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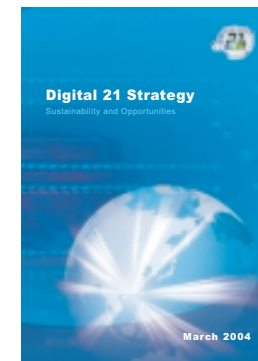
Digital 21 Strategy

Sustainability and Opportunities



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Foreword



Harnessing the full potential of information technology (IT) is a major challenge. Economies around the world have sought to meet this challenge in different ways through formulating strategies that are suitable for the conditions of their own communities to exploit IT to enhance productivity, generating economic growth and improving the quality of life for all.

In Hong Kong, we first set out our Digital 21 IT Strategy in 1998. The focus was to build Hong Kong's information infrastructure and create an enabling environment for e-business to prosper. Recognizing that our strategy and programmes had to keep pace with the ever-changing technological landscape, we committed then to regularly review and revise the Strategy, and update our goals and targets. We duly did so in 2001.

Since then we have made great strides in putting in place the right environment, infrastructure, skills and culture to encourage the development and adoption of IT by the entire community. The Hong Kong community is now a mature and avid user of IT.

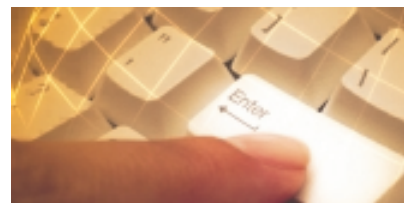
The challenge now is to sustain the momentum created in the last five years and continue to harness the benefits of IT for our community. This updated Digital 21 Strategy maps out actions in the following eight main areas to take Hong Kong forward in this information economy:

- Government leadership
- Sustainable e-government programme
- Infrastructure and business environment
- Institutional review
- Technological development
- Vibrant IT industry
- Human resources in a knowledge economy
- Bridging the digital divide

While government leadership is vital in realizing our goal of making Hong Kong a dynamic digital city, we will also continue to work with industry, academia and the community to implement these action programmes to sustain Hong Kong's position as a leading digital city in the globally connected world.

John C Tsang, JP
Secretary for Commerce, Industry and Technology

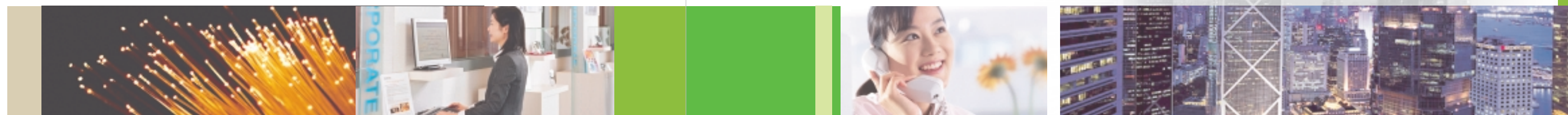
WHERE ARE WE COMING FROM?



- 1.1 We live in an information age. Economies and cultures at different stages of development all face challenges brought about by this inescapable fact. Like the rest of the world, Hong Kong needs to respond to such challenges effectively.
- 1.2 First, Hong Kong is an open economy that thrives on international trade and commerce. We are an important part of the global economy. We need to connect ourselves effectively to this global system and our partners, and use information technology (IT) to sharpen our competitive edge.
- 1.3 Second, IT manifesting itself as infrastructure and processes strengthens our business environment and creates opportunities for productivity gains. And IT also avails itself with opportunities in new or improved products and services. It drives our economic expansion and transformation.
- 1.4 Third, the innovative capability of an advanced economy, of which Hong Kong is one, depends increasingly on information and knowledge. Our ability to master IT, either on its own or in its many applications, is vital for Hong Kong's transition to an innovation driven and knowledge based economy.

- 1.5 Fourth, the above challenges also point out strongly and clearly that we have the societal aspiration, capability and sophistication to benefit from, and not to be disadvantaged by, an information age. It boils down to the quality of our society and its human resources - through education, training and bridging the digital divide - in understanding, using and deploying IT to improve our standard of living.
- 1.6 Fifth, IT - deployed to support appropriate e-government programmes - also improves access to government information and services, increases transparency of public administration, requires greater accountability of the Government, and ultimately enhances governance.
- 1.7 The Government of the Hong Kong Special Administrative Region has been championing the promotion, application and development of IT. In the first Digital 21 Strategy published in 1998, we said that our aim is to "enhance and promote Hong Kong's information infrastructure and services so as to make Hong Kong a leading digital city in the globally connected world of the 21st century". This remains our aim.
- 1.8 We are determined to make our endeavours sustainable, to ensure that they remain relevant to the rapidly changing technological and business environment, and to realize the opportunities available to us in this process.

WHERE ARE WE?



- 2.1 The importance and impact of IT on our economy and our way of life is taken as axiomatic nowadays. The Government of the Hong Kong Special Administrative Region has taken the leadership in promoting the development and adoption of IT by setting out its vision, initiatives and programmes of how the Government, business, industry, academia and the public can work together to make Hong Kong a leading digital city in a globally connected world.
- 2.2 Against this background, the first Digital 21 IT Strategy was published in 1998, and was reviewed and updated in 2001.
- 2.3 Our remarkable progress and achievements have received international recognition. Hong Kong was ranked first in the International Telecommunication Union (ITU) Mobile/Internet Index 2002, and seventh (second in Asia-Pacific) in the Digital Access Index published in 2003 by the ITU. The Economist Intelligence Unit ranked Hong Kong first in Asia in 2003 in terms of e-readiness. Accenture ranked Hong Kong seventh in the world in 2003 in terms of e-government leadership. The Electronic Service Delivery (ESD) Scheme also won the prestigious Stockholm Challenge Award in 2001. An important milestone in this regard is the coverage of 90% of amenable public services with an e-option by the end of 2003. Hong Kong has come a long way in positioning itself as a leading digital city.

