

For discussion on  
9 December 2013

**Legislative Council Panel  
on Information Technology and Broadcasting**

**Public Consultation on 2014 Digital 21 Strategy**

**Purpose**

This paper seeks Members' views on the proposed new Digital 21 Strategy (Annex).

**Digital 21 Strategy**

2. Digital 21 Strategy is the blueprint for Hong Kong's overall development in Information and Communications Technology (ICT). The Government first published the Strategy in 1998 and updated it thrice in 2001, 2004 and 2008.

3. Technology is moving fast. The advent of wireless and multi-platform technologies, cloud computing, Internet of Things and big data in recent years has provided new impetus for social and economic developments. In this connection, we are updating the Digital 21 Strategy so that it grows and evolves continuously in pace with global trends and aspirations of our community. Entitled "Smarter Hong Kong, Smarter Living", the new Strategy sets out the framework for Hong Kong to leverage on new technologies to drive economic and social developments on various fronts.

**Way Forward**

4. We have launched public consultation on the proposed new Digital 21 Strategy with a view to gathering views from the public. We will take into account the feedback and suggestions garnered in refining the Strategy and mapping our way forward. We plan to promulgate the new Digital 21 Strategy early next year and proceed to implement the various measures.

## **Advice Sought**

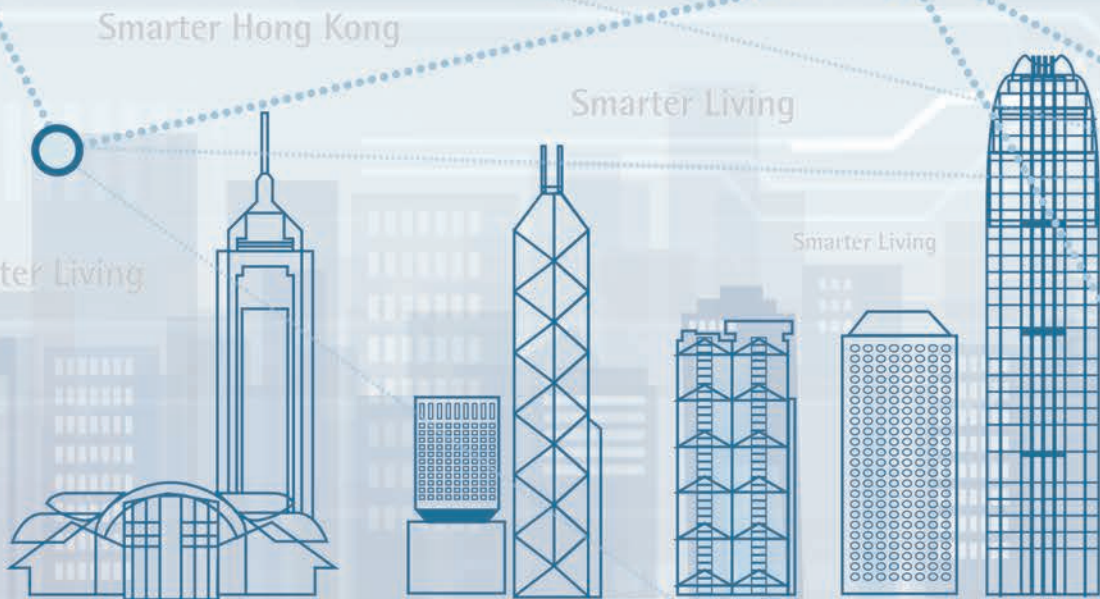
5. Members are invited to comment on the proposed new Strategy.

**Office of the Government Chief Information Officer  
Commerce and Economic Development Bureau  
December 2013**

Annex

Public Consultation on  
2014 Digital 21 Strategy

# Smarter Hong Kong Smarter Living



Commerce and Economic Development Bureau

September 2013

## Foreword

Information and communications technology (ICT) is not only a key enabler underpinning Hong Kong's thriving economy, it is also taking shape as an economic sector in its own right. The 78 000 strong workforce constitutes roughly only 2% of the total labour force, but contributes around 6.1% of our GDP.

We have come a long way since issue of the first Digital 21 Strategy in 1998 setting out the blueprint for ICT development in Hong Kong. In its World Competitiveness Yearbook, the International Institute for Management Development ranked Hong Kong first in technological infrastructure in both 2012 and 2013. Our Internet connection speeds, and our broadband and mobile penetration rates at 85% and 231% are among the highest in the world. Adept use of ICT, among other things, has helped maintain Hong Kong at the global forefront of financial services, logistics and international trade. The Government and the public also benefit from the advanced use of ICT in bringing about enhanced efficiency, greater convenience, customised services and better quality of life.

Technology is moving fast. The Digital 21 Strategy has since been updated thrice in 2001, 2004 and 2008. With the advent of wireless and multi-platform technologies, cloud computing, Internet of Things and big data in recent years, it is time to update the Digital 21 Strategy again. The Government commissioned IBM to review Hong Kong's achievements under the Digital 21 Strategy and make recommendations on a new blueprint to steer our ICT development in the next few years. 19 engagement sessions with ICT industry bodies, academia and ICT professionals, major users and Government departments were held to gauge their views and insights on the way forward. IBM's findings and recommendations, endorsed by the Digital 21 Strategy Advisory Committee, form the basis of this public consultation document.

The "Smarter Hong Kong, Smarter Living" Strategy sets out the framework for Hong Kong to leverage on new technologies to propel continuous economic development, build platforms for sharing and collaboration, deliver intuitive and integrated e-services to the public and foster a thriving ICT industry. It will be a living strategy that grows and evolves continuously in pace with global trends and aspirations of our community.

