Valorization of knowledge

The desirability and financing of spin-offs at Maastricht University

Action Learning Project
Steep Face Program 2014-2015

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Management summary

Without proper information on the do's and don'ts, patenting and licensing can have a negative effect on the free flow of academic information, e.g. by delaying publications. However, without the protection offered by a patent, private undertakings may not be willing to make the initial investment to bring a university innovation to the market. This report aims to provide insight into the possible and preferable ways of technology transfer, by exploring the pros and cons of both licensing and the creation of spin-offs.

Licensing intellectual property to existing undertakings will often be easier for universities than the creation of a spin-off, but certain inventions will not be sufficiently market ready, which makes it difficult to find investors who are interested in becoming licensees. The creation of a spin-off may then be the only way to bring the knowledge to the market. It therefore seems there are no one-size-fits-all solutions to the question which strategy is best.

Based on a literature review and interviews with stakeholders, the following recommendations with regard to knowledge/technology transfer are presented:

- Communicate about procedures, possibilities and risks to staff and students in a transparent way;
- Implement a careful case by case approach when deciding whether to patent and/or to create a spin-off, by introducing a well-equipped technology transfer office;
  - In the case of licensing, focus on mature and multi-purpose technology, require sufficient and affordable dissemination, and make non-exclusive licenses the default;
  - In the case of creating spin-offs, start with a virtual one, create an investment fund with external parties, and organize events for potential investors;
- Reward and facilitate entrepreneurial researchers;
- Facilitate student entrepreneurs by increasing flexibility of their study paths.
Foreword

This report is written in the context of an action learning project (ALP) within Steep Face, a leadership development program for Maastricht University staff.

At first the project group struggled with the assignment. The main reason for this was the specific financial background needed to formulate policy recommendations for UM on how UM can stimulate spin-offs through investment and financing policies. After the first interim presentation to stakeholders and fellow Steep Face participants, the project group, in consultation with the project sponsor, decided to broaden the scope of the assignment. As a result this report also discusses the desirability of valorization and possible ways to stimulate valorization from the perspectives of different stakeholders.

With this report to the Executive Board of the UM we aim to provide some new insights on valorization that can enrich the current discussion on how to integrate valorization in the day to day business of the UM.
Part one: The place of spin-offs in the university

Introduction
The licensing of patented research products and the financing of spin-off companies bring academic inventions to the market and, if everything goes well, generates revenue for the university. Indeed, technology transfer is perhaps the most persuasive form of knowledge transfer to society, and an important task of universities.

The transfer of knowledge is the third core task of Dutch universities. It has been described as such in the Wet op het Hoger Onderwijs (article 1.3 clause 1) since 2005. According to Dutch law, knowledge transfer should take place within the academic community, but also to the rest of society. As such ‘valorization’ can be defined as ‘The process of making knowledge gained from scientific education and research available or useful for economic or societal utilization, or translating it to competing products, services, processes and new entrepreneurship’ (VSNU, 2013). Valorization in this definition applies to both ‘knowledge dissemination’ and ‘knowledge utilization’. In the Strategic Program 2012-2016 of Maastricht University, it is mentioned that the UM will ‘further develop major initiatives together with [its] partners’, ‘sustain or grow the number of spin-off companies’ and ‘develop a view on societal valorization and accompanying policies’. According to the strategic program, valorization will be given a boost ‘not only to help the university reduce its dependence on declining government funding’, but also to address ‘grand societal challenges’ and to ‘expand into new markets’.

In the literature, 11 forms of valorization have been distinguished (see Bongers et al., 2003), ranging from dealing with intellectual property to entrepreneurship activities, to participation in professional networks. In the current report, we will focus on licensing of patented technologies and creating university spin-offs.

