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Abstract	Task 4.1 builds the value proposition of Unite! to reinforce business-academia cooperation, by means of stakeholder analysis: identifying the needs and value for all actors. To accomplish that, a literature review has been done about best practices of business-





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	<p>academia cooperation, a patent analysis has been run to understand the main areas of specialization of each Unite! partner, a survey has been addressed to Unite! TTOs aiming at mapping the barriers, drivers, and main activities of each one of them, and finally, a value proposition for each stakeholder has been developed. For conducting such a survey a specific instrument was developed.</p>
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History of changes

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v0.2	17.Feb.2022		Josep Bordonau - UPC	First revised version
v1.0	28.Feb.22		Coordinator and Management Team	Final version to be submitted to EC

Abbreviation list

IP – Intellectual Property

TTO – Technology Transfer Officer





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Introduction

The present report constitutes the first deliverable of work package 4 (WP4), and it refers to task 4.1.

In accordance with the initial proposal, WP4 aims at reinforcing the academia-industry cooperation, by creating “a community of Technology Transfer Offices to improve collaboration co-working with companies and institutions in the diverse Unite! regions. The TTO community will foster the participation of companies and institutions in the innovation process in the Unite! ecosystem, while assessing their requirements of structural changes regarding the use of ICT and their involvement in the SDGs, for creating an effective collaboration within Unite! This is a complement to the Regional Involvement and Innovation activities in Unite! E+.”

The objectives of WP4 are as follows. Objective 4.1 aims at creating a community of Technology Transfer Offices to improve co-working of academia with companies and institutions in the diverse Unite! ecosystems. Academia will cooperate in assessing the needs of structural changes regarding digital transformation and the involvement in the SDGs goals and building a roadmap to co-work them. WP4 also identifies resources, services, best practices, and models of Unite! TTOs to develop a common/shared offer for companies and institutions. Thematically, the technological specialisation of the Alliance members will be mapped through intellectual property analysis and other sources, with a special focus on technologies related to digital transformation and SDGs in business. Objective 4.2 aims at understanding the business point of view and developing a value proposition using stakeholder analysis.

Therefore, task 4.1 builds the value proposition of Unite! to reinforce business-academia cooperation, by means of stakeholder analysis: identifying the needs and value for all actors. To accomplish that, we made a literature review about best practices of business-academia cooperation, a patent analysis to understand the main areas of specialization of each Unite! partner, a survey to Unite! TTOs aiming at mapping the barriers, drivers, and main activities of each one of them, and finally, define a value proposition for each stakeholder in Unite! network. For conducting such a survey a specific instrument was developed.

The report is organized as follows: next we present the literature review, then the main findings from the patent analysis, the instrument developed to survey the TTOs, and results from the TTO survey, and finally the value proposition statement.





Literature Review

Universities generate two important resources for companies: (i) their education mission produces highly qualified talent; and (ii) their research mission produces knowledge with potential to offer competitive advantages to companies. These relevant roles of the university were later complemented by a third mission of making knowledge more useful to society.

Despite the obvious advantages of the synergies between the university and the industry, these collaborations do not seem to happen as often as one would expect. The search for the reasons that prevent this collaboration has been the subject of many studies, both in the analysis of examples of collaboration and in the systematization of observed collaborative models. In this report, we are particularly interested in studies that seek to identify the main factors that prevent more collaboration and also those that seem to facilitate its existence.

In classifying obstacles to collaboration, Bruneel et al. (2010) differentiate them into two types:

- The first are the obstacles related to the orientation of the two types of entities. While universities are oriented towards the generation and transmission of knowledge, industry is oriented to compete in the market and to produce value for its shareholders.
- The second type of (transaction) obstacles is related with the establishment of the collaboration itself, that is, difficulties in defining the commitments of the parties and the ownership of the results

Orientation-related barriers

The main barrier related to different university and industry orientations is the long-term goals of the first versus the short-term goals of the second. It is therefore suggested to ensure a set of mutually beneficial principles and situations that provide a long-term commitment (Awasthy et al. 2020).

In a previous article, Awasthy et al. (2017) had already identified the need for a collaboration that produces more immediate results for the industry while allowing the university to focus on more fundamental research. This paper also mentions the lack of visibility of the state and outcomes of fundamental research as an obstacle to collaboration. This results from a misalignment of goals where university researchers develop tools without concern or knowledge of their potential value to the industry (Awasthy et al. 2017).



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Finally, there is still the difficulty in finding suitable interlocutors. The initial lack of trust between the parties tends to prevent the sharing of information and knowledge necessary for the successful establishment of collaboration (Inkpen and Tsang, 2005).

Transaction-related barriers

The main barrier to contracting the collaboration is related to conflicts over the intellectual property of eventual results (Brunell et al 2010). Many entrepreneurs and business managers feel that universities exercise their intellectual property rights too aggressively, giving the impression of preventing collaboration from taking place (Siegel et al., 2003). Small and medium-sized companies also find it difficult to deal with the rules and regulations of large institutions such as universities. This barrier is not seen as so relevant by large companies, but the complex processes of approval of collaboration contracts is a barrier felt by both parties (Brunell et al 2010).

