

University of Twente:

The entrepreneurial university of the Netherlands through hi-tech and human touch



Enschede, Netherlands





General Information

Title	University of Twente										
Pitch	The entrepreneurial university of the Netherlands through hi-tech and human touch										
Organisations	University of Twente and Kennispark Twente										
Country	The Netherlands										
Authors	Arno Meerman (University Industry Innovation Network)										
Nature of interaction	<table><tr><td><input checked="" type="checkbox"/> Collaboration in R&D</td><td><input type="checkbox"/> Lifelong learning</td></tr><tr><td><input checked="" type="checkbox"/> Commercialisation of R&D results</td><td><input type="checkbox"/> Joint curriculum design and delivery</td></tr><tr><td><input type="checkbox"/> Mobility of staff</td><td><input type="checkbox"/> Mobility of students</td></tr><tr><td><input checked="" type="checkbox"/> Academic entrepreneurship</td><td><input checked="" type="checkbox"/> Student entrepreneurship</td></tr><tr><td><input type="checkbox"/> Governance</td><td><input type="checkbox"/> Shared resources</td></tr></table>	<input checked="" type="checkbox"/> Collaboration in R&D	<input type="checkbox"/> Lifelong learning	<input checked="" type="checkbox"/> Commercialisation of R&D results	<input type="checkbox"/> Joint curriculum design and delivery	<input type="checkbox"/> Mobility of staff	<input type="checkbox"/> Mobility of students	<input checked="" type="checkbox"/> Academic entrepreneurship	<input checked="" type="checkbox"/> Student entrepreneurship	<input type="checkbox"/> Governance	<input type="checkbox"/> Shared resources
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Supporting mechanism	<table><tr><td><input type="checkbox"/> Strategic</td></tr><tr><td><input checked="" type="checkbox"/> Structural</td></tr><tr><td><input type="checkbox"/> Operational</td></tr><tr><td><input type="checkbox"/> Policy</td></tr></table>	<input type="checkbox"/> Strategic	<input checked="" type="checkbox"/> Structural	<input type="checkbox"/> Operational	<input type="checkbox"/> Policy						
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Summary	<p>The University of Twente (UT) together with the Kennispark Twente, are key drivers behind regional innovation and growth and the renaissance of the Twente region. From its foundation in 1961 during difficult local economic conditions, UT has grown into a world-class entrepreneurial university through its top-to-bottom innovative and entrepreneurial institutional culture, its human resource strategy (i.e. hiring entrepreneurial and innovative staff members) and its strong regional network. Their activities have led to over 100 new start-ups per year on average, over 1,000 spin-offs still operational to date, and in excess of 20,000 jobs created. The UT spin-offs also account for 10% of the fastest growing high-tech companies in the Benelux countries. All of these factors, together with the number one Valorisation University Award in the Netherlands in 2015, highlight why UT has a worldwide reputation for entrepreneurship.</p>										



Introduction & Overview

1. BACKGROUND

The University of Twente (UT) is a public higher education institution located in Enschede (The Netherlands) with approximately 3,000 staff members, 9,700 students, and degree programmes offered in engineering, social and behavioural sciences. UT was established by the Dutch Government in 1961, as a policy measure to support the revival of the declining local economy after the loss of the textile industry to Asia. Between 1950-1980, employment in the textile industry dropped by 80%, which compelled the city to seek future directions for its economy.¹

The university management at the time took a leading role in the region to revive the economic climate, slowly but steadily building up a regional entrepreneurial ecosystem, and aligning with the needs and interests of the local industries. Over the years, UT designed and delivered a range of educational and support activities, set up governing structures, and incorporated networks to support and facilitate entrepreneurship, and to drive innovation.

In the early 2000s, a common innovation agenda to draw in funds from national and international sources was set and consolidated regional links and infrastructure by bringing together key regional actors such as the local municipality, the regional development agency, the local higher education institutions (i.e. Saxion University of Applied Sciences and the University of Twente) and the science park (Kennispark Twente). This resulted in a reformulation of regional engagement activities of UT with a more systematic approach envisaged.