Valorization at Maastricht University
The South Limburg Valorization Program provides for the need to broaden, deepen, renew, and accelerate the Limburg knowledge economy: the program has united Maastricht University (UM), the Maastricht University Medical Centre (MUMC), Zuyd Hogeschool, Liof, Brightlands Chemelot Campus and Brightlands Maastricht Health Campus into a consortium. The partners of this consortium will invest €12.5 million between 2013-2018, in the form of start-up loans, patents, feasibility studies and to finance current and new personnel.

The Maastricht Valorization Center (MVC) provides support to researchers, students, and businesses in promoting entrepreneurship, valorization of knowledge, and making high-level knowledge, skills, and talent accessible. Among others, the MVC encompasses the UM Holding and the Centre for
Entrepreneurship. Over the past 26 years, UM and MUMC have (co)created as well as (co)financed about 60 companies, which together have generated around €18 million profit.

Maastricht University has developed its valorization activities over the course of the last 10 years. Numerous initiatives have been developed, within the UM and in cooperation with other partners, for example AzM, the province of Limburg, and DSM. The 'Hoofdlijnen Akkoord' (2012) states that all Dutch universities should have developed a professionally designed and staffed valorization infrastructure in 2015. The current infrastructure for valorization of research at Maastricht University is quite complex, and responsibilities and tasks are not always clearly defined. To create a more transparent organization, including a one-stop-shop for researchers, a redesign of the infrastructure for valorization (both internal and external) has been proposed in the 'Valorisatienota Maastricht University' (2015). The proposal is to combine the internal valorization activities and corresponding support in one so-called Knowledge Transfer Office Maastricht (KTO-M), which will combine and connect the current activities on entrepreneurship, knowledge cooperation, technology transfer, and knowledge dissemination, as well as the corresponding support offices. The chair of the KTO-M will be responsible for all activities and reports directly to the Executive Board.

Is it a task of universities to commercialize knowledge?
The generation and sharing of knowledge has always been the core business of universities. The practice of science is all about sharing knowledge by reading, elaborating on and referring to knowledge generated and shared by the rest of the academic community. Whether the growing practice of patenting, licensing, and the creation of spin-offs is the best way of transferring knowledge however, is a topic of debate. In the scientific literature on technology transfer, the following three questions arise:

1. How does patenting relate to the academic culture of a free flow of knowledge and freedom of research?
2. Is it ethical to make money with publicly funded research?
3. Should universities invest in high-risk start-ups?

Free academic knowledge
The first question is how patenting relates to the academic culture of a free flow of knowledge and freedom of research. Several authors in the field suggest that patenting can have negative effects on the sharing of research results among academics, because they are encouraged to delay publication and presentation of research findings until a patent application has been filed (Sterckx, 2011). Even worse effects may occur by the patenting of the products of upstream research, i.e. fundamental or basic research that leads to the discovery of techniques useful in later stage research (Heller and Eisenberg 1998; Eisenberg 2001; Rai 1999; Nelson 2001). It has been argued that if research tools are
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patented early in the pipeline, it becomes difficult to do downstream research. In an academic culture that is dominated by patenting, universities increasingly run the risk being sued for patent infringement. The value of this argument depends, however, on the legal system. Many legal systems, and also the Dutch legal system, provide for a research exception, according patented technologies may be used for research purposes without a need for a license.

Some researchers suggest that current university policies on patenting and licensing may affect the direction of academic research within all domains of science (Geuna & Nesta, 2003; Powell & Owen-Smith, 2002), increasingly shifting focus from fundamental to marketable –applied– areas of research. A shift in academic research may also take place as a result of an increased emphasis on commercial or entrepreneurial competencies in procedures for the hiring of academic staff (Geiger & Sa, 2008).

Earning money with publicly funded research
The second question is whether it is ethical to commercialize publicly funded research. There is a risk of double taxation: Taxpayers often fund (part of) the initial research activities, but additionally, tax money is used to cover the cost of licensing payments, i.e. the prices of patented products and processes (Geiger & Sa, 2008).

Given the maximum effort universities currently put into safeguarding public access to research findings that are publicly funded - as is reflected in the tough negotiations with publisher Elsevier-, it seems strange that the same general public should be responsible for financing technical innovations created by that research.

