Kingdom of the Netherlands
Holland Innovation Network

Singapore delegation visiting Dutch Smart Industry and Robotics ecosystem

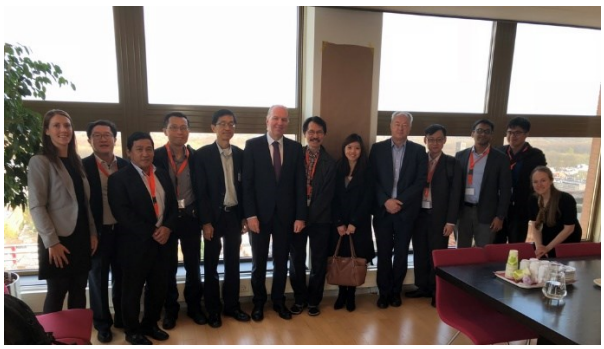
Singapore and the Netherlands have many similarities. Both countries struggle with an ageing population, have densely built cities and invest in technology to solve societal problems and keep their competitive advantage. From 15 to 18 April the Netherlands Enterprise Agency and the Holland Innovation Network of the Netherlands Embassy in Singapore, organized a study visit on Smart Industry & Robotics. The study visit was organized in the framework of the Influentials Programme of the Netherlands Ministry of Foreign Affairs. De delegation consisted of the National Robotics R&D Programme Office, National Environment Agency, Building and Construction Authority, Enterprise Singapore, National University of Singapore, Singapore University of Technology and Design, ST Kinetics and the Singapore Industrial Automation Association.

Holland Robotics – the bottom-up approach

One of the hosts during the study visit was Willem Endhoven, the Managing Director of Holland Robotics. Holland Robotics has developed a strategy to bring the Dutch robotics sector to the next level. The strategy targets five domains: manufacturing, healthcare, agriculture & food, logistics & transport and inspection & maintenance. The approach is bottom up and brings academia, industry and end-user together. In this triple helix they will develop roadmaps and projects that accelerate development. In November Holland Robotics led a mission to Singapore. The mission to Singapore and the study visit to the Netherlands are important for Holland Robotics to further develop the internationalization strategy of the Dutch robotics sector. And international collaboration is key in maintaining their competitive advantage.

Policy for innovation and the triple helix

First stop of the official program was The Hague, to meet Jeroen Heijs, Ministry of Economic Affairs and Climate Policy, and learn about the role of government and innovation policy. The Netherlands is famous for the triple helix approach. Public private partnerships (PPP) are an essential part of the Dutch innovation policy. There is currently a shift of focus to a mission oriented approach in order to deal with societal challenges such as healthcare, ageing and climate. PPP and R&D programming at universities is not driven by government, but driven by demand, joined programming. A Dutch public-private partnership run by the industrial employers' organization (FME), the Ministry of Economic Affairs, the Chamber of Commerce, Nederland-ICT and applied research institute TNO, designed the Smart Industry Action Program. The goal of this action program is to stay a manufacturing frontrunner in Europe. The main pillars of this action program are expansion of knowledge, skills and ICT and the set-up and acceleration of field labs.



Group picture at the Netherlands Enterprise Agency with Jeroen Heijs, Ministry of Economic Affairs and Climate Policy

From R&D to commercialization

An example of the innovative approach in the transition of a traditional industry towards a smart industry is the scale-up Smart Robotics. The company developed an innovative business strategy. Companies are able to rent their robots on a monthly basis, comparable with hiring a temporary employee. Making the step towards automation easier. The company has a good relationship with the Eindhoven University of Technology and sees the university as an important resource.

Although the software is robot independent, Smart Robotics uses the hardware platform of Universal Robots.

The key for success is to stay close to talent. DEMCON has several offices located near the technological universities in the Netherlands. They chose this set-up to be embedded in local ecosystems and connect with new talent. DEMCON showed impressive medical projects and presented a project they did for the Dutch water companies. DEMCON develops, together with their stakeholders, a platform for water pipe inspection robots.

The company VertiDrive commercialized their robots in the domain of inspection & maintenance. VertiDrive developed a series of robots that use magnetic force to climb steel constructions for cleaning. A new application is being developed as part of a EU project. In this project, the eShark, VertiDrive is responsible for design and build of an existing fouling release foil laminator prototype into a robot capable of moving along ship hulls.

Live demonstration of VertiDrive solutions

As time was limited, lunches were used to eat and meet with several small and medium enterprises. Some of the companies the delegation met were familiar faces. Cock Heemskerk, CEO of Heemskerk Innovative Technologies, is working with Singapore partners for the deployment of care robot ROSE. Tjibbe Bouma, Director of Sprint Robotics, an industry initiative for the development of inspection and maintenance solutions for capital intensive infrastructure, like the petrochemical industry, will launch the Asia Pacific chapter in Singapore in June. A start-up originated from Singapore found its way to the Netherlands, Kyle Tan from Airsquire, the company that provides image analytics AI for real estate to detect deviation from plans. Dutch Analytics is interested to explore the Singaporean market, the company develops deep-learning solutions with their customers and was exited to learn more about Smart Nation Singapore and the opportunities.