We are seeking your views and feedback to enable us to refine the Strategy in order to serve Hong Kong better.

A handwritten signature in black ink, consisting of the letters 'G' and 'S' in a stylized, cursive font.

Greg So  
Secretary for Commerce and Economic Development

## Chapter 1 : A Sound Foundation

The Digital 21 Strategy was first promulgated in 1998 as the blueprint for Hong Kong's overall development in Information and Communications Technology (ICT). The aim of the Strategy is to outline how the Government, community, business, industry and academia can work together to achieve our vision of putting Hong Kong in the forefront of global ICT development. The Strategy is a living document that evolves alongside rapid advances in technology and the changing needs of the community. Since 1998, the Strategy was updated thrice in 2001, 2004 and 2008.

2. Hong Kong is one of the forerunners in using ICT to drive our social and economic developments. Our achievements are consistently recognised by renowned international benchmarking organisations. For instance, Hong Kong ranks third worldwide in the World Competitiveness Yearbook 2013<sup>1</sup>, seventh worldwide and first in Asia in Global Innovation Index 2013<sup>2</sup>, 14<sup>th</sup> worldwide and fourth in Asia in the Networked Readiness Index 2013<sup>3</sup>, third in Asia in the Cloud Readiness Index<sup>4</sup> and sixth worldwide and first in Asia in the Data Centre Risk Index<sup>5</sup>. These studies have pointed out that Hong Kong, vis-à-vis other economies, is strong in ICT infrastructure, as well as business and innovation environment.

3. Hong Kong has an excellent and affordable ICT infrastructure supporting the delivery of secure e-services and the development of the local ICT industry. With market liberalisation, the infrastructure provides Internet access at an affordable price. Our household broadband penetration rate at 85% and mobile penetration rate at 231% are among the highest worldwide<sup>6</sup>. The average peak Internet connection speed of 63.6 Mbps and average Internet connection speed of 10.9 Mbps are among the fastest in the world<sup>7</sup>.

4. Since the last update of the Strategy in 2008, Hong Kong has made great strides in ICT development. We reported progress in implementing initiatives under the Digital 21 Strategy regularly to the Legislative Council Panel on Information Technology and Broadcasting. Progress reports on digital economy, e-government and digital inclusion are available at the Digital 21 website ([www.digital21.gov.hk](http://www.digital21.gov.hk)).

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<sup>1</sup> The World Competitiveness Yearbook 2013 published by the International Institute for Management Development

<sup>2</sup> The Global Innovation Index Report 2013 published by INSEAD

<sup>3</sup> The Global Information Technology Report 2013 published by the World Economic Forum and INSEAD

<sup>4</sup> Published by the Asia Cloud Computing Association

<sup>5</sup> Published by the Cushman & Wakefield and Hurleypalmerflatt

<sup>6</sup> Figures as at May 2013 from the Office of the Communications Authority

<sup>7</sup> The State of the Internet (1st Quarter, 2013 Report) published by Akamai

5. On the other hand, we acknowledge that some structural factors may constrain ICT development in Hong Kong. Our relatively small domestic market and shrinking manufacturing and industrial sector do not provide sufficient incentives to spur technological developments. Moreover, the ICT sector also faces keen competition from established economic pillars such as financial services, real estates and retail for resources (like land, office space and investment funding) and talent.

6. To transcend these intrinsic limitations, we need to seize the opportunities that exist for Hong Kong. As part of China, Hong Kong enjoys strategic and geographical proximity to the Mainland. The thriving ICT development on the Mainland presents opportunities for our ICT industry. In addition to facilitating entry to the Mainland market by Hong Kong ICT companies and professionals through the Mainland-Hong Kong Closer Economic Partnership Arrangement (CEPA), we are also in the best position to capitalise on the opportunities that arise from the National Twelfth Five-year Plan and our close collaboration with Guangdong.

7. Moreover, we should also leverage on the latest technologies and the next wave of technological advancements in driving Hong Kong's further development. Around the world, we are witnessing how new technologies, including wireless, cloud computing, big data and Internet of Things, are being exploited to boost the development of different business and industry fields. In order to stay in the forefront of the increasingly digitalised world, Hong Kong has to embrace these technologies and apply them in powering our economic and social development in the years to come.

## Chapter 2 : Smarter Hong Kong, Smarter Living

8. In propelling Hong Kong into the next stage of ICT development, we need to fully exploit the latest technologies and adopt them in various sectors with a view to powering their further advancement.

- **Cloud computing** — Cloud computing is bringing rapid and radical changes to the ICT service industry landscape, redefining how ICT services are delivered. It provides a scalable and portable computing environment for businesses without the need to own or manage computing assets, allowing users to acquire and utilise computing resources as a service to cater for demands and requirements, thereby significantly reducing capital investment and set-up time.
- **Big data analytics** — Big data and the increasing adoption of cloud computing, mobile communications, social networking and new analytics technology have created new opportunities for business intelligence analytics. The unprecedented volume, velocity and variety of data available and accessible over the Internet, e.g. business demand trends, climate information, road traffic condition, mass transportation demands, science and researches, etc., have enabled businesses and research institutes to develop advanced decision-making capabilities. Big data analytics can give useful insights into phenomena, capabilities and collective behaviours, providing the basis for informed decisions and intuitive services.
- **Internet of Things** — Internet of Things refers to the pervasive presence of devices embedded with sensing, data capture and communication capabilities, such as Radio-Frequency Identification (RFID) tags, sensors, and actuators. With new level of Internet-enabled connectivity and communication capabilities, these devices can monitor changes in the physical environment, movements or consumptions. The data obtained can trigger follow-up actions, improve coordination and yield detailed evidence-based analysis. This technology has prodigious potential for application in retail, healthcare, logistics, city management, public services and many other services.
- **Wireless and multi-platform** — Recent years have seen an explosive growth in the use of mobile devices and consequently in mobile e-services. Our tech-savvy populace expects to do anything at anytime and anywhere through different platforms. Businesses and Government have to design and deliver services in real-time, wireless and multi-platform fashions.



