Brochure on generalised models and blueprints for the UIS interfaces building blocks

Document Type	Deliverable
Document Number	D 2.3
Primary Author(s)	Luca Remotti | Ilaria Torquati
Document Version/Status	2.0 | Final
Distribution Level	Public

Project Acronym	**Science2Society**
Project Title	Improving university, industry and society interfaces to boost the throughput capacity of Europe's innovation stakeholders
Project Website	www.science2society.eu
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Grant Agreement Number	693651

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 693651

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DOCUMENT HISTORY

Revision	Date	Author/Organization	Description
1.0	2018-09-09	Luca Remotti / JIIP	Final
2.0	2019-09-26	Luca Remotti / JIIP, Ilaria Torquati / i2m, Edith Hammerschmid / SD	Revision based on P2 review meeting

TABLE OF CONTENTS

1 Executive Summary 4

Annexes:

- Policy Brief: How policy makers can facilitate the open approach to innovation
- Blueprints: University – Industry Interaction Mechanisms 2.0

1 EXECUTIVE SUMMARY

This deliverable collects the main outcomes of the Science2Society modelling activities based on the 7 Pilots ran within the project. The deliverable consists out of two parts. A first part embodies a Policy Brief and focusses upon *How policy makers can facilitate the open approach to innovation*, based on Science2Society outcomes. A second part consists of a collection of Science2Society Blueprints and focusses on the *University – Industry Interaction Mechanisms 2.0* which have been deployed within the 7 Pilot programmes.

Keywords: Policy Brief, guidelines, generalized models, blueprints, open innovation mechanisms

Science 2 Society

Policy Brief

How policy makers can facilitate the open approach to innovation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 693651

Editorial

Science2Society is an EU-funded project that aims to boost innovation efficiency across Europe. To improve the output of innovative processes, Science2Society analyses business creation, the use of knowledge in creating solutions, products and applications generating value from academic and scientific research. Science2Society brings together practitioners and system experts, including universities, industries and research & technology organisations. Through this interaction, the project makes available a wealth of experiences and practices which can help improve the performance of innovation processes, introducing the principles of open innovation.

Content

Our Purpose	4
The Pilots	4
What are the Principles of Innovation Processes?	4
Open Innovation: What is it and what are its main trends?	5
The Science2Society project: What did it pursue and what did it find?	7
The lessons from the pilot implementations	7
How can policymakers ‘make the difference’?	9
Science2Society Consortium	11

Our Purpose

Open Innovation (OI) is an effective way to 'innovate innovation', guiding enterprises, universities and research organisations to improved approaches and increased performance. The Science2Society project has experimented and practically applied OI concepts to seven interaction mechanisms, demonstrating their empirical implementation and their sustainability. The result are seven S2S service blueprints. The S2S pilots have also demonstrated that policy makers have a role and responsibility to put in place framework conditions, which facilitate the open approach to innovation and improve the process output. The guidelines in this document will support policy makers in their decision-making process, provide suggestions for action action and make innovators aware of policy instances.

The Seven Pilots

- **Pilot 1:** Co-creation
- **Pilot 2:** Co-location
- **Pilot 3:** Collaborative R&D and Innovation
- **Pilot 4:** Intersectoral Staff Mobility
- **Pilot 5:** Big Research Data Transfer
- **Pilot 6:** University Knowledge Transfer
- **Pilot 7:** Open Innovation Marketplace

What are the Principles of Innovation Processes?

- Innovation is an engine of competitiveness, entrepreneurialism, economic growth and job creation, as well as a means to tackle socio-economic challenges.
- Innovation is the outcome of a journey whereby new ideas are turned into products, services or processes ready for adoption and diffusion.
- It is useful to underline that innovation of the S2S pilots focuses on every possible aspect of the process, not only the creation of technical knowledge and the reengineering of technical processes, but also all surrounding areas, such as finance, marketing, sales, human resources, etc.
- The innovation process is a multi-stage, non-linear process consisting of multiple knowledge transfer steps and involving a wide variety of actors.

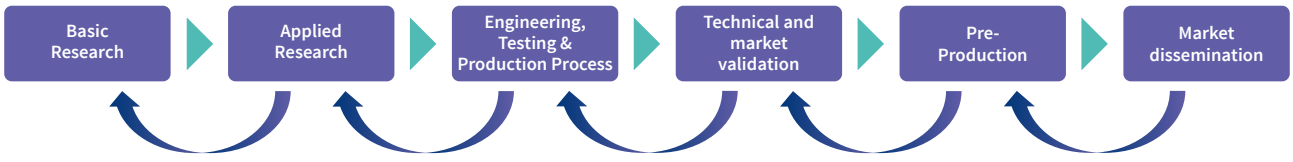

Figure 1: Innovation process

Innovation is made up of several stages from basic research to market dissemination. Each stage is an attempt to coordinate different knowledge components. The coordination must be successful at every stage for innovation to progress. Otherwise it stalls, or a new combination of knowledge components must be tested.

Knowledge flows between actors depend on their learning and absorptive capacity and are directly influenced by the overall framework in which they occur (including rules and regulations in force).

- Since the innovation process is inherently a systemic phenomenon, its outcomes depend on the well-functioning of specific functions within a given framework, which is itself subject to the presence of the appropriate actors, infrastructures, networks, institutions and capabilities.

Innovation systems include market and non-market players (including research organisations, universities, industry, public administrations, users, citizens etc.), which influence the direction and speed of knowledge flows between them. To varying degrees, these actors contribute to the achievement of the following functions: entrepreneurial activities; knowledge development and exchange; direction of research and innovation efforts; formation of markets; mobilisation of resources; and counteracting resistance to change.