Today, defining entrepreneurship as its second nature, the UT is an institution committed to making social and economic impact in the region of Twente. The entrepreneurial activities of UT started in 1981 with the launch of the Business and Technology Centre Twente (BTC-Twente), and was followed by start-up programmes and training courses. The initiative gained further momentum after the knowledge park, Kennispark, was established next to the UT premises in 2006. The Foundation Kennispark is now linked to the broader Twente Knowledge Triangle Ecosystem, a network of agents from the regional government agencies, universities, and connected knowledge and tech-based companies in the region of Twente. The Kennispark hosts over 400 companies, houses close to 6,000 employees and has resulted in over 250 new business relationships to drive innovation.

2. OBJECTIVES AND MOTIVATIONS

The move to increase the profile of entrepreneurship activities within University Twente actually began in the early 1980's and was initially driven by regional development roles, such as creating high-tech spin-off firms, providing skilled graduates, investing in new businesses, and providing an infrastructure for nanotechnology labs.² Since then, the motivations behind the UT entrepreneurial practices have evolved towards the adaptation of a more internationally competitive university-business cooperation (UBC) outlook. In the last years, the UT has reframed its vision to become Europe's most entrepreneurial university, with the fundamental objective of "creating value for and have impact on partners and stakeholders in the Twente region, the Netherlands, Europe, and ultimately society at large".

Aligned with its main objective, the UT has devised nine strategies, and a number of specific future actions linked to accomplish them to:

- ▶ **position the UT as a world-class entrepreneurial university** by sharing success stories, involving staff and students in the improvement process, and designing a curriculum to reinforce an entrepreneurial attitude amongst its employees;
- ▶ **help start-ups and SMEs to grow** over the long term by enhancing their intellectual property (IP) awareness, providing financing facilities, and allocating workspace to entrepreneurs;
- ▶ **facilitate active and proactive contact with the business community** by developing strategic partnerships, cultivating equipment makers, drafting framework agreements, providing insight into the UT's IP position, making management information available, and benchmarking;
- ▶ **nurture talent and thereby stimulate market-driven innovation**, stimulating new research positions, and promoting the PDEng (a post-doctoral programme in engineering in which a trainee develops a design solution in just two years), and finally enabling lifelong learning;
- ▶ **put emphasis on the key research areas that lever the UT's strengths** and the community's needs, through identification of key research areas, starting up industrial strategic research organisations, and providing insight into trends;
- ▶ **position and professionalise the UT's centres of expertise** and shared facilities;
- ▶ **create an effective university gateway for the business community** by clearly publicising the UT's account managers, and improving the websites and communications;
- ▶ **provide incentives and develop useful tools** by creating a coupon book, matching talent with companies, and initiating public-private partnerships through industrial strategic research organisations;
- ▶ **involve University of Twente stakeholders**, by collaborating and aligning with governments as stakeholders, and increase the UT ambassadors' involvement.

3. STAKEHOLDERS

The primary stakeholders of the UT entrepreneurial ecosystem are a broad network of Twente public and government institutions, together with students and academics of the UT. More particularly, the innovation hub where the stakeholders intersect is Kennispark, which has the legal status of a foundation with a board of two directors and a team of support staff. Regarding the stakeholders of the initiative, there are three groups of partners that have played an active role in the foundation and operation of the park; categorised as Founding Stakeholders, Executive Partners, and Network Partners.

The **Foundation Kennispark Twente**, the 'key orchestrator' of Twente's entrepreneurship ecosystem, was established by the joint partnership of the University of Twente, Saxion University of Applied Sciences, the Province of Overijssel, the City of Enschede and the Twente Region. The initiative bolsters Kennispark's goals of creating 10,000 new jobs for the region through innovation and the valorisation of knowledge. These founding partners have invested in Kennispark Twente as the executive foundation for the regional innovation policy.

Executive Partners include *Powered by Twente* for innovation events in the region; the Chamber of Commerce for innovation projects with SMEs; the regional development agency *Oost NV* for match-making with innovative companies and locating businesses in Twente, and the Twente Branding Foundation website Twente.com.

The third group, **Network Partners** include Technology Circle Twente, a network for innovative companies; the World Trade Centre Twente; the Entrepreneurs Society Kennispark; and the food R&D company Innofood, and Kiemt, a network of environmental technology companies.

