizing trade fairs in Hong Kong, China and from advertising revenue. In 2000-2001, it organized 330 promotional events around the world and 15 major international trade fairs.

Affects of the “New Economy”

The Internet enables the TDC to have a much closer relationship with Hong Kong, China and overseas companies, and better coordinate with its own global network of offices. It allows more frequent contact as well as instant service—saving time, effort, and cost. Without the Internet the quantity of information, frequency of exchange, and volume of contacts would not have dramatically increased.

Between 1995 and 2000, and despite the severe economic downturn in Asia between 1997-1998, the TDC invested over US\$23 million to upgrade its internal IT system and provide more comprehensive, user-friendly, on-line services. The move was made to stay on top of rapidly evolving technologies to ensure Hong Kong, China’s continued success as a business information hub.

The first step was the installation of an Internet e-mail system in 1995, linking the TDC with its global network of offices and to enable easier trade contact. The annual number of business inquiries processed each year jumped to 350,000 after e-mail was introduced.

An on-line version of *Hong Kong, China Enterprise*, the TDC’s flagship product promotion magazine, was launched in 1996. Furthermore, *TDC-Link*, the on-line text-based trade information service was upgraded and re-launched. Business inquiries to the TDC jumped to 750,000 per year—more than double that received previously.

Free services on *TDC-Link* include access to the Hong Kong, China database as well as an electronic marketplace of bids and offers for the sourcing and supplying of products and services. Local corporate subscribers, for a nominal fee, can access Mainland Chinese, Chinese Taipei, and overseas business opportunities and company contacts.

In 2000, the TDC home page was transformed into trade portal *tdctrade.com*. Users can access a lot of useful information in both English, and for the first time, in Chinese in both traditional and simplified characters, to suit Mainland China, Hong Kong, China and Chinese Taipei audiences. It features five industry-specific vertical portals—electronics and electrical appliances; garments and textiles, gifts and household wares; toys and sporting goods; timepieces and jewelry; and optical goods—reflecting Hong Kong, China’s major export sectors. The daily hit rate for *tdctrade.com* has been steadily climbing to an average of 1.4 million per day—more than four times the hit rate of the TDC’s old website.

The TDC has partnered up with others to increase exposure of *tdctrade.com*, including the Microsoft Network and China's Ministry of Foreign Trade and Economic Cooperation (MOFTEC). It has also forged alliances with many IT service providers in developing its capabilities. Among them is Tradelink Electronic Document Services, and together they promote IT awareness among SMEs and provide training seminars. Tradelink, working with the government to automate commonly used forms like trade documents and export licensing, is also helping TDC develop electronic data interchange (EDI) on-line services for *tdctrade.com*.

Tdctrade.com also launched TDC webcast, a multimedia broadcast platform, and a cyber SME center serving SME needs. Visa applications forms and requirements of around 100 countries are also available for local users using the portals Visa-On-Demand service.

TDC joined forces with Dialog, a leading provider of Internet-based business information services to provide information on market research, competitive intelligence, business directories, corporate financials for US and international companies, and worldwide patent, trademark, and copyright developments are available for secure on-line purchase.

Trade enquiries handled by the TDC have now reached 1 million per year as a result of having a better presence on the Internet. Many print publications have been phased out as they are now available on-line, which has reduced costs and increased circulation. The TDC believes that the Internet has helped it to have greater impact in promoting its work and enabled it to serve its local and overseas customers better.

Reasons for Slow IT Up-Take among SMEs

Despite clear government policy and public sector encouragement, Hong Kong, China businesses are still slow in embracing e-commerce. This can be seen from the results of a survey conducted by the Hong Kong, China Productivity Council and IBM in September 2000. The following chart shows the e-commerce adoption rate among the 1,122 Hong Kong, China companies, mostly SMEs, interviewed.

e-business Adoption Index

Levels 0-5	Identifiable features	%
0: No intention	No e-mail address and no intention in next 6 months	54.4%
1: Show intention	Plan to set up an e-mail account and/or a website within next 6 months	45.5%
2: Basic adoption	E-mail usage only	42.4%
3: Prospecting	Well-established web page and e-mail communication	15.3%
4: Business integration	Web application for online transaction or basic integration with internal operational systems or with external business partners	3.8%
5: Business transformation	On-line transaction, on-line payment, internal and external integration, web page, email	0.3%

There are a number of constraints as to why Hong Kong, China SMEs have been slow in developing IT capabilities. Firstly, Hong Kong, China starts from a relatively low technological base. It has a strong trade and weak technology tradition. In order for local traders to catch-up on technology to enhance their business, they first need to become more familiar with the use of computers and software applications.

Secondly, even among the SMEs who use the Internet, most of them take a conservative approach to fully embracing e-payment capabilities, as do their bankers. There are over 20 banks in Hong Kong, China offering various forms of Internet banking but HSBC's experience is instructive since it is the bank with the deepest penetration in Hong Kong, China. HSBC indicated that whilst many of its SME customers use the Internet for e-mail and information gathering, only the "early adopters" are using it for banking functions. While its Personal On-line Banking services—enabling the checking of account balances, transferring of funds between accounts, and making payments to third parties over the Internet—have been available since August 2000, these services will not be fully available to business customers until later 2001. Because the investment for banks in developing depth and breadth of e-banking services is substantial, they are reluctant to offer such services until their own research shows broad-based usage.

Thirdly, many SMEs were wary to invest in IT over the last few years at a time when the region was in recession and their profit margins slashed. For example, in the 1998-1999 tax year, less than 5% of the companies contributed more than 80% of the corporate profits tax, and 80% of the companies contributed 7% of the corporate profit tax yield. Even though Hong Kong, China's economy has improved, profitability remains an issue for many SMEs, who remain reluctant to make investments in IT up-grade.

Fourthly, in the catching-up process, there is a lack of the right kind of personnel to assist with everything from general computer maintenance services, to programmers, systems analysts, database administrators and project managers. According to a government study, there were over 60,000 IT practitioners in Hong Kong, China in 2000, with average annual growth of 11.8% expected through 2005. Hong Kong, China local tertiary institutions are offering around 19,000 full-time degree-level places in IT-related fields annually. Over 30 new programs at the diploma, graduate or post-graduate levels on e-commerce and related subjects are on offer. The Vocational Training Council is offering around 17,000 sub-degree level IT places annually, while the Employees Retraining Board is providing over 44,000 IT related training places each year.

However, there is a shortage of experienced personnel today. Like elsewhere in the region, the government has set-up special visa schemes to attract overseas technologists, including from Mainland China.

APEC E-Commerce Readiness Assessment Guide—Hong Kong, China

APEC's *e-Commerce Readiness Assessment Guide* provides a self-assessment tool that can be used by economies to assess their readiness to participate in the digital economy.

Results can help governments identify steps to be taken in improving the e-commerce environment, and facilitate dialogue between governments and businesses on policies.

The Hong Kong, China authorities conducted a self-assessment in October 2000 and found that the city has a solid foundation from which to build an information society. It already has an advanced telecommunications infrastructure in place and wide consumer choices. The use of the Internet has become an integral part of the daily lives of Hong Kong, China people. Mobile penetration is already very high and more people will be able to access the Internet and conduct m-transactions as mobile services continue to grow. Indeed, Hong Kong, China's m-services are far better than those in the US and Europe. Hong Kong, China's challenge is to help its SMEs to become more IT savvy.

ELECTRONIC FINANCIAL TRANSACTIONS IN HONG KONG, CHINA

Financial Services Bureau
Government of the Hong Kong Special Administrative Region

Introduction

Hong Kong, China, China is a major international financial centre in the Asia Pacific region. Its integrated network of financial institutions and markets is characterised by a high degree of liquidity. The institutions and markets operate under effective and transparent regulations which meet international standards. The Government of the Hong Kong, China, China Special Administrative Region encourages market liberalization to enhance competitiveness, product innovation and efficiency. The Government also encourages the use of information technology (IT) to further integrate the full range of financial services—securities, futures, clearing—through an open and secure electronic network. These measures are a good pointer to Hong Kong, China, China as a market with increasingly attractive investment potential.

There are over 150 licensed banks in Hong Kong, China, China. There are also about 120 representative offices in Hong Kong, China, China representing banks from over 40 different countries. The volume of the banking system's external transactions is about US\$780 billion, the tenth largest in the world and third largest in Asia. In foreign exchange, Hong Kong, China, China is the world's eighth largest centre in terms of total foreign exchange and derivatives transactions, with total average daily net turnover at US\$82 billion. Hong Kong, China, China's stock market is the tenth largest in the world and third largest in Asia. Total market capitalisation of the main board is about US\$570 billion, with average daily turnover at about US\$1.14 billion. The second board's total market capitalisation is US\$8.2 billion and average daily turnover is US\$17 million.

Electronic Transactions in the Banking Sector

E-Banking Services for Retail/Personal Customers

Over 20 banks or banking groups, which consist of the majority of retail banks in Hong Kong, China, China, have introduced Internet banking services for retail or personal customers. In addition, a number of other retail banks are planning to introduce Internet banking services in the near future. The Hong Kong Monetary Authority (HKMA) is processing a few applications for setting up Internet-based banks in Hong Kong, China. Regarding the services offered over the Internet, many banks have introduced investment services, apart from banking services, over the Internet. For instance, these include Internet stock trading services and other investment services (e.g., FX margin trading, e-IPO, unit trust) over the Internet.

As regards the use of mobile phones or other electronic channels for offering e-banking services, around 10 banks or banking groups have launched mobile phone banking or stock trading services (over mobile phones using SIM Toolkit technology), through which their customers can transfer funds or trade stocks using certain types of mobile phones over designated mobile networks (e.g., networks of PCCW HKTelecom, Orange). A few banks have used other channels to offer e-banking services, such as through the kiosks or intelligent telephone sets installed at non-branch outlets, and the households' television sets with Internet connection.

E-Banking Services for Business Customers

Several banks have introduced Internet banking services (e.g., trade services, cash management and payment services, FX trading, custody and clearing services) for their business customers. A few banks plan to offer bond trading services to their business customers. Many international banks have formed alliances or joint ventures to develop portals for bond trading.

Many banks have introduced e-commerce related services for business customers. For instance, a number of banks have launched Internet payment processing services for their merchant customers. Some banks have introduced online shopping malls or electronic marketplaces.

While there are no relevant statistics about the exact extent of banks' reliance on outside vendors or other third parties in Hong Kong, China, banks in Hong Kong, China generally have been working with outside vendors and other relevant service providers (e.g., Internet service providers, mobile network operator) in developing their e-banking systems so as to acquire the expertise for operating and maintaining the systems. Some banks will make use of the expertise of their parent banks or overseas head offices in introducing e-banking services. Banks have been reminded of the importance of developing their internal expertise to manage the risks associated with the e-banking services.

E-banking raises the challenges of risk management particularly in respect of strategic risk, operational risk (including security risk), legal and reputation risk. Moreover, e-banking could raise customer protection issues. For instance, the ability for banks to collect personal information of a customer through an open network (e.g. the Internet) raises privacy issues.

Electronic Transactions in the Securities Sector

The Securities and Futures Commission (the Commission) conducted a survey with all registered dealers in April 2000 in relation to the use of online trading facilities. It was found that 28 brokers offered online trading facilities at that time. Most of them offered online dealing in Hong Kong, China listed securities. A few of them offered online

dealing in overseas listed securities (predominantly US securities) and online trading in futures contracts. In addition to online trading, these brokers also offered services like research information, real time price quotations for financial instruments, provision of investment advice, securities offers including initial public offerings and placements, and funds dealing. By December 2000, the number of online trading services offered by brokers registered with the Commission has increased to 86, a three-fold increase since April 2000.

An On-line Trading Working Group was established in early 2000 to study the growth of online trading in Hong Kong, China and make recommendations to facilitate its development. The Commission, in the process, has consulted various securities firms that offered or intended to offer online trading services and identified issues of consideration for future development. In December 2000 the Commission issued a “Consultation Paper on the Regulation of On-line Trading of Securities and Futures” to solicit market comments. The consultation paper has identified problems faced by existing online brokers. These include heavy influx of competition, small population of users compared to other Asia countries, decreasing brokerage commissions, costs of ongoing compliance, and shortage of experienced management, traders, information technology personnel and technicians. Regulatory issues were identified which include the security, capacity and contingency of the online trading systems.

Impediments and Challenges to the Development of Electronic Financial Transactions

For the Banking Sector

Hong Kong, China Infrastructure

Hong Kong, China has a good infrastructure to support the continued growth of the development of e-banking businesses. Hong Kong, China has one of the finest telecommunications infrastructures in the world. Over 80% of households and more than 90% of business buildings are covered by broadband network. Its external connectivity is also amongst the highest in Asia. In addition, penetration rates for electronic delivery channels in Hong Kong, China are among the highest in the world:

- about 50% of households have PCs;
- about 36% of households have Internet access;
- 74% of the population use mobile phones.

Regulatory Framework of E-Banking

The HKMA’s regulatory approach tries to strike a balance between dealing with the risks of e-banking services while promoting competition and innovation. A number of guidelines have been issued on electronic banking since 1997.

Impediments and Challenges to the Development of E-Banking Services

While we are not aware of any major impediments facing banks regarding e-banking services in Hong Kong, China, there are several major challenges that the banks may encounter when providing e-banking services:

- (a) Cost savings through e-banking services have proved to be difficult to realize. The potential of the Internet to reduce operating expenses for banks depends on their ability to migrate customers onto the new low cost channel and to close the resultant surplus branches or convert them into sales outlets rather than transaction centres. While this process is going on, the banks will have to increase their spending on front & back-end IT & associated expenses such as advertising;
- (b) Revenue growth through e-banking has been difficult to achieve. Ability of banks to cross-sell products is unproven, and margins will come under pressure from greater price transparency;
- (c) Banks need to handle increased competition from new, low-cost new entrants (e.g. virtual banks, e-lenders, and aggregators). They may need to differentiate themselves from existing players through image, culture, products, service, integrated and personalized approach to customers;
- (d) The Internet also poses new challenges to the banks on security risk because of its open nature. If the security issue is not properly managed, it will damage the banks' reputation and their customers' confidence.

As for system failures of Internet banking services, there were several such occurrences, which had minimal impact on the banking services to their customers, because the Internet is not the only channel for banking services.

For the Securities Sector

To facilitate electronic trading, Hong Kong Exchanges and Clearing Ltd has undertaken a number of projects to further automate the trading processes since its official establishment in March 2000. They include:

- (a) the launching of the Automated Trading System (the "HKATS") (an electronic trading platform for the trading of futures and options contracts) by its subsidiary Hong Kong Futures Exchange in June 2000; and
- (b) the rollout of the third generation of the Automatic Order Matching and Execution System (the "AMS/3") (an electronic trading system for securities trading) by its subsidiary the Stock Exchange of Hong Kong since October 2000.

Both the HKATS and the AMS/3 are equipped with access functions to enable investors to trade online via brokers. Investors can place orders through the Internet or a

broker's proprietary system. Both the HKATS and the AMS/3 allow direct connection of a broker's proprietary system to its trading engine through a defined API (Application Programming Interface) to facilitate straight through processing of orders. According to SEHK statistics, about 10 % of its participants have proprietary systems which are developed by outside vendors.

The Steering Committee on the Enhancement of the Financial Infrastructure in Hong Kong (the "SCEFI") was established in early 1999 to examine and recommend ways to enhance the financial infrastructure. The Steering Committee completed a report in September 1999 with a full range of recommended measures to reduce the cost of transactions, increase efficiency and facilitate better risk management. Among the key recommendations are the establishment of an open and secure electronic network that will allow straight through processing of securities and derivative transactions and the development of a scriptless securities market. Good progress has been made in the implementation of these recommendations.

Legal/Policy Framework

The Electronic Transactions Ordinance (ETO), which was largely based on the United Nations Commission on International Trade Law Model Law on Electronic Commerce, was enacted in the Hong Kong Special Administrative Region (HKSAR) in January 2000. The ETO provides legal recognition of electronic records and digital signatures as that of their paper-based counterparts. It provides a framework for the establishment of local public key infrastructure (PKI) and recognition of certification authorities (CAs) operating in Hong Kong, China. With the use of CA services and digital signatures, the four major concerns of electronic transactions, i.e. authentication, integrity, confidentiality and non-repudiation can be addressed. The ETO and establishment of a local PKI have provided a favourable and reliable environment for electronic transactions and led to the development of applications to facilitate electronic transactions in different service sectors.

For the Banking Sector

Policy Framework of E-Banking Services

The HKMA's role is to provide a regulatory environment in which banks will properly manage the risks arising from electronic banking, while not standing in the way of these developments. Given the rapid pace of development in this area, the HKMA has been keeping its supervisory policy for e-banking under review. Since 1997, the HKMA has issued a series of guidelines and guidance notes to set out its regulatory approach on electronic banking services and to provide authorised institutions with recommendations on the risk management for these activities. Existing banks seeking to offer an Internet banking service should consult with the HKMA in advance.

In 2000, the HKMA issued a Guideline on the Authorization of Virtual Banks (available at http://www.info.gov.hk/hkma/eng/guide/guide_no/20000505e.htm) under the Banking Ordinance. The main principle is that virtual banks, which deliver banking services primarily through electronic channels, should satisfy the same prudential criteria that apply to conventional banks. Moreover, the HKMA issued two guidance notes to provide authorized institutions with recommendations on the security aspects of electronic banking.

While HKMA will continue to issue guidelines and guidance notes when appropriate in relation to the latest development of e-banking and emerging technologies, the HKMA established a specialist team of examiners with the necessary skills and technical knowledge to conduct more focused examinations on e-banking activities of banks.

Customer Protection Issues

As e-banking simplifies the collection and sharing of personal information, it may raise customer protection issues such as privacy. The increased risk for unauthorized transactions conducted over e-banking leads to the need for a fair allocation of liability between banks and customers for such transactions. The HKMA and the banking industry are in the process of reviewing the Code of Banking Practice to issue more guidelines, such as on customer protection and electronic disclosures, pertaining to e-banking.

For the Securities Sector

The Electronic Transactions Ordinance provides that:

- Where a rule of law requires information to be given in writing, that requirement is met by electronic records;
- Where a rule of law requires information to be retained; or retained or presented in the original form, that requirement is met by retaining or presenting the information in the form of electronic records;
- Where a rule of law requires the signature of a person, that requirement is met by a digital signature; and
- Contracts shall not be denied legal effect solely on the ground that electronic records are used in their formation.

