OPENING ADDRESS BY MR ONG YE KUNG,
ACTING MINISTER FOR EDUCATION
(HIGHER EDUCATION AND SKILLS)
AT THE NUS-ISS 35TH ANNIVERSARY DINNER

Professor Tan Chorh Chuan, President NUS

Ms Janet Ang, Chairperson, ISS

Distinguished Guests, Ladies and Gentlemen

1.   I am happy to join you in celebrating the NUS Institute of Systems Science's (ISS) 35 years of nurturing infocomm and digital business leaders.

The IT Revolution

2.   We gather here at the cusp of an IT Revolution. But it did not just start with Uber, AirBnB and the sharing economy. The first digital computer was probably invented in the early 1930-40's, for military use. There were many iterations and improvements, and one made famous by Hollywood was the Turing machine used to break the German encryption machine, Enigma.

3.   But I remember getting my first office personal computer in the early 1990's, shortly after I started work, and then a laptop a few years thereafter. That was probably the first wave of a major breakthrough where computing powers were democratised. And then Internet came

along, so the computer is not just for computing and processing of data, it can now access an unimaginably vast amount of information and data on the worldwide web.

4.   Shortly after, the computer and the window to the Internet was miniaturised, with the advent of smart phones. I remember how Steve Jobs sold it when he launched the iPhone in 2007. He said Apple was coming up with a state of the art iPod, a revolutionary mobile phone, a breakthrough Internet communications device - all three were packaged into the iPhone. What he did not say was that it was also a powerful computer. Voila! Today many of us have in our hands more computing power than a World War Two Field Marshal, and this power comes in very useful for finding Pokemon and doing Snapchats.

5.   But that is not all, with miniaturisation of computing power comes the Internet of Things (IOT). Data can be collected ubiquitously, and round the clock. With data we can better match demand and supply, we can tailor solutions and products for every consumer based on his taste and wants. The sharing economy, Uber, AirBnB, and numerous applications being written in garages and incubators, are a small chapter of the sweep of technological development, and must be seen in context.

6.   If we take a further step back from the digital revolution, and broaden it to technological revolution. The former is a chapter, albeit a major climatic one, of the history of technological advancement. Before this we have the electricity, the light bulb, the steam engine, the assembly line, automobiles, oil and gas, petrochemicals. Every single one changed the lives of human beings. Some economists say global economic growth is sluggish because the digital revolution's impact on productivity is not as drastic as the technological breakthroughs that preceded it.

ICT Landscape

7.   Technological advancements have made many existing jobs obsolete. It is not unique to the digital revolution in this era. Computers did that to typists; petrochemicals to rubber tappers; kerosene to whale hunters; assembly lines to cottage industries. But as they did so, they created many more jobs.

8.   That brings us to the ICT sector, which is in the thick of the action of the digital revolution. From fewer than 800 ICT professionals in the early 1980s, there are now more than 172,000 ICT professionals in Singapore. Despite this tremendous growth, the IDA annual manpower survey in 2015 revealed that there are currently 20,000 unfilled IT job roles. The demand for technical IT specialists, including IT Development, Network & Infrastructure, Data Analytics as well as Cyber Security is expected to grow by about 40,000 in the next three years.

9.   We cannot hold back technological advancement and the human spirit to improve. Even if we do, other countries and places will progress and we will still be swept by the tide. Better we embrace it, make the full use of it, and be a leader and smart early adopter than a laggard. Be the one to come up with the digital camera than the one stuck with still using films; to make the early switch to listen to MP3 songs instead of the stack of CDs. By extension, Singapore needs to be at the forefront in using drones, IOT and big data, advanced robotics, autonomous vehicles and clean energy.

10.   We must have faith in the human resilience, that despite these disruptions, we are resourceful and will find new and even better ways to earn a living. Whatever we learn in a profession, we need to understand that a big part of it is transferrable to other domains. So a taxi driver does not just drive, he serves customers, shows empathy, ensures safety, assures reliability, works in a network, operates computing devices, thinks

on his feet when he encounters a drunkard or a pregnant women ready to pop anytime while in the taxi. These are transferable skills.

11.   But the human spirit to improve and human resilience to adapt can be latent, waiting to be activated or discovered. That is when we need leaders, mentors, friends, schools and universities to harness those attributes. This is where ISS can play a role. You can show current and aspiring ICT professionals the new digital world and its opportunities, you can equip others with the skills and bolster their confidence to ride the new wave.