- 2.4 The full liberalization of our telecommunications market has resulted in the availability of wider choices and better quality services at competitive prices. Affordable telecommunications charges have in turn stimulated service take-up. Our mobile and broadband Internet penetration rates are among the highest in the world, and the Hong Kong community is avid users of IT (Box 1).

Box 1

Where do we stand?

- Mobile phone penetration: 104% in 2003
- Broadband reaches all commercial buildings and virtually all residential buildings
- External telecommunications capacity: about 900 Gbps in 2003 (20-fold increase since 2000)
- Household personal computer (PC) penetration: 68% in 2003 (50% in 2000)
- Household Internet penetration: 60% in 2003 (36% in 2000)
- Household penetration for broadband Internet service: 50% in 2003 (18% in 2000)
- PC penetration in business sector: 55% in 2003 (52% in 2000)
- Internet penetration in business sector: 48% in 2003 (37% in 2000)
- Over 50% of businesses adopted some form of e-business (2003)
- 70% of Internet users had used e-government services, of which more than 60% rated e-government services as "very good" or "quite good"

- 2.5 Most of the initiatives set out in 2001 have been successfully completed. The remaining items are ongoing and proceeding on schedule. Our e-business environment has been further enhanced notably through the implementation of the e-government initiative; its outsourcing strategy with the support of an e-procurement system; the establishment of new information infrastructure at the Cyberport; and critical projects funded by the Innovation and Technology Fund (ITF) for upgrading our technology and infrastructure. A comprehensive programme of measures to assist business IT adoption supports these initiatives.
- 2.6 With a wide service coverage, focus on customer needs, improvements to service quality, enhanced efforts in joining up the stakeholders, the Government is now much more mature in e-service provision.
- 2.7 The package of immediate and longer term measures launched in the past years to address Hong Kong's IT manpower needs has also helped build a competent IT workforce to meet the demand of today's information economy.
- 2.8 The issue of four third generation mobile services (3G) licences in 2001, setting up of a high-speed link between the local tertiary institutions and the Internet2 backbone in the US in 2002 for research and development on advanced and multi-media applications, and roll-out of a new generation of multi-application smart identity card in June 2003 have laid the foundation for Hong Kong to exploit the latest enabling technologies to develop applications, services and content.
- 2.9 A detailed summary of the progress of our implementation of the 2001 Digital 21 Strategy is set out in Box 2.

Box 2

Progress of implementation of initiatives in 2001 Strategy

- All sectors of the telecommunications market liberalized from 1 January 2003 to encourage competition and provision of services at affordable prices.
- Four 3G licences issued in October 2001. 3G services rolled out in January 2004.
- Class licence to regulate public wireless local area network services introduced in February 2003 to promote the development and usage of wireless services.
- Among the first batch of economies in the world to open up the relevant frequency bands for IEEE 802.11 type of wireless services.
- Amendments to the Electronic Transactions Ordinance introduced into our legislature in June 2003 to ensure that Hong Kong has an up-to-date legal framework for the conduct of e-business.
- A non-statutory, not-for-profit corporation set up in 2001 to provide market-oriented Internet domain name registration services.
- Awareness building programmes, technical support and advisory services, financial support, and training programmes provided to businesses to assist them in adopting IT to enhance efficiency and productivity.
- The first three phases of the Cyberport completed in April 2002, February 2003 and January 2004 respectively to provide state-of-the-art IT, telecommunications and digital media facilities to create a strategic cluster of IT companies and to support and facilitate development of new technologies, applications, services and content.
- Phase I of Science Park opened in June 2002, with a strong information industry cluster being built up.
- HK\$445 million provided from the ITF to projects for upgrading IT and e-business infrastructure in Hong Kong.
- By end 2003, e-option available for 90% of the public services amenable to electronic mode of delivery.
- Some 180 public services from over 50 Government departments and public agencies now available via the ESD Scheme.
- By end 2003, over 80% of Government procurement tenders conducted through electronic means.
- Specific joined-up and Government-wide projects launched/initiated, such as the Common Look and Feel Website Design, Business Entry Portal, property information hub and Integrated Criminal Justice System.
- Professional IT training provided to students at all levels.
- Admission of Mainland and overseas IT talents to ensure adequate supply of quality IT manpower.
- Free IT awareness courses, IT Easy Link enquiry service, infotainment television programmes, IT promotion activities, free public computer facilities with Internet connection etc. to enhance IT awareness and promote wider use of IT in the community.
- Multi-application smart identity card rolled out in June 2003, which can be used as a public library card and can store a digital certificate. It can also be used for automated immigration clearance at border control points by end 2004 and for driving licence functions in about 2006.
- A high-speed link set up between local tertiary institutions and the Internet2 backbone in the US in 2002 for research and development on advanced and multi-media applications.

WHERE DO WE GO FROM HERE?



3.1 The challenge is to sustain the momentum that has been created in the last five years and continue to harness the benefits of IT for business, the community and Hong Kong's position in the world.

3.2 We see this endeavour in eight main areas of action:

Government leadership

Sustainable e-government programme

Infrastructure and business environment

Institutional review

Technological development

Vibrant IT industry

Human resources in a knowledge economy

Bridging the digital divide



Government leadership

3.3 Government leadership and commitment is vital in realizing our goal of building Hong Kong as a leading digital city in the region. This has proven to be the case in the last five years since the publication of the first Digital 21 Strategy in 1998. Public policy aside, the Government has strong influence on the direction of IT development through its resources allocation, implementation of information systems and procurement arrangements. For one thing, the Government is one of the leading investors in IT through its e-government programme and other administrative and operational systems. In the past three years, the level of investment has averaged at HK\$4.6 billion per annum.

