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CHALLENGES FOR UNIVERSITY - INDUSTRY COLLABORATION - A STAKEHOLDER VIEW

Abstract:

Purpose - The innovation strategies of the European Union and its member states have been well established over time and their implementation is being supported through government funding and legislative policies. This includes the promotion of strategic University-Industry Collaboration (UIC) involving its heterogeneous stakeholder groups. The purpose of this paper is to provide a shareholder analysis in form of defining the UIC activities, UIC shareholders and their interests and power in such collaboration while addressing the major challenges.
Methodology – A comprehensive thematic literature review of scientific research, as well as institutionally conducted research (primarily by European Union organisations) has been performed.
Findings – The review lays out the interest and power of the individual stakeholders while members of Academia, Industry and Government being the most influential ones. The primary challenges for Academia and Industry remain access to funding, however, also the tackling of contrary mindsets and mission as well as overcoming organisational and cultural differences create serious barriers to a successful cooperation.
Practical Implication: Preparing a shareholder analysis in the area of UIC and deriving with a thorough understanding of the shareholders motivation and power of UIC involvement will help prioritizing and managing the stakeholders, as well as help leading a successful cooperation.
Originality/value: This study is meaningful in that it serves as a practical overview in considering the interests and challenges in form of a stakeholder analysis of a UIC setting. It may serve as a guide for stakeholders interested in formalizing UICs to understand the weight, importance and motivation of their immediate collaborators, when preparing a formal UIC partnership.

Keywords:

Stakeholder Analysis, University-Industry Cooperation, Innovation Strategy

JEL Classification: O00, O30, O33

1. Introduction to UIC

1.1. UIC as part of innovation strategies

The broad-based innovation strategy of the European Union (EU) aims to foster the EU's competitive position within the global sphere (Morisson & Pattinson 2020, Hollanders & Rantcheva 2021). It encourages individual member states to voluntarily adapt this strategy and encourage a more efficient collaboration between institutional research and the industry (EC, 2007). Such cooperation is referred to as University-Industry Collaboration (UIC)[1] and can be defined as: "Bi-directional relationship between university and industry entities, established to enable the diffusion of creativity, ideas, skills and people with the aim of creating mutual value over time" (Chedid, Teixeira 2021). The aim of government bodies encouraging UICs is to generate structures that use resources more efficiently and enhance economic growth by promoting innovation and competitiveness regionally, country-wide and even cross-border. The EU, through its largest EU research and innovation programme Horizon Europe, has made available more than €90 billions of funding over a seven-year period between 2021 and 2027 (EC, 2021), stimulating an innovation environment within the boundaries of the EU and beyond. The UIC principles foster, among a number of stakeholders, knowledge exchange and technology transfers with a commercial purpose. This strategy was initially imbedded in the EU through the Lisbon Strategy Agreement from 2000, aiming for the EU to become the "the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion" (EC, 2021). According to European Business Innovation Centres, around 21,000 companies were supported in 2019, in turn supporting the creation of almost 20,000 jobs in the EU (Maini 2020).

1.2. Areas of University-Industry Collaboration

The to-date largest European-wide study on UIC revealed that UIC cooperation in the area of research, including joint and contract research, is the most sought-after type of collaboration (Davey et.al, 2018 p. 119). Following closely is the area of education. Firms are mainly interested in student mobility whilst gaining access to the best future employees (Davey et.al, 2018 p. 121). Cooperation in the area of valorization and management shows the minimum level of developed cooperation, mainly due to limited awareness of such collaboration possibilities. The table under Figure 1 summarizes and the areas of cooperation and defines their applicable context (Davey et al. 2018 p. 119).

Figure 1: Summary of areas of University-Industry Collaboration

Research:	Joint R&D, consulting to business, mobility of staff
Education:	Curriculum co-design, curriculum co-delivery, mobility of students, dual education programmes, lifelong learning
Valorization:	Commercialisation of R&D results, academic entrepreneurship, student entrepreneurship
Management:	Governance, shared resources, university support

1.3. Evidence of increasing UIC taking place

A significant amount of literature discusses the growing number of co-authored publications between academia and the industry. Pohl (2021 p. 1) suggests in his study, that there is a

[1] The term University-Industry Collaboration (UIC) is used synonymously with the term University-Business Collaboration (UBC), whereas UIC is the predominant version used in this article.