In addition to the public and private institutions that facilitate the generation of a UBC network and the visibility of the Kennispark ecosystem, there are external stakeholders directly involved in the day-to-day teaching and learning activities that take place at UT.³ Local and regional stakeholders take an active role in assisting UT students with their theses and seminars, offering coaching in the Venture Lab programmes, and visiting as guest speakers. By means of their links with a wide network of local business associations, the faculty clubs offer unique opportunities for entrepreneurs and researchers to meet and exchange insights. The UT academic centre for entrepreneurship, NIKOS, ensures an engaging learning environment in the Venture Lab activities by inviting renowned academics and professionals as guest lecturers.

Beyond the local network, the UT ecosystem is further linked to the regional Twente Knowledge Triangle Ecosystem, thus adding a cluster of additional agents and bodies of educational and local governmental institutions, including the ROC Twente Vocational School, Technologie Kring Twente, and the Twente Board.





Implementation

4. INPUTS

The input provided to the UT entrepreneurial ecosystem is made up of a combination of human, financial, and physical resources.

Human resources form one, if not the most important, element of the UT success in the development towards an entrepreneurial university. This starts at the top and works its way down throughout the entire organisation. The UT and the Kennispark focus on hiring people with a strong opinion, a blend of experience, as well as creativity and 'stubbornness'. It is essential that staff members have an entrepreneurial mind-set, are constantly developing and looking to further develop themselves.

Financial resources are a key precondition in an effective entrepreneurial ecosystem. The UT and Kennispark have recognised this at an early stage. Many state-sponsored funding sources are managed by people with a history in the banking sector, which results in a conservative and cautious approach and a lack of seed-funding for (high) growth start-ups. In response, the Twente Technology Fund was founded to provide investments for innovative industries. In addition, Cottonwood, a venture capital fund, has established a permanent office on the Kennispark, providing funding for high-potential start-ups of the UT. In addition, the Twente region consists of a large business ecosystem, which is very well connected. This network contains a large number of SMEs and private investors keen to invest in start-ups, often in related industries or providing complementary services to their own.

The UT campus and Kennispark, as a **physical resource**, facilitate connections to boost the growth of the high-tech entrepreneurial ecosystem. The park is directly next to the university premises, which helps to create a geographic advantage due to the proximity of all actors involved. Through more than seven shared facilities and the co-working spaces within the campus, links are forged between the UT and businesses, as well as with the start-ups on-site. This results in knowledge exchange, curriculum development, consultancy contracts, collaboration in R&D, guiding and mentoring for students, and entrepreneurs and new start-ups.

5. ACTIVITIES

Kennispark is the umbrella organisation driving innovation and regional growth. It is the first contact point for the UBC activities of the UT and Saxion University of Applied Sciences. Some of the broad range of entrepreneurial activities offered by the Kennispark include extracurricular entrepreneurship training, awareness-raising events and workshops, start-up support, commercialisation of research, a support network and the use of joint facilities.

In Kennispark, replicating the development phases of a new venture, three interconnected streams of UBC services are provided for students and researchers: (1) entrepreneurial mindset, (2) start-up development and (2) support in business growth. The Kennispark staff organise over 100 events a year, including workshops, seminars, and forums. They also provide educational offerings such as *TOP*, *VentureLab International*, and *Zinnergy* business development programmes to develop an entrepreneurial mindset amongst students and researchers. To support the development of start-ups, the

Kennispark assists students and researchers in the legal matters and finance management, and provides start-up funding. In order to support business growth, contact is provided to experienced entrepreneurs and business leaders for guidance and advice, and access is also provided to a network of angel investors, capital-providers and seed funders. Additionally, Kennispark offers the business partnership platform *Portal to Innovation*, and *Science Shop* for innovative idea development, to UT students and researchers.

In respect to research commercialisation, **six major UT research institutes facilitate commercial knowledge valorisation, spin-off development, and facility sharing**: MESA + Institute for Nanotechnology, Centre for Telematics and IT, Institute for Innovation and Governance Studies, MIRA Biomedical Technology and Technical Medicine, Science Based Engineering (SBE), and ITC Faculty of Geo-Information Science and Earth Observation. Regarded as one of the world's leading nanotechnology research institutes, MESA + Institute for Nanotechnology has delivered research that generates annual turnover of €50m, established 50 high-tech spin-offs, and created 1,000 jobs in the region. The centre also shares its laboratories with industry partners for prototype development, testing, and equipment use, leading to 40% external users.