3.4 The Government will continue to play a significant role in sustaining and deepening the momentum that has been created. This is particularly important despite the budgetary stringency within which the Government operates. We will also need to find new impetus to take the e-government programme to the next stage after meeting the initial target of covering 90% of amenable public services with an e-option. Another consideration is the need, in the course of Hong Kong's economic transformation, to realize the opportunities, business or technological, afforded by government investment in the promotion of IT and its wider adoption in the community.

3.5 Our conviction is that the Government should be an effective facilitator to enhance the innovative capability of both industry and the community, promote the development of industry and enterprises, and in this process encourage investment and innovation in IT. The following are obvious examples of what the Government will continue to do as a facilitator in promoting IT and its applications:

- ***Government as an advocate and champion***

The stride towards building a digitally connected city and keeping up as a leading digital city is a long-term endeavour. The Digital 21 Strategy has already established its reputation and indeed branding to symbolize our effort and actions. The Government should continue to be a leading "shaker and mover" of public opinion to support Hong Kong's pursuit and as a champion to promote Hong Kong's international image as an aspiring, dynamic digital city.

- ***Continued enhancement of the IT outsourcing programme***

The Government is a major user of IT. About 88% of our new IT projects in 2002-03 were outsourced. We will continue to press on with our e-government strategy and expand our outsourcing policy, covering new projects, application maintenance, and system management and operation. This will not only generate business opportunities for the private sector (and where appropriate, local service providers), but also opportunities for innovation, entrepreneurship and technological development.

A notable new target will be the outsourcing of the computer centre operation in the Information Technology Services Department (ITSD).

We will also review the Information Technology Professional Services Arrangement tendering approach in 2004. We will consider the need for a supplier/contractor registration system under this scheme as well as other measures that can facilitate small and medium IT companies in bidding Government tenders.

- ***Enabling the development of innovative technological applications***

Hong Kong's position as a major international service centre in financial services, trade and commerce, and transportation and logistics at a sophisticated level of operation has made these sectors major users of IT. This has provided an enormous platform for the development of innovative applications, contents and services based on IT. The Government can facilitate and augment this process through its information system requirements, procurement policy that demands such innovation, and other supporting measures, such as the opening up of intellectual property ownership by the Government for wider application by the IT industry.

- ***Facilitating the development of e-commerce through the e-government programme***

E-commerce in Hong Kong, like the rest of the world, is still not living up to its promises. However we must not lose sight of the impact of e-commerce and supply chain management in a highly globalized business environment if Hong Kong industry is to derive productivity gains and maintain its competitive edge in international trade and commerce. While the main onus will be for business to adopt e-commerce, either with their customers or their business partners, the Government will have an important role to play through education and facilitation.

Specific tools which are available to the Government in this respect that need to be sharpened are:

The e-procurement arrangements. The Government, like any other governments in the world, is a main player in the purchase of public goods and services.

The ESD Scheme. This will need to be reviewed and sharpened so as to promote greater adoption of online transactions.

- ***Fostering the development of the digital entertainment and broadcasting sectors as creative industries***

The potential of these sectors cannot be over-emphasized. While there are wider public policy issues that are fundamental to the development of these sectors, such as education, the Government can also play a major role in the provision of the supporting infrastructure and enabling environment, and also through changes to the relevant regulatory regime based on technology neutrality, facilitation of convergence, and deregulation.

Sustainable e-government programme

3.6 A good example of government leadership is the policy on, and implementation of, the e-government programme. The Government is committed to leading by example the use of e-business, both in conducting internal business and delivering public services. The use of e-business not only allows us to improve efficiency through technology exploitation and service transformation, but also drive the wider adoption of IT in the business sector and the wider community.

3.7 With the implementation of the e-government programme in the last four years and 90% of the amenable public services covered by an e-option, the main challenge in e-government strategy is: where do we go from here?

- ***Sharpening the e-government focus***

As with other governments' e-government programme, our initial target and focus was to provide an e-option for better access to Government services. In 2004, we need to deepen the e-government programme, including the ESD Scheme, and focus more sharply on service quality and effectiveness. In particular, the e-government programme should seek to bring value to customers as well as to the Government. Specifically, we intend to focus on the following aspects:



Driving utilization through a better understanding of what customers need, improving customer interface and promoting customer relations management (CRM)

Promoting service integration and transformation towards customer-centric and quality-oriented service delivery with more effective business process re-engineering

Enhancing accessibility to Government and transparency in its process

Leveraging on the most appropriate technologies

Improving measurement of the performance and value of e-government initiatives

Formulating a roadmap for the further development of e-government services, including the ESD Scheme, having regard to the above and other relevant considerations

- **Driving utilization and creating value**

Creating value for our customers in the use of e-services is fundamental to driving utilization. At the same time, driving utilization and creating a critical mass of users for e-services are key to the realization of the benefits of e-government. Specific actions to promote the migration of customers towards e-services include:

Identifying specific high-value services for targeted improvement of utilization and helping departments set and achieve such targets

Identifying suitable services for introducing cost segmentation and price differentiation for online services



Rationalizing different channels of service delivery and scaling down the provision of less cost-effective channels where possible and justified

- **Engaging customers**

Engaging customers is the key to creation of customer value.

We will set out clear CRM policies and guidelines for all projects involving a customer interface, and link them with funding conditions.

We will also introduce measures to obtain more customer feedback in project implementation and in monitoring service utilization.

- **Driving IT adoption through e-government**

We are taking the lead to drive the business sector and the community to adopt IT. This includes:

Deepening electronic procurement starting with certain types of Government purchases. We will introduce arrangements to encourage adoption by suppliers, including small and medium enterprises (SMEs).

Exploring further the inclusion of value-added applications on smart identity cards. Such additions may have commercial and e-commerce applications.