Invest in high-risk start-ups
Related to the second issue is the question whether investing in high-risk start-ups is ‘gambling’ with taxpayers’ money. Dutch government demands that universities spend at least 2.5% of their budget on knowledge transfer in the broadest sense. However, investments should never endanger the first two key objectives of universities: education and research. Therefore government funding should not, or to a relatively small degree, be used to invest in high-risk start-ups. In the case of the UM holding, the investments in start-ups are not taken out of general funds.

Is patenting the way to go?
The literature suggests that patenting is not the most effective way of transferring knowledge to the market. Indeed, research shows (see e.g. Sterckx, 2011) that only in the biomedical fields patenting plays a significant role. And even in those fields the licensing of patents is not the most important way of knowledge transfer, whereas research publications and conferences are.

Generating profit is often taken as the main indicator of success in licensing of university inventions to industry, especially by the managers that are directly
involved in the investments. However, for most universities, patenting and licensing activities are unprofitable. If there is any profit, the profit is generated by a very small number of very successful inventions, mainly in the biomedical field (e.g. Sterckx, 2011).

Maastricht University is no exception. The UM Holding in itself is generating profit. However, if one takes into the equation the financial costs – within the whole of Maastricht University - involved before patents can be licensed, technology transfer creates loss instead of profit. The profit generated by licenses and spin-offs currently do not compensate for the costs made at the Maastricht Valorization Centre, BioMedbooster B.V. and the holdings (Bollen & Hoenjet, 2015). Rather, contract research and contract education are the most important way of generating extra profit at Maastricht University. Other valorization initiatives, such as the MKB-Portal, Science Service Factory, and the Maastricht Centre for Entrepreneurship, are on or around the breakeven point.

Creating start-ups versus licensing to existing companies

If universities decide to patent research products, broadly speaking there are two options: licensing to existing companies, or creating a spin-off company. At first sight, licensing to an existing company seems to be the easy way out: the university concludes a contract with a licensee and it collects royalties. There is no need for risky investments, and production and marketing of goods as well as all management related issues are left with firms who have experience with these issues.

However, licensing to an existing company also has a number of drawbacks. First, when the technology is still in an early stage of development, you may not find licensees, since established firms may not understand the technology and/or its potential, they may consider the technology not market-ready, or unfeasible in terms of leading to concrete products or services, and they may be uncertain about the market - i.e. they might consider it a high-risk investment (Swamidass, 2013).

A second drawback of licensing is that intellectual property rights will inevitably expire. After a certain period royalties will stop, and the university will no longer receive income from the license. By contrast, when the university has transferred the intellectual property rights to a firm in return for shares, they will retain part of the company (Swamidass, 2013).

Thus, university spin-offs may be necessary to get early-stage technologies to the market, to bridge the gap between an early stage technology and a marketable product. Licensing may be the best solution when the technology has already reached a developed stage, and may be of interest to various fields. On the other hand, although investing in a spin-off company includes taking financial risks, the benefits are that the university will remain shareholder and that employment in the region is created.
Different ways of financing spin-offs

Once a university has decided to create a spin-off, what are the financing options? Firstly, the University itself can invest in the start-up, or provide a loan to the newly formed company. However, there is debate whether it is ethical to use university money for starting up businesses.

Secondly, the start-up can try to receive a loan from a bank (Wright et al., 2006). This is the most common way of financing small start-ups by individuals, but it is almost never used by university spin-offs (Wright et al., 2006). Especially since the most recent financial crisis, banks generally consider the risk of investing in academic spin-offs too high. Sometimes governments provide special types of loans, which do not need to be refunded if the business does not become profitable (e.g. Pre-Seed and Proof-of-Concept funds, see also below).

