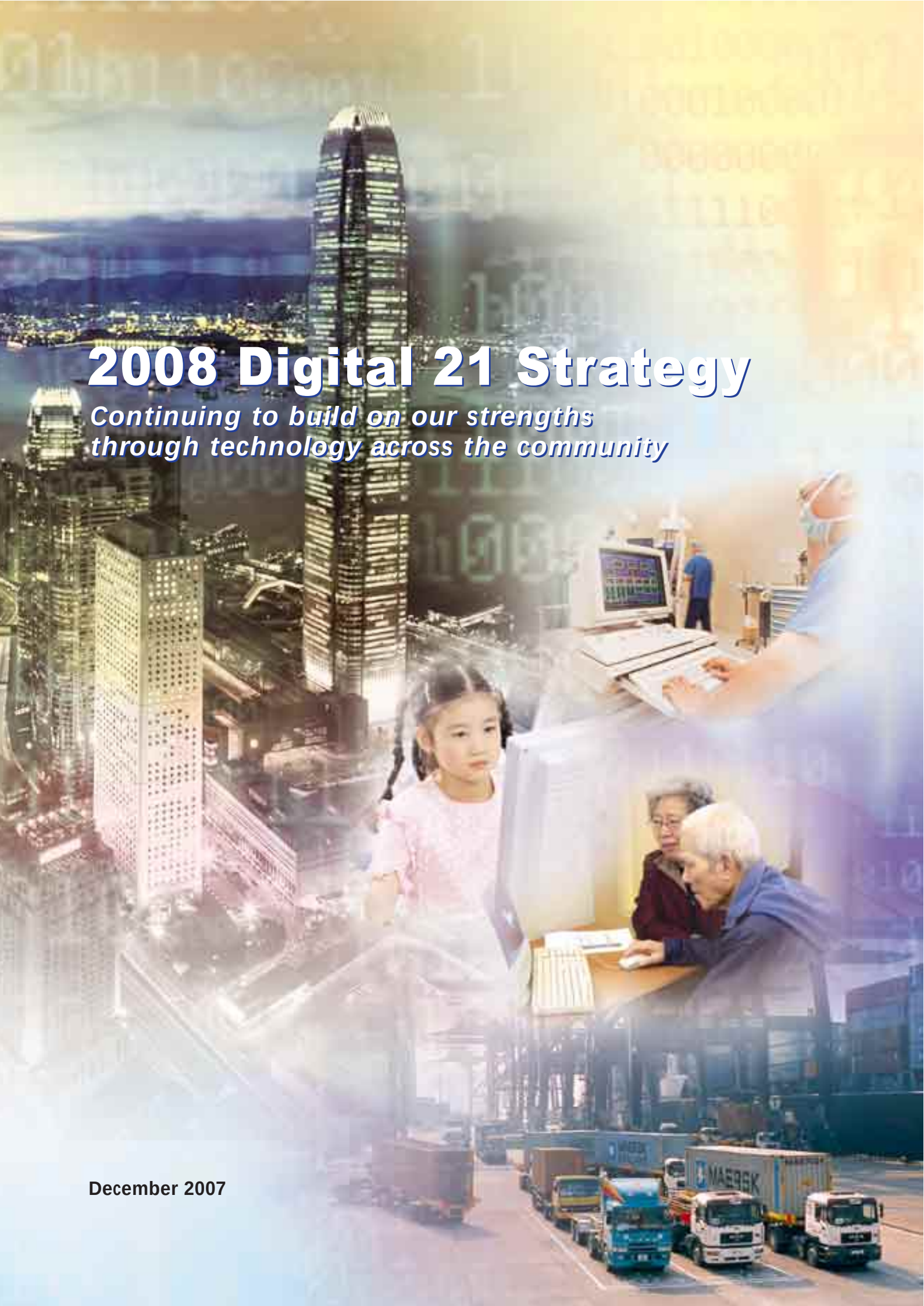


2008 Digital 21 Strategy

Continuing to build on our strengths through technology across the community

December 2007

CONTENTS

Foreword

Advancement in information and communications technology (ICT) generates huge potential for moving business and production up the value-chain, and improving the quality of life of citizens. At the same time, it brings about new challenges in areas such as information security, protection of intellectual property rights and privacy in the digital environment and the appropriate mode of regulation in the face of increasing media convergence. Leading digital economies need to embrace both the opportunities and challenges brought about by ICT development in order to stay in the forefront of the league.

Hong Kong has made great strides over the years in ICT applications which serve to increase our competitiveness and efficiency, and at the same time bring more convenient and user-friendly services to the community. The Digital 21 Strategy was first published in 1998 as the blueprint for Hong Kong's ICT development. It was updated on a regular basis to take into account technological and socio-economic changes.

Achieving the vision of enhancing Hong Kong's status as a leading digital city requires collaboration amongst all stakeholders in the community, including the Government, the ICT industry, other sectors, the academia and members of the public. That is why the formulation of the Digital 21 Strategy has all along been integrated with a thorough public consultation process to strive for a balanced view on the future direction of ICT development in Hong Kong.

The 2008 Digital 21 Strategy has now been finalised after undergoing public consultation. It contains five key action areas:

- Facilitating a digital economy;
- Promoting advanced technology and innovation;
- Developing Hong Kong as a hub for technological cooperation and trade;
- Enabling the next generation of public services; and
- Building an inclusive, knowledge-based society.

With the advent of information societies, a robust information infrastructure, just as essential physical infrastructure, is crucial to supporting and propelling the growth of economies. I believe Hong Kong has a solid ICT foundation which allows us to move further ahead. Our penetration rates for broadband Internet connection and mobile phones are amongst the highest in the world, thanks to the ICT-savvy population and the competitive pricing offered by service providers in a wide range of products and services. We have built up a substantial e-government presence over the years and will endeavour to increase the user-friendliness of our electronic public services. The initiative to install Wi-Fi hotspots in major government premises to provide free access to broadband Internet further demonstrates our commitment to enhancing the ICT capabilities of the community. At the same time, we will spare no efforts in extending the benefits of ICT to our younger generation and disadvantaged groups in the society.

Rapid economic development in the Mainland, particularly with the emphasis on technological advancement in the Nation's 11th Five-Year Plan, opens up immense opportunities for Hong Kong to serve as a hub for fostering cooperation amongst local, Mainland and overseas ICT enterprises. The availability of excellent professional and financial services, a rigorous intellectual property protection regime and advanced infrastructure such as Cyberport and Science Park enable Hong Kong to play this unique role.

The ability to leverage technology is an important attribute of a world city in the modern era. The Commerce and Economic Development Bureau is firmly committed to furthering the ICT development of Hong Kong having regard to the aspirations and needs of our businesses and citizens.

Frederick S. Ma
Secretary for Commerce and Economic Development

Executive Summary

I Background

- The Digital 21 Strategy was first published in 1998 by the Government of the Hong Kong Special Administrative Region to set out our vision of developing Hong Kong into a leading digital city. As a living document, updated in 2001 and 2004, it has taken into account the evolving needs of the community and technological advancements.

- In the 2008 edition, we note that Hong Kong offers the world's most affordable Internet connection and mobile phone services with penetration rates among the highest in the world. Cyberport and Hong Kong Science Park have been developed as strategic hubs bringing together clusters of high-tech information and communications technology (ICT)[1] companies and professional talent from all over the world. The Government is pursuing a vigorous e-government programme that has achieved good progress over the years.

1 This document generally adopts "ICT" as the term to refer to all technologies and applications that involve information processing and/or exchange over communication network(s), including the Internet. Nevertheless, we have kept the term "IT" (information technology), which is generally used interchangeably with ICT by the industry, in the naming of specific programmes or projects.

II The Challenge

- There are opportunities and challenges ahead for Hong Kong to strengthen its position as a leading digital city. Technology and innovation will continue to play a key role in helping Hong Kong to compete by enabling businesses to transform and provide goods and services of increasing value. With regard to the experience in advanced economies, creativity and business opportunities unleashed through connectivity and data sharing over cyberspace are expected to emerge as new economic drivers. Harnessing our strategic role as the two-way platform assisting Mainland enterprises to bring in foreign investment and participate in the global economy is a critical opportunity and challenge that underlines Hong Kong's positioning as a source of competitive advantage.

- Moving towards the goal of an inclusive, knowledge-based society, we need to ensure that the benefits of ICT adoption are widely available to different segments of the community. Issues relating to data standards, information management and intellectual property rights protection become areas of increasing focus. The vision is an ultimate information society, under which everyone can create, access, utilise and share information and knowledge, thereby empowering individuals and enterprises to achieve their full potential and improve their quality of life.

III Moving Ahead

- ICT applications are prevalently used in Hong Kong to support and further Hong Kong's role as an international financial, trading and aviation centre. Pressing forward on ICT development will contribute towards the policy areas in the Chief Executive's policy blueprint, in particular in facilitating progressive development and raising the quality of life.

- **The vision underpinning the 2008 Digital 21 Strategy is "advancing our achievements and seizing new opportunities: building on Hong Kong's position as a world digital city"**. To lay the foundation for ICT-enabled development in Hong Kong in the next decade, the Government has identified the following key action areas in 2008 Digital 21 Strategy for implementation between 2008-2010.

(i) Facilitating a digital economy

- We will continue our leadership and commitment for bringing relevant stakeholders in the community together through a consultative process to work out a blueprint for ICT development.

- The Government will continue to play a significant role as an investor in the e-government programme, a sponsor of research and development (R&D) and innovation, a champion of digital inclusion, a facilitator of cross-boundary technological cooperation and a regulator of the relevant ICT sub-sectors.

(ii) Promoting advanced technology and innovation

- We will strengthen Cyberport and Science Park, with their technological talent and excellent infrastructure, as hubs for innovation and technology.

- We will facilitate intellectual property transfer and commercialisation of innovation through the newly established R&D Centres.

- The Government through the ICT industry will provide focus and support (where appropriate) to important technology domains including: (i) communications technologies; (ii) development of digital content; (iii) sensor and identification technologies; (iv) software development and packaging; and (v) next-generation Internet.

- We will position Hong Kong as a regional test-bed and launching pad of innovative technologies.

(iii) Developing Hong Kong as a hub for technological cooperation and trade

The Government

- has established channels to cooperate with Mainland authorities and Guangdong Province on innovation, information management and the development of technology standards.

- is facilitating the continued upgrading of the ICT workforce through developing competency standards to strengthen training and is paving the way for professional recognition.

- is engaged in regular exchanges with the ICT industry to listen to industry opinions and raise the transparency over formulation and implementation of ICT policies and initiatives.

- will ensure the continued presence of an environment that is conducive to technological business.

    - Reliable telecommunications network: the Government will play a coordinating role to ensure transparency and responsiveness in the event of disruptions to the telecommunications networks.

    - Information security: we have recently published a risk assessment and electronic authentication framework for public reference and will continue to promote the framework in 2008.

    - Privacy safeguards: vigorous efforts will continue to be made to safeguard personal data privacy.

    - Protection of intellectual property rights: building on safeguards for intellectual property rights through legislation, we will put in place the necessary digital rights management infrastructure to cultivate a legal download culture in the community.

    - Development of data standards: we will collaborate with different sectors to develop industry-specific data standards to facilitate the provision of joined-up, value-added services.

    - Regulatory framework: we will establish the Communications Authority as the single regulator for the entire electronic communications sector.

(iv) Enabling the next generation of public services

- The Government is committed to leading by example in the use of e-business, for both internal and public services.

- The focus of the e-government programme is a citizen-centric mode of service delivery emphasising customer engagement, information management and the development of simple yet secure means of authentication. Increased efforts will be made to integrate services across government bureaux, departments and agencies.

- The new government portal, GovHK, officially launched in August 2007 as the single entry point to online government information and services provides the necessary platform for transformation to a citizen-centric mode of service delivery. We will explore opportunities for private sector participation to provide value-added services on GovHK.

- As e-channels grow, we need to examine the possibility of rationalising different delivery channels according to what customers need and value. A Channel Management Strategy will be developed in 2008 for this purpose.

- We have embarked on the electronic procurement pilot programme and will consider further roll-out in the Government so that we can encourage private sector suppliers to adopt electronic commerce, thereby improving their competitiveness.

- We envisage the existing e-government investment as a basis for the development of a next-generation government where the programme becomes fully engrained in policy-making and the daily business of all government bureaux and departments. Healthcare and transportation are potential areas for the provision of highly integrated and personalised services to citizens across both public and private sectors.

(v) Building an inclusive, knowledge-based society

- To enable citizens and businesses to realise the full potential of the information society, we will work with the ICT industry and the wider community to pursue the following five goals to develop Hong Kong into an inclusive, knowledge-based society:

(i) broadband connectivity for citizens; (ii) allowing every student access to ICT facilities to support learning; (iii) more affordable access to industry software solutions; (iv) information management; and (v) digital rights management infrastructure and culture.