Infrastructure and business environment

- 3.8 The importance of a world-class infrastructure and a business friendly environment cannot be over-emphasized. These are the very fundamental factors contributing to the development of a digitally connected city and a highly competitive economy in a globalized environment. Hong Kong's achievement in these aspects is evident. By international standard, we stand out in terms of external connectivity, penetration of broadband access, and use of mobile network services. On the other hand, the free and competitive market of Hong Kong, its strong entrepreneurship, excellent financial services and capital market functions, legal system and rigorous protection of intellectual property rights (IPR) have provided Hong Kong with a very favourable business environment. The last aspect, namely the rigorous protection of IPR, is particularly relevant for the promotion, application and development of IT. It will remain a cornerstone in our Digital 21 Strategy.
- 3.9 The telecommunications sector has benefited from this development. Our policy to liberalize the telecommunications market has reached a new milestone with the full opening up of the fixed telecommunications network services market on 1 January 2003. We have one of the most advanced telecommunications infrastructure and networks in the world. Industry accounts for the bulk of this level of investment. Our operators provide quality and innovative services on a highly competitive basis. They embrace new opportunities afforded by new technologies, such as 3G mobile services. Over the three-year period from 2000 to 2002, total investment in the telecommunications sector exceeded HK\$24.5 billion.



- 3.10 This achievement is, among other things, the result of public policy that promotes competition, investment and innovation in the telecommunications market.
- 3.11 We will strengthen these success factors and apply them to other sectors where appropriate.

- ***The broadcasting industry***

Broadcasting is another sector that provides promises for Hong Kong to be the leader in Asia. The regulatory regime was reviewed in the late 90s', resulting in the enactment of the Broadcasting Ordinance in 2000. We have witnessed the further expansion of the domestic pay television market, not just in terms of the increase in number of licensees from two to five but also the diversity of the technology platforms from which services are launched, including transmission over cable, satellite and fixed network, as well as broadcast over the Internet.

From this evolution we are seeing the impact of convergence on the telecommunications and broadcasting industries. This in turn leads to the question of how the current regulatory regime is able to deal with the challenges to industry as a result of the rapidly changing technological landscape and new business and operational models caused by convergence.

The Government is reviewing these developments and considering necessary changes to the regulatory regime to meet the above challenges. We intend to strengthen our policies and regulatory framework by facilitating convergence, removing regulatory burdens and providing an enabling environment for industry to innovate and develop new services. We will consult the public on our thinking in 2004.

- **Digital broadcasting**

We are conducting a second round of consultation on digital terrestrial television regarding specific issues such as technical standards, licensing approach and transitional arrangements.

Although the decision to provide digital terrestrial television services will be a matter of commercial judgment, it will be helpful if the Government sets out the regulatory framework within which such services are to be planned and provided. Subject to the outcome of the consultation, we plan to invite expression of interest in the second half of 2004. We propose that the existing two terrestrial broadcasters should start simulcast in 2006 and achieve digital full coverage in 2008.

- **Broadband infrastructure and wireless access**

An efficient and advanced broadband infrastructure underpins the development of IT applications and services. We already have one of the most advanced broadband infrastructures in the world and are concerned that it is continuously upgraded and improved to meet the increasing demand for bandwidth and innovative services. We have already embarked on a review of the current policy for interconnection arrangement. Our objective is to formulate an updated policy and regulatory regime that facilitates effective competition and promotes investment by industry, including in the development of a competitive, advanced and high bandwidth infrastructure. We intend to complete the review in 2004.

Apart from a broadband infrastructure over fixed networks, we are monitoring the rapid development of wireless access technologies, notably those based on the evolving IEEE 802.16 and 802.20 standards. Where appropriate we will facilitate their deployment through appropriate regulatory measures, including the allocation of the necessary frequency spectrum. These technologies complement or extend the reach of broadband access by wirelines and may better meet the needs of users and consumers in some circumstances.

- **Make the best of our technology infrastructure**

The two flagships of the Government's programme to promote technological development through the creation of high value-added industrial clusters, namely the Cyberport and Science Park, are making steady progress in the fulfillment of their missions. Apart from leasing and recruitment of tenants, these projects are also intensifying their efforts to sharpen their technology focuses and promote wider industrial application in such sectors.

The Cyberport provides supporting infrastructure for the development of wireless applications and services and for digital media technologies. On the other hand, the Science Park has stepped up its support for integrated circuit design and related support. Photonics will be its next focus area.

These and future initiatives will receive public funding support where justified.



- **Promote the adoption of e-business**

We have established a world-class e-business environment including our telecommunications infrastructure, the Electronic Transactions Ordinance which provides a clear legal framework for the conduct of e-business, a public key infrastructure for secure electronic transactions, Chinese language interface and market-oriented Internet domain name registration services.

Amendments to the Electronic Transactions Ordinance were introduced into the Legislative Council in June 2003 to update and improve the Ordinance. We aim to complete the legislative process within 2004 so that our legal framework keeps pace with international e-business practices and technological advancement.

We will continue to drive e-business and IT adoption by business sectors. Our targets are SMEs. Apart from our existing generic programmes, such as provision of advisory services, awareness programmes and financial support, we will also roll out sector-specific programmes. We will collaborate in this endeavour with trade associations. ITSD will initially provide support to the Travel Industry Council of Hong Kong to launch a campaign to encourage the wider adoption of IT among travel agents. These efforts will be expanded to other sectors. We will also work with trade associations and make use of relevant public funding to develop common processes and data standards, as well as solutions that can enhance the competitiveness of our SMEs in general or in specific sectors.



- **Promote information security**



Given the global concern over information security, we are committed to maintaining a secure environment in the promotion and development of IT. The Government leads this endeavour and Government departments uphold high standards of security and data protection through its information security management framework. We will continue to organize publicity and public education programmes to enhance public awareness, support the operation of the Hong Kong Computer Emergency Response Team Coordination Centre for coordinating the handling of local information security incidents, and promote the use of digital certificates that enable secure electronic transactions to be carried out.