The Commission has issued the following regulatory guidance in relation to Internet regulation and online activities. They include:

- Guidance Note on Internet Regulation;
- Circular on Provision of Financial Information on the Internet—Licensing Requirements
- Guidelines for Registered Persons Using Internet to Collect Applications for Securities in an Initial Public Offering
- Guidance Notes on the Application of the Electronic Transactions Ordinance to Contract Notes

These guidance notes set out and clarify the Commission's regulatory approach towards various issues or concerns raised by market participants in relation to the offering of online trading services. Electronic copies of these guidance notes are available on the Commission's web-site (<http://www.hksfc.org.hk>).

Cross-Border Supervisory Issues

For the Banking Sector

While we have not encountered any specific cross-border supervisory issues with respect to electronic banking in Hong Kong, China, we recognise that cross-border e-banking may increase the potential for jurisdictional ambiguities with respect to the supervisory responsibilities of different authorities, which might lead to insufficient supervision of cross-border e-banking activities. In particular, customers in Hong Kong, China may be able to gain access to financial services or advertisements for financial services provided by overseas organisations that may or may not be subject to supervision. The HKMA has studied the issue of Internet advertisements for offshore deposits and completed the proposed legislative amendment to regulate such advertisements. The HKMA will then develop a guideline to set out the factors that the HKMA will take into account in determining whether an Internet advertisement for deposits is targeted at the general public of Hong Kong, China.

For the Securities Sector

The Commission has set out the basic regulatory approach towards Internet trading in its "Guidance Note on Internet Regulation". It stipulates that *"the fundamental principles of regulation for activities over the Internet are not premised on the use of a particular medium of communication or delivery. Regulated activities should be uniformly regulated irrespective of whether such activities are conducted via paper-based media or electronic media. As a general principle, The Commission will not seek to regulate securities dealing, commodity futures trading and leveraged foreign exchange trading activities that are conducted from outside Hong Kong, China and over the Internet, provided such activities are not detrimental to the interests of the investing public in Hong Kong, China."*

However, if a person or an entity who uses Internet technology to induce people residing in Hong Kong, China to trade in securities, commodity futures contracts or leveraged foreign exchange, or holds himself out as carrying on such business activity in Hong Kong, China, such person or entity will be subject to registration requirements and other regulation imposed on traditional brokers. The Commission, in determining that, will consider the totality of the facts of each case, including the actual physical location or presence of the business, the manner in which and nature of the activities that have been

carried out in Hong Kong, China, and the motives for and circumstances surrounding the conducting of such activities.

Payment and Settlement

For Commerce/Trade Sector

Electronic Financial Transactions (EFT), e.g. through Real Time Gross Settlement (RTGS) system, autopay instructions, SWIFT payments, PC banking, is widely used for B2B (business to business) and B2G (business to government) transactions. We have noticed a recent trend that more banks have introduced Internet payment services for their business customers. However, paper-based payment instructions such as cashier orders and paper cheques are also used by corporations for making payments to the Government or businesses. We understand that the service providers normally implement security policies, apply security technology in the processes and have their own ongoing audit and monitoring arrangements. For B2B transactions, Secure Socket Layer (SSL) protocol or Secure Electronic Transaction (SET) technologies have been widely used.

Specifically for B2G transactions, we have launched various initiatives where businesses and citizens can now pay almost all the Government bills via electronic means, including via the Internet, a tone phone, bank autopay system and a bank Automatic Teller Machine (ATM). For instance under the payment by phone service, registered users using a tone phone can pay for a wide range of public services including Government services, utilities, telecommunications service, any time and any where. The Electronic Payment Service (EPS) enables all citizens and businesses to pay for all kinds of services via a bank ATM. Recently, our banking sector has embarked on various new Internet banking services. For instance, subscribers to Jetco-online, an online service of a local bank network, will be able to pay their bills online via the Internet.

In our recently launched Electronic Service Delivery (ESD) scheme which is a portal providing a wide range of public services online, electronic payment can be made in public information kiosks and at home or office through their personal PCs.

One good example showing the extent of the use of EFT is the payment of tax via electronic means. Taxpayers are well receptive to electronic payments. Earnings and profits tax paid by electronic means during 1999-2000 reached 19% of the total payment in the previous two years.

Our Customs and Excise Department will adopt an EFT approach in collecting duty payment for the dutiable commodities via the Electronic Data Interchange System for Dutiable Commodities Permits (EDI-DCP) project. It is expected that the EFT will be implemented by mid-2001 in line with the roll-out of EDI-DCP. This will serve as an additional facility to the over-the-counter duty payment.

In all these EFT applications, service providers have delivered their service by using widely recognised technologies e.g. the encryption using Secure Socket Layer (SSL)

protocol or Secure Electronic Transaction (SET) technologies, digital certificates, to address the security concerns.

In Hong Kong, China, EDI is a type of electronic service involving computer-to-computer exchange of information electronically in a standard format. The application of EDI in commerce in Hong Kong, China has resulted in improved efficiency and a significant reduction in paperwork. Since 1997, the Hong Kong Government has adopted the EDI service provided by a private sector service provider to allow businesses to submit trade-related documents electronically. As far as we are aware, the EDI technology is not directly used for payment and settlement.

There is a wide range of electronic payment and settlement infrastructure provided by the private sector in Hong Kong, China. They include PPS, ATM, multi-purpose cards, internet banking, phone banking, etc.

For the Securities Sector

The Central Clearing and Settlement System (the “CCASS”) of Hongkong Clearing is the key settlement infrastructure for B2B transaction in the securities market in Hong Kong, China.

Trades concluded in the Stock Exchange of Hong Kong are transmitted electronically to the CCASS for clearing and settlement. Trades are currently settled on T+2. Securities settlement is effected either by scheduled daily batch settlement runs or immediately on-line by the input of Delivery Instructions on settlement day.

During each batch settlement run on settlement day, the stock account of the delivering participant is debited and that of the receiving participant is credited. However, a delivering participant may choose, or be requested by its counter-party, to settle a position or transaction on-line by initiating Delivery Instructions. Each Delivery Instruction takes immediate effect upon input, if there is sufficient stock balance available in the delivering participant's stock clearing account.

Hongkong Clearing provides money settlement services for all transactions settled on a DVP basis. Each participant is required to establish an account at a designated bank and authorise Hongkong Clearing to initiate electronic instructions to debit or credit its designated bank account. Book-entry money records are generated for a participant in its money ledger with respect to its settlement and other financial obligations due to or from Hongkong Clearing. Settlement is processed through the clearing system of the Hong Kong Interbank Clearing Ltd. against participants' designated bank accounts.

Trades settled under the Continuous Net Settlement system of CCASS are always settled on a day-end DVP basis. The money positions arising from a broker participant's trades settled under the Continuous Netting System in each stock position are netted, resulting in a single net amount due to or from the participant. This is settled by direct debit or

credit instruction issued by Hongkong Clearing to the designated bank of the participant at the end of settlement day.

Hongkong Clearing acts as a facilitator for Isolated Trades, Settlement Instruction and Investor Settlement Instruction transactions settled on a DVP or Real-time DVP basis, and issues electronic payment instructions to the designated banks of the participants concerned to effect money settlement. For Isolated Trade transactions, participants can choose to settle on a DVP or a Free of Payment basis. For transactions settled on a Free of Payment basis, participants make their money settlement outside CCASS without involving Hongkong Clearing. Participants can also elect to settle Settlement Instruction and Investor Settlement Instruction transactions on a Real-time DVP basis. Under the Real-time DVP system, shares are delivered to the stock account of paying participant upon receipt of payment confirmation from the Hong Kong Interbank Clearing Ltd.

Electronic Payment System for Business to Government

As one of the key initiatives to develop electronic Government and promote electronic commerce in Hong Kong, China, the Information Technology and Broadcasting Bureau (ITBB) has launched the Electronic Service Delivery (ESD) Scheme which provides a one-stop-shop portal of online services 24 hours a day and seven days a week. The public can now access these services through a common interface via the Internet using their personal computers and public information kiosks installed at various convenient locations like subway stations, supermarkets and major shopping malls. The ESD infrastructure is open to the private sector to deliver online commercial services to the community.

The ESD Scheme accepts a wide range of electronic payment methods, e.g. debit card (EPS and JETCO), credit card (Visa, Mastercard and Diners) and smart card (Visa Cash). Advanced technologies such as SSL (Secure Socket Layer) and SET (Secure Electronic Transactions) will be used to ensure secure electronic payment. Examples of electronic services for which electronic payment is supported by ESD include renewal of driving and vehicle license, application and renewal of Business Registration Certificate, application for search or copy of Birth/Death/Marriage Certificate etc. Moreover, citizens can also pay various types of Government bills electronically via ESD, e.g. rates and rent, water and sewerage charges, tax etc.

There is no Customs tariff in HKSAR. Excise duties are levied on four groups of commodities irrespective of whether they are imported or manufactured locally. These commodities are hydrocarbon oil, tobacco, liquor and methyl alcohol. The Customs and Excise Department will introduce an electronic duty payment system for dutiable commodities in mid-2001. Under the proposed system, traders can opt to pay the duty via Internet banking services. They can also pay the duties by making transaction at a computer installed with the electronic fund transfer software.

Importers and exporters of other general cargoes have to pay trade declaration charges which are notional in nature. The traders can lodge the import or export declaration of their goods via the electronic data interchange (EDI) system provided by a specified electronic service provider (SESP). SESP is entrusted for the payment of the relevant charges to the HKSAR Government on behalf of the traders.

Real Time Gross Settlement (RTGS) System

Hong Kong, China's interbank payment system successfully changed to the RTGS system in December 1996. Over the past four years, the system has provided smooth and efficient settlement for interbank payments. The RTGS system in Hong Kong, China is a single-tier settlement structure with all banks maintaining settlement accounts with the HKMA. All RTGS payments are settled in real time, transaction in transaction basis across the books of HKMA. The banks' settlement accounts are not allowed to go into overdraft. Intraday liquidity can be obtained by the banks through the use of their Exchange Fund Bills and Notes for intraday repurchase (repo) agreements with the HKMA.

Coordination in the Development and Promotion of the Use of Electronic Payment Systems

The policy objective of Information Technology and Broadcasting Bureau (ITBB) is to provide the necessary legal and physical infrastructure to facilitate developments of electronic commerce (e-commerce) in Hong Kong, China. While ITBB's focus is on infrastructural developments to facilitate electronic transactions in general, it has no policy oversight nor the expertise over the institutional framework for the coordination and development of electronic payments systems in Hong Kong, China. As part of the electronic government initiatives, ITBB is liaising with the Treasury for the provision of the electronic payment gateway for the electronic settlement of fees and charges payable by the public to various Government bureaux and departments.

One of the main functions of the HKMA is to develop Hong Kong, China's financial infrastructure to enable money to flow smoothly, freely and without obstruction. This function has been facilitated by the introduction of the RTGS in 1996. In the context of the development of electronic payment systems, and insofar as interbank fund transfer are concerned, the HKMA continues to play the role as the overseer in this area.

There exist a number of policy initiatives by the various bureaux and departments of the government to promote the use of the electronic payment systems. At the same time, the government endeavours to accommodate, as it has been successfully doing so, the market development with a free market environment, so that the private sector is able to conduct business using electronic payment systems and to carry out researches on technical innovations.

Summing Up and Looking Forward

Hong Kong, China is well-poised for the new opportunities in the New Economy. With a good infrastructure in IT and telecommunications, business-friendly policies, up-to-date legal and regulatory framework meeting international standards, Hong Kong, China stands ready to meet the challenges in electronic financial transactions. The geographical compactness of Hong Kong, China and the presence of a large number of banks, brokers and financial services intermediaries provide easy access and a high degree of convenience to investors. Hong Kong, China is also well connected not only electronically and geographically but also in terms of movement of goods, people, and capital. Such characteristics are valuable assets for Hong Kong, China in the New Economy.

E-TRANSACTIONS IN HONG KONG, CHINA

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Introduction

Various estimates of e-commerce by research organizations place Hong Kong, China around the Asia-Pacific average of 1 percent of GDP, of which 96 percent is estimated to be business-to-business (B2B) or government-to-business (G2B) and the rest business-to-consumer (B2C). Other data suggests less than 4 percent of individuals have ever purchased online in Hong Kong, China. Such fragile figures indicate the age of electronic commerce is still very much at its inception.

Undoubtedly one reason for the dominance of B2B and G2B is the fact that many business transactions are doing no more than transferring existing business from offline to online to streamline supply chain management and reduce transaction costs. By contrast, B2C is largely about forging new business, growing new markets and creating new distribution channels that are in competition with existing bricks-and-mortar shops and shopping malls. In a clustered urban environment like Hong Kong, China, the genuine benefits of B2C have yet to prove themselves.

Does any of this matter? If the markets operate efficiently and effectively without e-commerce then no, it doesn't, at least not to the functioning of the economy. At this level the test should be whether the markets are sufficiently informed about e-commerce to know when is the right time, the cost-effective time, to adopt electronic transactions, and whether the adoption process is relatively painless. Why then are governments so concerned about promoting and facilitating e-commerce? Clearly the detailed answer will vary from economy to economy, but in principle the answer is fairly simple. E-commerce is seen as a pre-requisite to becoming an effective player in the global economy, and the spread of e-commerce is also seen to be stimulating to local companies innovating in information and communications technologies (ICTs). For example, a 'new media' value chain is emerging which can be layered as follows:

1. Content conception—creative activity
2. Content creation—from drawing board to realization
3. Content packaging—making content marketable
4. Content service provision—distributor of content
5. Content transmission—distribution channel, such as cable TV or mobile phone service provider
6. Content access device—computer, TV, cellphone, handheld PC
7. Content consumer—private, public, business, mass market consumer

Each economy will identify its own strengths and weaknesses along this chain, and there are similar value chains for other elements of the ICT sector. For example, some economies are major producers of IT, others, like Hong Kong, China, are major users of IT. For this reason the Hong Kong government sees a role in facilitating and promoting the use of ICTs to build upon areas of competitive strength and innovation, especially in ICT applications and content. For example, a good test for the future will be the adoption of mobile e-commerce (m-commerce) as packet-switched (Internet) mobile cellphone networks replace second generation (2G) circuit switched (voice and SMS) networks in Hong Kong, China.

Underpinning the successful adoption of ICTs is the information infrastructure. A decade ago this was less true because the adoption of IT was mainly in the form of stand-alone computers or workstations networked internally through a local area network or LAN. Only the larger corporations bought private leased circuits from a telephone company to establish a wide-area network or WAN. Today, computer networking is the essential prerequisite of e-commerce, and the use of Internet Protocol (IP) has transformed IT systems and brought convergence to the IT and communications worlds, hence ICTs. In this regard Hong Kong, China enjoys an enormous advantage in having a truly world class ubiquitous telecommunications network. In fact Hong Kong, China has several fixed and wireless networks, narrowband and broadband, since the sector was opened to competition in the 1990s.

Part 1: SMEs in Hong Kong, China

Computing and processing technologies, and the underlying physical infrastructure to connect them, are clearly enablers that offer organizations and individuals the opportunity to increase their productivity (output in relation to cost) and their productiveness (their range of outputs) as well as extend their reach to connect to new markets. But Hong Kong, China's economy, like many in Asia Pacific, is dominated by small and medium-sized enterprises (SMEs) and they are naturally reluctant to embrace capital expenditure unless and until the costs and benefits are unambiguously favourable. This is not so much risk-averse behaviour as good commercial common sense. Hong Kong, China's SMEs have shown an agile mobility in being able to change products, or geographical markets or even location—especially to southern mainland China—in reaction to shifts in supply and demand conditions. One aspect of this mobility is the high demand for very portable enabling technologies, such as fax machines, pagers and mobile phones, and an aversion to avoidable sunk costs.

According to a Census and Statistics Department ¹² survey of 340,000 establishments in 2000, only 52 percent had computers. While 90 percent of larger establishments had purchased their first computer before 1997, this was true of only 55 percent of all establishments. Perhaps most sobering of all is that 95 percent of establishments without a computer had no plan to install one. 'The major reason for not installing PC was mostly

¹² Census and Statistics Department (2000) *Report on 2000 Survey on Information technology Usage and penetration in the Business Sector*, Hong Kong SAR, PRC.

no business benefits to do so, followed by lack of personnel familiar with using a PC.’ (p.5)

Enterprise type	Percentage with computers	Average number of computers
Large	92	110
Medium	78	8.5
Small	48	1.3
All	52	4

Large defined as having 100 or more staff in manufacturing, or 50 or more staff in other industry sectors; small as having less than 10 staff.

Of these two reasons, the first is clearly commercial, and therefore presumably rational, although it is equally possible that lack of information means missed business opportunities. The second reason is clearly a barrier problem that is likely to diminish as a younger generation of entrepreneurs takes over or replaces traditional family-run businesses. It is also a problem that can be addressed directly by governments in terms of training and assistance programmes, and through the public provisioning of computer access, such as making available computer kiosks in public libraries, malls and community centres.

Having a computer is obviously a pre-requisite for e-commerce, but the percentage of businesses with computers undertaking online ordering or transactions remains quite low.

Enterprise type	Percentage using e-commerce
Large	18.5
Medium	10.4
Small	4
All	4.9

Of those using e-commerce, 73 percent said the major use was ‘general online order or purchase of goods, services or information’, and of these 93 percent said the major use was ‘online receipt, browsing or searching information. Only 2 percent expressed that the major activity was general on-line receipt of digital products and services.’ (p.11)

‘Regarding the major reasons for not having ordered or purchased through electronic means, 47 percent of the establishments that had not done so considered that there were no business benefits. The opinion was, however, quite different for large establishments. According to large establishments that had not ordered or purchased through electronic means, 39 percent expressed that it was not popular in the industry.’ (p.10)

So here we have two distinct market segments. Larger establishments are more prepared for e-commerce but are held back by the general low level of acceptance within their industry. This will obviously vary with the industry in question. For example, the utilities sector (16 percent) and the financial, insurance, real estate and business services sectors

(12 percent) showed higher levels of adoption in the Census and Statistics Department survey. As firms get smaller the primary constraint becomes one of perception. The benefits are just not perceived. No doubt this factor is compounded by the lack of experience and know-how with IT among many SMEs. Falling IT prices suggest that cost of equipment may not be a factor, but the—often hidden—running costs maybe. These include the need to upgrade software, the requirement for IT literate and skilled staff, the dangers of viruses, the logistics of management of a web site and of files and backups, and so on. A well known survey in the US in the late 1990s, for example, found that while PC prices averaged US\$1,000 business running costs easily reached US\$12,000 annually per PC. SMEs may not have these estimates to hand, but they have a pretty good idea that once spending on IT starts it rarely stops.