Thirdly, there is the possibility of finding investors. This is the most preferred option. As with licensing, the technology will generally have to have reached a certain stage of maturity before it becomes attractive to external investors (see e.g. Wright et al., 2006). Generally there are two types of investors who invest in the early stages of the startup of a business, so-called business angels and venture capital firms. Venture capital (VC) is financial capital provided to early-stage, high-potential, start-up companies, and initial investments are often around € 500,000. The venture capital fund earns money by owning equity in the companies it invests in, which usually have a novel technology or business model in high technology industries, such as biotechnology and IT. An Angel investor or business angel is an affluent individual who provides capital for a business start-up, usually in exchange for convertible debt or ownership equity. A small but increasing number of angel investors organize themselves into angel groups or angel networks to share research and pool their investment capital, as well as to provide advice to their portfolio companies.

In the Netherlands, the government issued the SKE arrangements (Subsidieprogramma KennisExploitatie) which enabled universities to provide pre-seed and proof-of-concept loans to start-up companies. Under the South Limburg Valorization Program, more than €17 million will be invested between 2013 and 2018: €1.3 is made available for the Pre-Seed Fund, and €1.7 million for the Proof of Concept Fund.

The Pre-Seed Fund offers loans worth up to €100,000 at an interest rate of 6%, of which € 50,000 is provided by Maastricht University/AzM. They provide the starter with the capital to make an initial investment in the company: to draw up a business plan, test the market, develop the initial product, and organize financing. If the initial investment leads to the setup of a company, part of the loan can be converted to shares. In other cases – for example, if no investor can be found – the loan may be wholly or partially written off.
The Proof of Concept Fund offers loans to finance technical feasibility studies, to test whether the idea or product meets basic technical and scientific requirements. The loans – worth up to €250,000 per feasibility study at an interest rate of 6% – are granted to starters, SME entrepreneurs or social enterprises. To be eligible for such a loan, the project must involve the valorization of knowledge and ideas from knowledge. The loans are valid for a period of two years after issue, and may be converted to shares.

**Best practice: Research and development at KU Leuven**
Considered a ‘best practice’ case in Europe, Leuven Research & Development (LRD) is the tech transfer office (TTO) of the Katholieke Universiteit (KU) Leuven. Founded in 1972, it is a separate entity within the university and aims to promote and support the transfer of knowledge and technology between university and industry and society. Although it has no specified technological focus, it tends to focus on IT and Biomedical Ventures, due to the strength of the KU Leuven in these areas. A multidisciplinary team of experts helps researchers with the valorization of their research results. LRD offers professional legal, technical and business-related advice. Its core activities consist of: offering professional advice on innovation advice & technology brokerage; intellectual property rights management; creation of spin-off companies; promoting entrepreneurship and innovation by stimulating network activities; and regional development.

LRD has currently reached a turnover around €180 million, and has created 98 spin-off companies (85 of which are still active) which employ around 4200 individuals. In addition, around €700 million was attracted from external investors. Thus far, only 10% of LRD’s startups have failed.

Leuven R&D is a public/private partnership. The management of its Venture Capital (VC) fund - the Gemma Frisius Fund - and the business plan assistance are paid with public money. The VC fund itself is a joint venture between the KU Leuven (represented by Leuven R&D; 20%), KBC Investment (40%) and Fortis Private Equity (40%). The Gemma Frisius Fund invests in a spin-off company in the stage of validation of the business plan. The fund invests around 250,000 to 350,000 Euro per project. The external investors only invest in the second round of financing of a spin-off company. In Leuven R&D, 25% of companies receive venture capital financing in this second round within the first three years.

Leuven R&D is self-sustainable and gets its revenues out of research contracts, patents and spin-off companies. The KU Leuven asks 7% overhead costs for each research contract. 5/7 of these revenues go directly to Leuven R&D. The same principle is used for the revenues generated by patents and spin-off companies (Andries et al., 2014; Debackere, 2000; Clarysse et al., 2005).

**Strong points**
One LRD creates so-called ‘virtual spin-offs’ before finding investors. Essentially, there is an incubation period during which the business plan is fine-tuned.
During this time, the spin-off gets its own account, they will go and look for customers, start looking for proof-of-concept – in essence they function *as if* they were a company already. This period could last a few weeks, or up to 6 months.