- Specifically, we will:
  - build Hong Kong into a wireless city through a combination of government investment and market forces.
  - ascertain the barriers to ICT adoption for disadvantaged groups, including students of low-income families who do not have personal access to ICT facilities at home, and take appropriate actions to overcome the barriers.
  - work with the ICT industry to formulate measures to increase ICT take-up among small and medium-sized enterprises (SMEs).

- The Government plans to publish the third IT in Education Strategy in January 2008 to set out specific measures to further empower schools to exploit the potential of ICT in enriching learning and knowledge.

- We will set up a task force in 2008 to formulate strategies and initiatives for digital inclusion.

IV Conclusion

- The Digital 21 Strategy sets out our vision of building on Hong Kong's position as a world digital city through advancing our achievements and seizing new opportunities. It is in alignment with the Chief Executive's policy blueprint set out in his Manifesto. The realisation of the Digital 21 Strategy vision requires the participation of the entire community including the ICT industry, business sectors, academia and the general public.

- As an integral part of the Strategy, key indicators of Hong Kong's ICT development will be measured and tracked over time for public reference.

- The Office of the Government Chief Information Officer (OGCIO) is the focal point in the Government for dialogue with the public on the Strategy, for coordinating with all parties within the Government on its implementation and for tracking progress on an annual basis.

Chapter One:
Where We Are

1.1 The Digital 21 Strategy was first published in 1998 by the Government of the Hong Kong Special Administrative Region to set out our vision of developing Hong Kong as a leading digital city in a globally connected world. The aim of the strategy is to outline how Government, business, industry, academia and the public can work together to achieve this goal. It is a living document that requires constant review to take account of advances in technology and the changing needs of the community. Updates to the Strategy were made in 2001 and 2004.

1.2 Progress and achievements in ICT development in Hong Kong have received international recognition. The Economist Intelligence Unit ranked Hong Kong fourth in the world and first in the Asia Pacific region in 2007 in terms of e-readiness. With market liberalisation, which generates healthy competition, Hong Kong offers the world's most affordable Internet connection and mobile phone service according to a survey conducted by the International Telecommunication Union (ITU) in 2005. Hong Kong ranked third in the world according to the 2007 ICT Opportunity Index developed by the ITU, which measures maturity of infrastructure, skills and ICT utilisation in society. The Government's leadership in developing electronic applications in the delivery of public services has also received international recognition (see Box 1).

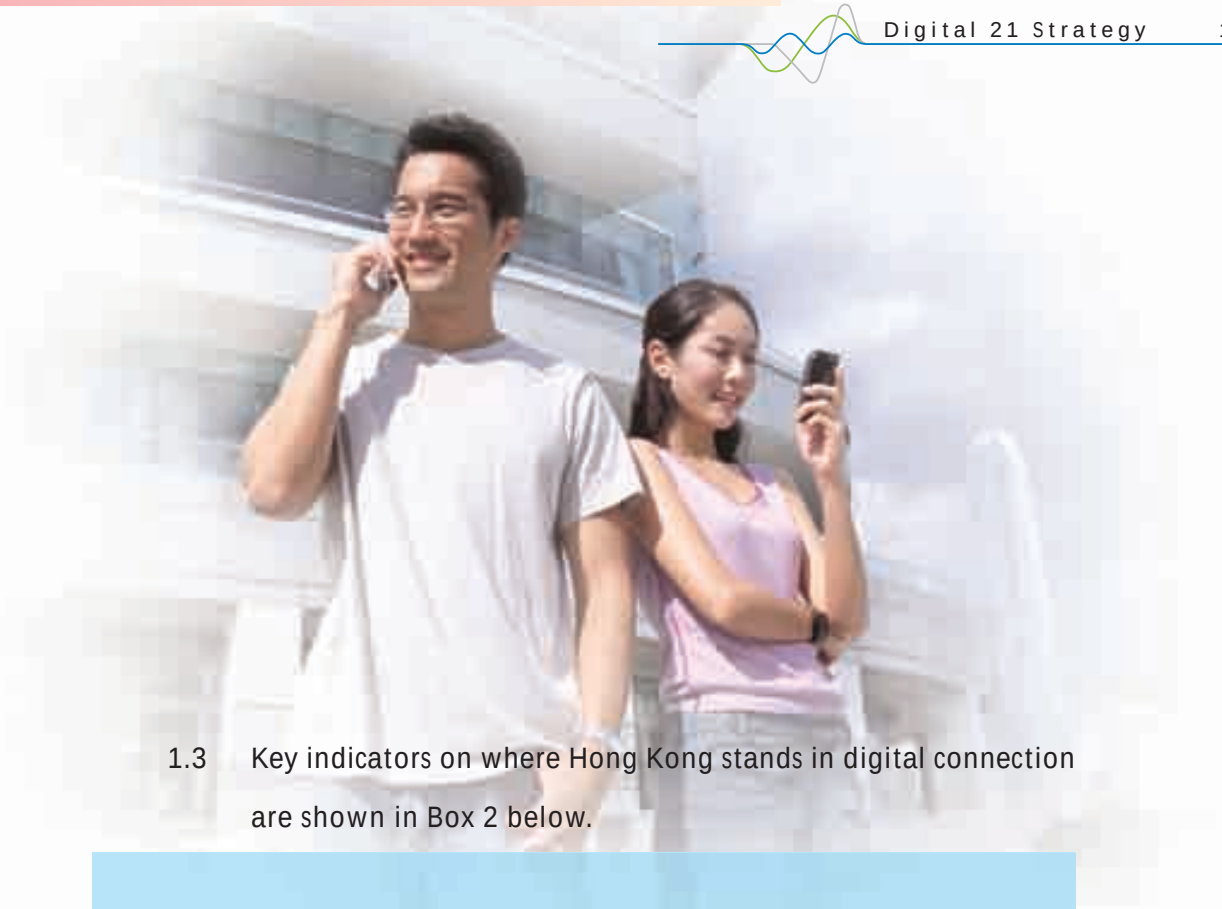
Box 1

International recognition of government ICT projects

- The "Policing Disease" project gained the Stockholm Challenge Award in 2004 for its innovative application in turning the Hong Kong Police Force's IT system into a smart tracking system to identify the chain of human transmission of severe acute respiratory syndrome (SARS).

- The Hong Kong Smart Identity Card was awarded the Card Technology Breakthrough Award in the implementation category by Card Technology Magazine in 2004. In 2005, the Entry/Exit Processing and Records System implemented at immigration control points won the Pioneer Award of the 7th Annual Government Solutions Center Award conferred by the e-Government Institute of the United States.

- In the Asia Pacific ICT Awards 2005, the Hospital Authority's Electronic Patient Record with Radiological Image Distribution won the top prize in the healthcare category, while the Immigration Department's Face Recognition System was the winner of the e-Government and Services category. The Automated Passenger Clearance and Automated Vehicle Clearance Systems (e-Channel) of the Immigration Department was the winner of the same category for the 2006 Awards.



1.3 Key indicators on where Hong Kong stands in digital connection are shown in Box 2 below.

Box 2

Where do we stand?

- Broadband can be reached by all commercial and residential buildings
- Equipped external telecommunications capacity: 1,596 Gbps (June 2007)
- Mobile phone penetration rate: 139.8% in 2007 (104% in 2003)
- Broadband household Internet penetration: 74.8% in 2007 (50% in 2003)
- PC penetration in business: 63.8% in 2007 (54.8% in 2003)
- Internet penetration in business: 59.8% in 2007 (47.5% in 2003)
- 59.3% of establishments had undertaken transactions of one type or another through electronic means in 2007
- 96.7% of primary and secondary school students have computers at home in 2007, of which 97.6% have access to the Internet

1.4 The 2004 Strategy set out eight action areas, namely government leadership, sustainable e-government programme, infrastructure and business environment, institutional review, technological development, vibrant IT industry, human resources in a knowledge economy and bridging the digital divide. Most of the initiatives set out in the Strategy have been successfully completed. The remaining items are ongoing and proceeding on schedule. A summary of the implementation of the 2004 Strategy is shown in Box 3 below.

Box 3

Progress of implementation of 2004 Strategy

- The Digital Media Centre opened in Cyberport in March 2004 to provide hardware, software, technical and marketing support to the digital entertainment industry.
- All four phases of Cyberport were completed by June 2004, creating an environment for a cluster of ICT companies dedicated to developing new technologies, applications, services and content.
- The implementation framework for digital terrestrial television was announced in July 2004.
- The second IT in Education Strategy, entitled "Empowering Learning and Teaching with Information Technology", was published in July 2004.
- Since December 2004, Hong Kong permanent residents holding the smart Identity Card can perform self-service immigration clearance at control points installed with e-channels, where the fingerprint verification technology is deployed for authentication of a person's identity.
- The Digital Solidarity Fund was set up in 2004 to sponsor worthwhile digital inclusion projects.
- Since 2004, nine different industry sectors have benefited under the Sector-Specific Programmes to promote e-commerce adoption.

- Special arrangements for Hong Kong IT service suppliers in respect of Computer Information System Integration Qualification Certification under the Mainland and Hong Kong Closer Economic Partnership Arrangement started in January 2005.
- A collection of guidelines on the selection and adoption of open source software and management issues relating to its usage were issued for reference by government bureaux and departments in July 2005.
- An Industry Training Advisory Committee was established in July 2005 to oversee the development of a Qualifications Framework for the ICT industry.
- The "Three Smart Tips to Clean PC" and the "Clean PC Day" campaigns were launched in 2005 and 2006 respectively to enhance public awareness of information security.
- Anti-spam measures were launched in 2005.
- In 2005-06, about 93% in value of our new IT projects were outsourced. The hosting services for departmental information systems of the Central Computer Centre were also outsourced in 2006.
- Five research and development centres were set up in April 2006 with strategic focus in five areas, automotive parts and accessory systems, logistics and supply chain management enabling technologies, nanotechnology and advanced materials, ICT, and textiles and clothing.
- A three-year pilot scheme to open up intellectual property ownership in government IT systems was implemented in 2006.
- The "3G Cyberport" Project to support the development of innovative 3G applications was completed in 2006.
- The Unsolicited Electronic Messages Ordinance was enacted in May 2007.
- The GovHK one-stop portal, the main Internet gateway to government information and services, was soft launched in September 2006 and officially introduced in August 2007 to provide user-friendly e-government services.

Chapter Two:
The Challenge

2.1 The Information Age presents challenges as well as opportunities for economies all over the world. Competition in the global market is moving from purely cost considerations to selection based on quality and usability. At the same time, virtual connectivity overcomes barriers previously presented by physical distance and enables vigorous outsourcing in a highly competitive environment. Technology offers huge potential, not only in terms of lowering cost through productivity and efficiency gains, but more importantly in the value it can offer consumers through business transformation leading to better quality goods and services.

2.2 Developing economies that are relatively unencumbered by legacy systems are making significant progress in adopting state-of-the-art technology, which enables them to upgrade their production along the value chain. Falling under this category is the Mainland economy, which has undergone remarkable economic advancement over the past few decades. This generates new dynamics in its economic relationship with Hong Kong. The challenge is to sustain Hong Kong's edge amid growing competition from other economies. We believe technology and innovation play key roles in helping Hong Kong meet the challenge.

2.3 First, Hong Kong is currently the 11th largest trading economy in the world, and trading will continue to be our lifeblood. Economic advancement on the Mainland makes it both a supplier and consumer of technology and related products. Hong Kong has the essential physical infrastructure and a strategic cluster of companies and professional talent from all over the world engaging in different technology businesses and innovative activities. Coupled with a conducive business environment and vigorous protection of intellectual property rights, Hong Kong can serve as a hub for technological cooperation and trade among local, Mainland and overseas enterprises.

2.4 Second, as a trading and services economy with an international clientele, effective communication and responsiveness to changing market conditions is of paramount importance in a competitive environment. This is particularly relevant to Hong Kong given the molecular nature of our economic structure with most companies being SMEs[2]. Connectivity can be significantly improved through the development of an ICT-enabled common platform and a virtual marketplace to support our financial and trading infrastructure.

2 In Hong Kong, 98% of our business establishments are SMEs, which together employ around 60% of our workforce in the private sector.

2.5 Third, the vision of a ubiquitous society with total connectivity in everyday life is no longer fictional as we are moving towards media convergence, wireless connectivity and development of next-generation networks. This will give further impetus to the creation and exchange of digital content and information, which is expected to grow in exponential scale and speed. Apart from generating a new horizon of business opportunities for products and services that may revolutionalise our way of living, important issues such as data standards, information/content sharing and management, security and privacy considerations need to be properly addressed.

2.6 Fourth, continuing efforts are being made to deepen and broaden the e-government programme by putting more information online, introducing seamless services and revamping back-end business processes to tie in with front-end electronic services. The challenge is to entrench ICT in the business of bureaux and departments to provide efficient and user-friendly services to citizens, so much so that e-government will no longer be viewed as a distinct programme. A new form of ICT-enabled governance will emerge.

