Surfing the IT World

by Dr. Winnie Tang

The story of a young lady's 20-year journey to change the landscape of the mapping industry in Hong Kong from paper to digital, and develop a leading IT company in the process.

Dr. Winnie Tang

Dr. Winnie Tang JP is an Honorary Professor in the Department of Computer Science at the University of Hong Kong(HKU), she is one of the locally-bred IT entrepreneurs of Hong Kong. Dr. Tang has over 20 years of experience in the Information and Communications Technology (ICT) industry. Dr. Tang is the Founder and Chairman of Esri China (Hong Kong) Limited, an international office of Esri which specializes in Geographic Information System (GIS) technology, and is among the top 50 software companies in the world.

Dr. Tang actively promotes ICT application through writing articles for a range of publications in which she also shares her views on environmental protection, tree conservation, smart city concepts and entrepreneurship. She has published 6 books in Chinese and English as well as over 200 research papers, newspaper articles and journals, mainly published in the local Chinese media, such as Hong Kong Economic Journal, Hong Kong Economic Times and Recruit as well as the English media, such as South China Morning Post, Harbour Times and ComputerWorld.

Dr. Tang is a pioneer in bringing Geographic Information System (GIS) technology to benefit the public and private sectors in Hong Kong. She has also been actively advocating the use of technology through her services in government and non-government organizations.

Major appointments that Dr. Tang currently holds include: Member of Antiquities Advisory Board; Founder and Chairman of Steering Committee of Smart City Consortium; Advisor of Our Hong Kong Foundation; Member of Computer Science Advisory Committee, Department of Computer Science, HKU; Founder and Chairman of the Conservation E3 Foundation; Co-Founder and Board Member of eHealth Consortium; and Director of Asia eHealth Information Network (AeHIN).

Dr. Tang received her Bachelor of Arts degree and PhD from HKU. Currently, she is an Honorary Professor in the Department of Computer Science at the Faculty of Engineering in HKU where she teaches a masters course on smart city concepts.

In recognition of Dr. Tang's outstanding contributions to society, she was recognised as one of the Distinguished Alumni by the Faculty of Science of HKU in 2009. In the same year, she was also appointed as Justice of the Peace (JP) by the Chief Executive of the Hong Kong SAR Government. In 2006, Dr. Tang was recognised as one of the Ten Outstanding Young Persons of the year by the Junior Chamber International Hong Kong (JCIHK). In 2004, Dr. Tang received the Young Achiever of the Year in the Women of Influence Award presented by the American Chamber of Commerce.

Surfing the IT World

by Dr. Winnie Tang

This book is dedicated to my colleagues,
thank you for your support and staying with the company
for so many years, despite occasionally disagreeing with
my unconstrained ideas.

Preface

Translating vision into reality

Esri President and Co-Founder Jack Dangermond

I first met Winnie more than twenty years ago. On that occasion, I felt her enormous drive on the Geographic Information System (GIS) and great enthusiasm as a young entrepreneur was really unforgettable. Throughout these years, apart from being good business partners, we also became close friends with mutual admiration for each other despite coming from different generations.

I have always looked for a business partner who not only has integrity and performs well in business but also a vision to lead GIS to a new horizon of technology. After working with Winnie for the last two decades, I can say that she is the one.

As a leader, one has to possess the aspiration of higher achievement. Winnie and I shared the same vision of realizing the potential of GIS in Hong Kong long before anyone else recognized it.

GIS technology utilises geographic knowledge to integrate information; and it is changing how people see the world. It is getting embedded into almost everything from consumer applications in navigation to monitoring climate change.

My parents were immigrants to the U.S.A. who started a plant nursery when I was a kid. I learned from them around the dinner table about cash flow, customer service and how to nurture a business. They had little schooling and were not rich, but they passed on to me strong values that I have cherished throughout my life.

I am grateful for being able to do what I want to do. Very few people get the opportunity of seeing their vision to its eventual realization. I want to compliment all young entrepreneurs for doing that, because it is difficult.

Similarly, Winnie was also brought up by her family, her grandma in particular, which groomed her to be a leader. As a smart leader, she always upkeeps three attitudes: to inspire the team, to get work started and to sustain the momentum.

I've heard of Winnie's startup story many times but still feel enchanted every time by her persistence and resilience. How many nights was she the last one to leave the office? But that is what it actually takes to create a business from scratch. What's more, she is also grateful to society at large for offering her an opportunity to succeed. In return, she is determined to repay society by lending young people her helping hands through giving them advice and direction.

Both of us aim to assist anyone who works to enrich the world with the knowledge of GIS and, in particular, see its importance in education. I have provided the mapping software ArcGIS to over 100,000 schools in the U.S., so that students can learn citizenship and science as well as creative problem solving skills through the cloud-based advanced software. This is entirely free to students and schools.

In Hong Kong, we have just launched the Asia's first Map in Learning (MiL) Program, a free cloud-based mapping platform, for all primary and secondary schools in Hong Kong, this is because of Winnie's commitment to education. It is also an homage to Life-long Learning advocated by the Education Bureau of the HKSAR Government.

I feel proud to have witnessed Winnie's contributions to business, education and community service for the last twenty years. I am confident that with GIS going from strength to strength, together we shall reshape our future and move beyond our limits.

With Jack taken in 2015

Content

Content

3rd stop: Around the World 150

Surfing the Real World

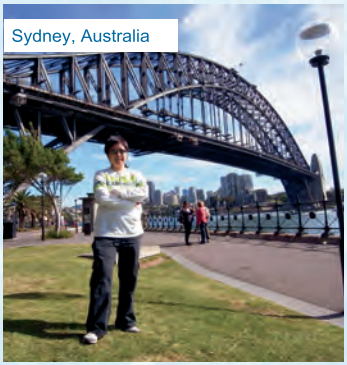
Travelling allows me to discover the real world. In the last 20 years, I have been to more than 50 countries on five continents and seven oceans. Let me share with you some fascinating moments.


Kagoshima, Japan


Jingzhou, China


Great Wall, China

Jeju, South Korea


Sydney, Australia


Bhutan

Golden Triangle


Cairo, Egypt

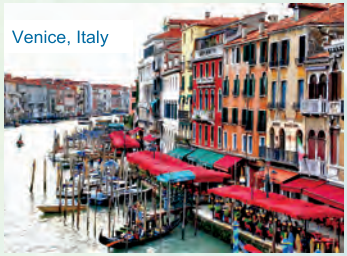

Luxor, Egypt

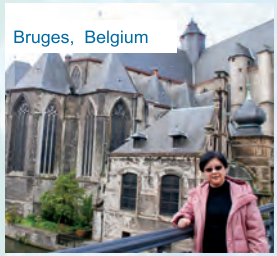

Indian Ocean, Indonesia


Santorini, Greece


Crete, Greece

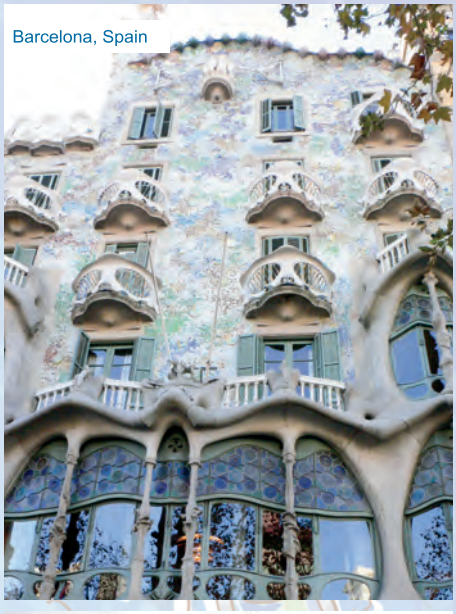

Amsterdam, Netherland


Venice, Italy

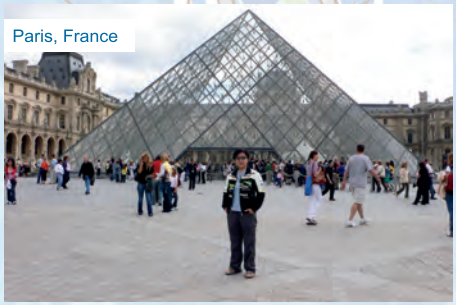

Bruges, Belgium


Milan, Italy

Lisbon, Portugal


Barcelona, Spain

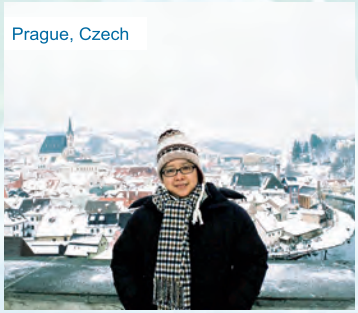
Cabo da Roca, Portugal


Paris, France

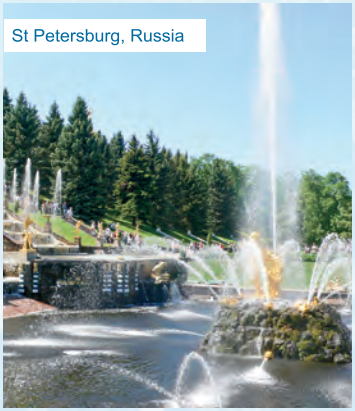
Hannover, Germany


Moscow, Russia


Moscow, Russia

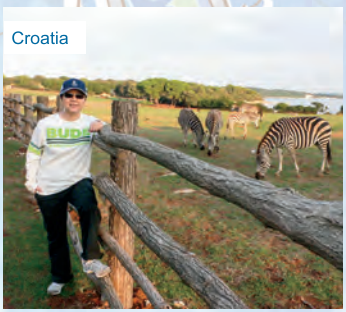

Prague, Czech


St Petersburg, Russia


St Petersburg, Russia

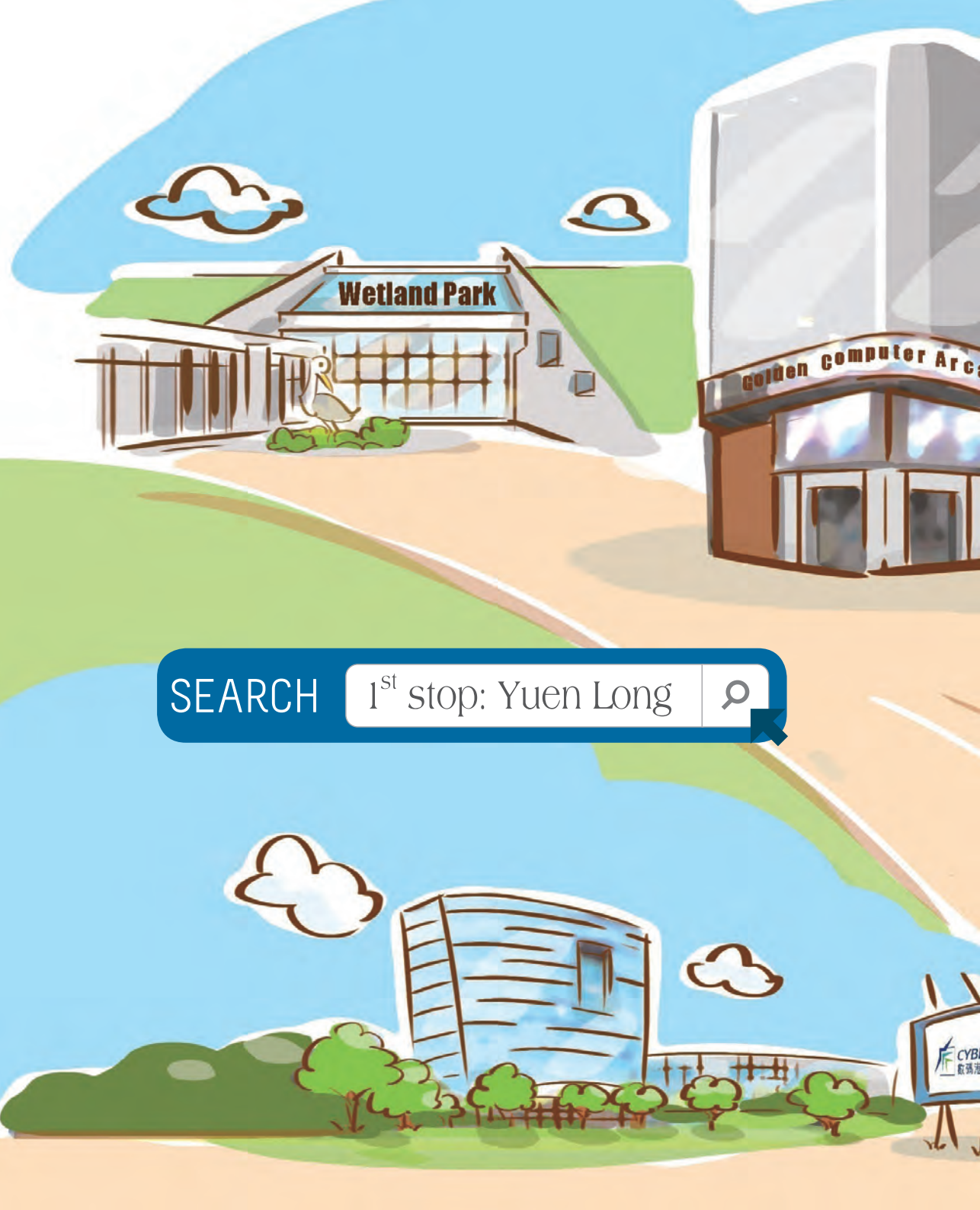

Croatia


Plitvice Lakes National Park, Croatia


Croatia


Lithuania, Baltic states


Lithuania, Baltic states


Wetland Park
Golden Computer Arc
SEARCH
1st stop: Yuen Long

I was born and grew up in Yuen Long, my family and teachers guided me through my childhood. My love of maps led me to leave Yuen Long and start the adventure that became my career. The story of how this experience shaped the person I am today is what I would like to share with you now.

Grandma is always on my mind

Grandma is my heroine and my role model.

As my parents were busy earning a living, I was taken care of by my Grandma when I was little. Her teaching and role model has been influencing me since then.

My Grandma was born at the beginning of the 20th century; she was widowed at the age of 39. Though illiterate, she did not blame the gods nor accuse others for her misfortunes. She raised seven children single-handedly, and all of them went on to achieve significant success either in business or academia.

20 years of business experience has taught me that mutual trust and building long-term relationships with customers are the keys to success

The U.S. President Barack Obama described his grandmother as “demure and principled”, words which also fit my Grandma.

In the 1950s and 1960s in Hong Kong, most people were living in poverty and it was difficult to earn a living. Despite the difficulties, my Grandma took education seriously. Irrespective of gender, she supervised our studies, and told me to contribute to education for the benefit of society when I have the capability to one day. Since I was a child I aspired to be a teacher, doubtlessly influenced by my uncle and aunt, who were teachers and highly respected by their students. Recently, I have resumed teaching at the University of Hong Kong, and I maintain close contact with higher education institutes and universities. I am glad to contribute to education again and fulfil my Grandma’s wish.

My Grandma was a very strict tutor; I was not allowed to buy my first soda until I was in Primary 5. I was not allowed to watch T.V. at night nor go out at weekends. Judging by today's standard, my childhood was quite dull as I really spent all my time studying. My only entertainment was hanging around the local library. However, I did not find it boring at the time, I enjoyed that lifestyle and I was able to develop my interest in maps which was to have a significant impact on my future.

My Grandma's generation were more reserved and introverted, they tended not to reveal their feelings easily. I still remember the time when we lived in a village house in Yuen Long, when it rained there were leaks everywhere... I was often glued to my Grandma, who sometimes felt annoyed when she was busy doing housework. However, whenever it rained she would always carry me to a dry place no matter how busy she was. My Grandma was very smart, she taught herself sewing. She made all my winter

clothes herself. During that time I felt her love deeply, even though she rarely expressed her feelings in words.

The Science Daily website reported a U.K. study conducted by the University of Oxford and the University of London-UCL Institute of Education. The study interviewed nearly 1,600 children aged 11-16, who were raised by their grandparents. It found that children grew up healthier in such environments, as grandparents often had more time available than their busy parents to help children solve problems.

My Grandma was a hard-working woman; she had to raise her children while working day and night to make a living by doing needlework. She worked very long hours, staying up late and then getting up early in the morning to continue working. When many people were surprised that I slept only four hours a night in the years when I started my business, I smiled knowingly with my Grandma's hard-working example in my mind.

My Grandma often mentioned old-fashioned principles like “practiseing charity and taking the correct path”, which the Cantonese actors Cheung Ying and Ng Cho-fan had so often said in the movies. She taught me to be an honest person; she told me “not to take shortcuts” and “contribute to society once I have the capacity”. These words seem stupid with today’s get-rich-quick mentality, but it is very true in the long-run. People say "It is imperative to be cunning in business dealings". However, from my past 20 years of business experience, mutual trust and long-term relationships with customers are the keys to business success. Thus, taking the "correct path" is the one and only way to success. More than 10 years ago when I was struggling in my career, I still spared time for social welfare services. That is because I always had my Grandma’s teachings in my mind, I can only attribute my rewards and reputation to my Grandma.

My Grandma passed away over a decade ago, but I still remember her teachings vividly and I believe that she is gratified in heaven.

Like Parents, Like Daughter

At all times, parents and their children are constantly inextricably linked.

Since my parents were busy making a living, I grew up cocooned in the love of my Grandma. Over the years I started to realize that I am truly the daughter of my parents as I inherited their character and approach to life. Today, I am grateful to my parents for this inheritance which has contributed greatly to my success in business.

My mother was a primary school teacher, she was passionate about education and she always wanted to nurture talent. She

The so-called "special skill" is simply sincerity, faithfully promoting quality products to meet the needs of our customers

wanted children to grow up properly, serve society and contribute to the community. I probably inherited her studious gene, I have achieved good results in my studies ever since I was little, and I love teaching too.

My mother spent two years training as a teacher. During that time, she taught at a private primary school every morning and attended training in the afternoon at the Grantham College of Education. At night she prepared for her lessons, wrote teaching plans, produced teaching aids, marked exercises, practiced piano and took care of me. I was only a one-year-old baby at the time so you can imagine she had a busy life!

My mother is also very compassionate. Once she left some money for the washroom cleaning lady and I was curious and so I

asked her why she had done that. She said it was because she was sympathetic towards people who had difficulty in earning a living. My mother has given me a particular respect for the elderly and I actively participate in the development of elderly services.

The School of Medicine in the University of North Carolina published a report in an authoritative medical journal called Nature Genetics, the researchers found that in mammals, both fathers and mothers contribute an equal number of genes to the offspring. Perhaps the father's genes is more visibly influential on the children. In other words, the father's DNA has a greater influence on the children.

I smiled when I read this news.

My father has seven brothers; he is the eldest son in the family. My grandfather passed away a long time ago. My father, being the eldest son, assumed the role as head of the family and he started working to support the family when he was 15. Mr. Cao Ren Chao,

the late, well-known financial analyst once mentioned that his father died very young and, as the eldest son, he had to take up the responsibility of supporting the whole family, including his brothers' and sisters' living and education. It was common in those days for a child to support the family if the father had died.

My father is highly respected by his brothers and sisters; he is very strict, disciplined and hard-working. These characteristics were very influential in his later success in business. My father was a technician; he started his business from scratch by opening a small shop selling electrical appliances in Yuen Long. He worked from 8:00a.m. to 10:00p.m. every day, and even on the first day of Lunar New Year, for 30 years. Following his example, I learnt to be diligent and disciplined.

My father is also a natural-born businessman. Although he had not taken any economics or marketing courses, he had an acute business vision. In the 1960s and 1970s, when electric fans were still

very popular, he already perceived the potential of air conditioning in the prospering economic environment. He boldly introduced air conditioners to the market and made a great profit from the booming business.

His example taught me the importance of foresight in business success, rather than blindly following the crowd. I followed this same approach when I insisted on promoting digital maps and the Geographic Information System (GIS) at the time paper maps were still prevailing despite widespread cynicism. After 20 years, I am so glad that my foresight has been recognized.

My father is a well-respected man who speaks with eloquence. I grew up and assisted him in his electrical appliance shop, and I witnessed how good he was as a salesman in the neighbourhood with his "special skill". Although he did not teach me any marketing skills, I practiced his "special skill" unconsciously when I ran my own business.

The so-called "special skill" is simply "sincerity", faithfully promoting quality products to meet the needs of our customers. I adhere to this approach when I promote the GIS to customers.

