



# UniBus Methodology

*Cooperation for innovation and the exchange of good practices*

## Intellectual Output 2 (IO2)

*Authors: Ekaterina Albats (LUT)*

*Contributors: UniBus Consortium*

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## Abstract

This intellectual output (IO) 2 is a deliverable in the UniBus project (PROJECT NUMBER - [2017-1-TR01-KA203-046678]). It is based on the concept, requirements for UniBus (IO1) as well as the field studies conducted by the UniBus project consortium for the project. This document outlines the key stakeholders in the university-business collaboration, the key barriers and drivers in such collaboration, the main collaborative modes. It also provides an overview of the existing digital solutions facilitating university-business collaboration, outlines their strengths and weaknesses and implications for the UniBus platform development. The proposed framework is based on the university-business collaboration process model (its key stages) and follows the needs of the key stakeholders (potential platform users) involved – university’ teachers and students as well as company representatives involved in collaborations.

## 1. UniBus State-of-the-art

This chapter outlines the state-of-the art in university-business collaboration (UBC) – as a starting point and problem statement for UniBus methodology. It introduces the key stakeholders in UBC, the differences in their rationale and motivation, which in turn helps to introduce the barriers and drivers of UBC. The chapter follows with outlining the UBC as a process and its key stages. Finally, the chapter closes with a brief overview of the market of digital solutions designed to facilitate UBC.

### 1.1. University-Business Collaboration Stakeholders

Despite the university-business collaboration being an action of only two actors by default, in the age of an increasingly connected society and knowledge-based economy, these relations involve more than universities and companies as the stakeholders (Lambert, 2003; Carayannis and Campbell, 2010) – see Figure 1.

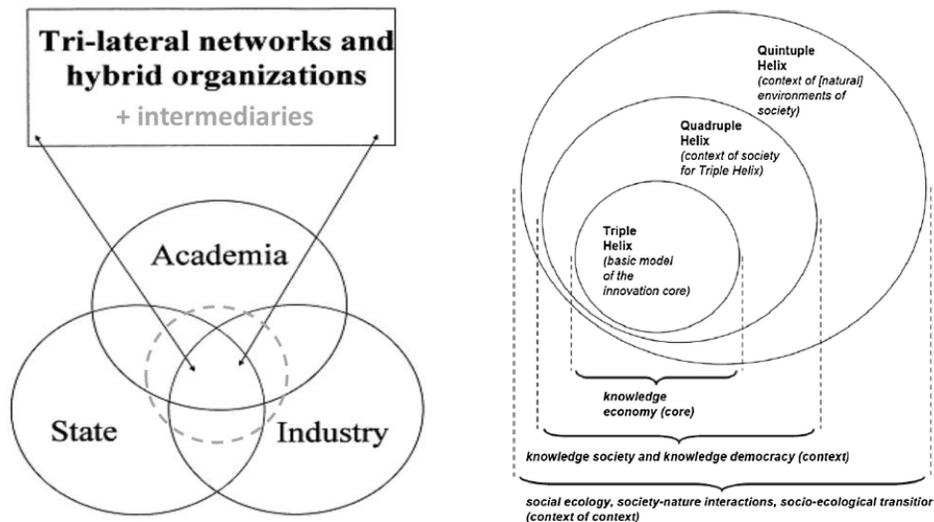


Figure 1: mapping the stakeholders of university-business collaboration (Etzkowitz and Leydesdorff, 2000; Carayannis and Campbell, 2010; Albats, 2018)

The following Table 1 outlines the key collaborating stakeholders in UBC as well as their key motives for playing a stakeholder role in university-business collaborations. As it can

be seen those vary significantly from one stakeholder to another (Parker, 1992), which additionally points out to the challenges in bridging academia and industry (Galán-Muros and Plewa, 2016)