2.7 Fifth, in tackling concerns over the digital divide, we must recognise that ICT is in fact a powerful tool to increase social cohesion by connecting people and businesses, promoting the sharing of knowledge and enabling disabled people to gain better access to information and services. The Government will endeavour to promote the opportunities of ICT to all segments of the community so as to transform Hong Kong into an inclusive, knowledge-based society.

2.8 Our vision is to strengthen Hong Kong's role as a world digital city where ICT underpins both business and the personal lives of citizens across the entire spectrum of the community, thereby generating impetus for further technological advancement and bringing economic benefits and improved standards of living to society. This is in alignment with the Chief Executive's policy blueprint of facilitating progressive development, generating employment opportunities, empowering underprivileged groups, raising the quality of life, optimising our demographic structure by attracting talent and through quality education, and enhancing public engagement to strengthen governance.

2.9 We have identified five action areas to achieve the vision in the Digital 21 Strategy:

- Facilitating a digital economy;
- Promoting advanced technology and innovation;
- Developing Hong Kong as a hub for technological cooperation and trade;
- Enabling the next generation of public services; and
- Building an inclusive, knowledge-based society.

2.10 The Digital 21 Strategy is a forward-looking document going beyond existing programmes and projects. It encourages stakeholders to explore new possibilities and to rise to new challenges. Active participation and cooperation among the Government, the ICT industry, businesses, academia and the public is required to realise this vision.

Chapter Three:
Facilitating a Digital Economy

3.1 Continuing government leadership and commitment is crucial in realising our vision of building on Hong Kong's position as a world digital city. The Digital 21 Strategy Advisory Committee provides the Government with expert advice, and the Government has a unique role to play in bringing businesses, the ICT industry, academia and the general public together through a consultative process to work out a blueprint for the city's future ICT development. This is reflected in regular updates of the Digital 21 Strategy.

3.2 Apart from forging community consensus, the Government continues to play a significant role as a user, supporter and facilitator of ICT and its applications:

- The Government will continue to invest in IT to support and improve our operations. About $5.4 billion was earmarked for IT spending[3] in the 2007-08 financial year. The outsourcing policy applies not only to new government IT projects[4], but also application maintenance and system management and operations[5].

3 This is the amount of IT expenditure of the entire government machinery, including the Trading Funds, Housing Authority, Hospital Authority and subvented schools.
4 About 89% in value of our new IT projects in 2006-07 were outsourced.
5 The hosting services for departmental information systems of the Central Computer Centre, for example, have been outsourced since June 2006.

- Reviewing the experience gained in the implementation of existing electronic services, the Government will set the agenda for a deepened e-government programme with increasing interface with citizens and business, thereby encouraging migration to the electronic channel.

- In order to spearhead the development and application of advanced technology in the knowledge-based era, the Government will continue to demonstrate its support of advanced technology by providing financial assistance for R&D and innovative work and facilitate their wider application and commercialisation.

- The Government will ensure that the regulatory framework in relevant industries keeps abreast of advancement in technology and the changing needs of the community. The increasing convergence of telecommunications, broadcasting and information technology industries is an emerging reality.

- The Government will generally maintain a technology neutral policy, so that the market is free to choose different technologies to suit business needs, which will in turn maximise choices for consumers. We will continue to foster a conducive environment for the market to grow.

- While penetration rates of mobile phones, computers and broadband connection in Hong Kong are high by world standards, the Government will sharpen its focus in implementing digital inclusion programmes among SMEs and citizens with special needs.

- Since ICT is very often embedded in merchandise as well as the business process, increasing trade and economic integration between Hong Kong and the Mainland also calls for closer cooperation in the ICT field. While business and technological collaboration between Hong Kong and Mainland enterprises are prevalent, the Government has a significant role to play in forging partnerships with the relevant Mainland authorities, such as the Ministry of Information Industry, Ministry of Science and Technology and our immediate neighbour, Guangdong Province, which has the Mainland's largest high-tech production share. Such strategic partnerships will provide the platform for cooperation between business enterprises of both sides. CEPA (Mainland and Hong Kong Closer Economic Partnership Arrangement) framework and the Hong Kong Guangdong Cooperation Joint Conference are essential for such strategic partnerships. The nation's 11th Five-Year Plan will provide further impetus to technological cooperation.

3.3 The remaining chapters will detail the specific work of the Government in providing leadership in the above areas.

Chapter Four: Promoting Advanced Technology and Innovation

Leveraging our technology infrastructure

4.1 The ability to harness technology and the business opportunities it generates is vital in enabling our economy to move up the value chain and stay competitive in the global market.

4.2 Cyberport and the Hong Kong Science Park are our technology flagships providing the infrastructure for the development of applied R&D, technological innovation and technology-related applications and businesses. They serve as hubs bringing together a strategic cluster of high-tech companies and professional talent from all over the world, thereby facilitating synergy and partnership among different segments of the ICT industry as well as research personnel in local universities.

4.3 Cyberport's business focus will evolve beyond digital entertainment to cover digital lifestyle. A Digital Lifestyle showcase (e.g., DigiHome) will be opened in Cyberport in the coming two years to demonstrate the adoption of advanced ICT in the daily lives of citizens. Opened in September 2007, Phase 2 of Science Park offers R&D buildings in stages from 2007 to 2010 to cater to the growing demand for technological infrastructure.

Continued investment in R&D

4.4 We will adopt a highly focused approach to support applied R&D to promote technology upgrading in different industries. Over $2 billion has been earmarked under the Innovation and Technology Fund to set up five R&D Centres, all of which exploit applications of ICT. These Centres will be dynamic hubs that forge partnerships among multiple players including the ICT industry, different industrial sectors, academia and overseas/Mainland enterprises in the development, application and commercialisation of new technology. To encourage private sector participation and to facilitate commercialisation of the fruits of R&D, the Centres will consider adopting a more flexible approach as appropriate by allowing industry sponsors with significant contributions to own the intellectual property rights of the projects.

4.5 The R&D Centre for Logistics and Supply Chain Management Enabling Technologies[6] (R&D Centre for LSCM) was established in April 2006 to foster the development of core competencies in logistics and supply-chain-related technologies with Radio-Frequency Identification (RFID) as an initial focus. The initial technology roadmap of the LSCM Centre focuses on three major areas, namely RFID hardware and systems, networking and infrastructure technologies, and application systems and decision support technologies. Efforts will also be directed at the development of common technology and application platforms, which will facilitate adoption not only in Hong Kong but also in the wider Pearl River Delta Region. In this connection, the LSCM Centre will work closely with the Guangdong RFID Technology Service Centre in areas of mutual interest, such as applications relating to the tracking of cross-boundary movement of products. Research outcomes of the LSCM Centre are expected to enhance competitiveness of Hong Kong's global logistics operations by integrating information flow, legacy systems and business processes for better interoperability. Fierce competition from ports in the Pearl River Delta with much lower operating costs makes it critical for Hong Kong to harness technology to further drive efficiency and quality services in order to maintain its status as a major regional port.

6 The Centre is hosted by the University of Hong Kong, the Chinese University of Hong Kong and Hong Kong University of Science and Technology.

4.6 In anticipation of rising interest and applications in RFID technology, the Science Park and GS1 Hong Kong have collaborated to establish the Supply Chain Innovation Centre. Opened in February 2007, the Centre demonstrates how the latest Electronic Product Code (EPC)/RFID technologies can help businesses throughout the Pearl River Delta to enhance their competitiveness through supply chain excellence.

4.7 The R&D Centre for Information & Communications Technologies[7] (R&D Centre for ICT) was established in April 2006 with the objective of promoting applied R&D and facilitating technology transfer and commercialisation under four closely interrelated domains - communications technologies, consumer electronics, integrated circuit design and opto-electronics. The work of the Centre is complemented by the Wireless Communications Test Laboratory of the Science Park to provide support services such as pre-compliance tests and measurement for 3G and 3.5G, and testing platforms for terrestrial and handheld digital broadcasting technologies. Separately, government sponsorship was given to the Hong Kong Wireless Development Centre to set up a TD-SCDMA[8] test-bed at Cyberport, the first trial site outside the Mainland, for the industry to develop innovative 3G applications and services.

7 The Centre is hosted by Hong Kong Applied Science and Technology Research Institute Company Limited (ASTRI).
8 TD-SCDMA is the 3G standard adopted on the Mainland.

4.8 The work of R&D Centres in other technology areas is also closely related to the development of ICT. For example, ICT is the enabling technology that underpins the research on automatic navigation systems in the R&D Centre for Automotive Parts and Accessory Systems. In respect of the R&D Centre for Textiles and Clothing, ICT is being adopted to enhance the dissemination of information on textile materials and clothing products. The R&D Centre for Nanotechnology and Advanced Materials is conducting industry-oriented research, the outcome of which will bring significant business opportunities to the ICT industry. The Centre will shape the next generation of consumer electronics products and devices by improving product performance and functionality, making them smaller, cheaper and more reliable.

4.9 With excellent infrastructure and the presence of a strategic cluster of technological firms and talent, Cyberport and Science Park are ideal incubators for start-up firms. There are ongoing incubation programmes to provide business and technical support to qualified organisations in their formative stages.

4.10 Riding on our unique advantage of being a compact place equipped with advanced ICT infrastructure within the wider Mainland market, Hong Kong is well positioned as a test-bed and launching pad for innovative technologies. We will suitably leverage the facilities at Cyberport, Science Park and the R&D Centres for the purpose and ensure that our policy and regulatory frameworks are conducive to the development of new technologies.

Key technologies

4.11 Building on Hong Kong's strengths in innovative applications, particularly in communications products and services, we expect to see further progress in the application of a number of key technologies in the coming years. Such applications will lead to the development of new services that would in turn drive new demand from business and citizens. Apart from supporting R&D and putting in place the necessary infrastructure, the Government will keep in close touch with the ICT industry on the latest developments and matters of business interest and, where appropriate, support pilot projects with a significant ripple effect. We will also establish a business-friendly policy framework and regulatory environment to encourage innovative applications to flourish.

4.11.1 *Communications technologies*

- The traditional boundaries between telecommunications, broadcasting and information technology are becoming increasingly blurred with the advent of digitalisation. Such technological integration and media convergence will stimulate developments in different sectors of the communications value chain, including innovation in distribution technologies, investment in upgrading delivery networks, creation of new content and services, investment in digital rights management technologies and manufacturing of new consumer products. The trend of technology and media convergence is exemplified by increasing interest in mobile television services in major economies.

- The Government will facilitate the introduction of commercial mobile television services in Hong Kong by addressing the related regulatory and spectrum assignment issues. Since this is a new area with significant business opportunities as well as considerable market uncertainty, the Government is carefully considering the views collected from the industry and the public during the public consultation exercise completed in May 2007 before working out a draft implementation framework for introducing mobile television for a second round of consultation.

- On a more imminent front, the launch of digital terrestrial television (DTT) by the two local terrestrial television broadcasters by end-2007 provides another digital platform for media convergence. DTT will bring free-to-air high-definition television programme services to Hong Kong. It is also expected to spur the growth of interactive services such as datacasting (e.g., financial quotes and flight information). ICT manufacturers and the consumer electronics industry will benefit from the demand for consumer electronic products capable of receiving DTT services.

- The Government will continue to provide an enabling environment for the introduction of new communication technologies, such as broadband wireless access for fixed-mobile convergence and ultra-wideband for home networking. The Government has promulgated the Spectrum Policy Frameworks in April 2007. Regulatory arrangements will be reviewed as and when necessary to take account of prevailing market situations.

4.11.2 *Digital content*

- "Content is king" is the often quoted slogan of the media industry. Emergence of new distribution platforms, such as DTT and mobile television services, will boost the demand for new content in different formats (e.g., tailor-made clips and short programmes for mobile television) as well as enhanced content (e.g., high definition content and interactive advertising).

- The roll-out of DTT, possible future introduction of mobile television services, convergence in electronic delivery networks (fixed and mobile, Internet Protocol and telephone networks, telecommunications and broadcasting) and user devices (personal computers and mobile devices) are expected to further stimulate the demand for new digital content, research and application of interactive technologies and investment in digital rights management solutions. At the same time, business opportunities will be created for the traditional audiovisual industry and the new digital multimedia industry as well as the ICT industry. Apart from creating impetus for the development of telecommunications, broadcasting, creative and other related industries, we expect that new technologies and media convergence will engender diversity, connectivity and enhance our quality of life.

- With our solid industrial base and a ready pool of creative talent in film production, broadcasting and advertising, Hong Kong has the means to develop into a digital content and services hub in the Asia-Pacific region. To spearhead development in this area, the Government has sponsored the establishment of various industry support centres at Cyberport, including the Digital Entertainment Incubation-cum-Training Centre and the Digital Media Centre, to provide state-of-the-art facilities as well as technical and marketing support to companies involved in computer graphics, animation, and the production of films and games.