Revenues generated by commercial activities flow back to the researchers, who have decision authority on how to spend it, and use the money to attract new PhD students or fund 'blue sky research', the kind of research that might not receive funding in other ways. Generally, there is a positive attitude towards technology transfer at KU Leuven.

LRD is active in visiting and organizing activities to attract and inform investors, such as 'Invest in Leuven', where both existing and virtual spin-offs present their ideas. See Annex 1 for an interview with Paul van Dun, LRD Central Manager.
Part two: Perspectives of different stakeholders on the current valorization processes at Maastricht University

Interview with a scientific staff member FHML working on a spin-off
This perspective is based on an interview with a staff member who recently was granted a proof of concept loan.

The motivation of staff members to consider establishing a spin-off company is often assumed to be financial in nature. One insight from the interview is that the main driver is not financial. Establishing a business is a way to bring the technology derived from scientific research to the patients who can benefit from it as soon as possible. Academic staff often invest a large part of their academic careers on a certain subject or technology. The desire to actually make a difference for people, patients, environment or society can be strong a driver to take the step to develop a business. Of course financial revenues can enforce this and vice versa.

The staff member interviewed considered the process of establishing a spin-off to be very complicated. The current valorization activities of the UM could be more transparent. In addition, there appeared to be competition between the different organizations within UM/Maastricht UMC+ responsible for valorization. It took a very long time, about 3 years, to come to an agreement. With respect to the financial investments the 1/3 holding, 1/3 department, 1/3 private money of the researcher appears to be the standard. The fact that a researcher privately needs to invest money is questionable given the many years of research that has already been invested. Also the continuous efforts to establish the spin-off should be taken into account.

Possible improvements and stimuli to increase the number of start-ups are to increase transparency of the current valorization activities and services of UM and Maastricht UMC+. In addition a suitable HRM-policy could be put into place. As mentioned before, a researcher who wants to start a spin-off personally has to take substantial financial risks. A business can only be established once financial investments are made. Once the spin-off has been realized the business development takes time and may require to (temporary) reduce/end the contract with the UM. This is another step/risk a researcher must be willing to take. It might be helpful to reduce this risk by introducing a ‘terugkom-garantie’ or ‘detachering’.

Another issue is that the university culture is one of debate and compromise. To be successful in developing spin-offs more a market-driven attitude should be created. The increasing public-private cooperation, for example on the campuses, can promote this. A second measure that has already been implemented is the obligatory valorization paragraph in all dissertations. This is
a first step to force all academic staff to consider the options to valorize their research. In addition it is important to optimize the information provision to academic staff regarding patenting. Patent should precede publishing because once the research is published it is publicly owned and the option to valorize this knowledge is not feasible anymore.

**Interview with a student entrepreneur**

This perspective is based on an interview with a student who started a business alongside her education at Maastricht University.

The student was very positive about the support provided by amongst others the Maastricht Centre for Entrepreneurship. The different possibilities like workshops, the ME-week, the Local Heroes contest etc. provide great opportunity to develop and expand a business. Altogether the student experienced great support from Maastricht University.

A suggestion to further improve the support and to increase the accessibility for students is to make the different options more transparent and better known amongst students, so to improve communication. It might also be helpful to organize events in which students from different backgrounds can pair up to realize their ambitions.

The greatest problems the student encountered in creating her start-up are related to combining her entrepreneurial ambitions with her education. Exam rules and regulations are strict and, within the reasonable, more flexibility in this respect would be helpful.

**Interview with a dean**

This perspective is based on an interview with a dean of a faculty at Maastricht University.

The dean does not agree with the observation that there has been an increase in the emphasis on valorization. In his view, universities have always had three core objectives. That what we call now valorization is not a new practice. It is the label that is new. The new label can have real world consequences. It suggests for example that first we create knowledge and then we give it value (or not), while another view would be that the creation of knowledge in itself already has value.