Entrepreneurial training and education activities at the UT has its roots in the 1980s, with two of the first entrepreneurial initiatives by the university. One of them was the elective training course, 'Become your own boss', which provided training to all UT students in writing and presenting a business plan. The other is the business start-up programme TOP, which assisted graduates and entrepreneurs to start up a company. Today, TOP is still available for the entrepreneurs, along with the benefits of interest-free loans, office space, and a year-long training course. Throughout its history, there have been over 500 companies benefiting from the **TOP programme** and received over €10m in funding. In addition to the guidance for emerging start-ups, educational programmes at the UT cater for the needs of established companies. The MBA-level business development programme VentureLab International supports technology-based firms and start-ups in their efforts to accelerate growth.

NIKOS, the academic centre for entrepreneurship in the Netherlands, designs training activities across different target groups and levels at the UT. The courses are either delivered directly, as NIKOS activities, or are offered in collaboration with the faculties and the research centres. Besides the organisation of educational activities, the centre focuses on research, entrepreneurial support, consultancy, and valorisation. It does so in partnership with a number of institutions including Kennispark, the University of Groningen (RUG), the RUG Centre for Entrepreneurship, University Medical Centre Groningen, Energy Delta Institute, EIT ICT Labs, TUBerlin, Higher School of Economics-Moscow, ITB Bandung, and Binus Jakarta. At all study levels, entrepreneurship and innovation is offered as an elective course, or as a 'career track' by over 200 students every year.

Other engagement activities undertaken include the *Innovation Lecture Series*, *Science Cafe Enschede*, and *Open House University of Twente*, which stimulate the public perceptions towards innovation and entrepreneurship. Meanwhile the international summer school project *Curiousu*, and previous year's *Startify* target bachelor's and master's students from all around the world, offering them a selection of academic courses, which include the most popular fields of research in entrepreneurship and risk management. These additional roles in entrepreneurship education fulfilled by the UT and Kennispark help create an organisational culture that aligns with the vision of the university.

6. OUTPUTS

Since its start, the UT, along with Kennispark, has generated considerable results when it comes to UBC outcomes. **Every year over 100 new start-ups are founded** by students or staff from the UT and the Saxion University of Applied Sciences. Currently the campus **hosts around 400 businesses**, including those run by UT students and alumni. The UT alone has over **1,000 spin-offs currently in operation** with each on average employing over nine full-time employees. Three well-known Dutch 'unicorns' were founded in Twente: Cheaptickets.nl, Booking.com and Takeaway.com, of which the latter has raised \$368m in its first initial public offering in September 2016, valuing the company at \$993m (€951.7m).

7. IMPACTS

The impact of the UT knowledge transfer on the local and regional level could be assessed in connection with the outcomes of the business and start-up support, education, and the valorisation activities that take place in Kennispark and its linked networks. In a broader sense, the regional impact is expedited by the UT, facilitating collaboration with the stakeholders in the mentioned networks. The institution has played an influential role in business creation and employment, made possible via flagship initiatives, such as Venture Lab, Twente Technology Fund, TOP, as well as other incubation and start-up support provided to entrepreneurs.

The impressive outputs of the UT, Kennispark and Saxion University of Applied Sciences also led to great impact on the Twente region, with over **20,000 jobs created** and the UT spin-offs accounting for **10% of the fastest growing high-tech companies in the Benelux countries**. Although impact remains hard to measure it cannot be denied that these three main stakeholders have made a large impact on the region's economic prosperity. The activities of the last 30 years have led to the creation of a fully functional regional entrepreneurial ecosystem.





Support & Influencing factors

8. SUPPORTING MECHANISMS

There is a wide variety of mechanisms supporting UBC between the UT and Saxion University of Applied Sciences as well as with business. UBC is embedded in the long and short-term strategies of both organisations, and has been implemented through **offices dedicated to UBC**, (extra)-curricular training and mentoring programmes focused on UBC and its networking events. The key mechanism in this case is the Foundation Kennispark Twente, the joint initiative of local stakeholders that acts as the engine and architect of the ecosystem.