9. The new edition of the Digital 21 Strategy envisions that Hong Kong should leverage on these enabling technologies to become a smarter city where the intelligent use of ICT enriches the quality of life and enhances productivity. In “Smarter Hong Kong”, people’s needs can be anticipated, business innovation and competitiveness will be enhanced, and the ICT industry will reach new heights, endowing the community with “Smarter Living” in a truly knowledge-based and sustainable city.

10. “Smarter Hong Kong, Smarter Living” is the theme of this new edition of the Digital 21 Strategy. It encompasses four strategic thrusts of leveraging on ICT to —

- empower everyone through building platforms that enable the public and businesses to realise their aspirations;
- ignite business innovation through research and development and provision of open data;
- support a thriving ICT industry by recognising excellence and facilitating established and emerging ICT set-ups to gain foothold in the Mainland and the international markets; and
- transform and integrate public services by developing intuitive, personalised and multi-platform e-services.

11. The four-thrust Strategy is aimed at bringing benefits to everyone in the community — the public, visitors, innovators, ICT service providers, companies of different scales, startups, and so on. This combination of initiatives will not only strengthen what Hong Kong has done well in established areas, but will also explore and exploit new areas and opportunities arising from changes in the economic, social and technological environments.

## **Chapter 3 : Empowering Everyone**

12. ICT is embedded in practically all aspects of people's life — public services, education, work, business, leisure, entertainment, arts and culture, etc. To harness the potentials presented by ICT, we need to have the basic skills and confidence to use technology, and have easy access to it. At the same time, we can make full use of ICT in upgrading the quality and delivery of services. It is therefore vital to ensure that everyone has the basic capability to operate in an ICT-rich environment and enjoy the benefits and conveniences it brings. The next generation should not just be groomed to be adept ICT users, but should also be inculcated with the predilection and ability in resorting to technology for solutions and enhancements for everyday tasks, which would spur continuous social and economic development for the society as a whole. We should continue to upgrade our existing ICT infrastructure and related soft skills so that everyone can better their life through the smart use of ICT — “empower everyone through technology”.

### **(A) Free and User-friendly Digital Identity (ID)**

13. We put in place the infrastructure for digital ID as early as 2000. The Electronic Transactions Ordinance (Cap. 553) enables individuals and organisations to conduct legally binding electronic transactions where confidentiality and integrity of data, authentication of genuine users and non-repudiation of completed transactions can be safeguarded by the use of digital certificates. A number of e-services require the use of digital certificates, e.g. voter registration, renewal of vehicle licence, etc. Digital certificates are issued by two certification authorities, namely the Hongkong Post Certification Authority and Digi-Sign Certification Services Limited upon application in person at a fee.

14. Such infrastructure carries great potentials for legally binding and secure e-services requiring proper authentication. As borne out by growing popularity of e-commerce and e-government services, the public is well aware of the benefits of e-services. For instance, the number of e-banking accounts in Hong Kong has been swelling, with the numbers of accounts of individuals and businesses in 2012 having reached 8.4 million (425% increase from 2002) and 0.76 million (533% increase from 2002) respectively. The overall utilisation of e-government services in 2012 has increased by more than 1.3 times that of 2011 in terms of total number of information searches and electronic transactions.

15. However, this useful infrastructure is not fully tapped as the take-up rate of digital certificates is on the low side. There were only 63 000 active digital certificate users (individual) in 2012. In order to unlock the potentials of digital ID, thus allowing people to enjoy the benefits of secure and authenticated e-services, we propose to work with the relevant parties to facilitate the provision of free digital certificates to all Hong Kong citizens. We will also explore ways to make digital certificates more user-friendly, such as lengthening its validity period and easier authentication. With wider use of digital certificates, more organisations would be encouraged to make more services requiring authentication available online. There is scope for more e-services ranging from authorising access to health records, signing e-cheques, permitting children for school activities, etc.

16. On the part of Government, we would consider introducing more secure services requiring digital certificates. As more secure and other non-secure services are made available online, this would present a good opportunity for the development of a unique online account for each Hong Kong resident to access transactional e-government services and receive targeted and personalised messages from the Government, including like licence and passport renewal, payment of government and utilities bills, reminder service, provision of important personal documents (like public examination certificates), etc.

## **(B) City-wide Wi-Fi for the Public and Visitors**

17. Connectivity is the cornerstone of all e-services. A city is truly well-connected only if its people can easily enjoy online services. In this regard, Hong Kong is one of the foremost cities in the world. Our pro-competition approach in regulating Internet service providers keeps quality up and prices down. Our mobile tariffs affordability ranks third in the world in 2013<sup>8</sup>.

18. With the concerted efforts of the service providers, the private sector and the Government, public Wi-Fi hotspots are now widely available across the 18 districts in Hong Kong, covering Government premises and public areas such as libraries, parks, museums, sports venues, public enquiry service centres, job centres, community halls, cooked food centres and markets, tourist attractions, major transport facilities such as airport, MTR stations, ferry terminals, buses and ferries, as well as various coffee shops, restaurants, shopping centres, and so on. Today, the public and visitors can conveniently enjoy public Wi-Fi services, which are either completely free of charge or free for a certain period of time through some 10 000 hotspots at over 5 400 locations. Similar to broadband

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<sup>8</sup> Global Information Technology Report 2013 by the World Economic Forum and INSEAD

penetration, our city-wide Wi-Fi penetration is also among the highest in the world.