The emphasis on financial valorization, which is prominent in the UM strategy, fits broader contemporary views and beliefs. Of course such a cultural model tries to force one to act according to it. But as a faculty one can give the label valorization a broader definition, for example by emphasizing other forms of knowledge transfer than creating spin-offs. Examples are writing popular
scientific books, giving lectures, writing policy briefs, appearing in the media, doing contract research, doing contract education, etc. This is ‘risk reduction by broadening the definition’ according to the dean.

The dean doesn’t recognize the effect discussed in the literature that the model of valorization would lead to a preference of biomedical research over research in the humanities. Faculties teaching humanities are a school; knowledge transfer is core business. The University Board realizes this, as it is very apparent. Even the process of doing research often directly involves knowledge transfer. A historian contacting people for his research is part of a local community. Both community and researcher benefit from that.

As for taking financial risks with taxpayers’ money, the dean emphasizes that universities cannot become more self-sufficient without taking financial risks.
Part three: Conclusions and recommendations

Without proper information on the do’s and don’ts, patenting and licensing can have a negative effect on the free flow of academic information, e.g. by delaying publications. However, without the protection offered by a patent, private undertakings may not be willing to make the initial investment to bring a university innovation to the market. This may cause many of these innovations to ultimately not reach the market. Patenting university innovations may therefore be socially desirable in certain situations.

Licensing intellectual property to existing undertakings will often be easier for universities than the creation of a spin-off, but certain inventions will not be sufficiently market ready to find investors who are interested in becoming licensees. The creation of a spin-off may then be the only way to bring the knowledge to the market. Similarly, although a spin-off fully financed by external investors would of course limit the risk and costs for the university, it may be difficult to find investors who can see and believe in the potential of early highly complicated technologies if the university itself is not willing to (co-)invest.

Although licensing as well as the creation of spin-offs is seen as a possible revenue stream for universities, we have understood that at Maastricht University it altogether costs money.

In the light of these findings, and based on the literature on the subject, we present the following recommendations:

1. Communicate about the procedures, possibilities and risks

From our interviews it became apparent that at Maastricht University, the options and procedures surrounding valorization of knowledge, in particular regarding commercializing research (i.e. licensing or creating a spin-off) are relatively unknown to researchers. Although more effort has already been put into communicating the possibilities of valorization of knowledge to researchers and supporting staff, more can and should still be done. Regulations and procedures surrounding licensing and entrepreneurship should be made more transparent. Researchers and other interested parties should become aware of the risks and possibilities of valorizing intellectual property. Moreover, currently most efforts with regard to commercializing of knowledge are aimed at faculties located in the Maastricht Health Campus; efforts should be made to inform –and inspire– the other faculties (i.e. ‘the inner city’) as well. Also from a student perspective the need to improve and streamline communications is identified.
The existing information about the support system could be more transparent and accessible to inspire more students to develop their entrepreneurial talents. A starting point to realize the streamlining of communication is the creation of a technology transfer office.

2. Implement a careful case by case approach

Invest in a good technology transfer office - The decision to patent and/or to create a spin-off requires a case by case approach where researchers and specialists in intellectual property and business development need to work in close cooperation. Scientific and social consequences of patenting need to be carefully weighed. Nevertheless, in order not to unduly delay publication, the process must not take up too much time, and must not be unduly burdensome from an administrative point of view. The development of a well-equipped technology transfer office is a cost, but also a must-have for a socially responsible university. Although a case by case approach is of the essence, a few general guidelines will be given below.

Guidance for licensing

Focus on mature and multi-purpose technologies - Licensing to existing undertakings will generally be advisable in cases where the technology in question has already reached a certain maturity and where it can be used in a wide variety of industry sectors.

Ban on suing other universities - Although most patent laws contain a research exception, providing that the rights of patent holders do not prevent academic research on or with the object of the patent, the UM could include in its license agreements a clause that prevents the licensee to sue other universities for IP infringement.