So the question for governments is how to change the perceptions of SMEs—which should include how to help them master the cost management of IT as well as seeing the advantages of adoption—and how to encourage a greater acceptance of e-commerce in industry. In Hong Kong, China these two tasks tend to be addressed in two different ways. Quasi-autonomous non-governmental organizations ('quangos') such as the Hong Kong Productivity Council, the Vocation Training Council and the Hong Kong Industrial Technology Centre Corporation (now part of the Hong Kong Science and Technology Parks Corporation) devote much of their energy towards promoting and facilitating IT adoption and applications among SMEs.

The surveys of the Productivity Council, for example, found in September 2000 that 54.4 percent of SMEs had no intention of adopting e-commerce, a decline from 60 percent a year earlier. Those using e-mail—nowadays the most basic level of e-communications—went up from 34.5 percent to 42.4 percent, and the trend for SMEs to have web sites—the next rung on the IT ladder—increased from 10.2 percent to 15.3 percent. Almost static over the period were the numbers who had gone further and had begun to integrate their web sites with their front-end sales systems (around 4 percent) or transform their back-end business systems (0.3 percent). Numerous reasons were offered by SMEs for their reluctance, of which the most frequent were: (a) bank support for online payments facilitation was too expensive, (b) the high costs of logistics for the delivery of goods ordered online, (c) lack of IT and web-skilled people, (d) a weak revenue model to support the investment, (e) no convincing examples of successful cases, and (f) information security risk.

Encouraging industry to accept e-commerce as a cost-effective way of doing business that simultaneously widens business opportunities is more the role of the government in Hong Kong, China. Of course, the main driver is the market, and for industries like banking and insurance, transportation and logistics, business consultancy and law firms, the adoption rate is largely a natural progression of trade and commerce. But for the majority of Hong Kong, China companies, and for Hong Kong, China citizens, the experience of e-commerce and e-transactions is very limited. It is in this context that Part 2 examines the efforts of the Hong Kong, SAR Government to go online.

Part 2: New Times in Hong Kong, China

It is often said that Internet time is much faster than pre-Internet time, the clock has been speeded up. The observation known as Moore's Law that the number of transistors on a silicon chip doubles every 18 months, or the cost falls by half, has been driving the ICT sector for the past twenty years, and over the past decade the position of governments has shown similar fast change. It is instructive to recognize just how radical it has been. In 1995 with full confidence I could write that:

little effort has been made by government to encourage the use of on-line information. For example, the Government Information Service (GIS), which is the primary interface between government and the Hong Kong, China media, is not on-line, although file transfer is available, and in 1995 the teleprinter service was replaced with a proprietary standard non-interactive on-line broadcast connection to the media, but not the general public—and only two government services, laws and the land registry, are provided on-line.¹³

By 1998 my assessment was very different.¹⁴

Just three years later this view is quite out of date. A check of <http://www.info.gov.hk> will reveal that just about every government agency is now on the Web as part of the government's efforts to emphasize the importance of IT in building an information society in Hong Kong, China. This is a long step forward from 1992 when two principal members of the government's Information Technology Services Department, which is responsible for promoting civil service efficiency, wrote,

'...no preferential treatment to the information technology sector has been given. The use of information technology in Hong Kong, China is requirement-driven rather than coordinated and promoted by the Government, apart from promotion through its own consumption. such a stance is welcomed by the community and the IT industry at large.'¹⁵

The clearest statement of the new commitment came in the Chief Executive's Policy Address in 1997. "Our targets... are:

- The availability of an open common interface for electronic transactions between Government, businesses and individuals
- The extensive use of IT within Government
- Higher computer literacy rate in the community

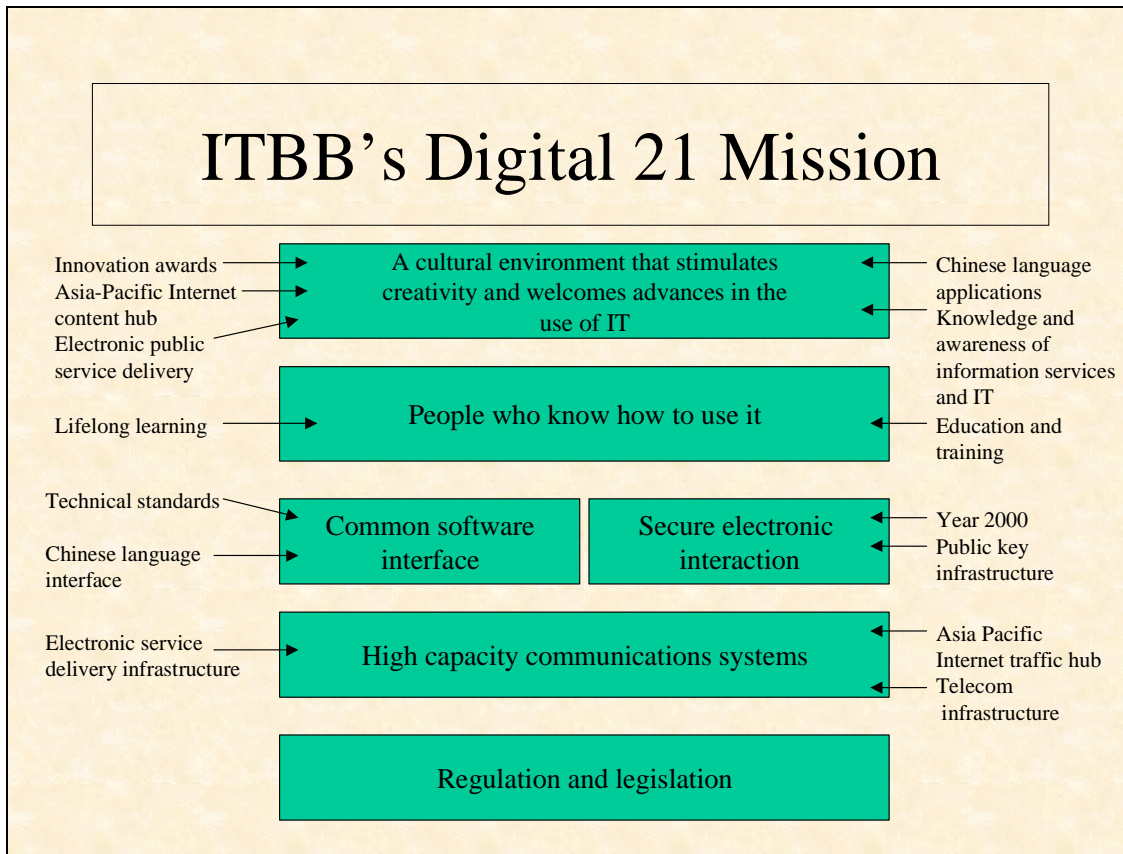
¹³ Petrazzini B. and J.Ure 'Hong Kong's Communications Infrastructure: The Evolving Role of a Regional Information Hub'. In J. Burn ed. (1997) *Information technology and the Challenge for Hong Kong*. Hong Kong University Press (pp. 61-90).

¹⁴ J.Ure 'Convergence in Hong Kong' in M.Hukill, R.Ono and C.Vallath eds. (2000) *Electronic Communication Convergence: Policy Challenges in Asia*, Sage Publications, New Delhi (pp. 148-176)

¹⁵ C.C.Greenfield and E. Lee 'Government information technology policy in Hong Kong' in J.King ed. *Informatization and the Public Sector: Special Issue v.2.2 1992* (pp.125-132)

- High IT take-up rate in businesses and households
- Hong Kong, China's active participation in international and bilateral IT co-operation

The Information Technology & Broadcasting Bureau has been tasked with the implementation of these policy objectives in the strategy document Digital 21. The conceptualization of Digital 21 is set out below.



In the 1990s the liberalization of telecommunications policy was accompanied by a transparent and light-handed regulatory regime, and this has since been supplemented with the Electronic Transactions Ordinance, enacted in January 2000, that establishes a legal framework for a public key infrastructure, including digital certificates and recognition of certification authorities. A Personal Data (Privacy) Ordinance and legislation providing for protection of copyright, trademarks, patents and other intellectual property, along with powers against computer crime add to the 'soft' infrastructure supporting e-commerce in Hong Kong, China.

The physical telecommunications infrastructure is now able to provide broadband connectivity throughout Hong Kong, China. The software infrastructure is being built with the promotion of Chinese language interface standards and a supplementary Hong Kong, China character set. In addition to numerous campaigns to spread IT awareness

among SMEs and the general public, the initiatives include IT awareness courses for housewives, the elderly, the disabled, new arrivals, as well as IT literacy classes in community college programmes. Over 2,200 public computers have been installed in public libraries, post offices and community centres for the free use by the public. About a hundred kiosks are also installed in subway/train stations, shopping malls, supermarkets, Government buildings etc to facilitate the public to gain access to e-government services under the Electronic Service Delivery (ESD) Scheme.

An important aspect of the Government's strategy has been to enhance the role of the Information Technology Services Department (ITSD) as a champion of IT usage in the economy as well as in government. As we saw above, this is a marked change from the position in 1992 when the ITSD's role was merely to monitor and coordinate government use of IT. For example, under the Electronic Transactions Ordinance it is the director of the ITSD who is responsible for approving certification authorities. The ITSD also runs the Tripartite Forum on Commercialisation of IT Research Results in Hong Kong, China at which technology research and development projects are presented to audiences comprising venture capitalists and IT companies looking for talent and ideas. The ITSD over recent years has presided over the growth in IT usage within government as the following table illustrates.

Year	Civil Servants	PCs	PCs/civil servant
2001 (Q1)	180,600	93,000	51%
2000	183,400	84,000	46%
1999	187,000	73,000	39%
1998	189,300	72,000	38%
1997	185,200	63,000	34%
1996	184,200	50,000	27%

Note: > 70% Government computers are networked. 23% had Internet access, December 2000

Government has gotten smaller and IT larger. But the important development has been how the IT is used. During the 1990s the government began going online, first with some departments but not others developing informational web sites, and this was followed by the Government Information Service (GIS) building a web page for public access to all government agencies. (See <http://www.info.gov.hk>). Then, in 2000 the Hong Kong SAR government launched the Electronic Services Delivery (ESD) online service for citizens, a portal enabled for interactivity and transactions.

Electronic Services Delivery: G2C

The 'must read' message on the ESD web site (<http://www.esd.gov.hk>) states

The objective is to provide more comprehensive services to users and make use of the ESD information infrastructure *to pump-prime the development of e-commerce in the private sector.* (emphasis added—JCU).

So ESD is more than just a community service making good use of IT. It is intended to pump-prime, and by that standard it will need to be judged over the coming years. The service is provided by ESD Services Ltd, a privately contracted joint venture of Hutchison Global Crossing and Compaq. The government is just one of several content providers and is not held responsible for the site. The government estimate the cost advantage of this outsourcing is an average payment per transaction of HK\$5.5 (US\$0.70) for the five year period of the contract in contrast to an average HK\$13 per transaction for 'over the counter' services. Navigation of the site is by means of three channels, 'People', 'Business' and 'City' and a search engine. As of June 2001, 29 government departments were to some extent online, offering 79 services in 9 service categories: citizenship, business, education, employment, finance, household, leisure, transport and tourism.

Visitors per day rose from 35,000 in March to 105,000 in May 2001, but the percentage performing 'transactions' remained hovering around 4 percent. 'Transactions' is defined rather widely to include the booking of appointments as well as making payments. For payment transactions a digital certificate is required, but by March 2001 the number of business certificates issued by the recognized certification authority, the Hongkong Post, was 10,600, or just 1 percent of business establishments in Hong Kong, China. Those issued to individuals represented around 3.5 percent of total households. However, Tradelink, a consortium set up to act as a gateway between government and the importing and exporting sector—but yet to receive recognition under the ETO as a CA—had issued over 150,000 business certificates.

Job search was the most frequently used service with average 43,000 visitors per day January—April 2001, followed by tourist information services. Third came the payment of Government bills, such as rates and taxes, with transactions rising from 630 per day in December 2000 to 1,350 per day January-March 2001. Although these numbers are not yet huge, the trend is clearly encouraging. On a personal note, my observation is that some parts of the portal are not always possible to reach, which may have to do with server congestion, or network congestion, or possible congestion on the LAN that I use to access to site. Whatever the cause, this can be a source frustration, especially for those less acquainted with IT usage, and governments everywhere must be aware that success implies an inevitable spiral of supply-leads-to-demand which calls for a growing commitment of resources. Outsourcing may reduce costs, but it will not halt the growing demand for electronic resources.

Electronic Tendering and Procurement: G2B

This is the area of most direct impact upon the business community, and upon SMEs in particular, in bringing about industry acceptance of e-commerce. It is particularly relevant in Hong Kong, China's case where less than 2 percent of Government supplies came from the local economy, but 90 percent of the tenders submitted are from local agents. These figures have since risen to 11 percent and 97 percent respectively. The

Government's Electronic Tendering System (ETS) which handles contracts below the value of HK\$10 million (US\$1.3 million)—this ceiling will be raised from July 2001—encourages local SMEs to submit offers and also widens the scope, and cuts the costs, of sourcing. Just over 70 percent of tenders are sent electronically, and by value around 75 percent. Over the period June 2000 to June 2001 ETS registered suppliers have increased 130 percent to 5,304, still a small number but significant growth.

On the backend of the Government's IT network a **Goods-On-line Ordering, Distribution, Stock Management and Accounting Network** system (GOODSMAN) provides remote terminals over two LANS for online goods ordering and inquiries, with a barcode reading system for stock management. Quality monitoring is undertaken by a system known as PMSU (a **Procurement Management System Upgrade**) that makes evaluations of offers, orders, contracting and supplier performance. For large-scale public works tendering an ETS approach is to be adopted during 2001, and since August 2000 all tender documents go out in CD-ROM form. The use of an ESD system for public works tendering is also under study, which would make possible the exchange of planning and design documentation, feasibility studies, utilities information, tendering and administration.

Planned for the near future is more backend automation, such as ASLPS (**Allocation Stores Ledger Posting System**) for the automatic replenishment of standard store items, and the use of e-marketplaces for the volume purchase of small value items at the department level. On a grander scale the automation of customs clearances using EDI is foreseen, although this is a huge challenge for an economy that rides on the burgeoning re-export trade from mainland China. Through all these means the Hong Kong Government is widening the opportunities to tender online, which brings benefits to public expenditure and brings equal opportunities to local SMEs and foreign companies to supply the public sector. The learning curve for SMEs who grasp this opportunity is a benefit not just to them but to the whole economy.

Conclusion

E-government in Hong Kong, China is designed to meet certain challenges beyond the simple task of bringing information and—*less simple*—accessible government to citizens. On the consumer side of the economy it is designed to be pump-priming, to stimulate the take-up of inter-active services, such as the payment of taxes and online applications. On the producer side of the economy it faces two principal challenges. At the industry level to increase the level of acceptance of e-commerce as the normal business practice. For SMEs, to bring tangible benefits at low cost with user-friendly systems so as to encourage the adoption of IT leading to e-commerce.

It remains too early to judge the success of the initiatives outlined above, or to identify the lessons to be learned. But one thing is already clear, this is an ongoing process. Success will breed success, and that in turn will increase the demand for electronic resources in the public as well as in the private sector. Managing this will, in turn, require

a continued commitment by governments. Although outsourcing will bring tangible benefits in terms of outside expertise and resources, governments, like the private sector, will need internal champions to sustain the commitment. In Hong Kong, China the ITSD has been thrust very much into this role, and it has embraced it with enthusiasm, but will it be enough? Governments are uneven across departments, and in the final analysis it always requires commitment from the top, and that cannot be outsourced.

MINI-CASE STUDY: JAPAN

On the Effects of the New Economy on the Japanese Economy

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Macroeconomic Effects

Information technology (IT) has a potential to accelerate long-term economic growth by improving productivity, and has to become driving force behind a new economic development worthy to be named “New Economy.”

The long-term impact of the latest IT has yet to be known, but we see the growing possibility of the IT as great technological innovations such as the steams engine, electricity and the automobile. The impact not only benefits IT-related manufacturers and telecommunications businesses but also transforms business styles in a wide range of industrial sectors by dramatically cutting costs of communications and information search. New products and services using IT are exerting a great influence on the lifestyles of consumers. The IT impact on the economy is likely to be even greater.

According to estimation (Economic Planning Agency 2000) using the ORANI-G model, a multisectoral general equilibrium model, improvement of the productivity of manufacturing IT-related equipment industries and the spread of e-commerce up to 2004 will have a direct effect of 2.1% (approx. 11 trillion yen) of GDP. The effect on the economy as whole including ripple effect will be 4.2% (approx. 23 trillion yen).

From the trough of the business cycle in the period from April-June quarter 1999 to the period from July-September 2000, IT-related demand and production contributed to economic recovery. Exports had contributed greatly to growth against the backdrop of heightened global demand for IT-related goods of which production centers are located in Asian countries. Electrical appliances and other IT-related industries have also been major forces driving production and business investment. IT accounted for roughly 30% of exports, 50% of production and 80% of business investment (Figure 1—see figures at end of case study). There was also marked growth of job offers in the information services industry and other IT-related industries. Amidst an overall lack of growth in consumption, there was a marked increase in IT-related expenditures, including spending on telephone charges and personal computers. In contrast, growth in production and business investment in the non-IT-related sector was poor, while non-IT-related household consumption also experienced sluggish growth.

