



# Boosting the knowledge valorisation process: putting plans into action.\*

Direct your university towards entrepreneurship

A practical study concerning the spin-off generation process at universities

The Hague, June 2006

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# Boosting the knowledge valorisation process: putting plans into action

Direct your university towards entrepreneurship

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# Pre-face

The generation of spin-off companies from knowledge institutes is regarded as one of the important ways to innovate the Dutch economy and improve productivity. In the last few years, the Dutch government has therefore launched several new grant schemes to promote the valorisation of knowledge and spin-off generation in particular.

Some Dutch knowledge institutes are already well on the way implementing knowledge valorisation processes aimed at the creation of spin-offs. Others are still in the initial stages of promoting entrepreneurship and setting up facilities, networks and support measures to stimulate the process of spin-off generation. This is a good moment to analyse current practices and how Dutch universities deal with implementation issues at hand.

PricewaterhouseCoopers has therefore conducted this study in collaboration with TechnoPartner. Both organisations have a shared interest in the area of knowledge valorisation, respectively from an innovation consulting perspective and as an action programme of the Ministry of Economic Affairs and the Ministry of Education, Culture & Science, stimulating the climate for techno starters.

In order to maintain momentum and confidence as well as to further enable success there is a clear need to put plans into action. With this report we intend to inspire universities and show how to deal with some major issues. Issues are for instance cultural change, reward systems and selectivity towards opportunities. We provide potential solutions to tackle these issues and illustrate them with examples of good practice.

The Netherlands has a significant advantage: our research base is generally of a high to very high quality. This is concluded from international comparative studies that measure the impact of scientific publications (VSNU 2005). Therefore, if the Dutch universities succeed in effectively directing their universities towards entrepreneurship, social economic returns are promising!



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# Content

Pre-face	3
Executive Summary	6
<b>1 Background and objectives</b>	<b>9</b>
Tackling the European Knowledge Paradox	9
Practical recommendations how to boost the spin-off generation process	9
Methodology	10
Structure of the report	11
<b>2 Defining the spin-off generation process</b>	<b>13</b>
Stages in the spin-off generation process	13
Definitions	15
<b>3 Direct your university towards entrepreneurship</b>	<b>17</b>
Establish an entrepreneurial culture	19
Show strong commitment from the board creating a sense of urgency	20
Cherish successful people and successes and let them act as role models and good practices	21
Include entrepreneurial skills and knowledge into the curriculum	21
Reward entrepreneurship	22
Rewards create an incentive at the university level to engage in entrepreneurial activities	23
Rewards motivate inventors to consider licensing an invention or start a new venture	23
Other researchers may get inspired by rewarded colleagues	24
Implement a dual approach towards knowledge valorisation	25
Implementing a dual approach by putting selection mechanisms in place	27
Use effective screening and assessment systems	28
Implementing a dual approach by differentiating in support measures	29
Get connected to the market	30
Recruiting entrepreneurial experts brings in entrepreneurial knowledge and skills	31
Networking provides the university with knowledge about the market	32
Market connection provides the university with potential investors	34
Support potential entrepreneurs	35
Special funding is required to finance essential steps in the valorisation process	36
Venture teams of limited size require support in specific areas where capacity/expertise is lacking	36
<b>4 Keep going in the right direction</b>	<b>39</b>
<b>Appendices</b>	
Appendix 1 – Literature and web links	41
Appendix 2 – List of interviewees	43

# Executive Summary

Although the knowledge base of the Dutch universities is generally of a high to very high quality<sup>1</sup>, effective transfer of knowledge to industry is cumbersome. In this way the materialisation of scientific findings into new appliances and socio-economic return is hindered. One of the routes of scientific innovations to the market is the generation of spin-off companies.

In this practical study PricewaterhouseCoopers has in cooperation with TechnoPartner analysed the current approaches towards spin-off generation of a selection of Dutch universities. The objective is to exchange experiences and to enhance mutual learning between universities on the subject. We emphasise that this study does not intent to be of a scientific nature, resulting in indisputable conclusions; we followed a practical approach resulting in practical recommendations.

We have selected universities that are assumed to be at the forefront in generating spin-offs. However, although our data collection has focused in particular on universities, we are convinced that our recommendations will also provide valuable insights for research institutes and higher educational institutes.

From our analysis we have concluded that there is a genuine need to direct the university towards entrepreneurship, reconciling the old core tasks of education and research with the new task of valorizing scientific inventions in the market place creating socio economic return. The required change at hand is of a revolutionary nature and requires all hands on deck.

We underpin this conclusion by five main recommendations illustrated with examples of good practice and addressing specific implementation issues. These recommendations are:

## a establish an entrepreneurial culture

The university as a community needs to build new shared norms and beliefs that foster entrepreneurship as apposed to norms and values that resulted from the historical focus on education and research. We found three main approaches that foster cultural change:

- show strong commitment from the board creating a sense of urgency;
- cherish successful people and successes and let them act as role models and good practices respectively;
- include entrepreneurial skills and knowledge into the curriculum.

## b reward entrepreneurship

According to our findings entrepreneurship needs to be rewarded on two levels: on the organizational level, i.e. the university, and on the individual level, i.e. the inventor or person within the university that actively brings knowledge to the market.

## c implement a dual high and low selective approach towards knowledge valorisation

Universities need opportunities with market potential. Without these opportunities knowledge can not be brought to the market successfully. From our literature review and interviews we concluded that universities tend to scout and screen either for high quality opportunities with a high business potential or for a high quantity of opportunities. We argue that if universities manage to combine the two approaches entrepreneurship is fostered in a stronger way and more spin-off companies will enter the market successfully.

<sup>1</sup> Vereniging van universiteiten (2005): *Onderzoek van waarde – Activiteiten van universiteiten gericht op kennisvalorisatie*. Den Haag: Vereniging van universiteiten (VSNU), p. 9

d **get connected to the market**

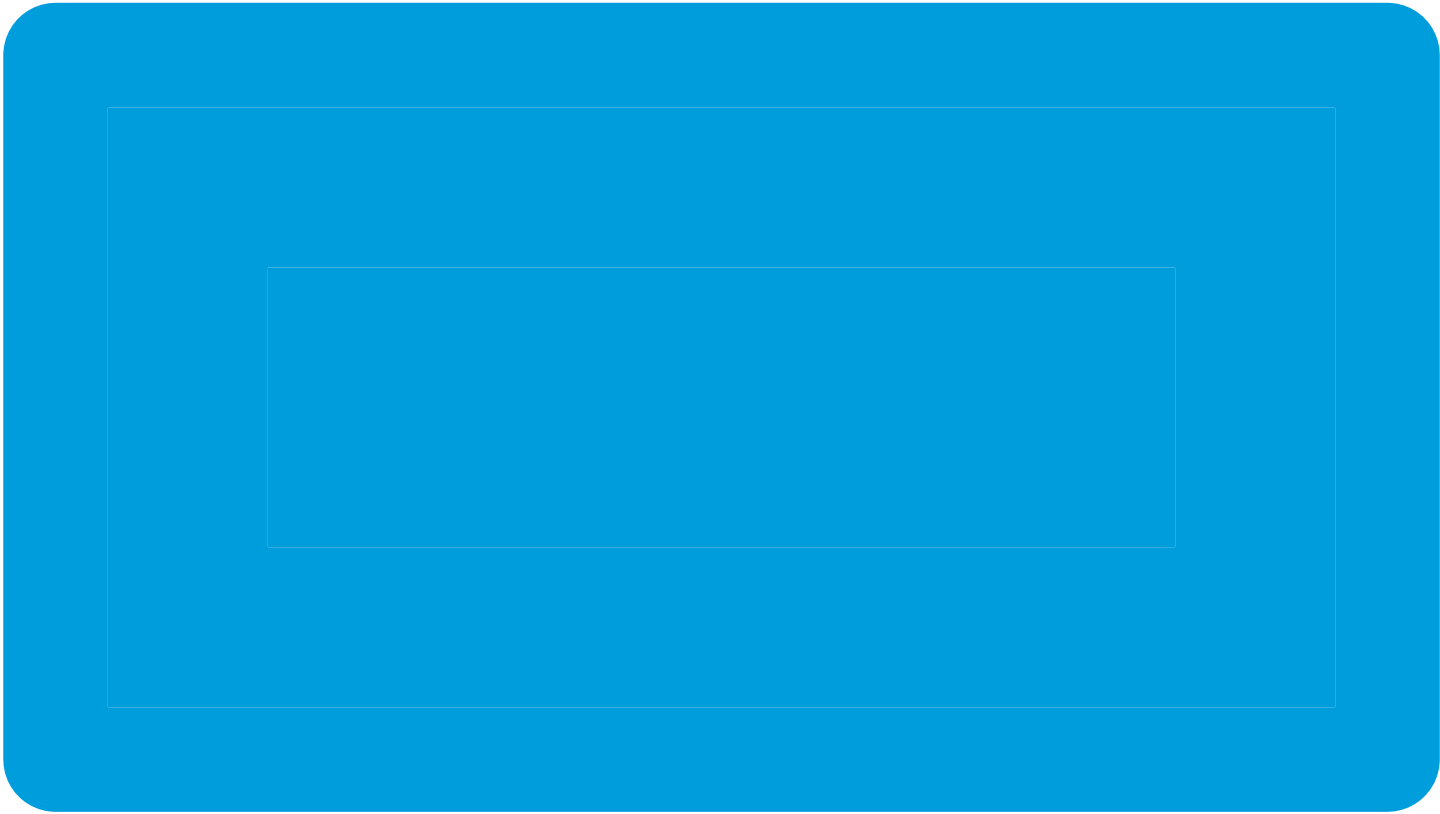
Universities need to strategically initiate and maintain their networks and relationships to get and keep connected to the market. This connection to the market will enhance the university's knowledge about the market needs, its functioning and the players involved in it. Also the enrolment of external experts could be a valuable method to get and maintain this connection.

e **support potential entrepreneurs**

It is generally acknowledged that the generation of spin-offs requires support of the university. Researchers often do not have the knowledge nor the resources to start a company. Universities can play an important role in this. We found that universities considered successful in terms of their spin-off generation do not only financial support potential entrepreneurs, but also provide non-financial arrangements, like use of facilities, consultancy services and training.