While my father was busy in his small shop business, my mother worked tirelessly as a teacher. No matter how busy they were, they spared time to see me and Grandma. One day, my father bought me a copy of Reader's Digest that came with a small selection of rock samples. I was so excited when I saw those colourful rocks. I still have them now. I enjoyed reading the scientific stories in the Reader's Digest and it further inspired my interest in geography.

Although I am introverted by nature and rarely outspoken, I must say that I am very grateful to my parents. From the bottom of my heart, Mom and Dad, thank you!

Not to be served but to serve

On my first day of school at S.K.H. Ling Oi Primary School in Yuen Long, the principal explained the school motto to all the students. “Not to be served but to serve” – to light up oneself and to illuminate others for the benefit of the community – this became my motto when I grew up.

As my Grandma, mother and father have embodied this motto, I naturally engraved it on my mind.

My Grandma's refrains of “Practice charity, take the correct path” and “Contribute to education for the benefit of society” were deeply rooted in my mind. My father's dedication in business which

This "customer-centric" approach has influenced how I run my business and enabled me to build strong, trusting relationships with my customers

gained him the trust of the neighbours, and my mother's devotion to education... were all poignant examples of the concept "...but to serve".

I lived with my Grandma ever since I was little; my father's six siblings were like big brothers and sisters to me. They were my companions as well as role models. My four uncles and two aunts have different characters, however, they all achieved academic success and are dedicated to contributing to society.

Among the six of them, three were teachers. Uncle number four is quiet and introverted. He was admitted to the University of Hong Kong on the basis of his impressive academic performance. Due to the financial constraints of the family he had to work as

a teacher while studying at the training college. He is a learned scholar in both Eastern and Western studies. Aunt number seven is optimistic and outgoing. She was an English teacher and was loved and respected by her students. Though retired now, she still maintains contact with her students. Uncle number five achieved excellent academic results. After graduating from the Chinese University of Hong Kong, he went to Canada to continue studying and went on to became a professor at the University of Toronto.

From their examples, I realised that studying not only enriches ourselves, but also benefits all of mankind and earns respect. The international achievements of Uncle number five also impressed me; I wished to become a scholar like him and teach at a university.

As for Uncle number four, he loved gardening. He often pursued his hobby on the rooftop at home. He even demonstrated gardening at school. Today, I promote environmental protection and green

living to pay tribute to him after he passed away some years ago.

The other three worked in the service industry – the humorous Uncle number three first worked in a textile factory and then he started his own business like my father. He was very hands-on and dedicated to serving customers. He worked on stitching meticulously and diligently. Aunt number six is a nurse who devoted her life to the medical profession; she has served at several public hospitals. When I was growing up she also cared for me a lot. Uncle number eight is a responsible man who went to study in the U.K. and returned to Hong Kong to become a civil engineer, serving the Hong Kong Government and private enterprises. He is a person full of life – not just within the family but also with the family dog. He once built a kennel for the family dog when he was young.

John Locke, one of the most influential Enlightenment thinkers of the 17th century in Britain and pioneer of the American Revolution, said that, "Children are like a whiteboard, we have to shape their

thoughts through personal experiences and education is the most important training for them". Two thousand years ago, the Chinese educator Xun Zi said: "The fleabane growing in the field of hemp becomes straight itself without support", meaning that one can become virtuous by living among the virtuous. He pointed out the decisive influence of a postnatal environment to children's growth.

I grew up in a people-centric and selfless atmosphere of "Not to be served but to serve", my family members were vivid examples of the motto which was deeply rooted in my mind. This people-centric approach has influenced how I run my business and has enabled me to be trusted by my customers and build strong relations with them over the past 20 years.

Under the inspiration of words, deeds and guidance from my teachers and family, I grew up healthy and happy; it also laid the foundation of my success today. I am really very thankful to them.

Rising to the challenge

Since I was a child, I enjoyed creating something from scratch. There is great satisfaction in bringing something into existence single-handedly out of a blueprint.

Carpentry was once my favourite. Uncle number eight, a civil engineer, once built an amazing kennel for our family dog. I watched him drawing up his sketch, buying the required materials, cutting the wood, assembling and colouring, and then a fantastic kennel was there in front of me. It inspired me and woodwork then became my major interest after school. Once, I was the only girl attending a carpentry class but I enjoyed it very

"Never give up", and "A strong opponent strengthens you", mottos which drove me to entrepreneurship and progress

much and was not embarrassed by other people's stares. There was also a time when I loved pottery.

However, it wasn't until my first encounter with a computer that I really found my true love.

In the 1970s, personal computers emerged, but it was not until the 1990s that they became widely popular. In 1975, the first commercial personal computer the Altair8800 was launched, priced at U.S.$421 (around HK$ 3,241 at that time the HK dollar had not yet been pegged to the U.S.$); you had to pay an extra U.S.$200 (approx. HK$1,540) for assembly. According to an estimation, in 1977 the global production of personal computers was just over 40,000, of which only one quarter were purchased

by families, most of the rest were purchased by companies or professionals. By 2015, the global production of personal computers had already reached over 200 million in the first three quarters of that year alone.

When I was 14 or 15, I heard of a new thing called a computer which would one day be the master of our future. I was fascinated by it and started my journey of exploration.

An assembled computer was too expensive for a secondary school student like me, but I didn't give up. I began to assemble a computer on my own – I bought the motherboard, hard drive, memory and other parts to assemble the computer myself. I travelled an hour after school by bus no. 68 from Yuen Long to the computer centre in Sham Shui Po. In the beginning, the shopkeepers probably just considered me a small girl and didn't bother to entertain me. However, I persisted and continued to

hang around the shops regularly. Gradually I got familiar with them and jotted down every little bit of information I could gather. This was a skill I had developed from compiling a notebook which categorized geographic information from all around the world. I saved my pocket money to buy computer parts and I shopped around assiduously to make the most of my limited budget.

I was of small build but the computer parts were heavy. The shopkeepers wondered how I could carry the computer parts around. Somehow I managed to drag the bag of computer parts home. Soon I found the speed of my computer was constrained by the motherboard and I had to save money to upgrade the motherboard. I also saved money to buy computer books which were expensive since only English language versions were available. These not only addressed my queries in assembling

computers, but also updated my knowledge. I almost buried myself in those books at the time. Gradually the shopkeepers came to accept me and we frequently discussed the latest developments in the computing field.

I loved to play computer games, particularly during the stressful times while I was revising for examinations. I learned to play chess on the computer and after studying a chapter, I relaxed by playing chess. This approach helped me get through that period. Fortunately, I frequently excelled in examinations and I even won a scholarship.

I believe that it was by luck and chance that I became interested in geography and computers whilst studying in primary and secondary school. Through immersing myself in those two subjects, I found my direction for my university studies.

My Grandma often teased me about being so engrossed in something that it was as if I had fallen in love. I compiled my own geography encyclopaedia while in primary school, I assembled my own computer while in secondary school and I studied GIS when I was in university. These all gave me great satisfaction in starting something from scratch. I was excited by the feeling of marching towards my goal; even when the path was unclear and difficult or I was beset with obstacles. I was never deterred. The greater the challenge, the more motivated and determined I became.

"A strong opponent strengthens you", this motto is not only relevant to young people. Jack Dangermond, my mentor and friend, aged 71, is an embodiment of this motto. Over the past years, there have been many ups and downs in the technology industry - the trends of Sony Walkman, Nokia 'banana-shaped'

mobile phones, pagers, etc., eventually they all faded out. Jack established the GIS software company Environmental Systems Research Institute (also known as Esri) in 1969. The privately-held company managed to survive at least “five tectonic shifts in technology” (Forbes 2015) and intense competition over more than four decades by continuously innovating and keeping up with the latest technologies. Today, Esri has 350,000 clients from public and private organizations to governments worldwide. Each day, Esri creates 150 million new maps. The title of a recent Forbes article summarises this concept "You Cannot Kill Jack Dangermond's Company. Try, And It Will Only Get Stronger."

“Never give up”, and “A strong opponent strengthens you”, these mottos drove me to entrepreneurship and progress. I would like to share these important concepts with all young people today!

The source of happiness

I had never thought of starting a business. When I was young, I always thought I would become a teacher. However, I chose to start my own business 20 years ago. I believed that by doing so, I could fully utilize my strength and potential.

I loved playing table tennis when I was in primary school. At University, I was a member of the table tennis team and I won several championships for my dormitory, Simon K.Y. Lee Hall.

At that time, the University hired a mainland coach to train us. The coach walked me through a strength and weakness

When choosing a career, find out what motivates you most and then focus on that

analysis. I was short and small so it was disadvantageous for me to play long shots or short shots as it was easy for my rival to win those points; but I was nimble so I could react quickly. The coach asked me to practice a strategy of "edge ball" which involved pushing the ball towards the four corners of the table, especially near the net. This technique could beat tall opponents. I practiced hard day and night. As a result, our team won the Hall Table Tennis Championship thrice.

However, my greatest interest was still with maps. I loved reading maps when I was in primary school. I did not have much entertainment at that time; going to the library was my only option. Since I was small and short, I could only reach the lowest

level of the book shelves where all the heavy and big maps were located. Through those maps, I acquired a lot of knowledge about the world and its history.

While in secondary school, I began collecting different map displays. The first item in my collection was a first-day cover of a Hong Kong map, launched in 1984 showing the 1819 China map which is in the University Museum of the Fung Ping Shan Building and was printed on a HK$5 stamp. Among my collection of over ten thousand maps and more than one hundred globes, the oldest one is a wine glass engraved with the world map which I bought in an antique market during a tour in Spain. As claimed by the shopkeeper, the glass is said to be dedicated to a European emperor, the aluminium frame supporting the glass could focus heat to warm the wine. You can imagine that the emperor was fascinated by the map while drinking wine which could have led him to explore the world.

Geography was my clear choice of subject to study at University. After graduation, I eventually started my business in the Geographic Information System (GIS). In 2003, as the Severe Acute Respiratory Syndrome (SARS) epidemic struck Hong Kong, I spent three weeks drawing up the world's first ever SARS map to show the spread of the virus. The map not only benefited Hong Kong people, but was also adopted by the Center for Disease Control and Prevention in the United States as well as the World Health Organization.

Through this, I realized that combining one's strength with one's interest could deliver impressive results and bring one great satisfaction.

There is an article written by Robert Steven Kaplan, the Dallas Federal Reserve Bank President and former Senior Associate Dean of Harvard Business School, which talks about human potential and careers. When he taught at Harvard, he

was the mentor of many senior executives and MBA students; he was surprised to see that so many high flyers were full of frustration or even regret. They thought they had pursued the wrong career, but that was too late to make a change. The article encourages us to look deeply into ourselves in order to recognise our strengths and weaknesses and bear these in mind when choosing a career. Find out what motivates you most and then follow that. If you follow others blindly in choosing your career path, you will end up regretting it.

Actually, I love playing basketball as well. Although I seldom participated in the matches in primary and secondary school due to my height, I enjoyed being the captain responsible for co-ordination and arrangements for various basketball matches.

Regardless of whether it is at work, during studies or in social activities, if you can find a position in which you can contribute and be a part of an organisation, that is the path to satisfaction and happiness.

My encounter with GIS

At the University of Hong Kong (HKU), my major was Geography and my minor was Economics. At that time, Geography covered a wide range of topics, including urban planning, environmental studies and even underground and ground surface building design.

When I was in years 2 or 3, there was a class taught by a visiting professor on the Geographic Information System (GIS). My first feeling was that GIS could provide a framework for the future. I have been in love with maps since I was in primary school when I categorized and consolidated the information such as

topography, climate, language, and culture of different countries in a notebook to form my own encyclopaedia. However, with the growing amount of information collected, it was getting more and more cumbersome to illustrate all this information on paper. At that time, I could not think of any better way to solve this.

GIS combines geography, cartography and information technology. When the data is linked with spatial location, such data can be easily retrieved by organizations and individuals, thereby assisting them in decision making and improving productivity. Using computers to analyze and organize multi-level geographic data is much more convenient than using paper maps.

The GIS class enrolled only 20 students and I was fortunate to be one of them. Out of the 20 students, I was the only one who continued in the GIS field after graduation.

By establishing a market for GIS, there was an opportunity to solve the problems arising from paper maps, whilst also bringing together the innovative technology, innovative people and creative thinking that could enhance Hong Kong's competitiveness

It was satisfying to be able to complete the first vegetation map recording plants for the World Wildlife Fund Hong Kong and the Hong Kong Government. Due to Hong Kong's unique geography and climate, the diversity of plants in Hong Kong surpasses that of the United Kingdom. The vegetation coverage is very important to Hong Kong as it is an indicator of environmental protection. In producing the map, I was very proud of having the opportunity to apply my expertise and knowledge of GIS to contribute to society. Later, I jointly established Hong Kong's first ecological database with the teachers and students from the Department of Ecology & Biodiversity at HKU, this provided data for the study of Hong Kong's ecology.

I also taught GIS at HKU. Initially, I was satisfied to be able to spread knowledge about GIS, but later I wanted to do more to promote GIS beyond just teaching that class. As there were only 20 to 30 students in each class, even if I taught for eight or ten years, that would only reach several hundred students so the potential influence of this small group would be limited. At that time, GIS was only a little known subject in the University, the Government and business sectors were still using hand drawn paper maps, lagging far behind other countries such as the U.S. and Canada.

To promote GIS, I realized that I had to step out of the University, to leave my comfort zone and to start my own business. I needed to introduce GIS to potential customers, thereby establishing a market which would become a self-sustaining environment to create employment opportunities for students to apply their knowledge. By doing so, I could solve the

problems arising from paper maps and, at the same time, bring together innovative technology, innovative people and creative thinking. This would also help to develop a new economy and a new market and thus enhance Hong Kong's competitiveness.

Therefore, I decided to invest all my savings in the new business to promote GIS. This bold decision was not supported by my friends and relatives who feared that I would ruin my teaching career.

At that time, the legendary story of Otto Wallach (1847 - 1931), a German chemist who won the Nobel Prize in chemistry in 1910, came to my attention. He loved literature and art when he was young, and his parents supported his interests. But later, he fell in love with chemistry as he found that his meticulous character was well-suited to the field, so he decided to devote himself to studying chemistry. "The spark of knowledge was

ignited at once," resulting in the development of a truly great chemist. His story demonstrates that combining one's unique character and interests can deliver impressive results. In fact, I had analyzed the market conditions and I was certain about my decision – I was only in my 20's, without family dependents and I could afford to make such a bold move.

After making up my mind, I proceeded on my entrepreneurial expedition.

Where is the silver lining

I had plowed all my savings into the new business by 1997.

To start, I rented a small office of 200 sq. ft. in Sheung Wan, which was also convenient for my part-time teaching in the University of Hong Kong. The rental was low as the office was opposite to coffin shops and salted fish shops. In the early days of operation, I had to handle all the tasks myself including painting the office and installing the cable wiring. I used second hand furniture and an old telephone. To reduce running costs, there was only one telephone line which was shared between

the telephone and the fax machine. I began work every day at the office by boiling water, since distilled water was too expensive. Once, a customer called while the water was boiling, I had to answer a series of tough technical questions while at the same time keeping an eye on the water being heated and then someone knocked on the door to collect cheques. That was my typical busy working day.

After settling in, I called the largest GIS software development company Esri (Environmental Systems Research Institute) in the United States to propose my business plan and exclusive cooperation program. I had previously won the first scholarship sponsored by Esri in Asia when I was studying at the University and that had given me the chance to practice at their U.S. headquarters. Through this I had known the staff at Esri for some time. This time, however, I visited them to discuss business

cooperation with my new company. We met six times, the first meeting was with their lawyer and the procurement department, accounting department, etc., to discuss terms and work out the details. Since this was the first official cooperation, they asked me to buy more of their products to save transportation costs. In the end, I filled two large cardboard boxes with their promotional materials, and carried them myself to the airport for delivery to Hong Kong.

As soon as I was back in Hong Kong, I started selling the products to different customers. In the early days of my new business, I was rejected and given the cold shoulder many times. There was one customer who told me at the first meeting, “You are here only to sell something... I do not think there is any problem with the hand drawn map I am using". At the second meeting, he said, “You sell software, but we do not

It seemed there was no light at the end of the tunnel, but launching a new business is very rarely smooth sailing.

have a computer hard drive". I originally intended to give them a dual-core computer for trial use, but he rejected that. He said, "I want a quadruple core computer!" The quad-core computer was expensive at that time – take Random Access Memory (or RAM) as an example, it cost me U.S.$100 (HK$780) for 1MB in the 1990s. In the last 20 years, its price has dropped significantly and the current price of 1MB is less than U.S. 1 cent! But with no argument, I gave him the hard disk of the digital computer with GIS software installed. At the third meeting, he asked me to train his colleagues one by one on how to use the software. At the fourth meeting, he asked me for reference books for free and he still hadn't paid me a cent by then.

At this time, I slept only four hours each night and often stayed up late to prepare sales pitches. During the day I travelled to and from the customers' offices, carrying a large and heavy computer to provide service without payment. However, I was determined and remained focused. Retreat was never an option, even though at times it felt like I was walking in an endless dark tunnel without any light in sight. But no entrepreneurs have an easy time during the early stages of a new business.

Fortunately, my effort was gradually recognized by the customers and we built up friendships and mutual trust over time. Eleven months of hardship finally earned me the first deal.

That was not the end of the hardship however. I could finally afford to employ a colleague to assist my business operations and I sponsored her to go to the U.S. for GIS professional training which was not available in Hong Kong at the time. Unfortunately,

she passed away from cancer several months after completing the training.

She brought me a book – Building a Successful Software Business – from the U.S.. The book, a symbol of my colleague's protection, has been with me over the years. Due to word of mouth, and my colleague's blessing, my business was gradually on track. Three years later, we had signed up over 200 customers from the public and private sectors.

No room for doubt at 20

Twenty years have gone by.

At the age of 20, many people are entering the prime of their lives, people have many queries and are still exploring. The company has had many ups and downs during the last 20 years and I have experienced a great deal of personal growth. Witnessing all the turmoil in Hong Kong and the global markets over the last 20 years it seems that 30 or 40 years had gone by in the past two decades. Confucius said, "At thirty, I established my goal; at forty, I had no doubts." Although the company is only 20 years old, it has been through so much it is like someone

with 40 years of experience. Today, I have a clear vision for the company and do not have any confusion or doubt.

Teaching remains my lifetime goal, even after working in the business sector for many years. My work in business was often related to teaching. In the first ten years of my business, I had to juggle GIS teaching among different universities. Every time I moved to a new office, I would reserve space for a training room and a library, so I could teach my colleagues and customers about GIS. The training room was sometimes borrowed for lectures as well.

Looking back I can split the time into phases of 5 years. The first 5 years (1997-2001) were focused on business development

Although the company is only 20 years old, it feels as though we have had 40 years of experience packed into that time.

and it was also a critical period for laying a solid foundation for the company.

In 1997, Hong Kong was returned to Chinese sovereignty, it was an epoch-making year. The following year, there was the financial crisis in Asia, Hong Kong's economy slumped, property prices dropped and there was deflation as well as a rise in unemployment. I started my business in that difficult year. I visited different customers alone every day to provide them with a full range of solutions, covering hardware assembly, software support, staff training, and operating notes. I never forgot the details of a customer's request. During the first eleven months of entrepreneurship, I experienced the hardship of having no income.

Young people can be bold. I was not scared by the situation; rather it drove me to press on. Every year, I managed to spare time to attend the world's largest Esri User Conference in the U.S. to learn different creative techniques from over 3 million professional users across the world. I was also invited to speak at the Conference to illustrate and promote Hong Kong's GIS experience in the international forum.

In 1999, I boldly organized the first Hong Kong User Conference on GIS. People might have considered that such a move would be a waste of resources for a start-up company which had been founded for only two years ago. It seemed too aggressive to them. However, my mind has always been focused on a goal – to promote GIS, to share my international experience and to enable Hong Kong to move forward in the international arena.

My efforts were gradually recognized by customers, mostly government departments which have adopted our software in building a huge database to solve operational problems. In 2000, the Millennium Bug crisis created a significant opportunity for us to expand. The Millennium Bug or ,Y2K, was an issue which would lead to possible computer programming errors. Computers could potentially malfunction when processing the date transition to 1st January, 2000. At that time, many companies wanted to ensure a safe transition of their operations from 1999 to 2000, there was huge demand for hardware and software optimization. However, as the problem was unprecedented and unpredictable, many software companies were reluctant to take up these projects. Unfazed by the new challenges our team worked day and night to meet the needs of our customers irrespective of their company size.

As a result, our company's position was established and our reputation spread like wildfire, enabling us to move into the second five-year phase smoothly.