Effects on Business Investment

IT-related business investment (hereinafter referred as “IT investment”) contributed greatly to growth from the mid-1990s (Figure 2). According to “*Questionnaire Concerning Corporate*

Activities 2000", IT investment accounted for 15.2% of overall business investment over the past three years and was expected to account for 18.3% of the same over the next three years. These results show the aggressive attitude of enterprises toward IT investment despite the recession. A comparison by industry revealed that IT investment ratio of non-manufacturing industries was about twice as high as that of manufacturing industries. Among the former, the particularly high IT investment ratios of wholesale and service industries indicates the considerable weight of information intermediary business in these industries (Figure 3).

IT investment is also becoming specialized. While the ratio of "Acquisition of computers and peripheral equipment" and "Acquisition of software" will fall, those of "Software development" and "System operation and development" are increasing particularly in large enterprises (Figure 4, 5)..

Regarding the status of the introduction of IT-related equipment, PCs (excluding portable PCs), e-mail, LAN and Internet are being introduced on a company-wide scale at 70-90% of enterprises (Figure 6). However, another comparison by company capital shows that large enterprises are generally outstripping medium sized enterprises in this area. In particular, the introduction of LAN Internet and other network infrastructure is not advancing among smaller enterprises. Intranet and groupware introduction ratio is also lower among enterprises with smaller capitalization (Figure 7).

Concerning targeted business areas of IT investments, there has been a shift from the areas of "Human resources and salary" and "Accounting" to areas that greatly affect corporate competitiveness, especially "Management planning" and "Procurement" (Figure 8).

There have also been changes in the objectives of IT investment. While "speed up of operations" is becoming less important, other objectives are getting more important, such as "Strengthening business and sales force," "Organizational reformation," and "Reduction in procurement cost." From this it can be seen that IT investment is being undertaken as an active corporate management strategy (Figure 9).

However, while many companies have experienced the effect of "speed up of operations," the other objectives have not yet to been realized in many companies (Figure 10).

On the other hand, in companies' proceeding with IT investment, their major problems are a scarcity of professional personnel and employee education issues. In addition, pointed out are the rapid obsolescence of technology, the low cost effectiveness of IT investment, and high telecommunications charges (Figure 11).

Many companies choose the option of outsourcing as a measure to resolve these problems. It can be seen that there is a growing trend for companies to seek human resources and capabilities in the IT sector, in which there is a lack of talent, both internally and externally (Figure 12).

One of the reasons for slow expansion of production and business investment in non-IT related industries is the ripple effect of IT-related goods on other sectors. Looking at the

ripple effect on the manufacturing industry caused by increased demand for machinery, the ripple effect of IT-related goods on other industries is smaller than those of automobiles and conventional household appliances. The ripple effect of IT-related goods is confined to its own sector is high. Two reasons can be cited for this situation: i) Automobiles and conventional household appliances require parts made by various sectors, such as steel and chemical products, while PCs, mobile telephones and other finished IT-related products use semiconductors, liquid crystals, batteries and many other parts that are IT-related; and ii) Investment in finished IT-related products has a higher import ratio to the input compared to automobiles and home electric appliances.

IT investment has following macroeconomic effects: i) Boosting IT-related demand among enterprises and households; ii) Raising productivity at enterprises; and iii) Effects on employment.

Effects on Consumption

While total nominal consumption has been falling, IT-related spending has served to support total consumption. According to the Family Income and Expenditure Survey, IT-related expenditures reveals continual marked growth, mainly on PCs and telephone charges, amidst year-on-year decreases in overall consumption expenditures. As a result, the ratio of information-related spending to overall consumption expenditures has been rising.

Prices of IT-related consumer goods have been quickly declining. Price decreases have been seen in wider areas of IT-related goods from around 1993. Provider connection rates and other Internet connection-related expenses are also decreasing. These price decreases are likely contributing significantly to expansion of consumption and investment.

Business-to-Consumers (B to C) e-commerce is expanding affected by the spread of the Internet. The introduction of B to C e-commerce is either completed or planned at a very high ratio in the areas of homepage creation and Internet advertisement and direct sales (Figure 15). The most often cited impacts of the increase of these kinds of e-commerce are "Intensifying price competition" and "Elimination of intermediates in the distribution process," while few enterprises cited "Increased sales" and "Increased profitability" (Figure 16). On the other hand, "saving the trouble of going shopping," and "being able to order goods when you like," were cited as benefits that can be derived by consumers through the spread of e-commerce (Figure 17). In addition, there is comparatively high latent demand among consumers for e-commerce. Items that consumers want to buy through e-commerce include "Air and rail tickets," "Hotel reservations," and "Concert and theater tickets." E-commerce for such products fulfills the function of retail sales without having to use a retail store (Figure 18). Conditions cited for the future spread of e-commerce include "Computer and Internet literacy," "Reliable settlement methods" and "Cheaper communications charges." (Figure 19)

Effects on Supply

The effects of technological innovations on supply-side include the improvement of productivity. We have measured the productivity-boosting effect of IT investment by measuring productivity for IT-related and other capital and have confirmed the productivity-boosting effects of IT investment in the latter half of the 1990s (Figure 20).

It is also said that the effects of IT first become evident in cases where there are high levels of IT-related investment and human capital, and where corporate flattening and delegation of authority are advancing at the same time, while in other cases productivity improvement is sluggish due to the mal-adaptation of the enterprise toward IT. It was found that in cases where human capital accumulation and corporate flattening were promoted at the same time as moves toward IT, Total Factor Productivity (TFP) tends to increase. This suggests that changes in human capital and workplace organization are needed in order for firms to reap the benefit of higher productivity from IT adoption. Although firms are mainly responsible for such reform, policy measures to make labor markets more flexible and help enhance human capital will greatly complement individual firms' efforts.

Effects on Employment

Concerning the effects of new technologies on employment, demand for white-collar workers, especially those in the mid-and older-age groups, has apparently declined as the IT revolution has lowered information transmission costs. On the other hand, while IT-related job offers have been increasing, the number of dispatched workers has retained an uptrend since the middle of 1999. This apparently indicates that the IT revolution has led to an increase in jobs that can be undertaken by temporary workers rather than regular workers who are more familiar with their company environment.

When changes in corporate management to respond to the IT movement are examined while focusing on trends in employment relations, until now the most popular example is "Use of temporary employees and part-timers." This is indicative of the strong moves to supplement insufficiencies in personnel involved with IT. Frequently observed are the changes involving employment adjustment such as "Reduction of administrative and management personnel", and "Reduction of manufacturing and sales personnel."

Meanwhile, IT has also influenced labor supply by allowing telework for child-raising housewives who cannot commute. According to a report by the Japan Telework Association, the number of teleworkers in Japan stood at 2.5 million in 2000 and is projected to increase to 4.5 million in 2005.

Employment relations from now on are expected to develop more along the lines of "Treatment based on merit and ability," "Securing human resources with priority on competitiveness and expertise." These responses seem to foresee that enterprises will try to link IT to their competitiveness more strategically by advancing restructuring of the human resources within their organizations (Figure 21).

Effects on Finance

IT development have had great effects on the financial sector as well as the real economy. First, the development of IT has led to more efficient electronic financial transactions. Electronic transactions that have traditionally existed between financial institutions have begun to expand between these institutions and consumers. The introduction of Internet banking and Internet stock trading services indicates that the IT development has improved convenience for consumers as well as financial institutions. Manufacturing companies and long-existing banks are now planning to establish Internet banks without offices.

IT have enhanced the convenience in the financial sector. On the other hand, we cannot deny that IT has served to destabilize financial and capital markets. For example, an increase in the number of the so-called day traders using Internet stock trading has reportedly added fuel to market fluctuations by bringing about an expansion of herd behavior, meaning that some market participants tend to follow the suit of others in trading.

Effects on Business Activities and Business Organizations

Information sharing using IT, and IT management methods like Customer Relationship Management (CRM) and Supply Chain Management (SCM) are expected to be rapidly introduced over the next three years (Figure 23, 24), with a particularly high penetration rate in processing manufacturers.

- CRM: Formulation of marketing strategies based on customer's individual needs, using customer data.
- SCM: Common use of information such as inventory, sales and procurement to optimize operations between business as a whole.

It is forecast that B to B e-commerce will make a transition through the Internet from interaction between individual companies to a marketplace type, with large numbers of buyers and sellers being able to congregate on the web and do business when their individual conditions are met (Figure 25). The influence of the increase in B to B e-commerce is expected to result in, "intensifying price competition," "growing gap between companies," and the "elimination of intermediaries in the distribution process." In addition, "increase in corporate partnerships and mergers and acquisitions," "reduction in long-term sustainable business," and "increasing horizontal division of labor with outside companies," while currently not making much impact in replies to the survey, are expected to increase in significance over the next three years. The increase of B to B e-commerce will therefore not only result in a smaller role for intermediaries, but will also bring about a change in B to B commercial relations as a whole (Figure 26).

In the 1980s, the organization of Japan's big companies responded to economic environment changes very flexibly. It has been frequently noted that these companies' cooperative relations with subcontractors contributed to the overall flexibility. These companies maintained competition between their subcontractors and encouraged them to make stronger business efforts. At the same time, these companies built up long-term business relations with

subcontractors, allowing for positive technological transfers and subcontractor participation in product planning. This close exchange of information served to lower information costs.

In the 1990s, however, business environment changes were witnessed. Those changes include i) efficient information transmission and processing under IT development, ii) both improvements in production know-how in developing countries and iii) standardization of business systems through the globalization.

In such circumstances, some Internet business companies can focus on their core strengths, while outsourcing production, delivery, payment management, etc. Individuals and small groups of people can easily start businesses. This means that various ideas now can be put into practice more easily and that entrepreneurs can choose business location more flexibly.

Some companies from Europe and the United States have positively responded to such business environment changes, shifting priority to external transactions by spinning off part of their divisions. Over the recent years, the Top 100 U.S. companies have increased their share of total assets held by all U.S. companies and reduced that of operating facilities. This indicates that big U.S. companies have increasingly spun off production and marketing divisions and put them under their indirect control through capital participation.

It is suggested that in response to the increasing development of IT, corporate management structure is expected to undergo a large change in the future, focused on, “bottom up transmission of information,” “top-down transmission of information,” and “corporate flattening” (Figure 28).

New Technologies and Aging Society

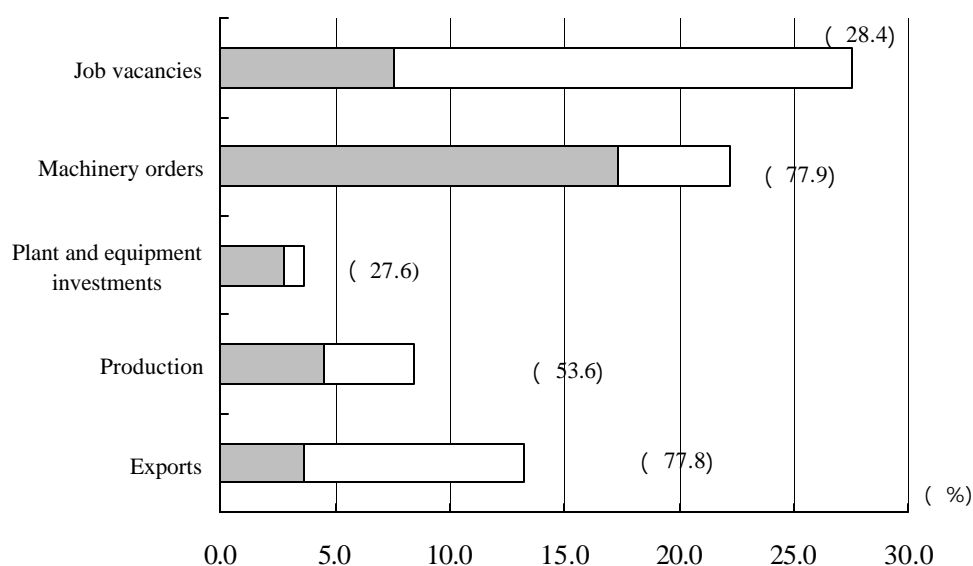
The recent IT-related consumption concentrates on the younger-generation. In order to link future technological innovations to economic growth, however, Japan will have to look to older people with greater potential purchasing power. The rate of diffusion among older people, however, is very low, limited to only 5.4% for personal computers and to 0.5% for mobile terminals. Present information technologies do not necessarily promote facility for older people. If IT systems were to become easier to use, older people would take and interest

The fast-aging society may be unfavorable from the viewpoint of productions capacity, but it indicates that several new technologies can be combined to stimulate new demand, such as on-screen health checks using telecommunications services (Figure 29).

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- Economic Planning Agency (2000), *Economic Survey of Japan 1999-2000*
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Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2000* (available in Japanese only)
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Figure 1 Contribution of IT-Related Industries



Source: Economic Planning Agency (2000), *Current Status of Japanese Economy 2000*

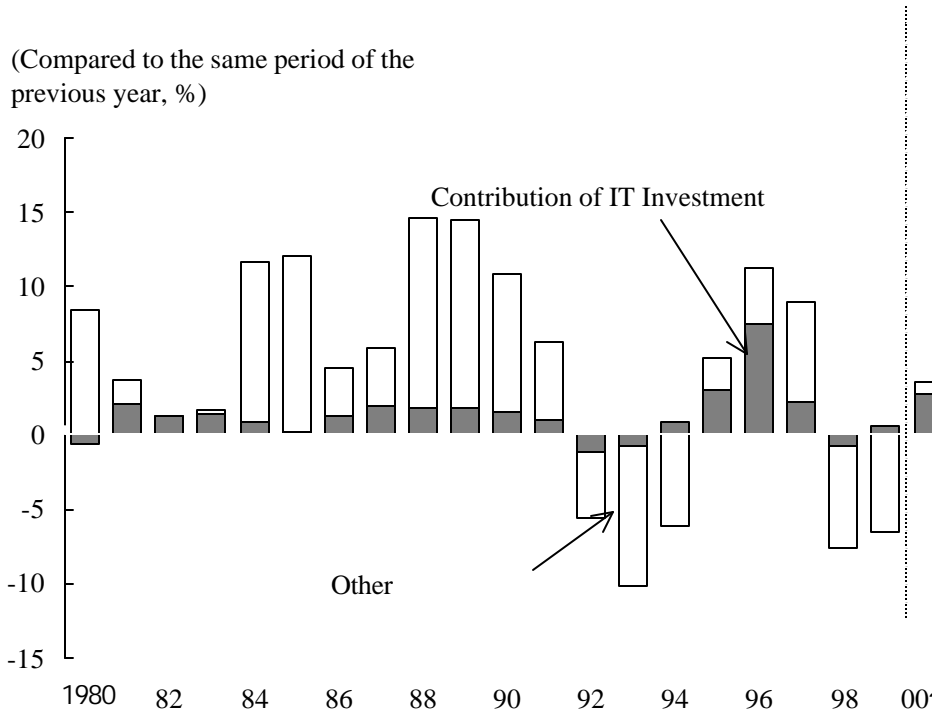
Notes: 1. Figures given in brackets are the percentage of the IT-related contribution (= IT-related contribution/total growth)

2. In regards to the plant and equipment investments, the ratio of the first half of 2000 to the same period in the year before, and regarding the others, a comparison of the April-June '99 period to the July-September 2000 period.

3. In this analysis, the IT-related sectors are defined as below :

- (Exports) The total of "Electronic parts such as semi-conductors" "Office machinery" "Telecommunications apparatus" "Scientific and optical equipments"
- (Production) The total of "Telecommunications apparatus" "Telecommunications electronic parts" "Semi-conductor devices" "Accumulation circuit" "Semi-conductor parts" "Electronic computers" "Batteries"
- (Plant and equipment investments) The annual investment amount was found by taking the domestic consumption into account and calculating the computerization investment amount every five years, differentiating by the investment entity of the total investment amount and IT manufacturers (general machinery, electric machinery), IT-user manufacturing industries (foods, textiles, paper/pulp, chemicals, petroleum/coal), ceramics/stone and clay, steel, non-ferrous metals, metals, transportation equipment, precision machinery, other manufacturing industries), IT-user non-manufacturing industries (construction, electricity/gas, wholesale, financing and insurance, real estate, transport, services), and IT infrastructures (communication, radio and television broadcasting). (Calculated based on the Inter-Industry Relations Table, Management and Coordination Agency)
- (Job vacancies) "Electronic machinery manufacturing industry" "Information services industry"

Figure 2 Contribution of IT Investments to the Business Investm

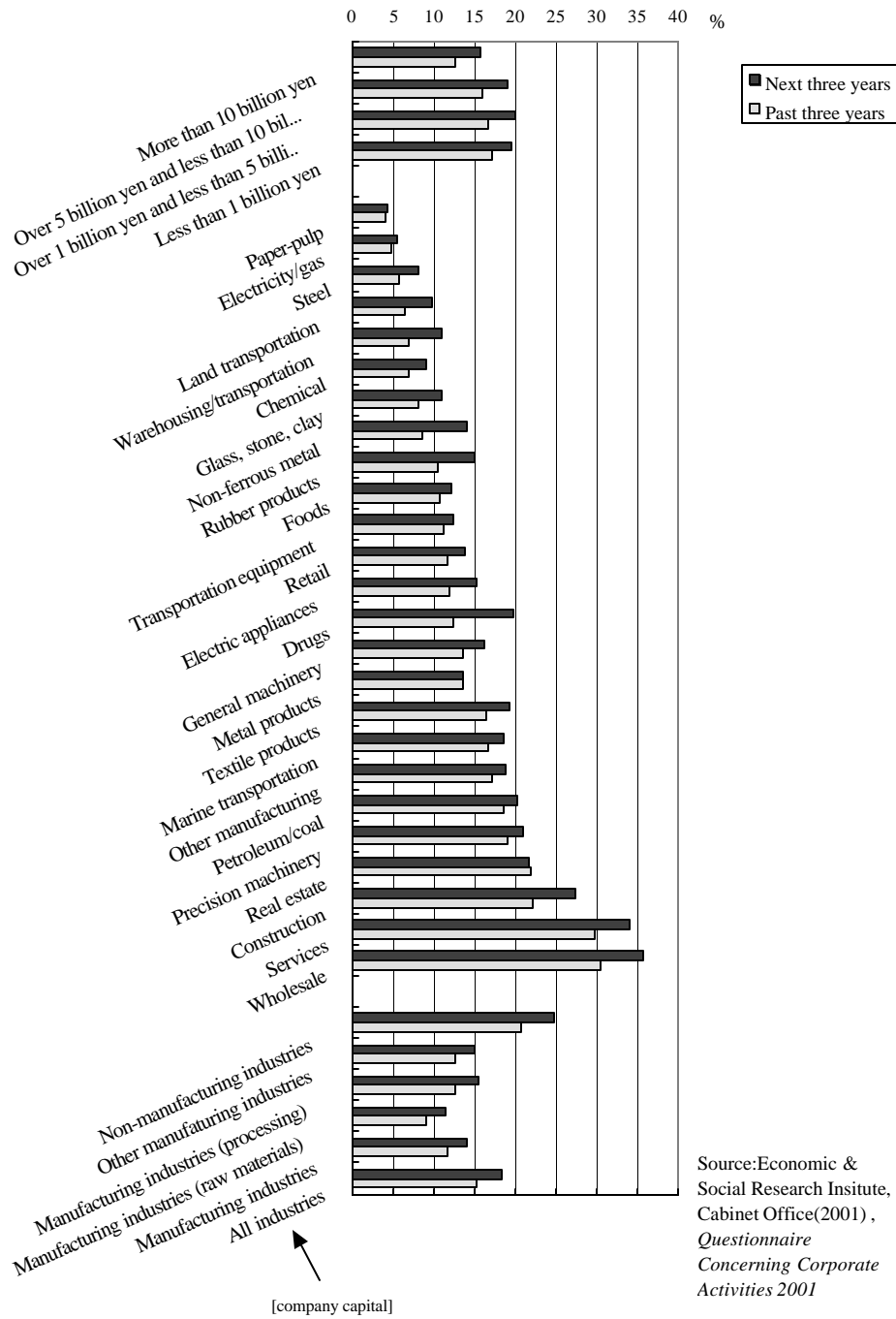


Notes: 1. Sources: *National Accounts* , Economic Planning Agency; *Inter-Industry Relations Table*, Management and Coordination Agency; *Census of Manufacturers* , *Monthly Statistics on Machinery* , Ministry of International Trade and Industry and the *Monthly Trade Table* , Japan Tariff Association.

