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Methodology for successful spin-off setting in academic area

Intellectual Output IO3 / Final Version

TECHNICAL UNIVERSITY
OF KOŠICE

Univerzita
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UNIVERSIDAD
DE GRANADA

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1.Introduction

1. Introduction

This document has been created as part of the joint project **Technology Transfer Together** (acronym: TEchTransfer, project number: 2020-1-CZ01-KA203-078313) between the three project partners – University of Hradec Kralove (as a coordinator), University of Granada and Technical University of Kosice – with the overall aim to improve knowledge and share experiences in the area of academic spin-off creation.

The document looks at the overall perception and understanding of spin-offs, describes the key considerations related to spin-off creation and management, provides an analysis of the data obtained from the partner universities and introduces a methodology for spin-off creation. Finally, the document also looks at some of the key motivational mechanisms to foster entrepreneurial thinking within the academic environment and contributes to spin-off creation.

This methodology is by no means prescriptive and should be adapted to take into consideration and reflect the legislative, cultural, socio-economic and other factors of the country in which the university is located.

2.Introduction to spin-offs

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Commercialisation of research results has become increasingly important for universities worldwide. These can be available to other entities to obtain financial benefits. The goal of commercialisation is the practical implementation of the developed research result to meet requirements of modern markets and needs of business and industry. As such, the end product of this commercialisation is transformation of knowledge and intellectual property into new products, technologies, services and organisational solutions.

There are many ways to commercialise a research result. The establishment of a spin-off company is one of them. The concept of spin-off is mostly associated with universities or other research institutions that carry out research and development. Spin-offs are established for the purpose of transferring the results of their research into the market. Although the decision to commercialise such research results through the establishment of a spin-off depends on the capabilities of an individual university or research institution.

Spin-offs are simply businesses (in most cases spin-offs are businesses, though they can have other legal forms) that use the research results of universities for the purpose of their commercialisation. However, this mechanism is more often used in cases, where the successful commercialisation of a research result is not certain and where it provides a possibility of involving an inventor or researcher in the commercialisation process.

2.1 Definition of spin-offs

The literature dealing with the issue of spin-offs provides several definitions, each focusing on a different aspect of this concept. Therefore, it is very difficult to find a clear and uniform definition of a spin-off. However, it can be agreed that the term spin-off is not limited only to companies established at universities or research institutions, but also to companies established in the environment of business firms. However, the focus of this chapter is mainly on university spin-offs.

According to the Cambridge dictionary, spin-off is a new business created by separating part of

a parent organisation. Merriam-Webster defines spin-off as the distribution by a business to its stockholders of particular assets and especially of stock of another company and also as the new company created by such a distribution.

According to the economic encyclopaedia Euroekonom, spin-offs are organisational units, companies that are created based on the separation of a certain activity or group of people from the primary organisation. A university can also be such a primary organisation. At the same time, however, it is true that the primary organisation generally maintains a dominant influence on the activities of the newly founded organisation. Spin-offs, which are set aside at a university or a research and development organisation of the state sector, are created for the purpose of commercialising the results of research and development.

The Slovak Centre of Scientific and Technical Information (www.cvtisr.sk/en.html?page_id=58) understands spin-off as a business legal entity established for the purpose of using and developing the intellectual property of the university up to the form of a product or service applicable on the market. Intellectual property (mostly the result of research) is provided to the company through a licence agreement or sale. The university may or may not own a property share in the spin-off, the company, on the other hand, may agree with the university on the use of its laboratories or the provision of services. The innovators (researchers) of the relevant intellectual property usually also participate in the company's activities.

A spin-off usually refers to a separate company established in order to bring a technology or other invention developed by a parent organisation to the market. A conventional spin-off company can be created through the separation from a parent organisation which contributes with its financial, human and intellectual capital. The mission of such spin-off is mainly to further develop and commercialise the technology created at and assigned by the parent organisation. Together with the relevant intangible asset, the parent organisation also transfers the obligations and risks associated with the commercialisation of the intellectual property to the new legal entity. However, a spin-off can also be a company established, usually by a person external to the parent organisation, with a view of exploiting the intangible asset licensed by the parent organisation.

From these definitions, it follows that a spin-off company is a commercial company founded by a parent organisation in order to simplify the commercialisation of its research results. In most cases, the organisation establishes a spin-off company together with its employees, PhD. students or students who participated in the research, or external researchers who participated as inventors of such research results. A spin-off can also perform various activities depending on

the intellectual property rights made available to it by the parent organisation. Most spin-off companies cooperate with the parent organisations from which they were created. The cooperation may have a form of a search for business partners for the purpose of producing a product prototype, or the granting of a licence for the production and sale of products in order to resolve the protection of intellectual property, unless the necessary protection for the markets to which the products are to be introduced has been ensured. The task of the spin-off company is to ensure business activities associated with the granting of a licence and the search for partners who would be interested in it, or even the production and sale of products themselves.

2.1.1 Spin-off vs spin-out

Generally, there is much confusion about the difference between spin-outs and spin-offs and there exist many opinions about the differences. This confusion is due to the ambiguous use of these terms both in practice and academia.

However, in academic terms, the terms university spin-offs and university spin-outs generally refer to the same thing and are used in the same context. There is a view that it is better to use the term "academic spin-off" where the university retains equity, and "academic spin-out" where the university gets nothing, but this is not a general rule and in most cases there is no clear differentiation between the two terms.

2.1.2 Spin-off vs start-up

One of the first significant differences between a spin-off and a start-up is linked to their origin – the creation of a spin-off takes place within another organisation which can be a firm, an academic institution or a research institute – in our case it is the university.

Start-ups are also born from innovative business ideas, but, unlike spin-offs, they are not created inside an institution. They tend to exploit a market niche with great potential.

Another key differentiating factor between spin-offs and start-ups is the reason why they have been created. In general, a spin-off tries to exploit a research result discovered in research and development activities (at an academic or a research institution) to for the development of new services and technologies, and seeks new business opportunities.

A start-up, in contrast, is closely linked to the technology sector, and the founders are attempting to launch a totally new and ground-breaking service, technological accessory or application.

All spin-outs are start-ups but not all start-ups are spin-outs.

The differences that separate spin-offs from start-ups are fairly big, but there is no doubt that both innovation initiatives share the same motivation: to transform an idea to a product or service that addresses a commercial need and one that has an application in society.

	Spin-off	Start-up
Origin (Created by)	University	Outside University
Technology / IP	Owned by University	Developed and owned by start-up or licensed to start up by University
Managed by	University Staff	Outside University

Table 1. Spin-off vs Start-up Resource: WIPO

2.1.3 Spin-out vs spin-in

While a university spin-out will see university staff or students work with business teams to commercialise research, a spin-in is an independent company that chooses to partner with a university as part of its business strategy.

Spin-outs develop from research carried out by staff or students which has the potential for commercial application. The university ecosystem provides ideal conditions to develop and finesse this research, to be made ready for adoption by industry or consumers.

For existing businesses, teaming up with a university can offer the same opportunities through working collaboratively with leading

researchers in a relevant field. This can lead to the development of new technologies and products which can lead to new growth. Reducing risk, the spin-in approach allows access to translational funding, bridging the gap between early-stage technology created through research and its commercialisation.

The spin-in approach provides existing businesses access university intellectual property, know-how, research, technology and facilities to develop a commercial opportunity in return for an equity stake in the company for the university.

The biggest difference between spin-ins and spin-outs is the development and ownership of the initial intellectual property. Rather than a university starting with the ownership of the IP and providing resources before knowing how the business opportunity will turn out, a spin-in allows the university to access the performance of the company and carry out greater due diligence before collaborating - the university's key focus being to assess a spin-in opportunity in light of its own research objectives and the likely success of the collaboration through the integration of the university's expertise and resources.

2.2 Approaches

The creation of a spin-off company by university is one of the suitable ways to commercialise the research results. Parent organisations should always consider the objective behind the spin-off creation, the values between parent organisation and industry, as well as between parent organisation and its researchers as the innovators and creators of research results. The creation of a new spin-off company may often benefit from the structures of universities, such as incubators and science parks. Following the definition of a spin-off from the beginning of this chapter, for the establishment of a spin-off company the role of researchers or students of parent organisation should be predefined. In order to successfully commercialise the research result by a spin-off company, the cooperation of its inventors, innovators and authors with the spin-off company is essential. In general, researchers and or students may hold the following positions in the spin-off company:

- partner/associate - depending on a legal form of spin-off company, researcher and or student would be a co-owner of such company by investing financial capital in this spin-off upon its establishment;
- executive manager - this person would act on behalf of the spin-off company and would be authorised to perform certain legal actions;
- employee - researcher and or student would have specific rights and obligations based on an employment contract, which could be full-time or part-time or based on a different agreement, which could depend on the performance of work, on work activities, or for example on part-time work of students;
- external expert - researcher and or student would perform individual activities according to the agreement based on a specific contract.