"positive correlation between the share of academic–corporate co-publications in a country and the innovation performance in indices such as the Global Innovation Index and the European Innovation Scoreboard." According to this, benefits of UIC research positively reflect the country's innovativeness and hence achieve the primary goals of the Government shareholder, namely an increase in the country's innovativeness and competitiveness. It is worth noting that the top three innovative countries according the European Innovation Scoreboard 2021 are Switzerland, Sweden and Finland (Hollanders & Rantcheva 2021), of which two countries are not members of the EU.

Further proof of this trend is provided by another study, whereby a growing cooperation in the area of UIC research (between 2015 – 2019 by 10%) can be found in the rising number of co-authored papers published by HEIs and company partners (Elsevier, updated 2021 p. 1). In addition, it has been shown that articles published in partnership with UIC have been cited significantly more than articles without such cooperation (Elsevier, updated 2021 p. 6). This indicates clearly that there is interest and trust in research conducted in the format of cooperation.

Looking back at past trends when commercialization of university research emerged as a major topic, a number of trends started evolving, such as technology, transfer or licensing office (TTO/TLO), incubators and university spin-offs. In their study, EPO (2020 p. 46) reveals that about "three quarters of patented inventions the TTO/TLO in charge of their exploitation is directly embedded in the university or public research organisation" proving its significant value of such. Entrepreneurship as a topic in universities, particularly in those without a focus on economic education, has also become a trend. More and more universities are adding entrepreneurial education to their programmes in order to prepare their students' mindset for a commercially orientated work environment.

Although University-Industry Collaborations are on the rise (Elsevier, updated 2021 p. 1), the overall engagement in UIC according to Davey et.al (2018 p. 5, 14), can still be considered in its infancy also in the EU, despite strong efforts from the EU policy and funding side looking to foster such cooperation.

2. Literature Review

For the purposes of this article a comprehensive literature review of sources and topics from the region of Europe has been conducted. While search results for stakeholders' perspectives of UIC has returned a vast number of articles, a refined search of UIC on the European region has reduced the amount to a manageable size. In general, this proves there is an extensive interest in the topic worldwide, and also within a European context.

A number of literatures indicate there is still insufficient knowledge about building successful collaboration models between university and industry (Ankrah & Al-Tabbaa 2015 p. 388, Fernandes et al. 2016 p. 879) and despite the increasing European and national government initiatives to foster such relationships, the examples of successful outcomes and case studies listed are scarce (Davey et.al 2018, Gattringer, Hutterer, Strehl 2014, p. 272, Elsevier, updated 2021 pp. 2) and tend to be of a larger and more investment intensive scale of cooperation (large corporations in partnership with prominent universities).

Although some scholarly literature defines the existing stakeholder structure and areas of conflict (Elsevier, updated 2021 pp. 2; Awasthy, R., Flint, S., Sankarnarayana, R. and Jones R., 2020) and the European Union is providing white papers and reports on UICs (EPO 2020, Maini 2020, EC, 2007, Morisson & Pattinson 2020) literature laying out detailed overviews and roadmaps for the different types of stakeholders of UIC is limited and not extensive. Little evidence is known on smaller scale UICs, as the interest in academics cooperating with larger companies is significant larger (Davey et.al 2018, p. 113; Gattringer, Hutterer, Strehl 2014, p. 281). However, helping to motivate SMEs and smaller HEI's taking the step towards entering formal relations provides significant room for grows. In addition, little has been published about the types of models for UIC cooperation (Gattringer, Hutterer, Strehl 2014, p. 276) and which models have been tested and proofed successful within the EU.

Therefore, this paper intends to solve the question of who are in detail the internal and external stakeholders and define and analyse their interest in UIC and power within such collaboration while looking at their challenges. The aim is for partners looking to enter into partnership to better manage their relationships and avoid or better tackle potential conflicts.