19. Riding on this success, we propose to further extend the *GovWiFi* service provided completely free by the Government to more leisure locations, such as beaches, major district parks and harbourfront promenades, as well as popular focal points. The Government will also work with other public organisations such as public hospitals to provide Wi-Fi services at their premises. At the same time, mobile operators and service providers have developed strategies to expand their deployment of Wi-Fi and enhance their technological capability to address such aspects as performance, authentication and security. With these efforts, we envisage that the number of Wi-Fi hotspots available for public access will increase by over 10 000, bringing convenience to both the public and visitors.

20. To make it easier for the public and visitors to access free Wi-Fi services, we propose to promote a common Wi-Fi branding, e.g. “WiFi@HK”, for Wi-Fi services which are offered by the public and private sectors completely free or free for a certain period of time in Hong Kong. It will help the public and visitors find and connect to the public Wi-Fi hotspots throughout Hong Kong. With the concerted efforts of Government and the industry, Hong Kong will further advance its position as a highly connected city in the world.

### **(C) Broadband and Wi-Fi Access for Schools to Drive e-Learning**

21. Technology transforms the way education is delivered for maximum effectiveness. Over the years, technology in education has moved from just an academic discipline to an integral part of the learning process. Nowadays, e-learning heavily involves real-time, interactive and multi-media elements, allowing students to tap into the ocean of online learning resources and facilitating sharing of knowledge and exchange of ideas.

22. Effective e-learning predicates on easy and speedy Internet access. At present, though most primary and secondary schools are having reasonably good broadband coverage, Wi-Fi access in classroom is insufficient to support effective e-learning. To allow students to reap the full range of benefits of e-learning through interactive and multi-media applications, we propose to equip every Government and aided school with Wi-Fi to facilitate constant and stable access to the Internet.

## **(D) Programming in Every Child's Education**

23. Given that ICT is embedded in almost all economic and social activities, imparting knowledge in ICT is a must in today's education. ICT education has been included in our secondary school curriculum since 1982. Building capacities for the future requires more of ICT education than sheer adept use of applications. We consider it essential to acquaint the next generation with programming skills, which emphasise the design of a solution, the algorithm with which students need to be equipped to manage complex problems they may encounter in their lives. Equipping students with programming capabilities can help foster a logical and creative mindset. Moreover, by exposing students to how problems can be resolved and solutions can be found through the use of ICT, a readiness to look to ICT for solutions can be fostered.

24. Further to the most recent promulgation of the Enriched Technology Education Key Learning Area Curriculum by the Education Bureau, which expressly advises schools to allocate at least 30% of time of the Computer Literacy subject to programming concepts at junior secondary level, we propose to explore ways to train students in structured and logical thinking through basic programming so as to make ICT congenial to them, thereby equipping them for the future.

## **(E) ICT as a Tool to Support Underprivileged Groups**

25. Advancement in ICT opens up ample opportunities for the underprivileged groups to expand their social horizons, integrate with the society and enhance their quality of life. Hong Kong has spared no efforts in supporting underprivileged groups to access and learn to use ICT. The usage of computers among the elderly and persons with disabilities has improved significantly since promulgation of the 2008 Digital 21 Strategy. The percentage of computer usage among the elderly and persons with disabilities reached 20% and 24.8% respectively in 2011, representing increases of 51% and 156% respectively from 2008. The Government will continue to implement targeted digital inclusion initiatives to bridge the digital divide, like extending the Web Accessibility Campaign to mobile applications (apps) and non-government websites, development of mobile apps with contents or services catering for the specific needs of different underprivileged groups, and initiatives to encourage more elderly to use ICT in their daily life for social and generational inclusion. We will continue to enhance the quality of life of the underprivileged groups and help them integrate with the information society through ICT and its wider adoption.

## **Chapter 4 : Igniting Business Innovation**

26. The capability of Hong Kong to continuously innovate is critical to our economic growth and competitiveness. More specifically, it could lead to a demand for high-value jobs, expand the export of products and services, and drive growth in a variety of industries.

27. In recent years, some of the most exciting and influential business enterprises excel not in new technological inventions, but in ingenious ideas to exploit technology. The strategic thrust of “Igniting Business Innovation” aims to establish new innovation and collaboration platforms on business applications of technology, and unlock innovation by providing open government data for free use, in order to ignite, nurture and commercialise such innovative ideas with added value.

28. ICT helps boost operational efficiency and business opportunities. Unlike large-scale corporations, small and medium-sized enterprises (SMEs) may find it hard to afford the cost and acquire the skills to use ICT more extensively. To ensure that SMEs in Hong Kong will not miss out on the benefits brought about by technology in driving their business, we will encourage and support SMEs to adopt cloud computing, which is particularly suitable for their scale and mode of operation.

### **(F) Establishing Innovative Platforms**

29. The higher education sector is the major driver of Hong Kong’s technological innovation. Expenditure on research and development (R&D) in our higher education sector has been rising in recent years, reaching \$7,155 million in 2011 (i.e. 3% increase from 2010). Universities are now conducting more patent filings, company spin-offs, proof-of-concept production, etc. In the 2011-12 financial year, the number of patents granted to the six local tertiary institutions engaged in technological research and development increased by 27% as compared to 2010-11, the number of economically active spin-off companies increased by 4%, the income generated from intellectual property rights increased by 120% and the number of consultancies undertaken by these tertiary institutions increased by 16%. Technological innovation can lead to original and effective business solutions. To fully capitalise on the outcome of technological innovation, Hong Kong needs to encourage technology transfer from universities to the industry. We propose, on the one hand, to further promote the availability of such knowledge assets to the industries and potential investors (e.g. through symposiums and other high-profile events). On the other hand, we propose to further encourage the academia to exploit such knowledge and expertise and explore subsequent

transfer of such highly valuable assets to the commercial sector. This can help ensure that innovative ideas and research outputs from universities are actualised to bring about economic benefits.