Realizing the significance of the change universities need to go through, it is essential that the academic community exchanges experiences, proven good practices and ways to address major issues successfully. In this way the knowledge valorisation process can be boosted. Once the right directions are pointed out with trust and confidence, plans can be put into action effectively and with a high pace.

The aim of this practical study and the possible directions pointed out is to inspire universities to discuss how the right processes and structures can be developed. Some of our recommendations may give a feeling of 'I am aware of this'. We are however convinced that more attention has to be paid to the issues surrounding these recommendations and how to implement them. Within this respect, this study provides valuable new insights and directions to boost the spin-off generation process within universities.



# 1 Background and objectives

## Tackling the European Knowledge Paradox

1.01 Capturing and leveraging the value of science and technology is commonly accepted to be one of the main drivers of the European knowledge-based economy. A general concern however is that while universities are very productive in terms of high quality publications, industry makes relatively little use of scientific progress. This phenomenon, known as the 'European knowledge paradox' hinders the realisation of the ambitions set at the Lisbon Council of 2000.

1.02 The Dutch government recognizes the problem and takes several measures to stimulate academia and industry in bridging the gap between them. This resulted in changes in legislation regarding the role of universities in society. Besides the two traditional pillars (education and research) the universities were based on, the third pillar (contribution to the society) now implies also knowledge valorisation activities. Next, several grant schemes and incentives exist that on the one hand stimulate universities to valorise their knowledge and on the other hand try to stimulate companies to use academic knowledge.

1.03 One of these grant schemes is the SKE aimed at the creation of Knowledge Exploitation networks that facilitate the exploitation of scientific results via existing and new companies (so called techno starters). Other initiatives are the Smart Mix Programme supporting long term industry/academia collaborative research and the STW Valorisation Grant that provides projects at universities with funding for market/technology feasibility studies and preparations for spin-off. Furthermore, recently the incentive scheme "Knowledge Vouchers" has been launched after two successful pilots in 2004 and 2005. With these vouchers small and medium sized enterprises can 'buy knowledge' from research institutes, universities and large R&D-intensive companies.

1.04 Universities actively use these grant schemes to support their Technology Transfer Offices (TTOs), University Holdings or equivalents in their efforts to exploit their intellectual property. However, the approaches and level of experience concerning e.g. stimulating business-university relationships, licensing and the creation of spin-off companies vary per university.

## Practical recommendations how to boost the spin-off generation process

1.05 PricewaterhouseCoopers carried out this study in cooperation with TechnoPartner amongst a selection of Dutch universities to analyse and compare the current status of knowledge valorisation activities. The purpose of this study is a practical one: to learn from current experiences, defining possible directions and recommendations illustrated by examples of good practice that can assist universities in boosting the knowledge valorisation process.

1.06 We found that many universities are still in an initial phase of developing their knowledge valorisation strategy and planning their activities. One university might be slightly ahead of another and certain activities may already be in the execution phase, but in general many plans still need to be put into action. This study report can be used as input for discussion about how to implement plans and approaches. We identified issues universities are currently struggling with and provide possible solutions to address these issues, without intending to be exhaustive. Again, the main aim here is to help universities to learn from each other's experience and to prevent universities from reinventing the wheel.

1.07 Our study is mainly directed at universities as it is based on data collected amongst universities. However, this report will also be of value to other stakeholders in the knowledge based-economy. We are confident that it will provide valuable insights for research institutes and higher educational institutes as well as policy makers that deal with knowledge valorisation matters.

1.08 Apart from a general assessment of the spin-off generation process, we have particularly focused on the recognition process of business opportunities and on how the development of these opportunities into spin-off companies is supported. The relevant stages between opportunity and readiness for spin-off concern:

1. research (establishing proof of principle of inventions);
2. feasibility (developing proof of concept regarding market and technology);
3. preparation (developing market and product).

1.09 The next chapter 'Defining the spin-off generation process' elaborates on these stages in more detail.

## Methodology

1.10 Our recommendations are based on desk study work and information we collected by means of interviews at six Dutch universities. These universities were selected on the basis of a survey among Dutch universities and research institutes<sup>2</sup>. Respondents were asked to nominate the five best examples known to them of successful spin-off generators in The Netherlands and to motivate their nominations. Respondents were directors and managers of university holdings, knowledge valorisation departments and TTOs (or equivalents).

1.11 We selected the following six universities that were mentioned most as successful spin-off generators by fellow universities. In alphabetical order these are:

- a Delft University of Technology (TUD);
- b Eindhoven University of Technology (TU/e);
- c Erasmus Medical Center (Erasmus MC);
- d Leiden University (LU);
- e University of Twente (UT);
- f Wageningen University and Research Centre (WUR).

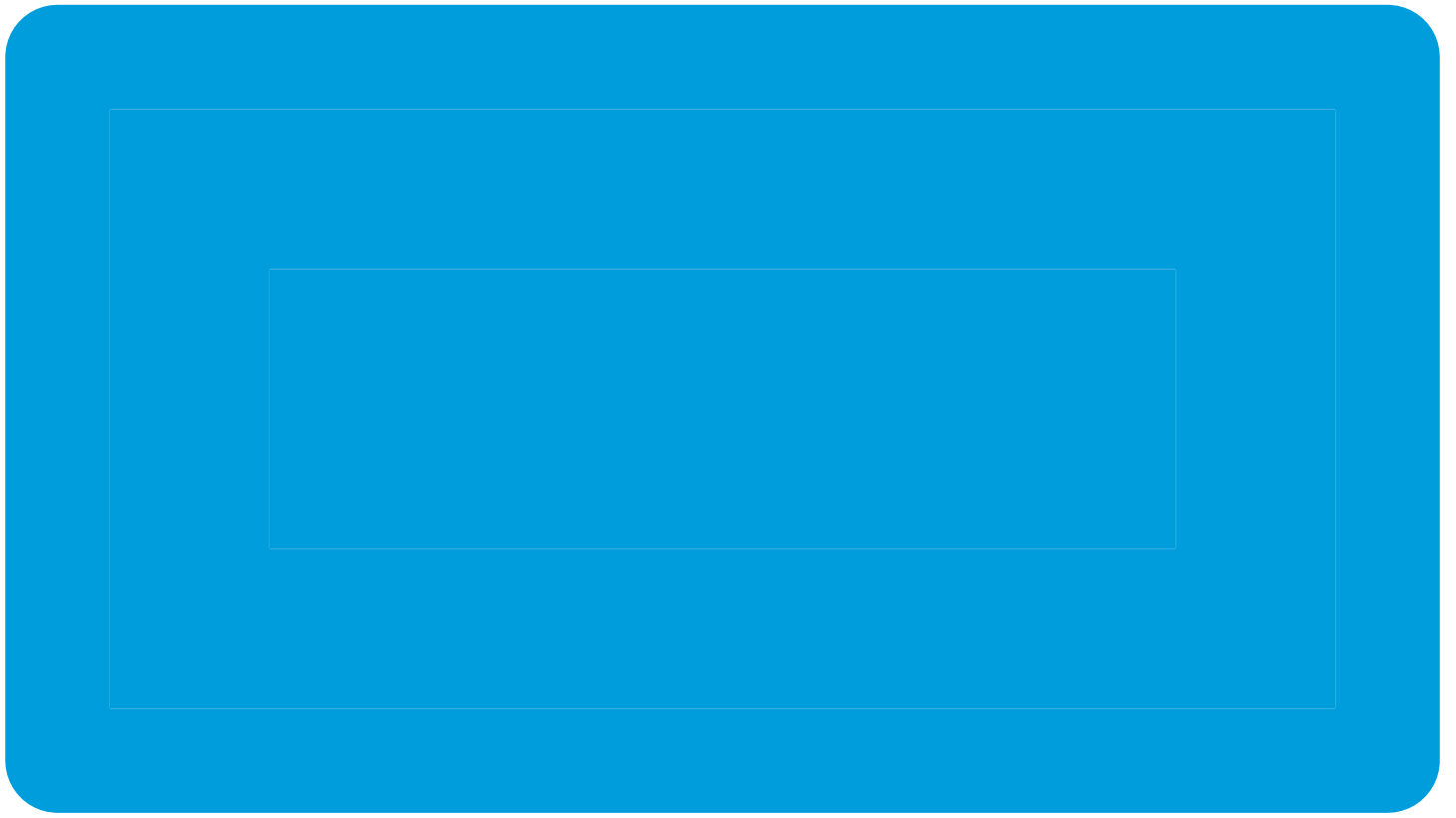
1.12 This list only contains universities, while also research institutes generate spin-offs. We need to acknowledge that the respondents to our questionnaire mainly consisted of universities and bodies related to universities. This could have caused a bias in the response in the sense that universities may tend to nominate only fellow universities.

1.13 We have conducted interviews at each university. These interviews were guided by a questionnaire, which is developed on the basis of our desk study. The questionnaire consisted of a semi-structured part by which we discussed the knowledge valorisation activities and spin-off generation process in general and of a structured part that particularly focused on topics related to the scouting and screening phase.

<sup>2</sup> We did not include higher educational institutes in our sample as they do not create knowledge and can not be a source of science based spin-offs we focus on in this study.

## Structure of the report

1.14 The structure of the report is as follows. In chapter 2 we first give a description of the knowledge valorisation process providing a common reference of the several process stages. In chapter 3 we report our conclusions and elaborate on them by providing practical recommendations. For every main recommendation we discuss its relevance, how it can be put to practice and what issues might be relevant to the recommendation. Moreover, with examples of good practices at specific universities we illustrate how to stimulate entrepreneurship. In the last chapter of this report, chapter 4, we give our opinion about the desired follow-up on the recommendations in this report.



## 2 Defining the spin-off generation process

2.01 Spin-offs aim to translate knowledge into commercially viable products and services. The spin-off generation process starts at the discovery of a new invention with a perceived business potential. After that it is generally a long bumpy road towards developing the idea into a technological and market viable business case. Along the way there are many casualties and the ones that do make it have to prove their viability in a competitive marketplace.