3. Methodology

The research design followed an approach by means of a comprehensive literature review carried out on the topic. The search included topics, such as the current state of UIC in Europe, UIC stakeholders, their values, interests and power, as well as conflicts of UIC among the primary UIC stakeholders. On one side a thematic review of most relevant scholarly literature was performed through prominent scientific databases (Google Scholar, Web of Science, Scopus). Literature in the area of UIC has proven to be extensive so that a more defined search was carried out with a narrower search of regional sources and on the specific topics from the European region. A range of most relevant scholarly articles has been selected to be of value to this article.
While researching for relevant material on this topic, it has become clear that a number of applicable information on UIC have been compiled through extensive market research by the order of the European Union or its associated organisations. Results of such studies and reports have become a valuable part of this article and supports the findings of the scholarly research used. Literature from such publications include:

- The State of University-Business Cooperation in Europe
- Improving knowledge transfer between research institutions and industry across Europe
- European Patent Office
- European innovation scoreboard 2022
- European Business and Innovation Centre Network
- Interreg Europe Policy Learning

In a first step the aim was to define the UIC stakeholder groups and their subgroups by systematically looking at who is affected by the four types of cooperation (see Table 1). In a further step a comprehensive outline of the stakeholders` interests or motivation within UIC were laid out by reviewing the literature and using the qualitative results derived by the author in her work towards her PhD thesis. This includes her direct involvement in a UIC project serving among others as a project coordinator.
The stakeholders are then being categorized based on their interest and power by placing them within a Stakeholder Matrix (also Mendelow's Matrix, or Interest-Power Matrix). Last but not least, an evaluation of commonly cited conflicts has been conducted.

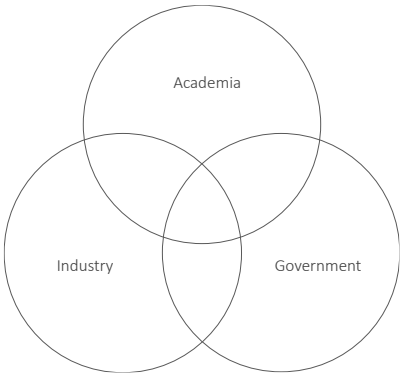
4. Results

4.1. Stakeholders of UIC

UIC combines a number of internal and external stakeholders which bring with them a very diverse set of missions, mindsets and motivation. It is therefore natural that bringing stakeholders together into a formal cooperation can create conflicts and form barriers to successful partnerships. A clear understanding of a stakeholder's position within such cooperation will help manage potential conflicts prior to them occurring. One effective way of achieving this, is through drafting a stakeholder analysis, addressing the interests and power of all involved. The key internal stakeholder groups of UIC can be identified as Academia, Industry and Government, commonly referred to as the Triple Helix (Etzkowitz and Leydesdorff 2000). The Triple Helix Approach describes some level of interaction or cooperation taking place

between two, but also all three parties, and is commonly visualized by partially overlapping circles, indicating the areas of collaboration (Figure 2).

Figure 2: Triple Helix Approach



Primary stakeholders of UIC:

- Academia refers to the higher education institutions (HEIs), such as universities and includes the institute as an organization, its management (rectorate), the faculty and its departments, teaching staff, students, researchers, as well as technology transfer consultants (i.e. TTOs – Technology Transfer Offices). The HEIs have an interest in long-term partnerships and are interested in more than one area of collaboration (i.e. research, student placement, curriculum development, etc.).
- The Industry group is presented by a firm (corporates or SMEs) as an organization, incl. its shareholders, management team, researchers and employees. Companies tend to take an active part in the formalization of the collaboration and may exert influence with their corporation strategy and company vision. Though cooperation with one HEI may include only one project, companies tend to forge long-term collaboration with more than one HEIs. Companies in proximity to HEIs tend to cooperate more than those further away (Davey et.al, 2018 p. 139), their prime motivation is directed towards research. (Davey et.al, 2018 p 119)
- According to EPO (2020 p. 35), SMEs are the most important partners for European Universities and public research organisations, particularly for planned exploitation of patented inventions (actual: 41% vs 39%, planned: 49 % vs 30%). In almost three quarters of the cases, the cooperating partner is located in the same country (EPO 2020 p. 35), reducing conflicts of cultural difference, language barriers, enabling efficient cooperation due to geographical proximity.
- The Government stakeholder, with the role of policy maker and funding support, holds a particular stake within the regional and local government, but also in the case of the EU, within an EU governance level. The government stakeholder takes on a guiding and supporting role for UICs, aiming to generate a positive outcome for the whole society, in particular for the society within its boundaries. They do not take an active part in forming and fostering collaborations between HEIs and the industry but provide instruments to do so. Their aim is to trigger UIC, while the success of their work can be found in improved economic performance of their region.

