heinnovate

CASE STUDIES

Building success on partnership: Technical University of Delft and City of Delft[1]

LEADERSHIP AND GOVERNANCE

PREPARING AND SUPPORTING ENTREPRENEURS

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What is this case study about?

The core mission of the Technical University of Delft is to develop scientists and engineers, who have a genuine commitment to society, who can translate knowledge into technological innovations with both economic and social value.

The City of Delft wants professionals, and new companies, to come and make their home in and around Delft. As the biggest employer in the region, TU Delft is an important partner in delivering this strategic agenda.

By joining efforts, YES!Delft was created to support 'tomorrow's leading firms by supporting technostarters with growth potential'. The strength of this approach, which combines training, coaching and incubation facilities seems to lie in the nature of the personal relationships, including positions on overlapping committees, which lead to greater transfer of tacit knowledge. These relationships are long-term and high trust – like in a good family – and allow networks to thicken and grow.

Link to HEInnovate dimensions

This case links to the HEInnovate dimension of **Leadership and Governance**, with a focus on the University's role as driving force for entrepreneurship and innovation in regional, social and community development.

- Entrepreneurship plays a major part of the HEI's strategy.
- There is a commitment at a high level to implementing the entrepreneurial agenda.
- There is a model in place for coordinating and integrating entrepreneurial activities across the HEI.
- The HEI is a driving force for entrepreneurship and innovation in regional, social and community development.

Additionally, the case links to the HEInnovate dimension of **Preparing and Supporting Entrepreneurs**, particularly regarding the support offered for students, graduates and staff to move from idea generation to business creation.

- The HEI increases awareness of the value of entrepreneurship and stimulates the entrepreneurial intentions of students, graduates and staff to start-up a business or venture.
- The HEI supports its students, graduates and staff to move from idea generation to business creation.
- Training is offered to assist students, graduates and staff in starting, running and growing a business.
- Mentoring and other forms of personal development are offered by experienced individuals from academia or industry.
- The HEI facilitates access to financing for its entrepreneur.

- The HEI offers of facilitates access to business incubation.

TU Delft: technical roots, regional collaboration with a focus on synergy

The Technical University of Delft (TU Delft) originates from the Royal Academy founded by King Willem II of the Netherlands, in 1842, to train engineers and civil servants. It is the oldest and largest university of technology in the Netherlands with approximately 16 000 students, many of whom are international. TU Delft has eight faculties, offers 14 undergraduate courses and over 30 postgraduate courses in design, engineering and science. All Masters' degrees are taught in English; most undergraduate-level courses are taught in Dutch. TU Delft prides itself on being forward-looking and creative with an international outlook. The value of problem-solving through teamwork is greatly valued and encouraged. Teaching at TU Delft is focused on providing students with technological training, analytical skills and critical thinking in world-class facilities.

With strategic partnerships with industry, governments, trade associations, and numerous universities in the Netherlands and worldwide, TU Delft University degree courses allow students to carry out internships and research projects, which are designed to give them a head-start in their professional careers. TU Delft trains scientists and engineers that have a genuine commitment to society and a broad academic grounding. Technology is essential in answering global problems, as is the underlying scientific knowledge generated and disseminated by a modern university of technology [www.tudelft.nl].

TU Delft is becoming more and more international, almost 60% of the faculty and academic staff are international. The support staff are still mostly Dutch. Among the scientific staff the Dutch tend to be a minority. In the big companies in Delft one finds the same pattern, so it is important to get people to come here and stay. To achieve this, one needs to make immigration easy, - easy for incomers to find houses, schooling, etc.

Building a viable interface between TU Delft and the City of Delft

The city of Delft (approximately 100 000 inhabitants) wants professionals to come and new companies to make their home in Delft. From a municipality perspective, strategically economic growth and jobs are fundamentally important. As the biggest employer in the region, TU Delft is an important partner in delivering this strategic agenda, which has three main strands.

1. Improving the ecosystem, making Delft a place where people stay and build their careers and businesses.

2. Connecting the university campus with the science park and the city. Connecting university staff and teams with the campus and city.

3. Climate proof and resilience.

From our perspective, everything that enhances the ecosystem is good, so the municipality is a shareholder and helps to keep start-ups in Delft. The University provides a starting point for a career. We hope to keep them here in Delft.