Orientation-related facilitators

The main thing that helps to establish a collaboration between university and industry is the existence of previous collaboration experience (Brunell et al 2010). For this, the recognition of organizational and cultural differences and the approximation between them (Burquel, 1997) helps. Geographic proximity between university and industry is also a good predictor of collaboration potential (Segarra-Blasco and Arauzo-Carod, 2008). Another factor that facilitates the approximation is the existence of non-formal relationships between company employees and academics. Maintaining a strong and ongoing relationship with alumni contributes to increasing the link between the industry and the university (Awasthy et al 2020).

Transaction-related facilitators

Collaboration is facilitated when industry commits to contributing additional funds to research when there are insufficient public funds (Sjöö and Hellström 2019). The previous experience of university services in dealing with industry requirements is also a factor that facilitates contracting. The existence of experienced collaborators with standardized protocol models that serve as a basis for the negotiation process facilitates and accelerates the establishment of the collaboration agreement (Brunell et al 2010). This agreement is so much easier to achieve when the parties see themselves in a situation of reputational equality. High-status universities, researchers and industries tend to be more likely to collaborate with each other (Sjöö and Hellström 2019). One way





to reduce transaction barriers is to start with small steps, such as student placements or informal collaborations, to later evolve into more sustained collaborations (Bruneel et al 2010).

Table 1: summary of the barriers and facilitators for university-industry collaboration

	Barriers	Facilitators
Orientation-related	<ul style="list-style-type: none"> Long-term vs short-term objectives Different timeframes Lack of visibility of research Goal misalignment (open vs close) Difficulty in finding the right interlocutors 	<ul style="list-style-type: none"> Previous collaborative experience Similar culture and mindsets Environmental context (proximity, government support, etc.) Non-formal external relations (alumni, previous collaboration, etc.)
Transaction-related	<ul style="list-style-type: none"> IP and commercialization conflicts University rules and regulations Complex approval procedures 	<ul style="list-style-type: none"> Availability of funds for collaboration Experienced university organization (TTO, IP policies, standard procedures, etc.) Status centrality (company and university reputations) Small collaborations are easier to setup

Conclusions of the literature review

Table 1 summarizes the results of the literature review on barriers and facilitators for university-industry collaboration. The results suggest a need for change from both sides. In the case of the universities, the Unite! network can contribute to the reduction of barriers and the empowerment of facilitators in several aspects.

The first is to help reduce bureaucratic barriers to collaboration. This can be achieved by establishing standardized collaboration models, protocols and contracts that take into account the experience of successful collaborations in the past.



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The second is to increase the innovative mindset of researchers, making them more sensitive to the role of industry in transforming their discoveries into benefits for the citizens. The Unite! network can help increase the visibility of each researcher investigation and find the right interlocutor in the industry.

The interconnection of the innovation ecosystems of each partner university will allow the contact of researchers with industries that would be difficult to access. The Unite! network may serve to increase the importance of the university's reputational facilitator within its local industry, but also to extend it to the other universities in the consortium.

Finally, Unite! could also serve to share best practices in the relationship between universities and society. This aspect should include formal activities, such as technology transfer, but also the promotion of non-formal relationships. The latter must include the way of maintaining good and continuous relations with the alumni who, as we have seen, are privileged facilitators of the university's relationship with society.

Patent Analysis

A separate report was written under the title “Comparison between the technological specialisation of the Unite! universities and their regions: An analysis carried out using EPO patent data”, a work carried out in the frame of Task 4.1 (a full version of that document is attached as a separate document).

The objective of that report was to assess how the technological specialization of the universities that belong to Unite! compares with the technological specialization of their respective regions. This was achieved by using data regarding patent applications submitted to the European Patent Office (EPO) that were published between 2001 and 2020. In addition to the identification of the specialization patterns, the collected data also allowed to track co-invention patterns within Unite! and between Unite! universities and other stakeholders, namely business companies. The analysis of the technological comparative advantage of Unite! and its members was conducted to support a more informed value proposition.

Patent data were drawn from two proprietary databases, Dimensions AI and ORBIS IP. Patent data from Dimensions was disambiguated to identify patent applications from universities, and regional patent data at the NUTS2¹ level from ORBIS IP. These two patent datasets were combined to study the technological specialization patterns of both the Unite! universities and their regions. The option for analysing EPO data instead of other alternatives (PCT applications, national applications)

¹ NUTS stands for “Nomenclature of territorial units for statistics”.