Speechless gratitude

In the first five years it was the united effort of my colleagues that helped to build a solid foundation for the company.

Our business developed rapidly in the second five years (2002-2006), the company's business and employees doubled with steady growth.

We were among the first group of tenants that moved into Cyberport which was the first community in Hong Kong specifically for technology tenants. As a local IT startup, I naturally supported the idea. However, it was a tough decision to move to the newly established site. Its remote location and

poor provision of public transport made it difficult to access for our colleagues especially those living in the New Territories and Kowloon. I was grateful that many colleagues continued to work hard with me, despite such difficulties. Today, the company has achieved a degree of success, which I am obliged to attribute to the selfless dedication of my colleagues. I cannot fully express my appreciation and gratitude to them in words!

In 2003, during the epidemic of SARS in Hong Kong, people were afraid to go out. There were virtually no tourists and the traffic at the Hunghom Cross Harbour Tunnel during weekend nights was so light it frightened even the most experienced taxi drivers. However, even in such difficult times, I never thought of making any redundancies as we were a team.

At that time, it seemed there was no end to the disaster. Everyone was dejected and disheartened. In order to raise the

The company's success should be attributed to my colleagues' selfless contribution to the company

team's spirits, I boldly organized an Open House event to let customers understand our company and learn about the latest software applications.

Many colleagues disagreed with my idea at the time. They thought it was a waste of time and effort. Despite their unwillingness, they kept up their professional service and worked on diligently. On the morning of the Open House Day, the 20,000 sq. ft. office was crowded with visitors. Many officials from various government departments as well as representatives from public and private organizations attended. I was deeply impressed to see this spectacular event that I would never forget.

As a result, not only were my colleagues inspired, but our

customers were excited by such a great event amid the gloomy economic situation under the SARS threat. Recently, I read some valuable advice from American business magnate Warren Buffett to start-up businesses, "Don't just satisfy your customers; delight them!" I understood the importance of that with a knowing smile!

During the SARS outbreak, my team and I worked day and night to create the world's first SARS map, so that the public could have a clear grasp of the epidemic. This map was adopted by the Department of Health in Hong Kong, the Center for Disease Control and Prevention in the U.S. and the World Health Organization, the U.S. media also used our map when reporting the news!

Customer enthusiasm and recognition strengthened my confidence even during the economic doldrums; and I was committed to substantial investment and business expansion.

To enhance the team's international exposure and introduce the most advanced GIS software applications, user experience exchange is very important. Therefore, I made yet another bold decision in 2005: to hold the first ever Esri Asia Pacific User Conference in Hong Kong in 2006. It was a big challenge for a small company to organize such a large event for the first time. Despite the challenge, we managed to successfully host the Conference thanks to the dedication and spirit of our team. The Conference was attended by 500 users from twenty different countries. Their international experience stimulated Hong Kong users and inspired them to develop a broader scope of software applications.

Our company had gone through two wonderful five year phases by this point and the business was on track; it was time for me to move forward and further expand the business.

Life is like a box of chocolates

In the third five year phase (2007-2011), we experienced the 2008 global financial crisis which significantly weakened Hong Kong's economic recovery. Inevitably our company was adversely affected. Fortunately, we had built a solid foundation during the previous 10 years and we had previously survived the Asian Financial Crisis, so we knew how to cope with difficulties and tough times.

Gradually, I was able to spare time to engage in more public service. There was a period when I was a government-appointed member of numerous advisory bodies, including the Education

Bureau, the Town Planning Board and the Independent Commission Against Corruption; I also took up 20 public service positions.

In 2011, we used GIS and Web 2.0 to develop the "Tree print 2.0" mobile application and online platform to promote e-education and environmental conservation. It was a perfect combination of crowd-sourcing and an internet and mobile application for smartphone users to download for free. This enabled the messages of tree conservation and environmental protection to be easily disseminated to the public.

I ended up spending more time on public and social services than in my full-time job. The company's operation relied heavily on my colleagues who had been ably assisting me for so many years. Without my colleagues, I could not be such a headstrong woman.

In the fourth five year phase (2012-2016), the company's business was stable. We faced fierce market competition but we kept up with the latest developments and launched a cloud-based system to install the software for mobile platforms such as smartphones and tablets, which could be conveniently used by professionals away from the office.

The customers were increasingly demanding, so we strived to adjust our methods of operation, including cooperating with other IT companies to combine our respective strengths. In a project that was similar to when we made the 360-degree 3D video of the streets of Hong Kong for the Government, we worked with a foreign high-tech company to shoot the streets and then combined that with computer drawn maps, so users could have more accurate information.

I also planned a succession program. Everyone was surprised by my planning for a successor since I was only in

As long as I remain focused on my original goal to contribute to education and support society when you have the capacity – then I can calmly face any external turbulence.

my early 40s. In fact, this idea had been growing since the 10th anniversary of the company. I observed the performance of our colleagues and encouraged them to continue studying and expanding their knowledge. I wanted to accumulate a pool of talent to ensure the continued healthy development of our business.

As for myself, I have been spending less time in the office, and I take up fewer official positions although I still continue with my social services. I launched several social service projects in 2016, such as the Good Map which listed over 500 social enterprises in 18 districts, including catering, laundry, environmental products, post-natal care, child care and car

repair, etc. The Good Map enabled the public to search for social enterprises, the map listed details of them and their operating rationale. I hope that the Good Map will help disadvantaged people to find jobs and facilitate work training for different trades.

In 2014, the U.S. Headquarters of Esri promised President Obama that the company would provide primary and secondary schools as well as kindergartens (K-12) free usage of the company's professional software called ArcGIS Online. I tried to bring the project to Hong Kong when I heard the news. After a lot of effort, the free electronic education program named Map in Learning (MiL) Program finally arrived in Hong Kong. By the end of 2015, we launched the MiL Program in some primary and secondary schools, the response we received was tremendous. By 2016, when the MiL Program was officially launched by the Education Bureau, there were over 100 primary and secondary

schools participating. It was encouraging to witness the creativity of the teachers and students in how they made the most of this opportunity.

I hope that the MiL Program will inspire young people, and nurture more talent for the development of our smart city.

Another project I have championed is the Esri Startup Program. It is a continuation of the U.S. Headquarters' subsidy scheme to encourage young IT entrepreneurs. The company offers free usage of software and provides training and technical support to start-up businesses. The start-ups also have a chance to attend the largest Esri User Conference to learn how to use the software from the world's top users and developers. I act as a mentor to these start-ups, providing business advice and introductions when necessary. I hope to help these young entrepreneurs.

At the same time, I also founded the non-profit organization Smart City Consortium, and I acted as Chairman of the Steering Committee. I hope despite the problems, to bring together the elite leaders from the business and non-government sectors, in order to propose strategies to the Government to develop Hong Kong as a smart city. Within two to three months of establishment, the Consortium has recruited more than 100 individual and corporate members. Support from all these sectors has also confirmed that we are on the right track. There will be more exciting developments by 2017.

Last but not least, I have been appointed as an honorary professor in the Department of Computer Science at the Faculty of Engineering in the University of Hong Kong where I will teach on a masters course that focuses on smart city concepts. I look forward to interacting with young people; and to their sparks of intelligence and academic excitement.

Looking back over the past 20 years, the world has continued to change at different times. As the movie character Forrest Gump observed, 'life is like a box of chocolates' with so many unknowns it can be hard to keep track. However, as long as we stay focused on our original goal, just like my Grandma's exhortation – contribute to education and society when we have the capacity – then we can calmly face external turbulence and continue our journey.

Family

My happy childhood was cocooned in the love of my Grandma.

Hobby

My love of maps, playing table tennis, gardening and nature since I was young remains unchanged.

The University of Hong Kong

HKU moulded me into what I am today - I encountered Geographic Information System (GIS) which combined my two interests: maps and computers. Most importantly, I met life-long mentors there.

Cyberport

As a local IT start-up, I naturally supported Cyberport which is the technology hub in Asia. We were among the first group of tenants to move in.

Esri

To promote GIS, to share my international experience, as well as to enable Hong Kong to move forward in the international arena, Esri China (Hong Kong) has held a number of user conferences for customers in the region.

No Doubt at Age 20

Although the company is only 20 years old, it feels as though we have had 40 years of experience packed into that time. Today, I have a clear vision of the way forward for the company.

SEARCH 2nd stop: Beyond Hong Kong

The global ranking of Computer Science & Information Systems departments in our universities has historically been high, while our young people are also well-known for their creativity. They are able to take up the challenges the world is facing today if their potential can be fully realised.

The discussion of the latest technological trends in this chapter is to inspire our youngsters. To all young men and women, our future is in your hands, please lead us onwards.

Young Man, what have you got to lose?

While everybody was looking at the latest QS World University Rankings released in April 2015, my interest focused on a specific subject: Computer Science & Information Systems, which gave me a big pleasant surprise.

The surprise came from the international recognition of our local universities – Hong Kong University of Science and Technology(HKUST), The University of Hong Kong(HKU) and The Chinese University of Hong Kong(CUHK) ranked 8th, 12th and 18th respectively, all within the top 20. HKUST is the best among universities in Asia, while its rivals in Singapore and South

Hong Kong's brilliant yet functional inventions and developments show great business potential. The question is: how can we keep the creativity sprouting, growing and prosperous?

Korea ranked after them - National University of Singapore 11th, Nanyang University 21st, Korea Advanced Institute of Science and Technology 39th and Seoul National University 42nd.

Our distinguished tertiary education in IT is well recognized, but why can the same not be said about our IT businesses, especially with the number of startups falling behind our neighbours?

A research study in April 2015 on Hong Kong's youth and their aspirations shed some light on the issue. The study interviewed more than 1,500 young people aged 15-39. When asked about their preferred mode of employment almost 60 per cent of the interviewees wanted to be a full-time employee. Only 15 per cent of respondents considered starting their own business. However, the

figure for entrepreneurs climbed to 25 per cent for people in the age range of 35-39.

Young people do not need to be so cautious, especially when the sky is the limit to their creativity and potential. Three people that have changed our lives enormously all started to pursue their dreams in their 20s: Mark Zuckerberg created Facebook at the age of 20, Bill Gates was also 20 when he left university to follow his dream and Steve Jobs launched his start-up aged 21. I also followed my dream in my 20s and started my own business after quitting a secure teaching post at HKU.

Have young children been taught to play so safe now that they do not dare follow their dreams?

I've been supporting and participating in various youth development activities for years, this gives me a good understanding of young people. The implications of this research about Hong Kong's young people disturb me a great deal. The

Hong Kong ICT Awards 2015 showed there are so many young talented people whose inventions are not only inspiring but also addressed our community needs, such as the requirements of our aging population. One of the winners was two Form Four students whose Mind Foot Print enables real-time monitoring of brain waves. This device works together with a GPS location tracking system to automatically alert rescue teams when someone is falling into a coma, potentially saving their lives.

In light of the ageing problem around the world as well as here in Hong Kong, this brilliant yet functional invention shows great business potential. The issue is: how can we keep creativity sprouting, growing and prosperous in Hong Kong?

In Hong Kong, many young people lose their enthusiasm for ICT inventions because parents can't see their potential and do not support them. When compared to careers in secure and stable alternatives many parents view ICT start-ups and

innovations as too risky. As a result talented and brave ICT entrepreneurs move to mainland China or overseas in search of angel funds or venture capital for funding.

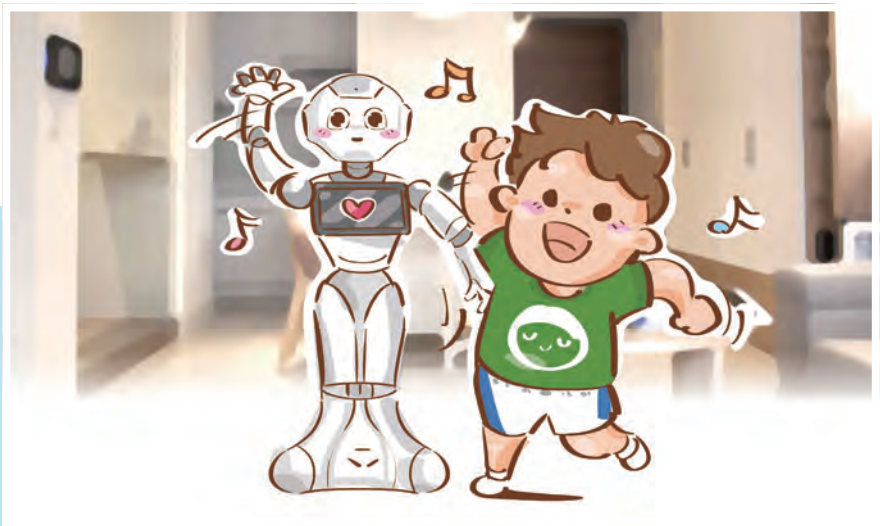
The latest Blue Book on Urban Competitiveness, issued by the Chinese Academy of Social Sciences, criticized Hong Kong for having relied too much on its core industries of finance, shipping, tourism and professional services, as well as failing to offer sufficient support for companies working in innovation and technology and other small but emerging industries.

The commentary is really to the point! Bearing in mind that we have the best ICT education in Asia and a lot of talented young people, what we need now is action from the policy makers to pull our resources together. I sincerely hope the new government officials on Innovation and Technology will work harder to help create an encouraging environment so that our younger generation dares to pursue their dreams.

Written in May 2015

Rise of the machines:

China's robotics market can only grow



"China is engaged in a historically unprecedented effort to develop its robotic technology industry as it tries to catch up with the global leaders. At Alibaba's Singles' Day shopping extravaganza this year, for example, the sales of one model of a vacuum-cleaning robot jumped to 315 million yuan (HK$380 million), double last year's sales and 150 times that of 2011.

Service robots assist human beings, typically by performing tasks that are dull, dirty or repetitive, such as cleaning floors. The

robot usually looks nothing like a human – the vacuum-cleaning robot mentioned above, for example, is a round machine. Currently, there are three main types of domestic robots: small home appliances that perform basic household chores, machines that assist in childcare, and humanoid robots designed to provide company for the elderly and those with disabilities.

In China, development has mainly focused on small home appliances. An industry insider said there are three stages in the evolution of the domestic robot: tool, governor and companion. Presently, China is still at the "tool" stage, where robots are mainly used to do household chores. To progress, the country must enter the "governor" and "companion" stages, where the main objective is social interaction. There's a major push in this direction as an ageing population becomes a challenge in China and the developed world.

With rising demand for both service and industrial robots and strong government support buoying the industry, Hong Kong will do well to nurture its edge in technology

Japan, for one, is leading the field of humanoid robotics. Recently, it launched the world's first robot that can express emotions. The robot does not do any household chores but is designed to "make you happy". It can read emotions, recognising tones of voice and facial expressions, as well as give you "ardent attention", make small talk and even tell jokes. The robot was sold-out within a minute.

In China, the demand for industrial robots is even greater. According to the 2015 survey of industrial robots, by the International Federation of Robotics, the global operating stock of industrial robots in the country in 2014 was estimated to be

close to 190,000, or 13 per cent of the global total. The figure is expected to surge to 610,000 by 2018, amounting to over a quarter of global demand. These robots are now mainly used in the automobile industry and by manufacturers of electronic products, such as smartphones and tablets.

The relatively low penetration of robotics in the Chinese manufacturing sector today means improvements are likely to be dramatic when they do come. According to the survey, China's robot density is currently a mere 36 units per 10,000 employees, compared with 478 units in South Korea, 315 in Japan and 292 in Germany.

Hong Kong should not be left out, since it actually has a competitive edge in the field.

Take Insight Robotics. Founded by home-grown innovators, the fire detection robot, which is equipped with a thermal imaging

camera and a high-speed computer vision processor, is able to locate a single tree catching fire within a radius of 5km. DJI, a world-leading drone maker, is another legend. The founder of the multibillion-dollar company was educated at the Hong Kong University of Science and Technology, and the idea for the start-up was conceived while he was there. Meanwhile, the Chinese University of Hong Kong has also been actively promoting medical technology development through the introduction of robotic technology.

What's more, according to the International Federation of Robotics, among all the companies in the service robot market, 15 per cent are startups less than five years old. Continued growth and innovation in the industry is to be expected.

China's demand for both service and industrial robots is tremendous; Hong Kong must hone its edge in research and

development in the field. The newly established Innovation and Technology Bureau can help in that respect. I therefore have high hopes that our young people will grasp this golden opportunity to develop Hong Kong into a technological centre in advanced robotics."

Published in South China Morning Post on 1 December 2015

Virtual Reality: whatever you can imagine is what you can create

In August 2015, Time magazine predicted that the over 40-year-old virtual reality (VR) technology was 'about to change the world'. In the following month, the State Council of China announced an acceleration of the triple-play services throughout the country. These developments are suggesting that VR is ready to reshape our future.

VR is no longer limited to games and entertainment, it is used in education, beauty and fashion, as well as for vocational training and medical consultations

In China, a pilot test for triple play in selected cities was launched as far back as 2001. The aim of the trial was to promote resource sharing and interoperability among fixed line telephone networks, cable T.V. networks and broadband Internet networks. In other words, the state-supported policy encouraged a variety of services to be provided by a single operator, i.e. T.V. programs, Internet broadband services and fixed line voice services. In Europe, the U.S. and Japan, triple play or quadruple play (the bundling of fixed line, T.V., broadband and mobile networks) has been popular for years.

Triple play intends to promote stiffer competition, rather than network consolidation. Such change is bound to give subscribers

choice, which will directly lead to price reduction. Therefore, fierce competition or even price wars among service providers is likely to follow. Apart from competing in price, program content in particular, is crucial for operators to differentiate themselves from each other.

From triple play to VR

The answer to offering unique applications and program content is VR. That is why Facebook bought a virtual reality technology company, Oculus VR, for U.S.$2.3 billion last year. In an hour-long question and answer session on his social network, C.E.O. Mark Zuckerberg offered his view of the company's future—the focus on text, photo and video will one day change to an "immersive experience like virtual reality".

Recently Zuckerberg also showed off a new VR tool developed by Oculus VR that allowed users from different parts

of the world to play ping pong. Meanwhile, global IT giants like Google, Samsung, Sony and companies from mainland China are focusing on the development of other related hardware.

VR development in Hong Kong

In Hong Kong, most VR related research projects focus on its applications in the business world, including medicine, architecture and construction, logistics and retail, as well as video games and entertainment. This is a reflection of our economy's characteristics.

Most research projects are undertaken in the universities. One of them is the Virtual Reality Laboratory at The Chinese University of Hong Kong. It aims to provide multi-imaging data for surgeons to better understand the human anatomy and improve surgical skills accordingly. At the Hong Kong Polytechnic University, a VR based training program is being developed to

help patients with cognitive impairment. By providing virtual environments of a grocery shop or public transportations, patients suffering from learning disorder or brain injury can be trained for rehabilitation.

The University of Hong Kong has also invented a visualization system called imseCAVE, which simulates large and complex logistics environments, like air cargo terminals and port container terminals. It aims to provide VR-based training for ramp operations, as well as to allow managers and engineers to study the operational efficiency.

The Advanced Manufacturing Institute at the Hong Kong University of Science and Technology is also applying VR for developing product design concepts for manufacturers.

VR is becoming a reality with mainstream applications. They are no longer limited to games and entertainment for young

people, but also for the disabled or elderly, allowing them to shop or gather with friends virtually. Through VR, students can also study with teachers and their peers from all over the world. VR can also be applied in the beauty and fashion industry, as well as for vocational training and medical consultations.

2015 marks the 30th anniversary of the science-fiction adventure film Back to the Future. A few days ago, 21st October 2015, was the date to which Marty McFly travelled in the film. The film has proved remarkably prescient with regards to some future technologies, such as 3-D movies, video calls, fingerprint identification and smart eyewear. However, in others the world has advanced much faster than imagined by the film, for example the fax machine shown in the film has already faded out. Although shoes with self-tying shoelaces will be on sale shortly! Therefore, I anticipate that the immersive Augmented Reality (AR)

will become a part of people's everyday life soon. I look forward to seeing how the imagination of young people can unlock new horizons, brighten our future, and show us that "whatever can be imagined can be created"!

Posted on ComputerWorld on 31 December 2015

Computers are taking over the world? No way!

Do you remember Arnold Schwarzenegger's signature movie The Terminator?

I watched my all-time-favorite again recently. One of the scenes shows how Arnold, the robotic killer, welded and fixed the damaged parts of his body in a shabby motel room. A

cleaner passing by smelled the stink and asked if there was a dead cat inside. A few options for the response popped up for Arnold: “yes” / “ no” / “please come back later” / “piss off!” The intelligent robot picked the last answer which best suited the situation.