- This will create an environment that is conducive to the development and adoption of advanced technology related to digital content. Embryonic enterprises at Cyberport and Science Park provide molecular groups of talent that fuel the development of digital content and related services.

4.11.3 *Sensor and identification technologies*

- Besides applied research efforts being undertaken at the R&D Centre for LSCM, the Government has funded pilot projects to test and promote the use of sensor and identification technologies in supply-chain operations and management of imported food.

- With the endorsement of the Hong Kong Logistics Development Council, the Government has sponsored a pilot study of an On-board Trucker Information System (OBTIS). The tender for developing OBTIS was awarded to the contractor in June 2007. The proof-of-concept stage of the project has been launched in November 2007. The new system utilises Global Positioning System (GPS)[9] and RFID technologies to enable better job dispatch and fleet management among cross-boundary trucks covered under the pilot scheme. It also improves interconnectivity among different stakeholders along the logistics supply chain. The contractor shall provide other developers with free and open access to the OBTIS web service interface so that other developers will be able to develop systems to exchange data and information with the system.

9 GPS is a satellite navigation system that can accurately determine the location of an object anywhere on earth.

- Financial support was given to GS1 Hong Kong under the Guangdong/Hong Kong Technology Cooperation Funding Scheme to embark on a project to establish an EPC Network infrastructure riding on RFID technology to enhance end-to-end supply-chain visibility. The project was completed in May 2007 to provide a global reference model for EPC/RFID adoption.

- Food safety is another area where RFID technology can make a significant contribution. The Government cooperates with the Guangdong Government in conducting a pilot project under which RFID is used to track the movement of live pigs along the production chain for better control at source to safeguard food safety.

- Other potential applications of sensor and identification technologies closely related to our daily lives include distribution and security services, detection of counterfeit goods, management of waste, and transportation. Chapter Six will discuss in more detail the adoption of these technologies in respect to transportation.

4.11.4 *Software development and packaging*

- The Government encourages continuous improvement in the capabilities of the software industry so as to enhance its competitiveness in Mainland, regional and overseas markets. The Government will support its e-government contractors in developing a local centre of excellence through setting high standards of professional, managerial and technical practices. Through a pilot scheme of opening up the intellectual property in government IT systems, IT suppliers will be able to exploit the intellectual property commercially to demonstrate their expertise and excellence in new markets. Ongoing efforts of the Government in promoting the adoption of open and interoperable standards create cross-technology platforms and cross-market development opportunities. Various government funding schemes are available to support industry initiatives in this area.

- Having regard to the synergy between the software industries in Hong Kong and in the Mainland, Science Park will collaborate with the Shenzhen Software Park to support commercialisation and export of software products developed by Hong Kong and Mainland software companies and offshore outsourcing. Official collaboration is underpinned by cooperation at the industry level. The Hong Kong Software Outsourcing Alliance, a body established under government sponsorship, is in close liaison with the Guangdong Software Outsourcing Council in providing a collaborative platform to facilitate software companies in identifying business partners, exploring new business opportunities and developing industry best practices.

4.11.5 *Next-generation Internet*

- The Internet Protocol version 4 (IPv4) currently used was developed at the time when computers were far less common. With increasing computer and broadband penetration, the growing popularity of mobile devices with network connectivity and the trend of media convergence, it is envisaged that the address capacity of IPv4 will soon be exhausted posing a limit to further development and growth of the Internet. Internet Protocol version 6 (IPv6) is the protocol chosen by the Internet Engineering Task Force[10] as the next-generation Internet Protocol. IPv6 will generate a new horizon of business opportunities for ICT and other sectors. It has the potential to trigger revolutionary changes to our way of living, for example by enabling the development of "home networking" under which electronic devices and home appliances can be network-connected and remotely operated. The new Internet protocol is also expected to stimulate the production of extremely portable or "wearable" personal computers with information processing and networking power that can integrate sensors and human interface technologies ("the next-generation personal computer").

- The Government will take the lead in migrating to IPv6. The Internet backbone of the local universities has already been upgraded to a high-speed network of 10 giga-bit-per-second in support of IPv6. The new protocol will be adopted in the Government's internal network during 2008. Leveraging the IPv6 Forum Hong Kong Chapter established in

10 The Internet Engineering Task Force is an international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet.

Cyberport in January 2007, we aim to provide the ICT industry, particularly Internet Service Providers, with technical guidance for the deployment of IPv6 to assist them to plan for the ultimate migration.

Recognising excellence

4.12 To recognise outstanding achievement and to showcase Hong Kong's ICT success locally and abroad, we have consolidated the existing ICT awards into a mega annual event - the Hong Kong ICT Awards. The first award presentation ceremony was held in November 2006 and the second award presentation ceremony is scheduled for January 2008[11].

Promoting a culture of innovation, technology and design

4.13 To ensure the sustainable development of innovation and technology, it is necessary to enhance the interest of the general public, particularly the younger generation, in innovation, technology and design and to nurture more creative talents. The Government will work with the relevant stakeholders, including NGOs, academia, industry and professional bodies, in organising various kinds of activities such as exhibitions, roadshows, competitions and seminars to promote an innovation and technology culture in the community.

11 The Hong Kong ICT Awards 2007, to be presented in January 2008, have seven award categories - Best Business Award, Best Digital Entertainment Award, Best Digital Inclusion Award, Best Innovation & Research Award, Best Lifestyle Award, Best Public Service Application Award, and Best Ubiquitous Networking Award.

Chapter Five: Developing Hong Kong as a Hub for Technological Cooperation and Trade

5.1 Being an international trading and financial centre with the unique advantage of having the Mainland as our hinterland, Hong Kong is well placed to serve as a hub for technological cooperation and trade in high-tech products and services. The presence of a technology cluster of companies from different origins allows Hong Kong to contribute to cross-border technological cooperation worldwide. Rapid economic development on the Mainland makes it both a significant source of demand for technology and a growing supplier of certain technology items such as computers, consumer electronics and telecommunications products. The emphasis placed on technological advancement in China's 11th Five-Year Plan and the rapid increase in foreign investment in the Mainland economy after its accession to the World Trade Organisation are expected to serve as further catalysts in this process.

Strength of Hong Kong as a technology hub

Hong Kong-Mainland synergy

5.2 With a long history of economic cooperation with Mainland enterprises coupled with intrinsic strengths in customisation, innovative applications and commercialisation, Hong Kong is uniquely placed to foster technological cooperation between Mainland partners and international market players to enable businesses to move up the value chain. Necessary conditions including the availability of excellent professional and financial services, stringent intellectual property rights protection and enforcement are present here for technological business and trading to thrive. CEPA further enhances our position. Through this arrangement, Hong Kong can harness its role as an effective gateway for overseas technology providers to tap into the Mainland market.

5.3 The Central People's Government has set a clear objective as part of its 11th Five-Year Plan to strengthen autonomous innovation and upgrade the technology capability of industries. The local ICT sector should grasp this golden opportunity to facilitate technological upgrading in the Mainland, leveraging Hong Kong's position as a two-way platform assisting Mainland enterprises to bring in foreign investment and expand their business in the global economy.

5.4 To strengthen Hong Kong's edge as a conduit to the Mainland market, the Government has established channels for cooperation with the relevant Mainland authorities and Guangdong Province in areas such as innovation, technological development and informatisation. Areas identified for cooperation include software development, wireless and mobile technology, automotive parts and accessory systems, integrated circuit design, digital television, digital entertainment and digihome, digital certificates cross-recognition, development of standards and applications in emerging technologies such as RFID and next-generation Internet.

5.5 We will establish closer cooperation with Shenzhen through the "Shenzhen-Hong Kong Innovation Circle" which will serve as a platform for exchanges in expertise, information and resources to promote collaboration between R&D institutions. We will also seek to participate in the Mainland's technology development plans and the formulation of national standards through the Mainland/Hong Kong Science and Technology Cooperation Committee and the cooperation agreement with the Ministry of Information Industry. Setting a public and official agenda for collaboration enhances private sector confidence and interest in ICT investment. The ICT industry, professional bodies and academia from both sides will be involved in such initiatives.

5.6 The Guangdong/Hong Kong Technology Cooperation Funding Scheme was established in 2004 to provide financial support for R&D projects in technology areas of common interest, with a view to facilitating industry upgrading and economic development in the Greater Pearl River Delta Region.

5.7 The Hong Kong Trade Development Council (HKTDC) has identified technology as the new focus of its promotional strategy. With the objective of becoming an international marketing arm for Hong Kong's technology platform, HKTDC will promote Hong Kong as a technology marketplace in the region. A Memorandum of Cooperation was signed in June 2006 with the Shenzhen Government to promote high-tech cooperation, and a high-level advisory committee comprising members from the industry, academia and the Government has been formed to advise on the promotion of innovation and technology.

5.8 As follow-up to the discussions in the Economic Summit on "China's 11th Five-Year Plan and the Development of Hong Kong", the Government will explore the possibility of leveraging our reliable and secure telecommunications infrastructure to develop Hong Kong into a premier location for regional data centres, serving businesses in Hong Kong, the Pearl River Delta and the wider region. A feasibility study on land and related policy issues will be conducted as a first step.

5.9 Also arising from the work of the Economic Summit, we will discuss with the Mainland authorities the possibility of using Shenzhen as a pilot area to develop a reliable and secure cross-boundary broadband network to support e-business and digital content transmission between Hong Kong and Mainland enterprises.

Vibrant ICT industry

5.10 The development of Hong Kong as a hub for technological business must be underpinned by a vibrant ICT industry with a knowledgeable and versatile workforce. We see skill requirements increasingly being moved from operational capabilities in project management to the following key areas further up the value chain:

- ***Information systems and services management:*** with the increasing need for integrating different systems and processes in a complex business and multi-vendor environment, there is a rising demand for skills in system integration, contract management, quality control and risk management.

- ***Business transformation:*** as the ICT needs of individual enterprises progress from basic automation and infrastructure to business transformation with technology as an enabler, the ICT workforce should be equipped with the necessary knowledge to work with clients on such projects.

- ***Information management:*** effective information management is essential in the modern era to ensure that business analysis and knowledge sharing are empowered within a framework of privacy and security.

- ***Creative content:*** with increasing media convergence and rising public demand for value-added services with multi-media content, the ICT workforce should be properly equipped to exploit new business opportunities.

5.11 The Government is working closely with the industry to facilitate the continued upgrading of our ICT workforce to meet future challenges. In particular, we encourage the industry to involve relevant stakeholders in the development of competency standards to facilitate training and pave the way for professional recognition. Key initiatives are set out below:

- The Education Bureau is developing a Qualifications Framework (QF) under which an Industry Training Advisory Committee (ITAC) comprising representatives of employers, practitioners, as well as professional associations, has been established for the ICT industry. ITAC is working on a set of Specification of Competency Standards (SCS) for the ICT industry. The SCS represents a comprehensive set of competency requirements and standards for various functional areas of the industry at different levels under the QF. These competency standards will enable training providers to design education and training programmes in accordance with the requirements of the industry. With well-defined standards of qualifications and articulation ladders, the QF will promote lifelong learning and increase the competitiveness of our human capital.

- Separately, the Hong Kong Computer Society is implementing a Certification System for IT Professional Qualifications. The Hong Kong Institution of Engineers is also exploring the feasibility of setting up a registration system for IT practitioners. The Government welcomes complementary efforts by professional bodies.

- While every effort will be made to equip our younger generation with ICT skills through education and to train local professionals, the Government will also make sure that our immigration regime is flexible in admitting ICT professionals from outside Hong Kong to fill any gap in manpower supply[12]. The arrival of quality professionals is expected to generate synergy with and skill-transfer to the local workforce, thus enlarging our talent pool.

5.12 The OGCIO has set up an ICT Industry Partnership Forum since February 2007 to facilitate regular discussions and exchanges between the ICT industry and the Government on topics conducive to the healthy development of the industry. We will make use of the forum to listen to industry opinions and enhance the transparency over formulation and implementation of ICT policies and initiatives. We will also publish an annual catalogue of new opportunities for private-sector participation.

Creating a conducive business environment

5.13 The Government has a leading role to play in maintaining an environment conducive to the development of technological business. Building on the existing strong foundation, the Government will undertake initiatives in the following areas while recognising the emergence of new technology, changing market needs and public aspirations:

12 Professionals from the Mainland or overseas belonging to any sector, including the ICT sector, may apply to work in Hong Kong under the Admission Scheme for Mainland Talents and Professionals or the General Employment Policy, provided that they possess skills not readily available locally and are offered a job in a local firm at market rate remuneration. The ICT sector can also potentially benefit from the Quality Migrant Admission Scheme introduced in June 2006 under which quality immigrants may compete for an admission quota under a points test.