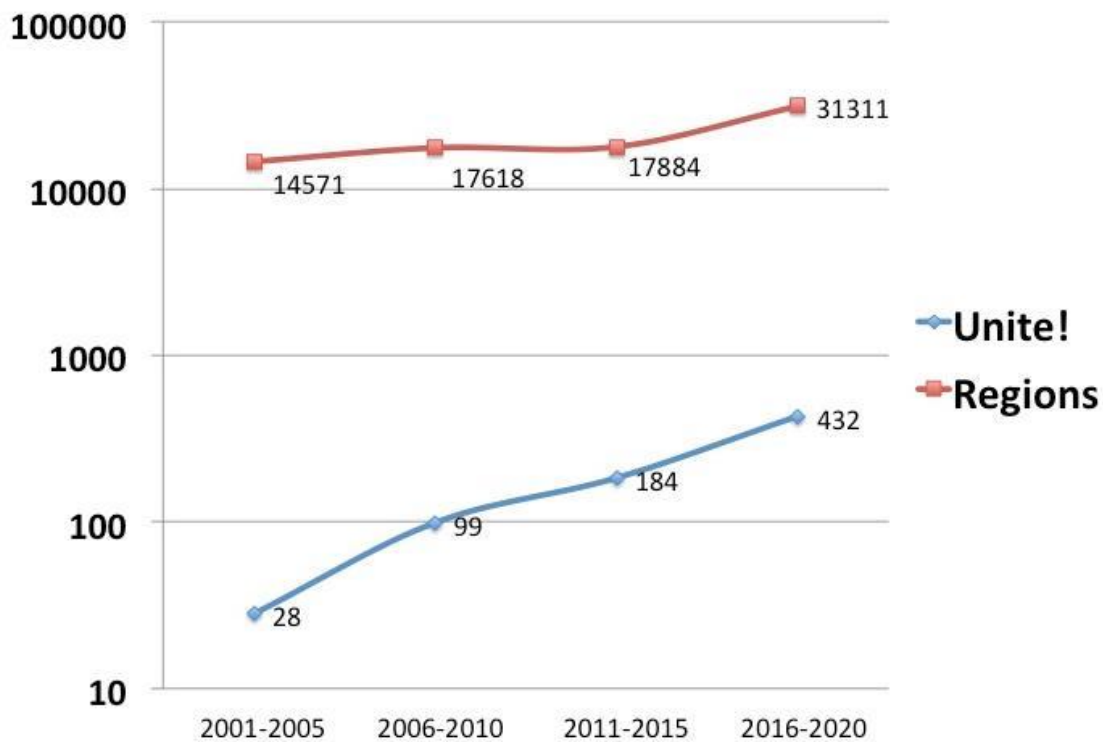




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follows the customary assumption that European universities try to obtain EPO grants for their most relevant inventions. Data was not retrieved for one Unite! member (KTH), as Sweden has kept the “professor’s privilege” system, that meaning most IP stemming from universities’ research not being registered under their name.

Figure 1. EPO patent applications by Unite! vs. respective NUTS2 regions, in 2001-2005, 2006-2010, 2011-2015 and 2016-2020



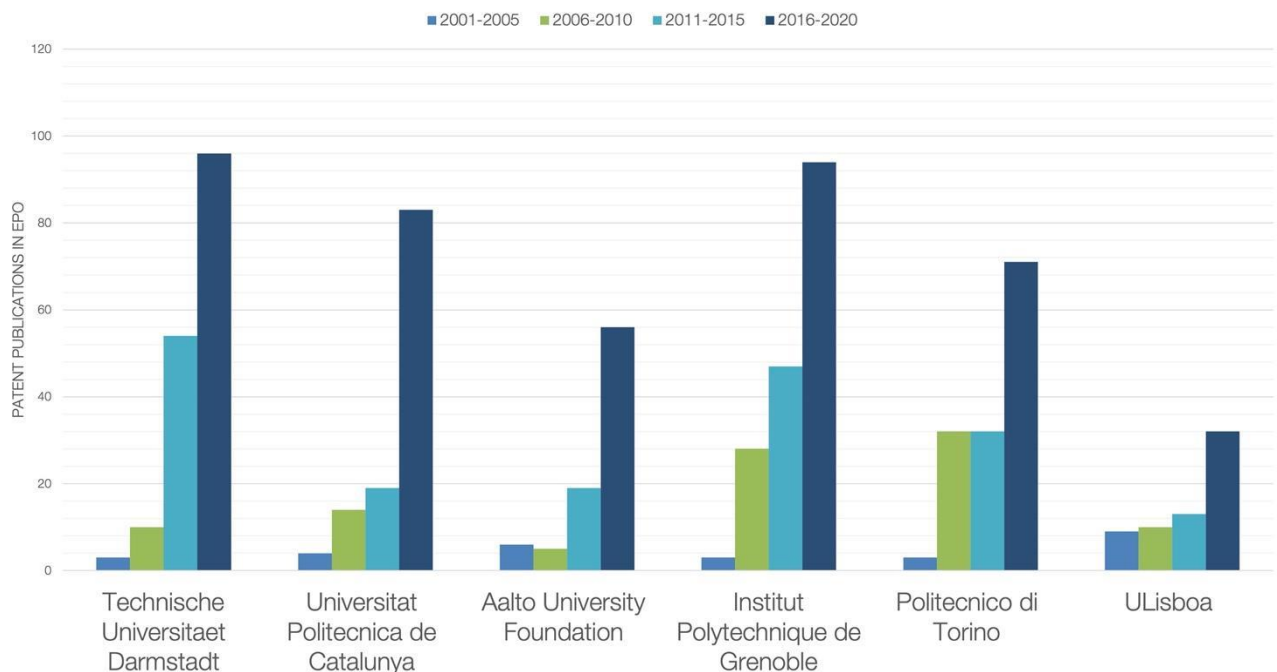
Source: Own calculations, based on Dimensions & ORBIS IP.

It was found that the Unite! universities for which patent data is available (AALTO, INP GRENOBLE, ULISBOA, POLITO, UPC, TUDa) had 746 EPO patent applications published from 2001 to 2020, a figure that compares with a total of 81,384 in their respective regions . Although during this period Unite! universities comprise less than 1% of total patent applications in their regions overall, their share has been rising faster than the regions. Specifically, the estimated annual compounded growth rate of the Unite! universities was 18.7% in 2001-2020, while for their regions was 4.9%.





Figure 2. EPO patent applications by Unite! universities, in 2001-2005, 2006-2010, 2011-2015 and 2016-2020



Source: Own calculations, based on Dimensions & ORBIS IP.

