

# A review of HK government “digital 21” strategy consultancy paper

Table: Technology vs ICT domains

TECHNOLOGY	Empower everyone to realize their aspirations	Ignite business innovation through research and development	Support existing and emerging ICT to gain foothold in Mainland and international markets	Transform and integrate public services into personalized and multi-platform e-services	Restriction to HK permanent residents
Cloud computing		<ul style="list-style-type: none"> <li>- PSI (public sector information dataset)</li> <li>- widening access by including machine-readable interfaces (API)</li> <li>- encouraging SME cloud computing usage to boost productivity, improve efficiency and enhance customer services</li> </ul>	<ul style="list-style-type: none"> <li>- Data centre and cloud computing setup support through Data Centre Facilitation Unit</li> <li>- TWO hectares of land in Tseung Kwan O for high-tier data centre use</li> <li>- Expert groups on cloud computing</li> <li>- the adoption of standards and best practices on cloud computing</li> <li>- opportunities in Nansha</li> </ul>	<ul style="list-style-type: none"> <li>- Government cloud computing platform for sharing applications among all departments</li> </ul>	
Big data analytics				<ul style="list-style-type: none"> <li>- RFID in airport</li> <li>- Interconnected sensors for weather, traffic data and others</li> </ul>	
Internet of Things			<ul style="list-style-type: none"> <li>- electronic certificate</li> <li>- RFID and e-lock technologies in transport management and customs clearance of goods</li> </ul>	<ul style="list-style-type: none"> <li>- Interconnected sensors for weather, traffic data and others</li> </ul>	
Wireless and multi-platform	<ul style="list-style-type: none"> <li>- More free WiFi in public areas</li> <li>- More WiFi and broadband in schools</li> <li>- eLearning</li> <li>- More support to underprivileged groups</li> </ul>			<ul style="list-style-type: none"> <li>- Multi-platform electronic services</li> <li>- Integrated two-way e-Services</li> <li>- Personalized services</li> </ul>	
Security control and identity management	<ul style="list-style-type: none"> <li>- Free eCert</li> <li>- Unique online account for each HK resident using all government electronic services</li> </ul>				
Workflow and electronic document				<ul style="list-style-type: none"> <li>- Paperless solutions and collaborative platforms (workflow)</li> </ul>	
General technical training	<ul style="list-style-type: none"> <li>- Programming training in secondary school</li> <li>- computer usage training for</li> </ul>		<ul style="list-style-type: none"> <li>- Qualification framework</li> <li>- Internship and placement for post-secondary students</li> <li>- more support on multi-platforms development</li> </ul>		

	<b>Empower everyone to realize their aspirations</b>	<b>Ignite business innovation through research and development</b>	<b>Support existing and emerging ICT to gain foothold in Mainland and international markets</b>	<b>Transform and integrate public services into personalized and multi-platform e-services</b>	<b>Restriction to HK permanent residents</b>
	underprivileged groups		- more conferences and seminars and networking		
Research and development		- Transfer of technology from university to commerce - Boarden the definition of innovation to include entrepreneurs of innovative products and services through ICT	- Science Park support - Cyberport support - business and legal advise - funding and loans - networking opportunities - more funding and conferences for digital media community - Closer collaboration with the Mainland - Sharing of ideas and technology cooperation in the implementation of smart cities and promoting mobile computing		
Open source					

Title:	A review of HK government “digital 21” strategy consultancy paper
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Outline:	<ol style="list-style-type: none"> <li>1) Overall comments</li> <li>2) Bases on domains, give the good, bad and ugly sides of each item</li> <li>3) The missing empty spaces in the table</li> <li>4) Missing technologies</li> <li>5) Performance indices of each possible strategy</li> <li>6) Restriction to HK permanent residents</li> <li>7) Environmental issues??</li> <li>8) Conclusion</li> </ol>
Content:	<p>“Digital 21” government strategy in 2013 consultancy paper has been doing a good job of covering major technologies and ICT community need domains. The domians cover career building, inovation support, technology business promotion to foreign countries and government electronic services. On the technology side, it covers</p>

cloud computing, big data, internet of things, multi-platforms of communication, security and identification management, workflow and electronic document, technical training and research and development. All the major strategies are very well planned. A table of strategy versus technology has been compiled for easy review of all details. In this consultancy paper, four ICT domains are well explored with many good suggestions in different technical areas.