5.13.1 *Reliable communications network*

Being an international financial and trading centre attuned to global, round-the-clock business, Hong Kong is critically dependent on a secure and resilient external telecommunications network[13] that offers reliable services at affordable prices. With the liberalisation of the telecommunications sector, there are some 180 Internet service providers in the market offering different products and services at competitive prices. Although the enhancement of our telecommunications network will continue to be market driven, learning from the experience of the disruption caused by the earthquake in the Luzon Strait in December 2006, the Government will play a stronger coordinating role to enhance transparency and responsiveness to emergency situations.

In consultation with the operators, the Office of the Telecommunications Authority has worked out outage reporting mechanisms for submarine cable systems and Internet access services so as to ensure prompt dissemination of information to the public. The Government will also strengthen regional cooperation to facilitate operators to acquire adequate backup capacity and effective route diversity, and to promote experience sharing in the handling of incidents. In parallel, we will enhance public awareness and education, with due regard to the needs of SMEs, through providing relevant advice on topics such as business continuity planning, incident management and response.

13 As at the end of 2006, the total capacity of Hong Kong's equipped external telecommunications facilities exceeds 1.2 terabits per second. Annual total incoming and outgoing telecommunications traffic reached 8.7 billion minutes.

5.13.2 *Information security*

The Electronic Transactions Ordinance (ETO) provides the legal framework for the conduct of e-business and recognition of digital signatures for secure electronic transactions. There is a growing list of authentication and encryption tools that take advantage of the latest technology to suit different business and security requirements. In particular, the Hong Kong Smart Identity Card contains a digitalised reserved personal identification number that can only be set and changed by the card owner. The optional storage of a recognised digital certificate presents a further means of authentication.

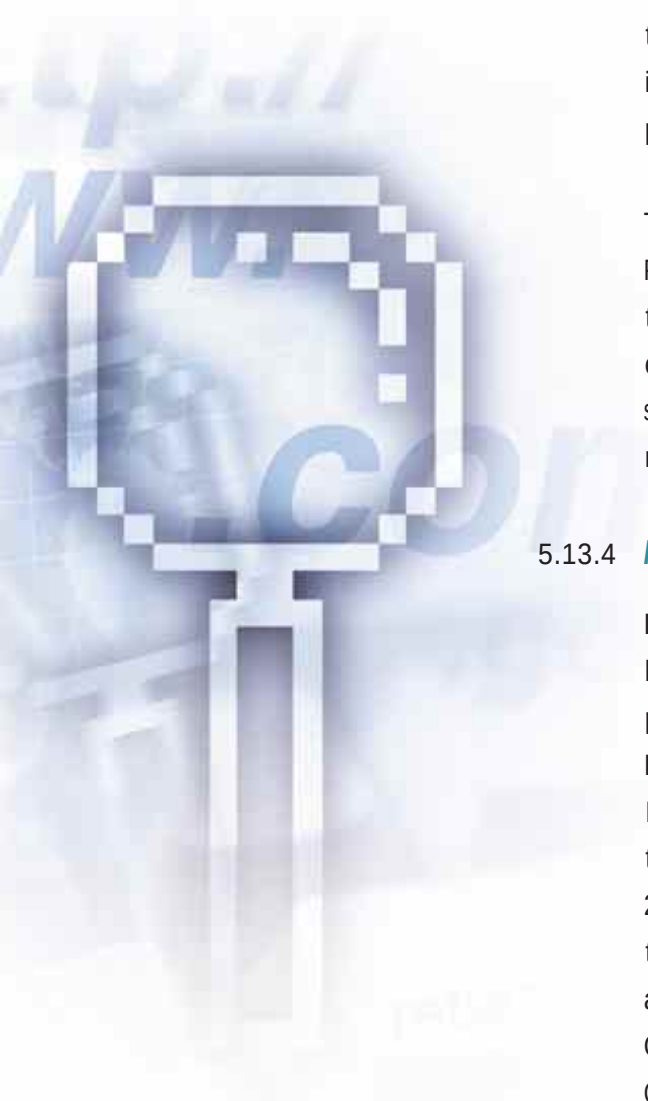
There is a critical mass of holders of digital certificates in Hong Kong with digital certificates embedded in their Smart Identity Cards. With growing community awareness of the lurking threats to information security, the availability of a Public Key Infrastructure is vital to safeguard the continued development of e-business. The Government will continue to improve the user-friendliness and portability of digital certificate services to facilitate the conduct of e-government and e-commerce transactions commensurate with the required level of authentication in a simple and secure manner.

To help businesses determine the appropriate assurance level and security requirements for different electronic transactions, the Government has published a risk assessment and electronic authentication framework for public reference in October 2007.

5.13.3 *Privacy safeguards*

The Government recognises growing concern in the community about data privacy relating to electronic transactions. Protection of data privacy is not a simple issue. Different components of a personal data record may require different security treatments. We will continue to work with the Privacy Commissioner for Personal Data to cultivate respect for and to safeguard personal data privacy. Apart from developing guidelines for ICT professionals, promotional efforts will be made to instil a greater sense of corporate social responsibility in the private sector to accord proper protection of personal data to their clients.

The Constitutional and Mainland Affairs Bureau and the Privacy Commissioner for Personal Data are reviewing the Personal Data (Privacy) Ordinance, and will, among other things, examine whether the existing provisions still afford adequate protection to personal data with regard to technological advances.



5.13.4 *Protection of intellectual property rights*

Development and exchange of digital content can only be effective in the presence of adequate intellectual property rights protection. With the support of the Innovation and Technology Fund, a Digital Rights Management (DRM) infrastructure employing state-of-the-art technologies was set up at Cyberport in November 2005 to provide a channel for digital content creators to distribute their products to consumers efficiently at a very low cost. With funding support from the Government, the Hong Kong Cyberport Management Company has been implementing a two-year programme since June 2006 to promote the use of DRM among ICT system developers, digital content developers and consumers, particularly young people, so as to cultivate a legal download culture in the community.

Separately, an Intellectual Property Servicing Centre was established in June 2006 as part of the Integrated Circuits Design Centre at Science Park. The Intellectual Property Servicing Centre provides a platform to support and facilitate the wider use of semiconductor intellectual property and to protect the technological investment of the integrated circuit design companies.

At the same time, the Government will continue with its efforts to provide a robust system to safeguard intellectual property rights in Hong Kong. This includes keeping our intellectual property legislation up to date, taking vigorous enforcement action against infringement activities and conducting public education to increase community awareness of, and respect for, others' intellectual property rights. Specifically, we have amended the Copyright Ordinance in July 2007 to strengthen copyright protection in Hong Kong and make our copyright exemption regime more flexible. Major changes include new civil and criminal provisions against circumvention of technological measures for copyright protection[14]. These measures will provide an environment conducive to the development of new e-business models in the digital era. In addition, the Government conducted a public consultation exercise on the review of copyright protection in the digital environment from December 2006 to April 2007. We will carefully consider public feedback to strike a proper balance between strengthening copyright protection and safeguarding users' needs for fair and reasonable use of copyright works.

14 The relevant provisions will come into effect following subsequent legislation on further exceptions to the new liabilities, and the conduct of public education activities to publicise the implications of the new provisions.

5.13.5 *Development of data standards*

An important prerequisite for the provision of integrated services and deepening of business collaboration is the availability of data standards.

We have developed the Digital Trade and Transportation Network (DTTN) to provide a neutral, open and secure electronic platform for logistics players to exchange information and data in an efficient, reliable and low-cost manner[15].

Based on the experience gained through the development of the Interoperability Framework for e-government systems, the Government will collaborate with different sectors to develop industry-specific data standards taking into account international standards and best practices. In the process, we will also attempt to enhance interoperability between the data standards of different sectors to facilitate the provision of joined-up, value-added services.

Geospatial information underpins different areas of public administration and commercial activity, such as property information, transport, public health and emergency operations. Effective coordination, integration and management of geospatial information will generate business opportunities for the provision of value-added services to the public. The Government has completed a initial study in 2007 to assess the potential of developing a Spatial Data Infrastructure having regard to the latest international and regional developments.

15 Relevant sectors have collaborated through the DTTN Standards Advisory Group (STAG) to review and endorse messaging standards adopted for use by the DTTN platform. In addition, the Government encourages the ICT industry to work with different sectors to provide value-added services by making use of the standards endorsed by STAG.

5.13.6 *Regulatory framework*

With the convergence of telecommunications, broadcasting and information technology to provide multi-media and value-added services to customers, major operators are moving into the triple-play business model of providing fixed telephone, television and Internet access services, or the quadruple-play model (triple-play plus mobile services). To tie in with the latest market conditions, we propose to establish the Communications Authority as the single regulator for the converging electronic communications sector by merging the Broadcasting Authority and the Telecommunications Authority. The mission of the Communications Authority is to promote competition, innovation and investment in the communications market. We are preparing for the introduction of legislation into the Legislative Council to set up the Communications Authority.

Separately, the Government has completed a review on radio spectrum policy and promulgated the Spectrum Policy Framework in April 2007. The Framework provides the communications industry with greater clarity and predictability of spectrum management decisions and enables the community to reap maximum benefits from radio spectrum deployment.

At the same time, the Government has concluded the consultation exercise on "Deregulation of Fixed-Mobile Convergence (FMC)". One of the conclusions is that the current regulatory guidance, which assumes an approach of "Mobile Party's Network Pays", will be withdrawn after a two-year transitional period. Under the new regulatory environment, operators should be able to respond promptly to consumer demand for FMC or technological advances promoting FMC without unnecessary regulatory constraints. This will enhance competition and benefit consumers.

5.13.7 *Tackling unsolicited electronic messages*

Following the launch of administrative measures in June 2006 to address the issue of unsolicited promotional calls generated by machines, the Unsolicited Electronic Messages Ordinance (UEMO) was enacted in May 2007 to tackle the problem of unsolicited electronic messages. The Ordinance aims to achieve a balance between respecting the rights of individual recipients of electronic messages and allowing the development of e-marketing in Hong Kong. The UEMO will come into full effect by end of 2007.

Chapter Six: Enabling the Next Generation of Public Services

6.1 Apart from underpinning economic activities and development, technology facilitates service transformation in both the public and private sectors to better cater for the needs and expectations of the public. The availability of convenient and secure electronic services will enhance citizens' quality of life and strengthen confidence in governance.

Public service delivery

6.2 The Government is committed to leading by example in the use of e-business, both in conducting internal business and delivering public services. Efficiency gains aside, technology-enabled delivery generates opportunities for business process re-engineering and service transformation so that new and improved public services can be offered. Enhanced user-friendliness will encourage migration to the electronic channel and drive wider adoption of electronic transactions in the business sector. We believe that increased effectiveness in the delivery of public services through ICT-enabled processes will contribute to an improved business and living environment, which is essential to sustain Hong Kong's competitiveness.

6.3 Having progressed from the initial stage of the e-government programme when information and services were incrementally put online, we have reviewed our work based on the objective set out in the 2004 Digital 21 Strategy to focus on service quality and effectiveness so as to strengthen e-government efforts.

6.4 The focus of the next wave of e-government services will be on the citizen-centric mode of public service delivery with strong emphasis on customer engagement and information management both during project implementation and after the system goes live. To enhance value to users, there is a need to move progressively to more service integration within and between departments, and to drive automation and re-engineering of back-office processes to tie in with front-end electronic services. Key initiatives are set out below.

New government portal

6.5 The new portal, GovHK (www.gov.hk), was introduced in September 2006 and officially launched in August 2007 to replace the Government Information Centre (www.info.gov.hk) as the single entry point to online government information and services. The portal provides access to some 1,200 existing government electronic services and many more new services that are in the pipeline. Rather than adopting departmental divisions as in existing government websites, content of the GovHK is organised based on user groups (e.g., residents, youth[16], non-residents and business & trade) and subject clusters (e.g., immigration services, employment, the environment) for easy access by users. A helpdesk service is available to assist citizens in using the new portal. We will continue to develop and enrich GovHK in the light of users' comments.

6.6 A common infrastructural platform is being developed to enable bureaux and departments to upload geospatial information onto GovHK to augment online services and textual information. We expect that geospatial applications will be progressively introduced on GovHK from 2009 onwards.

6.7 We will seek to identify new high-value and high-volume services to further build up utilisation of the electronic channel. To promote electronic delivery of public services, the Government will make it a policy that all bureaux and departments should give primary and full consideration to provide an e-option, in conjunction with other channels, when developing new or enhancing their services. The Guide on Customer Relationship Management promulgated in 2005 will form the basis for government bureaux and departments to design new citizen-centric services to ride on the GovHK platform.

16 The youth cluster caters for young people aged between 15 and 24.

6.8 A secure and user-friendly authentication/identification mechanism is vital to generate the necessary public interest and confidence in using e-government services. We will develop a unified identity management framework for adoption by all government bureaux and departments to ensure a consistent user experience, with the right balance between security and flexibility. We will also explore the inclusion of personalised features in the further development of GovHK.