Unite! universities moved from negligible numbers in EPO patent applications in the first five-years sub-period (2001-2005), to a total varying between 30 and 100 for each of them in the most recent five-years sub-period (2016-2020). With this the Unite! universities share vs. their regions overall raised from 0.19% in 2001-2005 to 1.38% in 2016-2020.

In relation to their individual regions, the regional shares of the Unite! universities patent applications vary from less than 0.6% (Aalto, TU Darmstadt) to more than 13% (ULisboa), with these shares referring to the full period 2001-2020. In general, the Unite! universities tend to be dominant players among regional HEIs seeking patent protection, though in Catalunya (ES51) and Rhône-Alpes (FR71) other HEIs have a strong presence.

For the period 2001-2020, the analysis of patterns of technological specialization of the six universities at the IPC 1-digit level (8 IPC sections, A to H), shows that they tend to be mostly specialized in G: Physics and in H: Electricity, and also, though to a much lesser extent, in C: Chemistry, Metallurgy and in F: Mechanical Engineering.

In general, all the six universities are not relatively specialized in the sectors in which their regions are strong. The analysis shows that a significant distance exists between the universities' specializations and the respective regional specializations: The same happens in relation to the technological specialization of the EPO region overall.



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Figure 3. Breakdown of applications by patent section, Unite! universities vs. EPO, 2001-2020



Source: Own calculations, based on Dimensions & ORBIS IP.

Most of the Unite! members have a diversified technological specialization, the exceptions being ULISBOA and INP GRENOBLE, whose concentration in a few technological areas has been on the rise (ULISBOA with 71% in 2 out of the 8 1-digit IPC sections, respectively in C: Chemistry, Metallurgy and A: Human Necessities, and INP Grenoble with 68% in sections H: Electricity and G: Physics).

The report provides a more detailed analysis of the specialization, focusing on the top 10 4-digit IPC classes of each of the six surveyed universities. The weight of those top 10 4-digit patent classes varies between 35-38% (TUDa, POLITO, AALTO) and 47-48% (INP GRENOBLE, ULISBOA and UPC). The Unite! members are very active in some of the most dynamic patent classes (those classes with both higher growth rates and significant shares in the total patent





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applications) in recent years, namely in A61B, A61K, G01N, G06F, H01M, H01L, H04L,² though none of them has on its top 10 4-digit classes H04W (wireless telecommunications), one of the most dynamic patent classes globally. Two of the six universities, UPC and ULISBOA, are more specialized in the A-related classes (generally connected to health care), while the remaining are more specialized in the G- and H-related classes (generally related to electronics, computing and telecommunications). However, some of the Unite! universities are also doing quite well in some other areas, namely TUDa in F- related classes (mechanical engineering) or ULISBOA in C-related classes (chemistry). **This diverse pattern of specialization of the surveyed universities conveys the added-value of the network, as the wider scope of specialization amplifies the value proposition of Unite!**

Unsurprisingly, the technological specialization of the regions shows more stability than the technological specialization of both the universities that belong to Unite! and all the HEI in their regions. The estimated measure of technological distance shows that the gap between the specialization of the Unite! universities and that of their regions, despite remaining quite high, has been narrowing. The fact that universities' specialization displays lower stability over time reflects a smaller critical mass. Specialization fluctuation tends to intensify as the universities interact with different partners, or eventually experience higher turnover rates, with younger researchers substituting retiring colleagues.

Unite! universities are involved in co-invention activities, but their co-invention rates vary significantly, from 16% up to 84% (this is the case of INP Grenoble). In general, most of the more important co-inventors are regional or national entities. There are companies as co-inventors, but mostly the co-inventors are other universities and other public research organisations. Often one or two large companies show up in the top 5 partners, but with those companies having their headquarters in the same country as each one of the six universities. A relevant finding is that no significant co-invention was found between the Unite! members.

A limitation of the analysis is that patent applications tend to be more concentrated in some technological fields than in others. The fact that there are restrictions to software patentability in the EPO may affect the possible inferences regarding topics such as "digitalisation", for example.

TTO's Survey

The general objective of this survey is to identify both the existing activities and gaps regarding the collaboration between Unite!'s TTOs and between each University and the industry. Based on the

² A61B - diagnosis; surgery; identification; A61K - preparations for medical, dental, or toilet purposes; G01N - investigating materials by determining their chemical or physical properties; G06F - electric digital data processing; H01M - Processes or means, e.g. batteries; H04L - transmission of digital information; H04W - wireless communication networks.





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results of the literature review and the identification of best practices of collaboration, an instrument was developed to be answered by Unite! TTOs.

Methods

Instrument Development and test

The instrument was developed based on the literature, named the factors that constitute drivers or barriers for university-industry collaboration (Bruneel et al., 2010). Other questions were developed to collect information about:

- Who are the relevant stakeholders of the TTOs and what is the scope of collaboration and what are the characteristics of those stakeholders, in terms of their geographical distribution;
- Specifically for the companies with whom the TTOs interact (start-ups, SME, and large companies), what are their sizes, technological intensity, industry/sectors of specialization, and main activities and business offerings;
- Identify the benefits that each TTO can offer to Unite!, especially in the SDG and digital transformation perspectives;
- Identify the main advantages compared to competitors;
- Identify potential and expected benefits that TTO's aim to achieve with the Unite! network.