Other most recent mechanisms highlighting the entrepreneurial decisions taken at the UT involve the introduction of two projects: the UT Impulse Programme and the UT Innovation Voucher Programme, as part of the initiative 'Top Technology Twente', which targets the expansion of partnerships with the business community.

- ▶ **The UT Impulse Programme** aims to bring together industrial interest with the research expertise of the university, in order to build joint PhD courses involving a number of related research projects. Financially backed by the UT Executive Board, institutional/departmental resources, and private parties with investment totalling €40m, the programme will have an intake of 100 doctoral students, to specialise in the industrial research areas.
- ▶ **The UT Innovation Voucher Programme** targets Centres of Expertise to maintain ties with the relevant business community, and share their facilities with third party actors. As an incentive, 50 innovation vouchers valued €10,000 each are offered to the Centres of Expertise to attract new partners. The total investment of €500,000 comes from the university and the Centres of Expertise. The programme has produced successful results so far, with 15 vouchers being awarded in two rounds, within six months.

Other recent mechanisms supporting collaboration and entrepreneurship are the establishment of three investment funds, with one initiated by the UT, and the other in the status of headquarters launched in the campus:

- ▶ **The Twente Technology Fund** was set up in 2010 with about €10.5m from wealthy families in Twente, in addition to €3m investment from UT and €1.5m from the regional development agency.
- ▶ **Innovation Industries** is connected to all Dutch Technical Universities and has now followed it as a second national fund.
- ▶ **The Dutch Student Investment Fund** is the first start-up fund in Europe that is led by a board of students, and an investment committee, again, composed of UT students. An estimated €1m worth of investment funds is saved for promising student start-ups in the region.

Recently Twente's entrepreneurial ecosystem has been attracting foreign investors as well. One example is the US based **Cottonwood EuroTechnology Fund** launching their first European branch at

the Kennispark, providing over **€20m investment** to start-ups specialising in photonics, advanced materials, healthcare and clean energy fields.

9. BARRIERS AND DRIVERS

In this context, one of the main drivers is the **strong management system that governs the UT and the broader Twente Knowledge Triangle** – a triple-helix form of government that enables continuous communication among the main actors.

Another driver is the **well-connected network**, with the universities in the central position forging partnerships, and Kennispark on the periphery reaching out to businesses for cooperation.

One of the barriers is the **limited proportion of jobs in the Twente region that require higher or medium levels of education**, which reduces the absorption capacity of the educated workforce. This, however, at the same time is a driver for stimulating more spin-offs and start-ups coming out of the universities.

The second barrier is the underdeveloped **investment climate** (compared to other entrepreneurial hubs), which is discussed in more detail in the challenges section.

10. FUTURE CHALLENGES

The institution has identified a few challenges relevant to the operations of the broader stakeholder network of Kennispark, financing, and the educational and training activities offered at the UT. Maintaining the focus on the shared goals of the triple helix cooperation, ensuring institutional support when new entrepreneurial programmes are introduced, and establishing contacts between faculties and research groups are some of the challenges experienced by those involved.

Although the **investment climate is underdeveloped** in the Netherlands in general, Twente has a relatively well-developed system. It is recognised, though, that The Netherlands as well as Twente still find themselves on a steep learning curve. The UT is facing similar issues, with many government and semi-governmental investment funds being very cautious in financing start-ups. Some of the reasons include:

- ▶ inexperienced parties;
- ▶ non-professional personnel who handle the private or public funding processes and
- ▶ limited knowledge of how risk capital and venture capital works.

Banks are considered another source of finance, but they are not able to provide seed-money due to the high risks involved. While the financial crisis did not have a major impact on investment, it affected the confidence of the entrepreneurs and investors. This is the main reason why the investment climate must be stabilised and strengthened for the development of the start-up industry, which is one of the core activities at Kennispark.

Other challenges regarding the entrepreneurship development in teaching and education are for example, the fact that not all students are exposed to entrepreneurship courses during their studies, which might have some consequences on the effective development of entrepreneurial attitudes and intentions. Moreover, the number of faculty members who are able to teach entrepreneurship is

low compared to the entrepreneurial ambition of the university. This is regarded as a barrier for wider implementation of the entrepreneurial goals in the faculties excluding business administration department.