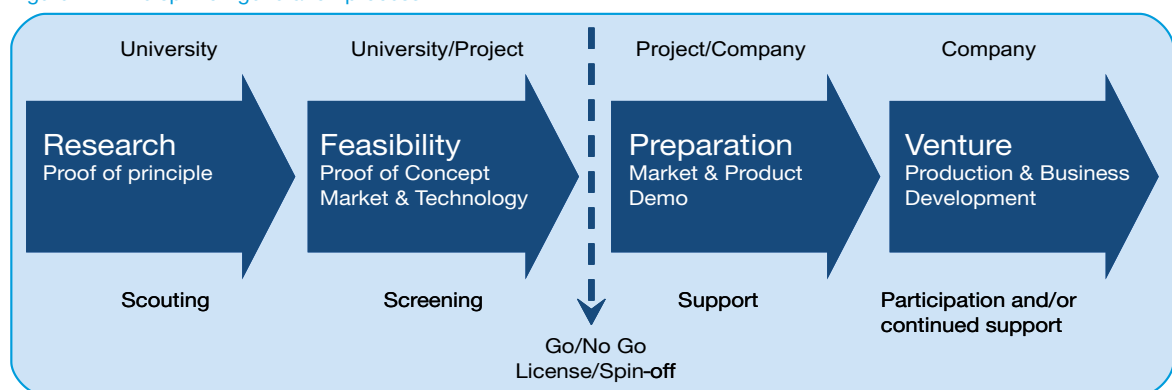
2.02 Description of the generation process is done in many ways, from a financial perspective (e.g. pre-seed, seed, growth) to a TTO perspective (e.g. identification, breeding, growing-up) that emphasizes the needs. However, the underlying development activities are the same. In this chapter we describe the process based on the stages of development. Furthermore we provide some clarifications of important definitions that are sometimes misinterpreted.

### Stages in the spin-off generation process

2.03 The spin-off generation process can be described by four main stages of development: Research, Feasibility, Preparation and Venture. The development stages are accompanied by different types of university activities: scouting during the Research Stage, screening during the Feasibility Stage, support during the venture Preparation Stage, and possible participation and/or continued support at the Venture Stage.

2.04 A critical point in the process is the transition of the Feasibility Stage into the Preparation Stage, when the decision has to be made whether to proceed or stop the initiative. Next, upon a positive decision one has to decide whether to license or to create a spin-off company. We will elaborate on every individual stage in the following paragraphs.

Figure 2.1: The spin-off generation process<sup>3</sup>



3 We have developed this figure based on work of Harold Evans (2005) in which he captures “The spin-out journey” in one integrated model.

2.05 The first stage implies scouting of commercially applicable ideas from the university's research base. The research base has to be of both high quality and high volume. The high quality of research is a prerequisite for patentable high potential ideas. Low quality research will generally not provide the university with high potential ideas. The high volume however implies broader opportunities for selection and more options for knowledge valorisation activities<sup>4</sup>.

2.06 By scouting ideas we mean finding those suggestions and inventions within the scientific community which can be commercially exploited. Scouting can be performed in a centralized way by formally appointed scouts, as well as decentralized through research directors with experience and expertise regarding knowledge valorisation. Scouting implies formal scouting via organized structures and schemes as well as scouting via informal intrinsically motivated networks.

2.07 After an idea for valorisation has been identified and developed at the first stage, the second stage aims to assess its feasibility. Feasibility assessment concerns both technology and market viability. Market oriented activities concern developing business cases, later on to be transformed into business plans. Technology oriented activities concern developing further proof of the technological concept by e.g. small scale set-ups or simulations that go further than lab scale.

2.08 During this second stage, the valorisation idea is transformed into a coherent and structured venture creation project. Two issues being addressed are the protection and the development of the idea. Sometimes the ownership of ideas belongs to researchers and sometimes to universities. Obviously clear agreements concerning ownership need to be made in an early stage. Development of an idea implies specifying the ways in which the idea will be actually exploited (business plan). As soon as the first assessment procedures are passed successfully further technological proof of concept is required. For high-tech ideas this usually implies getting access to expensive equipment and other costly activities.

2.09 Feasibility assessment results into the decision on whether to proceed or stop, and what the best strategy is towards exploitation – licensing or creating a new venture. The next step for a spin-off is the Preparation Stage aimed to prepare a techno starter for market entry. TTOs (or equivalents) generally provide both financial and non-financial support activities. Financial support refers to grants and loans that a university provides for techno starters e.g. to protect IP, develop business plans and prototypes, and cover other related costs. Non-financial support consists of consulting, training and coaching activities, and providing housing and access to facilities. During the Preparation Stage, business angels step in and also first contacts with venture capitalists are made.

2.10 At the end of the Preparation Stage, a new venture project should be ready. The Venture Stage deals with the creation of a new firm to exploit an opportunity managed by a professional team and supported by available resources. To enter this stage, there is a need for management expertise and good social networks, but in general the techno starters also still need to have access to facilities such as test devices, precise measurement instruments, laboratory equipment etc. Several options are possible in terms of institutional relationships between universities and their spin-offs: universities can hold some equity shares in newly generated spin-offs, universities can also provide spin-offs with an access to some university facilities, and finally universities can allow spin-offs to exploit a patented technology owned by a university.

4 Ndonzuau, F.N, F. Pirnay, B. Surlemont (2002): A stage model of academic spin-off creation. *Technovation*, vol. 22 (5): 281-289

## Definitions

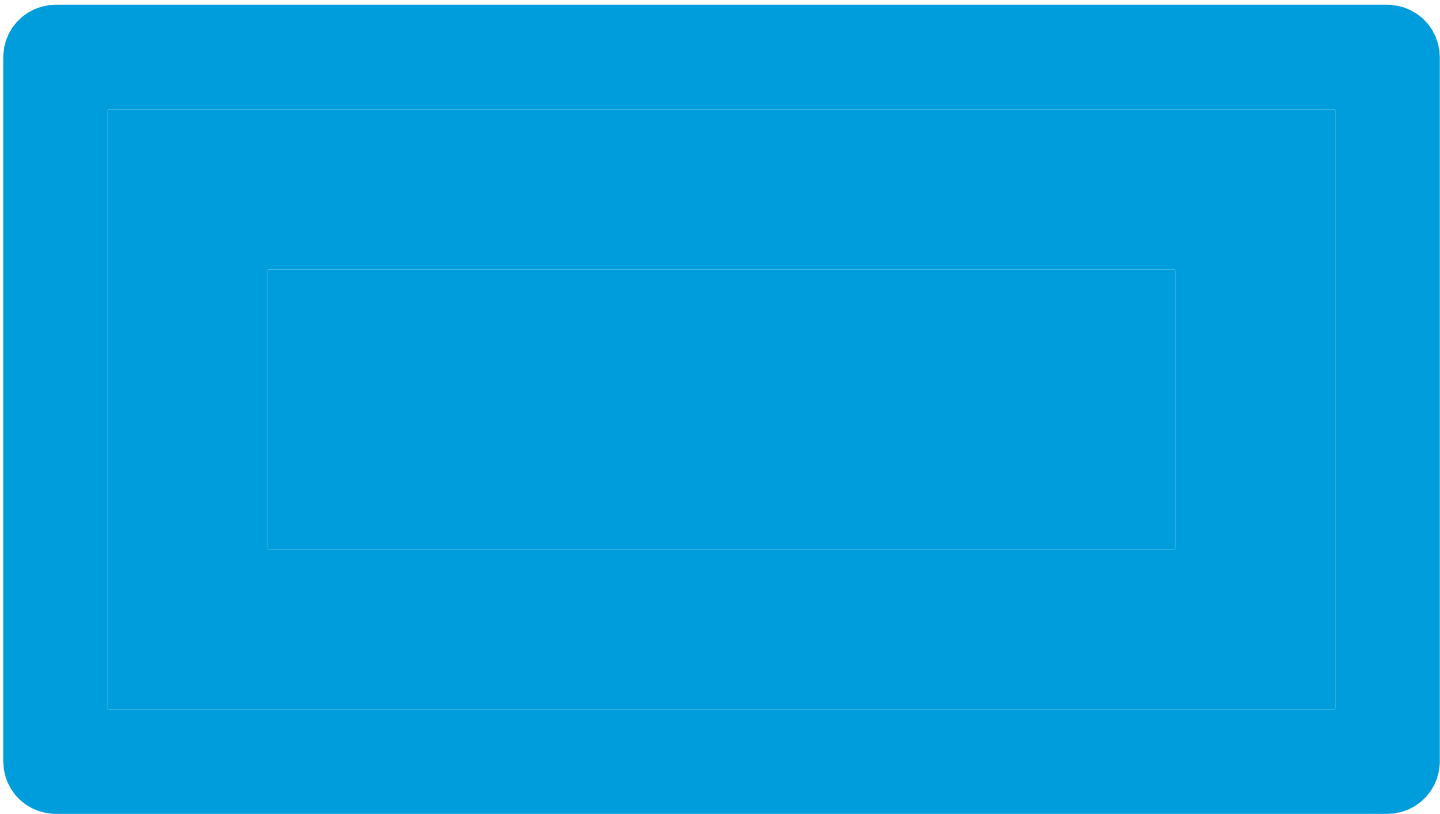
2.11 Here we clarify some of the key definitions we use throughout our report.

2.12 By **knowledge valorisation** we mean capturing value of knowledge and exploiting it by means of creating a new company (spin-off) or by licensing the technology out. Knowledge valorisation activities therefore include scouting & screening for both licensing and spin-off creation, as well as support and possible participation in newly generated spin-off companies.

2.13 By a **spin-off company** we mean a new company which formation is based on a core technology generated at and transferred from a university. It can be managed by both people who were former university employees as well as external people with experience in entrepreneurship from setting up previous ventures. In our study, we are focusing on so called high-tech spin-offs.

2.14 **Licensing** we interpret as selling or renting Intellectual Property of the university for commercialization to companies by means of a legal agreement. Mostly, it refers to the right on a patent or software package developed and owned by the university. However, also other IP can be transferred such as databases, biological or chemical materials (in that case one speaks about material transfer agreements), designs and architectures, procedures and tests, copyrighted materials, etc.

2.15 By **Intellectual Property (IP)** we understand a legal guarantee for access to benefits from certain types of information, ideas and other intangibles. The holder of that legal guarantee usually has exclusive rights to the subject matter of IP. When speaking about IP, we refer to patents, trademarks and copyrights related to the identification, protection and commercialization of university works and inventions.