Although individual positions within the spin-off company may not be mutually exclusive, it is possible for researcher and student to perform more than one role within such a spin-off company.

Afterall, universities should support their researchers and students in the creation of businesses, while the process should be as simple as possible in order to fulfil the predefined mission and objectives.

In addition to the involvement of universities, research institutions, researchers and students within the spin-off creation, another legal entity (for example a business partner) can join the spin-off. However, before a spin-off company is established, it must be clear what is the purpose of such spin-off, what activities and research shall be carried out, whether there is already intellectual property that could be invested in the spin-off, or whether the partners, managers and employees have the necessary know-how for the spin-off company to be able to operate independently and conduct research that would be feasible and useful.

Since the goal of a spin-off company is to commercialise the results of research conducted by the universities, it is necessary to acquire such research results by the spin-off company from the parent organisation. Such research result and any intellectual property associated with it could either be assigned to the spin-off company or could be licensed to the spin-off company.

Through assignment, the intellectual property is transferred and becomes the property of the spin-off company and part of its capital. The transfer should be done according to the internal procedures of the company and parent organisation, as defined by respective corporate agreements establishing the spin-off company. For a parent organisation it may be beneficial that such parent organisation should be granted back a licence to the technology assigned to carry on further research activities on it.

In case of licensing, the parent organisation shall retain the full ownership of the intellectual property with the possibility of using it in future (depending on a respective licence agreement).

However, assignment and licensing intellectual property to the spin-off company differently affect the activity of such spin-off companies. In the case of assignment, any decrease in the value of the intellectual property has a direct repercussion on the spin-off capital and a successful commercialisation, as well as the existence of such spin-off companies can be at risk. In the case of licensing, if the intellectual property loses value, this may be a reason for renegotiating the licence agreement, but it has no repercussions on the spin-off's existence.

Maintaining a balance between the rights, obligations and expectations between parent organisation, spin-off company and all associated partners is conducive when creating a spin-off company. Technology transfer offices of the parent organisation should act as intermediaries between all the parties.

Indeed, a technology transfer office plays a fundamental role in the construction process of any form of spin-off company, which might be passive or active. A passive role is when only the necessary resources are allocated to assist the process, without a direct involvement of such a technology transfer office. These resources may be in the form of materials, financial capital or personnel. An active role would occur when a technology transfer office actively participates in writing the business plan and agreements related to the intellectual property, secures or finds initial funding or assembles the management team.

2.3 Advantages

From the university's point of view, the advantages of spin-off creation are several, each with different scopes. Although the underlying argument for spin-off creation is to commercially exploit the result of research and apply it in the market in the form of a product, technology, service or organisational solution, there are other advantages for spin-off creation. Key element in technology transfer between university and industry is closer cooperation between such entities and spin-offs may have a role as a link between the research environment and industry as they are a powerful means of technology transfer between these two sectors.

The advantages of spin-off creation for the university can be directly related to the advantages for its researchers and students. Spin-off company generates the possibility of academic-industry cooperation with researchers and students, which in the end may result in the better application of student graduates in the market.

Such cooperation may also have a form of implementation of joint projects, creation of common technological background between both sectors by pooling the know-how of all associates of the spin-off company and by pooling the common contacts of all associates.

Where the research results may not exactly fit into the mission and objectives of university, spinning off such results would still allow their commercialisation.

A spin-off would also allow the university to participate in European research funded programmes through such spin-off companies as an industrial partner, which would result in obtaining funding not available for purely universities or research institutions.

A spin-off company that is commercialising the research result of university is also beneficial to industry.

Industry collaboration with academia and participation in the technology transfer process in general can accelerate the development of new products, services, technologies and organisational solutions and their introduction into the market.

For businesses, this can mean a competitive advantage in the relevant market.

In the end, spin-off creation and successful commercialisation of underlying innovation increases the reputation of the parent institution and also endows researchers with needed entrepreneurial skills.

2.4 Needs Analysis

Since spin-off creation is only one of the possible ways of commercialising the research results, establishment of spin-off companies should be carefully considered. Mission, objectives and general vision of the university plays a significant role in spin-off creation.

Motivation of such parent organisation in spin-off creation may reside in commercialising the research results in order to gain significant financial capital, in supporting researchers and students in their entrepreneurial endeavours, in positively affecting the industry in the relevant

region as well as in increasing credit of parent organisation in the eyes of all relevant stakeholders.

The creation of a spin-off company is a complex process involving the development of a separate business entity with the subsequent allocation of intellectual property rights, project and risk management and in certain circumstances, raising of financial capital in order to attract investors. In some cases, where the licensing of intellectual property from the university or research institution is not successful, or where there is no market for the respective research results, establishment of a spin-off company may be the only way to try and commercialise these research results.

It should be noted that often the researchers and students from the university may lack significant intellectual property management experience, which is likely to undermine the commercial potential of a new product, service, technology or organisational solution. Therefore, business-oriented support for the spin-off company and its relevant stakeholders is crucial to increase the chances to successfully commercialise the results created by the university or research institution's employees and or students.

Before establishing a spin-off company, it is important to prepare a business plan identifying the spin-off goals and the suitable actions to take.

Spin-off activities and focus should be consistent with the parent organisation's overall intellectual property strategy and the intellectual property should be properly assigned or licensed as well as managed. Financial support, as well as financial return and exit plan should be carefully prepared. The business plan should include a description of the research result that is going to be commercialised, a description of the spin-off company that is going to be commercialising this result, relevant market analysis and market gap analysis, description of competition and the differences between the spin-off's end product, services, technology or organisational solution and the market product of the competitors, a description of the marketing strategy, the company's growth, management of the spin-off company as well as realistic financial forecast.

Such a business plan should be preceded by qualitative and accurate description of the research result that is going to be commercialised by the spin-off company. Based on such a description, it should be possible to evaluate its commercial potential and use. Next, similar and substitutable solutions, products or services should be examined to determine whether it could affect the success of the research result's entry into the market.

The university should determine the direction of further implementation of the commercialisation of such research results and the support that it is able to offer to a spin-off company. Spin-offs may be supported in the form of financial capital, personnel, know-how and technical and material infrastructure of the parent company.

However, in order to successfully establish a spin-off company, the university should have a clear and transparent spin-off and intellectual property policy that is formally approved by this institution. Because for a business sector, it is essential to know conditions under which the university or other research institutions would cooperate. These policies should provide rules and guidelines for the commercial exploitation of intellectual property generated within the institution. Internal policies should define the responsibilities, rights and obligations of all stakeholders, establish ownership criteria, ensure that intellectual property created by its employees are utilised in ways most likely to benefit the institution and public. It is also important to establish basic guidelines for the administration of the intellectual property policy and to define rules for royalty sharing if the commercialisation of intellectual property generates income.

A key aspect in creating a spin-off company is the internal policy of the parent organisation defining conflicts of interest. Such a conflict occurs when an institution or person has a vested interest which puts into question whether their actions, judgement, or decision-making can be unbiased. Conflicts of interest can also be described as a situation in which a public obligation competes with financial interests. In particular, universities are often concerned that research is not skewed towards the interests of private companies or that the university is not distracted from its core mandate. In technology transfer activities, especially in spin-off activities, there may be specific types of conflicts of interest that need to be addressed, including situations in which a researcher may have a financial interest in any of its university's licensees. To avoid such a situation, policies and procedures should be developed for the disclosure and management of conflicts of interest. This may be critical for the credibility and esteem of the university and its researchers. Such policies also ensure that such activities are conducted in the public interest and not exclusively for personal gain.

Especially with regards to the creation of spin-off companies for the commercialisation of research results developed within the university, the internal policies should include, for example, whether the university is entitled to own equity in a company, whether the university can or should participate in the board of directors of a spin-off company and whether researchers are entitled to work in such spin-off company.

2.5 Expected Impact and Risks

One of the key impacts of successful commercialisation of research results of university by the created spin-off company is of course implementation and application of such results in the market for the benefit of all stakeholders. This may result in obtaining significant financial capital for the university, for the spin-off company, for researchers and students that are cooperating with the spin-off company. Although there might not be a financial benefit in the first few years, from five years onwards, the benefits can be very large. This shall result in effective support for the researchers and students in their entrepreneurial endeavours, in positive effect for the industry in the relevant region as well as in increased credit of parent organisation in the eyes of all relevant stakeholders.

However, it should be borne in mind that there are several risks associated with spin-off creation. For example, assignment and licensing intellectual property to the spin-off company differently affect the activity of such spin-off company. In the case of assignment, any decrease in the value of the intellectual property has a direct repercussion on the spin-off capital and a successful commercialisation. This means that the existence of the spin-off company can be at risk.