Secondary stakeholder groups include the following:

- Consumers of the product or service developed by a UIC partnership take on a passive stake, as they have little direct influence on the above cooperation. Their interests lie in new or improved products or services, bringing comfort to their lives.
- Society tends to hold a passive stake in UIC with little influential power. However, it benefits from commercialized innovation in form of increased GDP, an increase in the state's tax

income, and an increase in public spending (i.e. infrastructure, social support, etc.) added towards the well-being of their society.

4.2. Overview of UIC Stakeholders, their interest and power

The below table under Figure 3 summarizes the UIC stakeholders' interests and power, whilst taking into account the four types of cooperation mentioned in Figure 1. The list is based on content from selected literature, as well as the author's qualitative research results conducted throughout her work in preparation of her PhD thesis.

Figure 3: Overview of Stakeholders, their Interest and Power

Stakeholder	Interests	Power
Academia		
University Management/Rectorate	• Increased funding through government grants and other public sources (Elsevier, updated 2021 p. 3; Davey et.al 2018 p. 78; Gattringer, Hutterer, Strehl 2014, p. 276, 280) • Increased income through contract research, patenting, licensing or consulting, spin-offs, etc. (Gattringer, Hutterer, Strehl 2014, p. 276) • Increased competitiveness and prestige, helping to attract quality staff, researchers and students (Gattringer, Hutterer, Strehl 2014, p. 280) • Knowledge and technology transfer (Ankrah & Al-Tabbaa 2015 p. 392; Gattringer, Hutterer, Strehl 2014, p. 280) • Prestige through involvement in attractive projects and research outcomes • Improved University ranking through more publications and other factors (reputation) (Davey et.al 2018 p. 80) • Satisfying services to the industrial community and society (Ankrah & Al-Tabbaa 2015 p. 392; Davey et.al 2018 p. 78) • Satisfying government policies (Ankrah & Al-Tabbaa 2015 p. 392; Davey et.al 2018 p. 13) • Becoming part of the regional innovation system (Davey et.al 2018 p. 13)	High
Faculty & Department	• Student mobility (Davey et.al 2018 p. 13, 78) • Increased resources to develop the faculty and its departments • Enhance departments through additional funding for better staff • Prestige of association with notable industry partners • Increased professional recognition in scientific circles • Increasing number of student applications	Medium

Teaching staff	• Practical content for case studies and real examples in teaching (Ankrah & Al-Tabbaa 2015 p. 392) • Improve curricula development (Ankrah & Al-Tabbaa 2015 p. 392; Davey et.al 2018 p. 13, 78) • Additional teaching opportunities (life-long learning, corporate courses) (Davey et.al 2018 p. 13)	Low
University Researchers	• Increased opportunities to research and publish (Davey et.al 2018 p. 13, 78; Gattringer, Hutterer, Strehl 2014, p. 276; Fernandes et al. 2016 p. 878) • Opportunities for joint research output (Gattringer, Hutterer, Strehl 2014, p. 276) • Research output resulting in real application (Elsevier, updated 2021 p. 3; Davey et.al 2018 p. 13, 87; Gattringer, Hutterer, Strehl 2014, p. 276, 781) • Monetary reward for new and applicable research results • Increase achievement recognition (Ankrah & Al-Tabbaa 2015 p. 392) • Increased funding for own research projects (Elsevier, updated 2021 p. 3; Gattringer, Hutterer, Strehl 2014, p. 276) • Chances for promotion (Davey et.al 2018 p. 78) • Faster research results (Gattringer, Hutterer, Strehl 2014, p. 276) • Acquiring new skills	Medium
Students	• Chance for interesting practical work and gathering reference work • Employment opportunities (Ankrah & Al-Tabbaa 2015 p. 392; Elsevier, updated 2021 p. 3; Davey et.al 2018 p. 13, 78) • Gaining additional and practical know-how	Low
Technology transfer consultants (embedded in HEIs)	• Justify and solidify position by taking more projects • Coordination and advisory function • Financial reward	Medium
Industry		
Industry's Shareholders	• Interested in increasing profits by becoming more competitive, innovative, efficient in use of resources. (Ankrah & Al-Tabbaa 2015 p. 392; Elsevier, updated 2021 p. 3)	High
Industry's Top Management	• Access to public funding (grants) (Ankrah & Al-Tabbaa 2015 p. 392; Gattringer, Hutterer, Strehl 2014, p. 276; Gattringer, Hutterer, Strehl 2014, p. 276) • Reduce costs through shared resources (more efficient use) Gattringer, Hutterer, Strehl 2014, p. 276) • Inexpensive access to (external) qualified experts with expert know-how (Elsevier, updated 2021 p. 3;	High

