



Above photo: Professor Subra Suresh, President of NTU Singapore/ Credit: NTU Singapore

NTU Singapore President launches broad Smart Campus initiative with new multi-purpose Smart Pass

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Future smart initiatives include mobile payments, greater adoption of robotics, and research into smart infrastructure solutions to improve energy efficiency.

Professor Subra Suresh, the new President of Nanyang Technological University, Singapore (NTU), [unveiled](#) his vision today 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.

NTU is a top-ranked university for Artificial Intelligence (AI) research in global rankings jointly [compiled by Nikkei and Elsevier](#), based on measurement of research citations between 2012 and 2016. The University is also globally recognised for its strengths in engineering, computing and innovation.

Technologies such as 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, are driving the Fourth Industrial Revolution. Technological innovations will have to be integrated with research in areas such as social sciences, ethics, policy, and digital arts and humanities.

President Suresh noted that NTU's strengths in these areas have attracted interest from start-ups, global companies, other universities, and government agencies to establish partnerships and programmes that foster innovation and greater societal impact. NTU has the critical mass of talent and infrastructure to launch and testbed these rapidly advancing technologies to benefit educational and research activities.

"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.

"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.

As a 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, this year NTU is introducing an innovative undergraduate degree programme in Data Science and Artificial Intelligence.

First step – Smart Pass

The first phase of the broad and multi-pronged Smart Campus initiative was launched with the new NTU Smart Pass for the campus community. This is the first in a series of activities to be introduced in measured steps in the coming months and years.

Starting from this month, the new pass with an embedded contactless identity chip can be used with a single tap for a range of daily activities on campus. More services will be added later this year.

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.

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

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.

NTU has also tied up with leading payment solutions provider [NETS](#), to enable the NTU Smart Pass with the [FlashPay](#) function. This is in line with Singapore's [drive towards a cash-free society](#), one of the key [strategic smart nation projects](#).

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.

The NTU Smart Pass can also be used to pay for public transportation, including buses, MRT (Mass Rapid Transit) trains, car parks and retail stores enabled with FlashPay all across Singapore.

FUTURE INITIATIVES

Mobile payments

NTU is also looking into rolling out mobile payment solutions to complement the NTU Smart Pass, such as NETS QR, NETS Pay and [SG QR](#) (the common Singapore Quick Response code planned to be deployed and adopted through 2018), 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. (For instance, Singapore's first Smart Mobility consortium was [launched](#) in January 2017 to test new tech on NTU campus, bringing together 12 industry partners.)

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, following public trials on campus. The University will be setting up charging stations for electric vehicles and e-mobility devices including systems for wireless charging.

Robotics to counter manpower shortage

To overcome the manpower crunch in many labour-intensive fields, the University plans to increase adoption of robotics on campus. Use cases include 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, which would be useful for warehousing and logistics.

NTU is also [co-developing robots with industry](#) that can paint indoor walls up to heights of 10 metres or inspect buildings for structural defects.

Creating an eco-friendly campuses

Under its [EcoCampus initiative](#), NTU targets 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), and the University is on track to achieving the target of 100 per cent by 2020.

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.

There are also plans to 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.

In addition, an NTU virtual campus model is being developed that can perform computational simulations to identify real-time cost-saving opportunities and to evaluate benefits of a technology before actual implementation.