When the researchers are actively participating in the spin-off activities, they would need to blend business and academic interests, which can inhibit the development of the spin-off company. Less access of a spin-off company to the venture capital in the beginning could mean bigger reliance on the parent organisation. However, as financial resources of universities for the spin-off activities are limited, in the end this could mean that only a few spin-off companies would be supported, and only for a limited period of time. In case of unsuccessful commercialisation by the spin-off company, such over-reliance on parent organisation could mean that the parent organisation could be reluctant to let the spin-off company fail or forfeit even if there is very low probability of success. This reluctance could reside in the fact that in the case of little venture capital, such parent organisations can support only a few spin-off companies and would try to support

such spin-off companies even when resources could be used much more effectively in other cases. The support of parent organisations would then be unavailable for those spin-off companies that could be created with the greater probability of success.

The risk in the spin-off creation then directly correlates with the risks of the technology transfer in general. This may range from the low financial, material, and immaterial support for spin-off creation by the national strategic actors to the low awareness of the management and the researchers of the university about the benefits of these activities for the further development of both the parent organisation and researchers.

The internal rules of the university in the field of technology transfer directly correlate with the objectives of the university and the attitude of the management towards the spin-off creation. These rules and regulations are of great significance, the problem may arise when these rules are of purely administrative nature and do not regulate all the individual steps in the spin-off creation process.

The risk of successful spin-off company may also be directly related to the researcher or student himself and to his motivation to participate in the spin-off creation process and spin-off company activities through his research and creation of new knowledge and technologies, creation of new networks with industry and finally to dissemination and commercialisation of new findings into the market.

RISK	IMPACT
Assignment of IP to spin-off	If value of IP decreases, it will have a direct impact on the capital of spin-off (decrease of value on balance sheet).
Conflicts of interest – researcher not having sufficient time to commit to spin-off activities	Negative impact on spin-off development that can lead to failure to commercialise.
Lack of early-stage funding	Spin-off will not be able to fund core activities which can result in slower development or in overall failure.
Over-reliance on parent institution (university)	University will be able to support fewer spin-offs due to having to support existing portfolio. This could lead to missing out on opportunity to support more innovative spin-offs.
Lack of support from regional/national governments to support spin-off activities	Low awareness of entrepreneurial opportunities and lack of motivation to commercialise within researcher community - decrease in number of spin-offs.
Administrative burdens of internal university policies	Demotivation of researchers to get involved in commercialisation process.

Table 2. Summary of risks and impacts

3. Analytical Part: Summary and Key

3. Analytical Part: Summary and Key Findings

To help us gain a better understanding of the spin-off landscape at the partner universities, and to gain valuable inputs and data for our methodology, we carried out a survey between the project partners. The survey consisted of 18 questions (a mix of quantitative and qualitative). A copy of the questionnaire can be found in the Annex. The survey was followed up with an interview to validate our understanding of the data and the information supplied and to get clarification and more detailed information on some of the specific topics.

This chapter will summarise and analyse the data captured and the findings from the analysis will feed into the recommendations for the overall methodology.

3.1 Motivation for Spin-Off Creation

Universities are found to be an important source of new innovations and increasingly seen as a seedbed for new spin-off ventures. In most cases policy makers are encouraging research-based universities to increase the rate of spin-off formation.

> The government policies and legislative environment established in different countries will inevitably have a significant impact on the universities' motivation and drive to create spin-offs.

Based on our survey of the project partners, the top motivational criteria that are considered when creating a spin-off company were slightly different at each university. These criteria were influenced by the individual country's policies and funding mechanisms.

In the case of Granada, the desire to bring technology/innovation to market, encouraging student/researcher entrepreneurship and supporting local employment were the key considerations. This is also reflective of their overall approach with the spin-off creation. For the Technical University of Kosice and the University of Hradec Kralove the need to generate revenue was also listed in the top three criteria whereas this is not as much of a priority at the University of Granada. In the case of the University of Hradec Kralove, reputation was also listed in the top three criteria.

Motivation for spin-off creation	**University**		
	UGR	**TUKE**	**UHK**
Need to bring technology to market	✓	✓	✓
Encourage student entrepreneurship	✓	✓	
Support local employment	✓		
Need to generate revenue		✓	✓
Reputation			✓

Table 3: Top three motivation criteria for spin-off creation

3.2 Policies for Spin-Off Creation

As expected, University of Granada (UGR) is at the most advanced stage of having policies in place for spin-off creation. Their key regulatory document in this area, Regulations for the Creation of Technology-Based Companies of the UGR (Reglamento para la Creacion de Empresas de Base Tecnológica de la Universidad de Granada), has been in existence since 2016 and sets out the rules for spin-off creation. The regulation has 21 articles that are organised as follows:

1. Articles 1-3: Scope of application.
2. Articles 4-6: How to create spin-offs or participate in an existing one.
3. Articles 7-10: Common aspects about spin-offs in UGR.
4. Articles 11-14: UGR staff participation rules in spin-offs.
5. Articles 15-17: Support services from UGR to companies.
6. Articles 18-21: Other issues related to spin-offs.

In addition to the core document that enables the direct creation of spin-off companies, the University of Granada enacted an additional regulation in 2018. The regulation enables companies that have been promoted by members of the UGR but that did not meet the criteria to be considered spin-offs, the use of the brands „UGR startup„ and „Startup of the University of Granada“, this effectively giving them a layer of credibility through association.

Both these regulations have been fundamental to the University of Granada's success in commercialising university research and in the creation of spin-offs. They highlight the importance of creating and nurturing an entrepreneurial culture within all faculties of the university and making it easy for university personnel and students to create spin-offs to promote the transfer of research activity and results into business opportunity. This is reflected in having clear and easy to follow processes and regulations and in the provision of hands on support with the spin-off creation in every step. The University of Granada has a dedicated Research Results Transfer Office that will help researchers and students to guide them through the entire process.

A summary of the approved Regulations for the creation of Technology Based Companies of the University of Granada in English is available in the Annex. A highlight of the key points is given below:

- The critical importance of having a clear and easy to understand set of regulations that enable researchers, academic personnel and students to establish their spin-off enterprises efficiently and with full knowledge of the requirements, obligations and benefits.
- It is vital that researchers are given sufficient time to dedicate to technology transfer and spin-off activities. This has been enabled by reducing teaching credits and allowing members participating in a spin-off to take up to a 5-year break from academic life in order to focus on spin-off performance.
- New spin-offs sign a Technology Transfer contract with the university which regulates the research transfer and a Project Partner contract which will determine among others the rules of administration and governance of spin-off.
- University of Granada researchers and students present a project proposal that shows that the spin-off will be commercially viable and submit all the necessary authorisation requests.
- It is very important that the contracts clearly establish all aspects of the existing and future

The **Technical University of Kosice** (TUKE) has internal guidelines covering intellectual property protection, but does not have specific guidelines targeting spin-offs. General rules regarding activities, in which a university establishes a company, or acquires a stake in the company, are regulated in Slovak Law by the Act No. 131/2002 Coll. on universities, Act. No. 176/2004 Coll. on the disposal of the property of public institutions, as well as the statute of the university itself.

This policy is regulated by the laws on management of property of public institutions, on

colleges, on the performance of work in the public interest and also in the individual Statute of the University.

According to these regulations, the equity stake of the university in another legal entity or private company, or any other disposition, transfer or sale of the property of the university into the property of another legal entity or private company, requires an agreement from the collective body of the university.

The process at the TUKE is then as follows. If, in the process of creation of spin-off, any faculty of the university [but in the name of the university] plans to deposit its property [e.g. financial contribution, movable property or real estate] into the property of the spin-off, the academic senate of the faculty needs to approve of such action. Then, the rector of the university needs to submit a proposal to the academic senate of the university in order to acquire an approval with such action. If the academic senate of the faculty does not approve of such action, then the academic senate of the university can approve the creation of spin-off, but with two-thirds of the votes [instead of more than half votes]. After the approval from the academic senate of the university, the approval of the board of directors is required.

If a research department within a faculty of the university wants to transfer or assign anything of intrinsic value that belongs to the university to the underlying spin-off (e.g. financial contribution, tangible assets, intellectual property), this action needs to be approved by the senate committee of that faculty. The faculty then submits its proposal and approval to the Rector of the university who must then present this to the main academic senate of the university for their consideration.

Only then the university can establish a spin-off or acquire a stake in another business/company.

The only document usually needed for approval is the establishment contract of the spin-off company [or founder's deed, deed of foundation or any other document describing the legal obligations of the university, company and any other regulations].

The University of Hradec Kralove (UHK) does not currently have a policy developed for spin-off creation but they are actively looking to do so. The TEchTransfer project is also supportive of this task and they are looking to learn and adopt policies based on the outputs of this collaborative project.