30. Apart from enhancing the transfer of new technology, in order to exploit technology to the fullest extent in driving business, it is also important to encourage the application of existing technologies in new business solutions.

31. We therefore propose to advocate and adopt a broader definition of innovation, which should cover achieving product and service excellence through applying ICT, in addition to new technology development. One possible concrete outcome of broadening this definition is that entrepreneurs of innovative products and services through ICT could be included in certain innovation programmes. This could help trigger more business-driven ideas and technology applications, thus raising the competitiveness of our businesses.

### **(G) Public Sector Information (PSI) as Default**

32. PSI is the information produced, collected and disseminated by governments and public bodies. The Government launched a PSI portal ([data.one.gov.hk](http://data.one.gov.hk)) in 2011 to provide PSI data for free re-use. The data on the portal is machine-readable to facilitate free re-use for the development of online services and mobile apps. Thus far, 14 categories comprising hundreds of PSI datasets are available on the portal. They include real-time data like road traffic information, air pollution indices and weather data, and static data like geo-referenced public facility data, property market statistics, population census statistics, routes and fares of public transport, etc.

33. PSI datasets can be used and meshed together to create innovative new applications, as demonstrated by the creative and useful products and services developed from PSI in Hong Kong and around the world. For example, using PSI datasets on traffic snapshot images, a number of mobile apps have been developed to provide real-time traffic situation for users to avoid traffic jams in planning their traffic routes. Experience from other developed economies shows that widening access to PSI datasets can open up lucrative business opportunities and bring social benefits. By tapping the creativity of the community and entrepreneurs, the use of PSI can lead to positive social outcomes. For instance, in some cities in the United States, application of PSI on hygiene inspections has led to a significant drop in food poisoning incidents.

34. Through different channels (like press releases, publications, websites, etc.), the Government releases a lot of information in different areas. However, most of such information can only be read but cannot be used. In view of the immense benefits of widening access to PSI for free and easy re-use, we propose to make all Government information released for public consumption machine-readable by default. Where appropriate, datasets will be released with application programming interfaces (APIs), providing predefined functions to make their retrieval easier.

35. Apart from Government data, there are vast amounts of PSI handled, collected and disseminated by public organisations, which are equally useful for the development of innovative services and products. Therefore, we propose to encourage public organisations (e.g. public utilities and transport operators) to release data owned by them in machine-readable format.

#### **(H) SME Cloud Services**

36. Not all businesses share the need to innovate in their services and products, but many of them can adopt ICT to boost operational efficiency and business opportunities.

37. 98% of companies in Hong Kong are SMEs. High upfront set-up costs and long lead-time discourage the extensive use of ICT by SMEs. The advent of cloud computing and mobile apps in recent years has driven down the costs for setting up ICT, lowered the barrier of entry to systems and services enjoyed by more resourceful enterprises, and spared SMEs the trouble of building, maintaining and upgrading its applications.

38. In view of the obvious benefits for SMEs to employ ICT, we propose to facilitate the provision of cloud services for SMEs, in collaboration with cloud service providers and solution developers. This can, on the one hand, encourage SMEs to increase the use of trusted and reliable cloud-based services and applications to boost productivity, improve efficiency and enhance customer services. On the other hand, it can provide business opportunities to software and solution providers, many of which are SMEs. We will also promote how SME cloud services can help SMEs to stay agile, productive and competitive.



## **Chapter 5 : Supporting a Thriving ICT Industry**

39. At the core of innovation and change in the digital age, the ICT industry is also becoming a major sector in its own right in many economies. One of the missions of this Strategy is to “Support a Thriving ICT Industry”. The aim is not only to grow the local ICT industry as a sheer enabler supporting other industries, but also to facilitate the ICT sector to consolidate as a major economic contributor.

40. To sustain and grow the ICT industry, it is imperative to ensure a continuous supply of new blood in terms of quantity, quality and diversity of expertise, be it technician, system engineer, or mobile games developer. At the same time, the vibrancy of the ICT industry can only be sustained by the existence of a wealth of energetic and creative ICT startups as they are often the powerhouse in driving innovation in technology.

41. The ICT industry in economies around the world is facing keen competition. In order for Hong Kong to stay ahead, we need to build on our existing strengths and further develop in those ICT areas where we enjoy a leading edge, notably mobile apps and creative media. Given our advantages, including a high mobile penetration rate and robust telecommunications infrastructure, together with our pool of creative talents, Hong Kong is eminently poised to ripen into centres of excellence in these fields.

42. Meanwhile, Hong Kong also enjoys another unique advantage, namely our close proximity to the Mainland. As with many other areas, the opportunities in the ICT sector on the Mainland are plentiful and continue to grow. Our ICT industry can tap the manifold opportunities that arise from closer collaboration with the Mainland.

### **(I) Supporting the Startup Ecosystem**

43. Tech startups are powerhouses of innovation, playing a pivotal role in driving the sustained development of Hong Kong’s ICT industry. In recent years, tech startups are burgeoning in Hong Kong. A number of support measures have been put in place to support tech startups in both the public and private sectors. For instance, in the public sector, under the incubation programmes run by public bodies like Cyberport and Science Park, all-rounded support is provided to startups, including subsidised office accommodation, mentorship, as well as marketing and promotion assistance. Cyberport also administers a funding scheme to help startups build their prototypes. Besides, startups can also benefit from the various funding schemes for SMEs operated by the Innovation and Technology Commission and the Trade and Industry

Department. In the private sector, co-working spaces have been flourishing in recent years, providing startups with inexpensive and practical working space. These set-ups also organise seminars, networking events and pitching activities to meet the business and development needs of startups.