2. The annual investment amount was found by taking the domestic consumption into account and calculating the computerization investment amount every five years, differentiating by the investment entity of the total investment amount and IT manufacturers (general machinery, electric machinery), IT-user manufacturing industries (foods, textiles, paper/pulp, chemicals, petroleum/coal), ceramics/stone and clay, steel, non-ferrous metals, metals, transportation equipment, precision machinery, other manufacturing industries), IT-user non-manufacturing industries (construction, electricity/gas, wholesale, financing and insurance, real estate, transport, services), and IT infrastructures (communication, radio and television broadcasting). (Calculated based on the Inter-Industry Relations Table, Management and Coordination Agency)

3. For the year 2000, the estimation was made with the data for only the first half of the year.

Figure 3 Share of IT Investment



Source: Economic & Social Research Institute, Cabinet Office(2001), *Questionnaire Concerning Corporate Activities 2001*

Figure 4 Contents of IT Investment

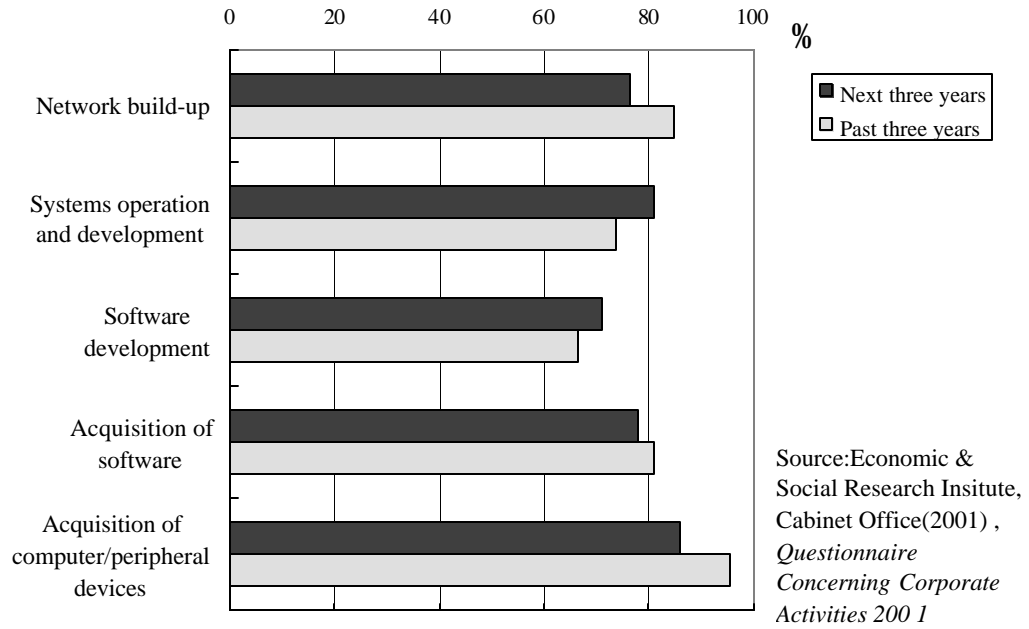
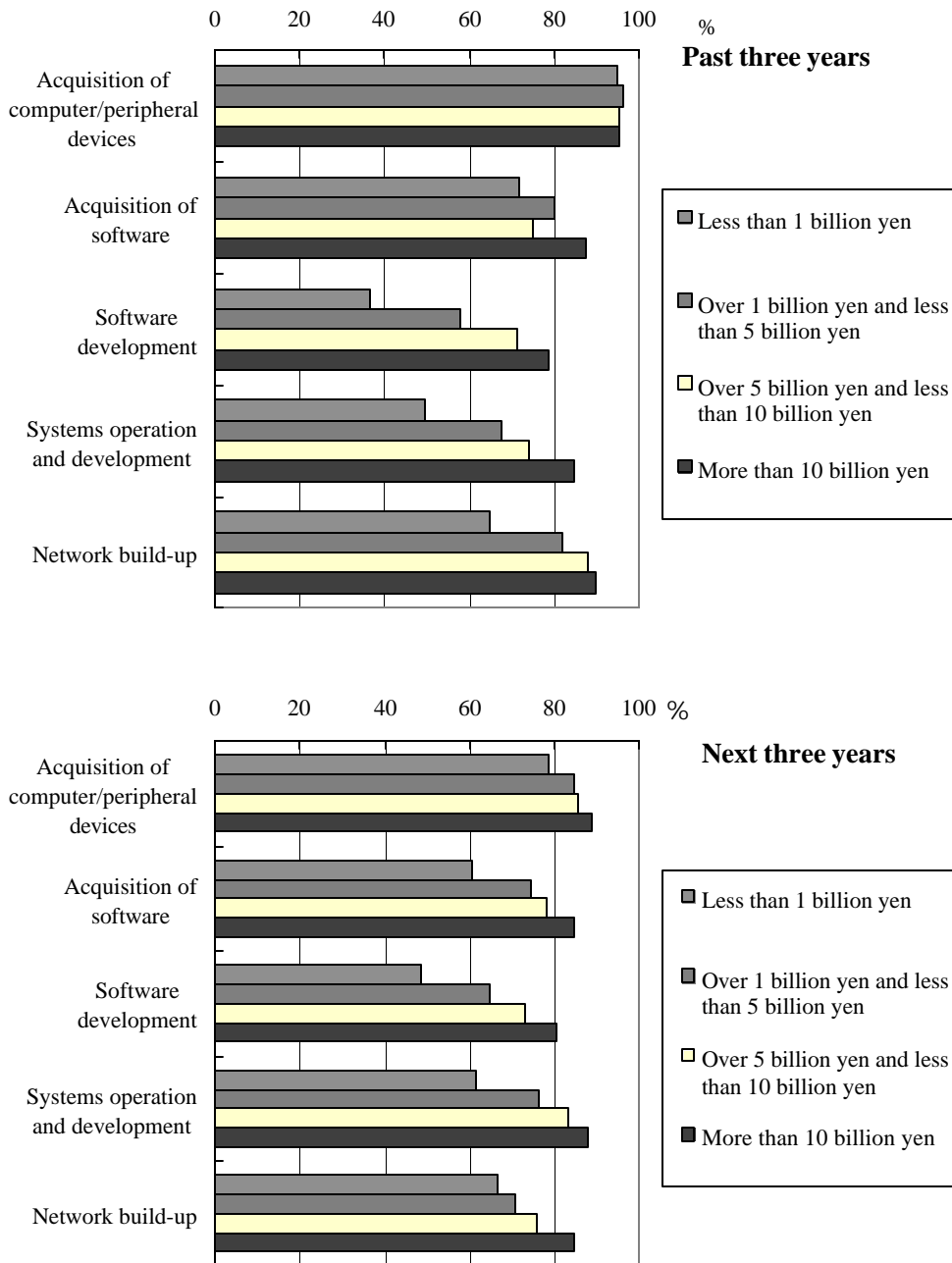
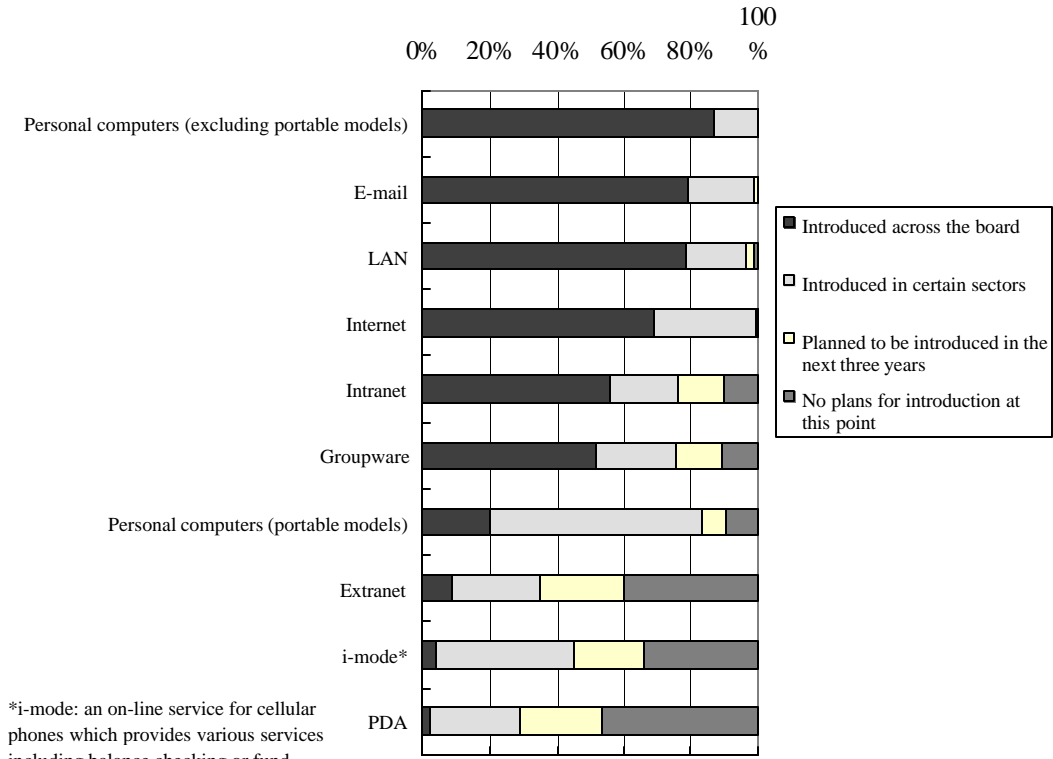


Figure 5 Contents IT Investment (by scale of company capital)



Source: Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2001*

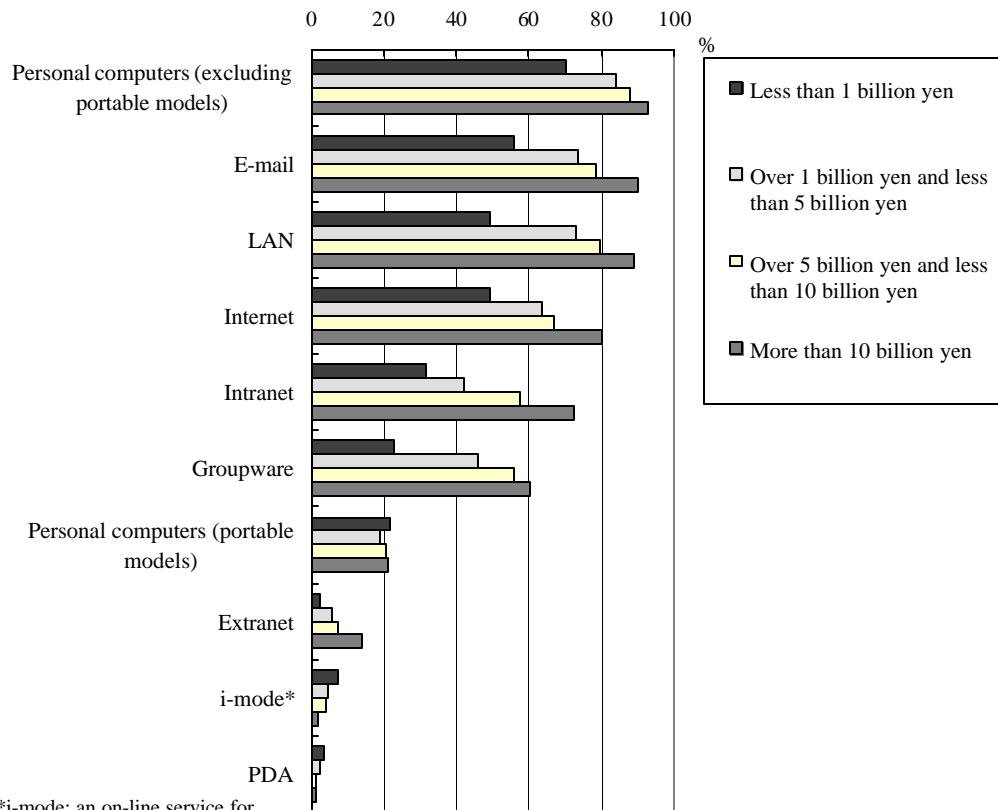
Figure 6 Status of Introduction of IT-Related Equipment



*i-mode: an on-line service for cellular phones which provides various services including balance checking or fund transfers from a bank account, retrieval of restaurant or town information.

Source: Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2001*

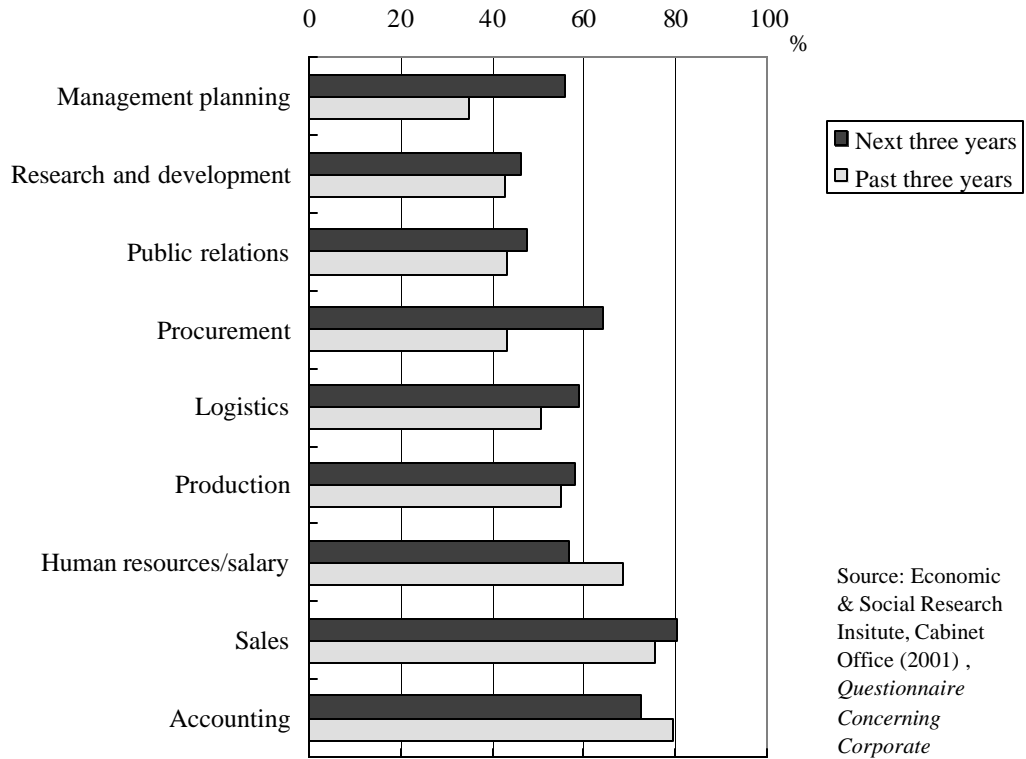
Figure 7 Status of the Introduction of IT-Related Equipment
(by scale of company capital)



*i-mode: an on-line service for cellular phones which provides various services including balance checking or fund transfers from a