## 3 Direct your university towards entrepreneurship

3.01 Universities need to direct and commit their organisations more strongly towards entrepreneurship in order to boost the knowledge valorisation process. This is the main conclusion from our study. Although in the last few years universities increasingly engage in activities to bring their knowledge to the market, knowledge valorisation is still a task secondary to research and education. This is strikingly illustrated by our respondents who all acknowledge that researchers give priority to publishing, rather than valorising new knowledge or inventions.

3.02 Valorisation of knowledge forces universities to partially depart from their 'old core tasks' (i.e. education and research). This refocus of creating knowledge to selling knowledge requires a strong entrepreneurial approach that from origin does not exist within the academic community. One should therefore not underestimate the magnitude of the change required to be successful in valorising academic knowledge.

### Three main drivers for knowledge valorisation

Our research shows – in line with theory<sup>5</sup> – that universities are driven by different factors to actively engage in entrepreneurship. First, there is the potential financial gain. Licensing out technology or creation of spin-offs may result in substantial financial benefits related to royalties or equity value of newly generated companies. Second, universities have the opportunity to contribute to the economic development of the region in which the university is located. Finally, there is a societal benefit. Knowledge valorisation provides an opportunity to make society benefit from knowledge which is mainly publicly funded. The three drivers are the same for most universities, although the relative importance of each driver may vary.

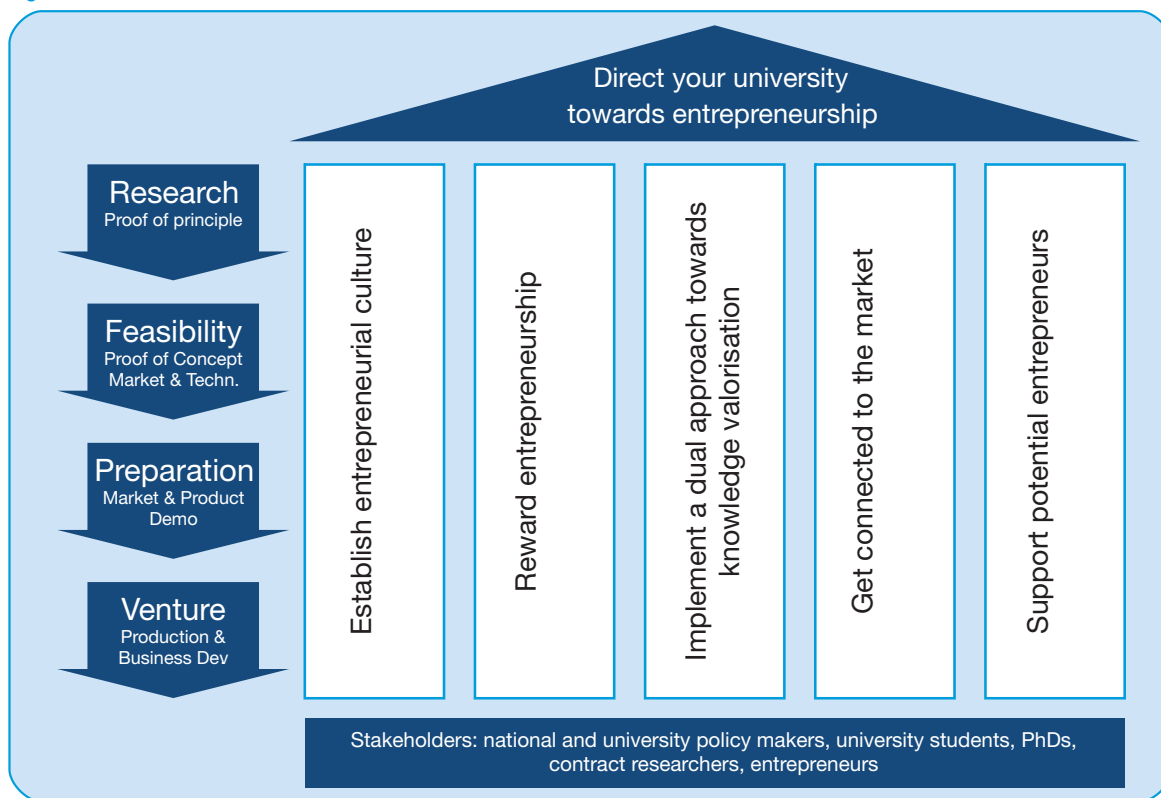
3.03 The universities that have taken part in this study recognize that developing knowledge valorisation activities is a long-term process, which needs to be embedded in the university's strategy. In policy documents and annual reports of these universities we have found several statements that acknowledge this belief. This conviction was again confirmed during our interviews. Apart from statements that show that universities have embedded the third pillar into their strategies, we found that they received (financial) commitment from the top level for the next years.

3.04 We found that a lot of good initiatives concerning the organisation of knowledge valorisation activities have already taking place. This is not surprising as the universities that participated were selected based on their reputation concerning spin-off generation. However, also these universities still (partially) tend to be in the phase of planning activities, rather than implementing and executing them. In order to maintain momentum and confidence as well as to enable success on the short to medium term, there is a clear need to put plans into action.

3.05 In order to direct the university towards entrepreneurship, certain actions need to be taken. We have clustered these actions within five main recommendations. Figure 3.1 provides an overview of the main conclusion and recommendations.

5 Tang, K., A. Vohora and R. Freeman (2004): Taking Research to Market – How to Build and Invest in Successful University Spinouts. London: Nestor House, p. 25

Figure 3.1: Conclusion and recommendations



3.06 Many of our recommendations address more than one stage in the knowledge valorisation process. Under the main recommendations we elaborate on the relevance of the subject, in what ways the recommendation can be put to practice and what the considerations are in doing so. In addition we have made illustrations with ‘examples of good practice’ we identified in our study.

## Establish an entrepreneurial culture

3.07 With the 'service to the community' having been added by law as a third pillar of the mission statement of universities, a new basic value has been introduced. This new value however still has to take shape through shared cultural norms and beliefs in order to get truly embedded in the academic community.



3.08 From a historical perspective, academic research is aimed to increase and enhance human knowledge paying little to no special attention to its practical application. Academics recognized only two ways of exploiting knowledge, the first one – via publications (books, articles or conferences) and the second one – via education thus providing students with opportunities to learn latest findings and discoveries. For a large part universities aim at protecting knowledge rather than sharing it until an invention or discovery is worth publishing. The academic culture, as a result, consists of values opposing the ones oriented on promotion of knowledge valorisation<sup>5</sup>.

3.09 Hence, the current university culture still consists of a set of cultural norms and beliefs that largely focuses at education and science. The university as a community needs to build new shared norms and beliefs that foster entrepreneurship. Moreover, (perceived) conflicts with ‘old’ values need to be addressed and solved.

3.10 Universities need to realize that the required change towards entrepreneurship is of a radical and fundamental nature that concerns the university as a whole. Therefore, it is essential to also change the organisational culture, which reflects the heart of an organisation (i.e. the university). Only a cultural change will provide a solid basis for other changes to succeed, such as changes in processes and structures.

3.11 When asked about how the universities create and support entrepreneurial culture, the respondents provided plenty of options. As a consequence of the central role of culture in the university, all the aspects that we discuss in this section will come back later on in other recommendations.

### Show strong commitment from the board creating a sense of urgency

3.12 Development and dissemination of a clear vision that answers the questions ‘why’ and ‘how’ the culture will be changed are essential. This is the main task of the board. It should be clear to the whole community that it is not a trend passing by but that knowledge valorisation is new core task that is here to stay. Moreover, that this new value will require the organisation to change. All universities in this study have adopted knowledge valorisation in their strategy in some way.

3.13 As a next step, management should take their stated strategic ambition further by implementing measures that stimulate an entrepreneurial culture. The board can commit itself financially and non-financially. Financial commitment can be shown e.g. by investment in high-profile professionals with experience in setting up businesses in general, as well as the ones with significant expertise in creating spin-offs from other universities in particular. By doing so, the entrepreneurial culture is imported from outside.

3.14 Hiring external professionals also means that the board needs to express non-financial commitment. These professionals need to be given a high degree of autonomy in order to be able to fully act as an entrepreneur. Another non-financial expression of commitment would be the investment of time. A board member could e.g. write columns in relevant media, participate at network events and assessment panels. The latter however incorporates a danger to conflict with the earlier mentioned need for autonomy by the professionals responsible for the university’s entrepreneurial activities.

5 Ndonzuau, F.N, F. Pirnay, B. Surlemont (2002): A stage model of academic spin-off creation. *Technovation*, vol. 22 (5): 281-289

## Cherish successful people and successes and let them act as role models and good practices

3.15 Role models are important carriers of organisational cultures. Entire books are published on how certain CEOs manage their organisations and how they make employees feel proud and committed to the organisation. Role models and the celebration of successes can also contribute to the entrepreneurial culture of the university.

3.16 During our interviews, we have heard several ideas varying from a booklet of successful spin-off companies and company kick-off parties to parking spaces assigned to professors and researchers that have successfully generated spin-offs. In marketing terminology this would be called 'creating rumour around the brand'. In this case, the brand is the university seen as an entrepreneurial community.

## Include entrepreneurial skills and knowledge into the curriculum

3.17 Another way to strengthen the entrepreneurial culture is to connect and partially integrate entrepreneurship with the two other pillars of academic activity: education and research. By including the other two pillars the entire university is reached. We found several examples of universities that incorporated entrepreneurial courses into the existing curriculum and created new entrepreneurial research chairs. In this way students are educated in entrepreneurship and further knowledge is acquired about valorisation processes by research. An example of good practice distinctive from others concerns multidisciplinary graduation at TU/e.

### Eindhoven University of Technology – Multidisciplinary graduation

The university has introduced the multidisciplinary graduation projects for writing the master thesis. Master students of different faculties have their own research project, but they are part of a larger project, often managed by a PhD student. Through this activity, master students learn to look beyond the boundaries of their own field of expertise, while a PhD student gains managerial experience.

3.18 Besides integrating entrepreneurship with the educational task, universities should also integrate entrepreneurship with the research task. The university needs to raise the awareness of entrepreneurship among researchers. They can do so by informing researchers about strategic objectives and targets, by keeping them close to the market e.g. through contract research, regular meetings with entrepreneurs and by stimulating them to come up with commercially exploitable ideas.

## Reward entrepreneurship

3.19 If you want people to do something, motivate them. Therefore, a set of financial and non-financial measures that stimulates people to engage in entrepreneurship is needed. We have found that universities are struggling with reward systems. Most universities do not have an explicit policy on reward systems and if there is a policy, it is generally thin and not yet tested in practice.