We intend to create a critical mass of digital certificate holders through the offer by the Hongkong Post Certification Authority (HKPCA) since June 2003 to smart identity card holders of one-year free use of its digital certificates. This in turn will provide the facility for greater use of e-government services, incentive for industry to develop applications and services on this platform, and a basis for HKPCA and its business partners to launch further applications.

- **Tackle spamming**

We are sensitive to the concerns of the community about the nuisances caused by spamming. We have already put in place some administrative measures with a view to containing the problem. We will review within 2004 their effectiveness and the case for the introduction of legislative measures. In conducting this review, we will take into account the relevant regulatory measures adopted by other jurisdictions and the need to strike a balance between minimizing the nuisances of spamming and avoiding stifling of legitimate business, notably e-commerce, activities.

Institutional review

- 3.12 We have proposed a visionary programme of measures with the aim of realizing the potential of IT to its full to provide the impetus to economic growth and prosperity. To deliver the expected results, an institution acting as a central focal point is required to coordinate, monitor and ensure their effective implementation.
- 3.13 ITSD has already embarked on a change programme under which it will, among other things, pilot the implementation of a knowledge management framework in 2004 to facilitate the sharing of knowledge in the Government and foster the development of a stronger Government IT community consisting of ITSD staff, departmental IT management units and IT users under the evolving new governance environment for the further development of e-government.
- 3.14 The convergence of telecommunications, broadcasting and the Internet and the rapid changes in technological development and business models have presented major challenges to regulatory authorities in the world.
- 3.15 Our institutional structure will also need to continue to evolve. In 2004 we will look into three main aspects:

- ***The case for a more integrated structure of the Government***

We will consider the case of a more integrated structure within the Government by merging the transforming ITSD into the Communications and Technology Branch of the Commerce, Industry and Technology Bureau (CITB). In addition to driving the e-government programme, the merged organization will have a coordinated role in promoting the development of applications and services, supporting the information industry and driving IT adoption. We will establish a Chief Information Officer (CIO) function, either in a person or an institution, within the Government whose responsibilities may indeed go wider than what it is understood in the corporate world¹. Our aim is to complete the exercise in 2004.

- ***Role of the Information Infrastructure Advisory Committee (IIAC)***

Since 1998 the highest-level government advisory body in IT matters has been the IIAC. As its name implies, the Committee's original focus was on information infrastructure. However, as it stands, the Committee is covering de facto an increasingly wider range of issues related to information and communications technology, industrial development and policy matters. We will examine how the terms of reference of the IIAC, its membership and its operation can reflect adequately this evolution, and come up with our proposal in 2004.

¹ A number of leading e-government countries, like Canada, the United States (US) and the United Kingdom (UK), have a powerful CIO role at the centre of government. The CIO function is characterized by strong leadership over the business direction of other government agencies and ample technical expertise, sometimes coupled with professional knowledge from the private sector. Such a CIO function has enabled the government to better manage information for the benefit of the community, to effectively perform its cross-agency leadership role and to take a whole-of-government approach in driving e-government.

- ***The case for a unified regulatory body***

The Federal Communications Commission (FCC) in the US and the Canadian Radio-television and Telecommunications Commission in Canada are single regulators covering both telecommunications and broadcasting. In recent years we have seen the evolution and transformation of regulatory bodies in other economies along the line of a single authority. The combination of five regulatory authorities in the UK to form a single regulatory body, viz. Ofcom, is one notable example (see Box 3).

In Hong Kong the regulation of telecommunications and broadcasting falls on two separate entities, respectively the Telecommunications Authority and the Broadcasting Authority, which operate under different legislative framework, institutional basis and professional support with different organizational culture and competency.

We will review whether this regulatory structure will best serve Hong Kong in the era of convergence and deregulation. We will put forward our proposals and consult industry and the public in 2004.

Box 3

Examples of recent initiatives to merge telecommunications and broadcasting regulators

In the UK, recognizing that content and networks, in economic terms, are becoming more and more intertwined, the Government has recently established a simpler and more flexible system where the single regulator Office of Communications (Ofcom) will be able to act independently in response to fast-changing circumstances. The Ofcom is formed by merging the functions of five regulatory bodies, namely, the Independent Television Commission, the Broadcasting Standards Commission, the Office of Telecommunications, the Radio Authority and the Radiocommunications Agency.

In Australia, the Australian Communications Authority and the Australian Broadcasting Authority currently regulate the telecommunications industry and the broadcasting industry respectively. The Government considers that convergence of communications technologies and markets is placing growing pressure on the current regulatory institutional arrangements. In August-September 2003, it conducted a consultation on the merger of the two authorities.

Technological development

3.16 Technology manifests itself as infrastructure, processes, goods and services. The opportunities afforded by technology are enormous. It enhances the innovative capability of industry and the community. It also builds the foundation of the knowledge base of society. IT plays a particularly important role in these aspects. It is a strong driver for productivity enhancement of any advanced economy.

3.17 We need therefore to strengthen our ability to adopt and apply IT and develop our capability for the development of innovative applications and services.

- ***Support for research and development***

The Government's continued investment in research and development is essential to the development of innovative applications, content and services that take advantage of Hong Kong's excellent infrastructure and competitive market. University research on IT has been a major beneficiary of public funding for research and development. The Applied Science and Technology Research Institute has also identified communications and Internet applications as its major focus technology areas.

The availability of funding for research and development is important, and so will be the need to link industry to the research organizations for more effective technology transfer and commercialization arrangements. Such a process is a major challenge for Hong Kong, as with other economies. We need to continue to work on this front so that public funding finds its best use and industry can harness the results of public sector research and development. To this end, we will step up our dissemination and commercialization efforts in order to ensure that ITF projects can benefit the industry. We are also reviewing the operation of ITF to further strengthen the commercialization process.