11. CONTEXT

The UT university campus is located between Hengelo and Enschede in the east of the Netherlands in the Twente region. Twente has approximately 620,000 inhabitants, with Enschede, the home of UT, being the main city of the region. The primary industries are agricultural, services, construction and transport although the region has a flat organisational profile with few large companies, Grolsch Brewery being an exception.

The UT ecosystem functions within a wider regional stakeholder community, with the UT as a component of the Twente network. **UT is the key player and the driving force behind this ecosystem**, accommodating nearly three quarters of the regional organisations⁴ and driving it with a constant supply of quality research as well as talented human capital to feed local business, or drive the commencement of new ventures.

The intensive clustering that has built up around UT allows organisations in the network to find each other more easily, establish new partnerships, and maintain relationships. The development of the tightly connected network is explained partially as a result of the technology-focused incentives and instruments introduced by both the Netherlands and the EU. One of the outcomes of this small-in-scope, yet intense, network cooperation is the outstanding number of innovation projects in comparison to the number of companies in the region.

Existing regional networks of public and private partners provide business development support to the students and entrepreneurs that consolidates knowledge and efforts, and brings out tangible outcomes, thus developing an attractive investment environment.

12. KEY SUCCESS FACTORS

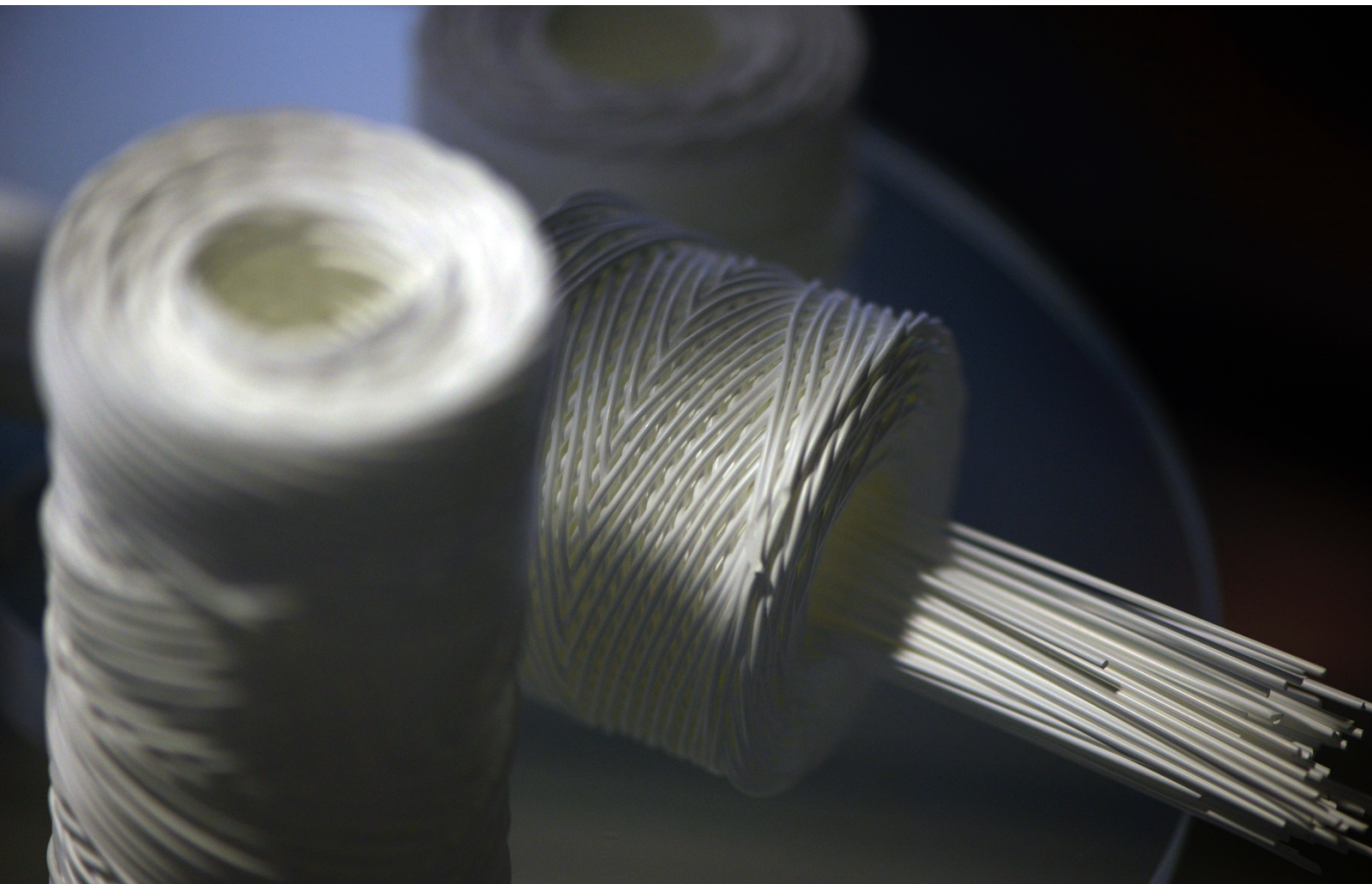
Key elements pertaining to UT's and Kennispark combined success are explained by four fundamental factors: **human resource management, institutional culture, organisational structure**, and the **regional network**.