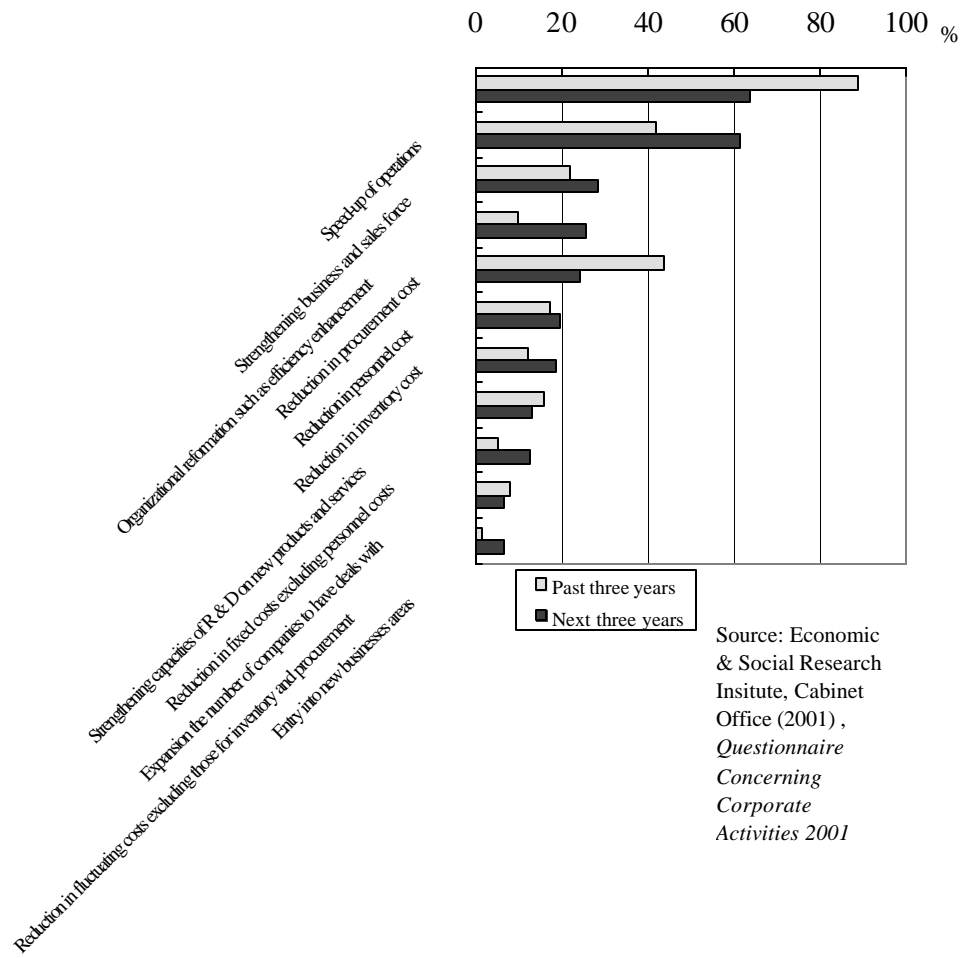
Source: Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2001*

Figure 8 Targeted Areas of IT Investments



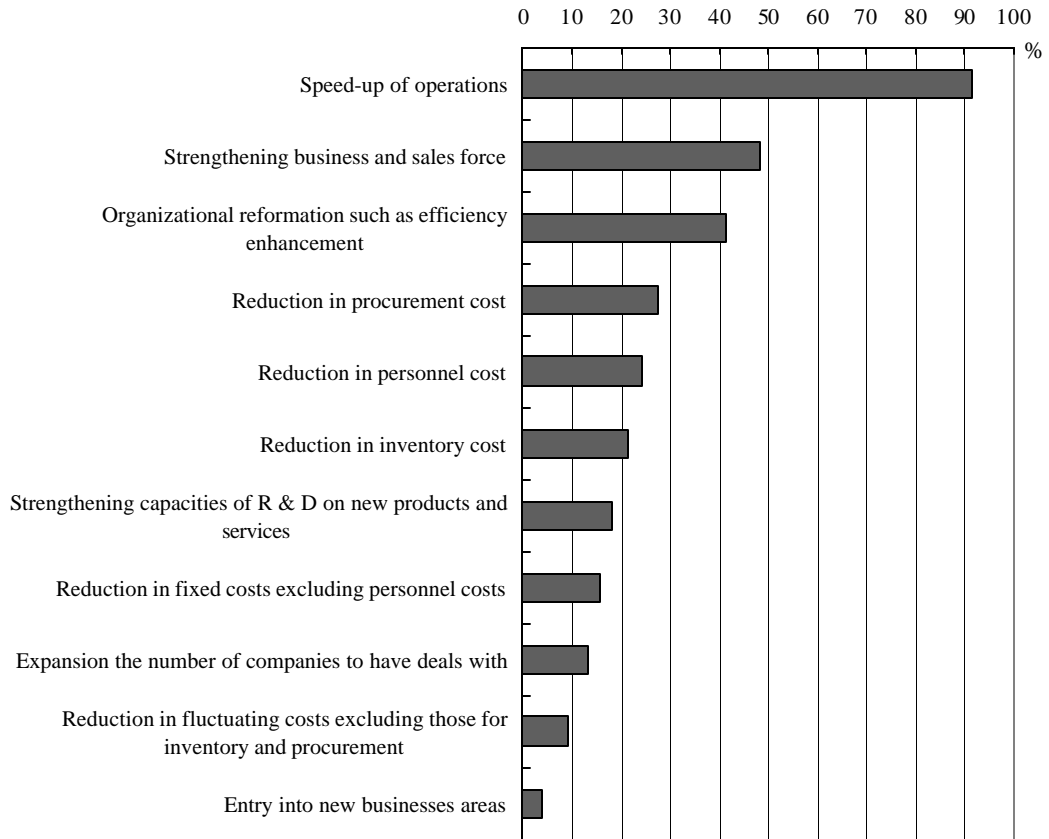
Source: Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2001*

Figure 9 Objective of IT Investments



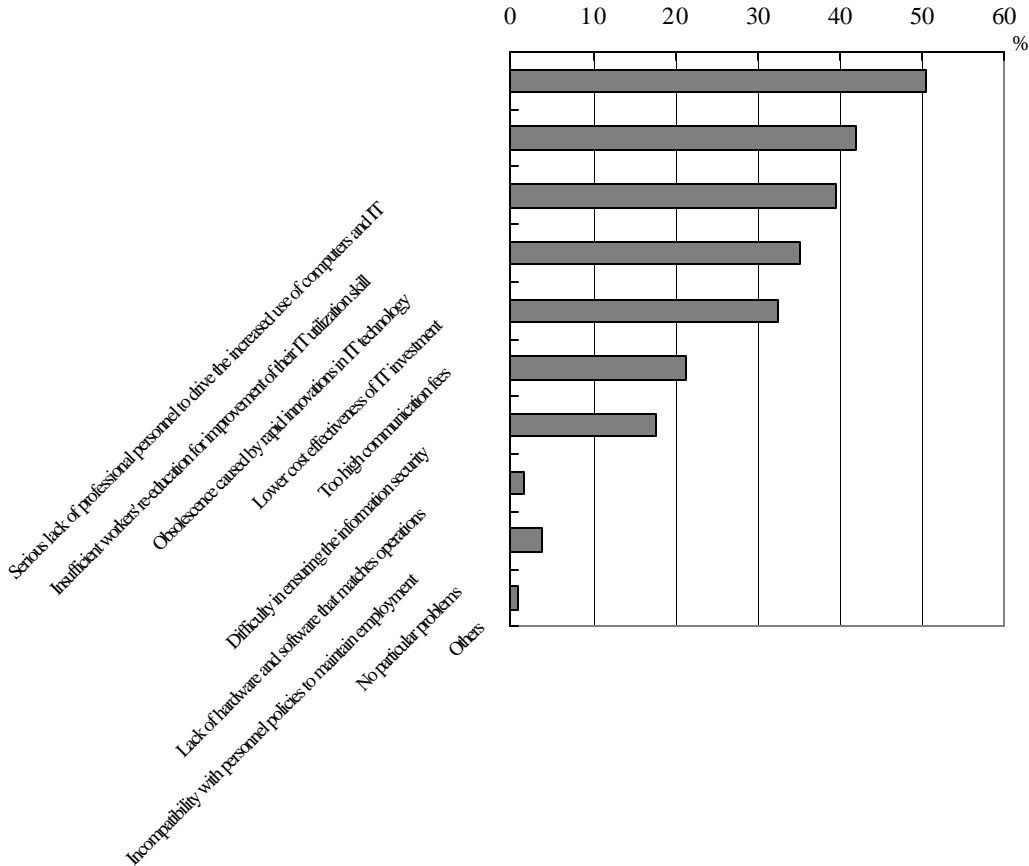
Source: Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2001*

Figure 10 Effects of Increased Use of Computers and IT



Source: Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2001*

Figure 11 Problems of Proceeding with IT Investments



Source: Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2001*

Figure 12 Measures to Solve Problems

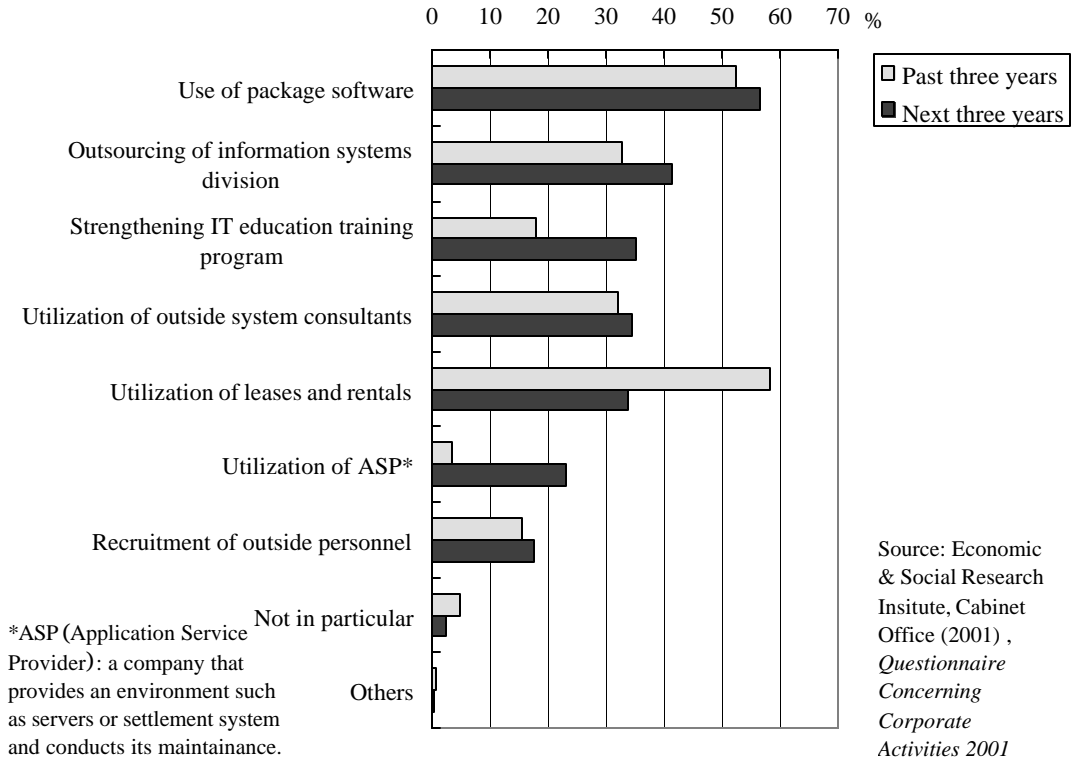
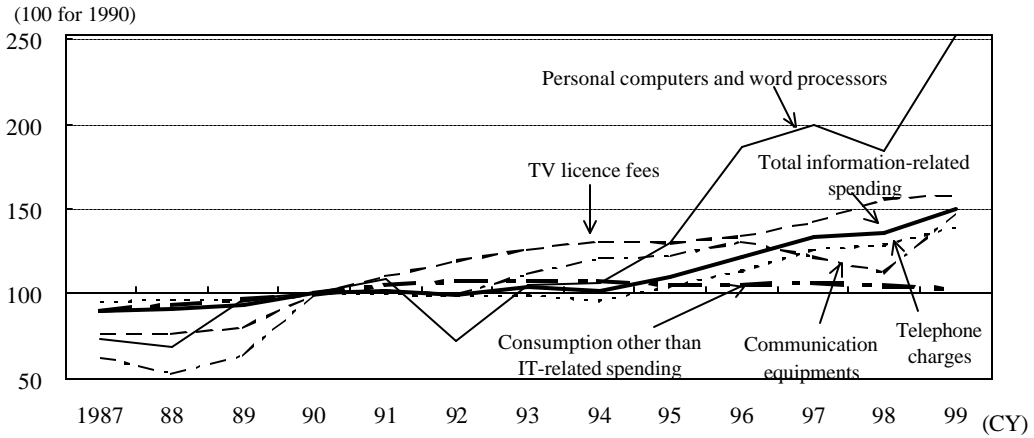
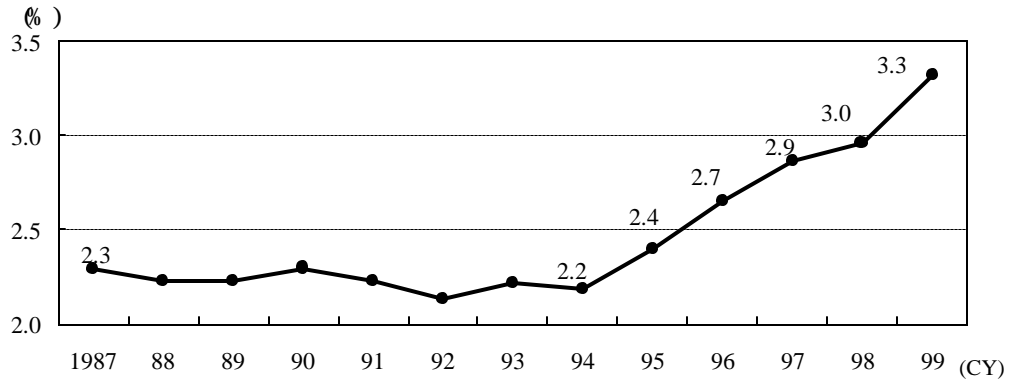


Figure 13 Growing IT-Related Spending (Nominal)

i) Changes in Nominal Spending



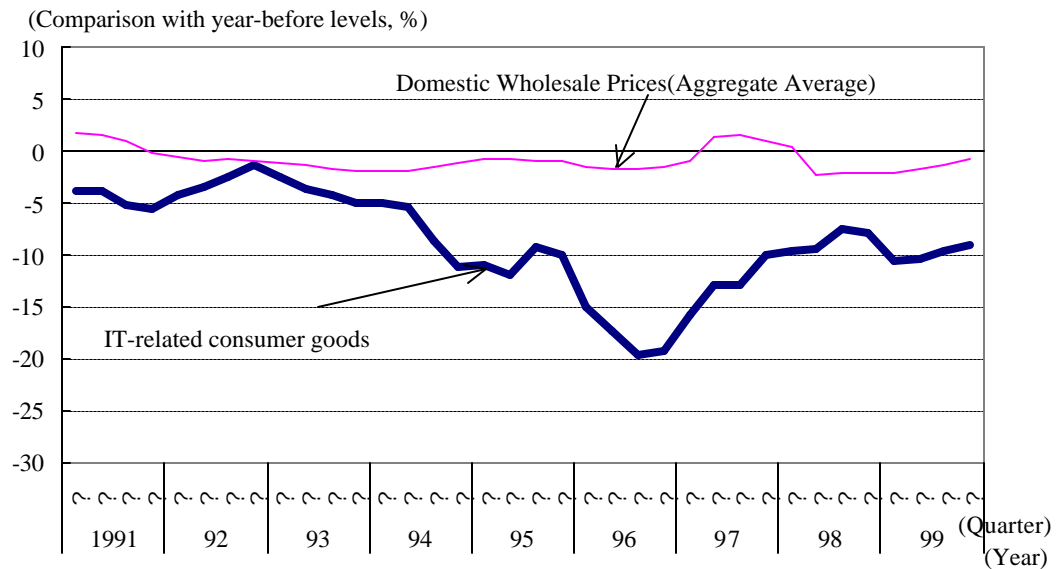
ii) IT-related Spending's Share to Total Consumption



Source: *Family Income and Expenditure Survey (All households)*,
Management and Coordination Agency

Note: IT-related spending covers telephone charges, communication equipments expenditure, personal computer and word processor expenditure, and TV licence fees.

Figure 14 Changes in Prices (Domestic Wholesale Prices) of IT-related Consumer Goods



Source: *Wholesale Price Index*, Bank of Japan

- Notes: 1. IT-related consumer goods price is a weighted average of domestic consumer goods prices for computers, telephone systems, fax machines, cellular phones, PHS (personal handy phone systems), pagers, word processors, and car navigation systems. The car navigation system has been adopted for the wholesale price index since 1995.
2. The effect of a consumption tax rate hike in April 1997 has not been excluded.