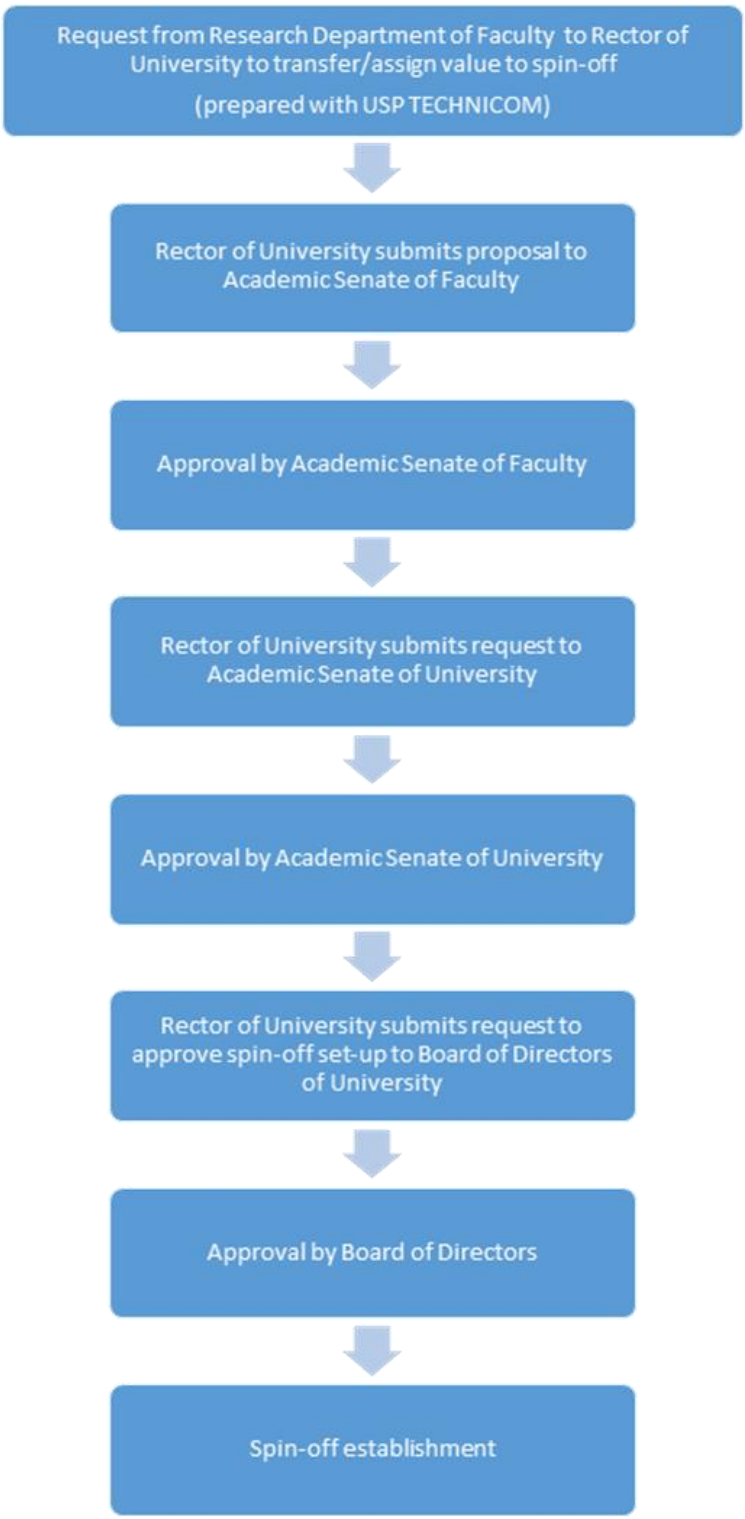


Table 4 – TUKE Spin-off approval process

3.3 Track record with Spin-off Creation

Most universities receive their research funding from public sources and commercialising of research results and providing incentives for academics to be involved in entrepreneurial activities have not been a high priority at many universities until recently. This has been consequently reflected in the track record of spin-offs of the different countries. In our analysis, the importance of having the right support structures and incentives in place are highlighted and reflected in the numbers of the spin-offs created at the different partner universities.

Since 1991, one of the priority objectives of the **University of Granada**, through its Office for the Transfer of Research Results, has been the promotion of the entrepreneurial culture and the creation of technology-based companies by the entire university community, understanding this as a fundamental tool in the transfer of technology. The average number of spin-offs created at the University of Granada is between 1 and 5 per annum with the total number of **123 spin-offs created** to date. The **survival rate** of spin-offs after 5 years is nearly **80%.** This high success rate can be assigned to the comprehensive application and strict selection process that the University of Granada has created and implemented.

Of the spin-off businesses created, **56** are **still active today.**

The University of Granada's decision whether or not to take equity in the spin-offs is based on different criteria:

- Their innovative character
- Their de
- gree of positive impact on the aims of the university
- Their contribution to the creation of skilled jobs
- Interaction with the socio-economic environment
- The economic sustainability of the company

These spin-offs sign **a Technology Transfer Contract** and a **Partners Agreement** with the University of Granada. The average participation in the capital of the UGR spin-offs is **4%.**

The Technical University of Kosice is less advanced in their spin-off activities than the University of Granada and to date 3 spin-offs have been created although the university strongly believes that the number annually will be increasing in the future. Of the 3 businesses created, one remains active and another was sold to a third party buyer.

The only document usually needed for approval is the establishment contract of the spin-off company [or founder's deed, deed of foundation or any other document describing the legal obligations of the university, company and any other regulations]. The equity stake of the university [decided on case by case basis] is usually around **15 %.**

The **University of Hradec Kralove** has developed 2 spin-off businesses, both of which are still active. The university does not currently take an equity stake in the spin-off businesses but obtains royalty revenue from the sale/licensing of the underlying research intellectual property.

3.4 Participation of Founders and the University Spin-Off Management

The founder's and university's participation in the spin-off can vary on a case-by-case basis. Our analyses of the three partner universities concluded that in most cases the founders remain an employee of the university after setting-up the spin-off.

All partners of the spin-off that are members of the **University of Granada** must sign, prior to or simultaneously with its creation, a contract between partners, which will determine, among others, the rules of administration and governance of the spin-off in accordance with the provisions of regulations (Reglamento para la Creación de Empresas de Base Tecnológica de la Universidad de Granada).

Recognising the importance of the founder's/researcher's involvement for the success of the spin-off, the University of Granada offers significant incentives for their members under which they can participate in the spin-off. One example of this is the option for university **members that participate in the spin-off to take a 5 years break in order to completely focus on the spin-off performance**. After that 5 years, the member cannot take another break until 2 years have passed. Also, university research members can participate in the spin-off using a part time contract. In this case, the research member that wants to work in the spin-off must present a report stating what are his/her duties in the company.

From the University of Granada's part, participation in the spin-off may involve the presence of representatives of the university in the spin-offs administrative board. The university also established a number of rules and obligations with regards to regular reporting from the spin-off such as submitting annual accounts as well as a management report, and any other documentation to its Office for the Transfer of Research Results. These rules and obligations are captured in more detail within their key document managing the technology transfer process.

At **the Technical University of Kosice** the role of management of the university is usually as a controlling body and/or supervisory body. Whilst **University of Hradec Kralove** appoints a representative from rectorate level who is a member of the Supervisory Board.

3.5 Geographical Location of Spin-offs

The spin-offs of the University of Granada are located either at the university premises or within the same region as the university which allows them to benefit from the close connection with the university even after they are established. The University of Granada also operates a number of Incubation Centres – see more in section below on support mechanisms.

At the Technical University of Kosice the spin-offs created to date have been located within the same region as the university. In the case of the University of Hradec Kralove, they were in some cases located outside of the region.

3.6 Funding of Spin-offs

When looking at the sources of funding of the spin-offs, they generally tend to come from a combination of sources which include university funding or other grants initially. This is then often followed by raising finance from Business Angels (where there is an established and active business angel community) at a later stage of the spin-offs developments.

None of the three partner universities have their own Investment Fund which would allow them to directly invest and as such provide seed funding or at a later stage growth funding to the spin-offs. This has proven to be a successful method in the case of some of the universities that have a high success rate in creating spin-offs. The University of Granada offers funding through the existing Grants in the universities own Research and Transfer Plan, in its Support Programme for the Constitution of Spin-Offs.

Whilst there are no specific government support and funding mechanism in Slovakia dedicated purely for the creation of spin-offs, there are a number of other indirect initiatives that are accessible for spin-offs in the same way as they would be for start-ups. These are listed in the table below, together with examples on government support from other partner countries:

CZECH REPUBLIC	SLOVAKIA	SPAIN
Ministry of Industry and Trade	Ministry of Investments, Regional Development and Informatization of the SR	Ministry of Science and Education
Technology Agency of CR	Slovak Business Agency	Innovation and Development Agency of Andalusia (IDEA)
TREND – Novacci	Slovak Investment and Trade Development Agency SARIO	Andalusian Technological Corporation (CTA)
	Ministry of Economy: • Innovation Fund • Innovation Vouchers • Competitions • EDIHs	Directorate-General for Industry and Small and Medium-Sized Businesses (DGPYME): Aid and incentives for business creation
	European Support Programs (Startup Europe) and Startup Competitions	Centre for Industrial Technology Development (CDTI)
		Official Credit Institute (ICO)
		National Innovation Company (Enisa)

Table 5 – Government support schemes in partner university countries

3.7 Support Mechanisms for Spin-Offs and Promotion of Entrepreneurship

The University of Granada provides a variety of support services for their spin-offs which contribute to the overall success of these companies in the early-stages of their development. These include:

- Access to university labs and testing equipment
- Hands on support of an allocated tech transfer officer
- Support with IP filing and searches
- Office space
- Training and skills development

To help promote entrepreneurship opportunities within the university, the University of Granada offers advice and supervision in the development of research projects, both the design and organisation of conferences, seminars and meetings on specific topics (gender, sustainability, social economy...), as well as the preparation, coordination and dissemination of training materials.