Table 1 – University-business collaboration stakeholders

#	Stakeholder	User groups	Key motives for playing a stakeholder role in University-Business collaboration
1.	University	Students	Career/employment prospects
		Teachers	Curriculum development and its alignment with the current industrial needs
		Researchers	Recognition within the scientific community; additional research funding
		Administrative	University marketing, partnerships and funding
2.	Business/Company	R&D (project) manager / director; university relations manager	Maintain control of proprietary technologies, ideas; access to university facilities and talents (students, researchers)
3.		HR manager	Access to university talents (students, researchers)
4.	Intermediaries		Financial gain – transactional fees, monitoring of industrial needs and university research results; additional research funding
5.	Government		Economic, innovation and social development on the regional and national levels
6.	Society		Economic, innovation and social development on the regional and national levels

### 1.2. University-Business collaboration domains and challenges

The university-business collaboration happens along the three key dimensions (see Table 2):

- 1) *education* (collaborative curriculum design and teaching students in collaboration with business partners; lifelong learning and training company employees; employment of students by companies);

- 2) *research* (mobility of staff between universities and companies; collaborative R&D) as well as
- 3) *valorization* (which implies entrepreneurship among university staff and students as well as commercialization of university R&D).

The challenges in UBC include such issues as a *connection barrier* (see Table 2) – being so diverse in nature, companies and universities struggle to identify the best fitting potential partners as well as value of each potential collaboration (Galán-Muros and Plewa, 2016). That creates a demand in matchmaking instruments to help the companies and universities to find each other and build at least an initial connection. Another barrier in UBC is a *lack of funding* as UBC as any multi-stakeholder collaboration requires additional coordination costs. *Differences in organizational culture* between companies and universities is also a barrier: higher educational institutions e.g. are often oriented towards long-term goals, while business is demanding for ready-to-implement and fast impactful solutions. Furthermore, universities and companies usually have very different organizational structures and internal operational procedures with varying levels of bureaucracy, which leads to the challenge of the *differences in the internal organizational characteristics*.

However, there are also factors, which are able to drive and steer UBC. Among those are *resource availability* (both financial and human resources): to establish and run a collaboration. Furthermore, there is a *relationship driver* – the previously carried out UBC partnerships and awareness of the existing links support follow-up collaborations. From prior relationships, an important relational component of ‘trust’ is being developed and this factor often becomes vital in the future partners selection. Established and prior collaborations are also particularly helpful in the development of shared goals and aligning expectations (Galán-Muros and Plewa, 2016)

Table 2 – University-business collaboration domains & activities, barriers & drivers  
(Galán-Muros and Plewa, 2016)

Factors		UBC domains and activities	
<b>Barriers</b>	Connections	Education	Curriculum design and delivery
	Funding		Lifelong learning
	Org. culture		Student mobility
	Internal characteristics	Research	Professional mobility
<b>Drivers</b>	Resource availability		R&D
		Valorization	Entrepreneurship
	Relationships		Commercialization

### 1.3. University-Business Collaboration Process

To facilitate university-business collaboration and coherent understanding of the process behind it is necessary. Figure 2 below outlines the five key stages of any UBC process based on the prior literature (Perkmann, Neely and Walsh, 2011; Albats, Fiegenbaum and Cunningham, 2018).

As any process, UBC starts with *inputs* – each collaborating party’ motivation, commitment, capabilities and resources (financial, human resources, infrastructure, etc.). Then, as outlined above, the UBC may take various forms of *in-process* activities: collaboration in education, in R&D, commercialization of university research outcomes or a combination of those. The immediate *outputs* may include new knowledge (the ‘know-

what’) and technologies (‘the know-how’) as well as developed skills of students and universities’ and companies’ staff. The further *outcomes* of UBC include new ideas, solutions, new products and services as well as increased employment. The greater impacts of UBC include the economic growth (through new value created in collaborative innovations), scientific advancements and human capital development. It is important to note that depending on the initial plan of any particular UBC, its priorities as well as expectations of all the stakeholders involved the particular components may vary from stage to stage (Albats, Fiegenbaum and Cunningham, 2018).