## Rewards create an incentive at the university level to engage in entrepreneurial activities

3.20 At the university level, there are no reward systems for developing entrepreneurial activities are known. The reward systems that do exist are project-based grants and incentives. This type of reward systems has the serious shortcoming that it does not provide a solid basis for continuation after the project period has ended. Moreover, for every project period a new plan has to be submitted with the risk that experienced people leave the team involved because of uncertainties.

3.21 There are many ways through which structural reward systems could be put in place either based on output indicators, such as the number of generated spin-offs or input indicators, such as the size of the research base. It is interesting to see that up till now for the 'old' academic tasks, universities do receive this type of funds, while for the new entrepreneurial tasks, they do not. Why this is (not yet) the case is unclear.

3.22 One explanation could be that entrepreneurship is believed to generate its own returns such that it could pay for investments in this area. Another explanation could be that educational and research tasks are funded through the ministry of Education, Culture and Science, while entrepreneurship would fit more within the ministry of Economic Affairs. Another practical hurdle with regard to output based reward systems is that there is no methodology available to measure performance consistently.

### The issue of measuring entrepreneurial performance

To be able to reward universities for their entrepreneurial activities it is necessary to measure these activities. Here a serious problem arises. Based on our study we can conclude that there are no clear or uniform definitions of entrepreneurial (output) variables (e.g. types of spin-offs, spin-off stages) and there is no agreement on how to measure entrepreneurial performance both input (entrepreneurial activities) and output (e.g. number of high tech spin-off companies). Therefore, it will be hard to benchmark universities or measure targets in order to effectively manage and reward universities on that basis.

## Rewards motivate inventors to consider licensing an invention or start a new venture

3.23 As mentioned before, we found that if scientists have the choice between starting a company and publishing in 'Nature', most of them will choose the latter. Unfortunately, these people are probably unaware of the possibility to do both. This of course needs to be pointed out by the university and effective patenting services need to be made available, however universities can do more to reward entrepreneurship at the individual level.

### Offer stocks in the spin off venture or a share of the licence fee

3.24 Depending on how the knowledge is valorised – by starting a new venture or by licensing the technology – the inventor may be rewarded by receiving part of the stocks of the new venture or a share in the profits of the license fee.

3.25 Most of the universities that were involved in this study did not have much experience with rewarding inventors. Within the 3TU network the three technical universities have developed arrangements that are quite similar to each other and basically come down to the following. One third of the net earnings is distributed to a patent fund, one third goes to the research institute or faculty and the inventor gets another one third. Systems for distributing stocks are still being developed although the aim is a similar 'one third arrangement'.

3.26 Other universities treat each case as unique and do not have ‘standardized’ reward procedures. Hence, for the start-up of a company or the sales of a license, each time negotiations take place between the inventor and the university.

#### The issue of envy

It takes a lot of effort to set up a company or license out a technology. This implies that the scientist/inventor has less time available for other tasks, such as coaching students or teaching. These tasks however do need to continue and probably need to be carried out by colleagues. As a result the pressure on colleagues will increase, though they will not be rewarded like the inventor. Maybe this will not be a serious problem yet, because it was the inventor that came up with the invention.

However, it gets more complicated when a scientist is on the point of a breakthrough, but is not there yet. The scientist– driven by the prospect of a major invention and big reward – will put as much time and effort as possible in the development of the idea. Again the colleagues will need to cover for that person and will even need to assist the inventor. Now they are indirectly cooperating with the invention itself. However, they will not be rewarded additionally for these efforts. This might result in envy and dissatisfaction once the inventor is rewarded.

#### Offer a turn back guarantee

3.27 To start a company the scientist takes a certain risk. From a safe environment with a fixed salary a person steps into an entire unknown and insecure world. All at once the scientist becomes an entrepreneur who is highly dependent on the success of the invention. The university can offer a turn back guarantee to mitigate this risk. A turn back guarantee will not directly motivate a person to start a new venture or license a technology, but at least an important barrier is withdrawn.

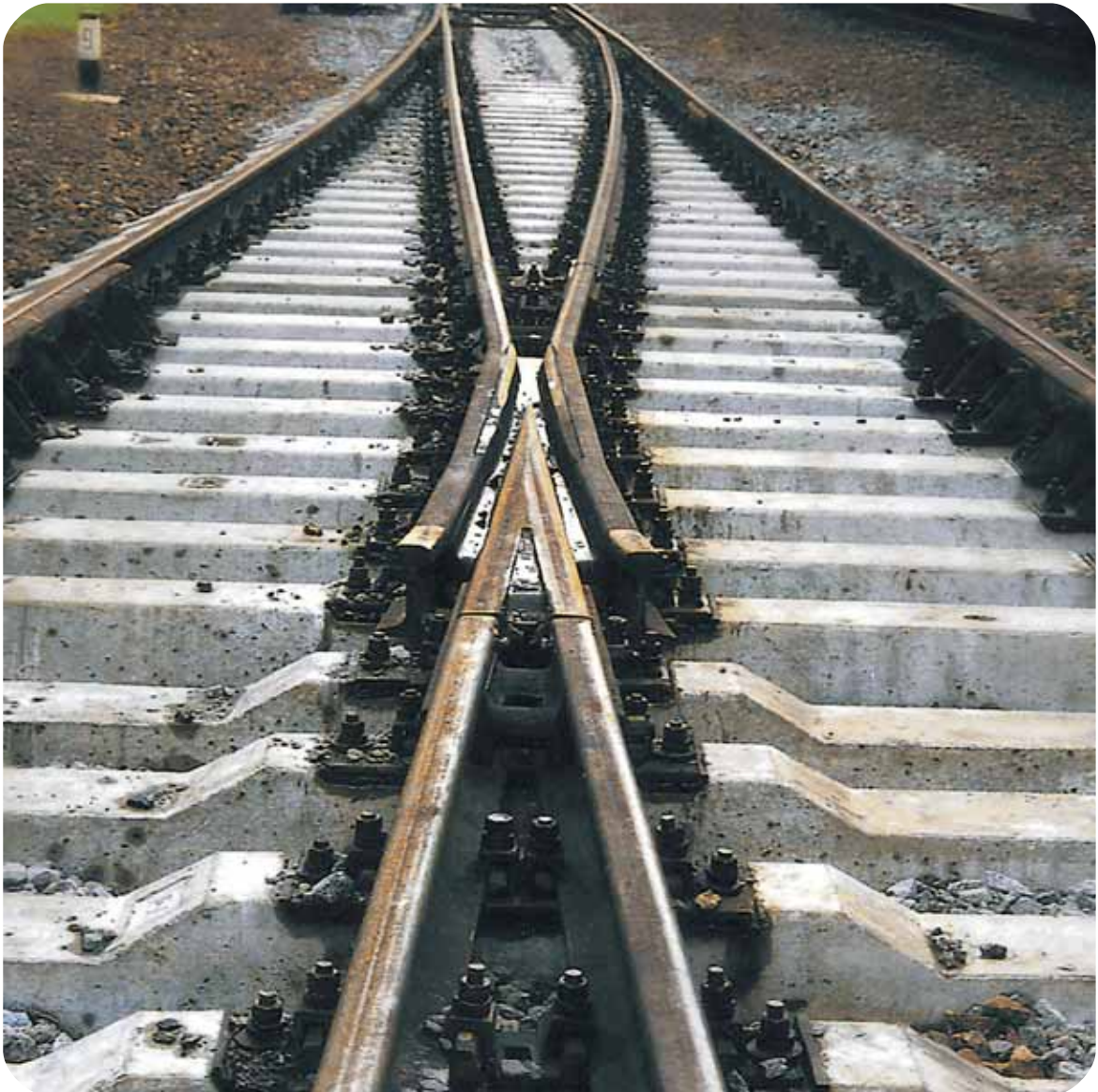
3.28 We have found several variants of turn back guarantees. Some universities guarantee a scientist to come back without any restrictions, while others provide the possibility for a limited period. Another option encountered is to only give a scientist the opportunity to come back if he/she does not take any shares in the spin-off company.

#### Other researchers may get inspired by rewarded colleagues

3.29 One of our interviewees said: “I would love to have two professors driving a Ferrari; this would make other people more aware of the possibilities.” This quote illustrates the positive effects expected when scientists are rewarded upon successfully bringing their knowledge to the market. There is however also a downside to this phenomenon. Again, jealousy amongst colleagues could grow, which would not benefit the atmosphere at work. Moreover, inventors could become greedy and demand for higher profit shares. This could be an argument in favour of an approach like the 3TUs, where all cases are treated similar in stead of starting negotiations for each individual case.

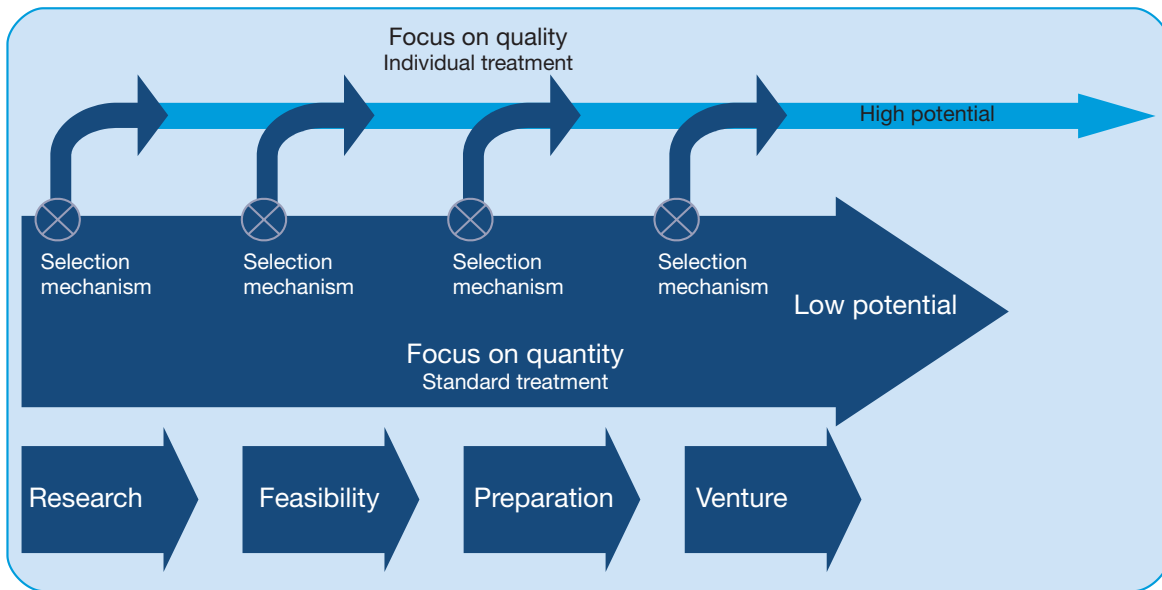
## Implement a dual approach towards knowledge valorisation

3.30 What is the best way, focusing on high potential initiatives or cherishing a wide range of initiatives that will prove their potential along the way? It makes sense to take a dual approach in this. When applying a mechanism focused on quality, a lot of attention and support can be given to initiatives with a high business growth potential. When applying a mechanism that focuses on quantity, a large pool of supported opportunities is created and the risk of missing out on an unidentified opportunity is low.