In order to promote technology transfer and support the creation of new spin-offs that provide value to society, the University of Granada provides several services to everyone that creates a spin-off inside the academic environment. These services are listed below:

- Spin-off incubation centre: The university spin-off incubation centre has 19 offices, 4 laboratories, 1 conference room, 3 meeting rooms and a cafeteria. Also, there is an entire building, the CELTIC building, dedicated exclusively for spin-offs.
- Assistance in the drafting of the Business Plan.
- Technological advice.
- Advice on the search for financiering, as well as in the negotiation of agreements and providing contact with organisations of private investors or venture capital.
- Training.
- Internationalisation.
- Strategic alliances.
- Proof of concept: The university can help researchers and students to test if their hypotheses are true by providing resources that help them to prove them. This is a very important step since it is important that research results prove to be valuable in order for the spin-off to be successful.

The **Technical University of Kosice** provides support services to spin-offs on a case by case basis but generally have a capacity to offer support in the following areas mainly through the University Science Park TECHNICOM:

- Access to university labs and testing equipment
- Business Incubation support (through the University Science Park)
- Support with IP filing and searches
- Introductions to external professional service providers
- Office space
- Training and skills development
- Networking opportunities
- Support with raising investment

Entrepreneurship activities, and the promotion of entrepreneurship is one of the main missions of the University Science Park TECHNICOM (USP TECHNICOM), as a department of the university located within the main campus. The USP TECHNICOM has been operating a business acceleration programme since 2014 which is open not only to university researchers, employees, students, but also to the public.

The USP TECHNICOM operates a Start-up Centre and Incubation Centre for ambitious entrepreneurs with innovative ideas.

University students and researchers have an opportunity to enter a business idea competition which takes place twice a year. The best ideas are selected by an expert panel and are offered a place at the Startup Centre. They take part in a 6-month acceleration programme which includes:

- series of educational workshops focused on starting and running a successful business
- a dedicated business coach/mentor to support them in the development of their business idea
- access to networking events (StartupConnect is a monthly networking event of the USP TECHNICOM providing an opportunity to network, learn and share experiences between the startup community)
- access to office space within the USP building
- help with investor readiness and help with connections to the finance community
- regular progress review and feedback from business experts at the Business Forum

Since its inception the USP TECHNICOM has run 15 Idea Competitions and has supported over 200 startups through its acceleration programme. The startups are evaluated at the end of their acceleration programme and they are presented with one of the following options:

- continue to develop within the Startup Centre – this is the case when the startups have made some progress but they are not mature enough to move to the Incubation Centre
- move to the Incubation Centre – at this stage startups are required to have a legal entity established and they pay a small nominal fee for their office space
- the relationship between the USP TECHNICOM and the startup does not continue – this is the case when the startups haven't made sufficient programme or have realised that their business idea is not commercially viable

In addition to the Startup Centre and Incubation Centre, the USP TECHNICOM runs other activities such as hackathons, to foster entrepreneurship and to support the creation of new startups. In July 2022, a citython focused on Urban Mobility took place at the premises of the USP TECHNICOM with over 200 attendees and in collaboration with 21 partners from industry and government. The winning teams received a 3,000 Euro prize win and have been offered a place in the Start-up Centre of the USP TECHNICOM. In November, a joint hackathon with the Slovak Space Office focused on space technologies and data will take place and the best ideas will be supported through the USP TECHNICOM acceleration programme.

University Hradec Kralove does not currently have any formal support mechanisms established for spin-offs but have an ambition to do so based on the experience of the project partners. They do not actively promote entrepreneurship opportunities at the university level. However, they have some courses at the faculty level, where they provide support and advice on how to turn ideas into commercially viable businesses and help with the development of a business plan.

3.8 Risks Associated with Spin-Off Creation and Mechanisms for Minimising Entrepreneurial Risk

The main risks associated with spin-off creation are linked to i**ntellectual property ownership** and to **conflicts of interests** for the researchers, students or staff involved in the spin-off creation. Trying to find a right balance between entrepreneurial and academic activities at the university can lead to conflicts of interests. Conflicts of interests can also occur when the researcher who is involved in the spin-off also works as an employee of the university. These risks can be minimised by setting clear and transparent rules and internal policies to address potential complications that may occur through the different stages of the spin-off creation process.

University of Granada has been successful in creating and setting rules and policies that help manage these risks. The staff linked to the university that participates in a spin-off, must protect the technology of the university and its research teams in accordance with the general intellectual and industrial property regulations of the university, and the agreements and conventions signed by this entity. The university has established necessary measures to protect its position against possible situations of conflicts of interest.

To help mitigate the risks associated with the spin-off creation, an agreement will be drawn up in which the appropriate mechanisms will be established to avoid conflicts of interest, as well as the obligation of the spin-offs to establish the necessary procedures so that the members of staff involved in their activities do not disclose industrial secrets and industrial and/or intellectual property that they have become aware of as a result of belonging to the university or to these companies, not only during the time of their stay, but also after the termination of their contractual relationship with the university.

From the **Technical University of Kosice's** perspective the main risks can be derived from the lack of financial support in creating and running the company. There can be some financial support from the university in the first few years, but the spin-off needs to become self-sufficient financially as soon as possible. From the Slovak government point of view, there are currently no systems focusing on spin-off creation support.

This risk is closely related to the ability of transforming the technology to the market needs.

The technology coming from the university is usually not prepared for the market and needs to be further developed and adapted for the needs of the final consumers.

This means that researchers need to be involved in the spin-off company, because only the researchers fully understand the technology. If the researchers are not able to cooperate with the spin-off company, this company has little chance to be successful. On the other hand, the spin-off company should be run by entrepreneurs that understand the market and understand how to properly run the company.

Since the university's function differs greatly from the function of any other business company, there needs to be constant cooperation between university, its researchers and students with businesses in order for these two worlds to understand each other properly. Therefore, the university promotes and supports cooperation with other entities, in forms such as contractual research, joint research, joint project activities, joint study programs aimed at students of the university, exchange of researchers, employees and students with business companies etc.

With regards to creation and with regards to running the spin-off company, emphasis is placed on leaving business to entrepreneurs, with the university having a support and controlling function.

4.Spin-off Process Map

4. Spin-off Process Map

Academic spin-offs are a key element of the innovation ecosystem. By commercialising research results or intellectual property created in universities, they facilitate the application of new technologies in the world and contribute towards economic growth.

Establishing a spin-off company is a **complex** and **challenging** process on many different levels. A spin-off is not a result of a single event or made in a short time, but usually dependent on long and complex development paths. It is not a quick and simple process and it needs to reflect a number of important considerations both from the researchers' and university's point of view.

The researcher/academic(s), in particular, must be fully committed, and be willing to devote the necessary time involved. If they are not, the spin-off is unlikely to be successfully established. In most cases, the researchers or students will have no or very little previous experience with setting up and running a commercial organisation. They will need to quickly learn to interact with a whole range of different stakeholders such as commercial partners, investors, potential customers etc. Researchers and students will also have to adapt to a whole new type of incentive structure. In academia, they are rewarded for new discoveries and for publications. In a spin-off, the only thing that they will be rewarded for is making tangible progress towards a commercially valuable product.

Another big adjustment is the pace. Researchers will often spend years doing research projects. In spin-offs, they will be racing against the clock. If the company doesn't hit a certain milestone before the current funding runs out, there is a risk that the company will run out of money and die. And these are just a few of the many differences that researchers will have to adjust to when running a spin-off.

University technology transfer offices play a vital role in fostering and enhancing technology transfer activities generally, and academic spin-off activities in particular.

