

**International Young Engineers Exchange Forum of
the Young Members Committee, HKIE**

Keynote Speech by Ir Alfred Sit JP, Director of Electrical & Mechanical Services

Trust me, you are the Engineer

Good morning Ir Yuen (HKIE Vice-President), Ir Tang (YMC Chairman), distinguished guests, young fellows, ladies and gentlemen, I am thankful to HKIE YMC for giving me this opportunity to meet so many young engineers and potential engineers. I enjoy spending time with young people as telling them my story always arouses sweet memories, and sharing them my beliefs often awakens expunged aspiration.

Over these years, Hong Kong has already developed to an Asia's world city. The devotion and persistence of our engineers are certainly a major reason for the prosperity of Hong Kong today. Our city is ranked as the world's freest economy for 24th consecutive years, while we are also the world's 2nd most competitive city according to the IMD World Competitiveness Rankings. Hong Kong is recognised as the 3rd top global financial centre and the 4th economies in the ease of doing business. Besides having the top cargo airport and the world's 5th best airport, Hong Kong also has the most skyscrapers in the world. Indeed, our infrastructure development is going to grow bigger and bigger in coming years. It is envisaged that the Government will further invest over \$1,000 billion Hong Kong dollars in infrastructure in the next ten years, with projects such as the Third-Runway System, housing development and the 500 billion Hong Kong dollars large-scale hospital development plan. There are myriad engineering opportunities waiting ahead of those who are prepared. And I believe that it is time for you, our future pillars, to get ready. In the 80s, when some of you and many other creations like World Wide Web (WWW) and Graphical User Interface (GUI) are still at infancy. I wondered if we could monitor the performance of all Hong Kong public E&M facilities in a single control room. I wondered if we could achieve the best efficiency of all installations and accurately predict equipment failure by data analysis. However, the convergence of

associated technologies was also in its infancy and the cost of maintaining data links was discouraging. Despite splashed with a bucket of cold water, the fire in my heart persisted. And I waited. After two decades of waiting, real-time remote monitoring technology has now been applied to E&M systems at major government venues. Coupled with integrated Building Management System (iBMS), these E&M systems can be centrally monitored, allowing more efficient and cost-effective operation and maintenance. Moreover, operation and fault data of the E&M assets are being collected, with a view to optimising their performance in future via big data analysis. As some of you may have heard, our famous actor Stephen Chow once said, “If we don’t have any dream in life, we’ll look like a salted fish (做人如果無夢想，同條咸魚有咩分別?)”. Over time, humanity has discovered and created things of all kinds. Dreams have pushed us to move forward, and to put forth the effort and equip ourselves to make our dreams come true. Today, I would like to share with you what I have learned throughout these wonder years and waiting years. And I have summarized them into two beliefs and three behaviours.

My first belief is “Make a difference”. When I was young, one thing my boss often told me was to keep finding room for improvement. Now I also say the same to my colleagues: there is always room for improvement. There is no the best, but only better. Indeed, improvement comes with determination to make a difference. There are many examples of how we can make a difference. EMSD and the Hong Kong Council of Social Service has jointly organised a competition called Gerontech Youth Challenge, which aimed to encourage the public, especially youngsters, to develop products that integrate technology with elderly care. Five students from Buddhist Wong Wan Tin College took the top prize in the secondary school group of the challenge by adding a special power device to upgrade an ordinary wheelchair. They turned a manual-controlled wheelchair to a powered one which could even be remotely controlled. This special device gives the needy a relatively affordable alternative to traditional powered wheelchairs. Inspiring cases are happening all around the globe. In Bangladesh where temperatures can climb up to 45°C in summer, over 60% of the population lives in tin huts without any cooling devices. Fortunately, Mr. Ashis Paul found the answer to help relieve the unbearable heat.

He invented the Eco-Cooler - the world's first "zero electricity" air-conditioner made of plastic bottles. The design utilizes the simple concept of compression and expansion of air to decrease the temperature of air blowing into the house, which can reduce the room temperature by 5°C immediately. It is cheap, incredibly easy to make yet efficient, and has already helped more than 25,000 households of the country. This is a remarkable example of how small innovative changes can even literally change people's life. "We can change the world and make it a better place. It is in our hands to make a difference." said Nelson Mandela. If all of us make little changes, someday we can achieve something big. Now it is your turn to think about what difference you can make to the existing things, be it a tiny routine like drafting a report or an earthshaker like landing on the Moon. My second belief is "Do the impossible". While you used to make a difference to what already exists, try also do the impossible by making real what does not exist. Nothing is impossible; and impossible is nothing. Making the seemingly "impossible" into "possible" is indeed happening every day, every moment.