The municipality is keen to keep good people in the region. We identified that it was difficult for people coming in to connect and integrate.' (Patrick van Geel) 3

Wilbert Hoondert [2]

When the Technopolis Science Park was built in 2005, close to the University campus, very few companies that wanted to settle there. Until 2010, University offered space in the science park but it wasn't easy for companies to locate there, the administration was a deterrent. There was no one-stop-shop approach to make it easier for start-ups and firms to locate in the science park. It was recognised that a different approach was needed. The municipality and TU Delft started to work closely together, each providing dedicated staff, two or three people, to help entrepreneurs and businesses. This support included helping them to settle in Delft and connect with the networks.

New comers need to be involved in the ecosystem. This often starts with someone coming to the university. We are aware that if people in key positions leave the university or the municipality it creates an imbalance.
Wilbert Hoondert

Although at present this service isn't actively promoted, the aim is to take away the hassle of moving to Delft – *'like a concierge in a hotel'.* The city administration supports the University by making it easy for students to settle in quickly. There is a 'conveyor' system for students to help them to find a permit, learn how to open a bank account, enter their inscription in the municipal records, etc. This is considered to be a very important part of delivering the regional and city strategy. Delft has a lot to offer and is proud of what has been achieved. Delft provides a good quality of family life, it is a good place to live in terms of human scale and is well connected with the rest of the Netherlands.

We are creating history. We are creative, innovative and have technological success
Patrick van Geel

YES!Delft – clear pathways – easy access – clear development

YES!Delft was started in 2005, as an initiative from TU Delft and the City of Delft supported by national public funding. The aim is to create 'tomorrow's leading firms' by identifying 'technostarters' showing growth potential. YES!Delft helps build and grow leading technology companies and encourages technology students to choose entrepreneurship as a plausible career path. It is strategically located in the Technolopolis Science Park to boost connectivity links from the university, to business and the region, and vice versa.

In 2005, start-ups were already 'a thing' in Silicon Valley, but in Europe and the Netherlands, many young people still considered being part of a start-up as a risky venture; only 1% of technology students considered becoming art of a start-up. *"We had to make technology start-ups cool."*

TU Delft has expanded and strengthened entrepreneurship education, which has contributed to greater student awareness of entrepreneurship as a promising option after graduation. Today, about 30% of TU Delft students consider building their own start-up.

Some TU Delft start-ups don't need this facility and some TU start-ups need more support than the university can provide. We are looking for the ones where our support can make the difference.
Wilbert Hoondert

[3] Patrick van Geel Senior Strategic Advisor in the City of Delft. He has co-ordinated several international programmes such as the EUniverCities Network.

[2] Wilbert Hoondert is a Senior Strategic Advisor in the City of Delft. He has a central role in the Smart Energy Delta Roadmap Next Economy and the Metropolitan region Rotterdam, Den Haag, Delft.

YES!Delft was set up to create an environment where technology could be rapidly transformed into economically viable products and services. YES!Delft took on the task to support up-and-coming start-ups by bringing them together, and putting them in touch with potential customers, suppliers, investors and a variety of experts. The ambition was to identify the teams with breakthrough technology ideas and help them grow into successful businesses. The programs offered by YES!Delft focus on customer validation and long-term growth of complex technologies. These programs offer access to mentors, experts, investors and partners who share their know-how and experience with entrepreneurs.

We offer top notch programmes for tech entrepreneurs. We have seen that the start-ups that knock on our door are becoming better and better.
Paul Althuis[4]

YES!Delft offers three levels of programme. These provide easy access (Discovery day) and a clear pathway (Discovery Day, LaunchLab, Incubation) for any graduate in TU Delft to explore technology based opportunities. Each programme requires a financial commitment from the participants.

Discovery Day is a one-day crash course during which participants are coached to take the first steps in finding a connection between a technology, its application and a potential customer. Its aim is to transform a technology idea into a potential business idea. The participation fee is EUR 35 per person and covers programme costs, working space, workshop material, coaching, and a lunch & drinks. Participants can sign up either with or without a tech idea and teams will be formed during the workshop. There are no selection criteria for Discovery Day, everybody can sign up.