Require sufficient and affordable dissemination - Apart from the ban on suing other universities, Maastricht University could incorporate other requirements in the license agreements. Since the goal of knowledge transfer is making sure the research findings reach the general public in some form, products based on research findings should be made accessible to the community, especially in the case of drugs or other essential health products. If licensees fail to disseminate products in a sufficient and affordable manner, they could be made punishable by loss of exclusivity, reduction of license term, reduction in license territory, etc.

Make non-exclusive licenses the default – Given the fact that knowledge is at the same time an input and an output for the generation of further knowledge, licenses should be non-exclusive unless the necessity for exclusivity can be convincingly justified. The maximization of the sale price of products derived
from licensed patents is not an acceptable argument. Only when extraordinarily high investments are required to bring a product to the market, exclusive licenses are justified. Rather, publication and appropriation of the result of research must become complementary rather than mutually exclusive (see also Antonelli, 2008).

Opening up licensing to more parties can generate substantial improvements to the licensed technology. Exclusive licenses will generate fewer improvements and can even block development if the single licensee fails to deliver (Lemley 2008).

**Open source licenses** - To protect the general public against double taxation (as discussed in part 1), it could be interesting to investigate more creative forms of licensing, such as open source licenses. In the tech industry this is a common way of sharing knowledge without just ‘giving it away’.

**Guidance for loans**

Loans may seem an attractive and ‘low-risk’ way of financing. But practice shows that many financial institutes are – particularly in the aftermath of the financial crisis – very hesitant to provide loans to young enterprises. Reasons are the high costs of checking business plans, high technical and market risks, and the expected inadequate return on investment. Similar concerns apply to universities considering providing loans to spin-offs. Indeed, many spin-off loans fail to be paid off, and in this sense, loans may be considered a risky way of financing spin-offs, and should not be a first option.

**Guidance for the creation of spin-offs**

**Virtual spin-offs** – Often, university spin-offs lack knowledge about the situation in the target markets. Elementary key information such as market potential, the competitive situation, one’s own market share etc. are often not known or are wrongly estimated. Thus, before actually creating a spin-off, create a virtual one! Give the ‘potential spin-off’ its own internal account and allow it to function as if it were a spin-off. Only create the actual spin-off if the virtual one has proven to be successful, and when a structured, solid business plan has been written.

**Create an investment fund** – Create an investment fund in which the university holds for example 20% of the capital. Importantly, the board of the investment fund should also consist of representatives of the other partners in the fund. Proposals for university spin-offs may be submitted to this board. Although people from outside the university may be more skeptical about highly specialized technologies that are not yet close to a marketable product, having
such an ‘external expert review board’, may provide a solution for a good number of projects. This approach has proven its success at the KU Leuven.

Organize events for potential investors – Organize events where successful UM spin-offs and proposals for new spin-offs can be presented to potential investors and where entrepreneurial researchers can network. This fits into the ‘university meets society’ approach on which also the Tapijnkazerne is based.

3. Reward entrepreneurial researchers

The motivation of researchers to apply for patents or to create spin-offs appears not to be to obtain personal financial gain. There is often a great willingness to let the financial benefits from a patent of spin-off flow back to research, provided the money can be used for the research researchers are passionate about but which may be difficult to finance via grants. However, researchers are concerned about the impact investing time and effort in valorization will have on their career. Here, again, clear communication about the procedures, rights, and obligations of all involved parties should take place. Given the fact that valorization is the third pillar in the strategic plan at the UM, arrangements – e.g. teaching exemptions – should be made for researchers that indicate an interest in creating a spin-off or licensing an IP. Moreover, this should be reflected in career development and performance reviews. Another approach is to support researchers who take the risk to devote more time to make the spin-off a success by guaranteeing a return to their position in case the spin-off is unsuccessful.