Up-Skilling ICT Professionals

12.   I am therefore pleased to learn that ISS is launching a set of stackable courses in Digital Solutions Development. These are four certificate courses - that can be taken separately as needed, or as a series that will stack towards a Graduate Diploma of Systems Analysis. This is a good example of how our universities and polytechnics will structure their adult learning programs under SkillsFuture.

13.   There are a few advantages of such stackable courses. First, individuals can choose to sign up for the individual certificate courses each on its own, without having to commit to a full qualifications programme at the start. Such bite-sized training is particularly useful for working adults looking to acquire certain skillsets according to their needs at any point in their career, while balancing work and family commitments.

14.   Second, stackable courses support lifelong learning, as study and work no longer need to be sequential but can be interspersed throughout a person's life. Individuals can take ownership of their own learning throughout life, learning and re-learning in areas relevant to their careers, and continually updating their skills and knowledge.

15.   Third, because they are stackable, the curriculum can respond quickly to industry developments, and we can ensure that the training is as relevant to industry as possible.

16.   Finally, for adult learning, there is much scope to recognise a learner's prior skills and know-how, and awarding relevant credit exemptions so that learning becomes more efficient. I applaud ISS for taking the first step towards recognition of prior learning.

Re-Skilling through Professional Conversion Programmes

17.   We must also ensure it is possible for mid-career Singaporeans in one sector to make a transition to enter the ICT sector. Every one of us builds up useful skills, some generic, some specific that are transferable to our future jobs, regardless of which sectors they are. What we lack are technical skills and experience practising them. This is where Professional Conversion Programmes (PCP) come in. The PCP matches an individual with a suitable employer before they attend a combination of training at ISS and on-the-job training. We have implemented this over the last 10 years, placing more than 7,000 professionals into new sectors. An additional $28 million will be set aside to expand the PCPs over the next two years, from 10 to 20 sectors spanning social to economic, domestic to export-oriented, high-tech to high-touch. This will help more PMEs re-skill to make career switches for new job roles and bring the total number of such PMEs assisted to over 10,000 by 2018.

18.   ISS already has a good track record of professional conversions and today I would like to share two stories of individuals who have made successful transitions into ICT careers.

19.   First - Ms Phoebe Xie was previously a real estate analyst with no formal training in IT. She had an interest for IT and decided to go for it. She signed up for the NUS Graduate Diploma in Systems Analysis in Feb 2015 which included a 5-month internship at an SME - iAPPS Asia. This enabled her to apply her learning at the workplace. After completing the programme in Mar 2016, she was employed by iAPPS as a Systems Analyst – with a good pay increase.

20.   Mr Douglas Sim worked at a boutique investment firm for 1 year after completing his National Service. He became interested in IT, and saw career opportunities in FinTech. He decided to acquire relevant technical knowledge and had just completed ISS's Full Stack Foundation programme in August this year. He is now the co-founder of a start-up named "Liquidity Exchange" which does credit analysis for peer-to-peer lending platforms in countries such as Vietnam and China.

21.   Building on the success of these existing programmes, I am pleased to announce the launch of two new PCPs offered by ISS - the Data Analytics PCP and the Full-Stack Software Development PCP. Both are supported by the Singapore Workforce Development Agency (WDA).

22.   As ISS enhances its PCP programmes and stackable courses, there also needs to be a more concerted effort towards matching trained individuals with employers.   Other than ISS's existing internship programmes and career fairs, ISS will scale up its career advisory services to both individuals and employers. ISS is also collaborating and sharing its expertise with other training providers by providing training on design thinking and business models for digital learning. As a National CET Centre, ISS is currently also co-developing the national CET Training Management System (TMS) with WDA.

Conclusion

23.　35 years have gone past quickly.　When ISS first started, I was a Primary Six student, probably just starting to use a calculator.　Yet we already had an ISS and raising the awareness of how life will change with the computer.　That is how prescient we are as a people.　And years later, we are better for it.　Let's not lose that foresight, the courage, and the spirit to improve and adapt.　I congratulate ISS on its fine achievements and look forward to ISS's continued growth and contribution to our national SkillsFuture agenda.　Thank you.