LaunchLab is a three-month programme, which uses Steve Blank's Lean LaunchPad method and business model innovation tools by Alexander Osterwalder & Business Model Inc. to develop a viable business model. Work is in teams, ambitious, driven and committed with the goal to build a leading firm around an innovative tech idea with a scalable business model. Participants test the correctness of their assumptions by talking to as many experts, potential customers and other stakeholders as possible. The participation fee is EUR 1 250 per team of two founders, and EUR 500 for every additional founder participating in the programme. The fee covers programme costs, working space, material, coaching, access to the YES!Delft network, and a lunch & drinks. The programme ends with a public 'Launch Day' with pitches in front of the industry, partners, investors and our community. The winner of LaunchLab receives a free (golden) ticket to the last selection round for the Incubation Programme.

The Incubation programme focuses on fast and sustainable growth. During the first six months, the 'Foundation', the founders work intensively on getting the basics right. After validation and the product/market fit, the focus is on growth. During the programme, the founders work full time on all aspects of building the company. At least one of the founders must work on the company 100%. Masterclasses on sales and negotiations are available. After six months, a milestone plan for success is created. The companies rent office space at YES!Delft and become part of an ambitious community that offers coaching hours, expert sessions and a broad network to grow. The incubation program is for actual problems (*no 'pizza delivery apps'*) focused on complex technologies and ambitious teams who are committed with the goal to build a leading firm around a technological innovative idea with a scalable business model. The Incubation program is for very ambitious graduate technical, engineers and scientists in energy, clean tech, medical & health, industrial solutions, mobility industries, who

[4] Paul Althuis is the Director of the TU Delft Holdings BV, the Valorisation Centre TU Delft, and a board member of the Special Funding of Regional Funding in the Netherlands.

will be live and trading in two to five years. YES!Delft doesn't take equity; when accepted into the Incubation Program it works with a success fee. At the program start the founder signs a contract stating the total commitment fee of EUR 25 000. Once the company generates EUR 200 000 in revenue, EUR 5 000 are paid to YES!Delft. When the threshold of EUR 1 million is reached, YES!Delft receives the remainder of EUR 20 000.

On the first Friday of every month YES!Delft invites interested students and staff to come and have their questions answered.

For LaunchLab and the Incubation program, admission is via online application. Teams can only indicate their preference to participate in a program. YES!Delft decides what program fits best.

* Round 1: ideas are selected for round 2.

* Round 2: application deck, you need to provide more specific information in an application deck, if the application deck meets YES!Delft's standard it is shared with the selection committee. The selection committee decides who they want to meet.

* Round 3: selection days. Teams are invited to the selection days at YES!Delft pitch their idea and meet the selection committee. There are in-depth discussions on topics that the panel wants to know more about. Successful applicants are told the following day which program they are being invited to join.

Since 2005, YES!Delft have supported more than 180 companies. One example, which illustrates the support journey offered by YES!Delft is Somnox, which addresses an important problem in society, is close to commercialization, and has a plausible scientific support for solving the problem addressed (clinical studies pending). By gathering data about the sleeping cycle, Somnox has developed a sleep support robot that simulates human breathing rhythm and assists the user in falling asleep. The pillow-shaped product is easy to use and controlled by a mobile application and offers light and sounds.

Somnox: a robot that solves sleep problems

In September 2015, four students (Julian Jagtenberg, Job Engel, Stijn Antonisse and Wouter Kooyman van Guldener) got together to work on a class project with the goal to develop a robot - a soft robot, one that would be cute and caring… a robot that matters to people.

The team started out by identifying a problem they could tackle, and after talking to people around them and came to realize that insomnia was an important issue. After examining their own experiences and reading pages and pages of academic literature, the team concluded that a slow and steady breathing rhythm is the key to people feeling peaceful at night. They have designed their robot to register users' breathing patterns and help them regulate those for a good night's sleep.

"We're all engineers, we're kind of geeky, and since there was no proper solution out there, we decided to create a robot that can help people fall asleep and solve their insomnia problems."

For Julian and his teammates, developing the robot was just course work. They were unaware of their idea's business potential until, after presenting their prototype at an open university event, they were featured in a local newspaper as one of the highlights of the day.