4. Facilitate students by increasing flexibility of their study paths

The Maastricht University programs are typically not geared to students who want to combine their education with a start-up business. Exam rules and regulations sometimes hinder the further development of the business. Like other universities Maastricht University grants exemptions to these rules to certain groups of student e.g. top athletes. It might be worthwhile to examine if such an arrangement can also be implemented for student entrepreneurs.
References


Annex 1: Interview with Paul van Dun, Leuven R&D Central Manager

‘Generally, we have three strategies to get a technology to the market – collaborative research, licensing, or creating a spin-off. We are guided by the question ‘Which strategy offers the best possibilities of getting the technology on the market?’ What we choose to do depends among other things on the state of the technology and the centrality of the technology within a research group. With licensing, it’s easier to get the technology to the market, but the objections are that no employment is created. On the other hand, if a spin-off fails, we have nothing.

Where our strategy differs, compared to other universities, is that we pay a lot of attention to the incubation period, and that this period takes a long time. If we consider starting a spin-off, usually such a company is active as a ‘virtual’ spin-off before we start looking for ways to finance it. The incubation period could last a few weeks to 6 months. During this time, the spin-off gets its own account, they will go and look for customers, start looking for proof-of-concept – in essence they function as if they were a company already. If we think we have a great business plan to go outside with, we start looking for investors. Usually, at this point, investors will get a good idea about our product, and this makes finding investors less difficult.’

‘The money invested in the virtual spin-off comes from different sources. A large chunk of the finances comes from the research departments themselves. In Leuven we have a decentralized system, and all commercially produced revenues flow back to the researchers that generated this money. This might be used for new start-ups. There is a very positive attitude towards entrepreneurship in our departments, since everyone knows the money will come back to them and not to the university at large. This money is not only used to finance new spin-offs though – most of it is used to fund new research, attract PhD students, etc. In sum – the decision authority on the money generated by commercial activities lies with the researcher/inventor. This leads to a big drive to commercialize knowledge.’

‘Although licensing is the easiest way to commercialize knowledge, still many researchers choose to start spin-offs. One of our researchers stated it thus: ‘The money generated by my spin-off is the only money I can spend on blue sky
research – research I don’t need to write applications for, no-strings-attached research, the kind of studies usually no-one dares to finance.’ There is legislation in Flanders that a fair amount of the revenue from intellectual property needs to flow back to the inventor(s), usually in the form of shares. But this isn’t the biggest motivation for researchers, most even get rid of their shares and leave the dividend on their lab’s account. With regard to intellectual property: sometimes we license it, sometimes we ask shares in return, depending on our association with the investor and the company. Some investors do not want to pay royalties, whereas others don’t mind. The type of IP also matters – software for example is much more difficult to license due to the fact that software changes and is continually moving. For life science IP it is often much easier to license.’ ‘Once there is a business plan, and we apply for proof-of-concept funding, the plan will be reviewed by a team of experts, of which 50% are industry-experts from outside the university. Other ways to get funding is to look for investors and business angels. Business angels usually take on smaller projects, and financing can happen within a month. For larger sums, we look for big investors, make appointments, present the idea etc. We are also very active in organizing and visiting networking activities such as ‘Invest in Leuven’, where virtual spin-offs and successful companies can present their ideas. By the way, we are also active as investors – we have private equity and venture capital investments.’ ‘As LRD, we never directly invest in a company. We have recently started a new fund for start-ups in chemical technology, and we invested in it from the general reserves. We are passive shareholder there, the other shareholders are companies that we find interesting to collaborate with – in this way, having invested in the fund is a calling card since we are the only knowledge institute that has invested in it. Besides this new fund, we have the Gemma Frisius Fund which exists since 1997. Here, we are also shareholders (20%), and we explicitly took a minority of the shares since we don’t want to give the impression we are able to influence any decisions on ideas we propose. There’s a gentleman’s agreement, if you will – we are allowed to propose interesting ideas for the fund, and the fund autonomously decides whether or not to invest. Often however, the fund is only 1 of the investors. To be fair, at the moment, there is no scarcity of money out there. And this leads to competition among investors, which is quite a luxury position, but of course, this is not always the case.’