I am still fascinated by the artificial intelligence (AI) model shown in the 1984 production, which still looks futuristic even today. Now, 32 years after the movie, we are still developing and refining AI!

AI is about to take over the world

AI is generally defined as "the study and design of an intelligent agent which is a system that perceives its environment and takes action” that maximizes its chances of achieving its objectives.

It has been widely used in various areas. A few years ago,

The use of AI enables us to maximize the uniqueness of human beings creativity and imagination - to the fullest extent

Siri, which could respond to your questions like a living human being, was the favorite toy of many iPhone fans.

Wikipedia, with almost all of its articles available for editing by anyone and registering 10 changes made globally every 10 seconds, started to deploy an AI robot to address accusations of inaccuracy. The robot is able to detect bad or malicious edits and alert Wikipedia's human editor to take action.

Local AI development

In Hong Kong, the development of AI has also been picking up in recent years. The City University of Hong Kong was awarded the Best Business Application Grand Award by the Hong Kong ICT Award in 2014 for its Integrated System for

Engineering Works Management built for Mass Transit Railway Corporation Limited(MTRC). According to the judging panel, the system innovatively deployed AI technologies to manage numerous combinations of data including manpower, wagon, locomotive, equipment, location, and train speed. It aims to provide conflict checking and work optimization for more than 2,600 engineering works every week. By handling the complexity, the system is able to help MTRC bring safety to its more than five million passengers every day.

Another example is the use of AI for stroke diagnosis. The Hong Kong Polytechnic University has developed a new application that “expertly analyses brain scans” to help doctors determine if a patient is in a life-threatening condition. Immediate diagnosis and treatment within the first three hours of an ischemic stroke can greatly minimize brain damage. Therefore, the application which takes less than 10 minutes can help save lives.

Late last year, The Hong Kong University of Science and Technology launched the WeChat-HKUST Joint Laboratory on Artificial Intelligence Technology (or WHAT LAB). The mission of the lab is "to foster artificial intelligence and big data research to improve people's lives and advance the frontiers of knowledge."

For WeChat, which holds a vast amount of data from its 650 million active users, the integration of AI and data mining technologies can reveal more knowledge and insights about users' preferences and habits. This will enable WeChat to serve its customers better.

Challenges for AI

Straight-forward and toilsome tasks are exactly what AI is good at. However, complicated tasks leading to an ambivalent attitude similar to the response in The Terminator movie pose a great challenge for AI designers to imitate the human thinking process.

Last November, a motorcycle cop in the U.S. stopped a driver-less car and warned the two engineers on board for creating a hazard, as it was going at 24 miles an hour within a busy 35 mph zone. The cutting-edge, law-abiding creation is supposed to lead to a world free of accidents. But it is now doing the exact opposite unfortunately: the AI operated vehicles have racked up a crash rate double that of human drivers, according to a study by the University of Michigan. These were all minor scrape-ups most of which are, ironically, caused by inattentive human drivers.

So the major challenge for AI is how to integrate the human behavior and decision making process, which can be intuitive, illogical and even chaotic, in addition to the normal conscious step-by-step deduction.

Researchers at Stanford University in the U.S. have a creative approach on this issue: by using crowd-teaching. They

developed a virtual 3D driving game with California's highways as the background and invited human drivers to play the game. For the first time, an AI machine can learn complex driving skills from the behavior of real people.

According to media reports late last month, China's Ministry of Industry and Information Technology is about to announce the next five-year (2016-2020) implementation plan and one of the focus areas is artificial intelligence.

Are computers taking over the world ?

So will AI take over our world one day?

A well-known critic of AI, also the co-founder of Paypal and Tesla, Elon Musk, does not think so. He recently formed a non-profit venture called OpenAI. The goal of the venture is "to ensure that the scary prospect of computers surpassing human intelligence may not be the dystopia that some people fear."

The new organization will pursue the most advanced forms of AI and make its findings known on a royalty-free basis to the public.

By the use of AI, we can avoid repeated and mechanical works. This enables us to maximize the uniqueness of human beings creativity and imagination - to the fullest extent.

On that note, may I suggest that youngsters in Hong Kong grasp this golden opportunity to develop a more beautiful world!

Posted on ComputerWorld on 2 February 2016

Our future can't do without wearable technology

People in Hong Kong are becoming more health-conscious and interested in sports in recent years. The rising popularity of running and other exercises in Hong Kong seems to resonate with many findings from the global healthcare and medical research.

World Health Organization (WHO) has identified physical inactivity as the fourth greatest health hazard since 2011. The sports magazine Runner's World also advised that "sitting is the

new smoking - even for runners." The runner magazine quoted a 12-year study of more than 17,000 Canadians which concluded that the more time people spent on sitting, the earlier they died, "regardless of age, body weight, or how much they exercised". The article also stated a study published in the American Journal of Epidemiology indicating an 18 per cent higher risk of dying from heart disease, if a man sits more than six hours a day.

Sports geek drives wearables mania

The rising awareness of fitness among the general public is probably the reason why wireless-enabled wearable technology devices like Fitbit have become hot picks recently.

Wearable technology also called "wearable devices" or "tech togs" are computers and advanced electronic technologies incorporated in clothing and accessories. According to Signals and Systems Telecom's research, investors have poured U.S.$ 1

billion (HK$7.8 billion) into wearable technology startups in 2015.

The category offers a wide range of fitness tracking products from a smartphone-linked smartwatch, to standalone wristbands, stick-on tattoos embossed on the skin and fashion electronics. Data being tracked includes the number of steps, elevation, quality of sleep, and life vitals like heart rate, body temperature and blood pressure. The data can be stored and uploaded to computers.

A question of accuracy

Wearable fitness trackers like Fitbit have become so popular that its annual sales was expected to rocket to U.S.$1.8 billion (HK$14 billion) in 2015, a 140 per cent increase from 2014. As the sales figures of different fitness tracker products are skyrocketing, the data accuracy becomes a question.

According to an article from The Guardian, an Iowa State University study found an inaccuracy of up to 15 per cent to 18 per cent, when comparing the accelerometer-based fitness trackers, including Fitbit, against a portable metabolic system.

Aiming to deal with this problem, an award-winning innovation from a Hong Kong-based company, Well Being Digital, is raising the accuracy in fitness monitoring products by using multiple sensors.

The company's patented innovation uses all rounded multiple sensor technology that couples with longer wavelength optical sensors that can penetrate deeper under the human skin to gather a wide spectrum of exercise-related parameters on their smart devices. It has also allowed the company to win the Best Wearable Mobile Technology at the 2016 Glomo Awards,

With the increasing popularity of wearables, a huge amount of data will be recorded and collected, which will fuel further development of the Internet of Thing as well as the associated gradual growth of smart cities.

organized by the GSMA Mobile World Congress in February.

Business opportunities ahead

Meanwhile, more advanced wearable products are proactively tackling medical issues.

A wearable headband can be used to detect brain injuries; a disposable capsule with a tiny camera when swallowed can track the condition of your stomach and intestines. An ingestible sensor within a medication tablet to measure actual medication patterns and the physiologic response of patients with serious mental illness is currently under the U.S. Food and Drug Administration (FDA) review. Some wearables claim to be able

to correct brain waves, helping to deal with work related illness caused by depression and anxiety. The list goes on.

Health and fitness applications may just be the tip of the iceberg for wearables. Its business potential in entertainment and communications is much higher. According to Pricewaterhouse Coopers (PwC), the sales of wearables could reach 130 million units in 2018.

The same study from PwC also found consumers, particularly the millennials, are expecting wearable technology to offer anytime anywhere access to their favourite social media network. They are found to be three times more likely, than the general population, to list real-time social media updates as an important benefit of wearables.

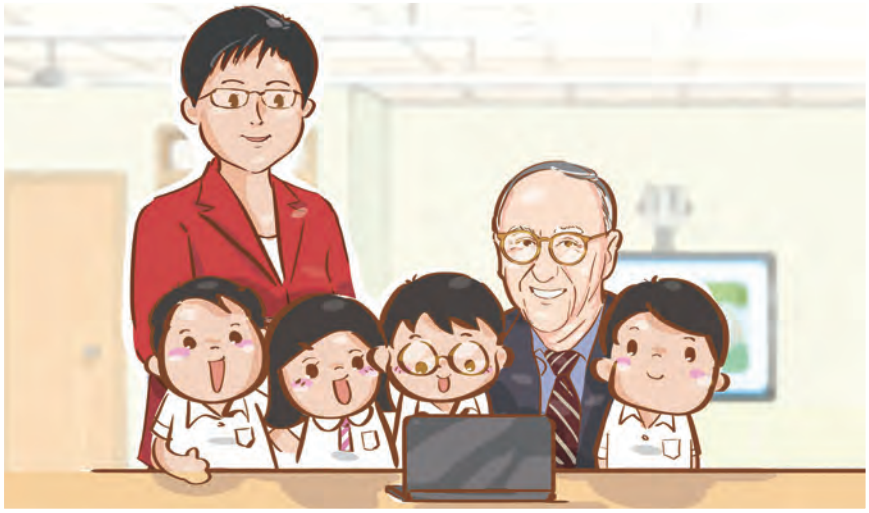
With the increasing popularity of wearables, a huge amount of data will be recorded and collected, which would further fuel the development of the Internet of Things as well as the

associated gradual growth of smart cities.

At the beginning of the Year of the Monkey, may I suggest the millennials to utilize their creativity and imagination for the betterment of mankind through wearable technology!

Posted on ComputerWorld on 30 March 2016

E-Learning for everyone!



Hong Kong has launched a free electronic learning (e-learning) program for all primary and secondary school students. It is a mirror of a program that commenced in the United States two years ago.

The free e-learning program in the U.S. was wholly sponsored by the Environmental Systems Research Institute (Esri), a private enterprise that focuses on Geographic Information System (GIS) software development. The sponsorship program was a response to President Barack Obama's warning that

those nations that "out-educate us today will out-compete us tomorrow."

Computers are not new to U.S. students. Nearly 70 per cent of teachers or students have been using them in classrooms since 2009, according to a government survey. However, U.S. student performance in STEM subjects (science, technology, engineering and mathematics) has fallen behind that of other developed countries. In the 2009 OECD "Program for International Student Assessment" (PISA) for 15-year-old pupils, held in 65 countries, students from the U.S. ranked only 23rd in science, and 31st in mathematics, while peers from Japan and South Korea were among the top four to six.

In response to President Obama's ConnectED initiative which aims to enrich education for every student in America through electronic learning, Esri's president, Jack Dangermond then decided to support the free usage of the company's GIS

software by all U.S. kindergarten, primary and secondary school students. This program has benefit over 100,000 schools.

Sponsored students can use GIS software and related professional map analysis tools originally developed for the government, public and private enterprises. Even better, they can use this cloud system on their smartphones, tablets and desktops anywhere. Through this initiative, Dangermond hopes to improve students' problem solving abilities.

As the Chairman of Esri China (HK), I feel proud when hearing such news. Deep down, I have always thought of bringing this educational program to Hong Kong, to inspire our students in the STEM disciplines, so that they may enjoy the learning process. After consultations with our U.S. headquarters and the Hong Kong Education Bureau, the free Map in Learning(MiL) electronic education program finally landed in Asia this year.

A free learning program in Hong Kong, to inspire our students in the STEM disciplines whilst nurturing a pool of talent for the smart city of Hong Kong

The MiL Program corresponds with the Education Bureau's "Life-wide Learning" paradigm, which prescribes student learning in real-life and authentic contexts. It provides students with a timely GIS analytical platform and relevant knowledge; it trains students to take full advantage of geographic information and enriches their learning experience.

Information already available on the GIS software platform includes demographic data (population and income), locations of local community facilities (libraries, beaches and schools), as well as global data on Gross Domestic Product (GDP), weather and even plate tectonics. Students can also upload other information

to the platform.

We started to contact local schools late last year and the response has been overwhelming! Over 100 schools have enrolled in the program. Amazingly, some youngsters have already utilised the software to explore the design of a footpath through an amenity area within their school compound.

I sincerely hope that the program will stimulate students' interest and enhance their learning ability while nurturing a pool of talent for the smart city of Hong Kong!

Posted on Harbour Times on 30 May 2016

Hong Kong regulators must not stifle the city's fledgling sharing economy

Many say the sharing economy is only for young people. A U.S. survey found that 68 per cent of workers in the sharing economy are between 18 and 34, while that age group constitutes only a third of the U.S. workforce, according to the Bloomberg research.

There is no official definition of the "sharing economy". However, it generally refers to activities organised around a technology platform that facilitate the exchange of space,

transport, goods or services between individuals across different sectors. The initial idea was to share resources on a non-profit-making basis. One of the best-known examples is Wikipedia; Vélo'v, a bicycle-sharing system first launched in Lyon 10 years ago, is another showcase.

The sharing economy offers flexibility to workers who can dictate their hours and, in some cases, set their own prices. Often, it allows customers to rent or buy products and services at a rate lower than through traditional channels. No wonder the new economic model attracts young people.

This is reflected by Uber's founder Travis Kalanick, who was 33 when he set up the most talked-about sharing economy platform. Brian Chesky was 27 when he co-founded Airbnb. Cheng Wei, the C.E.O. of popular car-hailing app Didi Kuaidi, was 27 when he established Didi Dache.

The new economy, instead of just displacing traditional jobs, has boosted customer demand. After studying Uber's internal data, Princeton University professor Alan Krueger, a former chairman of U.S. President Barack Obama's Council of Economic Advisers, stated in a co-authored report that there were clear benefits for "driver-partners" and noted that new financial opportunities have been created for tens of thousands of workers. What's more, because of lower prices for consumers compared with the traditional taxi dispatch system, Uber has attracted more customers, thus increasing income "for all workers with such skills".

Forbes estimated that the earnings gained directly by owners and workers from the sharing economy was well over U.S.$3.5 billion in 2013, with annual growth exceeding 25 per cent from the previous year. PriceWaterhouseCoopers predicts

A flexible but sound regulatory regime is needed to support promising local startups and enable our many young entrepreneurs to achieve their dreams

that the global revenue from the sharing economy could reach U.S.$335 billion by 2025.

The sharing economy is flourishing in many places. What about Hong Kong? Locally, we have several platforms established by youngsters aged around 20. One is a car-sharing site, Carshare, which encourages Sunday drivers to loan out their cars during the week. Presently, it has 1,500 cars and 20,000 members. Half use the service once a month. The daily average rate is HK$400-HK$500 and Carshare charges owners 30 per cent of the rental. A unique selling point is that it has taken out insurance to cover owners' and customers' liability.

Meanwhile, introduced in early 2015, tourist service operator, Sam the Local, provides a matching service between travellers and tour guides, who also set their own rate. Both pay a fee to the operator, of 10 per cent and 20 per cent of the rate respectively. Yet another service, the Gaifong ("neighbour" in Cantonese) app launched late last year, allows you to borrow or rent goods – from mattresses to musical instruments and electronic devices – from people nearby, rather than buy them.

Starting next year, people in the U.S. will be able to participate in equity crowd-funding. With approval from the Securities and Exchange Commission, small businesses and startups will be able to raise up to U.S.$1 million a year from almost everybody via online platforms. Currently, it is limited to "accredited investors" – people either with a net worth of at least U.S.$1 million or an annual income of at least U.S.$200,000. At the same time, Australia is in the process of reviewing the

investment regulations of equity crowdfunding for community energy projects.

Here in Hong Kong, regulatory issues remain one of the main hurdles for local entrepreneurs before they can operate in the same mode. To rectify this, the government must modify the antiquated legislation, to allow our young people to realise their dreams.

Published in South China Morning Post on 15 December 2015

Crowdfunding- an alternative financing for local startups

The hottest topic in town this year is definitely the local startups. Their creative business models, and often revolutionary ideas, are attracting attention beyond the Hong Kong border. Success of a startup, however, does not hinge solely on innovation.

Sustainability is even more important. Access to capital, whether it is for funding product development, trial rollout, or simply paying the first employee's salary is vital for young entrepreneurs. Alternative financing is a way out as bank loans are unlikely to be available to them due to the lack of a track record in profit making.

The rising availability of crowdfunding could be the answer for many small companies that create intellectual property.

What is crowdfunding?

Crowdfunding is to fund a project or venture by raising capital 'from a large number of people, typically via the Internet'. It was first seen in shares issued by the East India Company in Amsterdam at the start of the 17th century. The stock of the Dutch fleet 'was sold to a large pool of interested investors, who in turn received a guarantee of some future share of profits.' It was a huge success, over 1,000 civilian investors subscribed and raised capital equivalent to today's €100 million (HK$88.3 million).

According to a recent study by a research firm Massolution, global crowdfunding experienced accelerated growth in 2014, expanding more than 1.5 times compared to the previous year. Asian crowdfunding volumes grew by 320 per cent in the last year, to reach U.S.$3.4 billion, largely raised from the Chinese market. North America continued to lead the world in crowd-

funding volumes, and raised a total of U.S.$9.46 billion, which made up over 60 per cent of the world's volume. In 2015, the market is forecast to increase more than double.

How to start crowdfunding?

There are a few types of crowdfunding and equity-based investors obtaining ownership of a small piece of the business is the most popular. The funds raised ranges from a few million to tens of millions. The entry barrier of investment is relatively higher.

Small companies at the stage of germination or development, or Small and medium-sized enterprises (SMEs) with high potential, will find equity-based financing more attractive. According to the founder of a local startup that provides fire detection robots, a single test costs tens of thousands of dollars. This type of startup is unlikely to satisfy the profit and business

The local community is ready for an equity-based fund raising approach. The government should modify existing legislation to give Hong Kong's economy an energy boost

requirements for Initial Public Offerings (IPO) on the Growth Enterprise Market (GEM) board, so equity-based crowd-funding is the answer.

To encourage crowdfunding in the market, both the U.S. and China have established regulations and guidelines. The Jumpstart Our Business Startups Act ("JOBS Act") was established by the U.S. in 2012. In July, the People's Bank of China also issued the Guiding Opinions on Promoting the Healthy Development of Internet Finance ("Guiding Opinions") together with nine other Chinese authorities, including the China Securities Regulatory Commission. It aims to allow the participation of equity-based crowdfunding by both the accredited and non-accredited investors.

Shortly after the JOBS Act was passed, Duncan Niederauer, the retired CEO of NYSE Euronext, commented that equity-based crowdfunding 'will become the future of how most small businesses are going to be financed'. His forecast made three years ago is now materializing.

Getting HK ready for crowdfunding

While many startups across the world are tapping into crowdfunding to launch their innovative projects, the crowd-funding platform in Hong Kong is still in its infancy. Apart from the antiquated Hong Kong Securities and Futures Ordinance, there is no equivalent of the JOBS Act or Guiding Opinions in Hong Kong.

With increasing market demand, the local community is also ready for the equity-based fund raising approach. It is similar to the conventional securities and stock market mechanism,

in which the rules are nothing new to local investors. I believe the professional investors here also welcome more alternative investment options.

I strongly recommend that the government step forward in modifying the legislation. As such, we can maximize the opportunities brought by the digital era to give Hong Kong's economy an energy boost.

Posted on ComputerWorld on 19 October 2015

Future Food– Nature's nutrients

The global population will approach 10 billion by 2050, an increase of over 30 per cent when compared with 7.3 billion in 2015, according to the latest forecast from the United Nations. With improving economies in many countries, meat consumption is expected to double in the near future. For example, China's meat consumption per capita in the 1970s was 14 kg per year, while in recent years, the consumption soared to 52 kg per year - a fourfold increase. On the other hand, India's population is

expected to surpass China's to reach 1.6 billion by 2050. Their current meat consumption is only 3 kg per capita and it may also follow the trend in China.

How to feed the world's population has become the number one challenge of our day!

Consuming pork, beef and chicken not only satisfies our appetites, but also provides us with a major source of protein. However, rearing livestock generates a heavy demand on environmental resources as well as energy supplies. Rearing livestock takes up half of the Earth's arable land, one third of the available water, and generates half of the world's greenhouse gases. It is no wonder that people are striving to quickly develop alternative ways of providing protein.

Plant protein, by way of contrast, does not contain cholesterol or saturated fat. In China, people consume soy bean

Rearing livestock places heavy demands on natural resources and energy supplies as well as generating half of the world's greenhouse gases. We urgently need to develop alternatives sources of protein

products, such as, tofu and vegetarian goose; many people also substitute milk with soy bean milk. However, the soy product market has suffered in popularity recently, mainly due to concerns with genetic modification and estrogen-mimicking chemicals in soy.