	Davey et.al 2018 p. 13; Gattringer, Hutterer, Strehl 2014, p. 276) • Achieve cost savings through reduced R&D investment (Ankrah & Al-Tabbaa 2015 p. 392, Gattringer, Hutterer, Strehl 2014, p. 281) • Gain new know-how and achieve customized solutions (Davey et.al 2018 p. 80; Gattringer, Hutterer, Strehl 2014, p. 276, 281) • Satisfy company's shareholders in creating innovating products & services (Davey et.al 2018 p. 80) • Generate new patents or other licensing options • Increase company's profit and turnover (Fernandes et al. 2016 p. 878) • Enhance corporate image (Ankrah & Al-Tabbaa 2015 p. 392; Gattringer, Hutterer, Strehl 2014, p. 276) • Use of external R&D, reduce investment into R&D and reduce business risks (Ankrah & Al-Tabbaa 2015 p. 392; Elsevier, updated 2021 p. 3) • Gain competitive advantage (Gattringer, Hutterer, Strehl 2014, p. 276; Fernandes et al. 2016 p. 878)	
Industry Researcher	• Achieve research results faster (Davey et.al 2018 p. 80, Gattringer, Hutterer, Strehl 2014, p. 276) • New opportunities for research within new research facilities (Davey et.al 2018 p. 80) • Exchange with scientific researchers	Medium
Industry Employees	• Interesting new employment opportunities • Stability of work and personal income • Opportunity for further education, new qualifications (Ankrah & Al-Tabbaa 2015 p. 392)	Low
Government		
National Government	• Economic competitiveness over other countries and regions (Gattringer, Hutterer, Strehl 2014, p. 276; (Fernandes et al. 2016 p. 879) • Investment to increase long-term tax income (corporate and personal income tax) • Demonstrate how public funding is generally spent on HEIs (positive examples creating value for society)	High
Local Government	• Attracting business activities in the region, • Generating jobs and levy taxes locally • Improving the infrastructure and driving other positive societal impact	High
Consumers		

Purchasers of goods and services	• Interested in innovative products and services • Improving quality of life through better products and services	Low
Society		
The people	• Tax spending and investment into infrastructure and public services	Low

4.3. Stakeholder Matrix

For a better understanding of the motivation, influence and potential conflicts stakeholders may have within a cooperation, a Stakeholder Matrix is helpful in illustrating their level of interest and power. Results will help to prioritize and manage the stakeholders, as well as lead a project to success.

The following Stakeholder Matrix (Figure 4) maps out the individual stakeholders in a general UIC research cooperation and defines the players which need to be managed closely, kept satisfied, kept informed and be monitored. This matrix must be seen as a dynamic tool, as power and interest can change over time and stakeholders may change as well.