44. This notwithstanding, many startups still face difficulties in jumpstarting or sustaining their business. They require more readily accessible information on the supports available, practical advice on business techniques, as well as exposure, marketing and networking opportunities.

45. To further support tech startups, the Office of the Government Chief Information Officer (OGCIO) is developing an online portal that will serve as a one-stop platform for them. The portal will provide integrated information on, inter alia, existing support measures (such as incubation programmes, co-working spaces, and funding and loan schemes), success stories and startup events. It will also serve as a platform for startups to reach out to potential investors, and provide them with pitching and networking opportunities. Moreover, the portal will contain practical business and legal tips, with templates and samples for various documents, as well as a pool of mentors who are ready to offer advice to startups.

46. In addition, we propose to identify more opportunities for startups to showcase their products, with a view to providing an additional and effective avenue for tech startups to reach out to potential investors and markets.

47. The measures outlined above will help foster a vibrant ecosystem for tech startups to flourish, thus in turn boosting the sustainable development of the ICT industry in Hong Kong.

## **(J) ICT Talent Development**

48. Human capital is a critical component to the continuous growth of the ICT industry. It is therefore necessary to create an environment for an agile ICT workforce to flourish and meet the needs of the society. Despite that there are around 6 800 local graduates from ICT programmes each year, enterprises still find a gap between the demand and supply of ICT talent.

49. Competition for quality students is fierce at post-secondary level, which includes not only undergraduate programmes, but also sub-degree (Higher Diploma and Associate Degree), Yi Jin Diploma, continuous and vocational programmes. In choosing their course of study, students take into account career prospects and the public image of various professions. To attract talents for ICT development, we need to establish ICT as a widely recognised and highly valued profession in Hong Kong. On the other hand, we need to equip ICT graduates with all-rounded skills (e.g. strategic thinking, business acumen, project management, stakeholder engagement, etc.) to cope with the rapidly changing ICT landscape and technologies. We need to continue to foster partnership among academia, training organisations, professional bodies, employers and employees for the sustainable development of ICT manpower for Hong Kong. To this end, the Committee on Self-financing Post-secondary Education, which has an overarching advisory role on the development of the self-financing post-secondary sector from macro and strategic perspectives, has planned to organise a seminar for post-secondary institutions and industries later this year to exchange views on the closer alignment of post-secondary education with industry needs under the Qualifications Framework.

50. Overseas experience has shown that universities and the industry can mutually benefit from closer collaboration. As a leading business hub, Hong Kong has advantages in bringing in market insights into the education curriculum. We propose that ICT related programmes in universities can be co-designed and co-delivered with leading ICT companies. We also propose to increase the numbers of internship and placement opportunities for ICT students. These can incorporate more industry elements in the education process to ensure that our ICT human capital is aligned with market needs.

51. Together with the industry, we have already established the Qualifications Framework and developed the Specification of Competency Standards for the Hong Kong ICT industry. However, we lack an industry-accepted professional recognition scheme. OGCIO, with the support of academia, industry and professional bodies, is developing an ICT professional recognition framework that will clearly describe the required skills and capabilities for ICT professionals. It will accommodate different professional qualifications while dovetailing the Qualifications Framework so as to bring about a unified industry standard for ICT practitioners. This helps create a well-defined path for those interested in pursuing a career in ICT. The professional recognition framework will also make reference to internationally recognised benchmarks and standards so that it can be mutually recognised with comparable frameworks in other economies to raise the ICT professional profile of Hong Kong.

## **(K) Centre of Excellence for Multi-platform Apps**

52. We have seen the emergence of ever more apps for desktop computers, mobile devices and smart TVs. Hong Kong has done well in the use of wireless technology, as borne out by the number of successful mobile apps that have been created. The number of 3G/4G customers has more than tripled in the past five years, exceeding 10.6 million as at May 2013. The readiness of Hong Kong people to adopt the latest telecommunications technology provides a fertile nurturing ground for multi-platform apps.

53. In addition, Hong Kong does not lack talented app developers. Recently, innovators from Hong Kong have won awards in regional and international competitions, notably, Asia Pacific ICT Awards, Asia Smartphone Apps Contest and the World Summit Award Mobile. A number of locally made mobile apps have been handpicked by foreign developers or Internet business investors. Hong Kong enterprises have also begun to invest in a variety of mobile business solutions (e.g. online banking, movie ticket purchase).

54. In order to further consolidate Hong Kong's achievements in the development of multi-platform apps, it is necessary to create an environment where innovators could share their experience and further promote best practices in the development of multi-platform apps. The incubation programmes and funding schemes for tech startups as mentioned in paragraph 43 above are also applicable to multi-platform app developers. Further to that, we propose to organise conferences, seminars and promotional events for networking and information sharing. More competitions and awards could be organised to showcase successful apps.

55. To stimulate interests in innovating with mobile solutions, we also propose the Government to support the development of mobile apps to cater for the specific needs of underprivileged groups, who are often not priority customer segments. Such initiatives would harness Hong Kong's strength in multi-platform technologies to achieve social inclusion.