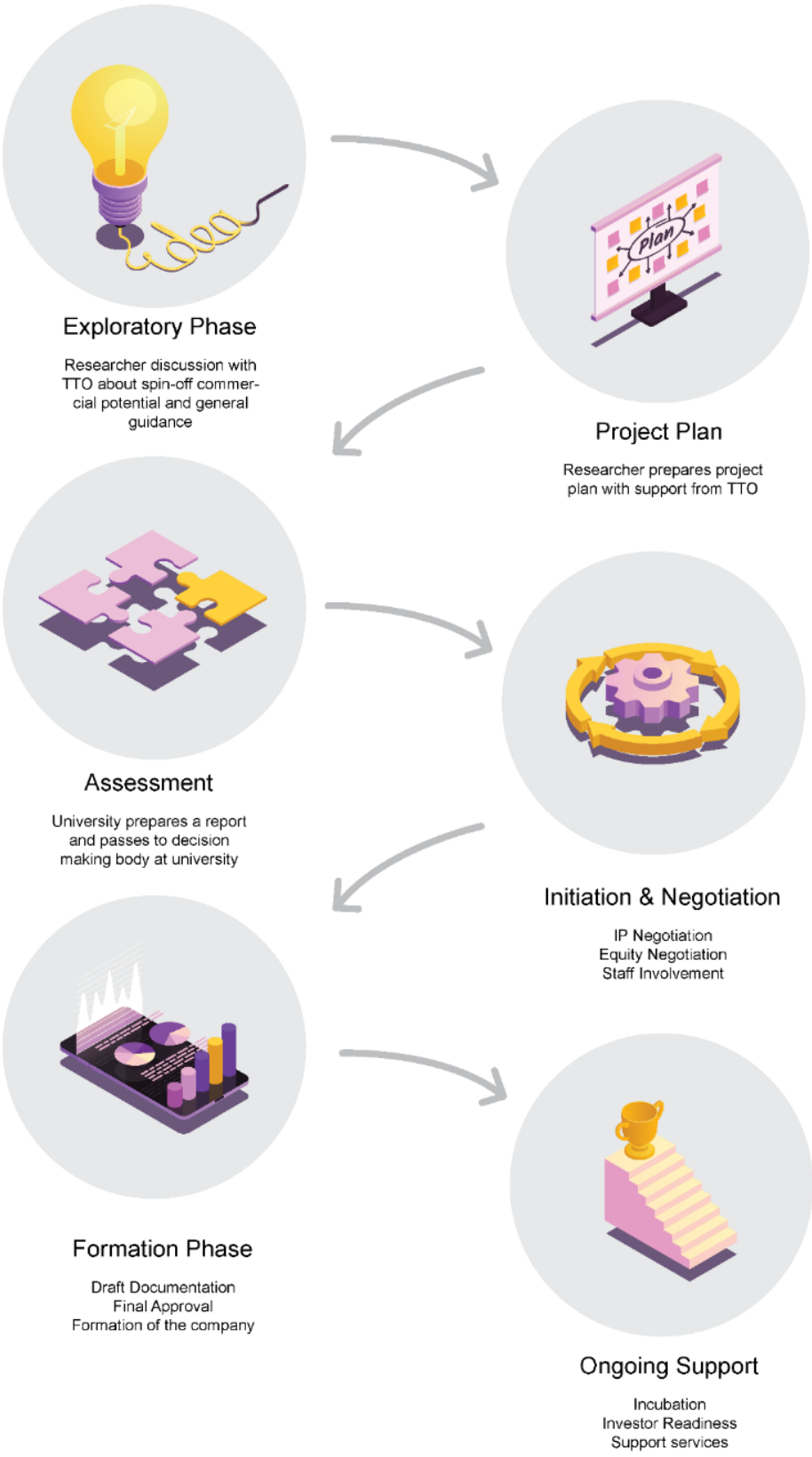
They can help diffuse an entrepreneurial culture of research, encourage the dissemination of research outcomes, and support scientists through the stages of commercialisation of the results of their research. They can offer help with protecting Intellectual Property, provide support with business plan creation and with seeking financial support and more.

It is therefore recommended that a dedicated technology transfer officer/ manager is assigned to each spin-off.

Depending on the size of the university and the size of its technology transfer office, the university may consider the involvement of an external organisation/consultant specialising in technology transfer commercialisation to support the spin-off establishment process.

It is crucial that the processes and rules of setting up and participating in spin-offs are transparent and easy to follow, otherwise it might discourage researchers and students from transferring their knowledge and from creating a spin off.

Based on our research findings and our learnings from the surveys carried out between the partner universities, we recommend the following stages in the process of establishing a spin-off:


Exploratory Phase
Researcher discussion with TTO about spin-off commercial potential and general guidance
Project Plan
Researcher prepares project plan with support from TTO
Assessment
University prepares a report and passes to decision making body at university
Initiation & Negotiation
IP Negotiation
Equity Negotiation
Staff Involvement
Formation Phase
Draft Documentation
Final Approval
Formation of the company
Ongoing Support
Incubation
Investor Readiness
Support services

4.1 Stage 1: Exploratory Phase

Before embarking on a spin-off journey, it is important that the researcher or student fully understands the nature and extent of the commitment it entails. Setting up a spin-off can be exciting, interesting and stimulating for researchers and students. It is also time-consuming, can be a stressful activity, and may distract them from their core activity.

Not all research is suited to becoming the platform for a new business or has the potential to be commercially viable. It is vital to establish early on if the research results can be translated into marketable products and profitable businesses.

Technology transfer officers should be the first point of contact for initial exploratory discussions between academic staff, researchers and students about the possibility of commercialising research and setting up a spin-off.

They can also carry out an initial due diligence on the intellectual property.

Technology transfer offices should provide advice on the following aspects:

- setting up and running a spin-off company
- help evaluate the business opportunities arising from research and
- investigate potential routes to commercialisation.

Completing a simple spin-off questionnaire or idea notification form can help support these initial conversations and can also focus the researchers to provide initial information to the technology transfer offices. It is also highly recommended to have a guidance document for researchers and students describing the key stages of setting up and managing a spin-off.

Some universities may choose to use the services of external technology transfer consultants to support the spin-off creation process.

4.2 Stage 2: Project Plan

If the researcher or student wishes to proceed with the creation of a spin-off, he or she must present a project plan covering the following areas:

- **Detailed description of the Research/Technology** they would like to commercialise and intellectual property considerations
- **Outline Business Plan (the technology transfer offices should provide a template and support with the creation):** Academic entrepreneurs should develop a thoughtful business case to understand the market potential, competition and funding needs of their business. It is rare for the business plan which is initially prepared by the spin-off team to be identical to the final plan which is used by the company as it goes forward. The plan usually goes through a series of iterations reflecting the emergence of new facts and ideas and feedback from different stakeholders. The key points that should be considered are:
  - What will the company do? What products and services will it sell and what need will they address?
  - Who are the customers?
  - What will be the chosen business model? How will the products or services get to the customers?
  - Which target markets will the spin-off aim for?
  - How will the company differ from its competitors? What are the unique selling points? What benefits are afforded by the IP?
  - What is the likely timescale between completion of research and going to market?
  - What funding will the spin-off require and where will it come from?
  - Who will be involved in the day to day running of the business?
  - Are specialist facilities required?
  - What legal form will the company take up?
- **Requests for approvals/authorisations** for team members and partners to be involved in spin-offs and the capacity in which they will be involved. It should include the names of individuals and state whether full or part time (quantify part time) and what their proposed responsibilities will be. Each member should provide proof that they can bear

with the responsibilities that they want to take on

Depending on the size of the technology transfer office of the university, it can either allocate a dedicated technology transfer manager to support the researcher or student with the application or it may decide to bring in an external organisation/consultant to support the process.

4.3 Stage 3: Assessment

Once the project plan has been presented and submitted to the university, experts on technology transfer will review all the information and prepare a report. It is therefore crucial that the spin-off is well defined within the project plan and covers all the important aspects that will have an impact on the creation of a successful spin-off.

Following the in-depth analyses, a detailed report will be issued by focusing on the following aspects:

- Evaluation of the technological base of the spin-off, based on the nature of the results to be exploited and the activity that they want to perform
- Definition of relationships between the spin-off staff and the university
- Draft of the Technology Transfer Contract with the proposal of the adequate compensation in favour of the University
- Proposal for the participation of the university in the share capital of the spin-off, indicating the suitability of such participation, establishing the terms and conditions under which it will be carried out
- Terms and conditions under with the acquisition of the participation will be carried out including draft of the Partners Contract
- The contribution of the university – these could include
  - Direct monetary/financial contribution
  - Contribution of goods and / or rights, such as patents or research results necessary for the development of the spin-off activity, valued on the basis of their market value
- Proposal for the spin-off to be incubated in the University Incubator

This report along with the project proposal is passed to the governing body designated by the university (based on the approval structure of a particular university). They will debate and decide whether the proposal should be accepted or declined. If the proposal is successful, the university will initiate the spin-off process.

In the event of the project plan being declined, the researchers have the right to appeal against the decision. The designated body of the university can propose changes for improvement for the project proposal and the researchers can re-submit the revised project proposal. This proposal will be considered and a final resolution will be generated.

4.4 Stage 4: Initiation & Negotiation

The next stage following the acceptance of the project plan is the Initiation Process and Negotiations. The main goal of this stage is to negotiate, prepare and sign-off the contracts covering all aspects of the universities relationship with the newly established spin-off. It is strongly advised that the spin-off is represented by a legal firm independent from the university legal team to make sure the spin-offs interests are protected.