3.31 In our study, we have seen that either a focus on quality or quantity can both lead to success. Some universities clearly focus on quality, being very selective in what opportunities deserve attention and support. Other universities embrace a more organic approach, being focused on the creation of the right conditions (e.g. network, coaching, training, financial arrangements) to the benefit of (in principal) every initiative good or bad. However, a dual approach – a focus on both quality and quantity – could be even more beneficial. The figure below illustrates how this dual approach actually works.

Figure 3.2: Dual approach model



3.32 The model in the figure above shows that from a large pool of ideas a limited number of ideas are selected and treated as high potential. This selection can take place anytime during the knowledge valorisation process as long as the university has different selection mechanisms in place.

3.33 Only the University of Twente is now combining a clear distinctive approach that focuses both on quality and quantity. Being very successful in generating large numbers of small spin-offs, there was a need to grow more large business successes. A dual high and low selective approach is their answer to this issue.

**University Twente – Many small spin-off companies and a few large successes**

Although the University of Twente is recognized internationally to be ahead of other Dutch universities in terms of the number of generated spin-offs, the university faces the challenge of expanding these companies. The spin-off companies have a high survival rate (75% for companies under the TOP arrangement), but they remain relatively small.

At the same time, companies like MESA+ show incredible results and constantly demonstrate success in terms of growth and turnover. To illustrate, MESA+, with a staff of about 380 employees, is now one of the leading research centres in Europe in the field of nanotechnology.

Both outcomes are the result of two distinctive approaches: a low selective approach concerning the TOP arrangement that supports many initiatives and a high selective approach concerning MESA+, an initiative that was picked out and developed into what it is now.

## Implementing a dual approach by putting selection mechanisms in place

3.34 Universities that apply a dual approach need to have the same selection mechanisms as universities that focus on ideas of high quality. From the large pool of opportunities – developed as a result of the focus on quantity – ideas need to be selected that have the potential to grow into large companies with high profits. We have found several mechanisms that contribute to the selection of high potential ideas.

### Apply a skimming approach towards your patent base

3.35 Several universities have a large patent base. The business potential of these initiatives varies highly. By applying a high selective screening approach, patents with a high potential can be identified. At the same time it offers the opportunity to selectively reduce the patent base, getting rid of patents with low business potential that only cost money to maintain. Certainly when the patent base has not been actively screened before, a skimming strategy can be highly rewarding on the short term and can assist universities in boosting the knowledge valorisation process.

#### Erasmus MC – Skimming the patent base

The technology transfer office at Erasmus MC started off implementing a clear IP policy: every patent is owned by the university and should be reported to the TTO. The vast patent base was screened and the ones with a high potential were selected. Of this selection a very small number of initiatives have been developed business wise, but successfully. Now the patent base has been exploited more emphasis will be given to scouting for new ideas that have not been patented yet.

3.36 Obviously, it is important to have an up-to-date patent database in order to be able to apply a skimming strategy. For this purpose it is necessary to have a clear policy about intellectual property rights including the reporting of inventions, how rights to inventions are assigned and how protection of these rights is maintained through patents. By being selective, it can also be prevented that a large costly patent base is maintained of which the larger part does not really have economic potential.

### Scout for ideas with a good business perspective both inside-out and outside-in

3.37 Scouting for good ideas is a matter of preliminary match making between the science the university has to offer and market needs. In order to truly understand market needs universities need scouts coming from the private sector. Moreover, to increase understanding on the technical potential of scientific findings you need people with a scientific background. It seems hard – if not impossible – to fully combine both requirements in one person. Therefore, it is useful to appoint both internal and external scouts.

3.38 Internal scouts can be appointed at the faculties or research units. Preferably these are people that have a good overview of research output and an external perspective with time to fulfil their role on a part-time basis. Internal scouts are part or should at least have the commitment of the management team of the faculty or research centre. As they are part of the organisation they can effectively build on the entrepreneurial climate from within.

3.39 External scouts (on the payroll of the TTO or equivalent) have a strong connection with the market and from this background are able to judge the business potential of ideas. As they work together with internal scouts at the faculties they can spend more time on preliminary assessment of initiatives and coaching. WUR is an example of a university that is starting to involve external scouts from their SKE initiative and Food Valley.

## Use effective screening and assessment systems

3.40 Many universities have informal screening mechanisms and assess opportunities on a case-by-case basis by people from the TTO (or equivalent) with business experience. Although this may be a good way of assessing opportunities, more structural systems and tools could speed up this process and enable funnelling of larger quantities of ideas. A good example we encountered is the Business Challenge of Wageningen University which is an event in which a number of 10 business cases is selected from about 60 business ideas at the start.

### Wageningen University and Research Centre – Business Challenge

At Wageningen University and Research Centre the opportunity recognition process generally consists of five phases. First, a person with an idea is either found by scouts (internal/external) or made contact with business developers on their own initiative and contact business developers within their science groups. Second, business developer signs up forms and describes the idea. Here comes IP protection issue already. Approximately 60 ideas at this stage. Next, it's time for the Business Challenge, which results in about 10 business cases. These persons are employed for 1-2 days a week for 1.5 years to develop a business plan and finalize the business cases. The last step involves final presentation - assessment of market feasibility, IP situation, and personal evaluation. WUR aims at generating approximately 5 spin-offs per year.

### A step in high-selection mechanism: Business Challenge

The main assessment procedure is the Business Challenge which represents a 'pressure cooker' (high-pressure business game), which was initially introduced by Biopartner. The game is 1 day long and usually takes 12 hours. During the challenge, participants address market, benchmarking, technology and team-building. It allows judges (usually they are the scouts, external experts) to assess how entrepreneurial participants are, how they develop their product, how easily they can catch the information and apply the data obtained during that day. However, if there is an idea, sometimes (especially when time-to-market is extremely important), there is no need to wait for the Business Challenge. It is possible to proceed without it. Business Challenge is preliminary to the business plan. The procedure is formalized.

3.41 Another good practice concerning assessment of ideas is to involve external parties in this activity. We found several universities applying this approach. External parties could for example provide more insight in the market needs for the idea. Furthermore, in particular banks and venture capitalists can be very helpful in assessing economic feasibility and possibilities for funding. Our recommendation on 'Get connected to the market' further elaborates on the advantages of involvement of external parties.

### Implementing a dual approach by differentiating in support measures

3.42 To implement a dual approach for the recognition of opportunities it is necessary to treat the opportunities in line with their potential. It does not make sense to spend a lot of support on an idea with low economic potential nor is it a good idea to neglect opportunities which may have a bright future. However, as argued before, although being selective towards ideas makes you able to efficiently direct your efforts, room for mistakes and a playground that stimulates innovation and entrepreneurship is also of value.

3.43 In this section we only discuss two types of support mechanisms and show how a university can differentiate in approach recognizing the difference in quality of ideas. Other support mechanisms are discussed in detail in the section on 'Support potential entrepreneurs'.

### Create generic and specific platforms/networks to develop and discuss ideas

3.44 All universities in this study recognise the importance of having an internal/external network and TTO or equivalent that support academics in idea development and transforming ideas into clearly defined business opportunities. Most networks are of a generic nature. These generic networks are aimed at supporting entrepreneurship and the development of ideas in general (whether good or bad). In this way a large stream of business opportunities can be generated of variable quality.

3.45 Specific networks with a limited number of partners around a certain technology/business theme are more labour intensive. However, setting up these types of networks can assist in developing strategic relationships with (industrial) parties in the supply chain that you need in order to successfully make a market introduction in a certain area (e.g. co-developer, launching customer, assembler etc.). Generally the initiative for this type of networks lies with specific faculties or research centres.

### Provide different types of coaching and training to develop business ideas into business plans

3.46 With respect to business development support universities take a very different approach. Many TTOs (or equivalent) provide support to (in principal) every academic with an idea in order to assist them in developing it into a business plan. The coaching and training provided have a relative low intensity when you compare it with a high selective approach. The amount of support varies and is not formalized. Ideas are mainly treated on a case-by-case basis.

3.47 Although attention is spread across many initiatives the big advantage is that a large number of ideas are given a chance to grow. People get an opportunity to develop entrepreneurial skills. When the decision is made whether to start a business or not they may come to the conclusion that the business concept is no feasible, however, they have had a learning experience. In that sense, it can strongly contribute developing entrepreneurial skills and building an entrepreneurial culture.

3.48 For high potential initiatives more intensive support measures are appropriate that provide the initiators with more resources and expertise in order to be able to build a strong business case and venture team. The advantage is that in this way initiatives can be well developed and thought through before external capital is being raised. The reputation towards external financiers in that sense can be managed well. The WUR has experiences following this high selective route and indicate that is no problem to get capital out of the market once a strong business case is built.

## Get connected to the market

3.49 To bring knowledge to the market one needs to know that market. It is essential to know the market's needs, its functioning and the players involved in it. For this purpose universities are establishing contacts with the market by means of creating and participating in networks but also by means of recruiting external 'business experts'.



3.50 We recommend that universities strategically initiate and maintain their networks, relationships and enrolment of external experts to improve the performance of knowledge valorisation and the generation of spin-offs in particular. This asks for a periodic analysis of the university's needs and the performance of networks and relationships.