Recruitment of the 'right' staff, and creating a stimulating atmosphere for innovation are seen as crucial for the organisation. The UBC context in the UT is shaped by carefully selected staff, from top management downwards, in an organisational climate that encourages and rewards entrepreneurship and innovation. This could translate in attracting experienced staff with a mixture of ability and entrepreneurial skills, and with strong personalities, who feel comfortable expressing and standing by their opinion regardless of this being different. They are sometimes characterised as 'stubborn', strong-minded and creative people that are in a process of continuous development. At the same time, they are flexible enough to be coachable. In addition, in terms of background, employees are expected to have an affinity with entrepreneurship, or have had previous entrepreneurial experience themselves. The development and initiative of the staff are strongly encouraged, rewarded by promotion.

The university prides itself on **attracting and keeping talent**, stimulating academics and students to think and act creatively, and builds upon the success points with the professional support of carefully selected staff. To facilitate this environment, the institution ensures there is a minimum amount of bureaucracy that the students and staff are subjected to, as well as a level of academic freedom that leaves space for researchers to focus on their interests and emphasise their strengths.

There are many examples of regions where different stakeholders collaborate to achieve a common goal. However, what makes the Twente region unique is the way that the Kennispark has been set up as an organisation. Already at an early stage, the regional stakeholders acknowledged that in order to change themselves and the region, they needed a **new neutral organisation that connects them all**. Rather than the higher education institutions, local and regional government, business and other stakeholders cooperating from within their own organisations, the Kennispark has been set up to represent the best interest of the region rather than that of the individual stakeholders. This increases the effectiveness of the activities in the region, reduces politically-tainted debates and shortens decision cycles.

Lastly, the **regional network** is a key to the success of the UT and the region in general. The influence of this network operates through coaching and mentoring of start-ups by experienced entrepreneurs and business leaders, funding of start-ups of governmental actors, venture capitalists and SMEs, and setting up joint businesses by students and regional business leaders. As funding is an essential precondition in the existence of a start-up, and although the Kennispark and UT also provide their own funds, it is also the network that they can tap into that brings these start-ups to the next stage. This large intertwined network is part of the fuel that keeps the entrepreneurial ecosystem engine running.





Further Information

13. MONITORING AND EVALUATION

Entrepreneurial activities are monitored regularly by the board of the UT, through an **advisory committee of representatives from industry and academia**. This committee advises the Executive Board and the team of scientific directors on the programme research and collaboration.

More particularly, the board of the Foundation Kennispark Twente is held accountable to its five founding institutions as external investors. These founders approve the annual plan and budget, and the board presents an annual report to the founders to account for its activities. The board members and the founders meet every three months for a 'state of union' meeting, to discuss the progress based in the metrics in the annual plan. The **Supervisory Board of the Kennispark Twente** does audits, and enables discussions between the founders and the board on the institutional mission and strategy.

From a regional perspective, the Twente ecosystem is governed by the **Twente Board**, composed of 10 representatives, which promotes regional economic development, focused on the sectors of high tech systems and materials. Upon creation of the common regional agenda *Twente Works* and set targets to achieve, in 2015 the board moved on to publish the *Twente Index*, to annually measure objectives.