Empowering everyone with technical training will enlarge ICT development community. Improving HK's WiFi network will bring in more computing usage. In turn, more business development will be underway. Our schools and students will benefit from better network connectivity.

Ignite business innovation by broadening the definition of innovation to include entrepreneurs of innovative products and services through ICT will improve the innovation funding towards entrepreneurs innovation in addition to research and development in university community. Improving the accessibility of PSI (public sector information) data set will boost development community's creativity. Encouraging SME cloud computing usage will improve SME's productivity, efficiency and services.

Data centre and cloud computing support will give existing and emerging ICT business to gain foothold to other countries outside Hong Kong. Creating internet of things will enhance our ICT market segments. Further funding and loans will nurture our startup business. Qualification framework will enhance our ICT workforce in many different areas. Our university internship program will be further enhanced to improve our students' working experience in the long run.

Transformation of and integration of public services into personalized and multi-platform electronic services not only will improve our daily life but also will further uplift Hong Kong's technical capability in global market. Cloud computing platform will integrate government electronic services. Widely deployment of interconnected sensors will improve our ability to manage our public facilities and to predict public events, e.g. weather and traffic events. Paperless solutions and collaborative platforms will further improve government services satisfaction.

According to the table above, we still have many possibilities. Different technologies should excel more in different ICT domains. Both Big Data and Internet of Things are not fully explored yet. There are incentives for Cloud Computing usage but there is no training for it. We have many devices using Debian Linux but we do not have training and promotion on Open Source. I am going to explore these many possibilities.

More training on cloud computing can be part of empowering ICT community. For example, Open Nabula is the open source of cloud computing framework. OpenFlow is the open source of software defined network (SDN) which is part of cloud computing framework. They are essential to cloud computing training and development.

Big Data is one of the not much explored area. Trainings based on artificial intelligence and data mining are vital to Big Data usage and development. Encouraging using PSI data sets is a good way of promoting Big Data. However, the derived data from PSI should be available to public as paid data or free-of-charge data. A registry should also be used to promote the PSI data and derived data. In this way, we can easily ignite business innovation and support ICT to gain ground in mainland and international markets. We should also

route and promote internationally freely available data and data from mainland to HK for our ICT community to create derived data. This will help our ICT community to gain foothold in foreign countries.

Internet of Things is another not much explored area. Theoretically, thing can be anything. For example, it can be sensor, traffic light, road sign, parking meter, home refrigerator, home lighting, phone, television set, car, transporter on plane, etc. They should be categorized into remotely controllable devices, data output sensor devices or active devices without external control. We also need security control on those devices using eCert and digital signature so that the commands from other parties can be verified for true identity. We also need to segment the devices into different areas so that if some eCert are compromised then the problem can be isolated without spreading to many other areas. We also need to standardize the device design and development for data format and security control. We also need training on the design and development with security protocol design. We can easily create a market segment for our HK ICT community. Business innovation can easily be ignited through Internet of Things. ICT services can easily be promoted to mainland and international community. Government electronic services can be easily deployed.

Security control is a major area in HK. Since the inspiration from Mr Snowden case, we should enhance HK security control in ICT community. However, we should not overdo it to affect our normal business activities. There should be a balance point between security risk and normal business activities. The relatively relaxation of eCert annual fee and expiration date is a good start. However, there should not be too much of relaxation. Besides, due to

the inspiration from Mr Snowden, everything signed by eCert using digital signature should always have expiry date shorter than or equal to the expiry date of the eCert. For example, public examination certificate, which has no expiry date, should not use digital signature. All items signed with eCert must be carefully managed due to short expiry dates.

Signing the e-Cheque with digital signature using eCert can be a bit different from what we would normally expect what digital signature can do for us. Digital signature is normally used for nonpediation for the protection of the receiving party. However, in this case, it should be perceived as protecting the issuing party. Digital signature is now perceived as a second factor for third party account transfer. Since in all cases, the e-Cheque must be issued by individual's issuing bank, each e-Cheque payee must be known advanced on issuing bank side. Payee is very well protected.

Single online account for individual to access government electronic service is wonderful. However, there must be procedure to take care of possible damage claim due to compromised online account or eCert. The revoking process must also be comparably fast for both online account and eCert. This will reduce the risk of damaging individual data and services.