Q is cool

The United Nations set 2013 as the "International Year of Quinoa". Coming from South America, quinoa is known as "Inca gold", and has been described as the 'perfect food', or a superfood, in recent years. The Food and Agriculture Organization of the United Nations commends quinoa as a promising food which can eliminate hunger and malnutrition;

NASA even selected it as the best food for astronauts. Quinoa is low-fat, low-calorie, low-sugar, and gives a fulfilling sensation at low consumption levels. It is rich in protein and fiber, and contains ten kinds of essential life-sustaining amino acids, iron, vitamin B, Omega 3, etc.

Algae is All Right

Another new star food is the humble algae. Scientists have discovered that micro-algae is one of nature's true superfoods. It contains more calcium, protein, iron, vitamins, minerals, fibre and antioxidants than vegetables. It is inexpensive to farm commercially, and can be grown in pools, similar to fish breeding.

A Bright Food Future?

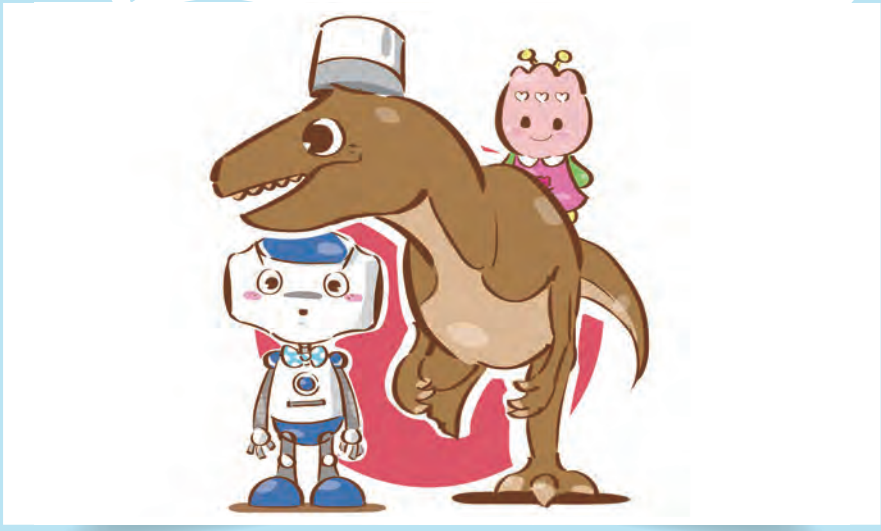
An American newspaper recently ranked the Top Ten Most Intelligent Countries in 2016. Hong Kong students scored an

average IQ of 107 and ranked Number One in the list, better than their counterparts in South Korea and Japan.

This is strong proof that young people in Hong Kong have a high potential and capability... accordingly, we hope we can count on them to use their imagination and creativity to explore the possibilities of our future food supply!

Posted on Ecozine on 18 August 2016

Hong Kong can learn from Japan's futuristic smart city tech development



In the near future, a series of smart city features will penetrate human society, causing major shifts in our lives and cultures.

The 2020 Tokyo Olympic Games will likely showcase some of these technologies. Here are some examples of what we can expect to see there:

Robots: Japan has always been active in robot research and development. It is expected that during the Olympics, a

The 2020 Tokyo Olympics will demonstrate Japan's progress in smart city technologies. Hong Kong has much to learn

large number of robots will provide foreign visitors with services including, translations, directions and taxi hailing, among others. These robots may be in the form of self-driven cars, tourist ambassadors or hotel receptionists.

Simultaneous interpretation: Foreign language proficiency varies in Japan. In light of this, the Japanese government is providing financial support to develop an application which can provide simultaneous interpretation in 27 languages, to be used in mobile phones and computers by both Japanese and foreign tourists. Companies are also developing a simultaneous interpretation device which can be hung around the neck and a mobile application which can scan and translate signs.

Fingerprint authenticated shopping: Japan has recently launched “fingerprint authentication” shopping tests with the goal of enabling tourists to use fingerprints instead of yen and credit cards when making payments during the games. This simplifies the tax refund process. Data will be encrypted and become big data for the analysis of tourist preferences and consumption patterns as well as for strengthening security.

Self-driving taxis: Japanese companies aim to launch the world’s first self-driven taxi services to cope with traffic troubles when 920,000 foreigners arrive for the Games.

Algae energy: Algae absorbs carbon dioxide when synthesizing its food and converts it into energy. In comparison with other green energy options such as solar energy, algae energy takes less space but it is currently much more costly. Aircraft manufacturer Boeing is currently working with Japan

Airlines, All Nippon Airways, the University of Tokyo and the Japanese government on research into transforming algae into aviation fuel.

Hydrogen energy: The Japanese government plans to spend ¥40 billion (HK$2.8 billion) on R&D that will pave the way for using hydrogen as an energy source during the Games. The Olympic Village will build underground pipelines to transport hydrogen with at least 100 hydrogen-powered vehicles, while the media center and athlete dormitories will also use hydrogen fuel.

It would be extremely exciting if any of the above technologies can be put into practice. Hong Kong would be wise to take note.

We can take a really big step forward in building a smart city, if the smart city blueprint to be announced by the local government covers a smart city road map, standards, as well as

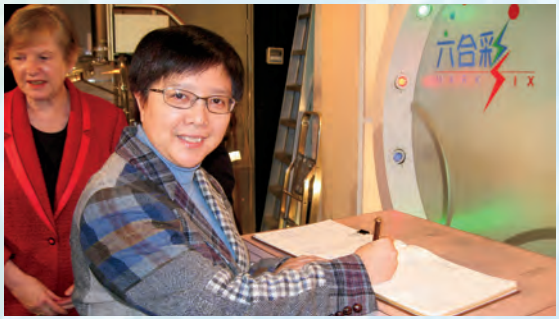
a mechanism for addressing the advice and recommendations of the public and various stakeholders.

I hope more people can actively participate during the public consultation stage in the second half of this year so that, together, we can build a better future!

Posted on Harbour Times on 13 June 2016

Social Services

In recent years, I have spent most of my time on community services as I have kept in mind Grandma's exhortation – contribute to education and support society when you have the capacity.



Innovation and Technology

Through actively attending IT events, as well as writing articles and publishing books, I hope to inspire young people in the area of ICT applications and innovation.

Young minds

Youngsters always energise me with their unbounded enthusiasm and inspiration. That is the reason why I like to interact with young people, for example by being a mentor to share my experience in business and life.

Contribution to the Community

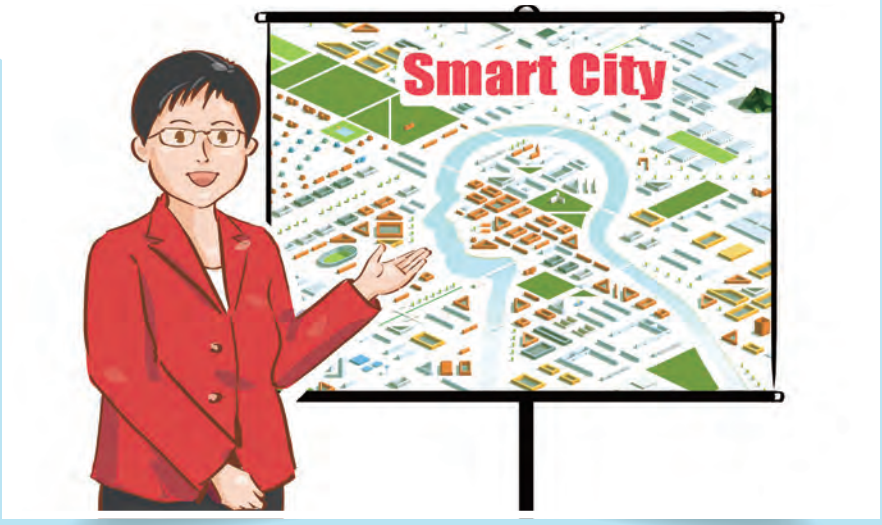
I am glad to have contributed to society through various sponsorship programs, e.g. the production of Good Map which listed over 500 social enterprises, providing free GIS software for local primary and secondary students for online learning, and supporting projects such as Tree Print and the Buddhist Botanic Garden to promote green life.

SEARCH 3rd stop: Around the World

The future of Hong Kong relies heavily on development as a smart city which is a complicated concept and requires popular consensus. How can the government best formulate policy and, most importantly, get people's buy-in?

This chapter looks into the issue from a macro perspective and proposes the way forward.

Hong Kong needs a tech upgrade to diversify its ailing economy



The public consultation on retirement protection has attracted overwhelming social attention. A reliable and balanced retirement scheme is important to our society, but equally crucial is the government's technology drive for a better economy. In this way, Hong Kong will be better equipped to face a host of challenges. As an advocate of Hong Kong's information technology development, I have some suggestions for the upcoming policy address and budget.

Firstly, Hong Kong needs to be a smarter city. Singapore and some mainland cities picked up top awards in the region recently with their outstanding smart city initiatives. Together with Seoul, these emerging smart cities have demonstrated how new developments can lift residents' quality of life. The government should therefore extend the pilot Kowloon East smart city scheme to cover the whole of Hong Kong.

Meanwhile, the government should seek to integrate all related information, on city planning, transport, medicine, commerce and logistics, to better co-ordinate and manage the planning, construction and operation of Hong Kong as a smart city.

Secondly, we can create a greener world through the internet. While nations agreed at the U.N. climate summit in Paris to cut greenhouse gas emissions, the success of the accord

relies on the co-operation of governments and communities. At the same time, Paris is ambitiously increasing the greening of the city following an online poll in 2015; one million square metres of roof and building facade greening will be installed by 2020. The "gardens on the walls" initiative aims to achieve a better climate, cleaner air and biological diversity. We should adopt something similar.

Thirdly, we can create a better future for our ageing population through e-health initiatives. Savings of 10 to 20 per cent can be achieved on total health care costs through e-health, such as, telemedicine (diagnosis and treatment from a distance) and the use of mobile devices (providing health care information to practitioners and real-time monitoring of patients' vitals). This would help ease the increasing financial burden.

Fourthly, IT education needs to be updated. Although 80

The government should turn Hong Kong into a smarter city, boost IT education and create more favourable conditions for entrepreneurs

per cent of Hong Kong households have internet access, the education sector has not been keeping pace with the speed of change in the digital age – the syllabus that sets out computer literacy requirements for junior secondary school students was last updated 14 years ago.

According to U.S. government statistics, by 2020, there will be 1.4 million computing jobs and only 400,000 students with relevant training to fill those roles. Moreover, computer science skills, such as coding, have become essential in many different fields. This is a global phenomenon.

Britain now includes coding as a compulsory subject for children as young as five, while Finland will also make it a

mandatory, cross-curricular activity from the first year of school, starting from this autumn. Australia and Singapore, too, are contemplating when and how to start compulsory education in coding.

To avoid being left behind, the government should incorporate computer programming as a compulsory subject in primary education to equip students for the future digital world, and stimulate them in logical thinking and problem solving.

Finally, in almost every corner of Hong Kong, you will find people starting businesses. The government should spare no effort to create favourable conditions to strengthen the entrepreneurial ecosystem.

It should maximise the use of existing public resources, seek to attract more overseas business incubators, accelerators and venture capital, while doing more to enable office space sharing.

Regulations need to be revised on raising contributions through the internet, such as, by using equity crowdfunding and mobile payments. Regulatory reform would benefit not only start-ups but also investors, with the result of boosting the market.

Innovation and technology can diversify Hong Kong's economy and provide greater employment opportunities for the community.

Published in South China Morning Post on 11 January 2016

Building a GIS- based smart city

Dr. John Snow (1813-1856) was the first to use maps tracing the source of cholera outbreak of London.

The 2016-17 Budget carries on the direction of the Policy Address, where there is substantial mention of policies related to innovation and technology development. These include the Pilot Technology Voucher Program that encourages SMEs to use technology to conduct research and development, the development of robots and intelligent home care, as well as the continuous promotion of Fintech development. This is encouraging news for the technology sector.

I was particularly heartened when Financial Secretary John Tsang suggested at the 2016 Budget announcement that "we shall refine the existing Geographic Information Systems (GIS) and explore ways to align and integrate the spatial data in Hong Kong, including the location and relevant information of facilities that are above, on and under ground level". However, I believe many may find it puzzling how GIS and spatial data can enable a smart city.

GIS data facilitates the planning of a smart city

They are absolutely related. GIS, a system designed to capture, store, manipulate, analyze, manage and present all types of spatial data brings a new dimension towards smart city development.

For example, at the planning stage of building a smart city, GIS allows the government to analyze the population and its demographics based on their geographical distribution. Such analysis enables the optimized development of public facilities

GIS, a system designed to capture, store, analyze and present all types of spatial data, can bring a new dimension to smart city development

such as transport, schools and hospitals. The information is also an important foundation to introduce other smart city services like e-health, e-learning and electric vehicles.

Although many government departments have a well-developed GIS, they are limited for internal use and not available to the public.

Different government departments like the Lands Department, the Highways Department, the Civil Engineering and Development Department have their dedicated GIS. But they rarely communicate with each other, nor release such information to the public.

Currently, the GeoInfo Map developed by the Lands Department

contains over 180 kinds of spatial data provided by 26 government departments. This is a good example of the government departments collaborating to offer geographic information for public use. But the service does not include the sharing of application programming interfaces (APIs), which is the foundation for the public and startup community to develop applications that interact with spatial data. Without opening up the APIs of the GeoInfo Map, the public cannot take advantage and integrate the spatial data in their applications to benefit society.

SDI to bring openness

Therefore a spatial data infrastructure (SDI) is an important foundation for building a smart city. SDI refers to a framework that collects, processes and manages a series of spatial data and geographic information related science and technologies, policies and systems. One of the major components within this framework is the management of APIs.

Many countries have recognized SDI as an important digital infrastructure. The United States started its development of a national SDI in 2003. Different geographic information was integrated through GeoPlatform.gov with APIs available for the general public. Europe and Singapore also have similar projects, called Infrastructure for Spatial Information in the European Community (INSPIRE) and the Singapore Geospatial Collaborative Environment (SG-SPACE) respectively.

Recently, the Los Angeles government also launched GeoHub, a city-level SDI. It contains more than 500 kinds of public geographic information provided by the L.A. government departments. It aims to improve public awareness of community issues, and also enhances government departments' efficiency and cooperation. GeoHub currently collects information like public road works and traffic black spots from public and private sectors.

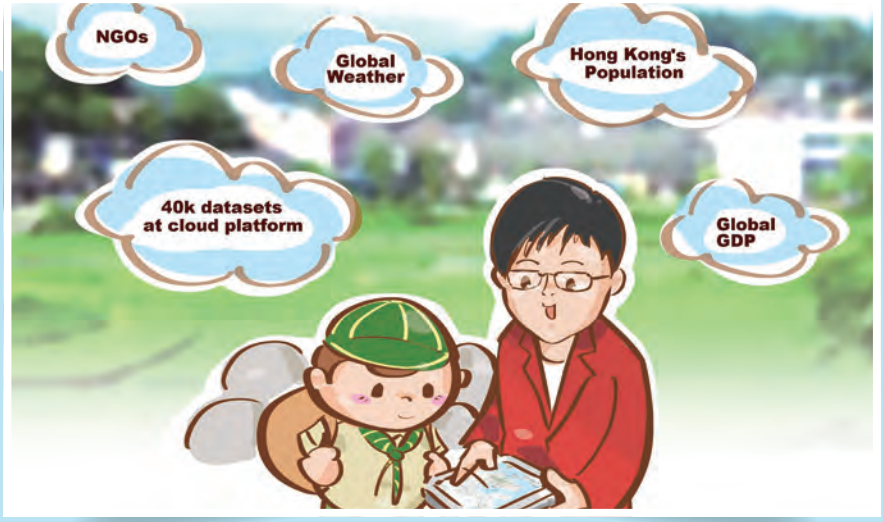
Services similar to GeoHub promote creativity in society. Through sharing the APIs, the private sector or individuals that are familiar with programming can utilize the geographic information, like real-time traffic conditions, road works, building inspections, and business statistics from the GeoHub to create their own applications or services.

This year's Policy Address has updated the Chinese translation of the phrase “smart city” to better reflect the true and accurate meaning of the word. The government's development in SDI is also a wise move and a big step forward in the development of a smart city.

I hope the government will expeditiously implement the relevant measures mentioned in the Budget to encourage the public to use geographic information and spatial data. Together, we shall build a better society.

Posted on ComputerWorld on 10 May 2016

Hong Kong cannot become a smart city without its people's buy-in



The Hong Kong government has scheduled a public consultation later this year to formulate a blueprint for smart city development.

Actually, national governments and cities around the world are investing in this. In mainland China alone, more than 300 smart city pilot schemes are planned, all aiming to address the challenges of how to move people and things around; how to provide energy; how to keep people safe when more and more

people are moving into cities from the countryside.

There appear to be three phases in a transition to a smart city. Phase 1 is characterised by technology providers promoting solutions to a society that has not fully appreciated the full benefits of these solutions or how they may affect the quality of life. An often discussed project is South Korea's Songdo, which is a purpose-built smart city. Located close to Seoul and its international airport, the new development remains woefully under-occupied since its official launch in 2009, with far less than half of the commercial space in the district being used.

In Phase 2, forward-thinking administrators take the lead in determining the future of their city. In this phase, city administrators increasingly focus on technology solutions as a means to improve the quality of life. One example is Rio's sensor network to mitigate damage caused by landslides in the hillside favelas.

In the past few years, Phase 3 has emerged, with leading cities beginning to encourage citizen's "co-creation" models. One smart city project in Vienna, for example, is a partnership with the local energy company, Wien Energy, through which Vienna included its citizens as investors in local solar plants as a contribution to the city's 2050 renewable energy objectives. In addition, the project also brought citizen engagement in addressing affordable housing and gender equality into focus.

Another city, Vancouver, engaged 30,000 citizens in the co-creation of the Vancouver Greenest City 2020 Action Plan.

Meanwhile, researchers in Jakarta have developed a real-time map of flooding by crowd-sourcing flood reports from Twitter to monitor severe annual flooding of the city during the rainy season.

Successful smart cities of the future will combine the best

Elsewhere, the successes and failures of efforts to harness technology for development demonstrate the need to consult with industry players and among the community

features of technology infrastructure while making the most out of the growing potential of "collaborative technologies", and above all, will have the citizens empowering them.

But how can this work in practice? How can cities effectively harness the collective power of citizens through digital technologies?

The formation of the Smart City Consortium in March this year was an effort to pull together talent from multiple disciplines to jointly create the future of Hong Kong. Its first member gathering late last month has proved the idea feasible.

More than 300 members and guests crowded the venue in Central. They came from various industries, including finance

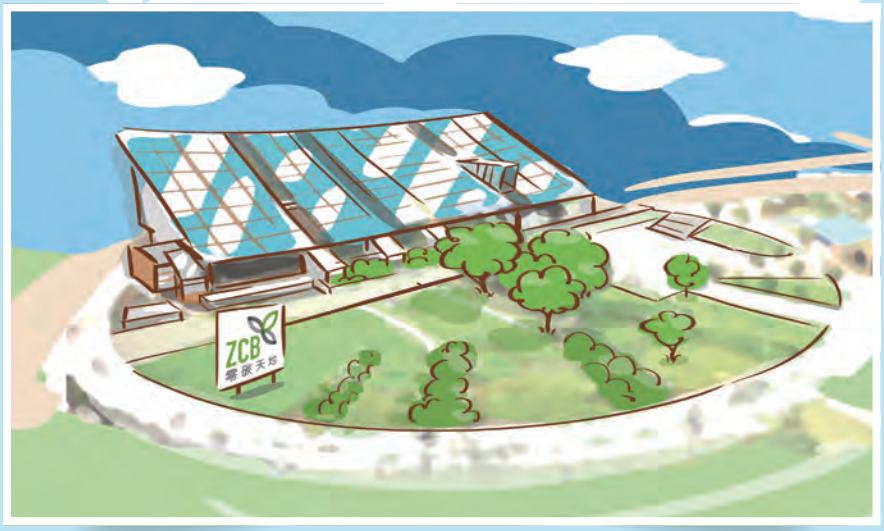
and banking, education, public utilities, professional consultancy, property development and government-related organisations. Government officials also attended.

But what really impressed were the young faces, local and overseas. Most were from start-ups trying to expand their networks and gain insights from interaction at the gathering.