6.9 With the improved services of GovHK, we will soon reach a stage where we must critically examine the possibility of rationalising different delivery channels, conventional counter services in particular, taking into account the needs of customers and the potential for efficiency savings. A Channel Management Strategy will be developed in 2008 for this purpose.

6.10 Although GovHK is a government project, it is an open platform that may allow private sector participation in the provision of related value-added services, alongside government information and services. The Government has an open mind on possible forms of collaboration conceived by the private sector. An Expression of Interest exercise was conducted in 2007 to gauge ideas and interest. Our plan is to introduce appropriate private sector content and services progressively on GovHK starting from 2007-08, subject to the necessary procurement processes.

Electronic procurement

6.11 Another example of e-government initiatives is our plan to embark on pilot electronic procurement (e-procurement) projects in a number of departments that will pave the way for further roll-out to other parts of the Government. The pilot project involves automation of the internal workflow, development of a procurement portal for knowledge-sharing within Government and information exchange between Government and suppliers, as well as e-catalogue and e-sourcing functions. This initiative will enhance efficiency, contribute to a green environment and drive the development of electronic commerce. We will start rolling out the functions progressively from 2008 to 2009, after which a review will be conducted and the findings will form the basis for the Government to consider the way forward for extending the e-Procurement initiative to all bureaux and departments. We believe that progressive adoption of e-procurement in the Government will encourage private sector suppliers, including SMEs, to migrate to electronic commerce, thereby generating fundamental changes to their internal processes and competitiveness. Support programmes will be conducted to introduce skills and technology to SMEs to aid the migration process.

Electronic information management

6.12 As internal government communication and external communication with business and citizens increasingly migrate to the electronic channel, we are formulating a strategy to encourage individual bureaux and departments to adopt electronic solutions to manage information to improve data accessibility and traceability, and at the same time, strengthen information integrity and security. We will also explore the effectiveness of adopting advanced technology in enabling a collaborative working environment to increase operational efficiency.

6.13 We envisage that the e-government programme is the gestation stage for the development of next-generation government where ICT becomes fully engrained in policy-making and day-to-day business of all government bureaux and departments. Rather than working on the re-engineering of existing processes and services, the formulation and realisation of policy objectives will be done by new ICT-enabled procedures that integrate back-office functions and cross-organisational services spanning Government as well as private sector and voluntary organisations. Riding on media convergence and increasing emphasis on mobility, e-government services will be progressively extended to the mobile platform according to citizens' needs to serve them anytime, anywhere.

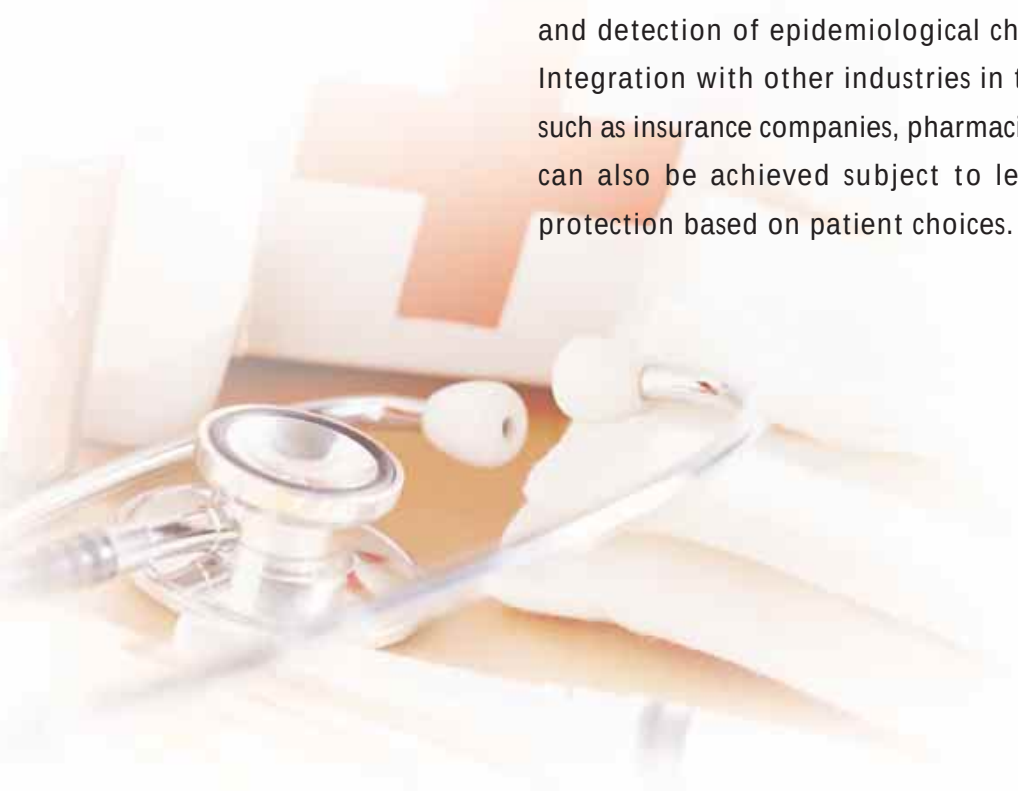
6.14 Effective transformation to this new model requires strong leadership in change management not only in terms of technology adoption, but also new perceptions in business, people management and citizen expectations. Accordingly, the Government must tackle adequate privacy protection and, at the same time, facilitate information management among relevant parties of the Government to provide integrated services. These are the common challenges faced by all jurisdictions embarking on ICT-enabled governance. Healthcare and transportation, for example, are potential areas for the provision of highly integrated and personalised services to citizens, which transcend the public, private and voluntary sectors. Like governments elsewhere, we are in a learning process, moving incrementally towards the vision of next-generation government.

Electronic health records

6.15 Over the years, we have developed an enviable healthcare system in Hong Kong, but these services require a substantial commitment of resources. While further work is being done to explore a more viable long-term financial framework, there is a parallel need to review the existing healthcare system, taking into account the changing needs and expectations of the community, as well as the challenges we are facing in relation to the ageing population and the risk of communicable diseases.

6.16 In July 2005, the Health and Medical Development Advisory Committee (HMDAC) issued a discussion paper entitled "Building a Healthy Tomorrow". The paper reviews Hong Kong's healthcare model to ensure that the community will continue to enjoy a quality healthcare service that is sustainable, affordable and accessible to all. The discussion paper pointed out a number of challenges, including the ageing population and over-reliance on the heavily subsidised public healthcare system. The paper further suggested that a key element of the future service delivery model is the development of well-integrated public and private sectors in order to promote healthy competition for service quality and professional standards, and provide a choice for the public. The role of the family doctor as a first point of contact and gate-keeper in primary medical care is also emphasised. The future healthcare system is one that can integrate care across organisational boundaries and quickly adjust to the changing needs of patients.

6.17 Continuity of care across different players in the healthcare system would not be possible if patient information remained segmented and stopped at organisational boundaries. Consistent with developments elsewhere in the world, the HMDAC discussion paper sets out the vision of a territory-wide electronic health record (eHR) system, with ownership by the individual who would then authorise access to his or her own records by selected healthcare professionals, as an integral part of the future healthcare system. Subject to confidentiality and security safeguards and the patient's consent, eHR could be accessed by a healthcare professional in public and private hospitals, clinics and residential care homes for the elderly. The availability of comprehensive records will enable timely and informed decisions to be made at the point of care. Other valuable spin-offs from eHR include enhanced capabilities in medical record management, medical analysis and planning, monitoring of healthcare outcomes and detection of epidemiological changes in disease patterns. Integration with other industries in the healthcare eco-system, such as insurance companies, pharmacists, social welfare agencies, can also be achieved subject to legal, security and privacy protection based on patient choices.



6.18 While an eHR system should promote healthy competition and collaboration, thereby generating more choices and better quality services for patients, it raises a series of fundamental questions that must be addressed. These include a body to oversee or regulate the eHR operation, whether legislative backing is needed, financing of the capital investment and recurrent costs, ownership of the records and limitations on access to these records, legal, security and privacy protection of individual data and the entire system, and whether any penalty should apply to proven cases of unauthorised use of the data. These questions must be properly addressed by all stakeholders before consultation with the community. Such a territory-wide project involves multi-faceted transformation programmes and a progressive, developmental and consultative approach should be adopted. A territory-wide eHR system that cuts across different sectors has far-reaching implications. It must be a system that the population embraces and has confidence in before it is launched.

6.19 We have a good foundation on which to build. The Hospital Authority (HA), which caters to over 90% of hospital care and represents about 50% of total healthcare activity in Hong Kong, keeps all the clinical data of its patients in electronic form in a Clinical Management System. The HA has embarked on a pilot project to share its electronic patient records with a number of private hospitals and private medical practitioners. But this pilot project is primarily one-directional at this stage. We will learn from this experience to see how we might further develop eHR progressively.

6.20 To strive towards this vision of a citizen-led system of integrated healthcare services, the Food and Health Bureau (FHB) has formed a Steering Committee on eHealth Record Sharing with members from both the public and private sectors to address the series of complicated questions raised above. The Government needs to work out pragmatic solutions to these questions before a proposed roadmap can be drawn up for further discussion with stakeholders. In parallel, the FHB and the Department of Health (DH) will explore how eHR can be implemented in DH and its interface with HA's system.

6.21 Given the significance of eHR to the entire population and its instrumental role in transforming the healthcare delivery system, the eHR system cannot be determined in isolation and will be considered in conjunction with other proposals for healthcare reform.

Intelligent transport systems

6.22 Hong Kong has developed over the years an efficient and world-class transport system. To meet rising expectations of motorists and public transport users for quality services and to ensure that our transport infrastructure is put to the most efficient use, the Government intends to establish a Transport Information System (TIS), which will provide two key services:

- **Intelligent Road Network (IRN)** is a Geographical Information System platform providing up-to-date information on traffic directions, turning movements at road junctions and stopping restrictions.

- **Public Transport Information Service (PTIS)** will be a web-based information service for public transport users and motorists. It will allow public transport passengers to search for optimal routes based on distance, cost and number of interchanges. Likewise, motorists will be able to search for optimal driving routes on a digital map according to pre-set options such as distance and toll.

Implementation of the TIS is scheduled for completion in 2008. It will open up new opportunities for the private sector to provide value-added services such as car navigation, fleet management systems and the provision of personalised services to the public through the application of technologies such as GPS and RFID.

Commercial services

6.23 Technological advancement has significantly changed the landscape and operations in the business and trading community. Different forms of ICT innovation and applications are used in enterprises to improve efficiency, productivity and customer value. We see a number of driving forces for ICT-enabled transformation in private sector services:

- Deepening of the e-government programme and the possibilities opened up for public-private partnership will have a direct impact on private sector entities having business interface with the Government. Large international and local firms equipped with comprehensive e-business solutions will also help push electronic adoption by their business partners further along the supply chain. With increasing erosion of the role of intermediaries as a result of enhanced communication between suppliers and consumers enabled by ICT adoption, SMEs need to maintain their niche by providing personalised, value-added services to consumers. They can be greatly assisted by various types of Customer Relationship Management applications and business intelligence tools.

- The development of data standards and a common platform in different sectors, as epitomised by DTTN, serve to enhance communication, collaboration and business integration within and across sectors. The Government has been, and will continue to be, a facilitator in this process. Specifically in the area of customs clearance, we will implement the Road Cargo System, which rides on the concept of electronic advance cargo information, to facilitate seamless customs clearance at land control points.

6.24 The emergence of cutting-edge technology and innovation will create new dynamics in a competitive environment, driving companies to exploit new opportunities to transform their businesses in order to stay ahead of competitors. As mentioned in Chapter Four, media convergence, sensor and identification technologies and next-generation Internet are examples of key areas where we expect to see major progress made in the years to come. Pilot projects spearheaded by the Government in the innovative use of technologies, such as RFID and GPS, will promote assurance, encourage wider adoption and eventually drive down costs through building up a critical mass of users.

Chapter Seven: Building an Inclusive, Knowledge-based Society

7.1 To enable citizens and businesses to realise the full potential of the information society, the Government will work with the ICT industry and the wider community to pursue the following five goals in order to develop Hong Kong into an inclusive, knowledge-based society:

Digital inclusion

- Broadband connectivity for citizens
- Allowing every student access to ICT facilities to support learning
- More affordable access to industry software solutions for SMEs

Knowledge-based society

- Information management in the community
- Digital rights management infrastructure and culture

Digital inclusion

7.2 Hong Kong is faring well in terms of Internet connectivity and ICT penetration. Broadband Internet reaches virtually all residential buildings and three quarters of our households are connected to broadband Internet. Large enterprises are adopting ICT extensively in doing business. However, there is a dichotomy in respect to under-privileged groups and SMEs. According to the survey conducted by the Census and Statistics Department in 2007, only 38.4% of households with monthly income below $10,000 have a PC at home. And only about half of Hong Kong's small establishments are connected to the Internet[17]. In this regard, we would like to see progress in the following three areas:

17 According to the 2007 Survey on IT Usage and Penetration in the Business Sector conducted by the Census and Statistics Department, only 59.8% of small establishments and 88.3% of medium establishments have installed personal computers, compared with 99.1% for large establishments; 56.1% of small establishments and 82.8% of medium establishments have Internet connection, compared with 93.3% for large establishments; and 14.1% of small establishments and 39.6% of medium establishments have a website/webpage, compared with 75.0% for large establishments.