4.4.1 Negotiation on Equity Stake/ Ownership Structure

It is important that the university has a clear and transparent policy on how it deals with the equity stakes in spin-offs. The policies should also provide flexibility on the participation of the university in the spin-off company to allow a decision on **a case-by-case basis**. It should not be the university's aim or obligation to always hold or maintain a stake in the share capital of the spin-off companies. Whilst obtaining economic return is an important consideration, it is important that the university should not limit or hinder the growth and the expansion of the company.

When deciding on the size of the equity stake the university takes in the spin off, the following criteria should also be considered:

- The innovative character of the spin-off, the research that forms the basis for the new business and any IP related to it
- The roles that the researchers have played during the preparation of the opportunity, and are anticipated to take after the new business is established
- The degree of the spin-off's positive impact on the aims of the university
- The spin-off's contribution to the creation of skilled jobs
- The economic sustainability of the spin-off
- The spin-off's interaction with the socio-economic environment
- Assistance with company formation and development – the level of support the spin-off requires

It is important to distinguish between three different types of equity when considering university equity:

1. **Equity for the intellectual property (IP)**: Academic inventors are university employees and in many cases those university policies dictate that the IP belongs to the universities. The rules on how inventors are rewarded and other guiding principles specific to each university and its particular cultural and economic circumstances should be set out in the university's IP policy.
2. **Equity for university support in company formation:** Depending on the particular circumstances of each university and of the academic inventors involved, universities may seek remuneration for the relative support offered in the process of company formation.

   A university may need to support the academic inventors through all the stages of company formation, development and investment. For instance, the university may provide real estate for the company to start and grow; legal services to help with incorporation; access to university core facilities, etc. The university will then also licence the invention to the newly formed company. Universities may therefore seek equity as remuneration for the relative support offered, in addition to the IP licenced and, when it is the case, the capital invested.

3. **Equity for financial investment**: Where universities have venture funds they may also receive equity for their specific financial investment in the spin-off. The greater the investment, the greater the equity is likely to be, as it is expected of any other investment.

Not all inventions are born equal. Inventions may be clear patent candidates, may be protected by other types of intellectual property such as copyright, or may not need formal protection. Inventions may require high upfront investments and more at growth stage, or may get by with little investment.

Inventions may require many years of development before the company is ready for exit or acquisition, or may make it to exit in only a few years. Different industry sectors tend to exhibit different characteristics in the type of technology being developed. Pharmaceutical spin-offs typically involve patentable inventions, requiring high upfront investments, many years of development and therefore a long-term commitment from founders and investors. The opposite can be said of software spin-offs, which underlying inventions might not be protected by patents, may require a relatively low amount of investment and may be acquired rapidly. Universities may offer equity terms commensurable with the stage of development and pathway to potential exit: lower levels of university support needed to spin-off and exit translate into lower equity stakes and vice versa.

4.4.2 Staff Involvement and Management of spin-off

It is crucial that the involvement of the researchers/inventors is clearly defined within the internal policy documents of the university.

Academic inventors have different preferences and entrepreneurial experience. Some inventors prioritise their research and prefer to leave the process of commercialisation to others. Some inventors are keen to build a patent portfolio

as part of their career strategy and are happy to have it licensed. Some others have entrepreneurial flair and invest their time and resources to start a company. Of those, some are starting a company for the very first time without any prior business experience whilst some have the skills, knowledge and networks to transform their invention into a profitable company.

Often, these different types of inventors are found in one single team behind one invention. Technology transfer offices should be prepared to cater to the full range of academic inventors, ensuring that the treatment and reward is equitable to all and commensurate with their contribution. Universities may therefore seek equity reflecting the composition of the team in terms of both relative support and reward offered to individual inventors through the process of licensing and/or company formation.

It is recommended that the researchers are given flexible options to be involved in the spin-off based on their skill sets and ambitions to get involved in the spin-off.

Should they wish to fully focus on the spin-off development, it is essential that they are given sufficient time to do so. This could involve giving the researcher a sufficient time to allow them to fully devote their time to developing the spin-off. A part-time option should also be on offer for those who wish to also continue in their research activities.

Based on the legal form of the spin-off created, the participation of the university may also involve the presence of a university representative on the spin-off administrative board.

4.4.3 IP Negotiations

The ownership of intellectual property and usage rights should be carefully negotiated between the spin-off and the university's commercialisation department.

The allocation of intellectual property rights on establishing a spin-off (as between the spin-off founders and the university) can be vital in its success. Establishing clear ownership, or exclusive rights to use valuable intellectual property rights will be attractive to potential investors and will have an impact on the success of the spin-off with securing angel or VC funding.

The university's commercialisation department will usually have an intellectual

property policy which will dictate the tone of the negotiation. The policy will be based on the university's desire to balance the exploitation expectations of the spin-off founders against the competing interests of public funding responsibilities and meeting its wider aims of stimulating the exchange and dissemination of academic ideas.

The ideal position for a spin-off founder would be for the spinoff to own the intellectual property rights outright (the university may request the right to use the intellectual property rights for academic research and teaching purposes only). The university is likely to ask for an ownership stake in the spin-off company to compensate them for this transfer of intellectual property rights into the spin-off.

However, in most cases, the university prefers to retain ownership of the intellectual property rights. In this case, the spin-off founder should try and secure an exclusive right to use the intellectual property rights (which may be in exchange for a licence fee payable to the university).

4.5 Stage 5: Formation Phase

The outcomes of the negotiation process between the university and the researchers will be summarised and captured in the key documents covering the spin-off establishment. Based on our learnings from the University of Granada we recommend that the key core documents are as follows:

- **Technology Transfer Contract** – regulates the research results of the technology transfer (covering IP, confidentiality, equity and other legal issues)
- **Partnership Contract** – all partners of the spin-off that are members of the University will sign a Partnership Contract which sets the rules of administration and governance of the spin-off

Establishing a spin-off company involves a more complex set of agreements and documents than licensing to an established company. The spin-off company is at the centre of a web of relationships – with the university, academics, investors, directors, employees, landlords, insurers and others. Put another way, as well as licensing or assigning intellectual property to the spin-off company, it is usually necessary to prepare/agree documentation in the following areas:

- forming the company and providing it with a constitution, officers, etc
- establishing the corporate relationships
- dealing with the intellectual property assets (which for various reasons, discussed below, is often more complex than when licensing an established company)
- management and organisation of the company

Once all the agreed terms are captured in the proposed legal documents for the spin-off establishment these are passed on to relevant bodies of the university for final approval and signature and subsequently the documents are signed by the founders of the spin-off.

At the same time the spin-off will be required to register the company as a legal entity in line with the legal requirements of the specific country. The spin-offs legal team can provide support with this.

4.6 Stage 6: Ongoing Support (University Support Mechanisms)

New ventures such as spin-offs will have to face lots of difficulties and challenges especially in their initial development stage.

> Providing access to a wide range of support services can hugely contribute to the survival rate and future success of a spin-off.

University Science Parks and Incubation Centres often take the role of these support functions.

Support services for academic entrepreneurship may include, but should not be limited to, the following:

- **Business incubation** – business incubation centres nurture members to grow their business by providing a unique entrepreneurial ecosystem. In most cases they provide a free or low-cost workspace that allows the spin-off to reduce overhead while it develops and grows. In addition, they also provide business support services as described in the next points. Being part of a vibrant ecosystem has huge benefits to an early-stage business which can benefit from additional resources, experiences and connections.
- **Evolvement of Business Plan** – every spin off will have to develop a clear and concise business plan that reflects the market potential, competition, and funding needs of the business. This should include a plan for developing the technology, processes and human resources and generating sufficient revenue to sustain and grow the business. This plan will be vital when approaching investors and pursuing funding. The business plan should address what investors want to know: a compelling concept, competitive advantage (including patent and IP position), market and financial potential, and proven management team. The plan should be evaluated and updated continuously.
- **Technological advice & access to test facilities** – access to research and technological expertise and specialist test facilities within the university can greatly

accelerate product and technology validation and development. Access to laboratories and equipment often comes at a high cost and can be difficult for early-stage companies to access and finance. Having a close and direct link to these facilities is a major advantage for spin-offs. In addition to the facilities, spin-offs will hugely benefit from the expertise and advice of the technical personnel within these facilities.

- **IP and legal services –** these can be either provided by the technology transfer office if the university has capacity to do so or a referral to an external organisation can be made who has experience with university spin-offs.
- **Coaching and mentoring** – providing access to experienced coaches and mentors who can guide the spin-off through the journey and help with various aspects of the business can be invaluable in building the foundation for a successful business.
- **Access to finance support** - access to funding is one of the biggest challenges for early-stage businesses. Incubation centres can provide vital support through advice on the search for capital and grant funding. When it comes to grants, the support can include monitoring relevant and appropriate grant schemes, support with proposal writing and help with creating consortia using existing university networks and support with project implementation. For those seeking private investment, incubation centres can provide support with investor readiness and developing an investor pitch as well as support with the negotiation of terms and agreements with private investor or venture capital organisations.
- **Networking opportunities and strategic alliances** – these can be extremely helpful in building valuable contacts (potential partners, customers etc) and in helping to raise awareness of the spin-off and its activities. The contact networks resulting from universities' links with different stakeholders will benefit the spin-offs themselves, facilitating their survival in the first years of their life.
- **Access to markets and internationalisation** - university networks and existing relationships with industry will be hugely important with building relationships with potential customers and provide a level of

credibility to spin-offs. In most cases these networks exist on a global scale which will help spin-offs with accessing international markets as well.