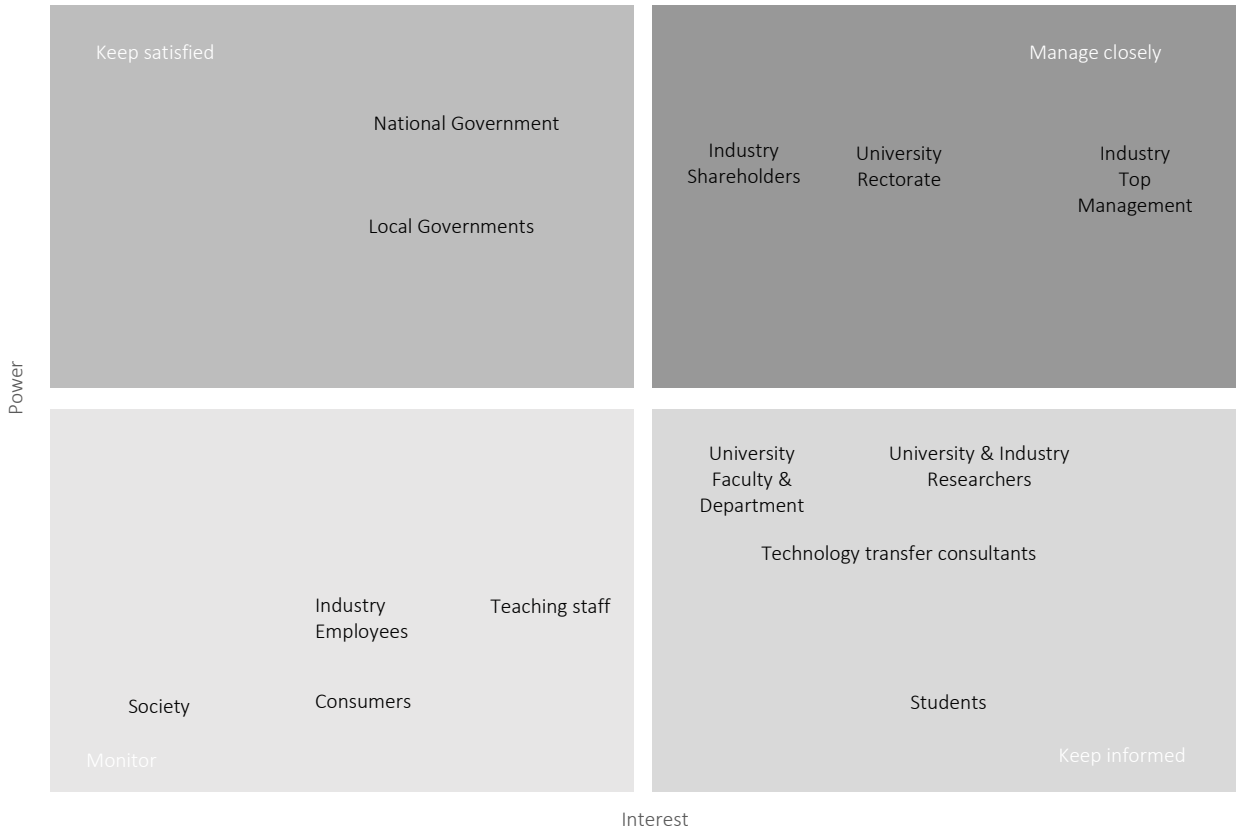
Those, whose interests in the collaboration need to be the most closely managed are industry shareholders and its top management, as well as the university management/rectorate, as they are key decision makers, responsible for financial input and outcomes of their organisations. Without their consent and commitment towards the partnership, the project is unlikely to succeed.

Governments (local and national, as well as EU level) represent a major funding partner in these partnerships and are considered to have a high power over the collaboration in form of policy and funding yet are passive in the operation of the same. They merely provide the vehicle promoting and encouraging their innovation strategies and need to be kept satisfied throughout the funding period.

Those stakeholders with less power, but a high professional interest are the staff directly involved with the partnership, namely the respective researchers, the university faculty and departments and their students. Technology transfer consultants directly embedded in the HEIs, whose job is to mediate such partnerships have a high interest and are also to be kept informed.

Stakeholders with little power and limited interest are staff of the organisations which are not directly involved in the partnership. Teaching staff faces a somewhat higher interest as knowledge exchange can influence their quality of teaching. Companies' employees are interested in the well-being of the company, their job stability and career opportunities. Society and consumers solely need to be informed about results of the UIC affecting them and are least on the priority list.