"After that newspaper, a lot of other newspapers, even radio and TV, started talking about us."

The coverage resulted in tens of emails from potential users who wanted to test the Somnox robot. It was this "surprising validation" that encouraged the team of four to take time off after finishing their Bachelors studies,

and focus full time on starting a business. In July 2016, they joined the EIT Health LaunchLab - a two-month program created by YES!Delft and EIT Health partners. They spent eight weeks developing their product and exploring the European market. This led them to joining the YES!Delft's Incubation Program.

"We are engineers and we had a product, but we didn't have any business thinking or experience" [….] "Everyone at YES!Delft wants to help you. It's a very nice atmosphere of people who have a vision and they want to have impact. […] and it is about helping each other in [creating that impact]."

Somnox have two main goals for 2017: to expand their community to reach people willing to test their product, and to create different prototypes to see what fits best within their potential customer base.

"*We have around 50 prototypes ready and we will use those to do some sort of clinical validation," […] "Together with a sleep expert, we will conduct research where hopefully a publication will show that there is a relationship between our product and the amount of time it takes to fall asleep."*

Awards for Somnox: Winner James Dyson Award NL 2016, LaunchLab EIT Health Public and Jury Winner 2016, #1 EIT Health Business Plan Competition Benelux 2016, Rabobank Best Pitcher 2016, etc.

A separate holding company.

The University wants to identify early-stage enterprises in which using TU Delft IP (Intellectual Property) and university resources (this network, and the facilities available in the university) are enough to make the difference to the company's success. To support this, TU Delft Holding B.V. was established as an autonomous entity, separate from the university, to better address the increasing interest in entrepreneurial activity at the Delft University of Technology among students, faculty members and partners within the industry. It enables valorisation (commercialisation) strategy to be implemented through the university's own legal entities. TU Delft Holding B.V. makes it easier for TU Delft to collaborate with industry and municipality partners e.g. the participation fund of the Regional Development Company Innovation Quarter. With collaborative funding instruments TU Delft seeks to scale its valorisation activities. TU Delft is the sole owner of TU Delft Holding B.V.

There are currently around 50 companies within this holding company. Of course, not all companies entering this programme are equally successful. The university executive board recognises this and tolerates some losses.

TU Delft Holding has two sub-holdings, Delft Enterprises and TDH Services.

- Delft Enterprises holds proof-of-concept funds and pre-seed funds for additional research and early stage commercialisation activities that would be very hard to fund otherwise. One example is proof of concept funds for MedTech, working in collaboration with Leiden University Medical Centre and Erasmus University medical centre. TU Delft Holding allows for a one-stop-shop approach for graduates and researchers who want to start a business at TU Delft.

- TDH Services includes service companies that perform activities that are an extension of the activities of TU Delft e.g. the incubator YES!Delft, the Bioprocess facility and legal entities established for the benefit of research centres abroad.

The university holding company isn't a money-making business. The return to the holding company is in the form of shares and/or royalty payments.

'If the company does well, then the holding company also does well. This is good for expectation management. It creates strength in the eco-system. It is a long play perspective rather than looking for short-term gains. We

do a reasonable deal on shares, this is not return on investment as it is normally understood commercially. That isn't realistic.
Paul Althuis

For all companies entering the holding company system, Delft Enterprise agree to the exit policy. The conditions of exit are given in the term-sheet. The exit clauses are activated when the added-value of TU Delft's contribution, e.g. technology development or team creation, is diminishing. This applies to both companies that are succeeding and companies that are failing. Delft Enterprise helps the companies to focus on creating a scalable technology.

We recognise that the people are key. We look for teams. We ask, 'is there the right team to scale the technology?' The company may need to create teams for specific purposes. Usually one needs a team -not a single person- some people are good at creating teams. However, we are open to discussion, if someone is very good – we have soft boundaries.
Paul Althuis

One of the potential benefits of joining Delft Enterprise, for the company founders, is further education and qualification. The university investment is long-term. Selection is focused on the willingness and ability of the entrepreneur to scale. Most of the companies selected require a little more R&D. This provides the opportunity for a research qualification to be gained as part of the company development pathway. There is often synergy between what the company needs and the requirements of a PhD. This way both, the University and the student, benefit from the relationship, and the company has a better chance of succeeding too. TU Delft works with 100-150 graduates a year including architects. In the incubator, there are twenty to twenty-five companies each year working on scalable technology.