- **Focus area: wireless technologies and services**

With one of the world's highest mobile phone penetration rates and roll-out of 3G mobile network services, Hong Kong stands to benefit from the rapid development of wireless technology and services, particularly through deployment in business process to enhance productivity and efficiency.

To provide a platform for development of wireless applications, solutions and services, the Government supports the Hong Kong Wireless Technology Industry Association to set up a wireless development centre at the Cyberport with funding from the ITF.

Opened in December 2003, the Hong Kong Wireless Development Centre brings wireless solutions developers together with mobile operators and equipment vendors and provides a neutral and central platform for the development, testing and marketing of innovative applications and services. The developers will have access to information on technology standards and market information. The centre will also identify anchor projects for the industry and assist in marketing outside Hong Kong, including the Mainland. The parties will work together to make the centre a focal point of the industry and a main driving force to "push" Hong Kong technologies in the Mainland and Asia.

The IIAC published a report from its working group for the promotion of wireless applications at enterprise level in January 2004. Together with industry, we will follow up the relevant recommendations.



- **Focus area: digital entertainment**

Digital entertainment is a relatively new and evolving industry worldwide. Hong Kong has considerable advantage in developing this sector with our industrial base in film production, broadcasting and advertising and also the considerable training facilities that have been put into our universities and institutes of vocational education. To harness the opportunities afforded by digital and multi-media technologies, we will work on three major fronts.

First, the IIAC published in September 2003 the report of its Working Group on Digital Entertainment. The report recommends a package of measures aiming to strengthen the infrastructure, human capital, IPR, research and development, and marketing and promotion for the local digital entertainment industry. We will follow up the implementation of the recommendations.

Second, we are establishing a Digital Media Centre in the Cyberport with funding from the Cyberport and the ITF to provide hardware, software, technical and marketing support to the computer generated graphics, animation, films and games industries. Multi-media content creators can make use of the centre facilities on a time-sharing basis without the need to invest in their own expensive equipment initially. We will make sure that this new infrastructure is instrumental to supporting industry, particularly start-ups, and spawning of new companies.



Third, we issued a solicitation theme under the ITF on "media technologies for digital entertainment" in September 2003 to specifically invite applications for conducting research and development on digital entertainment. The response is encouraging. 7 applications involving a total of HK\$16.8 million have been approved under this solicitation theme. We will continue to encourage research and development on digital entertainment so as to improve the capabilities of companies in this industry.



- ***Riding on new developments***

The introduction of new technology platforms for service delivery, such as 3G mobile network for telephony and data services; digital broadcasting; the convergence of telecommunications, broadcasting and Internet services; smart card technology; location based services including Global Positioning Systems (GPS); spatial and geographic information systems (S/GIS); radio-frequency identification (RFID) technology; and the development of a Digital Trade and Transportation Network have provided an enabling environment for the development of innovative applications, contents and services based on these new operating media.

The Government will provide the necessary support, in public policy, infrastructural and funding terms, to industry to harness these potentials.

- ***Openness in technological and standards adoption***

Hong Kong has been a pioneer in the adoption of new technologies. We are, for example, the first to have our telephone network digitized in the early 90s' and the first to adopt the CDMA standards in the world. This has put Hong Kong at the forefront of competitive telecommunications services.

We need to keep up with this openness and spirit of pioneering. Although the onus will mainly fall on industry, the Government will continue to set an example.

Thus we will continue to adopt open and interoperable standards and enhance our Interoperability Framework (IF) to reflect major changes in the industry. The IF, implemented since late 2002, sets out Government's standards and practices to ensure data and technical interoperability among its IT systems and e-government services.

The Government's policy on procurement of software products is based on objective criteria, such as value for money, functionality, security, system compatibility and the availability of reliable technical support. To widen product choice and maximize the potential for cost savings, we will promote the use of open source software (OSS) technologies and solutions within the Government through showcases and trials organized by ITSD's IT Solution Centre. We will also promote OSS development and adoption in the private sector through provision of funding support from the SME Development Fund and ITF for projects that develop OSS or assist SMEs in using OSS. We are conducting a survey on OSS adoption in the business sector to identify barriers to OSS adoption and measures to promote wider adoption.

Grid computing is another area that deserves attention. The Government has already started a pilot scheme with the Environmental Protection Department as the client department. We will continue to monitor international developments on grid technologies and services and their readiness for local adoption. We will consider and encourage wider adoption of the technology when it becomes mature and when applications are ready.

- ***Outsourcing and opening up of intellectual property ownership with a pro-innovation angle***

This is discussed in section 3.5 above.



Vibrant IT industry

- 3.18 We need to promote a vibrant, competitive and innovation driven IT industry in Hong Kong. The reasons are obvious. Hong Kong already has had considerable advantage in terms of its infrastructure, service economy and related domain knowledge. We also have an industry that is highly dynamic and international in outlook. The fostering of a vibrant industry will leverage on these strengths and add to the economic diversity of Hong Kong. A vibrant and competitive industry will in turn be able to contribute to innovation in applications and services and technological development.
- 3.19 The opportunities afforded by the Mainland market hardly need any emphasis. The Mainland is known to be a very large market for goods and services; it is also a major source of technical expertise and human resources; it has ambitious aspirations to become a major world player in the information industry; and its motivation to play a major role in the world IT market is fully justified.
- 3.20 This is an ideal background against which to promote a vibrant, competitive IT industry in Hong Kong. The Government will act as a facilitator. While the Government's economic policy is clearly not to subsidize industry, there are a lot that it can do together with industry support organizations and trade associations to support the industry, including the identification and exploration of business opportunities locally, in the Mainland and other overseas markets. The courses of action open to us are as follows.