Figure 4: Shareholder Matrix



5. Discussion

Whilst UIC has proven to be of economic value, barriers and conflicts do exist, hindering a successful and widespread UIC strategy. Based on available research, the following compiles a number of important challenges for UIC and provides recommendations in overcoming these. Challenges arising may be of financial, organizational or motivational nature and can hinder the success of specific UICs.

5.1. Access to funding

According to the study 'The state of university-business cooperation in Europe', both academics and businesses rate the access to funding as being the biggest barrier to UIC (Davey et.al, 2018 p. 130). It proves that the expectation and need for public funding is indeed necessary for promoting such collaborations. Public funding is commonly used as a driver to promote UIC and is typically released on a project-by-project basis with a given timeframe. A funding prerequisite, as set out by the funding organization, is the commitment on the part of partner organizations in UIC to allot a portion of their own funding resources. This may, especially for SMEs, present a significant financial risk, as committing to funding for a period of time can be challenging, particularly when a partnership is in its early stage and expectations, relationships and outcomes are yet unclear.

It is advisable to start with overseeable projects (Davey et.al, 2018 p. 132) and grow over time, as personal relationships foster and organisational partnerships develop. Consequently, business risk becomes more measurable.

In addition, funding faces a risk at a time of projects finalisation and next investment steps need to be taken, such as the commercialization of research result. From the academic and company stakeholder point of view a timely follow-up funding is of importance to keep the collaboration going (Davey et.al, 2018 p. 130). Public funding should therefore be made available for

successfully concluded projects in a timely manner to allow remaining in the foreground on the innovation curve.

5.2. Tackling contrary mindsets and mission

Although the mission of a university and a company are fundamentally different, they contain skillsets that support an interdisciplinary approach to innovation. The traditional purpose of a university is to preserve and spread knowledge and gain new knowledge through research (Miller, McAdam & McAdam 2014, p. 1). Their mindset is to share know-how. On the contrary, the purpose of a company is to return value to its shareholders and in so doing, they aim to protect their intellectual property rights (Elsevier, updated 2021 p. 1). The company's mindset is to protect know-how and their mission is to exploit it commercially (Elsevier, updated 2021 p. 1; Miller, McAdam, McAdam 2014 p. 1). It becomes clear that with such diverse mindsets and missions, a successful cooperation faces obstacles.

To achieve a framework of cooperation, the organizations' missions need to be reviewed and possibly adapted to suit a long-term partnership. On one hand, HEIs need to place a focus on research with a view for commercialization. Some universities follow the trend of an Entrepreneurial University, a key concept of the Triple Helix model developed by Etzkowitz (cited in Feola, Parente & Cucino 2020). Their mission is following also a commercial objective. The entrepreneurial mindset is taught amongst university staff and students while offering vehicles to support student entrepreneurship.

On the other hand, companies interested in UIC partnerships need to adapt the concept of open innovation and accept to share and exchange know-how. The concept of open innovation was first introduced by Professor Henry Chesbrough who stated: "that companies should make much greater use of external ideas and technologies in their own business and in turn allow unused internal ideas to go outside for others to use in their business" (cbsnews 2009).

The traditional HEIs mindset of conducting research for the sake of research vs. industry research for commercial benefit is unsuitable for a successful UICs. Both sides must adapt some element of their partner's mindset to foster a functional cooperation. It may be summarized as "Individuals with an understanding of both academic and business worlds are considered the driving force behind successful partnerships (Edmondsen et al. cited in Awasthy R., Flint S., Sankarnarayana R., and Jones R., 2020).

5.3. Overcoming organisational and cultural differences

Organisational and cultural differences among different types of organisations can vary largely. Working in a start-up, where few staff with limited resources work under a flat hierarchy with open communication, tends to be much more dynamic and creative than working in a cooperation, where job positions and responsibilities are clearly defined, resources are well planned in advance and hierarchies seem endless. A university's organizational structure and culture yet again proves much different, as the majority of members are students rather than employees. Matching the partners organizational set-up and values is therefore not an easy task, but crucial in finding the right partner for long-term collaboration.