### Recruiting entrepreneurial experts brings in entrepreneurial knowledge and skills

3.51 Selling a technology is different from designing and developing it. People need to know how to start and run a business, they need to communicate with potential buyers, they need to manage employees etc. In both theory and practise we identified a tension between training and preparing entrepreneurial academics and attracting academic entrepreneurs. The 'ideal researcher' and 'ideal entrepreneur' profiles represent different sets of required capabilities.

3.52 Scientists that want to sell their technologies have to develop entrepreneurial capabilities. Practice, education and training will help scientists to develop these capabilities. Some people however argue that a good scientist will never become a good entrepreneur and vice versa. Therefore, some universities hire external people for entrepreneurial positions.

### Hire an experienced entrepreneur to manage the valorisation activities

3.53 Several universities have hired experienced entrepreneurs to manage their knowledge valorisation activities. These entrepreneurs are usually hired for key positions in the organisations within a university that are responsible for knowledge valorisation.

3.54 An essential factor in working with experienced people on this kind of positions is the level of autonomy they have. Entrepreneurs need to have the freedom to act and to make decisions rather than being strongly managed by the board, also when it concerns finances. This may be in conflict with the university culture, but it is exactly why they are hired. Also to be a serious party towards e.g. VC's and strategic partners this autonomy is a necessity. This implicates that high commitment of the board towards senior managers engaged in the valorisation process is required.

3.55 Another characteristic of experienced entrepreneurs is that they can be quite expensive, especially in relation to the salaries paid in the public sector. This could result in some practical problems if salary demands exceed standard salary scales of the university. This requires some creativity by the university by e.g. contracting the person's company rather than putting him on the pay-roll or the board should be willing to make a rule of exception for market oriented personnel.

### Hire experienced entrepreneurs to scout and screen opportunities

3.56 Earlier in this chapter we have discussed active scouting and screening of opportunities. It was observed that universities actively involve external partners in scouting and screening activities. Although the ideas are mostly searched within a university, the persons who look for these ideas are the ones with experience in the field and deep market knowledge, i.e. experienced entrepreneurs. Several universities hire these people on contractual basis and use their expertise when finding and assessing potential business opportunities.

3.57 For example, UT hires former entrepreneurs for the position of business developers; WUR intends to involve external scouts from SKE and Food Valley. TU/e has hired scouts that are responsible for top-down scouting activities and for setting up bottom-up activities through a network of business developers at the research institutes. Other universities create the atmosphere of openness towards external communication and encourage the people from academic community to engage in networking relationships.

### Hire experienced entrepreneurs to manage spin-offs

3.58 Universities have different opinions about the presence of entrepreneurial skills among scientists. Having an idea and developing it is one thing, but actually bringing the idea to the market successfully managing the new venture is another. Obviously, universities that are convinced that scientists cannot become entrepreneurs have a different approach towards spin-off generation than universities that think the contrary.

3.59 From the universities we have investigated, TU/e is the only one that for the most part involves entrepreneurs from the internal academic community itself. WUR and UT first search for people available internally and assess the entrepreneurial profile of the researcher, and then in case of necessity attract people from outside. EMC, LU – and TU Delft to a lower extent – prefer to attract external entrepreneurs with market credibility.

### Hire / appoint a professor in entrepreneurship

3.60 All the universities that participated in this study have integrated entrepreneurship in their curricula. This is one way to strengthen the entrepreneurial culture within the university. It does however require the university to start creating and developing knowledge on the subject. We found that most universities already have appointed or are currently hiring a professor in entrepreneurship – or in a related field of expertise. Such a person not only brings in new knowledge but also a new network of experts in entrepreneurship (academia and/or public and private sector parties).

### Networking provides the university with knowledge about the market

3.61 A strong connection with the market through active participation in knowledge intensive entrepreneurial networks is important for all the stages of spin-off generation process. From an historical perspective, universities have mainly had internal clients rather than external clients. These two types of clients have different demands and quality requirements with regard to the knowledge generated.

3.62 For a university, a network encompasses a set of relationships with various organizations, including small and large businesses, other public research institutes, authorities, i.e. relationships that are connected with each other and create a wider network structure. From this perspective, universities can no longer be considered as autonomous, self-fulfilling units, but as an integrated element of the system aimed at bringing knowledge to the market. We have found different essential parties to be included within networks.

3.63 Most of the examined universities have established strong ties between the university and industry, and consider themselves to be active in networking. Later in this section we will provide some examples of various networking activities we have found.

### Establish a network that includes market parties

3.64 It almost goes without saying that to get to know market parties it is important to include market parties in the network. TU/e is a good example of a university that has strong networks with industrial parties both small and large directed towards knowledge valorisation. For instance, via Incubator 3+ it has recently closed an agreement with Philips to participate in a programme called TechnoSpurt with the aim to support 300 start-ups<sup>5</sup>. Moreover, in 2005 TU/e started cooperation with twelve small and medium sized companies by means of a joint R&D facility called DevLab.

3.65 Market parties can also act as launching customers. This implies that a future customer agrees to buy a certain technology still to be developed further when it complies with certain specifications important for application. The scientist knows that if he or she succeeds the technology will be sold. This approach has several advantages for all parties. The scientist learns more about the market and how to apply scientific knowledge more practically and may be able to get a part of the development cost funded by the future customer. The market party in return has more room to bargain a good price for the technology that is entirely in line with its needs and moreover it may negotiate the right of first use against certain conditions.

3.66 Another type of network including market parties are initiatives where start-up companies group themselves in order to share experiences related to starting up a company. A nice example of this is the Technology Circle Twente.

#### University of Twente – Entrepreneurial networks

In addition to larger industrial parties we consider it good practice to establish a network amongst the university's spin-off companies. The UT maintains strong connection with high-tech start-up companies. Technology Circle Twente (TKT) represents an entrepreneurial network of knowledge-base enterprises, in particular the companies that emerged from TOP arrangement. The network stimulates the cooperation between new members and brings them into contact with potential customers. The network is used for information exchange, as well as for joint presentation of members to the market.

### Establish a network that includes specific expert parties

3.67 Many specific expert parties exist that can be valuable network partners. Most of these parties have national networks of their own, by which the university expands its predominantly regional network. These parties could e.g. include Syntens or the Chamber of Commerce. Also other universities could participate in the network.

3.68 Currently, active cooperation takes place between the three technical universities, i.e. the 3TU cooperation. In addition the TU/e, Nijmegen University and WUR are cooperating in the NEW Triangle initiative. Cooperation within this network has already resulted in similar strategies towards reward systems, which proves that these networks effectively facilitate the transfer of experiences and ideas.

<sup>5</sup> Incubator 3+ is a collaboration between TU/e, NV BOM, NV REDE, Fontys Higher Education, Philips, TNO, Rabobank and Syntens to assist in the start-up of companies in the region.

## Market connection provides the university with potential investors

3.69 Potential investors are essential for the start-up of new companies. We found that for some part the university can provide funding for the stages up to and including the incorporation of a spin-off. In addition, the university usually also provides services and facilities at low or no costs. However, developing and launching new high technology products requires a level of funding that often exceeds what universities can offer. External funding in that case is essential.

3.70 The pre-seed stage commonly represents a gap in the support from external parties. The stage implies protection of IP, generating proof of concept and academic prototyping. It is the time when first significant investments are needed, though risks and uncertainties are still too high in order to look for financial support from venture capitalist. Thus universities have to provide the support measures themselves and for that they create internal funds. Costs related to IP protection usually are covered from a patent fund. Loans are often provided for covering other costs. These mechanisms were observed in UT, TU/e, WUR, and EMC.

3.71 The seed stage implies initial customer visits and venture capitalist visits, and thus requires strong connection with the market. Participation in networks allows to find the first customers, as well as the ones willing to invest in the development of a newly generated company. Academic firms struggle to establish close links with customers and suppliers after their spinout. Network collaboration not only enables a spin-off to find necessary partners and clients, but also enables to bring a product to the market faster and to cover larger regions.

3.72 An interesting issue is when to involve potential investors. Some universities only involve them when the business plan is finished and when investments become necessary. Other universities, like TU/e involve banks and venture capitalists earlier in the process to learn from the experience of these parties. Banks and venture capitalists usually have a broad and extensive experience with investing in new ventures, so why not use this knowledge? In the next section, 'Support potential entrepreneurs' we further elaborate on funding issues.

## Support potential entrepreneurs

3.73 Spin-off companies do not just emerge by an invisible hand. Therefore universities need to develop specific support measures to enable the generation of spin-offs. It is essential that these supporting activities do not only represent financial support, but also include e.g. consulting, provision of facilities, business guidance that enable entrepreneurs to overcome non-financial barriers.



## Special funding is required to finance essential steps in the valorisation process

3.74 Universities in general agree that there is a lack of funding to finance the different steps from idea up to the moment of spin-off. Other studies also report that stimulated by the need for equity funding for proof of market and technology, spin-offs are driven towards incorporation in a too premature stage.

3.75 We found that universities are increasingly trying to build their own funds. In general, three types of funds are helpful to generate spin-off companies.

1. **Patent fund:** When the market and technological feasibility have been proven the decision has to be made to proceed or stop. In case of a 'go-decision', intellectual property needs to be protected. Many universities have a patent fund or similar arrangement that can foresee in funding for this essential step.
2. **Pre-seed fund:** A characteristic of high-tech spin-off companies is that they tend to be capital intensive in the phase that the technological proof of concept needs to be delivered. This phase usually is still too risky for venture capitalists to invest, so the potential entrepreneur is almost entirely dependent on the universities' funds. Although some initiatives manage to get a contribution by a cash grant like the STW valorisation there is a clear need for pre-seed funds established by the university.
3. **Seed fund:** Seed funds become necessary when the proof of concept is finalised and the spin-off is ready for business. Usually, at this stage private financial backers are willing to invest as risks have significantly decreased. Therefore, in general it is not necessary for the university to participate in these funds as the market will jump into this finance gap.

3.76 Universities focussing on high potential opportunities state that if a good mature business proposition can be presented for which proof of market and technological feasibility has been established there is no problem whatsoever in getting money out of the market place. This does of course require the university itself to cope with significant financing of both technological and commercial development (prototypes and business plans).

### Wageningen University and Research Centre – Full story for the market

'Business cases and proof of concept are paid by WBG [Wageningen Business Generator]. Usually the University stops providing financial support as soon as a spin-off is on the market. WUR provides the support till A Round including, inviting the investors to step in B Round only. This makes the offer very attractive because of the reduced risk profile. Thus we accompany techno starters till the latter stages and together with them develop a full story for the market. That is why we do not have any problems with getting money from investors. It's very easy for us.'