What was also found important is the need to continuously (at all the collaboration stages) govern, monitor and reflect on each UBC process (Albats, Fiegenbaum and Cunningham, 2018). That allows partners to make amendments in the ongoing partnerships as well as evaluate the work and fit of the partners involved into collaboration. Moreover, it helps organization’s self-assessment, which in turn points out to the internal organizational weaknesses, lacks of certain capabilities, and thus supports their further development.

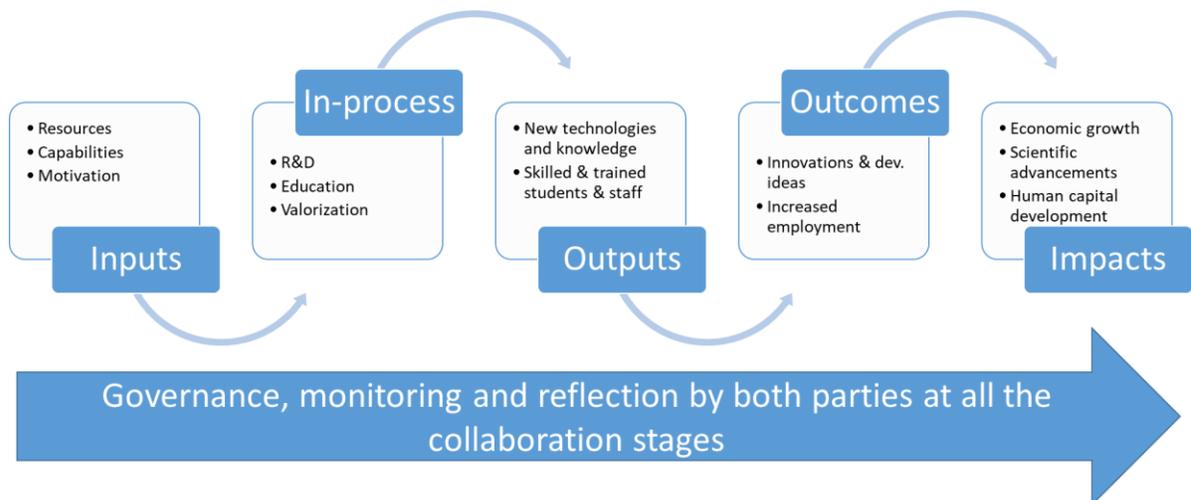


Figure 2: University-business collaboration process (based on Perkmann, Neely and Walsh, 2011; Albats, Fiegenbaum and Cunningham, 2018)

#### 1.4. Overview of the Existing Platforms & Methodologies

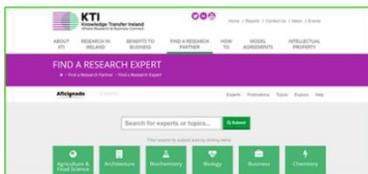
To understand the landscape of the existing digital solutions for facilitating the university-business collaboration a comparative analysis has been carried out (for methodological details see Albats and Alexander, 2017). A sample of nine existing platforms bridging universities and companies was analyzed – see figure 3. Those analyzed platforms were clustered into three key groups according to their key functions:

- 1) The digital platforms supporting *training students* based on the real company challenges. The examples of those include: [www.edusourced.com](http://www.edusourced.com); [www.nimblebee.eu](http://www.nimblebee.eu); [www.telanto.com](http://www.telanto.com) – all commercial businesses enabling challenge-base students education. Those are developing and growing with its both strengths as well as weaknesses and limitations. Those limitations include narrow/thematic scoping, making the solution fitting the needs of only limited number of companies and universities globally as well as imperfections in the software tools and processes operating behind each platform. However, as any young businesses those are actively growing and developing to meet a growing demand.
- 2) Tools for *finding a partner* – match-making and networking tools, such as [www.konfer.online](http://www.konfer.online), [www.knowledgetransferireland.com](http://www.knowledgetransferireland.com) – mainly state-supported instruments often having a strong national/regional focus.
- 3) The digital tools for *commercializing the university research results*, such as [www.in-part.com](http://www.in-part.com); [www.leadingedgeonly.com](http://www.leadingedgeonly.com) or [www.seedsprint.com](http://www.seedsprint.com). Those tools often match a university inventor or the university' technology transfer office with the potential technology buyers – commercial companies.