Most of our successful companies come from applied subjects, including architecture. We find that scientists who want to become entrepreneurs are often less ready to gain real value from the holding company programme. Scientists can have a different approach and mindset from engineers and applied disciplines. This can inhibit, or at least slow down, their potential to build a successful business and sustainable company. When we have applications from scientists, we look to see whether they followed some of the courses relating to commercialisation, which take technology to a business plan.
Paul Althuis

Dutch universities want to strengthen collaboration at local and regional level and look for a complementary agenda, at a national level. At TU Delft, the entrepreneurship team encounters very little political agenda or conflict between Dutch universities. Many of the people involved already have long-term connections and know each other well. Collaboration is made easier because the three technical universities, Delft, Twente, Eindhoven, do not compete for undergraduate students. For technical universities, most of their Bachelor students come from the region, so courses fill up naturally.

Another example is Medical Delta, a network of 14 Dutch universities in sciences, health and technology which brings together a rich body of knowledge and experience and acts as a catalyst for heath innovation and co-operation seen as very successful. This has acted as an inspiration for further collaboration *If Medical Delta is successful then we should do more [www.medicaldelta.nl]*.

A game changer: Delft Centre for Entrepreneurship

The Delft Centre for Entrepreneurship (DCE) is part of the Faculty of Technology, Policy and Management. DCE collaborates within the Delft ecosystem of entrepreneurship which includes YES!Delft and the TU Delft Holding with its two sub-holdings, Delft Enterprises and TDH Services.

The Centre (DCE) is an autonomous entity which enables the cross-fertilisation of research and both education in entrepreneurship and engaging in entrepreneurship in practice. DCE contributes to the existing entrepreneurship ecosystem within TUDelft, mainly through its research and education on entrepreneurship. This puts entrepreneurship, and entrepreneurship education, on the agenda in a new way – not just as support for would-be entrepreneurial students, but as an important aspect of developing and delivering the skills and business innovation expertise to create new businesses, and even industries for the benefit of the wider community.

The activities of DCE rest on three pillars:

1. Education for Entrepreneurship.

2. Research on Entrepreneurship.

3. Entrepreneurial activities in practice.

The cross-fertilization of the three pillars is vital to enhance entrepreneurship education and to preserve its quality at the highest level. The three pillars expose nascent entrepreneurs with the latest developments and insights from research and industry. Over recent years, the Delft Centre of Entrepreneurship has evolved into a centre of expertise in technology-based entrepreneurship. Approximately 400 students follow entrepreneurship courses every academic year; many of them start their own companies.

The creation of DCE helped to establish entrepreneurship as a subject area which is distinct from business and management as normal, and facilitates the bringing together of educators, researchers and entrepreneurs on an equal basis.

Key learnings from the case study

1. TU Delft has a policy of collaboration, with industry, with other universities, with the City and with the region. It is in their culture. Their Strategy, vision, mission, core values, integrity policy, diversity policy, governance, etc. are all clearly accessible through their main website [www.tudelft.nl]. In many ways, this means that they take excellence, collaboration and value creation for granted.

2. Commitment by all parties to collaborate creates a foundation for success. It is important for all parties that the university has a successful start-up programme, YES!Delft. Companies that start from the university tend to stay in the region.

3. Commitment and transparency allows for synergies, greater value and better fall back conditions e.g. TU Delft like to see the founders in the incubation programme also get PhDs for their research work. Successful YES!Delft companies commit to pay for their support once they have succeeded and in turn help the next generation of new technology companies.

4. Transparency, including admitting and discussing conflicts, speeds things up and develops higher levels of trust e.g. clear terms sheets and an understanding that TU Delft is there to work with the start-ups for as long as real value is being created. When value creation stops then it is time to leave.

5. It is important to take a long-term view and actively create synergy. It takes two to five years to develop a technology and take it to market. It takes around ten years to build an

ecosystem. Long-term relationships allow for deeper understanding, confidence and greater efficiency and effectiveness. The City of Delft, by collaborating with the University makes it easy for staff and students to settle in Delft, by building connections and university/business links everyone benefits.