Two pre-tests were carried out with two individuals, one with a past career as a TTO officer, and another currently serving at a TTO for one of the alliance members. As a results from those pre-tests, some questions were changed to improve clarity. In Appendix A we present the questionnaire.

Data collection

The questionnaire was developed using Qualtrics software and was sent by email to Unite! TTOs. Data was collected during October 2021. Since technology transfer is organized in different ways among the Unite! network, we intended to collect data from at least one TTO or other office dealing with innovation, within each university belonging to Unite!.

We sent the questionnaire link by email to all the contacts available in "Unite! Network of Technology Transfer Offices" (project available data). Initial emails were sent between 04/10/2021 and 07/10/2021. Follow-up emails were sent on 18/10/2021.

We obtained 8 complete responses and 4 partial responses. The list of respondents is as follows (see table 2):





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Data analysis

Table 2. Survey participants

University	Unit
Aalto University	Innovation Ecosystem Services
KTH Royal Institute of Technology	KTH Innovation
Politecnico di Torino	Technology Transfer and Industrial Liaison Department (TRIN)
Technische Universität Darmstadt	Dezernat Forschung und Transfer - Referat Forschungstransfer
Universidade de Lisboa	Faculdade Ciências Universidade de Lisboa/Tec Labs
	School of Agriculture / Linking Landscape, Environment, Agriculture and Food (LEAF) Research Centre
	Instituto Superior de Agronomia – School of Agriculture
	Instituto Superior Técnico, Technology Transfer Office
Universitat Politècnica de Catalunya	Area de Recerca (TTO)
Université Grenoble INP-UGA	UGA Innovation Transfer Office
	Université Grenoble Alpes
	company Floralis, TTO of the UGA

The data collected allowed us to characterize:

- TTO's activities and distinctive features (practices, potential benefits, examples of successful university/industry collaboration, and potential gains from Unite! network);
- TTO's stakeholders (Stakeholders' industries, organization type, and geographical proximity);
- TTO/stakeholder relationship (regarding barriers to collaboration and factor's relevance);
- Intellectual property and royalties' norms adopted.

Results

The first group of questions aimed at understanding the current practices about innovation's ownership regarding Intellectual Property (IP) and Royalties, an information that can be relevant in future partnerships among Unite! members. Table 3 depicts the current state of intellectual property, inventor's share of revenues and spin-offs of IP licensing. We can see that for the majority of the respondents, the university owns the IP but the inventor has a share of the revenues.





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Table 3. Intellectual Property and Royalties

University/ Unit	Intellectual property	Inventor's Share of revenues	Inventor's Share of revenues (detail)	Spin-offs IP licensing
Aalto University Innovation Ecosystem Services	Inventor and university	yes	40% of net income the University receives	yes
KTH Royal Institute of Technology KTH Innovation	Inventor	no		yes
Politecnico di Torino Technology Transfer and Industrial Liaison Department (TRIN)	Inventor and university	yes	50% of profit	yes
Technische Universität Darmstadt Dezernat Forschung und Transfer - Referat Forschungstransfer	University	yes	30% royalty share of the income generated by university according to the German employee inventor act	yes
Universidade de Lisboa Faculdade Ciências Universidade de Lisboa/Tec Labs	University	yes	75%	yes
Universidade de Lisboa Instituto Superior de Agronomia – School of Agriculture	Inventor and university	no		no
Universidade de Lisboa Instituto Superior Técnico, Technology Transfer Office	University	yes	After deducting the costs, 80% up to 500K euros and 50% on wards.	no
Universitat Politècnica de Catalunya Area de Recerca (TTO)	University	yes	50%	yes
Université Grenoble INP-UGA Innovation Transfer Office	University	yes	50% of the royalty received	no
Université Grenoble INP-UGA company Floralis, TTO of the UGA	University	yes	basically, 50% of the revenues after deduction of the IP and other expenses	no

To further understand the nature of the activities of each Unite! TTO, we asked respondents to identify the main activities, types of organizational stakeholders and industries. Tables 4, 5 and 6, respectively present the summary of responses regarding those dimensions. We can see that advice on IP and contracts, support for university spin-offs and strategic alliance establishment with industry partners, are the top three main activities carried out by Unite! TTOs. Students' placement and alumni relationship management are the less expressive activities in this context.

Table 4. Main TTOs activities

Activity	AVG (1)	Rank
Advice on Intellectual Property (IP) and contracts	2.24	1





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Support for University spin-offs	2.74	2
Strategic alliance establishment with industry partners	3.29	3
Project management	4.62	4
Contract Research	5.26	5
Consulting	6.14	6
Other activities	7.48	7
Student master or PhD thesis with industry collaboration	7.50	8
Alumni relationship management	7.62	9
Student placement	8.12	10

(1) AVG stands for the average positioning by the respondents in a ranking from 1st (most important) to 10th (less important).

The type of organizational stakeholders is concentrated in university spin-offs, large mainly domestic enterprises, and other technology-intensive SMEs (table 5) whereas information and communication and professional, scientific, and technical activities are the top two sectors reached out by Unite! TTOs (table 6).

Table 5 Main types of organizational stakeholders

Stakeholders type ranking	AVG (1)	Rank
University spin-offs	2.18	1
Large mainly domestic enterprises	2.39	2
Other technology-intensive SMEs	2.96	3
Large multinational enterprises	3.00	4
Other business companies	4.86	5
Other organisations	5.61	6

(1) AVG stands for the average positioning by the respondents in a ranking from 1st (most important) to 6th (less important).