- **Skill development** – these could include workshops, webinars, conferences and other formal or informal educational activities on the various aspects of technology, business and entrepreneurship.

A lot of these activities can be offered as a separate service, but in most cases they are included the support services offered by a Business Incubator. However, these individual services can be provided through external partners and stakeholders of the University.

4.6.1 Ongoing financial support from University

University spin-offs often face the same or similar challenges as other technology start-ups in the early stages of their development – one of the most challenging one is having access to early-stage funding. University funding to support spin-offs is generally limited and spin-offs rely on various government grants or other (mostly international) funding sources available to early-stage businesses to support feasibility studies, proof-of-concept or prototyping activities.

On the other hand, spin-offs have the additional benefit of being part of the university infrastructure (access to labs, test facilities, technology experts, contacts and networks) to develop a proof-of-concept/prototypes and in some cases where university investment funds are in place, they also benefit from initial financial support.

Whilst some European universities have been successful with a creation of an investment vehicle to provide the funding required by spin-offs to bring research to the market, most universities are out of this game. European spin-offs frequently face a daunting view when looking for go-to-market funding and, while the number of financing mechanisms is multiplying, it is also evident that the competition is also ramping up.

However, it is important to recognise that spin-offs should not rely on university or government funding in long term and the aim should be to make the new companies stand on their own feet financially as soon as possible. The university or its technology transfer unit should encourage and support spin-offs with the development of business plans that attract the interest of potential investors (support with investor readiness). Spin-offs should look for outside investment funds early on, and listen to the feedback they receive from potential investors.

The university should not try to help struggling spin-offs get over their difficulties in long term. If the company is not succeeding, and cannot find further funding from commercial sources then the university has to accept the message that it’s not going to be commercially viable and focus their limited resources on supporting other spin-offs that may have a better chance to succeed.

5. Establishing a Motivational Environment for Spin-off Creation

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In the previous chapters we have touched upon the challenges and difficulties around creating spin-offs within a university environment. To help overcome these barriers and to encourage spin-off creation, it is therefore hugely important to have the right support mechanism in place to raise awareness, provide practical, business and legal guidance and ongoing support to spin-offs.

Universities should cultivate strong entrepreneurial spirit, have access to a wide range of commercial resources from a variety of providers and be prepared to be a source of guidance on the path to commercialization.

Some of the key mechanism that universities should consider include:

- Technology transfer offices
- Business Incubators and University Science Parks
- Summer Schools
- Joint initiatives with industry
- Mentoring

5.1 Technology Transfer Offices

Technology transfer offices play a crucial role and are one of the key support mechanisms that can foster spin-off creation.

In most cases, they provide general business and legal advice and assistance to foster entrepreneurship among researchers and students.

The WIPO website describes technology transfer offices as entities that facilitate intellectual property rights management and technology transfer by bridging the gap between research and practice. They provide support for collaboration and mediate relationships between different innovation stakeholders, such as academia and industry.

From an IP management point of view, a technology transfer office should have the following functions:

- Promotion of IP awareness among the institution's staff members;
- Management of IP disclosure;
- Filing for IP protection;
- Commercialization: Marketing, negotiation and licensing; and Creation of spin-offs;
- Maintenance of IP assets;
- Enforcement of IPRs;
- Management of revenue sharing;
- Management of conflict of interest and commitments.

From a spin-off creation point of view, Technology transfer offices can support the process at different stages:

1. **Pre spin-off creation**
    - Awareness raising and promotional activities for research commercialisation
    - Evaluation of research ideas and IP searches
2. **During spin-off creation**
    - Support with legal and business advice
3. **Post spin-off creation / Ongoing support**
    - Business incubation support
    - Access to university test facilities

The involvement of Technology transfer offices in spin-off creation and management may vary in terms of the level and intensity of support. In some cases, they play a very active role and work closely with the spin-offs. This is usually the case when academic entrepreneurs lack the necessary commercial skills required to set up and manage a new company. In other cases, the spin-off might need minimal assistance from the Technology transfer offices– this could be because they might be on their second or third spin-off and have built-up the necessary skill sets and networks to succeed.

5.2 Business Incubators and University Science Parks

University Science Parks also play an important role in stimulating spin-off creation.

They offer a perfect environment for knowledge and technology flow between universities and industry. In addition to providing office space in a building with other innovative and like-minded high-tech businesses, they offer access to technology clusters and networks, educational workshops and forums increasing the survival rate of early-stage businesses. The geological proximity of the science parks to the university can also positively contribute to spin-off creation.

Business Incubators are organisations that provide a wide range of support programmes to help turn ideas into thriving businesses. Universities that operate their own business incubators are well placed to support researchers working on commercially promising research and transport ideas from the lab into the marketplace and contribute to the creation of university spin-offs. They are a great mechanism to instil an entrepreneurial spirit across the university and also have a positive impact on regional growth.

Idea competitions or hackathons are frequently used by business incubators to create a pipeline of new start-ups and these are widely promoted within the university at each faculty. Exposing researchers and students to these initiatives can also help foster the entrepreneurial spirit and motivate them towards commercialising their research.

5.3 Summer Schools on Technology Transfer and Spin-off Creation

Summer schools are another great way to give researchers and students the necessary skill sets to validate the commercial potential of their research and to teach them how to get their research ideas from the lab to the market. The course usually covers topics such as the basics of technology transfer, identifying the commercial potential of research, how to patent and licence it, how to develop a spin-off and what is involved in creating and running a business.

They also tend to offer opportunities to meet and network with experts in tech transfer and other inspirational speakers. In addition to gaining theoretical knowledge on the different aspects of technology transfer, researchers acquire lots of practical skills as well.

5.4 Joint Initiatives with Industry

Activities and initiatives that involve bringing together academia and industry are a great way to showcase researchers what innovations and solutions are sought in the market and encourage them to solve real life solutions. Being part of a team that brings real benefits to society can also be a drive to researchers and encourage them to spin-off creation.

Spin-offs addressing existing industry problems with a real commercial potential have a higher chance of success and will also help in securing funding from investors.

These joint initiatives and activities can take place in a variety of ways including scientific conferences that bring together representatives from both sides, knowledge exchange programmes, collaborative research programmes and other initiatives that allow researchers and industry to work together.

5.5 Mentoring

Mentoring and the establishment of mentoring programmes is another key area where universities can utilise their status in local business communities to provide experienced commercial assistance to spin-off companies. Most entrepreneurs that start spin-off businesses come from a scientific, technical, engineering or innovation field and will almost certainly be deficient in business skills and knowledge in areas such as finance, sales and marketing, operations and growth strategies. It is important that the mentoring provided is done in such a way as to help develop these missing business skills within the spin-off entrepreneurs rather than simply providing them with solutions that they either do not understand or fail to wholly commit to.

Stimulating academic entrepreneurship is becoming a crucial issue for universities and governments as they are being recognised as an important mechanism to drive economic growth.

Evidence suggests that universities with spin-off creation support programs have a better track record and higher success in spin-off creation. It is usually a combination of different strategies and support mechanisms that can successfully lead to academic entrepreneurship.

6. Conclusion

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University spin-offs are seen as an increasingly attractive way of commercialising university intellectual property, boosting innovation and are also being considered to have the potential to bring significant impact on regional economic and social development.

However, as this methodology outlines, setting-up a spin-off in academic area is a complex and challenging process often involving lots of different stakeholders with conflicting interests and requiring a supportive national legislative, financial and administrative framework.

The methodology summarises and draws on the experiences of the three partner universities in spin-off creation and introduces a methodology for spin-off creation. This methodology is by no means prescriptive and should be adapted to take into consideration and reflect the legislative, cultural, socio-economic and other factors of the country in which the university is located.

We found that one of the key pre-requisites of successful spin-off creation is for the university to have a clear, transparent and easy to follow spin-off and intellectual property policy that is formally approved by its institution. Whilst there is a need for clear policies, it is also important that the policies provide a level of flexibility to allow a decision on key aspects such as equity stakes, participation of researchers and IP on a case-by-case basis.

Another important aspect to the spin-off creation is to establish a motivational environment that increases the awareness of commercialising research results amongst researchers and also to allow researchers gain essential entrepreneurial skillsets for setting up and participating in spin-offs. Technology transfer offices, university business incubators, science parks and summer schools are just a few of the many support initiatives that universities can use to stimulate academic entrepreneurship and the creation of spin-offs. Also addressing this issue in the university strategy is very important to create sustainable environment for supporting spin-offs and start-ups in the academic area.