Paperless electronic document and workflow have been around for more than 13 years. It is good to mention it. However, it should have been fully deployed for a long long time. Workflow needs good security control. eCert can be deployed to simplify the use of workflow and electronic document but eCert is not the only mean of achieving the efficiency of workflow. Proper training of eCert, electronic document and workflow are needed. Many people confusing electronic document with imaged document. Imaged document requires

scanning of physical document which may have individual physical signature. However, electronic document has neither physical document nor physical signature. Electronic document has a electronic file with digital signature which can only be verified through PKI decryption and hashing function. In order that workflow and electronic document can be widely accepted by public, a publicly available software, which can verify whatever digital signature, must be widely available for whatever operating systems. A java applet available on internet as web service can be useful.

Multi-platform development is important to all kinds of electronic services. When iPhone appears on market, ICT community starts to realize that it is important to provide services to all possible platforms, e.g. over-the-counter, phone, automated machine, internet, iPhone, Android devices, game console, etc. However, it can be very costly for some companies to support all platforms at the same time. The platforms may not have common user interface standards. Most of the platforms have their own development platform and tutorials. It may not be necessary to recreate another centre to compete with the commercial world. However, it is a very good idea to do research on creating standards or sub-standards across all platforms. It may be even better to do compilation for local business ICT community. It really helps the community in the long run.

WiFi has been around for very long time. It covers many public areas already. Of course, it is good idea to further expand the coverage. It is also important not to compete with those mobile telecommunication companies since it can be unfair competition for them. Besides, the mobile data is almost unlimited for most of the customers.

Providing more WiFi to local schools is good. However, local schools have more issues on other essential equipment. For example, maintenance of computer equipment is very important since computers are getting aged. Operating system should not be restricted to Microsoft Windows. It can be Ubuntu Linux, Apple Mac OS, etc. We should encourage publishers to use other development platforms for their teaching aids (OpenOffice, LibreOffice, DIA, GIMP, FireFox, etc). If all teaching aids are restricted to Microsoft Windows applications (MSOffice, VISIO, IE, etc), it can post unfair competition to others. Government should step up their effort on open source applications. Besides, in order to help schools on their work, teaching and learning materials, it is important to simplify their workload of daily life in schools.

eLearning is good for schools and students. However, most of the softwares are not helping the schools at all. For example, some learning softwares cannot deliver what they promised, or they only have fluent English speaking sales, or they do not have enough application data to make the software application up and running. In most cases, the softwares have not benchmarks on their effectiveness of teaching and learning. Government should not only provide more funding on eLearning but also provide research and benchmarks of all the softwares available (including those from universities) on the effectiveness of teaching and learning.

Open source application development is now very common in ICT community. It should extensively be promoted by the government. Nowadays, we actually have only two major camps of operating systems: Debian Linux (RedHat Linux, Ubuntu Linux, Mac OS, iPhone iOS, Android) and Microsoft Windows. Microsoft Windows is dying. Therefore, we should concentrate on open source application

development. We should build up open source training camp, provide funding on open source business innovation, support open source ICT community to expand to foreign areas, destinate open source projects, etc.

There is another domain which is never mentioned. It is about restricting projects being developed by mostly HK permanent residents. There must be certain number of HK permanent resident employees involved in the project depending on the company size. This will definitely promote more students attending computer science related degree programs. Besides, we should also put more funding on promoting and training more HK permanent residents within the mentioned technologies.

For every strategy proposed, there should be a related performance index to determine the effectiveness of such strategy. The performance index will tell you whether you should select such strategy in the future. The performance index should use observable data for calculation. It should also avoid data due to other factors. Performance index should not rely on absolute value and should depend on relative data since we are looking for relative performance.

Environmental issue is never touched on in this consultancy paper. It is still ICT community's responsibility to reduce use of energy, reduce electronic trash, prolong the equipment life, increase the use of sustainable energy sources, etc. Linux and open source can do it. Most of the time, Linux and open source are more compatible with old equipment and old hardware drivers. Blade server uses centralized power supply and fans. In turn, blade server should reduce the waste of energy and increase the efficiency.

In conclusion, it is still a very good consultancy paper with diverse proposed items covering many important areas. It just needs some touchup works.