When I was young, I watched Sci-Fi movies such as Star Trek and Star Wars. The technologies appeared in the movies were remote or even impossible to people in those days, but now they seem so familiar to us. For example, characters using mobile communicators to talk to each other or even with aliens looked so unreal; but if you don't have a smartphone now, you may be the one considered as an alien. A universal language translator was also once a fantasy, but now we have Google, Siri and all types of software that facilitate instant translation. In the past few decades, we have seen so many ideas, imaginations and dreams coming close to reality. Now, when I am in my fifties but still young at heart, I still watch Sci-Fi movies such as Star Trek and Star Wars. The new sequels may share similar characters and storylines, but they still portrait technologies that seem impossible to us today. I am pretty sure that with the belief of doing the impossible, they will come true someday - perhaps with the help of one of you sitting in this room. Maybe a fans of Iron Man will make Jarvis the artificial intelligence come true in the foreseeable future. It is always easier to say "It is impossible" than "Let me have a try". But once you give in, you are also letting go the possibility of your future.

Doing the impossible is sometimes a lone journey when people think you are talking nonsense. But like Walt Disney said, *“It’s kind of fun to do the impossible.”* I choose to believe in the impossible and enjoying the process of exploration. What we need is courage and determination. I guess many of you should have heard of the well-known unmanned aerial vehicle (UAV) brand named DJI. DJI is now the world's largest consumer drone company and should still maintain its leading role for some years, but its founder did not start out successful in his career. DJI is indeed established by a fresh graduate, Frank Wang, who graduated from The Hong Kong University of Science and Technology. When Wang built a helicopter flight-control system for his graduation thesis in 2005, it failed the night before the presentation. When he first started his company in 2006, the only capital they had was Wang’s remaining university scholarship funds. Yet, because of never giving up and believing in the possibility to develop a great control system for UAV, Frank Wang has finally succeeded and is now the world's first drone Billionaire. Now, it is your turn to imagine. What does the future look like to you? Maybe the road is full of autonomous vehicles; maybe humanoid robots have become the main appliance in our daily life. Dream big and do the impossible. After all the future is yours. Would you rather take part in defining your own future, or allow others to define it for you?

These two beliefs have driven me throughout my career. Belief shapes behaviour, and behaviour affects outcome. Here, I would like to further share with you the three behaviours that my beliefs have given me, making me who I am today. The first behaviour is “Listen”. Remember to “Listen before Judge.” It is common that a snap judgement overpowers decision making. I always remind myself that hasty judgement can kill ideas, so I set a rule for myself: never say “No” for the first minute listening to others’ suggestions or views. This does not mean to skip my judgement. Instead, it gives me the chance to think twice and evaluate the possibility of every option, and opens my mind to embrace new and bold ideas. Back at EMSD, I am pleased that “listen” has become a corporate culture. We highly encourage bottom-up communication among our staff, and we even have an unspoken rule among ourselves – when the junior speaks, the senior

stays quiet. He or she needs to listen to the junior before making any comment. This culture has helped us nurture countless valuable ideas for the future development of our organization; many of which are originated from our young colleagues. Examples include our recently established Inno-team for promoting innovations, the “E&M Inno Portal” facilitating I&T collaboration, as well as an Interactive Learning Centre for adoption of I&T in staff training. In particular, the “E&M Inno Portal” is an interesting creation where startups and universities are invited to put E&M related I&T solutions on the platform to match with our government agencies’ service wish list. We will then provide venues for trial of suitable projects, conduct prototype testing and pilot project in a collaborative way. This is essentially another form of “listening” - instead of subjectively turning down proposals, we listens to the people who have the wish and wisdom to give it a try, and provide them opportunities to turn their imagination into reality.

If a brilliant idea really sounds, you will hear it when you listen, and so can you see it when you watch. So, you probably know I am going to talk about “seeing”. The second behaviour is “*See*”. By “seeing” I mean to explore, to step out and to experience something new. Sometimes it is not enough to just listen to opinions. Sometimes it is not enough to just stay at home and surf the Internet for knowledge. Sometimes we have to actually see something with our own eyes to draw a conclusion. As the Chinese saying goes : "It is better to travel ten thousand miles than to read ten thousand books (讀萬卷書不如行萬里路)". If you ever has doubt to anything, I suggest that you go to see it by yourself to determine if it is a fact, or even an opportunity. “Seeing” can be in many ways. Travelling is an excellent option to discover new and interesting things, be it your own journeys at leisure or engineering visits. I know that the organizer of our Forum today, the HKIE-YMC is keen on organizing visits and delegations for their young members, and there are many exchange programs offered by various education institutions. We ourselves are also constantly providing overseas delegation and studying opportunities for our colleagues in EMSD. Seeing is Believing - see what others have achieved, learn from their experience and gain your own insights. Recently, our department has also organized delegations to the Guangdong-Hong Kong-Macao Greater Bay Area with our