- **Mainland and Hong Kong Closer Economic Partnership Arrangement (CEPA)**

CEPA's impact on promoting the free flow of goods, services and professional personnel between the Mainland and Hong Kong is clear. Phase I of CEPA is encouraging as it covers specifically the telecommunications sector. This will enable Hong Kong's telecommunications industry to have a first mover advantage in five value-added services in advance of the commencement of China's obligations under the World Trade Organization. The promotion of e-business as a means for trade facilitation is already referred to in the Arrangement.

CEPA is an evolving process and works on an incremental basis. We will continue to work closely with the industry and identify further areas to be included in the Arrangement for the expansion of business opportunities and mutual benefits of Hong Kong and the Mainland.

- **Pearl River Delta (PRD)**

The PRD is a natural economic ally of Hong Kong, given its geographical proximity, cultural and linguistic affinity, and long established economic inter-dependence, with Hong Kong. The economic integration between Hong Kong and PRD is a major item on the agenda of the Government. We would identify and work out measures that will foster a strong information industry in Hong Kong and Guangdong through the existing high-level government contacts between both places.

In this context, a standing communication channel has been set up between CITB and the Guangdong Provincial Information Industry Department to enhance collaboration between industries of the two places.



It must not be overlooked that there already exists a strong business network between Hong Kong based trade and professional associations and their counterparts in different cities and municipalities in the PRD. On the other hand, the Hong Kong Productivity Council is establishing its presence in Guangzhou, Dongguan, Shenzhen and Zhuhai. Integrated support and services will be provided through these offices to Hong Kong companies operating in PRD. This will include the IT sector.

- **Working with the Mainland**

The Mainland of China will be a major player in outsourced software development, IT services and software products in the world. Hong Kong with its international experiences and connections can play the role of a window to facilitate this outward process that will expand and enhance the competitiveness of the Chinese information industry internationally. The benefits to Hong Kong industry are more than just business opportunities, but the prospect of becoming part of a much larger and increasingly competitive, technological or otherwise, information industry.

We will continue to facilitate the local industry in launching initiatives to build this partnership. These initiatives will receive public funding where justified.

- **Hong Kong Trade Development Council (TDC)**

The TDC is already playing a very major role in supporting Hong Kong industry in raising the profile and branding of Hong Kong industry, and in exploiting business opportunities in Mainland and overseas markets. The Government will continue to work closely with it and relevant trade and professional associations to pursue this mission. We will also continue to encourage participation in international trade fairs, award schemes, trade matching and networking events. A highlight of these endeavours is the International ICT Expo in Hong Kong in April 2004.

- **Quality assurance and capability building**

As global competition becomes increasingly keen, our IT industry must constantly improve its quality in order to stand out from others. The ITF has approved funding for a Capability Maturity Model (CMM) Assessment Grant project, which provides funding support to 15 local software vendors to achieve CMM Level 2 or above. The SME Development Fund has also approved funding for a project to raise awareness of CMM in the local software industry.

We will monitor the progress of these projects and where necessary, explore provision of further funding to our software industry to obtain internationally recognized quality certification.

- **Procurement/outourcing strategy**

This is discussed in section 3.5 above.

- **Opening up intellectual property in Government IT systems**

This is discussed in section 3.5 above.

Human resources in a knowledge economy

3.21 To maintain Hong Kong's competitiveness, we must have adequate and quality human resources in IT to meet the demand of a knowledge economy and specifically that of commerce and industry. We will continue to work with the educational and vocational training institutions and industry to enhance the training and skills of our workforce and the next generation. As with the rest of the world, we will also facilitate the recruitment of talents to fill gaps in manpower, expertise and experience.

- **IT in education**

The five-year "Information Technology for Learning in a New Era" strategy promulgated in 1998 heralds the beginning of our efforts in integrating IT into education. The major achievement in the first five years is that all schools have been provided with the required infrastructure and connected to the Internet. All teachers have been trained on the use of IT in education and they are increasingly adept in using IT for enhancing the effectiveness of learning and teaching. Building upon the existing strengths and in the light of the Government's vision for future education and experiences gained, the Education and Manpower Bureau (EMB) is formulating the strategic directions for the further development of IT in education.



A steering committee comprising experts, academics and frontline educators has been formed to deliberate on the strategic directions and initiatives. A focus of the future initiatives will be on equipping students with the skills, knowledge and attitude to use IT effectively for lifelong learning. To this end, a framework of information literacy will be developed. Teachers and school heads will be continuously trained with a view to harnessing the power of IT for learning and teaching of different subjects. E-learning and enhanced partnerships between schools and the private sector will also be encouraged.

The Hong Kong Education City, the most popular education portal in Hong Kong, will continue to serve the education sector and the wider community by providing a rich repository of educational resources and educational information. It is also expected to develop more online training for teachers and support project learning for students.

EMB will consult various stakeholders on the strategic directions and measures on IT in education in the coming months.

- ***Tertiary education and vocational training***

To meet increasing market demand for manpower and to equip students to master IT as a generic tool, the tertiary institutions in Hong Kong have been strengthening the IT component in their programmes and courses. Programmes that allow specialization in particular areas, such as e-commerce, information engineering and creative media have been introduced in the past few years. The institutions will continue to fine-tune the course contents to keep pace with developments in the IT field and meet market demand.

The Vocational Training Council (VTC) will continue to monitor the market demand for manpower in IT, review its programmes regularly and propose new ones in consultation with relevant industry bodies. New programmes and courses have been



introduced in the past few years to equip our workforce with the expertise and skills required by the market. These include game design, 3D animation, and video production and multi-media development. The VTC also keeps rolling out new courses on state-of-the-art technologies in web application development, e-commerce, and open source technology and information security.