Figure 15 Introduction Status and Plans of B to C

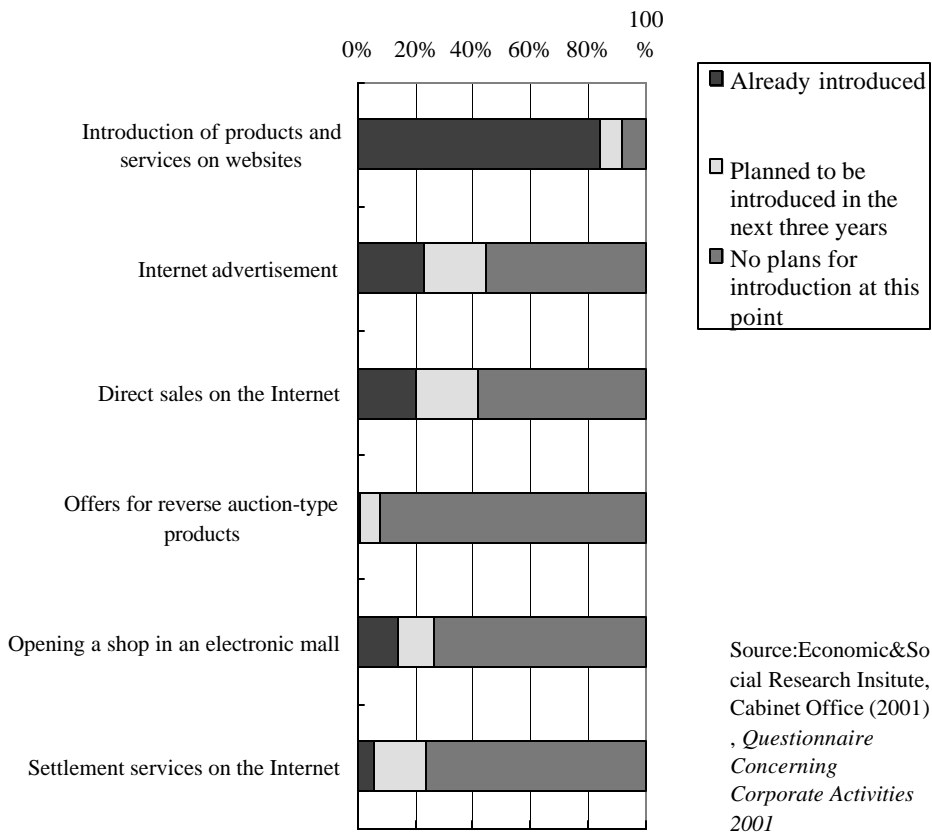


Figure 16 Effects of Growth in B to C E-commerce

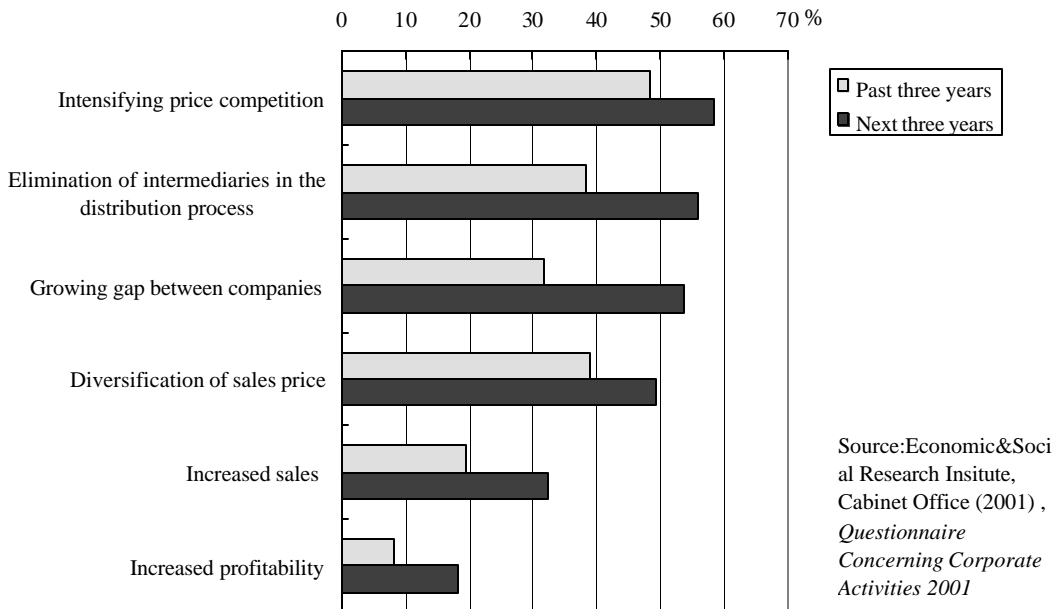


Figure 17 Advantages of Internet Shopping

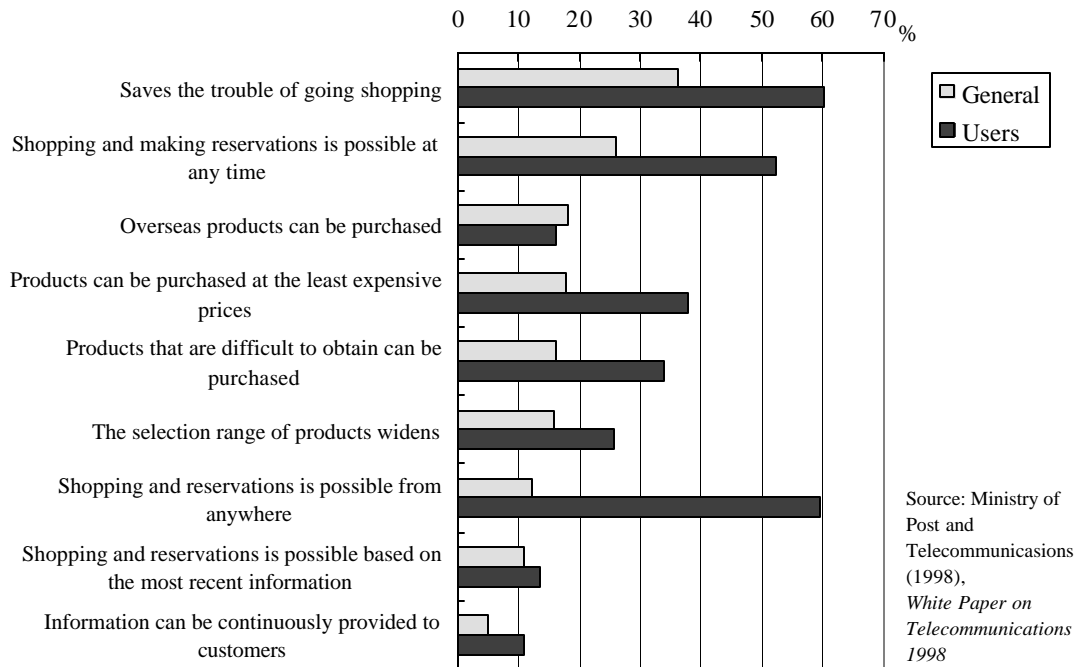


Figure 18 Product Purchased or Wanted through Internet Shopping

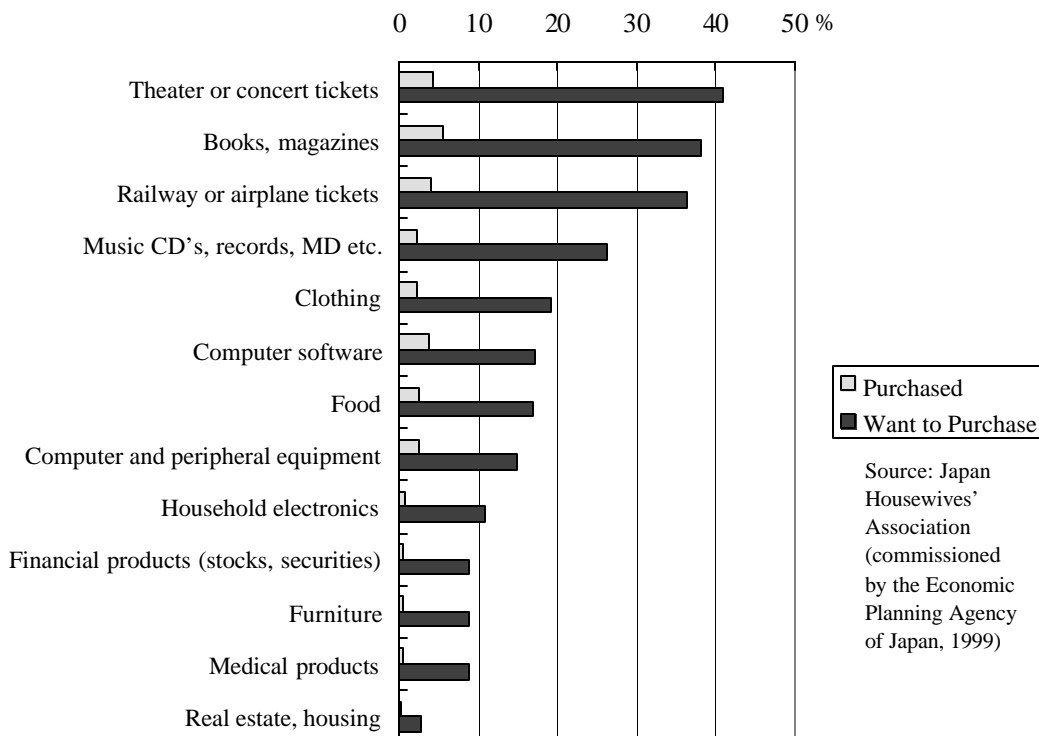
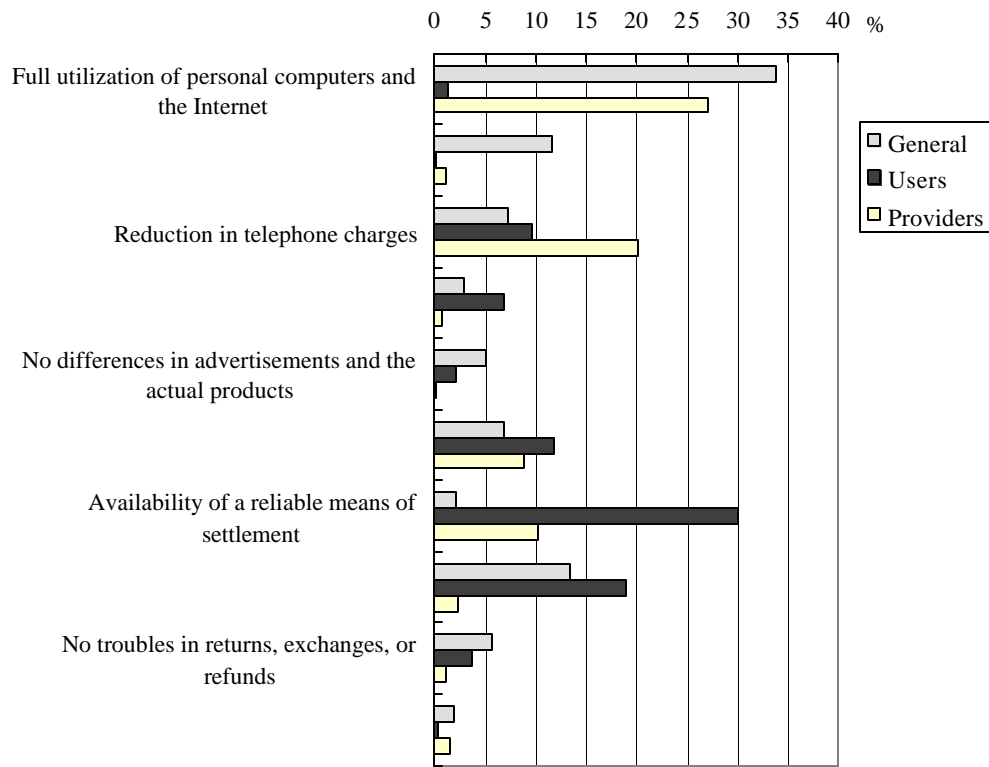
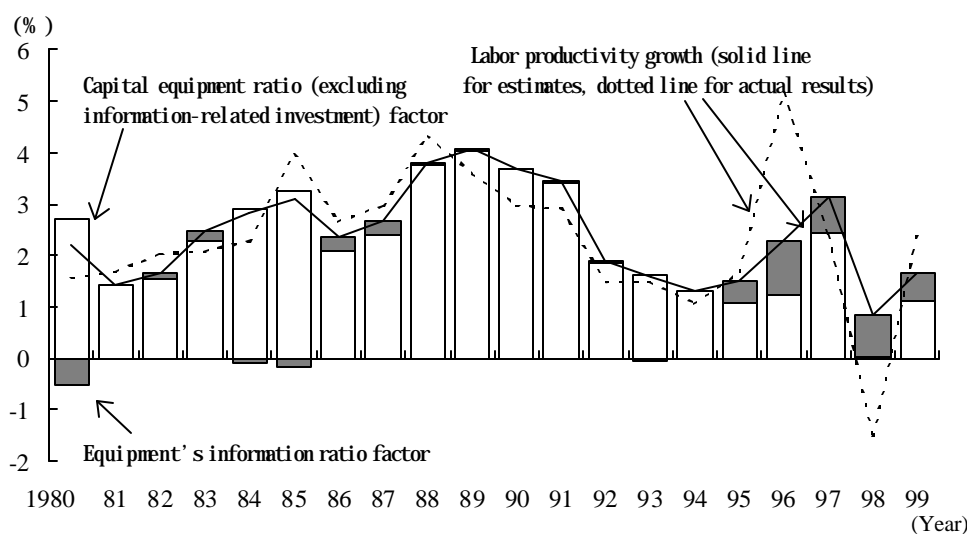


Figure 19 Preconditions for Promotion of Internet Shopping



Source: Ministry of Post and Telecommunications (1998), *White Paper on Telecommunications 1998*

Figure 20 Factor-by-Factor Breakdown of Labor Productivity



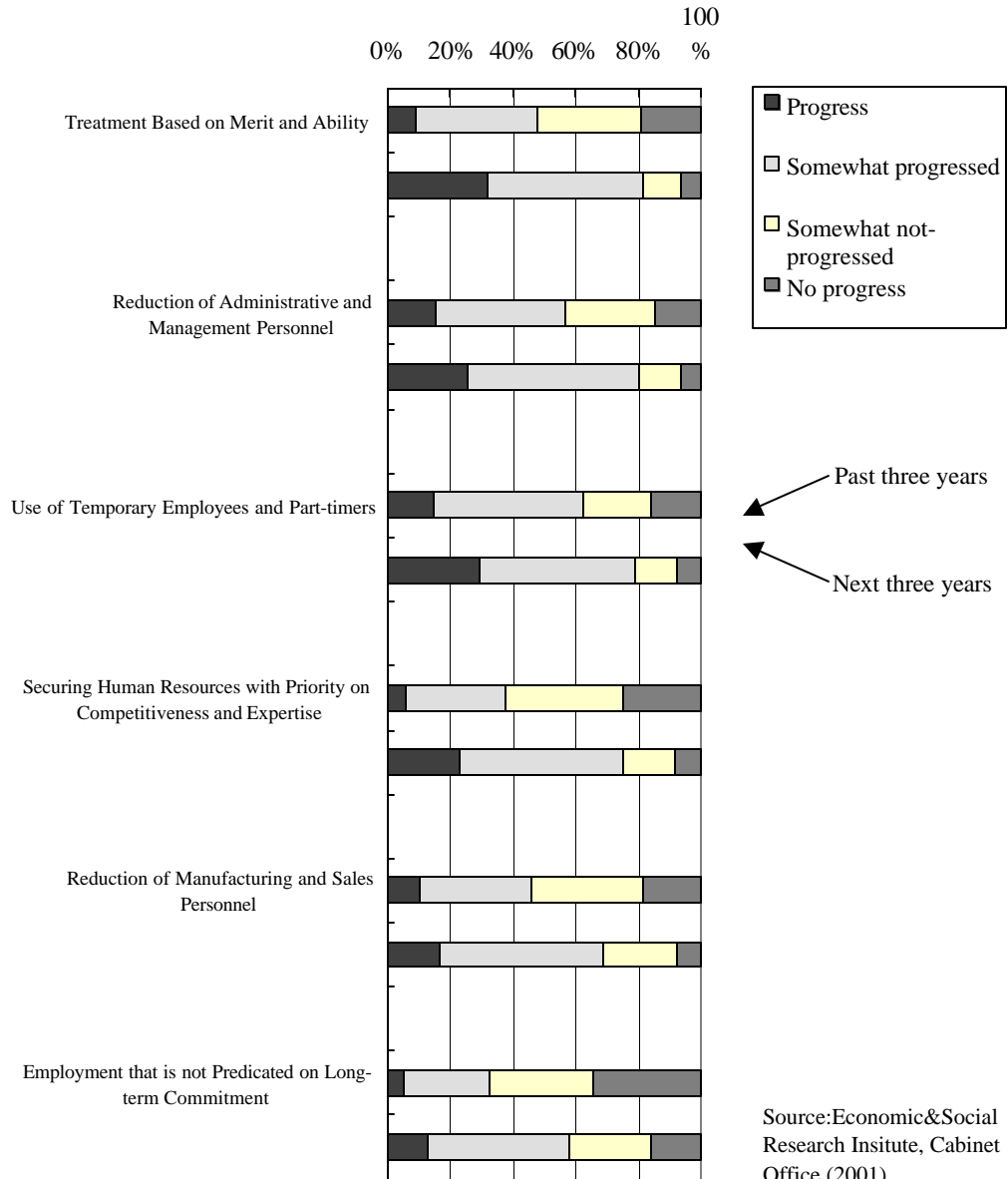
	(%)			
	Labor productivity growth	Capital equipment ratio (excluding information-related investment) factor	Equipment's information ratio factor	Others
1980-1984	1.93	2.19	-0.06	-0.19
1985-1989	3.51	3.11	0.09	0.30
1990-1995	1.98	2.37	0.01	-0.39
1996-1999	2.03	1.18	0.70	0.14

Sources: Inter-Industry Relations Table, Management and Coordination Agency;
Census of Manufactures, Ministry of International Trade and Industry, *National Account Statistics on Gross Capital Stock of Private Enterprises*, Economic Planning Agency

Note: The change in labor productivity was broken into changes in the capital equipment ratio (excluding IT-related equipment) and in the IT equipment ratio.

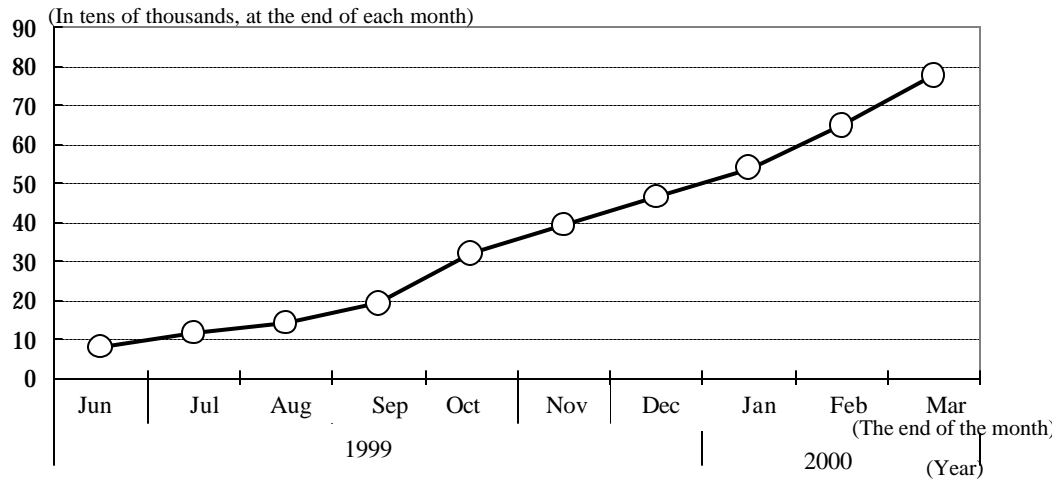
Its estimation was carried out according to the Cochrane-Orcutt method, using data on Real GDP, net capital stock, IT-related capital stock, Regular employment index, Gross real working hour index. and Capacity utilization ratio index.