clients, academics and trade representatives to see and appreciate different cities' latest development, especially in I&T and E&M skill training. While ten years ago we may not believe that our nearby Mainland cities can become so advanced, today we can easily witness the change ourselves. It has long been conspiracy theories from different parties that Hong Kong will be marginalised or assimilated, even before the proposed development of the Greater Bay Area. For this I always encourage my colleagues, especially the young ones, to go and see it for themselves, understand each other's strengths and weaknesses, and then determine if the proposal poses an opportunity or a threat.

The third and last behaviour I am going to talk about is "Feel". While listening and seeing complement each other to inspire innovations, feeling is the last piece of the puzzle that helps bring the impossible to reality. A more precise description of the "feeling" here is "empathy". Only when you feel what the others feel can you truly understand their problems and needs; and only then will you be able to put aside your preconceived thoughts, and go on to develop a favorable solution that can satisfy their needs. Often a small thought triggered by "feeling" can make a huge difference to the world. Do you know that more than one million babies worldwide die each year from premature birth, while many of their deaths are due to the lack of warmth? This problem occurs principally in developing countries where people cannot afford expensive incubators. The situation has not improved until a social enterprise called Embrace Innovations released a new incubator for the developing world in 2012. This Embrace Warmer is composed of a material that can be heated to normal human temperature and maintain it for several hours. It is small, light, portable and most importantly, costs only around USD\$200, which is affordable for families in developing countries. The founders of this company are three students from Stanford University, in which two of them are engineers. They developed an early prototype of the Warmer during their postgraduate study after feeling the pain of mothers in those remote villages. Their enthusiasm has further prompted them to form the Embrace Innovations after graduation to improve the Warmer to a market-ready product. Up till now, the team has saved over 300,000 premature babies across 22

countries. If saving babies in remote villages is a bit far, let's zoom back to Hong Kong. Many residents living in subdivided flats have to wash and dry clothes within their tiny homes, because they can hardly afford taking their clothes to the laundries. You can probably imagine that clothes will take forever to dry in such environment, not to mention the high indoor humidity and wet floors make the flat a hotbed for bacteria. Three students from Munsang College have felt the residents' needs and designed the "Smart Clothes Dryer" for them: the dryer is made of cheap cardboard and equipped with humidity sensors and fans, while it can also be lifted to a high position when not in use for space saving. Although only a prototype was developed for the time being, I must say I am deeply impressed by the students' creativity and human-centered concept. This is a great example to demonstrate the importance of "feel" and "empathize" when making an invention.

There are many successful engineers in the world and they may not share the same sets of beliefs and behaviours. But I am confident that they all share the common outcome - to provide engineering solutions for the benefit of people and the betterment of society. I hope that my sharing with you today can inspire you to find your own path, establish your own beliefs and behaviours, and pursue the same sublime outcome. Just as what my seniors have done - they did not impose any of their beliefs on me, they just helped me to find mine. I also hope to help you find yours, so that you will open your mind to the exciting future and carry on writing your own story.

Never underestimate yourself and think that you cannot achieve something big just because you are young. There are so many people who have changed the world at their young age - we have Katie Bouman, the 29-year-old computer scientist of the Event Horizon Telescope team that captured the first image of a black hole; Amin Hataman, the international award-winning inventor who created biodegradable plastic bags made from coconuts when he was 15; Malala Yousafzai, the youngest Nobel Peace Prize laureate at age 17 who firmly fights for female education, and so on and so forth. Perhaps in the near future, you will also be the one standing here to share with the audience what you believe

in. When this day comes, there is a small favour that I would like to ask of you. I would like you to help spread the words - to encourage your future audience to also find their own beliefs and behaviours. If all 240 young talents here today are going to share your beliefs with another 240 young engineers, after merely 4 rounds of sharing it makes a total crowd of 3.3 billions already - over one-third of the world's population! This follows that we will have 3.3 more billions of engineers with shared goals. From generation to generation, the possibility they can harness will be way beyond our imagination. Trust me, you are the Engineer - find your beliefs, go beyond your limits and I am looking forward to witnessing the impossible future co-created by all of you. In closing, I would like to share with you a quote from Albert Einstein. He said: "Only those who attempt the absurd can achieve the impossible". So young fellows, how absurd can you go? Thank you.

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