## Venture teams of limited size require support in specific areas where capacity/expertise is lacking

3.77 If by vestment of the new venture the perfect venture team has been assembled with plenty capacity and all expertise aboard there is no reason for support. However, the reality is often very different: to have this perfect venture team, venture capital is required and to get venture capital the VC wants to see the perfect venture team. To overcome this prisoner's dilemma some 'pampering' is required in the initial stages of a new venture. However, also in the preparation stage during which the initial venture team is being built up, support can be very effective.

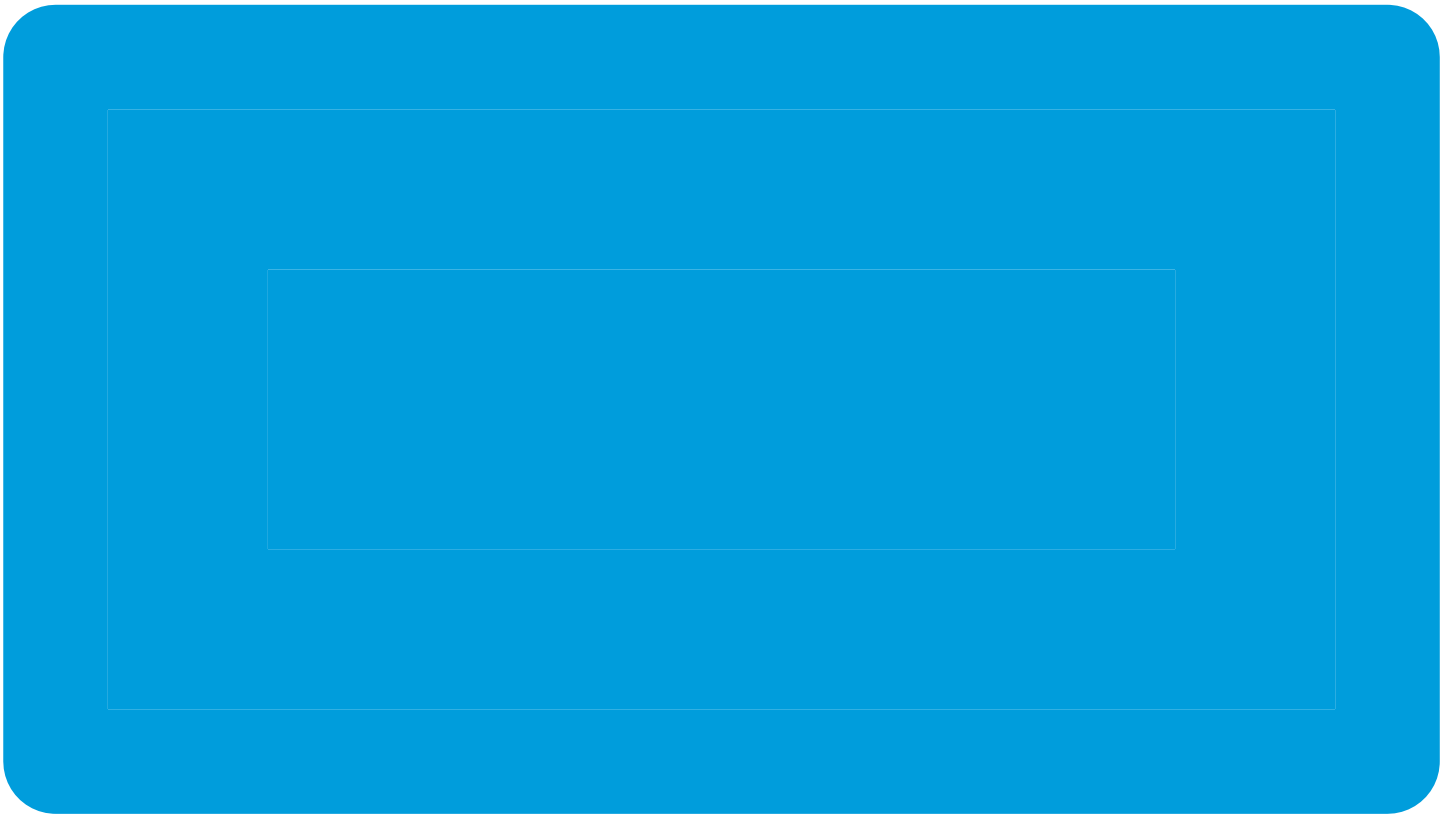
### Training, coaching and consulting services

3.78 Venture team members can get training in areas where they need to strengthen skills and knowledge. Many universities offer free or low-cost courses that teach in subjects like e.g. business plan writing, protection of IP and financial management. In addition coaching is offered by coaches and scouts of the TTOs (or equivalents). As these trainings for the larger part concern skills and knowledge of a generic nature, universities may benefit from the cooperation in further developing the training curriculum. To a certain extent this already is the case.

3.79 There is however also a large pool of 'free advise' and coaching potential that can be operationalized through a network. TU/e is good example of this. Within their Incubator 3+ network Eindhoven has relations within among others legal, finance, specific high-tech markets that can be consulted on a regular basis. Ideas for new ventures are discussed during regular meetings. For each idea that is expected to have potential a coach from the network will be appointed. Moreover, scientists will have access to all the partners in the network to improve their ideas and business plans.

### Providing access to university facilities

3.80 All universities in this study supply in a formal or informal way support by providing access to facilities like laboratory space, technical equipment and office facilities. Certainly for high-tech spin-offs technical facilities can be very important as it often involves unique and very expensive equipment for which capital is lacking.



## 4 Keep going in the right direction

4.01 The main objective of this study is to encourage universities to learn from each other with regard to their approaches towards spin-off generation. In this report we captured experiences and intentions of different universities that can provide a valuable contribution to the improvement of spin-off generation. However, a report is just a first step. To enhance impact it is essential that people in the field discuss the issues and recommendations provided and determine in what way these could be applied in their own organisation.

4.02 We encourage universities themselves to take the report one step further by discussing it internally and by using it to assist in the further development of knowledge valorisation activities. Moreover, we are of the opinion that universities need to pursue our objective to learn from each other structurally. We found that a lot of knowledge on spin-off generation is available at universities and that each university has its own unique approaches. It would be a shame if knowledge would remain within certain universities resulting in 'reinvention of the wheel' by others. We therefore encourage collaboration networks like the 3TU-network and the NEW Triangle initiative and would like to stress that also foreign universities could be included in these kind of networks.

4.03 Although this report is mainly intended for people within the academic community, we did discover certain issues that would need to be addressed by policy makers on the national level. Firstly, there is a lack of studies investigating the progress in valorisation processes at universities. As universities are working hard to get their spin-off activities on track, substantial changes and new insights will materialize in a limited period of time. It is therefore our conviction that a report like this, by which universities can learn from each other and bring their activities to a higher level, has to appear on a regular basis. We however do recommend a more in-depth study and coverage of all universities, ideally also including research and higher educational institutes.

4.04 Secondly, during this study we faced a lack of common understanding on the subject. Key terms, such as spin-off, spin-off generation process and knowledge valorisation, are defined in many different ways and there is no methodology in measuring performance consistently. As a consequence it is difficult to objectively determine the overall performance on knowledge valorisation and spin-off generation of Dutch universities and their mutual differences. In addition, the availability of data on performance is rather limited. Some information on knowledge valorisation activities can be found in annual reports of universities, but the type of information and the level of detail differ largely across the different universities.

4.05 Finally, we found that there are no reward systems for universities that excel in their knowledge valorisation or spin-off generation activities. Although to a certain extent universities are intrinsically motivated, they cannot do without structural financial resources. As argued earlier in this report the start-up of in particular high-tech companies generally requires a significant investment of pre-seed capital. This type of capital is hard to retrieve from the market and thus needs to be provided by the university. Financial rewards for universities based on performance regarding knowledge valorisation could bridge this financial gap and stimulate the university to improve performance at the same time. Reward systems do however require the development of clear indicators, the execution of periodic measurements and performance reporting.

4.06 In sum, we are convinced of the added value of this pragmatic report, but only as a first step. We encourage both people within universities and policy makers to use the report as a starting point to boost the spin-off generation process of Dutch universities!

# Appendices

# Appendix 1 – Literature and web links

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## Web links

- <http://www.erasmusmc.nl/content/englishindex.htm> Core activities, EMC
- <http://www.utwente.nl/nikos/> Dutch Institute for Knowledge Intensive Entrepreneurship, UT
- <http://www.wbg.wur.nl/> Wageningen Business Generator, WUR
- <http://w3.tue.nl/en/doelgroepen/company/> Knowledge exploitation, TU/e
- [http://w3.tue.nl/en/the\\_university/il/](http://w3.tue.nl/en/the_university/il/) Innovation Lab, TU/e
- [http://w3.tue.nl/en/the\\_university/tue\\_holding\\_bv/](http://w3.tue.nl/en/the_university/tue_holding_bv/) Holding, TU/e
- <http://www.tudelft.nl/> Contract research and patents, TU Delft
- <http://research.leidenuniv.nl/index.php3?m=&c=145> Knowledge transfer, LU
- <http://www.3tu.nl/nl/> 3TU web site
- <http://www.technopartner.nl/technopartner/menu/pionierssupport/ske> SKE program, TechnoPartner
- <http://www.minez.nl/> Ministry of Economic Affairs
- <http://www.minocw.nl/> Ministry of Education, Culture and Science
- <http://www.kvk.nl/> Dutch Chamber of Commerce
- [http://europa.eu/pol/rd/index\\_en.htm](http://europa.eu/pol/rd/index_en.htm) Research and Innovation, Activities of the European Union
- [http://ec.europa.eu/research/index\\_en.cfm](http://ec.europa.eu/research/index_en.cfm) Research, Development, Technology and Innovation, European Commission
- <http://www.businesstown.com/entrepreneur/article1.asp>

## Appendix 2 – List of interviewees

The content of this report is mainly based on the input of our interviewees. We largely relied on the willingness to cooperate and the openness of our conversation partners. We therefore want to thank the following persons for giving us ‘a glimpse behind the scenes’ of the spin-off generation process in their university:

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## Colophon

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