## **(L) Centre of Excellence for Creative Media**

56. Creative and media industries, including film, television, music, design, architecture, comics and animation, games and digital entertainment, etc., are growing in Hong Kong. As an example, Hong Kong is one of the world's largest film and television content exporters. In 2011, 56 locally produced films worth \$287 million were exported. Some of our post-production works in computer-animated films have won prestigious international awards. Hong Kong should continue to scale new heights in this area. In addition to the

existing funding schemes and talent development initiatives for the creative media industries, we propose to organise conferences, seminars and promotional events to bring together communities in the digital media delivery value chain. The events allow the digital media community to share experience and information, provide more networking opportunities and champion successful cases. They also encourage the media industry to invest in the necessary digital tool (e.g. digital media studio) for new digital media companies.

### **(M) Data Centre and Cloud Computing Hub**

57. Data centres are essential infrastructures to sustain Hong Kong's continued economic development, in particular in the ICT, financial, logistics and media sectors, while cloud computing is becoming a very important computing model in businesses across economic and social sectors given its agility and portability. Hong Kong is performing well on these two fronts, being ranked the safest place in Asia for setting up data centres since 2011<sup>9</sup> and the third most cloud-ready place in Asia in 2012<sup>10</sup>.

58. Our telecommunications infrastructure is one of the world's most advanced yet most affordable. Our electricity power supply is highly reliable. In addition, there is free flow of information in Hong Kong with no censorship on content and adequate protection of data privacy. These factors enable Hong Kong to develop vibrant data centre and cloud computing business.

59. Since 2009, the Government has implemented a number of facilitation measures for the development of data centres. We established in July 2011 a Data Centre Facilitation Unit to provide information and one-stop support to parties interested in setting up data centres in Hong Kong. We have also introduced a time-limited scheme (until 31 March 2016) to encourage the development of data centres in existing industrial buildings and industrial lots. Under the scheme, waiver fees for changing part(s) of eligible industrial buildings into data centre use would be exempted, and the premium for lease modification of industrial lots for development of high-tier data centres would be assessed on the basis of actual development intensity and high-tier data centre use. The Government has also set aside about two hectares of land in Tseung Kwan O for high-tier data centre use.

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<sup>9</sup> Data Centre Risk Index in 2011, 2012 and 2013

<sup>10</sup> Cloud Readiness Index in 2012

60. The development of data centres in Hong Kong has opened up opportunities to accelerate the growth and adoption of cloud computing services. The Government has taken the lead in using cloud services to drive industry development. We established in 2012 the Expert Group on Cloud Computing Services and Standards, with members from the industry, academia and professional bodies, to facilitate and drive cloud computing adoption and deployment in Hong Kong, as well as facilitate exchanges among cloud experts both within Hong Kong and with the Mainland. The Expert Group, with the support of its three Working Groups<sup>11</sup>, has developed and released a set of best practices and guidelines for the local community, so that cloud services can be deployed and adopted widely while remaining secure.

61. Down the road, we propose to develop common services and promote the adoption of standards and best practices on cloud computing, particularly on cloud security and data privacy. With the development of these common standards, best practices and guidelines, Hong Kong can establish itself as a thought leader in the management of cloud services.

#### **(N) Closer Collaboration with the Mainland**

62. As part of China, Hong Kong enjoys close proximity to the Mainland and access to its vast market. This represents a huge opportunity for the local ICT industry. Under the National Twelfth Five-year Plan (2011-2015), the Mainland would be actively developing innovation and ICT. It was planned that the expenditure on R&D would account for 2.2% of GDP, and 3.3 patents would be generated per 10 000 people. The Mainland's ICT market continues to expand, in particular in the areas of Internet of Things, big data analytics, cloud computing and social business. Hong Kong, with its high-end solutions and services which are born of our business acumen and innovative application of technologies, should continue to expand into the Mainland ICT market.

63. In addition to CEPA measures, we propose that Hong Kong should strengthen ICT collaboration with the Mainland in three key areas, namely cross-boundary e-commerce facilitation (e.g. mutual recognition of electronic signature certificates), technology collaboration / joint projects (e.g. cloud computing services standards) and technology transfer and exchange (e.g. co-organising conferences, forums and exhibitions).

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<sup>11</sup>The three working groups are Working Group on Cloud Computing Interoperability Standards, Working Group on Cloud Security and Privacy and Working Group on Provision and Use of Cloud Services.

64. Moreover, to take advantage of our close geographical proximity to and economic ties with Guangdong, we will further enhance co-operation between Hong Kong and Guangdong in the following areas:

- ***Collaboration in developing a cluster of smart cities in the Greater Pearl River Delta region.*** Rapid ICT development in Guangdong Province gives rise to opportunities to form a cluster of smart cities by further collaboration in such areas as cloud computing, mobile apps, telecommunications, big data analytics, and talent and startup development. For example, we propose to facilitate the sharing of ideas and technology cooperation in the implementation of smart cities, as well as to promote mobile computing. We also propose to encourage partnership between Hong Kong and Guangdong ICT talents in creative startup projects and development of business concepts in ICT.
- ***Wider application of Internet of Things to facilitate cross-boundary trade and commerce.*** We will continue to facilitate wider application of electronic signature certificates with mutual recognition status in cross-boundary transactions to enhance security and reliability. Besides, together with Guangdong, we will continue to promote the use of Internet of Things, RFID and e-lock technologies to enhance co-operation in various areas such as transport management and customs clearance of goods.
- ***Opportunities Arising from Nansha.*** Leveraging on the “Plan for the Development of Nansha New District of Guangzhou” as endorsed by the State Council in September 2012, Hong Kong and Guangdong are exploring the development opportunities for the Hong Kong ICT industry to make the best use of the resources and facilities in Nansha.

65. We also propose to undertake more vigorous and coordinated efforts, jointly with Cyberport, Science Park, Hong Kong Trade Development Council and Invest Hong Kong, to market and promote Hong Kong’s ICT industry, both to the Mainland and the rest of the world.

