NTU President Subra Suresh unveils plans to make NTU a Smart Campus

Professor Subra Suresh, President of **Nanyang Technological University, Singapore (NTU Singapore)**, announced today his vision to transform NTU into a Smart Campus that harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

Prof Suresh officially started his position as NTU President on 1 January 2018, although he has been actively engaged with the university community since his appointment was announced in July 2017. Today he launched the first phase of a broad and multi-pronged Smart Campus initiative with the new NTU Smart Pass for the campus community.

As an integral part of its Smart Campus vision, NTU will prepare all its undergraduate students for the future with new core educational modules to enhance their digital literacy, beginning with the new academic year in 2018. In addition, NTU is also introducing this year an innovative undergraduate degree programme in Data Science and Artificial Intelligence.

Harnessing the power of digital technology and tech-enabled solutions

NTU Singapore is ranked the top university in the world for Artificial Intelligence (AI) in a ranking jointly compiled by Nikkei and Elsevier that measures research citations between 2012 and 2016. The University is also globally recognised for its strengths in engineering, computing and innovation. "NTU's large, beautiful and green campus makes it the ideal place to research, testbed and showcase new smart technologies, from applications for sustainable buildings and efficient energy utilisation to electric and autonomous vehicles to enriching and improving the way we learn, work and live," said President Suresh.

The key components driving the Fourth Industrial Revolution include big data, the Internet of Things, robotics, artificial intelligence, real-time and deep data generation and analytics, 3D printing, machine learning, personalised health care and medicine, and cyber security. Their effectiveness in shaping the human condition in the 21st century will inevitably call for close integration of technological innovations with areas such as social sciences, ethics, policy, and digital arts and humanities.

"NTU's unique strengths in these areas have attracted keen interest from start-ups, global companies, other universities, and government agencies to establish partnerships and programmes that foster innovation and greater societal impact. We have the critical mass of talent and infrastructure here to launch and testbed these rapidly advancing technologies to benefit educational and research activities, and to enhance the quality of life for all," said President Suresh.

"We are working hard to ensure that NTU will be Singapore's largest Smart Campus, and that it will take the lead in Singapore's drive to become a Smart Nation. NTU will also strive to serve as a model for other communities in Singapore and around the globe by demonstrating how advanced tech-enabled solutions can help improve everyday life in a sustainable manner. It is not just about technology. It is equally important for us to focus on the impact of technology on humans, the natural and built environment, and local and global society," he added.

Launch of NTU Smart Pass

As the first in a series of activities to be introduced in measured steps in the coming months and years, Prof Suresh today launched the new NTU Smart Pass at his first University town hall meeting with staff and faculty.

The new pass with an embedded contactless identity chip can be used, beginning this month, with a single tap for numerous daily activities on campus. More services will come on stream later this year:

1. Cash-free payment

In line with Singapore's drive towards a cash-free society, NTU has tied up with leading payment solutions provider NETS, to enable the NTU Smart Pass with the FlashPay function.
The majority of retail and food and beverage outlets on campus are already equipped with the NETS contactless payment system. The new NTU Smart Pass can therefore be used to pay for a meal at a café or restaurant, for grocery shopping at the supermarket or minimart, and for a range of services including payment of fees, other retail purchases and parking on campus and across Singapore.

It is also ready for use at 80 per cent of the NTU canteens, with the rest coming on board in the next few months. There are plans for students to use the pass to purchase other customised services in the residential hall rooms too.

2. Personal identification

The new card serves as an identity card for students and employees. In the near future, the pass will also be used to register at the campus medical centre for health checks and consultations.

3. Security access

Having a contactless access system improves the security and safety on campus. The NTU Smart Pass is also a personalised key for access to hall rooms, offices, laboratories and facilities.

4. Campus services

Using the NTU Smart Pass, students and employees can borrow books and audio-visual materials from the libraries, pay for services such as photocopying and for access to network printers. Students can also use it to book campus facilities such as sports venues and study rooms.

5. Off-campus and island-wide services

As the NTU Smart Pass is equipped with the FlashPay function, it can be used to pay for public transportation, including buses, MRT trains, car parks and retail stores enabled with FlashPay all across Singapore.

6. More Smart initiatives in the pipeline

NTU is looking into rolling out mobile payment solutions to complement the NTU Smart Pass, such as NETS QR, NETS Pay and SG QR as well as other cash-free payment platforms.
There are also plans to install vending machines fitted with similar cash-free payment systems at the residential halls.

A living lab for future transportation

The NTU campus is already a testbed for various sustainable and energy-efficient technologies with trials underway to implement cutting-edge technologies for transportation on campus.
There are plans to deploy 22-seater fully electric shuttles, in addition to the driverless electric shuttles that are already being tested on campus. Several 40-seater autonomous buses that support ultra-fast charging are also being developed, together with bus stops that will have the complementary infrastructure.

The journey from halls of residences to classrooms will also be complemented by last-mile options such as e-scooters and e-bicycles, which will also undergo public trials on campus. The University will be setting up charging stations for electric vehicles and e-mobility devices including systems for wireless charging.

Greater adoption of robotics

To overcome the manpower crunch in many labour-intensive fields, NTU has plans for more adoption of robotics on campus. Some examples include robot cleaners and roaming tray-return robots in the canteens.
Among other smart technologies developed by NTU include a shelving robot that can read barcodes and carry parcels up to 5 kilogrammes, useful for warehousing and logistics. Other robots that NTU is co-developing with industry include robots that can paint indoor walls up to heights of 10 metres or inspect buildings for structural defects.

Eco-friendly Buildings

Under its EcoCampus initiative, NTU targets to achieve a 35 per cent reduction in energy, water and waste intensity by 2020, making it one of the world's most eco-friendly university campuses in the world. Over 95 per cent of NTU buildings spread over a 200-hectare (500-acre) campus are now Green Mark Platinum certified (equivalent to LEED-Platinum certification in the USA), well on track to achieving the target of 100 per cent by 2020.
Singapore's first Green Mark Platinum Star Champion, NTU will accelerate research efforts in smart infrastructure to improve energy efficiency. Partnering global tech giant Siemens, NTU will develop various infrastructure solutions using advanced data analytics that can optimise the performance of green buildings and self-driving vehicles.

Other ambitious projects include one that will connect all data streams from the campus into a single central analytics platform known as the integrated Building Management System (iBMS), leading to more energy savings with improvements in productivity and operations.

Another effort is the development of an NTU virtual campus model that can perform computational simulations to identify real-time cost-saving opportunities and to evaluate benefits of a technology before actual implementation.

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