I am glad so many "smart people" from various industries, age groups and nationalities have come together to exchange and explore ideas. This is a great way to move forward in developing our smart city as I believe that it should be co-created collectively by people living here.

Published in South China Morning Post on 24 July 2016

Getting ahead in Hong Kong:
Speak up for a smart city!



Stuck in traffic. Waiting for a bus. Puzzling over maps. Precious minutes and hours are lost every day, never to be regained.

But a city in Finland thinks it could crack the code and get that time back. Kalasatama aims to create a time machine, a time maker. Its target is an hour a day, delivered through the smart city.

Hong Kong has a long way to go to catch up with 'smarter' cities in the region – and you, as a community member, can help

Hong Kong could build that time machine – but first it has to get smart.

Hong Kong: "Builders" Stage

The international assessment program "City Initiatives for Technology, Innovation and Entrepreneurship" (CITIE) reviews the progress of adopting technological innovation in 40 cities around the world. The criteria measures progress towards creating a Smart City.

The assessment divides the progress of city development into 4 stages: "Front Runners", "Challengers", "Builders" and "Experimenters". Among the Asian cities reviewed, Singapore is the only one ranked a "Front Runner". As early in 2014, Singapore

initiated a national policy of becoming a "Smart Nation". The country has been vigorously implementing a top-down national policy to make the island nation a smart city. It plans to export the relevant experiences and technologies to others.

International Data Corporation, a market research company, estimated that by 2025, the annual demand for Smart City technologies will reach U.S.$1 trillion in Asia alone. Singapore believes its experience will help it to capture a large share of that market.

What about Hong Kong? In the same study, Hong Kong is ranked at the third stage of "Builders", along with Tokyo and Sydney.

Although different assessments have different criteria, and there may be subjective elements in the assessments, the findings are worth using as a reference.

For example, among the nine assessment criteria, Hong Kong scored the lowest in "making full use of data to improve services and promote innovation." This low score is not very surprising. In recent years, the Government and many public and private organisations have been working on information sharing with the public. However, they did their own work individually in the absence of an integrated platform. They also did not cater to the needs of those developing smart city applications, in particular mobile apps developers.

For example, the bus company's "Estimated Time of Arrival" service is very useful to passengers. However, such service is only limited to buses, not all modes of transportation in Hong Kong. People also criticize the decision to only make the information available in a format other than API, a format more easily used by app developers. Instead, developers must process the data before use, a time consuming, laborious and

manual process – the opposite of 'smart'.

In our case, my colleagues trying to use such data have been doing the conversion for some time. Our Map in Learning Program officially launched in June in which over 100 primary and secondary schools participated. This program sponsored students through the free use of GIS software. For the students to use local government data in their study, our colleagues undertook the labour intensive and time consuming data conversion on their behalf. Without our help, the bulk of their efforts would have been wasted in data conversion – not developing innovative uses of that data.

Kalasatama = Loads of data

When we talk about open data and smart city development, Helsinki in Finland is an exemplary model. Boyd Cohen, a leading smart city expert, and Joe Pine, an MIT visiting scholar,

have both studied the city and believe there is much to be learned from their experience.

Open data is a key focus of the city's development strategy; Helsinki currently opens over 1,200 datasets to the public and to civic organisations. The city encourages cooperation among different developers, and organises various activities each year, such as, a Hackathon, which gathers professionals and IT workers (game developers, programmers, interface/ user experience designers) in the areas of architectural design, engineering, construction, and geographic information systems, to study construction-related topics.

Helsinki is acclaimed for its experimental smart city district "Kalasatama". Kalasatama, originally a harbour in an industrial area, means "feast". The district is now equipped with various environmental design elements and encourages innovation

services. Its goal is “to let everyone earn one extra hour every day”, to save time for the convenience of the public.

The district also has a program to provide small grants, ranging from about €1,000-€8,000 (about HK$8,800 to HK$70,000), to promising startups. For example, Auntie Solutions, one of the experimental services, aims to prevent serious mental health incidences through easy access tools that help to tackle the most common life crises. Auntie experiments with different service packages for gaining an understanding of user experience and the effectiveness of different digital channels. As such, startups can test the new services on real users and companies, and get user feedback to improve their operation.

Boyd Cohen believes that the successful construction of a smart city should be driven by the government, such as the establishment of eGovernment and the internet of things (IoT),

in addition, to support from the general public, the attitude of the government and the public should be adjusted: the public is no longer a mere audience or customer, but a participant in the smart city development to improve their living.

Participation is the key

The public must contribute if it wants to help build Hong Kong's time machine and take back our minutes and hours lost to the inefficiency of a 'dumb city'. Earlier this year, the Government announced that a smart city development consultation would be held in the second half of this year. The Smart City Consortium (SCC) organised two discussion forums in early August to collect opinions from relevant stakeholders. The scope of discussion was very broad, covering the internet of things (IoT), eID, ehealth, financial technology (FinTech) and environmental technology.

In addition to the two discussion forums, the SCC also collected public opinions via email. The organisation concluded its consultation on 10 September 2016. By consolidating the information and submitting it to the Government, it aims to contribute to the perfection of a smart city blueprint to be released next year.

Everyone in Hong Kong has an interest in seeing a more efficient government and indeed, the improvement of their own life, in the smart city. If Hong Kong and her people can contribute, to speak up for 'smart', then we can build our own time machine and become a Front Runner in the global smart city future.

Posted on Harbour Times on 20 September 2016

How mobile payment technology could pay off for Hong Kong

With Octopus entering the battlefield, smartphone payment in Hong Kong is flourishing, with numerous operators, from telecoms providers and credit card companies to mobile manufacturers and mainland payment giants. In addition, Jetco has just launched a peer-to-peer interbank platform. With the payment systems ordinance introduced last year, people have high expectations for mobile payments in Hong Kong; the service has been thriving on the mainland for a number of years.

Looking around the world, mobile payments are most prevalent in Kenya. In 2007, the government launched a mobile app for subscribers to make payments by SMS, which is safe and convenient, with an almost 90 per cent adult usage rate. The transaction volume amounts to 60 per cent of the country's GDP.

In more technologically advanced countries, the situation is different, with only around 24 per cent of Americans willing

to use their mobile phone as a payment channel, according to a report by the U.S. Federal Reserve. In Britain, according to a survey last year, only 13 per cent use mobile payments.

There are two main reasons for this. First, developed countries have mature financial services, everyone has credit cards and, for daily necessities, they have prepaid cards. These services have proved to be effective and safe. However, in Kenya, financial services are underdeveloped with few bank branches, and it is not safe to carry cash. Under such circumstances, mobile payments have proved very popular.

Secondly, 70 per cent of Americans and more than 40 per cent of Britons are concerned about the security of mobile payments. According to the Hong Kong police, financial losses caused by computer crimes are growing and reached HK$1.8 billion last year.

Hong Kong could be a springboard for Mainland payment giants to expand overseas, but operators must demonstrate their security measures to win over a sceptical public

Thus, operators seeking to win the mobile payment battle must showcase their security measures to win over the public. However, to attract Hong Kong people, who have on average three or four credit cards plus an Octopus card, incentives may be needed. For example, one company promoted its mobile payments by giving HK$100 to customers for the first HK$100 they deposited in the account. The promotion attracted over 200,000 registrations. Almost 80 per cent of those surveyed in the U.S. and Canada said they would consider mobile payments if promotions were offered. Of course, sustainability of growth will rely on safety and quality of service.

If Hong Kong can make it work, it can act as a springboard for mainland payment giants to expand overseas. But, having only just developed a limited number of smartphone apps, we still have a way to go.

Published in South China Morning Post on 22 May 2016

How to engage private doctors in e-health record sharing

In Hong Kong, after ten years of experiments and preparation, the territory-wide patient-oriented Electronic Health Record Sharing System (eHRSS) commenced operating in mid March this year.

With patients' consent, the sharing of electronic health record (eHR) or electronic medical record (eMR) assists medical practitioners in providing more timely and accurate treatment. Data that participating doctors can retrieve includes allergies, medication, appointments records and discharge summary, etc. Errors otherwise

The success of Denmark, which leads the world in using eMR systems (with 98 per cent adoption rate among primary care physicians), comes from a combination of rewards and punishment

arising from transferring paper records and the duplication of tests can therefore be minimized.

The success of the eHR sharing in Hong Kong, however, depends heavily on the participation of private practitioners. Unlike Mainland China where the majority of medical services measured in terms of expenditure are state-operated, over half of Hong Kong's medical service is provided by private organizations. We have 11 private hospitals and around 3,700 private clinics. Fortunately, all private hospitals here have already agreed to join the eHRSS. But the response from private clinics is considered as just lukewarm at best with only 30 or 1 per cent having committed, according to the latest news reports.

To secure eHR, sharing with private organizations is always going to be challenging.

In Singapore, there are over 1,500 private practitioners providing 80 per cent of the primary healthcare service. The country launched a Electronic Medical Record Exchange in 2004 among public hospitals. The system was upgraded to a National Electronic Health Record in 2011 for data sharing to include private practice as well. However, four years after the program's implementation, only 550 private practitioners and clinics, which constitutes 37 per cent, had participated. The other two thirds remained uninterested.

What about Taiwan? Its national health insurance ensures every citizen can enjoy affordable healthcare services. Currently, there are around 500 hospitals and some 17,000 private clinics. According to the government statistics, each of its citizens consults doctors 15 times annually on average. Due to the lack of patient information transparency, many patients tend to visit several hospitals or clinics

on the same medical problem and their personal health records are scattered across several healthcare organizations with the duplication of tests and treatments.

To address this wasting of medical resources due to duplication of service, an interoperable eHR project had been set up in 2007 in Taiwan. As of 2014, a majority of hospitals – about 70 per cent – had joined the program. Those left out were small organizations with less than a hundred beds. On the other hand, private clinics seem unenthusiastic about the idea with no statistical figure available. The government website only mentions that the program had been promoted to 2,000 clinics in 2010.

A senior official from the Department of Health in Taiwan once talked about the barrier of sharing eHR in healthcare industry. The major problem was the fierce competition among hospitals and clinics. Financial assistance for adopting eHR should be available in the early promotion stage. To sustain the continuity, however,

appropriate legislation might be required.

A carrot-and-stick approach may be the secret to success – Denmark is a world leader in using information technology for clinical purposes with eMR system adoption by 98 per cent of primary care physicians. Its trick is a combination of rewards and punishment to rein in compliance.

With a population of 5.5 million and primary healthcare providers numbering three thousand, Denmark started using electronic means for health record transmission back in the 1980s. After the success of a eMR trial program, a non-profit organization called MedCom was formed in 1994. MedCom is responsible for defining national electronic communication standards that allow primary healthcare doctors to send and receive electronic records of laboratory test reports, medication prescriptions and refills, as well as referrals to hospitals and specialists.

The response of primary healthcare doctors in the early stage was also lukewarm – only about 15 per cent in the early 1990s. It rose to over 90 per cent by 2000 as most physicians saw the benefits of the new technology, in addition to the financial incentive of quicker reimbursement to doctors who used eMR. This made the leapfrog possible in the adoption of technology. Moreover, the doctors' participation was voluntary before 2004. The Danish government changed it to mandatory since then which led to the "widespread adoption of information technology" as concluded by Professor Denis Protti from the University of Victoria, Canada and Ib Johansen from MedCom in a co-authored article.

To sum up, every place is different but eHR does require collaboration among government authorities, healthcare organizations, doctors, clinicians, patients and vendors. As a patient, what we have to do today is to register your family and yourself so that we can enjoy a better healthcare service in the future.

Posted on Harbour Times on 18 May 2016

Pokémon GO driving the Smart City

Pokémon GO is the global craze of the year. Although the Hong Kong version was released a bit later, it still has attracted an overwhelming response. How many Pokémon have you caught so far? What level have you reached? How many kilometers have you walked? I am too busy and cannot afford the time to participate in the game. When I saw young people playing the game with great excitement, I could only envy them. I feel so close to the game, not because I associate it with my childhood memories, but because the game is based on an electronic map, a field in which I have been working for two decades.

Electronic mapping plays a vital role in Pokémon GO in connecting the virtual world with the real world. Each landmark chosen in the real world is developed as a PokéStop (depot) or Gym (dojo) in the virtual world for players to replenish resources and engage in battle. I heard one player (trainer) mentioning

a battle at a Gym—"Cheung Sha Wan Sports Centre" near my company – it was very exciting!

What is more exciting is that government provided open data, combined with a growing interest in electronic mapping can lead to better policy, real solutions and Hong Kong's development as a Smart City.

From mobile game to digital map

A friend once asked me if Pokémon GO applies the GIS (Geographic Information Systems) technology that I had been promoting for many years, my answer is "No".

From my professional point of view, Pokémon GO is based on a simplified version of an electronic map (called basemap). It does not meet the basic definition of GIS which calls for a map with precise details of geographic information and provides information for analysis.

Open data and interesting geo-mapping solutions could lead to people creating lasting smart city solutions for Hong Kong

In fact, corresponding to the Pokémon GO fever, some websites providing real time location information were created. For example, Pokévision uses GIS technology to show the location of Pokémon and when they will be on a precise map. It also provides hotly sought after information to the players. Unfortunately, most of these websites ceased functioning as Niantic, the Pokémon GO developer, stopped this feature. In future, if there is a website that adds an analytic function, such as statistics of the existence of various Pokémon in a certain place, or certain kind of Pokémon that most frequently appears in a certain location, then it may become an outstanding GIS application!

I also hope that the Pokémon GO players would develop an interest in electronic maps, GIS or programming after playing the game, or even join us to develop applications and services to benefit mankind.

As a start, interested parties can access a lot of publicly available data and resources via the internet. The information and analysis that are displayed in electronic maps are generated through GIS technology and this enables people to gain a deeper understanding of the world. In recent years, The Hong Kong SAR Government has released public information provided by government departments and public/private organizations through the "data.gov.hk" website (www.data.gov.hk). The public can obtain a variety of information on: population, industry & business, employment, environment, health and housing, etc.

Opening data is the foundation of a Smart City

The local technology sector, however, has criticized the government for providing most of the public information in Excel, CSV or PDF format instead of API format which can be directly used in program development and this forms an obstacle for public use.

A leading example of opening data for public use is the City of Los Angeles, an incubator for new ideas. Unveiled earlier this year, L.A.'s GeoHub gives the general public access to the city's location-based data through an online portal. People can download datasets as shapefiles, KML files, or into spreadsheets. It also allows users to access live, continuously updated data directly from the city as a service—rather than as a static download. Vision Zero is a Swedish example which uses a data-driven approach to reduce traffic-related injuries and deaths—

with the goal of eliminating them altogether by 2025. Web mapping applications like Street Wize have been developed to enable Angelenos to track current and upcoming permit and construction activity around the city so they can plan accordingly to avoid travel delays.

By opening Los Angeles' data, Mayor Eric Garcetti hopes to make city operations more efficient, stimulate partnerships between the city, academia, nongovernmental organizations, businesses, and startups, as well as give residents a greater controlling stake in government.

This is what the ultimate stage of a smart city should be.

When I was writing this article, there was a forecast that the current Pokémon GO craze cannot be sustained for more than a couple of months. However, if there are people who have developed interest in electronic maps, GIS, programming

or information technology after playing the game, it is already an extra bonus. Furthermore, if some Hong Kongers become GIS experts or choose to study IT because of this game, then catching Pokémon could drive him or her to start a career in a sector that lends to Hong Kong's development as a Smart City and a better place for all to live. What could be more pleasurable than this?

Posted on Harbour Times on 15 August 2016

Smart city– Building greener

Starting from August this year, Toyota Motors in Japan allowed its clerical staff, who need to take care of their children or elderly relatives, to work from home, and they are provided with specialized computers to facilitate the handling of confidential paperwork. There are around twenty thousand staff enjoying such arrangements, which not only reduces carbon emission, but also allows more staff to benefit from not being required to commute to work, therefore they have more time to improve their family life.

This is a good example of how science and technology contributes to a change of work pattern, and to people's better living which is the ultimate goal of developing a smart city.

The focus in developing a smart city is how to enhance our quality of life, while balancing the impact on the environment. Information technology plays a pivotal role in such development. It sounds like a paradise when we talk about achieving environmental protection and comfortable living at the same time, but recently I have seen such a paradise.

Earlier, I had a chance to visit a hotel in Sheung Wan which started business three years ago. The hotel looks quite miniature but it has won numerous environmental awards, namely: "BEAM Plus Platinum Rating" from the Hong Kong Green Building Council, "LEED for New Construction Platinum" from the Green Building Council in the United States, "BCA Green Mark" from the Building and Construction Authority in Singapore, and the highest

Plans for rehabilitating older buildings, such as greening rooftops and façades can revitalise and refresh how they look whilst also absorbing carbon dioxide

honor of "LEED (Samsung)" from the China Green Building Council.

The hotel is well known for its environmentally friendly design, which caters for every aspect of environmental protection, from the rooftop solar panels (which save 58.5 per cent of electricity usage compared with other hotels), the substantive coverage of greening (the vertical greening coverage of the hotel is 47.5 per cent), to the collection of rainwater and "dripping" of air-conditioners to water plants (saves 5.7 per cent of water). What's more, after reviewing the one-year record of live load on the lifts, they adjusted the counterweight of them to save electricity. The hotel strives consistently to operate within every aspect of environmental protection.

As Warren Buffett advises start-ups: "Don't just satisfy your customers, delight them!" The hotel carries out a 1.5-year monitoring program on two selected guest rooms from the total of 200: One hour after the customer switches off the lights for sleeping, cool air will be quietly emitted from the headboard of the bed. One can hardly notice the cool air as it only covers the area for sleeping, and the slight blowing of cool air will not induce headaches. With such arrangement, customers will wake up feeling refreshed with a clear mind, while the temperature of the room needs not be lowered and this reduces power consumption. Such ventilation brings memorable experiences to the customers, and also saves energy.

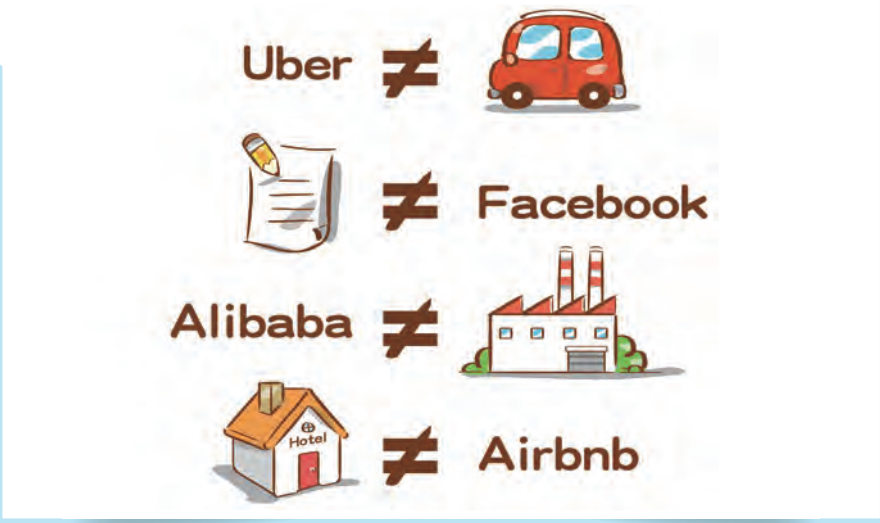
I believe that it is worthwhile to appreciate the environmental initiatives of this hotel, such as vertical greening. I have seen some local buildings adopting vertical greening, but within a

short time the plants withered. However, the façade of this hotel remains evergreen so far, since they have chosen the right local species. They only need to trim the plants once every few months to maintain the pleasant outlook.

According to the Urban Renewal Authority, currently there are around 4,000 buildings aged 50 or above, and the number is expected to increase by 500 every year in the coming 10 years. Have we taken introducing environmental elements into consideration while formulating plans for rehabilitating the old buildings? Measures such as greening of the rooftop and façade enable buildings to look brand new while providing a refreshing appearance and absorbing carbon dioxide! This is definitely a solution to provide a wider range of benefits.

Posted on Ecozine on 20 September 2016

To innovate, Hong Kong needs to groom more top scientists and engineers



More and more citizens see the need to advance Hong Kong as a "smart city", and have contributed ideas to its development. However, some have raised a fundamental question: do we have enough talent to implement the plan?

Smart people are, of course, key to a smart city. We need people to run a hi-tech city and drive future growth.