Table 6. Top industries covered by Unite! TTO's

Top 5 Industries	# of TTOs
Information and communication	8
Professional, Scientific and Technical Activities	8
Manufacturing	6
Human Health and Social Work Activities	6
Electricity, Gas, Steam and Air Conditioning Supply	4





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Tables 7 and 8 present respectively the drivers for university-industry collaboration and the barriers to the quality of the university-industry collaboration.

Table 7. Drivers for University-Industry collaboration

Important Factors to The Quality of The University- Industry Collaboration	AVG of Importance (1)
Status centrality (university, researchers, and company reputations)	3.93
University organization (TTO, IP policies, etc.)	3.86
Resources (availability of funds for collaboration)	3.79
Culture (researchers' entrepreneurial mindset)	3.71
Collaborative experience (previous collaborative experiences)	3.64
Environmental context (proximity, government support, etc.)	3.61
Boundary-spanning functions (non-formal external relations)	3.00

(1) AVG stands for "average" in a scale of 1 to 5; 1=not important; 5= very important; Weighted average (1/7 factor)

Table 8. Barriers to University- Industry collaboration

Main Barriers of the University- Industry collaboration	AVG of Importance (1)
Lack of understanding about expectations and working practices	3.50
Concerns about confidentiality vs. the need for publication of research results	3.43
Difficulties for the industry to find a interlocutor (Absence or Low profile of TTOs)	3.39
Orientation towards pure science: researchers do not apply their research	3.36
Industry' s acceptance of rules and regulations	3.29
Long-term orientation vs. immediate problems faced by the industry	2.86
Oversell research or unrealistic expectations regarding University IP	2.86

(1) AVG stands for "average" in a scale of 1 to 5; 1=not important; 5= very important; Weighted average (1/7 factor)





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The next three boxes identify the results from the TTOs' survey, with regard to respectively:

- (i) some distinctive practices pointed out by respondents
- (ii) the potential benefits offered; and
- (iii) the potential gains from Unite! network.

Box 1. The distinctive practices of the TTOs, as pointed out by respondents

- Active role in supporting the researchers in concept development from invention disclosure to commercializable innovation.
- Development of the KTH Innovation Readiness Level (TM) Model that is the core of the support process.
- Very active support around team building and recruitment.
- Innovation panel that uses the alumni and network to get feedback on new ideas in a scalable way.
- Standardized method for consulting founders and another for consulting inventors of university. Overall, offer an open-minded technology transfer consultation which considers the individual personality and motivation of the researcher.
- Procedure for knowledge transfer/valorization established with all needed support documents and a dedicated team trying to do a constant work of scouting of projects - Proof of Concept programs Challenge@PoliTo The spin-off chains and ScienceIN2Business
- Work with many universities and industry entities, both nationally and internationally, thus offering UNITE! TTOs contacts towards creating new and productive partnerships.
- The involvement of the IP unit in the analysis of the IP clauses of all research contracts that do use the pre-approved standardized clauses.
- A well-defined IP policy that regulates the ownership of IP of professors, researchers, grant holders and students, together with a budget and rules for the internationalization of patents.
- Innovation Ecosystems: Creation of a means of relationship between university and society, based on workshops, coffee-breaks,... bidirectional, not only from University to society. Promoters specializing in technologies
- Incentives for researchers who are involved in innovation projects Phd innovation award Innovation and transfer awareness-raising measures





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Box 2. Potential benefits offered

- Direct links to the Finnish innovation ecosystem and experience in the creation of an Innovation Ecosystem
- Experience in collaborations with different stakeholders (company, SME, Venture Capitalist)
- Professionalism, networks and an Innovation and business platform HIGHWAY (<https://www.highway.tu-darmstadt.de/public/>)
- Share best practices of the implementation of our Entrepreneurship & Innovation Education Department and the ScienceIN2Business implementation data and learnings.
- Broad expertise in areas from social studies to artificial intelligence offers stakeholders a wide range of competences.
- Industry: "**one place shop**" for matters related with IP licensing, building bridges in finding experts or in setting innovation or pre-competitive research projects, Talents@Tecnico program (job bank, job fairs, career weeks, summer internships, etc.).
- Researchers: help with the negotiation of IP clauses in industry sponsored research, promotion of IP protection in IP Talks@Tecnico, handling of invention disclosures and the process that leads to the establishment of an IP right, support in bringing technology to the market (Lab2Market program, contacts with investors, etc.)
- Students: Career Discovery@Tecnico (career training, internships, mentoring, etc.), support of student clubs and societies, handling of invention disclosures by students.
- Alumni: involvement in Tecnico Alumni Network, opportunities for mentoring, possibility of creating bridges between their employer and IST Tecnico, alumni founders can apply to the IST spin-off community.
- Incentives for researchers who are involved in innovation projects Phd innovation award Innovation and transfer awareness-raising measures

Box3. What are the potential gains from Unite! network

- Wider network of potential collaboration partners and investors as well as learning from benchmarks.
- International contacts and networks.
- Getting new ideas of doing business and enhancing our offerings.
- Build upon synergies and existing contacts and include respective parties in a constantly self-adapting network given needs and demands.
- Learning with universities with much more mature ecosystems how to grow and scale other internal ecosystems in terms of industry connections and partnerships but also in the tech transfer work we do.
- A network of Unite! TTOs could help in providing greater visibility not only to the IP portfolio, but also to the researchers that created it.
- Share and manage the IP portfolio to promote our patent portfolio to be attractive and licensing it.





unite! | Definition of the value propositions for the Unite! network

The main challenge is to identify business-academia opportunities of cooperation that can be leveraged by and to other members of Unite!