Broadband connectivity

7.3 We believe that Hong Kong can develop into a "wireless city" in which ubiquitous access to networks is achieved through a combination of government investment and market forces. The Government will install wireless facilities at major government premises with high public patronage[18] for free access by the public. At the same time, we will ensure that our regulatory regime is conducive to fostering market activities and initiatives in providing wireless access points (sometimes called "hotspots") in commercial premises. Government facilities in public streets (such as lamp poles) are being made available to enable operators to set up hotspots and base stations at nominal rents.

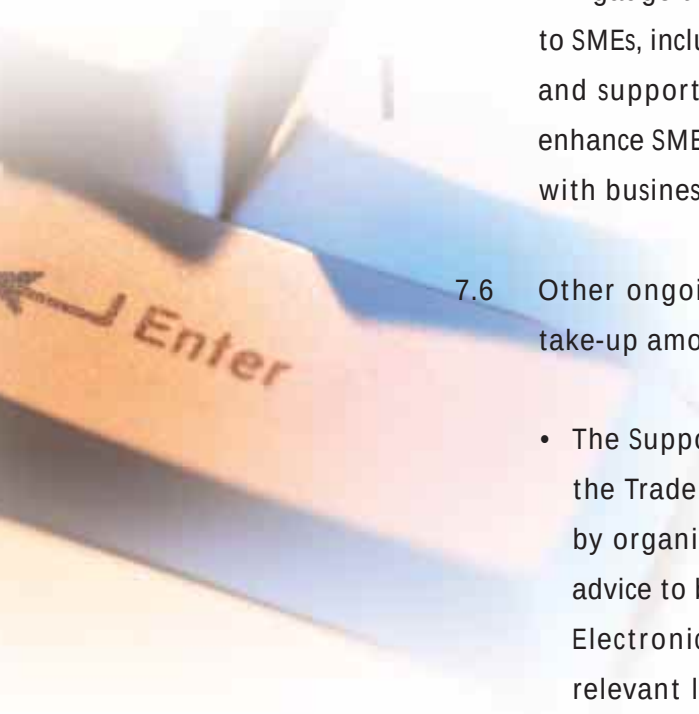
ICT facilities for students

7.4 Over the years we have implemented a number of programmes to enable students of low-income families to gain ICT access. Currently, 96.7% of primary and secondary school students have PCs at home mostly with broadband connectivity. To tackle the specific problems facing the remaining minority, we have conducted a study to ascertain the barriers to these families in ICT adoption and will take appropriate actions to overcome the identified barriers.

Access to industry software solutions

7.5 At the business level, there is a huge divide in the level of ICT adoption between large companies and SMEs. Very often, SMEs do not see the need to use ICT in their daily business, and even if they do, they may lack the resources or knowledge to upgrade their ICT capabilities. Open source software solutions, software-as-a-service and pay-as-you-go models may offer more affordable choices for SMEs. We will work with the ICT industry to devise measures to drive ICT take-up among SMEs. In particular, we

18 These government premises include public libraries, community centres, major parks, government buildings and offices.



will gauge the industry's interest in offering all-in-one packages to SMEs, including PC hardware and software, Internet connection and support services at affordable prices. The objective is to enhance SMEs' productivity and strengthen their communications with business partners.

7.6 Other ongoing measures are taken to encourage greater ICT take-up among SMEs:

- The Support and Consultation Centre for SMEs (SUCCESS) of the Trade and Industry Department promotes ICT awareness by organising free seminars and workshops. It also tenders advice to business start-ups on ICT and e-business applications. Electronic business content, such as market intelligence, relevant laws and regulations and product information are provided to SMEs to encourage them to use the e-channel;

- Through the SME Development Fund and other relevant government funding programmes, the Government will sponsor worthwhile ICT projects that can contribute to improving SMEs' business efficiency, productivity and competitiveness; and

- The Government will continue to conduct support programmes for different sectors[19] in collaboration with professional bodies to enhance awareness and ICT capabilities of SMEs by disseminating best practices, rendering technical support and assisting in the development of industry portals for knowledge-sharing and collaboration. Where appropriate, we will also sponsor research studies proposed by the industry to ascertain the ICT needs of individual business sectors so as to facilitate the ICT industry to develop suitable services and products.

19 Sector-specific Programmes (SSPs) have been launched since 2004. Nine business types - travel agents, private medical practitioners, drugstores, logistics, accountants, beauty services, watches and clocks, social services and trade - have benefited under the SSPs.

Knowledge-based society

7.7 The advent of information societies and the increasing demands for information from citizens and businesses have led to higher levels of availability and sharing of digital data. This is a global phenomenon.

7.8 ICT is an important enabling tool in our pursuit of building Hong Kong into a knowledge-based society where information is readily accessible and widely available. To foster the continuous creation, aggregation, renewal and use of knowledge in the society, there is a need to facilitate effective sharing of data held by private and public entities across community under the following two areas:

- Information management: enabling data/content sharing through the digital channel while protecting privacy and intellectual property rights is conducive to knowledge building. Development of data standards across different sectors can also facilitate the provision of joined-up services.

- Digital rights management: with media convergence, we need to put in place the infrastructure and create a culture where the intellectual property rights of software and multimedia content, like those of physical goods, are respected and protected.

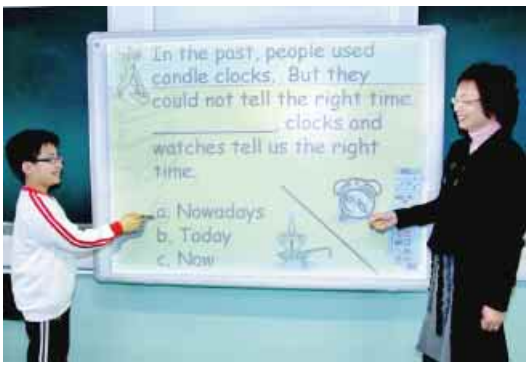
7.9 The Government will launch a new round of district-based programmes to promote the benefits of ICT applications in an information society.

7.10 The Government encourages citizens and organisations to build up their own digital knowledge database for their development and life-long learning. Such personalised or proprietary databases are valuable assets in a knowledge-based society. To lead by example, the Government has advised bureaux and departments to make good use of the ICT infrastructure for knowledge management and sharing among the workforce, and encourages them to deploy state-of-the-art technology in electronic document management to build up a corporate knowledge base.

Education, knowledge creation and sharing

7.11 ICT usage is introduced to students as early as junior primary level. Online learning is more fun for students and helps extend their horizons beyond the set curriculum. Teaching and school administration are also increasingly dependent on ICT for knowledge-sharing and resource management.

7.12 The Hong Kong Education City (HKedCity), set up in 2000, provides an interactive electronic platform with rich e-learning resources for teachers, parents and students. Through the portal, users can exchange experiences and promote effective practices. HKedCity works with a large number of non-government organisations (NGOs) and the ICT industry in promoting electronic learning to portal users.



7.13 The Education Bureau plans to release its third IT in Education Strategy[20] in January 2008. The updated strategy will focus on how best to take advantage of the connectivity and infrastructure built up over the years to encourage more interactivity among teachers, students and parents. Managing the cultural and behavioural change in the use of technology, rather than the technology itself, is often the most challenging aspect of ICT-enabled transformation in education. New technology provides teachers with a wide range of content choices and delivery options. Through ICT adoption, teachers will be partially relieved of the burden of content construction and delivery, assessment and testing; they will have more time for individual students.

20 The then Education and Manpower Bureau published the IT in Education Strategy in 1998 and updated it in 2004 with the objective of harnessing IT in the delivery of policy objectives and outcomes, in areas such as curriculum development, professional development of teachers, lifelong learning, sharing of knowledge and effective practice, and fostering collaboration among schools, parents and the community.

7.14 There is a need to move from just putting content online by encouraging teachers to make better use of technology in delivery, assessment, curriculum development and knowledge management. Also important is the sharing of knowledge and effective educational practices through the HKedCity platform and Centres of Excellence on IT in Education. The IT in Education Strategy is expected to propose specific measures to empower schools to better exploit the potential of ICT in enriching learning and knowledge management.

7.15 For syndicated testing delivered through ICT to progress further, the strictest security controls will be necessary to ensure important examinations are not compromised.

Holistic approach to bridging digital divide

7.16 Education may enhance ICT adoption and knowledge building in some, but not all, segments of the community.

7.17 The digital divide is not a simple binary problem. Cost is only one of the barriers to take-up. Some individuals may not have the skills to use computers, even though they may actually want to get online. Most simply do not see ICT as a powerful tool to transform their lives. The content and application divide, on top of accessibility problems, have to be tackled. We need to discern the different needs of individual groups in order to devise proper measures to address their problems.

7.18 The Government takes a leading role in bridging the digital divide through forging partnerships with NGOs in running digital inclusion programmes, expanding the availability of free computing facilities and sponsoring the Digital Solidarity Fund.

7.19 Currently around 5,500 public computers with Internet connection have been installed at various places for free public use, and some are equipped with special devices for the disabled[21]. The Home Affairs Department has joined hands with NGOs to set up district cyber centres to enhance ICT accessibility and to provide training opportunities for the public, the under-privileged groups in particular. We will explore with NGOs and the private sector the possibility of setting up more cyber centres staffed by people with technical knowledge to help citizens gain access to online information and services, including those hosted on the GovHK portal.

7.20 To ensure that a holistic approach is taken in tackling the digital divide issue with regard to the different needs of sub-groups, we will set up a task force comprising representatives from relevant government departments as well as industry and community stakeholders to formulate strategies and initiatives for digital inclusion.

21 To cater for the needs of special groups, such as the elderly and the visually impaired, devices such as screen reader software, voice synthesiser software and Braille display have been installed in the personal computers at selected community cyber points.

7.21 In addition to international benchmarks and other statistics produced in regular surveys conducted by the Government, the task force will also refer to the findings of the Impact Analysis Study on the Degree of Digital Inclusiveness in Hong Kong conducted by the University of Hong Kong on the accessibility, usage, knowledge and affordability of ICT, which show that different segments of the community have different needs:

- ***The elderly***

Affordability and physical access is less of a concern than the lack of incentive and knowledge. They need ICT training at a slower learning pace to build up their knowledge. Development of suitable web content (e.g., healthcare, Cantonese drama, games) will help arouse their interest.

- ***New arrivals***

They need tailor-made ICT training conducted in their native languages to enhance their ICT literacy and interest.

- ***Female homemakers***

Basic ICT training of a suitable mode (e.g., usage relating to management of family affairs and education of their children) that suits their work schedule may arouse more interest.

- ***Single parents***

Just like female homemakers, they need basic ICT training that suits their family and work schedule. Relevant applications and content should be identified to encourage adoption.

• *Children of low-income families*

They may need assistance including financial help with access to suitable ICT facilities outside normal school hours.

• *Disabled people*

ICT creates the opportunity for the disabled to achieve parity and independence in more areas of their lives. There is a need to develop easy-to-use tools and technologies to assist disabled people. They also require support in acquiring affordable assistive tools, such as screen readers.

7.22 We have organised focus groups to better understand the particular needs and barriers to ICT adoption for individual disadvantaged groups so as to devise suitable measures to address their needs and overcome the barriers. We will measure digital inclusiveness on a regular basis so as to gauge the effectiveness of our initiatives.

Chapter Eight:
Targets and Outcomes

8.1 The Digital 21 Strategy sets out our vision of building on Hong Kong's position as a world digital city through advancing our achievements and seizing new opportunities and the blueprint for ICT development in Hong Kong in the coming years. Apart from relevance at the macro and strategic level in terms of Hong Kong's economic development, the Strategy has implications on our daily lives such as public service delivery, food safety, health care etc. The realisation of the vision requires the participation of the entire community, including the Government, the ICT industry, other sectors, academia and the general public. The Strategy is a dynamic roadmap that should be flexible and adaptive to take into account any changes in the technological landscape and the evolving needs of the society.

8.2 We will measure Hong Kong's ICT development over time with regard to the following indicators:

- Mobile phone penetration rate
- Household PC and broadband penetration rates
- Percentage of citizens aged 15 or above who have conducted e-business on the Internet
- PC and Internet penetration rates for businesses of different sizes

- Percentage of establishments which have undertaken transactions through electronic means
- Number of wireless hotspots installed by the Government and the private sector
- Equipped external telecommunications capacity
- Government ICT spending
- ICT investment in the business sector
- R&D expenditure
- Number of e-government services
- Percentage of government forms available through the Internet
- Percentage of government services amenable to electronic mode of service delivery that have an e-option
- Percentage of citizens aged 10 or above who have used online government services
- Level of satisfaction of citizens who have used online government services
- Number of visitors to GovHK
- Number of online e-government transactions
- Size of ICT workforce
- Digital inclusion index for different disadvantaged groups

8.3 Progress expected under each of the five action areas in the coming three years is set out in the following table. This will be updated in the light of the latest developments.