For a long time, Hong Kong's engineering and technology faculties have had difficulty in enrolling top-grade high-school

leavers. These students prefer to go into medicine, law or business, most likely because of the higher salaries. According to the University Grants Committee, the average annual salary of engineering and technology graduates was around HK$200,000 in 2013/14, half that of graduates of medicine, dental care and nursing.

There were around 4,000 graduates of engineering and technology programs in 2015. Of course, not all may join the local science and technology sector. According to the latest Global Competitiveness Report, Hong Kong's "availability of scientists and engineers" ranked only 41st in the world.

Salaries and career development in the technology sector must be made more attractive, while we should provide a nurturing ecosystem for research and development, as well as entrepreneurship. Through the joint efforts of government,

Hong Kong should be serious about raising its innovation and technology profile, and creating a smart city by doing more to draw talent into the industry

industry and academia, we could create an ecosystem that sustains the technology industry. Meanwhile, we should also seek to attract more foreign talent.

No doubt commercialising the research efforts of local universities is challenging. In the past, there have been successful projects like “MyCar”, an electric vehicle project from Polytechnic University, the “Wisers” search from Chinese University and, in recent years, DJI, which specialises in easy-to-fly drones, from the University of Science and Technology. All these have demonstrated the potential of academic research. Unfortunately, follow-on development lacked adequate support from both local industry and the government.

Government support has increased in recent years, however. Officials should join forces with the industry and academia to focus on the areas that Hong Kong needs most or where it has a leading edge.

The government should also carry out a comprehensive review of its ICT education policies, to ensure sufficient numbers are attracted to technology sectors; to build a solid foundation for a smart city.

Published in South China Morning Post on 9 August 2016

The next Chief Executive should create a harmonious society

While we had to bear the 33°C hot Mid-Autumn Festival in mid-September this year, NASA announced that the global surface temperature in August had broken the record of the hottest month ever recorded in the past 136 years!

Ed Hawkins, a climatologist at the University of Reading, U.K., has drawn a series of maps showing the average annual temperature from 1850 to 2016. When we review these 167 maps as a whole, the Earth was like an elegant lady over 100

years ago, with natural and pleasing shades of blue. However, in recent years, the Earth was scarlet just like a patient suffering from severe eczema, it is horrifying!

One of the causes of global warming is the gasoline used by motor vehicles. The exhaust fumes discharged by vehicles not only increases the temperature of the Earth but also pollutes the air damaging our health. According to the latest U.K. research which analyzed the brains of 37 dead bodies (aged 3 to 92), those who lived in the most polluted areas with heavy vehicular traffic especially diesel exhaust fumes, their brains had high levels of "magnetite". Magnetite is not only toxic but also generates free radicals causing brain damage, cognitive impairment and possibly Alzheimer's disease.

Lack of consensus hinders social progress

This is a pressing problem for which various solutions

have been proposed. Among the useful and constructive ideas published in the media, the promotion of cycling interests me the most. If we really want to implement this, we need to build a network of well-planned cycling tracks, not like the ones in the New Territories now where cyclists are required to get off their bicycles at many places. Also it would be great to have a cycling track along the waterfront of Hong Kong Island and Kowloon Peninsula to facilitate daily commuters.

Once the cycle tracks are in place, Hong Kong could follow the scheme of shared bicycles established in Lyon, France 10 years ago. A Hong Kong local start-up's award-winning foldable electric bike could also become popular. Some people, may argue that the idea is not realistic in a city where land is at such a premium. If different stakeholders with different opinions are unable to reach a consensus then these ideas will remain

Hong Kong has talented people, good infrastructure and a world respected judicial system, if our Chief Executive can create a harmonious environment, I believe the Pearl of the Orient can continue to flourish!

unrealised and unable to make any social impact. Therefore it is important that our government takes the initiative and has the determination to achieve public consensus and resolve difficult social conflicts.

Maintaining Hong Kong's competitiveness is a priority

With the conclusion of the Legislative Council election, people begin to focus on the Chief Executive Election and the Election Committee coming up later this year. I have been a Chief Executive Election Committee Member in the Information and Communications Technology sector from 2007 to 2016. In the upcoming term, I have decided to leave the post of Committee Member to new-comers.

Although I shall not be participating in the Committee election, I have a few words for the future Chief Executive: The first task of the Chief Executive is to maintain Hong Kong's competitiveness by combining the leading edges of ICT and related industries to create the core of the economy, with a focus on environmental protection in the process of development. The work is complicated. If the Government can coordinate different opinions and ideas and pull together public forces its administration will definitely be more effective.

Hong Kong has talented people, good infrastructure and a world-respected judicial system, if our Chief Executive has the ability to consolidate different opinions and create a harmonious environment, I believe the Pearl of the Orient can continue to flourish!

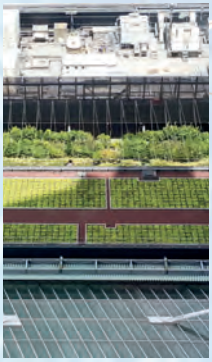
Posted on Harbour Times on 19 October 2016

Smart City Consortium

The formation of the Smart City Consortium (aka SCC) was an effort to pull together talent from multiple disciplines to jointly create the future of Hong Kong.

Greening and ICT Education

The problems of global warming are looming so the government needs to step up measures to protect our environment such as vertical greening. At the same time, ICT education should also be strengthened to build a solid foundation for a smart city.



Electronic Health

I was very excited about the inauguration of the territory-wide patient-oriented Electronic Health Record Sharing System after years of preparation.

FinTech

To keep up with New York and London, we have to quicken our pace on the development of FinTech.

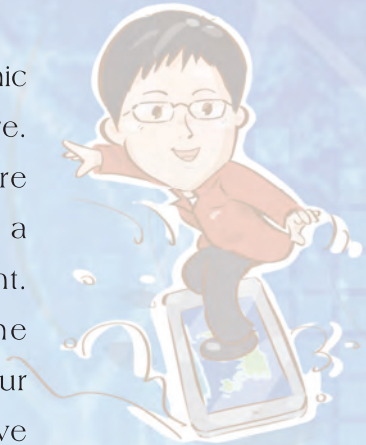
Epilogue

Do you still remember what a computer looked like 20 years ago? Perhaps, you seldom used a computer then, let alone the Internet! Those were the days when mobiles phones were really new and different models emerged continuously. At one stage everyone had a Nokia “banana-shaped” phone, or a "small turtle" Motorola flip phone, or even one of the practical options from Ericsson. In the 20 years from 1997 to 2016, so many brands and technologies have entered and eventually faded out amid the tectonic shifts in technology!

Our company surfed wave after wave and thrived in the last 20 years. I am truly grateful and attribute our success to my colleague's tireless efforts and the generous support of our customers. We strive ceaselessly to serve our customers in order to maintain our competitiveness in the market.

Time flies, it has been 20 years since then. This book serves as a review and an outlook. The global population is approaching 10 billion in the next two or three decades and the

challenges of an ageing demographic are getting more and more severe. The principles of a smart city are increasingly looked upon as a backbone for future development. It is our mission to protect the environment while developing our cities, to enable all residents to live more comfortably, and to preserve the Earth for the future generations.



The past 20 years were very exciting, what about the future? I have many plans in mind, and I am full of ideas for the decades to come. With your continuous support, we shall look forward to a bright and glorious future!

References

1st stop: Yuen Long

1. **Grandma is always on my mind**
   - Madelyn Dunham, Wikipedia, https://en.wikipedia.org/wiki/Madelyn_Dunham
   - Grandma And Grandpa Are Good For Children, 07-06-2008, Science News, ScienceDaily http://www.sciencedaily.com/releases/2008/06/080605091358.htm
   - Grandparents contribute to children's wellbeing, University of Oxford http://www.ox.ac.uk/research/research-impact/grandparents-contribute-childrens-wellbeing
2. **Like Parents, Like Daughter**
   - Genetically speaking, mammals are more like their fathers", 02-03-2015, Fernando Pardo-Manuel de Villena and James Crowley, UNC Health Care and UNC School of Medicine
   - http://news.unchealthcare.org/news/2015/march/genetically-speaking-we-are-all-more-like-our-fathers
3. **Not to be served but to serve**
   - "Some Thoughts Concerning Education", 1693, John Locke, London https://en.wikipedia.org/wiki/Some_Thoughts_Concerning_Education
4. **The greater the challenge, the stronger I become**
   - "PCs: More than 1 billion served", 18-03-2009, Michael Kanellos, CNET http://www.cnet.com/news/pcs-more-than-1-billion-served/
   - "Global PC shipments from 1st quarter 2009 to 3rd quarter 2015 (in million units)", 2015, Statista http://www.statista.com/statistics/264467/global-pc-shipments-since-1st-quarter-2009/
   - "You Can't Kill Jack Dangermond's Company. Try, And It Will Only Get Stronger.", 31-03-2015, Miguel Helft, Forbes http://www.forbes.com/sites/miguelhelft/2015/03/31/you-cant-kill-jack-dangermonds-company-try-and-it-will-only-get-stronger/
5. **The source of happiness**
   - "Reaching Your Potential", Robert Steven Kaplan, the July-August 2008 Issue, Harvard Business Review https://hbr.org/2008/07/reaching-your-potential
6. **My encounter with GIS**
   - Otto Wallach", Wikipedia https://en.wikipedia.org/wiki/Otto_Wallach
   - 〈讓興趣發揮優勢〉，26-01-2016，若靜，信報http://www1.hkej.com/dailynews/culture/article/1229467/讓興趣發揮優勢
7. **Where is the silver lining**
   - "Average Historic Price of RAM", 16-08-2015, John C. McCallum, NewEgg, Statistics Brain Research Institute http://www.statisticbrain.com/average-historic-price-of-ram/
8. **No doubt at age of 20**
9. **Speechless gratitude**
   - "Warren Buffett reveals his No. 1 piece of advice to anyone starting a new business", 07-06-2016, Portia Crowe, Business Insider http://www.businessinsider.com/warren-buffett-business-success-advice-2016-6
10. **Life is a box of chocolates**

2nd stop: Beyond Hong Kong

1. **Young Man, what have you got to lose?**
   - "QS World University Rankings by Subject 2015 - Computer Science & Information Systems", Quacquarelli Symonds, UK, 29-04-2015 http://www.topuniversities.com/university-rankings/university-subject-rankings/2015/computer-science-information-systems#sorting=rank+region=+country=+faculty=+stars=false+search
   - "Situations and Aspirations of Youths in Hong Kong", Hong Kong Ideas Centre, 13-04-2015 http://www.ideascentre.hk/wordpress/wp-content/uploads/2009/02/Youth-study-Report-final.pdf

2. **Rise of the machines: China's robotics market can only grow**
- 〈双十一阿里巴巴 电商交易爆表 智能机器人正起〉，12-11-2015，中国机器人 业联盟（源：经网[北京]）http://cria.mei.net.cn/news.asp?vid=3084
- "'Emotional' robot sells out in a minute", Angad Singh, 23-06-2015, CNN http://edition.cnn.com/2015/06/22/tech/pepper-robot-sold-out/
- 〈機械人技術 開創無限可能 DJI 創新不斷 領先全球〉，2015，香港科學園http://www.hkstp.org/zh-HK/News-Media-Events/Tech-Pulse/CEO-s-Chat-Room/Past-Issues/2015/DJI_Leading_the_world%E2%80%99s_robotic_technology_with.aspx.
- "The world's first single-tree wildfire detection system", Insight Robotics http://www.insightrobotics.com/solutions/wildfire-detection
- "The Chinese University of Hong Kong and Imperial College Collaborate on Healthcare Innovation and Biomedical Robotics", 21-03-2015, The Chinese University of Hong Kong http://www.med.cuhk.edu.hk/eng/home/press_releases/2015/2015_03_21.jsp
- "Industrial Robot Statistics", 10-2015, World Robotics 2015 Industrial Robots http://www.ifr.org/industrial-robots/statistics/

3. **Virtual Reality: what you imagine is what you get**
- "The future of Facebook is telepathy, reveals Mark Zuckerberg", 01-07-2015, Andrew Trotman, The Telegraph http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/digital-media/11709665/The-future-of-Facebook-is-telepathy-reveals-Mark-Zuckerberg.html
- "Recent Advances in Augmented Reality". Ronald T. Azuma, Yohan Baillot, Reinhold Behringer, Steven K. Feiner, Simon Julier and Blair MacIntyre, IEEE Computer Graphics and Applications, Vol. 21, No. 6, pages 34-47; November/December 2001 http://www.cs.unc.edu/~azuma/cga2001.pdf
- "Mark Zuckerberg shows off virtual reality ping pong", 15-10-2015, Karissa Bell, MashableAsia http://mashable.com/2015/10/14/oculus-ping-pong/#ZTdaoNRweuqN
- "Back to the Future Day: what Part II got right and wrong about 2015 – an A-Z", 20-10-2015, Catherine Shoard, The Guardian http://www.theguardian.com/film/filmblog/2015/jan/02/what-back-to-the-future-part-ii-got-right-and-wrong-about-2015-an-a-z
- "If you can imagine the future, you can create it", 21-10-2015, Nike Twitter https://twitter.com/nike

4. **Computers are taking over the world? No way!**
- • "The future of Facebook is telepathy, reveals Mark Zuckerberg", 01-07-2015, Andrew Trotman, The Telegraph http://www.telegraph.co.uk/finance/newsbysector/mediatechnologyandtelecoms/digital-media/11709665/The-future-of-Facebook-is-telepathy-reveals-Mark-Zuckerberg.html
- "Recent Advances in Augmented Reality". Ronald T. Azuma, Yohan Baillot, Reinhold Behringer, Steven K. Feiner, Simon Julier and Blair MacIntyre, IEEE Computer Graphics and Applications, Vol. 21, No. 6, pages 34-47; November/December 2001 http://www.cs.unc.edu/~azuma/cga2001.pdf
- "Mark Zuckerberg shows off virtual reality ping pong", 15-10-2015, Karissa Bell, MashableAsia http://mashable.com/2015/10/14/oculus-ping-pong/#ZTdaoNRweuqN
- "Back to the Future Day: what Part II got right and wrong about 2015 – an A-Z", 20-10-2015, Catherine Shoard, The Guardian http://www.theguardian.com/film/filmblog/2015/jan/02/what-back-to-the-future-part-ii-got-right-and-wrong-about-2015-an-a-z
- "If you can imagine the future, you can create it", 21-10-2015, Nike Twitter https://twitter.com/nike

- "Google puts AI expert in charge of its search algorithms", Richard Waters, Financial Times http://www.ft.com/intl/cms/s/0/044d82dc-caac-11e5-a8ef-ea66e967dd44.html#axzz3zFe9GeMy
- "Mark Zuckerberg", 04-01-2016, Facebook https://www.facebook.com/zuck/posts/10102577175875681
- "J.A.R.V.I.S.", Iron Man Wiki http://ironman.wikia.com/wiki/J.A.R.V.I.S.
- "Wikipedia releases artificially intelligent 'X-ray specs' tool to detect fake and damaging edits", 04-12-2015, Doug Bolton, Independent http://www.independent.co.uk/life-style/gadgets-and-tech/news/wikipedia-ores-ai-tool-editor-edits-a6760206.html
- "Humans Are Slamming Into Driverless Cars and Exposing a Key Flaw", Keith Naughton, 18-12-2015, Bloomberg.com http://www.bloomberg.com/news/articles/2015-12-18/humans-are-slamming-into-driverless-cars-and-exposing-a-key-flaw

- “AI Machine Learns to Drive Using Crowdteaching”, 21-12-2015, MIT Technology Review http://www.technologyreview.com/view/544926/ai-machine-learns-to-drive-using-crowdteaching/
- 〈 微信人工智能实 室：社交网 已成 人工智能的一个 点〉，19-12-2015，杜小芳，InfoQ http://www.infoq.com/cn/articles/yangqiang-chenbo-whatlab
- “HKUST and WeChat Establish Joint Lab on Artificial Intelligence Technology”, 01-12-2015, The Hong Kong University of Science and Technology http://www.ust.hk/about-hkust/media-relations/press-releases/hkust-wechat-establish-joint-lab-artificial-intelligence-technology-2/
- “MIIT intelligent manufacturing plan to eyes on robot, AI, industrial Internet”, 24-12-2015, Xinhua Finance http://en.xinfinance.com/html/Industries/Manufacturing/2015/181339.shtml
- “How Elon Musk and Y Combinator Plan to Stop Computers From Taking Over”, 11-12-2015, Steven Levy, medium.com https://medium.com/backchannel/how-elon-musk-and-y-combinator-plan-to-stop-computers-from-taking-over-17e0e27dd02a#.2iv1ja4ah
- 〈实施方案发布在即 智能制造再塑强国梦〉，24-12-2015，〈 源：上海 券 〉中国証券网 http://news.cnstock.com/industry/sid_rdjj/201512/3662948.htm

5. **Our future can't do without wearable technology**

- “New physical activity guidance can help reduce risk of breast, colon cancers”, 04-02-2011, World Health Organization http://www.who.int/mediacentre/news/notes/2011/world_cancer_day_20110204/en/
- “Sitting is the New Smoking- Even for Runners”, 20-07-2013, Selene Yeager, Runners’ World http://www.runnersworld.com/health/sitting-is-the-new-smoking-even-for-runners
- “Fitbit Reports $409M Q315 Revenue; Raises Guidance to $1.77 to $1.80B FY15 Revenue”, 02-11-2015, Fitbit press release https://investor.fitbit.com/press/press-releases/press-release-details/2015/Fitbit-Reports-409M-Q315-Revenue-Raises-Guidance-to-177-to-180B-FY15-Revenue/
- “ Well Being Digital Wins The Best Wearable Mobile Technology Award at GSMA Mobile World Congress”, 02-03-2016, Hong Kong Science and Technology Parks Corporation http://www.hkstp.org/en-US/News-Media-Events/Corporate-News/2016/Well-Being-Digital-Wins-The-Best-Wearable-Mobile-T.aspx
- "Temp tech tattoos can monitor your health and location", 25-11-2015, Mariella Moon, Engadget http://www.engadget.com/2015/11/25/temp-tech-tattoos/
- “Fitness monitoring: gimmick or game-changer for the NHS?”, 28-01-2016, Samuel Gibbs, The Guardian http://www.theguardian.com/society/2016/jan/28/fitness-monitoring-health-service-data-patients-trackers-fitbit
- “Startups Making A Name For Themselves In The $1 Billion Wearables Market”, 23-09-2015, Unity Stoakes, Forbes http://www.forbes.com/sites/unitystoakes/2015/09/23/wearables-are-revolutionizing-healthcare-not-just-fitness/#3294f26b125a
- “Wearable Technology Future is Ripe for Growth – Most Notably among Millennials, Says PwC US”, 21-10-2014, PwC http://www.pwc.com/us/en/press-releases/2014/wearable-technology-future.html
- “The future will eat itself: digesting the next generation of wearable tech”, 13-01-2016, Shivvy Jervis, The Guardian http://www.theguardian.com/media-network/2016/jan/13/future-eat-digesting-next-generation-wearable-tech
- “When will (or did?) wearable technology come to your workplace?”, 26-11-2014, Joyce Maroney, The Workforce Institute http://www.workforceinstitute.org/blog/will-wearable-technology-come-workplace/
- “Will the workplace lead wearable technology adoption?”, Heather Clancy, 29-10-2014, Fortune http://fortune.com/2014/10/29/will-the-workplace-lead-wearable-technology-adoption/?utm_content=buffer9dc55&utm_medium=social&utm_source=twitter.com&utm_campaign=buffer

6. **E-learning for everyone!**

- "What is ConnectED?", 06-06-2013, The White House https://www.whitehouse.gov/blog/2013/06/06/what-connected
- “Benchmark U.S. Educational Efforts”, United States Mission to The Organization for Economic Cooperation and Development (USOECD) http://usoecd.usmission.gov/priorities/benchmark_education.html

- "PISA 2009 Ranking: Comparing countries' and Economies' performance", PISA 2009 Key Findings, OECD https://www.oecd.org/pisa/pisaproducts/46619703.pdf
- "Billionaire Jack Dangermond's Esri Pledges $1 Billion Of Mapping Software To America's K-12 Schools", 27-05-2014, Liyan Chen, Forbes http://www.forbes.com/sites/liyanchen/2014/05/27/billionaire-jack-dangermonds-esri-pledges-1-billion-of-mapping-software-to-americas-k-12-schools/#66f3d8655ab9