In the literature, value proposition has been defined as “the firm’s single most important organizing principle” (Webster, 2002, p.61). In the present case of the Unite! Network, the purpose of the value is reinforcing business-academia cooperation, through the identification of the needs and value for all actors.

The literature review, the patent analysis and the TTO survey results provided the necessary inputs to develop the individual value propositions directed to specific stakeholders. First, the identification of best practices in business academia collaboration set the ground for the differentiated value creation for the Unite! network. Additionally, the patent analysis provides important insights regarding both the technological specialization and complementarities between the Unite! members and how they perform vis-à-vis their business stakeholders. That is complemented with the data collected through the TTO survey. This allowed us to determine the core value of existing TTO offerings and develop a first version for the value propositions.

Based on the outcomes of the previous steps, a draft of the value creation opportunities was put forward and discussed in a workshop conducted with WP4 participants. That workshop was held during February 2022 and counted with the participation of representatives of the following alliance members: University of Lisbon, Universitat Politècnica de Catalunya, Aalto University, Technische Universität Darmstadt and KTH Royal Institute of Technology. It started with the presentation of the main results from the literature review, IP analysis and the TTO survey. It was acknowledged that each of the Unite! universities has specific, different organizational business models to connect and interact with the stakeholders. Additionally, the alliance members also show different degrees of maturity and intensity in tech transfer activities, as well as in the patterns of technological specialization. The TTO survey results show that the alliance members display best practices in different activities areas, such as invention stimulation (PhD awards...), IP licensing and contracts, start-ups incubation and acceleration, research by contract, students’ placement (internships, jobs after graduation) and allocation of students to collaborative research (in connection to master and PhD thesis). It was pointed out that those best practices could be shared among Unite! TTOs to foster the creation of an innovation ecosystem at a European scale. Before opening the discussion





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to get feedback on the contents of the value propositions, the draft proposals contained in Box 4 were presented to start the debate.

Box 4. Unite! TTOs value proposition: Draft proposals

For companies

- **Unite! can provide specialized knowledge in a wider, diversified set of technological fields**

(it's possible to stress the fact that the Unite! network manages a diversified IP portfolio)

(it's possible to state the areas with more patenting and those with higher revealed technological comparative advantage)

- **Additionally, the network can make available talent (through students' placement) matching your needs**

For students

- **Unite! can facilitate mobility of their students to partner companies across the network**

The workshop participants reinforced the importance of the following topics to be included in the value proposition:

- Importance of having access to people and teams with distinctive knowledge and know-how that are valuable to the Unite! Stakeholders;
- Greater IP portfolio that could be "packaged" / "bundled";
- Increase visibility, transparency, and communication of areas of expertise to Unite! members and stakeholders;
- Importance of centrality of each university that belongs to Unite! in their respective national/regional settings, providing reciprocal access to the alliance partners and to their local stakeholders to that network;
- Role of Unite! on providing better conditions for high growth start-ups;
- Implement the "one stop shop" concept with advantages in terms of costs and time savings.

In the subsequent discussion, the following drafting of the value proposals was put forward:





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- *For companies:* Unite! is a recently established pan-European alliance of universities which excel in research and teaching in their respective regional/national contexts. Unite! convenes now a unique research power of 20,000-plus researchers across Europe, carrying out research in a multiplicity of frontier and applied areas. Unite! universities are actively engaged in partnerships with companies in the past and have the relevant know-how to keep up teaming with your company in finding innovative solutions. Since 2001 the members of Unite! submitted 700+ patent applications to the European Patent Office, with its members managing an extensive patent portfolio, providing business opportunities across a diversified set of technological areas. Additionally, the network can make available talent through students' placement matching your needs.
- *For students:* Unite! is a recently established pan-European alliance of universities which excel in research and teaching in their respective regional/national contexts. The members of the Unite! alliance are actively engaged in partnerships with companies to develop innovative solutions. Unite! can now facilitate the mobility of its students to our partner companies across Europe.

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Appendix A

QUESTIONNAIRE – TTOs of Unite!

This is a brief questionnaire whose objective is to characterise the activities of Unite! Universities TTOs and of any other units involved in knowledge transfer to the business sector, such as the support to university spin-offs, the promotion and formalisation of University-Industry collaborations, etc. For simplicity below we will refer simply to “TTO”.

The information collected will be used to help in the formulation of the “value proposition” of the TTOs belonging to Unite! Your answers to questions are particularly relevant given this purpose. We are not seeking precise quantitative values; please rely on your best judgement about your TTO activities in recent years (say last 3-5 years).