Training students:



Finding a partner:



Commercializing:

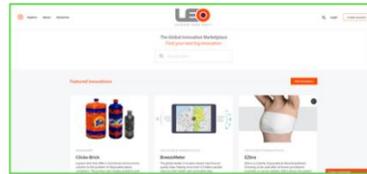
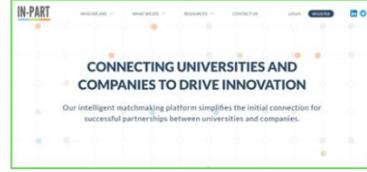


Figure 3: a set of UBC platforms analyzed in-depth – by their key functions

The UniBus project by its aims targets to particularly develop a new solution and related methodology for the function targeted by the cluster 1 – *training students*, as this type of solutions involve not only the university' and company' staff, but also the talents of the next generation professionals – the university students.

## 2. UniBus Methodology: against the process stages and stakeholders' perspectives

This chapter outlines the UNiBus methodology along the university-business collaboration (UBC) stages elaborated based on the high-level UBC process stages (see chapter 1.3): UBC initiation, kicking the UBC off, UBC implementation, UBC evaluation and follow-up.

### 2.1. UBC initiation

UBC initiation stage – the start of university-business collaboration, stakeholders' perspectives and implications for UniBus (Platform) methodology:

UBC phases & steps	UBC steps described	University perspective	Business perspective	Implications for UniBus (Platform) methodology
<b>Triggers for UBC</b>	Sensing the triggers for UBC, framing the internal (org./team) motivation & goals, formulating the challenge/problem.	Need in e.g. validating research findings, sensing new research directions, practice-based learning for students, making a social impact, access to research funding or facilities.	Need in exploring new/fundamental technologies, lack of qualified or specifically trained HR, motivation to make a social impact, develop an industrial standard, get challenges solved, access to research funding or facilities.	*Multi-user interface (university researcher, student, tech-transfer expert; company technology scout, HR specialist; trainer; governmental agent) *Multi-rationale based platform description
<b>Need for UBC partner(s)</b>	Internal capabilities & recourse assessment => identification of the need in UBC partnership	Identifying the need in business expertise, resources or capabilities.	Identifying the need in academic expertise, resources or capabilities.	*Showcasing UBS through success stories *Outlining the challenges that UBC helps to solve
<b>UBC scope &amp; domain</b>	Pre-selecting the UBC domain according to the goals	education / research /valorization – or any combination of these collaborative streams	education / research /valorization – or any combination	*Categorizing the UBC practices

			of these collaborative streams	*Multi-purpose interface
<b>UBC partner(s) search, assessment &amp; selection</b>	Identifying the criteria for selecting and evaluating the fit of potential partner(s)	partners' field of expertise (patents, products, services), location, past collaborations, goals, interests, motivation, etc.	partners' field of expertise (patents, publications), location, past collaborations, goals, interests, motivation, etc.	*Match-making instruments *Partner mapping tools
<b>Contacting the UBC partner(s) and UBC arrangements</b>	Initial and follow-up contacts, identifying the partnering terms (e.g. via collaboration plan).	Faculty/Tech. transfer specialist/Communication expert/potential project manager reaching the UBC partner.	potential project manager reaching the UBC partner	*Networking tools *User profiles

## 2.2. Kicking UBC off

The stage kicking the UBC off – driving the university-business collaboration towards implementation and implications for UniBus (Platform) methodology:

<b>BC phases &amp; steps</b>	<b>UBC steps described</b>	<b>University perspective</b>	<b>Business perspective</b>	<b>Implications for UniBus (Platform) Methodology</b>
<b>Joint goals, UBC domain, scope &amp; tasks setting, expectations management</b>	Matching the each party goals, expectations and interests, joint selection of UBC domain(s)	Aligning the university goals, needs and expectations with UBC partner(s)	Aligning the company goals, needs and expectations with UBC partner(s)	*Match-making instruments
<b>TRL, CRL, MRL</b>	Technology, commercial and market readiness level (1-10) along the collaboration stages	Technology readiness expertise	Market analysis expertise, commercial exploitation prospects	*Marking of related KPIs *Filtering algorithms
<b>Organizational fit</b>	Fit with org. strategy, vision and mission	Checking of and alignment with UBC partner(s) values, strategy, vision and mission	Checking of and alignment with UBC partner(s) values, strategy, vision and mission	*Organisational profiles
<b>Resources &amp; capabilities/expertise</b>	Resources: financial, human resources,	Internal capabilities & recourse assessment,	Internal capabilities & recourse assessment,	*Marking resources in place & complimentary

	facilities, infrastructures, etc. Expertise: technical and any other what might be relevant (e.g. IPR management)	tasks distribution	tasks distribution	external resources required *Marking capabilities/expertise in place & complimentary external resources required
<b>Timeline</b>	Timeline: milestones and DLs	Aligning the UBC timeframe with internal organizational schedules	Aligning the UBC timeframe with internal organizational schedules	*Marking the timeline for UBC
<b>UBC assessment</b>	UBC KPIs setting	Aligning UBC KPIs with internal KPIs	Aligning UBC KPIs with internal KPIs	*Showcasing typical KPIs of both actors to all users
<b>Responsible &amp; roles</b>	Responsible: key responsible and supporting people/teams	Assigning responsible people, incl. students supervisors	Assigning responsible people, incl. students supervisors	*Public and private UBC project interfaces with responsible people indicated
<b>UBC risk assessment</b>	Conflicts of interest, NDAs, IPRs, publication strategy, resources-related risks, etc.	Risks assessment and mitigation strategies	Risks assessment and mitigation strategies	*List of typical risks and mitigation strategies
<b>UBC formalization</b>	Contracts, agreements, informal collaborations	Preparing, reviewing and signing UBC related agreements	Preparing, reviewing and signing UBC related agreements	*Agreements templates
<b>Modes of interaction</b>	Physical and digital, confidentiality policies, information exchange, sharing practices and tools	Identifying the desired confidentiality and data protection policies, selecting the information sharing practices and tools	Identifying the desired confidentiality and data protection policies, selecting the information sharing practices and tools	*Information & file exchange features *Collaborative work tools

### 2.3. UBC implementation

UBC implementation stage – carrying-out the collaboration activities (education-related; research-related; valorization related or combinations of those) and implications for the UniBus (Platform) methodology:

<b>UBC modes</b>	<b>Related needs &amp; requirements</b>	<b>University perspective</b>	<b>Business perspective</b>	<b>Implications for UniBus (Platform) Methodology</b>
Education	Challenge formulated (not too broad, not too narrow) Regular (digital) meetings	Pre-selecting, guiding, supervising and evaluating students; arranging and facilitating company meetings; curricular development	Guiding, supervising and evaluating students; participating and contributing the meetings; enabling case-related data collection, resources, staff and facilities availability; providing reflections on commercial exploitation	*Assistance in aligning the challenges with university curriculum *Communication and collaboration tools *Information exchange infrastructure *Progress visualizations *Templates for collaborative modes and agreements
Research	A customized map of research expertise; policy and ready-to-use of collaboration	Scientific expertise including cross-disciplinary scientific expertise; collaboration modes, practices and policies in place	Technical expertise, scientific capabilities and ability to speak specific technical language; collaboration modes, practices and policies in place	*Digital map of scientific and technical expertise and related demands *Templates for collaborative modes and agreements
Valorization	IPR protection & valuation; Technology, commercial and market readiness level (1-10) along the collaboration stages	Technology readiness expertise	Market analysis expertise, commercial exploitation prospects	*Marking of related KPIs *Filtering algorithms