## **Chapter 6 : Transforming and Integrating Public Services**

66. E-government services offer a convenient and efficient option for the public in their dealings with the Government. In recent years, our e-government services have evolved from mere provision of information to citizen-centric, two-way customer services. New and emerging technologies like mobile, in particular, offer a transformational channel for more targeted services, anytime, anywhere. E-government can be more convenient, more integrated, highly personalised and location-sensitive.

67. At the same time, with increased and appropriate use of the Internet of Things technology, for example through connected sensors, Hong Kong can develop a smarter city infrastructure. This would be especially beneficial to Hong Kong, as being a densely populated city, we need to manage our resources effectively.

### **(O) Multi-platform Government Services**

68. With the advance in mobile technology and the ever-increasing number of smartphone users in Hong Kong, the public now expects access to information and services anytime, anywhere, on any device and through any platform. Providing services through mobile channels is gaining currency in both public and private sectors. In line with this trend, the Government has developed 59 mobile websites and 62 mobile apps.<sup>12</sup>

69. As Hong Kong continues to advance in the digital age and Hong Kong people become more adept in using the latest technologies, mobile e-services should be positioned not merely as an optional mode of access but a default channel for all e-government services. We will not only encourage Government departments to develop mobile or multi-platform solutions (including mobile apps, mobile web pages, mobile transaction, etc.), but also review existing public services and develop a mobile strategy to maximise the full potential of such technology to bring benefits.

70. For launching future e-services, the “multi-platform by default” approach will be considered. Under this approach, e-services, from inception, will be designed and developed with a view to being offered on multi-platforms. This multi-channel approach provides an integrated experience for the public and business irrespective of how they access the e-service, independent of time and location constraints.

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<sup>12</sup> As at August 2013



## **(P) Integrated Two-way e-Services**

71. In addition to multiple channels of e-service delivery, the public also expects intuitive, joined-up and personalised e-services. The ability to understand the public's needs holistically by putting together information gleaned from all the engagement points will help formulate integrated and customised services. With infrastructure for data sharing and technologies like big data analytics, it is now possible to develop and deliver quality services.

72. The Government has established the Interoperability Framework to make data exchange and the development of integrated e-government services technically possible. To further enhance services to the public, a framework that enables information sharing across Government departments in accordance with data privacy protection principles, enhances the ability to deliver effective and timely services, and improves operational efficiencies will still be needed.

73. Therefore, we propose to define standards and frameworks that allow them to interoperate, and develop services that are more targeted for individual needs. It requires a standard methodology for conducting architecture planning and implementation. Since it would be a joined-up initiative that requires considerable cross-departmental co-operation and communication, a common framework and infrastructure defined across departments would be indispensable. It would enable the development and offering of e-services using data scattered in different departments with minimal technical barrier. It may also enable the Government to take the initiative to provide, with consent, personalised services to individual citizens, e.g. reminder for vaccination, passport renewal, etc.

74. We will also encourage the use of the Government Cloud Platform (GovCloud) and shared services by all Government departments. In particular, all Government departments should leverage on this computing platform, where possible, to implement future joined-up public e-service initiatives. This could also be recognised as a flagship showcase for Hong Kong's development into a leading hub for cloud computing and data centre.

## **(Q) Paperless Solutions and Collaborative Platforms**

75. By resorting to a digital form of communication, "paperless" solutions can cut costs, save storage space, enable tracking, facilitate information sharing and protect the environment. The Government should cut down paper consumption and maximise business process automation through proactive adoption of paperless solutions for handling Government records, stock trading, statutory transactions such as licence applications, submission of building plans,

etc. For instance, Hong Kong Housing Authority has since 2007 been piloting with Building Information Modelling as a building design and project management tool for the entire building life cycle, leveraging on 4D simulation capability to walk through construction processes. Apart from environmental gains, the system reaps significant benefits in terms of building design, project planning and coordination, site safety, cost management, etc. It is for consideration that systems like this should be adopted more widely. Going “paperless” requires determination and change management, but the benefits are enormous. We propose that the Government should roll out more paperless solutions and workflow platforms in different policy domains progressively in the years ahead.

### **(R) Smarter City Infrastructure**

76. Hong Kong is a populous modern city and has a need to manage its resources and the multitude of metropolitan functions effectively to maintain a high standard of living. The emergence of connected sensors embedded into everyday objects provides the intelligence to make better informed decisions to address this need. Hong Kong has been a quick adopter of sensor technology in warehouse management, luggage handling, trade and logistics and livestock control, among others. Since 2012, the Hong Kong International Airport uses RFID tags on 70 000 baggages from more than 60 airlines a day, the largest scale in the world. The Transport Department has also installed sensors to collect real-time traffic data in selected areas. These data are provided to commuters through various channels and made available to the public on the PSI portal ([data.one.gov.hk](http://data.one.gov.hk)) for value-added re-use.

77. Interconnected sensors, along with big data analytics, will have an enormous impact on how the Government operates, makes decisions and delivers services to its citizens. For example, the Government could explore optimising traffic flow based on weather and traffic data. We propose to establish a Smarter City infrastructure by leveraging on the Internet of Things technology and explore the use of big data to better provide public services.

78. We propose Government departments to deploy sensors where possible in order to gain meaningful insight into all aspects of the city’s activities. Greater data sharing, with data subjects’ consent as necessary, between Government departments should also be encouraged. In this connection, OGCIO will promulgate standards, approach and guidelines for big data across Government departments. With these, both the Government and public can make informed, data-based decisions.

## Chapter 7 : Consultation

79. Your views are important in shaping our way forward. Please send your comments to us on or before 30 November 2013 by:

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80. Thank you.

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