1. Identification

Name of University:

School/ Research Center/ Unit:

Job title:

TTO Activities

1. Please, rank the following activities that are within the scope of your TTO in terms of importance:

- a) Student placement
- b) Student master or PhD thesis with industry collaboration
- c) Alumni relationship management
- d) Consulting
- e) Contract Research
- f) Project management
- g) Strategic alliance establishment with industry partners
- h) Advice on Intellectual Property (IP) and contracts
- i) Support for University spin-offs
- j) Other activities

2. Please indicate the total number of people working in the TTO

3. Please indicate the number of people (FTE) dedicated to each of the following activities:

- a) Student placement
- b) Student master or PhD thesis with industry collaboration
- c) Alumni relationship management
- d) Consulting





- e) Contract Research
- f) Project management
- g) Strategic alliance establishment with industry partners
- h) Advice on Intellectual Property (IP) and contracts
- i) Support for University spin-offs
- j) Other activities

Clients Characterization

4. In terms of the distance of the companies that interact with your TTO, indicate approximately the percentage for each of the following:

- a) Local (up to 10km) _____ %
- b) Regional (up to 50km) _____ %
- c) National _____ %
- d) International _____ %

Note: The companies with which your TTO is collaborating may have their headquarters outside your university's region. We suggest however to classify them as a) or b) if your TTO is interacting with local branches of those companies.

5. Which are the top 5 sectors/ industries the TTO is relating to?

- a) Agriculture, Forestry and Fishing
- b) Mining and Quarrying
- c) Manufacturing
- d) Electricity, Gas, Steam and Air Conditioning Supply
- e) Water Supply; Sewerage, Waste Management and Remediation Activities
- f) Construction
- g) Wholesale and Retail Trade; Repair of Motor Vehicles and Motorcycles
- h) Transportation and Storage
- i) Accommodation and Food Service Activities
- j) Information and Communication
- k) Financial and Insurance Activities
- l) Real Estate Activities
- m) Professional, Scientific and Technical Activities
- n) Administrative and Support Service Activities
- o) Public Administration and Defence; Compulsory Social Security
- p) Education
- q) Human Health and Social Work Activities
- r) Arts, Entertainment and Recreation
- s) Other Service Activities
- t) Activities of Households as Employers; Undifferentiated Goods and Services Producing
Activities of Households for Own Use
- u) Activities of Extraterritorial Organisations and Bodies



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6. Please, order the following types of stakeholders by their relative importance in terms of the services provided by the TTO:

- a) Large multinational enterprises _____
- b) Large mainly domestic enterprises _____
- c) University spin-offs _____
- d) Other technology-intensive SMEs _____
- e) Other business companies _____
- f) Other organisations _____
- g) Note: In case the % in f) is bigger than 20%, please identify which are the relevant "Other organisations" and their relative weight (%) in the TTO services:

IP Protection

7. Who is the owner of inventions created within the university?

- a) The inventors
- b) The university
- c) Both

8. Is it mandatory to pay the inventors in the case of licensing?

- a) Yes
- b) No

9. In case you answered yes to the previous question, please tell us what is the typical royalty share for the inventors

10. Can the IP licensing to the University spin-offs be swapped by equity?

- a) Yes
- b) No

Factors and Barriers in University- Industry collaboration

11. Please indicate the importance of each of the following factors to the quality of the University- Industry collaboration (1~5; not important ~ very important):

- a) resources (availability of funds for collaboration)
- b) university organization (TTO, IP policies, etc.)
- c) boundary-spanning functions (non-formal external relations)
- d) collaborative experience (previous collaborative experiences)
- e) culture (researchers' entrepreneurial mindset)
- f) status centrality (university, researchers and company reputations)
- g) environmental context (proximity, government support, etc.)





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12. Please, classify the importance of each of the following barriers to the collaboration between your university and industry (1~5; not important ~ very important):

Orientation-related barriers:

- a) University research is extremely orientated towards pure science: researchers do not apply their research resulting in a lower number of invention disclosures and in a low level of industry collaboration.
- b) Long-term orientation of university research prevents research to address more immediate problems faced by the industry.
- c) Lack of understanding about expectations and working practices of university researchers and industry professionals.

Transaction-related barriers:

- d) TTOs tend to oversell research or have unrealistic expectations regarding the value of University IP.
- e) Potential conflicts and concerns about confidentiality of the results of university-industry collaboration and the need for publication of research results.
- f) Rules and regulations imposed by universities or government funding agencies that the industry has difficulty in accepting.
- g) Low profile of TTO in the university which makes it difficult for the industry to find the right interlocutor.

13. Other barriers that you think are important and did not appear above:

Unique characteristics of your TTO

14. Please identify in which way your TTO differentiates itself from other organizations delivering similar services.

15. Can you name a few practices of your organization that you believe are distinctive and that can benefit other Unite! TTOs?

16. Please identify what could be the potential benefits your TTO could offer to other Unite! Universities' stakeholders.

17. Please identify what will be the potential gains in terms of improving your TTO services to its stakeholders stemming from being involved in the Unite! network.

18. Please, give us an example of a successful University-Industry collaboration that you would like to highlight, stressing the value proposition and benefits offered to the company and the main obstacles that you faced in that collaboration.





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Next steps after your responding to this questionnaire

Based on the results of this questionnaire, we will develop a value proposition for the industry-academia collaborations of Unite! Towards that objective, we aim at conducting a focus group with industry stakeholders.

19. Please indicate the names and email contacts of 1 or 2 key stakeholders for each group that could be contacted to participate in a survey or focus group:

- a) Large multinational enterprises _____
- b) Large mainly domestic enterprises _____
- c) University spin-offs _____
- d) Other technology-intensive SMEs _____
- e) Other business companies _____
- f) Other organisations that you think is relevant in the context of the present work _____