## 2.4. UBC evaluation and follow-up

UBC evaluation and follow-up – post-project evaluation and follow-up activities and implications for UniBus (Platform) methodology:

<b>UBC Evaluation and follow-up</b>	<b>Related needs &amp; requirements</b>	<b>University perspective</b>	<b>Business perspective</b>	<b>Implications for UniBus Methodology</b>
Education	Grading framework	The framework should enable assessing the students earning outcomes against the course curriculum	The framework should enable assessing the students against the initially established company challenge(s) (e.g. feasibility of the solutions proposed by the students)	*A tool to set up a grading framework meeting the requirements of assessing the course learning outcomes and the outcomes demanded by the company
	Periodic renewal and adjustment of the curriculum to the body of industrial challenges	Regular review of the courses content against the matching companies' challenges	Scoping the challenges against the existing university disciplines	*Filtering, drop-down lists of the challenges fields as well as open-ended options and key words
	Assessment of the work against the initially set KPIs and milestones	Critical evaluation of the students work done along the challenge solution and reflection towards the teachers role in the process	Critical assessment of the achievements against the KPIs, milestones versus the companies investments (time, money and other resources)	*Marking the milestones achievements and grading
Research	Assessment of the work against the initially set KPIs and milestones	Assessment of the work against the initially set university' KPIs and milestones	Critical assessment of the achievements against the KPIs, milestones versus the companies investments (time, money and other resources)	*Marking the milestones achievements and impacts
	Assessment of the value of establishing any follow-up projects in the same partnerships	Retaining contacts and follow-up activities against the potential value	Retaining contacts and follow-up activities against the potential value	*Marking the impacts and internal evaluation of collaborative relationships (e.g. trust)

Valorization	Assessment of the valorization activities and processes in place	University revenue and impacts from valorization activities	Assessment of the time versus costs versus value efficiency	*Marking the impacts and internal evaluation of collaborative relationships (e.g. speed)
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### 3. Key takeaways

The UniBus methodology have a number of implications for developing a university-business collaboration platform along the entire university-business collaboration process and for the key stakeholders involved – universities and companies.

First, the existing digital solutions for university-business collaboration are not yet able to meet all the demands of the complex university-company partnership full of challenges. The university-business collaboration in education tackles most of the stakeholders in UBC, including the young talents and generation of the future professionals – students. That is why this direction of UBC is particularly valuable, while the digital offering in this landscape remains limited. Thus, the UniBus platform is very timely and highly needed development.

Second, the UniBus methodology developed suggests that in the educational domain, the UBC platform is able to support the university-industry collaboration along the entire UBC project lifecycle. The platform may enable UBC from the project initiation and matchmaking phase via matching the university courses/curricular with the real companies' challenges. Then, at the stage of the challenge solving process, the platform is called to enable instant exchange of information, and knowledge, as well as constant tracking of both the challenge solving and course material absorption. Finally, at the stage of the UBC evaluation and follow-up the platform enables assessment of the outcomes against the initially set milestones and KPIs, as well as learning outcomes and students grading.

Finally, the UniBus methodology provides an outline of the ways for the digital solution of UniBus project to overcome the UBC barriers. It helps to understand how to overcome the connection barrier by matchmaking the partners; complement the existing resources with the students' talent and thus, achieve a greater resources efficiency; mitigate the differences in organizational cultures and structures via providing customized interfaces for each specific user group (teachers, students, company representatives). Track record of past collaborations (and their internal assessments) and contacts enabled by the platform will enable follow-up collaborations.

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