Figure 21 Responses to Employment Relations



Source: Economic & Social Research Institute, Cabinet Office (2001), *Questionnaire Concerning Corporate Activities 2001*

Figure 22 Changes in Number of Online Securities Investment Accounts



Source: Bloomberg

Figure 23 Status of Sharing Information Using IT

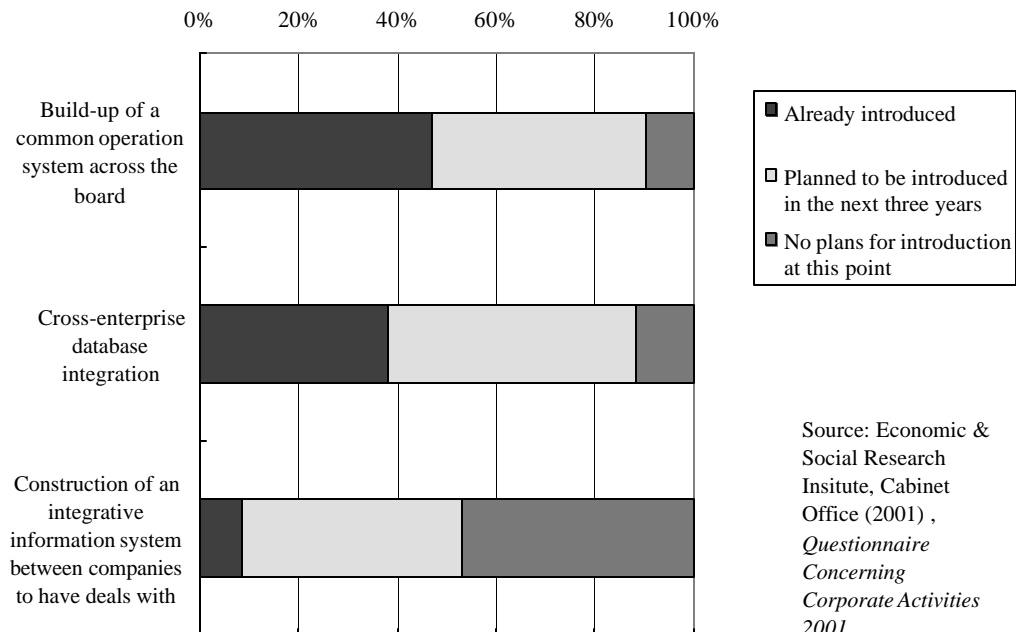


Figure 24 Information Sharing Using IT

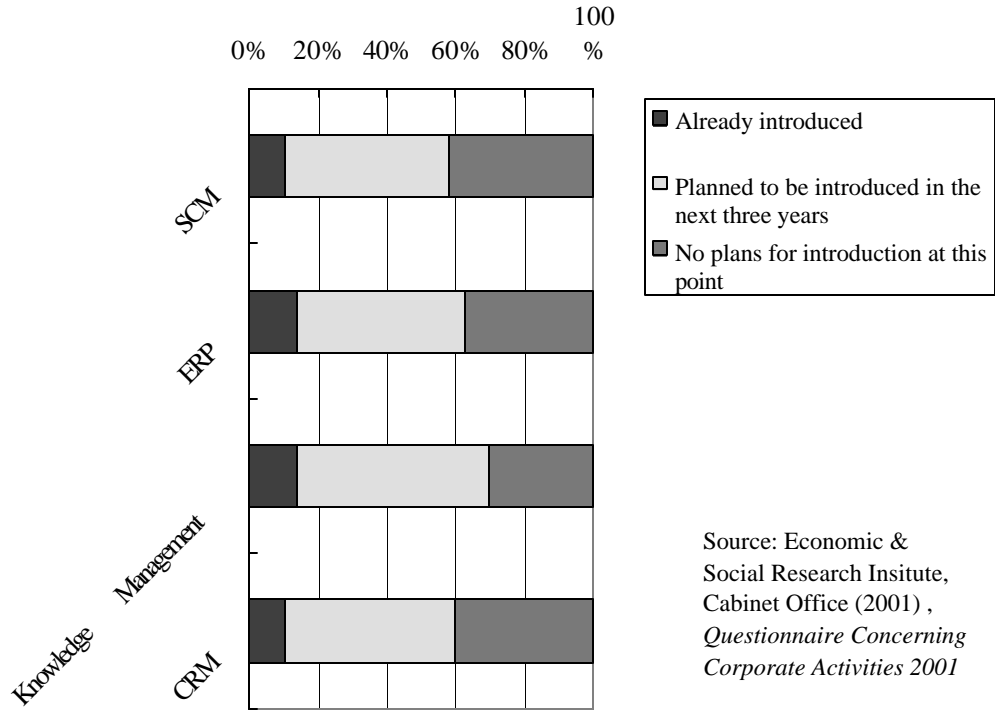


Figure 25 Information Exchange Between Businesses

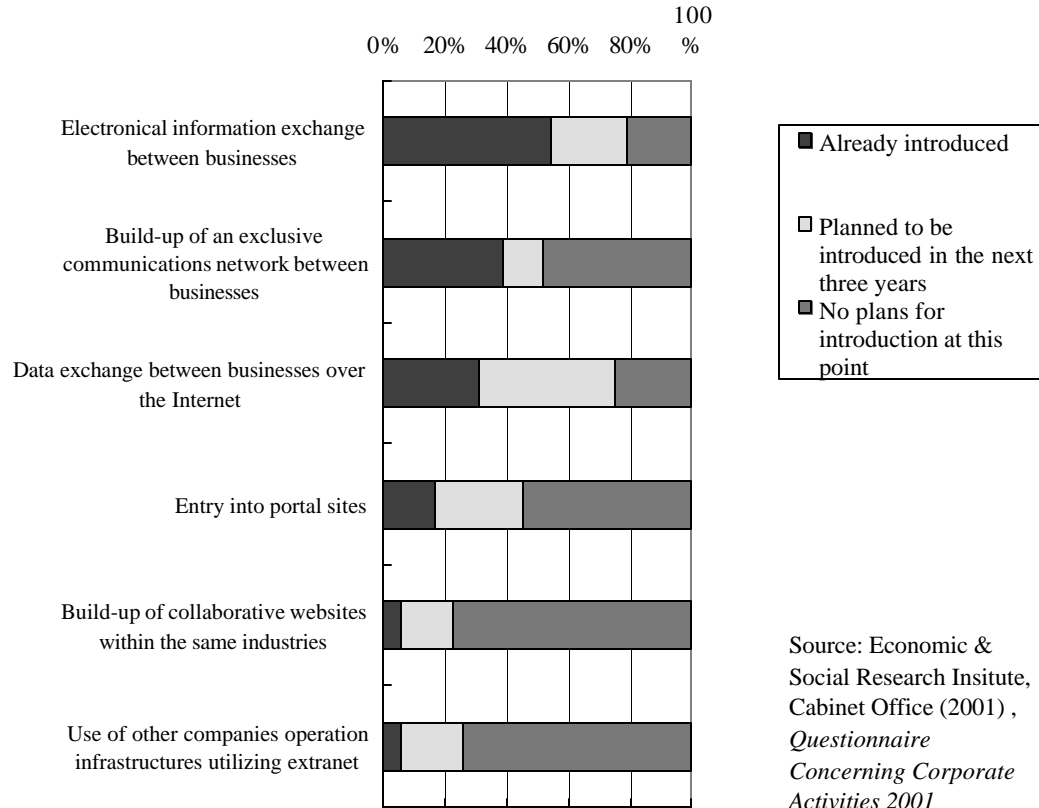


Figure 26 Effects of Growth in B-toB E-commerce

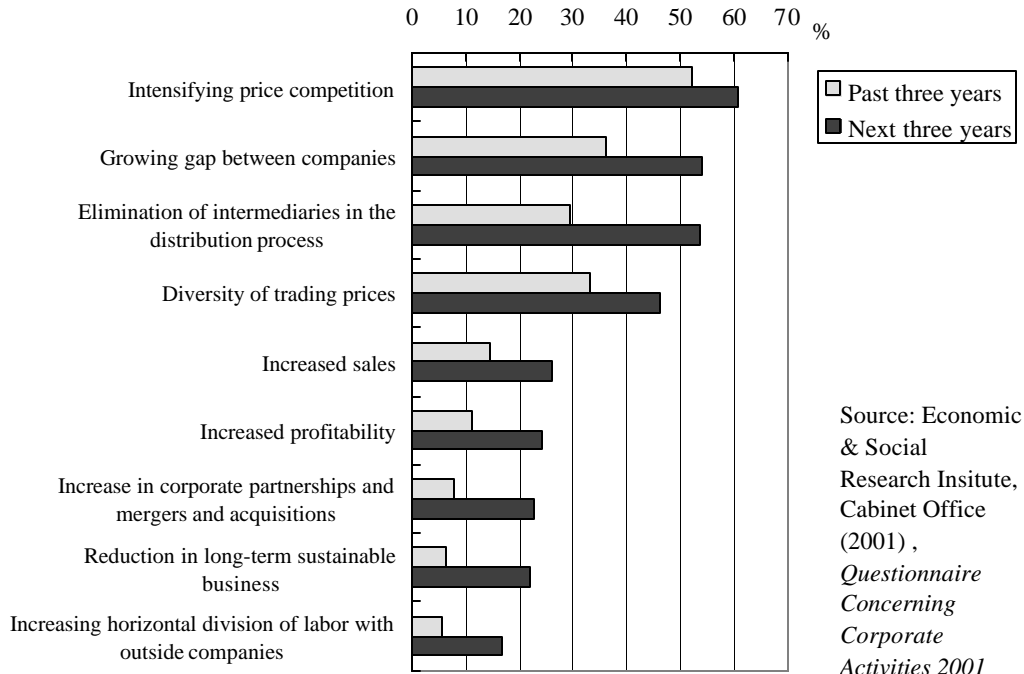
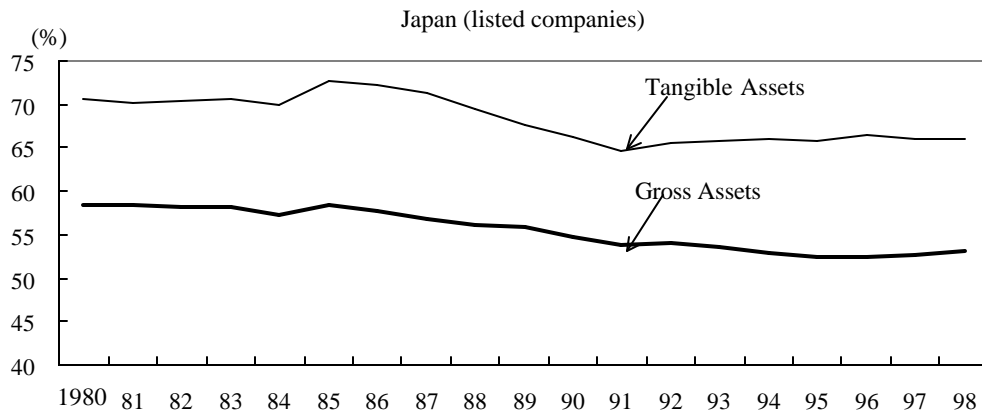
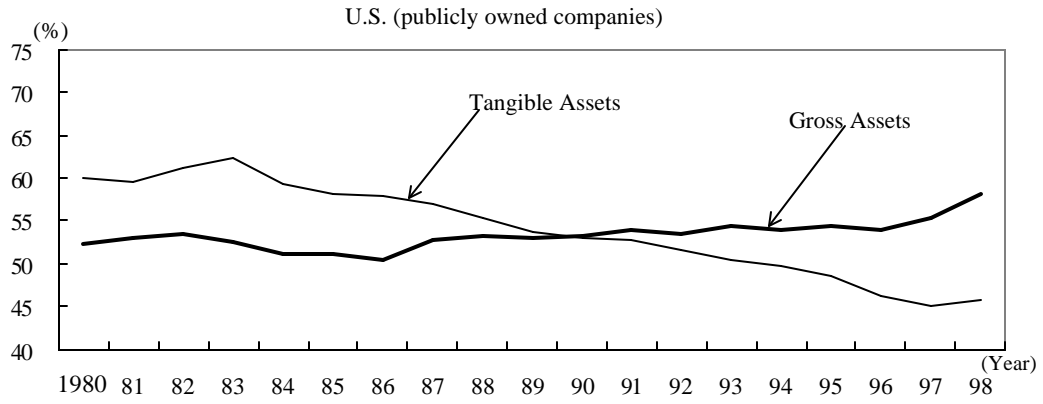


Figure 27 Top 100 Companies' Share of Assets
at All Publicly Owned Companies



Sources: *Corporate Finance Data*, Japan Economic Research Institute; *COMPUSTAT*, Standard & Poor's Inc. (Year)

Figure 28 Changes in Management Organization

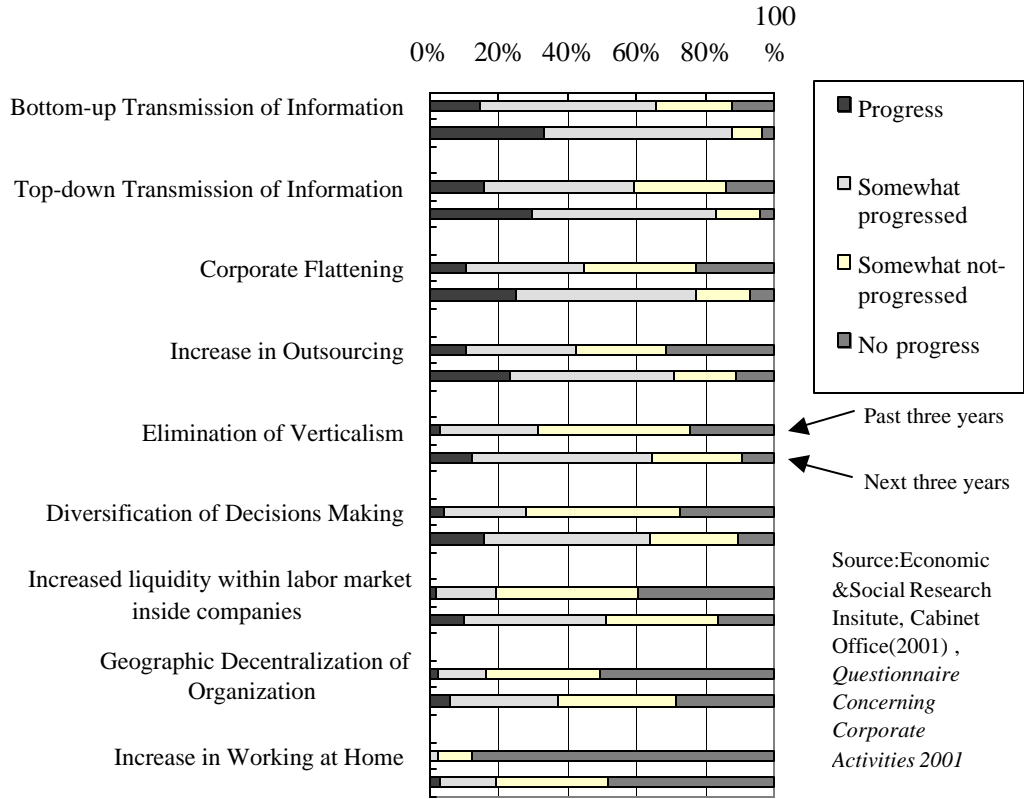
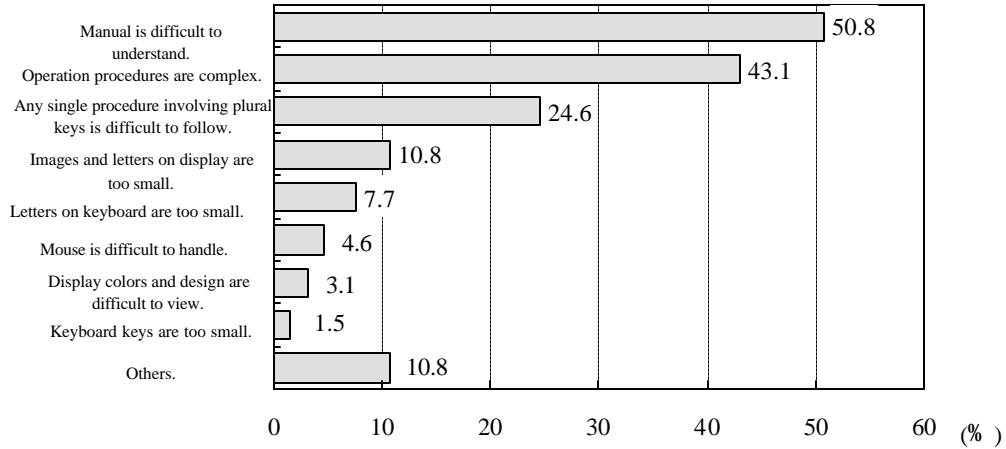
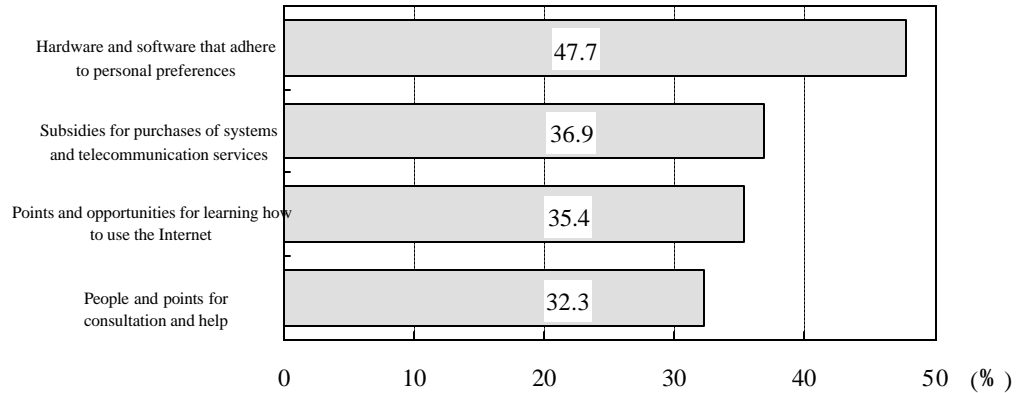


Figure 29 Older People's Views on Information and Communications Systems

i) Problems with Word Processors and Personal Computers



ii) Preconditions for Use of Internet



Source: *Research Report on Life-Supporting Information and Communications Systems*,
Ministries of Posts and Telecommunications, and Health and Welfare

Note: Respondents were allowed to choose plural alternatives.