

SPEECH BY DR FRANCIS YEOH, CHIEF EXECUTIVE OFFICER OF THE NATIONAL RESEARCH FOUNDATION, AT THE NANYANG TECHNOLOGICAL UNIVERSITY'S CONVOCATION CEREMONY FOR THE SCHOOL OF ELECTRICAL AND ELECTRONIC ENGINEERING ON 28 JULY 2009, 10AM, AT THE NANYANG AUDITORIUM

Good morning

Mr Pro-Chancellor,

Graduands,

Ladies and Gentlemen

- 1 Let me start by congratulating the graduands for having successfully completed this rigorous training at NTU to earn your degree in engineering. I can see your happy faces brimming with joy and expectation, matched by the beaming smiles of proud parents and relatives gathered for this ceremony. I am sure this will be a moment that you will all savor for a long time.
- 2 But life is a long journey and you are just at the start of a new phase of your life. The future is of course, exciting and full of adventure and promise. I'm sure you have great confidence to deal with whatever's coming up ahead, with perhaps just a little bit of apprehension about the uncertainties and unknowns in the future. But uncertainties, unknowns and change are very much a part of life.
- 3 Please allow me to share some thoughts with you on your special day. And perhaps set you thinking about some interesting opportunities ahead.
- 4 The world today is characterized by rapid change. This change is fuelled by the unrelenting forces of globalisation and technological advances, which leads to the continuous reshaping of the socio-economic and political landscape. The move from manufacturing to services, the transition to a knowledge-based economy and the phenomenal rise of China and India are some examples of major global shifts taking place.
- 5 As a nation, Singapore is familiar with change. We have shifted our economic strategy four times in four decades since our independence. In the 60s, when we gained independence, availability of jobs was the major challenge as we had a staggering 14% unemployment rate! We went out to woo multinational corporations (MNC) of all shapes and sizes to manufacture in Singapore because it was the fastest way to create large numbers of jobs. That was the

early labour-intensive stage of our economic development where we had factories making clothes, typewriter, toys and wigs. In the 70s, when other economies in the region followed our example, we adopted a skills-intensive approach by training our workers to achieve higher productivity. In the 80s, we shifted to a capital intensive phase of development with investments in expensive infrastructure and equipment. In the 90s, to ensure sustainable productivity, we moved to a technology-intensive phase by building up our R&D capability to support industrial development. We are now in the knowledge-based phase of development, in an economy which is characterized by information intensity, high technology, globalization and rapid change.

- 6 You have all heard that the only constant in the world is change. The current financial crisis is a grim reminder of how things can change suddenly and drastically worldwide, driven by forces that are oftentimes outside our control. With such changes come great insecurity and uncertainty in the global economy and employment prospects. The only way to survive and prosper in these times of great change is to continually adapt and ensure that we remain relevant to the new economic paradigm – Singapore needs to adapt as a small nation in the global economy in the same way that each one of you as a knowledge worker needs to continually renew your skills in your particular field of endeavour. Your ability to continually adapt and innovate will be your security.
- 7 But change is not entirely bad. Because change creates opportunity. This leads me to my next point which is about opportunity – specifically, opportunities in entrepreneurship.
- 8 We tend to think about the global economy and economic growth in terms of large multi-national corporations like the General Electrics, Boeings, Citigroups, and Toyotas of this world. What is not so widely known however, is that economic growth is actually driven primarily by new companies. For example, one-third of America's GDP is contributed by companies that did not exist in 1980. These companies were also the biggest creator of jobs. And the most successful and fastest growing companies are enterprises built on technology innovation.
- 9 According to renowned economic growth guru Professor Paul Romer, the fastest economic growth happens when new knowledge that is derived from research and development gets translated into products and services for the marketplace. We may even see entire new market sectors being created in the process, and these may become new growth drivers for the economy. Some economists have referred to this as 'smart growth', or innovation-led growth.