7. **Hong Kong regulators must not stifle the city's fledgling sharing economy**
   - "These Charts Show How the Sharing Economy Is Different", 15-06-2015, Jennifer Rossa and Anne Riley, BloombergBusiness http://www.bloomberg.com/news/articles/2015-06-15/these-charts-show-how-the-sharing-economy-is-different
   - "The Future of Work in the Sharing Economy", 02-12-2014, Economic Opportunities Program, The ASPEN Institute http://www.aspeninstitute.org/sites/default/files/content/upload/Background%20Fact%20Sheet%20.pdf
   - "Airbnb And The Unstoppable Rise Of The Share Economy", 23-01-2013, Tomio Geron, Forbes http://www.forbes.com/sites/tomiogeron/2013/01/23/airbnb-and-the-unstoppable-rise-of-the-share-economy/
   - "Uber, Airbnb and consequences of the sharing economy: Research roundup", 19-10-2015, Joanna Penn and John Wihbey, Journalist's Resource http://journalistsresource.org/studies/economics/business/airbnb-lyft-uber-bike-share-sharing-economy-research-roundup
   - "The sharing economy: how is it affecting you and your business?", 2013, PwC UK http://www.pwc.co.uk/issues/megatrends/collisions/sharingeconomy.html
   - 〈共享經濟調查(下)：全球共享時代來臨，香港準備好了嗎？〉，21-10-2015，陳嘉茵《端傳媒》https://theinitium.com/article/20151020-hongkong-shareeconomy02/
   - "How equity crowd-funding could transform the community energy sector", 02-12-2015, Chris Cooper and Tom Nockolds, One Step Off The Grid http://onestepoffthegrid.com.au/how-equity-crowd-funding-could-transform-the-community-energy-sector/
8. **Crowdfunding - an alternative financing for local startups**
   - "Global Crowdfunding Market to Reach $34.4B in 2015, Predicts Massolution's 2015CF Industry Report", 07-04-2015, Crowdsourcing.org http://www.crowdsourcing.org/editorial/global-crowdfunding-market-to-reach-344b-in-2015-predicts-massolutions-2015cf-industry-report/45376
   - "10 More Creative Ways to Finance Your Startup", Martin Zwilling, 07-03-2013, Forbes http://www.forbes.com/sites/martinzwilling/2013/03/06/10-more-creative-ways-to-finance-your-startup/
   - "China Digest - Internet finance update", 02-09-2015, Simmons & Simmons elexica http://www.elexica.com/en/legal-topics/banking/02-china-digest-internet-finance-update
   - "The new thundering herd", 16-06-2012, The Economist http://www.economist.com/node/21556973
   - "Hong Kong yet to catch up on crowdfunding boom", 26-05-2015, ejinsight http://www.ejinsight.com/20150526-hong-kong-yet-to-catch-up-on-crowdfunding-boom/
9. **Future food - Nature's nutrients**
   - "World population projected to reach 9.7 billion by 2050 with most growth in developing regions, especially Africa - says UN", 29-07-2015, United Nations http://www.un.org/en/development/desa/population/events/pdf/other/10/World_Population_Projections_Press_Release.pdf
   - "World Agriculture Towards 2030/2050: The 2012 Revision", 06-2012, Nikos Alexandratos and Jelle Bruinsma, Food and Agriculture Organization of the United Nations http://www.fao.org/docrep/016/ap106e/ap106e.pdf (p.75-76)
   - "Environmental Impacts of Cultured Meat Production", 17-11-2011, Wildlife Conservation Research Unit, University of Oxford and Swammerdam Institute for Life Sciences, University of Amsterdam http://pubs.acs.org/doi/abs/10.1021/es200130u?version=meter+at+2&module=meter-Links&pgtype=article&contentId=&mediaId=&referrer=https%3A%2F%2Fen.wikipedia.org%2F&priority=true&action=click&contentCollection=meter-links-click&
   - "Foods of the Future: What Will We Be Eating", 13-11-2015, Avi Gertzman, Forbes http://www.forbes.com/sites/forbesinternational/2015/11/13/foods-of-the-future-what-will-we-be-eating/#5a0041e841a1
   - "Protein Goes Green: Can Algae Become The Next Soy?", 11-08-2015, Jessie Rack, The Salt http://www.npr.org/sections/thesalt/2015/08/11/429985941/protein-goes-green-can-algae-become-the-next-soy

- 〈食字部：追尋藜麥潮〉，26-06-2013，蘋果日報 http://hk.apple.nextmedia.com/supplement/food/art/20130626/18311892
- "UN kicks off 'Year of Quinoa' with focus on world nutrition", 20-02-2013, United Nations Http://www.un.org/apps/news/story.asp?newsid=44184#.v1bdftv97rd
- "Quinoa brings riches to the Andes", 13-01-2013, Dan Collyns, The Guardian http://www.theguardian.com/world/2013/jan/14/quinoa-andes-bolivia-peru-crop
- "The future of fast food is⋯Quinoa?", 25-08-2015, Adam Bluestein, co-exist http://www.fastcoexist.com/3049209/the-future-of-fast-food-is-quinoa
- 〈平均107港人IQ全球居首〉，09-06-2016，星島日報 https://hk.news.yahoo.com/%E5%B9%B3%E5%9D%87107-%E6%B8%AF%E4%BA%BAiq%E5%85%A8%E7%90%83%E5%B1%85%E9%A6%96-221111168.html

10. **Hong Kong can learn from Japan's futuristic smart city technology development**

- "Inside Japan's first robot-staffed hotel", 14-08-2015, Monisha Rajesh, The Guardian http://www.theguardian.com/travel/2015/aug/14/japan-henn-na-hotel-staffed-by-robots
- "8 Reasons Why the Tokyo Olympics Will Be the Most Futuristic We've Ever Seen", 14-08-2015, Bryan Lufkin, Gizmodo http://gizmodo.com/8-reasons-why-the-tokyo-olympics-will-be-the-most-futur-1728007440
- "Tokyo Hopes to Make Hydrogen Power the Star of the 2020 Olympics", 11-09-2015, Mitsuru Obe, The Wall Street Journal http://www.wsj.com/articles/tokyo-hopes-to-make-hydrogen-power-the-star-of-the-2020-olympics-1442174267
- 〈推動乾淨能源　東京要藉2020奧運變身氫氣城〉，31-05-2016，蔡百薰，東森新聞 http://www.ettoday.net/news/20150531/514306.htm
- "Tourists in Japan to use fingerprints as 'currency' instead of cash", 11-04-2016, Danielle Demetriou, The Telegraph http://www.telegraph.co.uk/news/2016/04/11/tourists-in-japan-to-use-fingerprints-as-currency/
- 〈2020東京奧運公開亮相：未來急救時不怕堵車，因為救護車會「飛」來救你！〉，13-08-2015，飯山辰之介，商業週刊 http://www.businessweekly.com.tw/KBlogArticle.aspx?id=13402

3rd stop: Around the World

1. **Hong Kong needs a tech upgrade to diversify its ailing economy**

- "Global Digital Economy- E-Health, E-Education and E-Government Trends: Digital Economy Eliminating Unnecessary Costs, Creating Greater Efficiencies and Increasing Production", 18-12-2015, Digital Journal http://www.digitaljournal.com/pr/2782198
- "Coding at school: a parent's guide to England's new computing curriculum", 04-09-2014, Stuart Dredge, The Guardianhttp://www.theguardian.com/technology/2014/sep/04/coding-school-computing-children-programming
- "Greening Paris", 10-09-2015, Laura Kloser, Topos Magazine https://www.toposmagazine.com/greening-paris/
- 《科技教育學習領域課程指引(小一至中三)》，2002，教育局，香港特區政府 http://www.edb.gov.hk/attachment/tc/curriculum-development/kla/technology-edu/curriculum-doc/technology%20ed%20guide%20chinese.pdf
- "Computer Science is for Everyone!", 11-12-2013, Tom Kalil & Farnam Jahanian, the White House https://www.whitehouse.gov/blog/2013/12/11/computer-science-everyone

2. **Building a GIS-based smart city**

- "The 2016-17 Budget", 24-2-2016, the Government of the Hong Kong Special Administrative Region http://www.budget.gov.hk/2016/eng/pdf/e_budgetspeech2016-17.pdf
- "The Ecosystem of Innovation and Technology in Hong Kong", 18-12-2015, Our Hong Kong Foundation http://www.ourhkfoundation.org.hk/sites/default/files/media/pdf/ScTech_full_report_eng.pdf
- Los Angeles Launched GeoHub, Spring 2016, ArcNews http://www.esri.com/esri-news/arcnews/spring16articles/los-angeles-launched-geohub

3. **Hong Kong cannot become a smart city without its people's buy-in**

- 〈大会聚焦10多 新型智慧城市发展 〉，25-03-2016，　源：国际在，中國經濟網 http://district.ce.cn/newarea/

roll/201603/25/t20160325_9816464.shtml
- “The 3 Generations Of Smart Cities”, 08-10-2015, Boyd Cohen, Co Exist http://www.fastcoexist.com/3047795/the-3-generations-of-smart-cities
- “Rethinking Smart Cities From The Ground Up”, 18-06-2015, Tom Saunders & Peter Baeck, Nesta http://www.nesta.org.uk/sites/default/files/rethinking_smart_cities_from_the_ground_up_2015.pdf
- “Could Songdo be the world’s smartest city?”, 21-01-2014, Rita Lobo, World Finance http://www.worldfinance.com/inward-investment/could-songdo-be-the-worlds-smartest-city
- “Mission Control, Built for Cities”, 03-03-2012, Natasha Singer, The New York Times http://www.nytimes.com/2012/03/04/business/ibm-takes-smarter-cities-concept-to-rio-de-janeiro.html?_r=0
- “Citizens’ Solar Power Plants: solar energy for everyone”, Smart City Wien https://smartcity.wien.gv.at/site/en/projekte/menschen-gesellschaft/burgerinnen-solarkraftwerk/
- “Greenest City 2020 Action Plan”, City of Vancouver http://vancouver.ca/files/cov/Greenest-city-action-plan.pdf
- "Helping Jakarta track flooding in real time to save more lives", 02-12-2014, Mark Gillis, Twitter https://blog.twitter.com/2014/helping-jakarta-track-flooding-in-real-time-to-save-more-lives

4. **Getting ahead in Hong Kong: Speak up for a smart city!**
- Auntie, Finland http://auntie.fi/#newssheet
- "Top 5 Performing Cities”, CITIE http://citie.org/2015-results/
- “Singapore Is Taking the ‘Smart City’ to a Whole New Level”, 24-04-2016, Jake Maxwell Watts & Newley Purnell, The Wall Street Journal http://www.wsj.com/articles/singapore-is-taking-the-smart-city-to-a-whole-new-level-1461550026
- “Top Smart Cities in the world today”, 17-08-2016, Tan Wee Kwang, Enterprise Innovation http://www.enterpriseinnovation.net/article/top-smart-cities-world-today-676169304?utm_source=silverpop&utm_medium=newsletter&utm_campaign=EIeGoveNews
- 到站時間預報，九龍巴士 http://kmb.hk/tc/services/eta_enquiry.html
- AEC HACKATHON http://aechackathon.com/
- “Autumn 2016 pilots: Auntie solutions and KuntoKaverit”, Smart Kalasatama, Helsinki City Group http://fiksukalasatama.fi/en/agile-piloting/auntie-solutions-and-kuntokaverit/
- “Hack into the Future – Helsinki’s Kalasatama providing one blueprint for tomorrow”, 19-07-2016, Smart Kalasatama, Helsinki City Grouphttp://fiksukalasatama.fi/en/hack-into-the-future-helsinkis-kalasatama-providing-one-blueprint-for-tomorrow/

5. **How mobile payment technology could pay off for Hong Kong**
- • "The Future of Money", 22-11-2015, CBS News http://www.cbsnews.com/news/future-of-money-kenya-m-pesa-60-minutes/
- “Executive Summary - Consumers and Mobile Financial Services 2016”, 03-2016, Board of Governors of The Federal Reserve System http://www.federalreserve.gov/econresdata/consumers-and-mobile-financial-services-report-201603.pdf
- “Mobile Consumer 2015: The UK cut”, Deloitte http://www.deloitte.co.uk/mobileuk/assets/pdf/Deloitte-Mobile-Consumer-2015.pdf
- 〈統計數字：電 腦相關罪〉，資訊安全網，香港特區政府 http://www.infosec.gov.hk/tc_chi/aboutus/aboutus.html
- "JETCO strikes back in Fintech era", first quarter 2016, Sheila Lam, Computerworld Hong Kong (print version)
- “2014 North America Consumer Payments Survey: How consumer choice will shape the future of payments”, Accenture https://www.accenture.com/t20150715T045907__w__/us-en/_acnmedia/Accenture/Conversion-Assets/DotCom/Documents/Global/PDF/Industries_15/Accenture-2014-North-America-Consumer-Payments-Survey.pdf
- 〈儲值支付工具的監管〉, 23-11-2015, 金融管理局 http://www.hkma.gov.hk/chi/key-functions/international-financial-centre/regulatory-regime-for-svf-and-rps/regulation-of-svf.shtml
- 〈移動支付來襲 銀行宜順勢而為〉, 06-04-2016，黃金嬋，信報http://www1.hkej.com/dailynews/investment/article/1276998/%E7%A7%BB%E5%8B%95%E6%94%AF%E4%BB%98%E4%BE%86%E8%A5%B2+%E9%8A%80%E8%A1%8C%E5%AE%9C%E9%A0%86%E5%8B%A2%E8%80%8C%E7%82%BA

6. **How to engage private doctors in e-health record sharing**
   - 〈公私電子病歷3•13起互通〉，08-03-2016，東方日報 http://orientaldaily.on.cc/cnt/news/20160308/00176_018.html
   - 〈附錄C 香港私營醫療服務現況〉，07-2011，醫療改革第二階段公眾諮詢，香港特區食物及衛生局 http://www.myhealthmychoice.gov.hk/pdf/appendixC_chn_txt.pdf
   - 〈国家电子健康 (NEHR)〉單張，Ministry of Health, Singapore https://www.moh.gov.sg/content/dam/moh_web/Publications/Educational%20Resources/2011/NEHR%20Brochure_ENG_CH.pdf
   - "Keynote Speech at The Economist's 'Healthcare In Asia 2012' Conference", 28-03-2012, Gan Kim Yong, Minister for Health, Singapore https://www.moh.gov.sg/content/moh_web/home/pressRoom/speeches_d/2012/keynote_speech_by_Minister_Gan_Economists_Healthcare_in_Asia_2012_Conference_28Mar2012.html
   - "GPs utilisation of NEHR", 12-02-2015, Parliamentary QA, Ministry of Health, Singapore https://www.moh.gov.sg/content/moh_web/home/pressRoom/Parliamentary_QA/2015/gps-utilisation-of-nehr.html
   - 〈電子病歷推動專區—簡介〉，29-12-2015，台灣衛生福利部 http://emr.mohw.gov.tw/introduction.aspx
   - 〈全國電子病歷交換系統簡介〉，01-2015，台灣衛生福利部資訊處處長許明暉，《政府機關資訊通報》第327期 http://webcache.googleusercontent.com/search?q=cache:EK2P9yiyjzMJ:ws.ndc.gov.tw/Download.ashx%3Fu%3DLzAwMS9hZG1pbmlzdHJhdG9yLzEwL1JlbEZpbGUvNTU2Ni82OTY4LzAwNjIxMDhfMS5kb2N4%26n%3DcGFydDIuZG9jeA%253D%253D%26icon%3D..docx+&cd=9&hl=zh-TW&ct=clnk&gl=hk
   - "Widespread Adoption of Information Technology in Primary Care Physician Offices in Denmark: A Case Study", 03-2010, Denis Protti & Ib Johansen, The Commonwealth Fund http://www.commonwealthfund.org/~/media/Files/Publications/Issue%20Brief/2010/Mar/1379_Protti_widespread_adoption_IT_primary_care_Denmark_intl_ib.pdf

7. **Pokémon GO driving the Smart City**
   - "Location is Driving the Value of L.A.'s Open Data", 09-08-2016, Sari Ladin, Harvard Kennedy School http://datasmart.ash.harvard.edu/news/article/location-is-driving-the-value-of-l.a.s-open-data
   - "Mayor Garcetti and Esri Launch Innvative Platform that Puts Open Data to Work", 29-01-2016,Mayor Eric Garcetti Http://www.lamajor.org/ Mayor-Garcetti-and- Esri-Launch-Innovative-Platform-Puts-Open-Data-Work
   - Los Angeles Launched GeoHub, Spring 2016, ArcNews http://www.esri.com/esri-news/arcnews/spring16articles/los-angeles-launched-geohub
   - Auckland Open Data, Auckland Council http://www.aucklandcouncil.govt.nz/en/ratesbuildingproperty/propertyinformation/gis_maps/pages/opendata.aspx#download

8. **Smart city – building greener**
   - "Toyota to expand work-at-home program to help staff balance domestic demands", 09-06-2016, The Japan Times http://www.japantimes.co.jp/news/2016/06/09/business/corporate-business/toyota-expand-work-home-program-help-staff-balance-domestic-demands/#.V42M0dJ97rd
   - 〈Home Office夢想成真？從日本豐田看智慧城市〉，10-06-2016，健康空氣行動，立場新聞 https://www.thestandnews.com/nature/home-office-%E5%A4%A2%E6%83%B3%E6%88%90%E7%9C%9F-%E5%BE%9E%E6%97%A5%E6%9C%AC%E8%B1%90%E7%94%B0%E7%9C%8B%E6%99%BA%E6%85%A7%E5%9F%8E%E5%B8%82/
   - "Holiday Inn Express Hong Kong Soho", BEAN Plus online Exhibition, BEANPlus http://greenbuilding.hkgbc.org.hk/zh/projects/view/38
   - Urban Renewal Fund http://www.urfund.org.hk/en_about.html

9. **To innovate, Hong Kong needs to groom more top scientists and engineers**
   - University Grants Committee http://cdcf.ugc.edu.hk/cdcf/statEntry.do
   - "The Global Competitiveness Report 2015-2016", World Economic Forum http://reports.weforum.org/global-competitiveness-report-2015-2016/
   - "Budget Speech", The 2016-17 Budget, HKSAR http://www.budget.gov.hk/2016/eng/budget10.html
   - "Hong Kong X Grand Opening", 19-07-2016, Hong Kong X-Tech Startup Platform http://hkxtech.org/event/?lang=en

10. **The next Chief Executive should create a harmonious society**
- "NASA Analysis Finds August 2016 Another Record Month", 12-09-2016, NASA http://data.giss.nasa.gov/gistemp/news/20160912/
- Mapping changes in temperature (1850-2016), 24-08-2016, Ed Hawkins, Twitter https://twitter.com/ed_hawkins
- "Causes of Climate Change", Government of Canada http://climatechange.gc.ca/default.asp?lang=En&n=65CD73F4-1#X-201208011007512
- "Toxic air pollution nanoparticles discovered in the human brain", 05-09-2016, Lancaster University http://www.lancaster.ac.uk/news/articles/2016/toxic-air-pollution-nanoparticles-discovered-in-the-human-brain/

Surfing the IT World

Author
Dr. Winnie Tang Shuk Ming

Illustration
Tam Cheuk Man

Design
Zoe Wong

Production of Online Version
Esri China(Hong Kong) Limited
9/F , CEO Tower,
77 Wing Hong Street,
Cheung Sha Wan, Kowloon,
Hong Kong
esrichina.hk

Issued Date
May 2017

To know more about the author and get her latest update, please visit her website or Facebook below

Website

http://www.winnietang.hk/

Facebook

Dr. Winnie Tang

Technology advances rapidly. During the 20 years from 1997 to 2016, many popular brands and technologies faded out and were replaced. Examples that were once ubiquitous and are now obsolete include fax machines, Nokia mobile phones, pagers and bulky computer screens.

In 1997, it was in this rapidly changing environment that a young university graduate decided to launch a small technology company only a few years after graduating. Two decades later, with a unique vision, and amazing perseverance, she has built the company into a leader in the technology sector.

Whilst building the business she also managed to complete her doctorate, and developed the world's first SARS propagation map. For all her efforts she was recognised as one of the Distinguished Alumni by the Faculty of Science of HKU, and one of the Ten Outstanding Young Persons of the year by the Junior Chamber International Hong Kong (JCIHK). She received the Young Achiever of the Year in the Women of Influence Award presented by the American Chamber of Commerce, and was appointed as Justice of the Peace (JP) by the Hong Kong SAR Government.

In this book, Dr. Winnie Tang details her path of growth , she explores global technology trends and the development of smart cities with a view to stimulate and inspire the younger generation through her successful story to create their own unique story.

ISBN 978-988-78259-6-8
9 789887 825968