- ***Qualifications Framework***

EMB has proposed to set up a Qualifications Framework (QF) and its associated quality assurance mechanism across different sectors in Hong Kong. The QF will provide clear information on the standards of courses and course providers. With clear and flexible progression pathways, learners can draw up their own roadmaps to upgrade their skills and pursue lifelong learning. To underpin the implementation of the QF, EMB proposes to set up Industry Training Advisory Committees (ITACs) to develop Industry Training Specifications (ITSs) for individual industry sectors. The relevant ITAC will define competency standards, their aggregation into qualifications for different levels of jobs in a sector, and assessment criteria. Employers, employees, professional bodies etc. will be represented on the ITACs so that the training needs of industries can be met and the qualifications widely recognized. EMB has carried out a pilot study on the development of ITSs for the IT sector. EMB will continue to work with the IT industry to ascertain the suitability for establishing an ITAC and developing ITSs for the IT industry.

Bridging the digital divide

- 3.22 To ensure that the entire community will benefit from IT development in enhancing the quality of life, the Government has, in collaboration with the industry and non-government organizations, introduced a wide range of measures to bridge the digital divide in the community. The "IT Hong Kong" campaign is aimed to raise awareness and promote wider adoption of IT in the community. Specifically it consists of free courses providing basic IT training to different sectors of the community, free talks in public libraries, a dedicated website for information dissemination, district promotional activities and infotainment programmes for citizens. Other support includes the provision of public computers with Internet access at convenient locations, computer recycling for the needy, financial assistance to people with disabilities for purchase of computer facilities for home working and the installation of supporting devices in public computers for access by the blind and the visually impaired.
- 3.23 In addition, all Government websites are now in compliance with our internal accessibility guidelines to facilitate access and navigation by the visually impaired. Seminars and workshops are conducted regularly for the private sector to encourage the adoption of barrier free web design in the private sector.



- ***New initiatives***

The Government will, as a further step to strengthen public/private sector partnership in bridging the digital divide, work together with the social service sector and the industry to set up a Digital Solidarity Fund to provide funding for non-government organizations to carry out activities to bridge the digital divide. A committee comprising the parties concerned will be set up to consider applications.

Four Government departments, namely Information Services Department, Leisure and Cultural Services Department, Social Welfare Department and the Department of Health, will launch on a pilot basis in the first half of 2004 a sound version of selected information on their websites to enhance accessibility for the elderly and the visually impaired.

Further radio programmes will be provided to introduce e-government services, the web accessibility concept, functions of the multi-application smart identity card, and encourage the use of IT by citizens.

The free public enquiry service, IT Easy Link, has been extended for one year to provide helpdesk support to members of the public and businesses on the use of basic IT applications.

SUMMARY AND CONCLUSION



4.1 We have identified eight main areas of action, which represent our roadmap for driving further development and adoption of IT in Hong Kong:

- The Government will continue to be an advocate and champion to promote Hong Kong's international image as a dynamic digital city, and facilitate the development of innovative applications, e-commerce and creative industries by providing the right opportunities and programmes.
- We will sharpen the e-government focus, drive utilization, focus more on service quality and effectiveness in service delivery, and seek to bring value to customers as well as to the Government.
- We will continue to promote e-business adoption, intensify the support to different sectors provided by the two flagships at Cyberport and Science Park, strengthen our policies and regulatory framework to facilitate the development of the broadcasting and telecommunications industries, facilitate the growth of the broadband infrastructure and wireless access, and further promote public awareness of cyber security.
- We will review our current institutional structures in 2004 to ensure that we have the right institution in place to lead, coordinate, monitor and ensure the effective implementation of the programme of measures highlighted above.

- We will continue with our investment in research and development, strengthen commercialization arrangements, and foster the development of innovative applications and services in areas including wireless technologies, digital entertainment, open standards and open source software through provision of funding and other support measures.
- We will promote a vibrant, competitive and innovation driven IT industry in Hong Kong through leveraging on the opportunities afforded by the Mainland market, brand-building and trade promotion efforts of the Hong Kong Trade Development Council, and our programmes to help the local industry enhance service quality and build capability.
- We will work with educational and vocational training institutions and the industry to enhance the training and skills of our workforce and the next generation.
- We will continue to enhance our programme of activities to bridge the digital divide so that all sectors of the community will benefit from IT development in enhancing the quality of life.

- 4.2 We will develop the details of the proposals in the next 12 months. These include, among others, the merger of ITSD with CITB and the creation of a CIO function within the Government, the case for a unified regulatory body that covers both the telecommunications and broadcasting sectors, the next stage of the e-government programme and programmes to support the IT industry. We will consult the public and the stakeholders where appropriate and when we are ready.
- 4.3 We are seeking to bring practical value to the latest Digital 21 Strategy as improvements over its predecessors, not only in terms of process with proper public consultation but more importantly, we intend to give the Strategy "life" and use it as a working document. The new CIO's office will be required to measure our progress at the end of each year against what is set out in the Strategy and propose specific targets, actions and plans for the next year. This will be done in a transparent way and involve the contribution and participation of the stakeholders.
- 4.4 IT development is an evolutionary process that has to be sustained by continuous inputs in terms of innovation, investment, regulatory and policy support, and commitment of all stakeholders. The Government, industry, academia and general community have worked closely together in the past five years to realize the vision set out in the Digital 21 Strategy. This updated Digital 21 Strategy sets out a sustainable programme of measures with the aim of realizing the full potential of IT to accelerate Hong Kong's transition to a knowledge-based economy, and to provide the impetus to economic growth and prosperity. As in the past, collaboration of all stakeholders in the implementation of these measures is needed to ensure that they deliver the expected results. Our concerted efforts in implementing the Digital 21 Strategy will make Hong Kong a leading digital city, connecting the world and bringing benefits to all.