Well connected eco-system

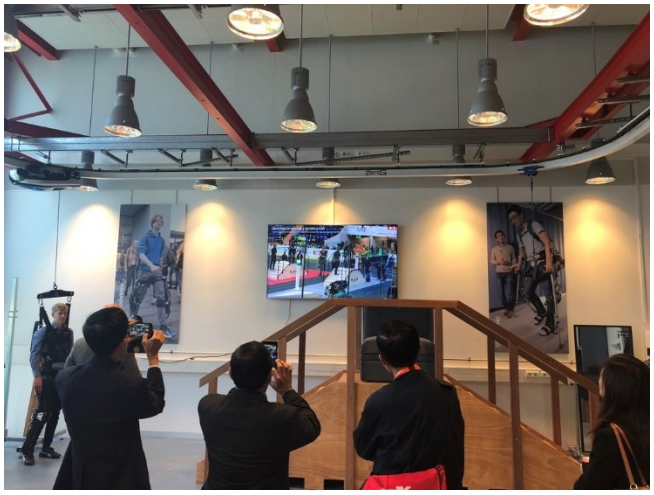
At the Delft University of Technology, the delegation met Professor Javier Alonso-Mora. His expertise is autonomous navigation for sustainable cities. The professor presented a few of his projects. In one of his projects he programs drones to follow and interact with people. Of course this was immediately put to the test.

Drone on follow mode tested by the Singapore delegates

As the week went by, the delegation from Singapore noticed that the triple helix approach was showcased by almost every company, university and research institute we met. One of the examples was RoboValley, helping start-ups, SME's and researchers with exposure and guiding companies in finding available knowledge at TU Delfts Robotics institute. The campus of Delft is also a living lab. With Robo House, a test facility for companies to create and learn how to work with robots. Another living lab is the Green Village, where new concepts of student housing is tested by student actually living in these new concepts. It is also a testbed for autonomous vehicles, coordinated by the Researchlab Automated Driving Delft.

Green Village in Delft with the Hardt Hyperloop Test Facility in the background

At the University of Twente we started with a showcase at the Wearable Robotics Lab of Professor Herman van der Kooij. The Professor explained how his team competes in the Cybathlon competition, that challenges the development of wearable robotics. The Professor also mentioned he is currently developing a roadmap for soft robotics. The Wearable Robotics Lab is a collaboration between the University and Roessingh Research and Development focused on innovations for rehabilitation and chronic care.



Showcase at the lab of Professor Herman van der Kooij

There was more robotic research to explore at the University of Twente. Professor Stefano Stramigioli provided an overview of several impressive research projects. Such as the Stormram made from 3D-printed plastic and is driven by air pressure. The advantage of plastic is that the robot can be used in an MRI scanner.

The last stop for our university tour was Eindhoven. Professor Bouke de Vries introduced the Smart City Program, a multidisciplinary approach that includes several areas of expertise in photonics, data science, wireless technology and autonomous systems. And in Eindhoven we met another familiar face. Professor Theo Salet, Visiting Professor at the Nanyang Technological University, shared about the development of the project 3D Concrete Printing. An impressive

technology, with printing results that are very artistic. The printer consists of a four axis gantry robot with a print bed of approximately 9.0x4.5x3 m3, coupled with a concrete mixing pump.

In conclusion

The visit was diverse and showed expertise of the different universities and (commercialized) technologies. The triple helix approach was a constant reminder of how the Dutch ecosystem functions. The shift towards a more demand driven innovation policy, addressing the societal challenges, aligns with the Singaporean approach. Several companies have expressed interest in the Singaporean and Southeast Asian market. Demcon, Vertidrive, Smart Robotics, but also some of the smaller companies like Dutch Analytics, are thinking of a follow up visit. There is already an exchange between Dutch and Singaporean universities. At the moment this is mostly connected by the professors. There is interest from the Dutch universities to see if there are more concrete projects that can be identified.

More information

The Holland Innovation Network at the Netherlands Embassy in Singapore focusses on innovation, technology and science collaborations between Singapore and the Netherlands. By organizing seminars and workshops the team informs and inspires about topics such as policy innovation, autonomous driving and robotics. The Holland Innovation Network writes articles to inform Dutch government agencies, knowledge institutes and companies about developments in Southeast Asia. To explore collaborations and business opportunities on smart industry and robotics R&D in the Netherlands, contact Ms Astrid Seegers, Advisor for Innovation, Technology and Science via sin-ia@minbuza.nl