Furthermore, it is suggested that a Programme and Project Management approach (PgPM) helps diverse partners to define joint responsibilities by collectively planning, financing and executing their project work (Fernandes et al. 2016 p. 879). PgMP distinguishes between programmes and projects. A programme contains a number of projects, which are managed jointly to achieve synergy (Fernandes et al. 2016 p. 880). Cooperation activities with a long-term view and which trigger interest in a deeper commitment, establishing a programme may be preferable to a project framework. Establishing a joint sub-organisation, possibly with its own culture in form of a programme can eliminate those organisational and cultural differences. The aim is to overcome the largely formal collaboration agreements, turning them into informal or personal ones for the employees to be productive in an adequate work environment.

It can be concluded that, "entrepreneurial behavior of leaders is believed to influence the effectiveness of collaboration" (Awasthy R., Flint S., Sankarnarayana R., Jones R., 2020 p. 56), meaning that both university and industry leaders or those designated and responsible for

concluding such collaboration need to have a vision and leadership skills in driving the partnership and motivating the staff to open-mindedly collaborate with each other.

5.4. Sharing IP rights

Registering and sharing IP rights in a UIC partnership can face significant issues when not dealt with correctly. According to EPO (2020 p. 21) 11% of patents registered by universities or other public research organisations result from a partnership with a company, while the remainder are registered through single ownership (76%) or through a partnership with another university or other public research organisation (13%). Is shows that there remains a lack of UIC cooperation within Europe. Oftentimes a lack of knowhow, understanding and trust in concluding the sharing of IP rights can face a hinderance in UIC. Whereas in the past, European universities did not enforce strict rules on intellectual property (IP) protection, more and more universities following their own guidelines in protecting and benefitting from own and shared research. Cooperating companies will need to be prepared to share IP rights to shared research results, as in any other business relationship.

Universities in Europe, through the FAIRsFAIR initiative of the European University Association (EUE) are preparing themselves for embedding FAIR Data Practices, while making data findable, accessible, interoperable and reusable (EUE 2021). Fair practice will also apply when dealing with partners from the industry.

5.5. Human factor (trust and commitment)

The human factor in any formal cooperation plays a big role in the success of such relationships. If one party does not keep the agreed commitment, trust is lost by the other partner and the relationship and consequently the partnership will fail. The same applies to UICs and particularly the relationship between those University and Industry stakeholders involved in day-to-day collaboration.

To help overcome individual issues, a clear project management plan with defined goals, milestones, responsibilities and facilitated communication between the parties is advisable. In this kind of collaboration, each participating stakeholder must understand the benefit of this collaboration not only for the overall organisation, but also on a personal level. Direct exchange among project's members providing personal and team motivators to achieve set goals, such as team buildings or trainings nurture mutual relationships. Thus, trust and commitment are fostered. In their study "The state of university-business cooperation in Europe", the authors concluded that all UBC stakeholders are in agreement that trustworthy, committed, financed and mutually beneficial relationships drive UBC (Davey et.al, 2018 p. 84). The human factor, trust and commitment play an important role.

6. Conclusion

In conclusion, the steadily increasing efforts of national and regional governments for innovation strategies are driving UICs. Through financial resources made available, they are looking to overcome the biggest challenge of this type of cooperation. Diverse evidence shows that an increasing collaboration between academics and industry is taking place, yet the development is in an infant stage in Europe and concentrates on collaboration with larger corporations and top national universities.

The primary stakeholders of UIC are Academia, Industry and Government, as well as external stakeholders are defined by their interests and power over the partnership. Understanding the partners motivation and influence within such partnership is important for defining a successful busines model for cooperation.

Significant challenges within this formal collaboration are evident. Although a number of publications have made efforts to recommend frameworks and recommendations to improve the state of UIC, a lot has yet to be done to standardize such partnerships and achieve increasingly positive outcomes in form of commercially applicable innovation. In order to map out a Programme and Project Management Plan for successful cooperation, it is crucial to understand the interest and power of its stakeholders and how these should be managed.

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