Despite the monitoring and evaluation systems in place to measure the impact of entrepreneurial activities in the UT, impact is mostly seen in the tangible results obtained as result of the assessments. Most indicators are focused on quantifiable outcomes, such as number of spin-offs, collaborations with the industry, and percentage of third-party funding, as part of the performance agreement with the Dutch government. A deeper insight into the less quantifiable, but equally crucial, impact of the UT entrepreneurship and training activities, for instance, the change in the attitudes and behaviour towards entrepreneurship, remains undiscovered.

14. SUSTAINABILITY MEASURES

The long-term sustainability of the UBC ecosystem in Twente is ensured not only by valorisation of research and formal education programmes, but also through the community outreach activities, in the forms of start-up support, summer schools, public lectures, and international think-tank events.

Curricular education is necessary in setting the base for students and teaching them the fundamentals, however, this happens in a pre-defined period and within a standardised curriculum. It is the practical application of the knowledge that builds these skills, and triggers change in society – a component of learning highlighted by the UT through a number of support initiatives.

The network and business development coaching, training, and advice available to the entrepreneurs in the programmes Venture Lab International, TOP and through the 100 annual workshops and events through *Powered by Twente*, have made it possible for the tech-based start-ups and innovative businesses to launch themselves in the market, grow, and create thousands of job opportunities for the community, with the outputs of the loop feeding back into the ecosystem.

These practical measures make this a self-sustaining system, backed up by the sustainability mission of the university at the strategic level, which places special emphasis on the practically-applicable nature of the research that enables close cooperation with the Kennispark, the platform where “business and science amalgamate each other”.

Additionally, at the operative level, the Kennispark makes clear that it is less of a concern to maintain sustainability of the organisation, since the entire staff is provided by the founders (UT, Saxion, the city, region and province) and no-one is on the payroll. The projects are largely financed by regional funds, followed by the occasional national and European funding. This ensures a strong connection with, and a learning curve for, the founding organisations.

15. TRANSFERABILITY

The UT is a university that has embedded itself in its region. There are many aspects of this case study that can be replicated in other regions, assuming the key stakeholders buy in to the concept and the strategy is adapted to the specific region. The approach of UT in building networks, involving the right type of people, and bringing economic growth to its region, is unique but transferable.

16. AWARDS AND RECOGNITION

The UT has been widely recognised for the outcomes and impact of its dedicated entrepreneurship policy in the national and international higher education sector. However, this is not reflected in the world university rankings (e.g. 153rd in the 2017 THE, and 177th in the 2016 QS Ranking), which do not recognise these activities.

However, earlier in 2015, the UT was ranked number 1 in the Valorisation Ranking of Dutch Universities as the best performing university by Elsevier Magazine. Among the thirteen universities included in the ranking, the University of Twente scored highest in delivering economic and social impact, thus was awarded the title ‘Most Entrepreneurial University’ of the Netherlands.

In October 2013, the region of Twente was presented as an ‘authoritative example’ of an innovative region in the Netherlands in the Erasmus Knowledge and Innovation Monitor. The same year, Kennispark was named the best business park at the 2013 National Business Congress held in Utrecht. The campus was ranked the best on the categories of economic value, clear profile, degree of organisation, adaptability, level of facilities, user satisfaction, and branding.

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18. LINKS

Twente University <https://www.utwente.nl/en/>

Kennispark <http://www.kennispark.nl/>

Entrepreneurship Development of Twente University <https://heinnovate.eu/resource/entrepreneurship-development-university-twente>

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² Benneworth, P., Pinheiro, R., & Karlsen, J. (2014). Strategic agency and institutional change: Investigating the role of Universities in Regional Innovation Systems (RISs)

³ Heinnovate URL: <https://heinnovate.eu/resource/entrepreneurship-development-university-twente>

⁴ Knowledge triangles in the Netherlands: an entrepreneurial ecosystem approach: Stam, E., Romme, A. G. L., Roso, M., van den Toren, J. P., & van der Starre, B. T. (2016). Knowledge triangles in the Netherlands: an entrepreneurial ecosystem approach. ISO 690