- 10 For Singapore to continue to grow and prosper, we need to pursue 'smart growth'. To do this, Singapore needs to build up an entire eco-system that supports and reinforces the growth of innovative high tech and high growth companies. The components of such an eco-system include a high level of knowledge creation capacity (which comes with R&D), good technology infrastructure, a pro-enterprise regulatory environment, strong IP regime, healthy industry structure, availability of venture financing and most importantly, a critical mass of entrepreneurial talent – who can create opportunities and wealth from these factors.
- 11 The Singapore government has, over the years, been building up such an eco-system to support the growth of entrepreneurship. Through the National Research Foundation for instance, the government committed \$5b to drive research, innovation and enterprise. Last year, NRF set up the National Framework for Innovation and Enterprise (or NFIE) with \$360m to support various programmes to bring R&D results to the market place through entrepreneurial ventures. This is on top of many other programmes developed by agencies such as EDB and SPRING Singapore.
- 12 I do not know what kinds of jobs you hope to find now that you have obtained your degree. But if I were addressing the graduating class at a top Israeli university today, I can be quite certain what the answer will be. The first career choice of most graduates from top Israeli universities is to work in a high tech start-up company, more so than for a large corporation and certainly way ahead of the preference to work for the government. It is little wonder then, that Israel was able to transform its economy into one driven by innovation and entrepreneurship, where high tech products and services form more than half of exports. It is also not surprising that Israel is second, only to the US in terms of the number of companies listed on the high tech NASDAQ market. Or that venture capital investment in 2008 was US\$2b, more than any region outside the US. The Israeli story is a classic example of 'smart economic growth'. You have probably heard the amazing stories about high tech Israeli companies such as Checkpoint, Mirabilis (which started ICQ) and Mercury.
- 13 Actually, the spirit of entrepreneurship is well embedded within the heritage and history of NTU. Its predecessor, Nanyang University was founded by entrepreneurs from South China who valued education highly. NTU has a strong engineering focus and works closely with industry. It is therefore quite natural for NTU to champion innovation as a key charter and infuse entrepreneurship into students and faculty as its differentiating edge. I am heartened that the reputable US Kauffman Foundation for Entrepreneurship has chosen NTU to be

- the first Kauffman campus outside the United States. Recently, NTU received S\$6.5 million from NRF for its Innovation Fund, to develop academic entrepreneurship and establish a vibrant innovation eco-system on campus. So in a few years time, we should expect to see a vibrant entrepreneurial culture and abundant examples of technology innovation on this campus.
- 14 As young people just embarking on your career, you are living in exciting times. You belong to what consumer marketing organisations describe as the millennial generation¹ - you want to take control of your own destiny, you are more loyal to people than to companies; and you want jobs that are interesting, not just to make a living. These are the very attributes of entrepreneurs. So you already possess the basic conditions for becoming a successful entrepreneur. The big step, of course is to actually do it!
 - 15 The most successful entrepreneurs are those with an engineering background. Singapore has a budding group of successful companies that take engineering solutions into the marketplace. Entrepreneurs recognize opportunity and gather the resources needed to launch a venture to pursue the opportunity. Your technical training has prepared you well to design and build products. Your engineering skills give you an appreciation of processes and systems and equip you with the ability to carry out complex analyses by applying principles from science and mathematics. Engineers are typically systematic and logical, proactive, goal-oriented and possess sound judgment. So as engineering graduates, you do have all the right attributes to be an entrepreneur!
 - 16 So as you consider the career options open to you, whether now or in the future, I would like to encourage you to think about the entrepreneurial opportunities that are becoming more abundant as our economy moves towards one driven by technology innovation.
 - 17 In closing, I wish all of you a fruitful, exciting and rewarding journey as you step out of school and enter the workplace. Your university education at NTU has equipped you very well for the challenges ahead. The knowledge economy is exciting and great opportunities beckon. Go for them!
 - 18 Thank you.

¹ NAS insights: Generation Y: The Millennials. Ready or not, here they come