Facilitating a digital economy	
We will ensure continued government leadership and commitment in sustaining Hong Kong's position as a world digital city by:	Key bureaux/ departments[22]
• Preparing for the introduction of legislation into the Legislative Council to set up the Communications Authority;	CEDB
• Continued ICT investment;	OGCIO/ITC
• Enhancing the e-government programme by facilitating joined-up services and integration with back-end systems;	OGCIO
• Fostering cross-boundary cooperation in technology and innovation; and	OGCIO/ITC
• Leading focused discussions among different sectors of the community to help Hong Kong move towards an inclusive, knowledge-based society.	OGCIO

22 These bureaux/departments will lead, coordinate or heavily engage in the implementation of specific action areas/initiatives under the Digital 21 Strategy. They include Commerce and Economic Development Bureau (CEDB), Education Bureau (EDB), Food and Health Bureau (FHB), Transport and Housing Bureau (THB), Office of the Government Chief Information Officer (OGCIO), Innovation and Technology Commission (ITC), Office of the Telecommunications Authority (OFTA), Hongkong Post (HKP), Department of Health (DH), Transport Department (TD) and Trade and Industry Department (TID). Other bureaux/departments will also contribute to the implementation of the Strategy and the e-government programme.

Promoting advanced technology and innovation	
We will build Hong Kong's innovative capabilities and harness the business opportunities they generate through:	Key bureaux/ departments
• Opening a Digital Lifestyle showcase (e.g., Digihome) in Cyberport by 2009;	OGCIO
• Completing Phase Two of Science Park in stages from 2007 to 2010;	ITC
• Preparing a draft implementation framework for introducing mobile television services for second public consultation in 2007-08;	CEDB
• Facilitating a smooth transition from analogue to digital terrestrial television broadcasting with a view to switching off analogue broadcasting by 2012;	CEDB
• Releasing radio frequency spectrum for broadband wireless access in 2008;	OFTA
• Government's internal network migration to IPv6 in 2008;	OGCIO
• Strengthening of Cyberport and Science Park as hubs for innovation and technology;	OGCIO/ITC
• Promoting applied R&D, technology transfer and commercialisation of R&D deliverables through the R&D Centres;	ITC
• Positioning Hong Kong as a regional test-bed and launching pad of innovative technologies;	ITC/OGCIO/OFTA
• Facilitating convergence among telecommunications, broadcasting and IT leading to emergence of new products and services; and	CEDB
• Building up the international profile of outstanding ICT achievements.	OGCIO

Developing Hong Kong as a hub for technological cooperation and trade	
We will groom a conducive business environment for Hong Kong to foster technological cooperation with Mainland and international partners by:	Key bureaux/ departments
• Completing a study on land and other policy issues relating to the establishment of data centres in Hong Kong in late 2007 or 2008;	ITC/OGCIO
• Facilitating the ICT industry to develop competency standards under the Qualifications Framework;	EDB/OGCIO
• Introducing new measures to improve the user-friendliness of the digital certificate issued by HKP in 2008;	HKP/OGCIO
• Implementing the Unsolicited Electronic Messages Ordinance;	CEDB
• Continued Hong Kong/Mainland liaison in setting agenda on cooperation in matters relating to technology and innovation;	OGCIO/ITC
• Strengthening of Hong Kong's role as a hub for technological cooperation and trade;	CEDB/OGCIO/ITC
• Cooperating with Shenzhen under the Shenzhen-Hong Kong Innovation Circle initiative;	ITC
• Strengthening regional cooperation in dealing with incidents relating to Internet service outage and raising public awareness and education on business continuity planning, incident management and response;	OFTA/OGCIO

• Examining the possibilities of setting up a secure and reliable cross-boundary broadband network for providing e-business and digital content transmission services;	OFTA/OGCIO
• Engaging in regular discussions and exchanges with the ICT industry through the ICT Industry Partnership Forum;	OGCIO
• Publishing an annual catalogue of new opportunities for private-sector participation;	OGCIO
• Continued partnership with the Privacy Commissioner for Personal Data to protect privacy;	OGCIO
• Cultivating a legal software download culture by building on the Digital Rights Management infrastructure; and	OGCIO
• Facilitating discussion on and development of data standards in different sectors.	OGCIO

Enabling the next generation of public services	
With special emphasis on customer engagement and information management, we will improve citizens' quality of life through:	Key bureaux/ departments
• Introducing private sector content and services on GovHK from 2007/08;	OGCIO
• Developing a common platform for dissemination of geospatial information on GovHK in 2009;	OGCIO/ Lands Department
• Promulgating a government-wide electronic information management strategy in 2008;	OGCIO
• Developing a Channel Management Strategy in 2008;	OGCIO
• Developing and promulgating a unified identity management framework for providing e-government services in 2008;	OGCIO
• Piloting e-procurement project in government departments from 2008 to 2009 in order to formulate plans for further roll-out to other parts of Government;	OGCIO
• Reviewing the Hospital Authority's pilot scheme on sharing its electronic patient records with private hospitals and private medical practitioners in 2007/08;	FHB
• Setting up the Transport Information System in 2008 to pave way for introduction of value-added services;	TD
• Transforming public service delivery through the continuous enhancement of GovHK;	OGCIO
• Addressing fundamental institutional, legal, security and privacy issues relating to the wider introduction and sharing of electronic health records among public and private medical sectors as well as other closely related sectors in preparation for wider consultation in the community;	FHB
• Formulating proposals to introduce electronic health records in the Department of Health; and	DH
• Fostering of ICT-enabled change readiness through enhanced communication and partnership among the Government, the ICT sector and other industries.	OGCIO

Building an inclusive, knowledge-based society	
In cooperation with the ICT industry and the community, we will lay a solid foundation for a knowledge-based economy by:	Key bureaux/ departments
• Installing wireless hotspots at major government premises with high public patronage from 2007;	OGCIO
• Planning to publish the third IT in Education Strategy in January 2008;	EDB
• Establishing a digital inclusion task force in 2008 to formulate strategies and initiatives to bridge digital divide;	OGCIO
• Measuring digital inclusiveness on a regular basis, starting from 2008, so as to gauge the effectiveness of our initiatives in building a digitally inclusive society;	OGCIO
• Working with the ICT industry to devise suitable programmes to increase ICT take-up among SMEs; and	OGCIO/TID
• Cultivating knowledge creation and sharing in Government, industries and the community.	OGCIO

8.4 We will provide reports on an annual basis on the updated progress on the above targets and changes in the key indicators. The reports will be published on the Digital 21 website for public reference.

Chapter Nine:
Conclusion

9.1 Capitalising on the foundations built up in the past three strategies, we have identified five action areas for further driving ICT development and adoption in Hong Kong in the coming years:

- Facilitating a digital economy;
- Promoting advanced technology and innovation;
- Developing Hong Kong as a hub for technological cooperation and trade;
- Enabling the next generation of public services; and
- Building an inclusive, knowledge-based society.

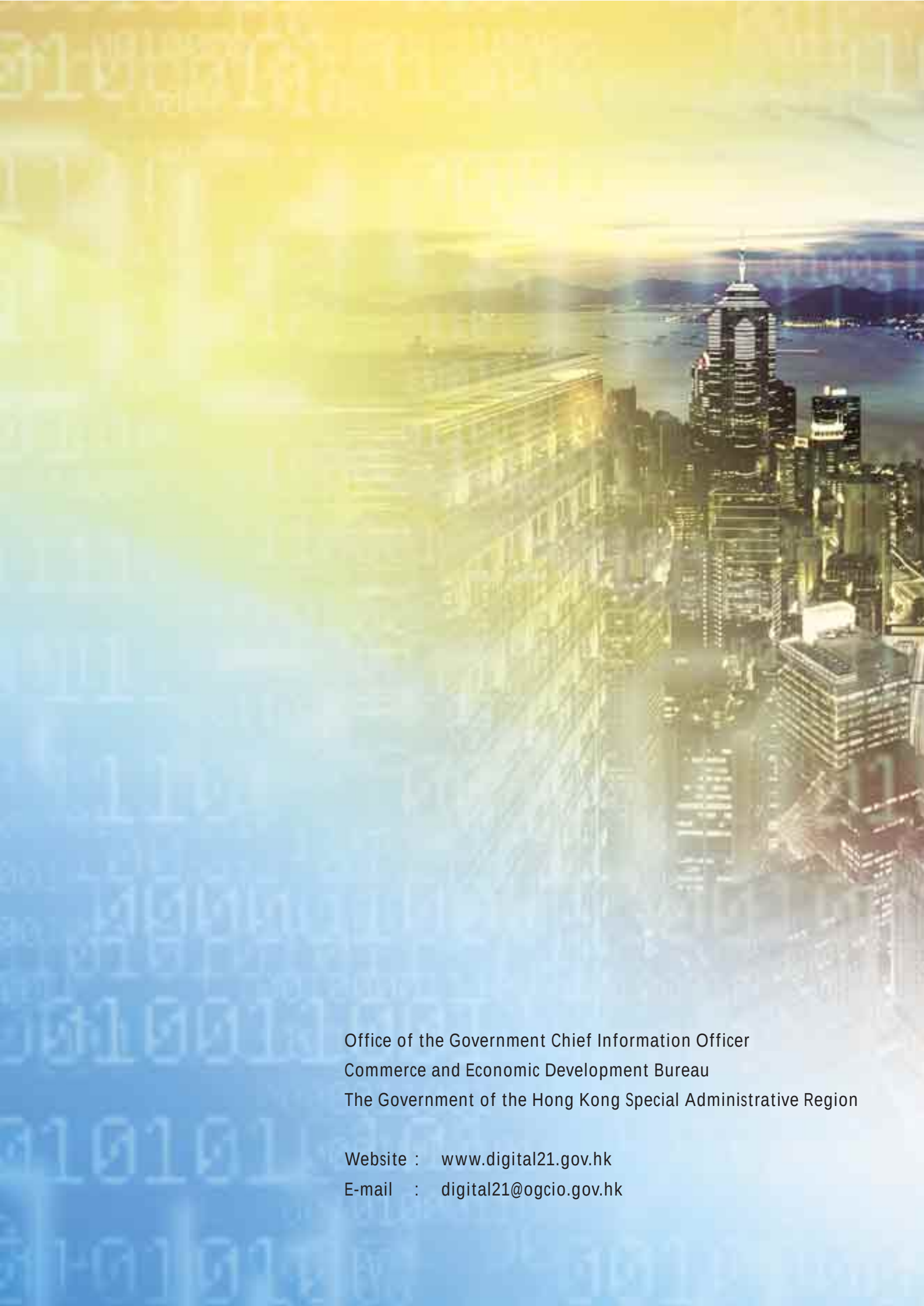
9.2 The action areas under the Strategy are in alignment with and in support of the Chief Executive overall policy blueprint for Hong Kong.

9.3 To sustain Hong Kong's role as a world digital city, we must harness our strengths in creativity and stay at the forefront of technological innovation. Bridging upstream R&D and innovation with industrial applications for wider commercialisation in the local, Mainland and overseas markets is an important area where Hong Kong can create value. On a macro level, Hong Kong can strengthen its position as an international trading centre by serving as hub for technological cooperation and trade, riding on the Mainland's increasing demand and supply of technology related products. To the citizens, the use of technology offers significant potential to raise quality of life, for example by providing better access to relevant information, enhancing food safety, improving health care services, and reducing paper consumption.

9.4 The Government has been promoting an e-culture in the community by pressing on with the e-government programme, integrating ICT in education of our younger generation, empowering SMEs and special groups through digital inclusion programmes, and protecting and raising awareness of intellectual property rights. Our vision of a digital city is that ICT is engrained in day-to-day business processes and the way of life of its citizens. With the prevalence of different forms of electronic transactions and the general enthusiasm and maturity of our citizens in the use of communications products and services, Hong Kong is well positioned to broaden ICT adoption by taking advantage of new technologies for service transformation.

9.5 The Digital 21 Strategy is a living document that concerns not only the ICT industry, but the entire community, including other industrial sectors, academia, non-government organisations and the general public. ICT has a direct bearing on almost every facet of our daily lives.

9.6 OGCIO is the focal point in the Government for coordinating with all relevant parties within Government on the implementation of the Strategy and for tracking progress on an annual basis.



Office of the Government Chief Information Officer
Commerce and Economic Development Bureau
The Government of the Hong Kong Special Administrative Region

Website : www.digital21.gov.hk
E-mail : digital21@ogcio.gov.hk