Policymakers, as keepers of the common good and supporters of societal values, have a strong interest in stimulating innovation to make it pervasive and more effective. Innovation has the capability of generating positive impacts on knowledge directly; on economic and social issues such as entrepreneurialism, economic growth and job creation; as well as on wider societal issues such as environmental sustainability, welfare and personal wellbeing.

Open Innovation: What is it and what are its main trends?

Open Innovation is a very specific approach to the configuration of the innovation process, matching outside-in and inside-out knowledge flows to connect with the organisation's external innovation ecosystem. It stimulates internal innovation processes, while simultaneously accelerating the external exploitation of the resultant knowledge.

The figure below provides a simple representation of the Open Innovation funnel. The innovating body normally bases on one single integrated internal science and technology base; however, it can reach out to several potential external science and technology bases which the ecosystem can make available.

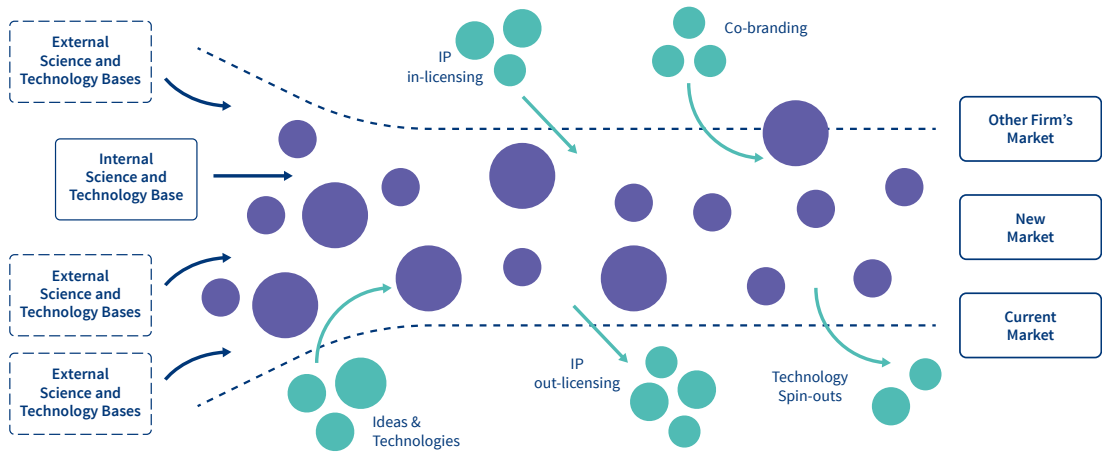

Figure 2: Concept of Open Innovation; based on Chesbrough (2006), format Rangus (2010)

Open Innovation contrasts with the theoretical 'closed' innovation model, in which (vertically) integrated companies try to put in place mechanisms to control their knowledge exchange and innovation processes and to set up procedures and rules to regulate knowledge diffusion and spill-overs. It is justified by the increasing technological complexity and embeddedness of technologies in manufacturing goods (blurring the line between products and services). Because **knowledge is becoming more specialised**, the cost of its production rises, which encourages companies to externalise it.

Open Innovation is a concept coined in 2003 by Henry Chesbrough, yet it describes practices that have been ongoing for long, which relate to the increasing involvement of new and external actors in the internal innovation processes of companies.

The involvement of external actors in companies' innovation processes aims to provide complementary sources of knowledge and therefore the functionality of innovations, i.e. their ability to be adopted, diffused and used.

- Due to the intrinsic characteristics and risks of basic research, it is generally expected that **public organisations** take care and **finance or perform it** directly. In principle, companies have no incentive to engage in it, because of the low appropriability of its outcomes.
- Users are increasingly involved in innovation processes to provide insights into their needs and practices and thereby help the development of innovations with a high uptake potential.
- **Early supplier involvement** in product development explains the **higher competitiveness** of the Japanese automotive industry in the 1980s and 1990s. It reduces development time and associated costs while improving and simplifying the production process.
- The **role of citizens** in innovation processes **has gained** a renewed interest following the emergence of grand challenges, which include Health, demographic change and wellbeing; Food security, sustainable agriculture and forestry; Secure, clean and efficient energy; Smart, green and integrated transport; Climate action, environment, resource efficiency, and particularly in Open Innovation-enabled processes.

Adopting Open Innovation approaches must be based on the recognition that companies are increasingly open towards external sources of knowledge but demonstrate lower commitment to outside-in knowledge transfer actions and strategies, as all pilot assessments confirm. The core missions of higher education institutes and public research organisations include sharing the knowledge they produce via education and training, publication in academic journals and participation in conferences.

Higher education institutes and public research organisations are expected to start embracing a 'third' mission – beyond their education and research activities, i.e. to increase the benefits of science to society. In line with this strategy, intermediaries, such as Technology Transfer Offices (TTOs), and other actions undertaken for the purpose of 'academic entrepreneurship' aim to stimulate further commercialisation of public research findings, sometimes via the establishment of new companies. However, **individual researchers** remain the **main actors** deciding on engagement in Open Innovation activities. They receive little incentive from their organisations' **top management**, who still **focus** almost exclusively on their **education and research missions**. Furthermore, TTOs have often limited resources and capabilities and their activities are restricted to the provision of advice on intellectual property management.

The success of Open Innovation strategies in every type of organisation - be it an enterprise, university or research institution - depends on the presence of appropriate cultures and mindsets; enabling procedures; effective incentives; skills and resources; and, the well-functioning of innovation processes and collaboration for innovation.

The Science2Society project: what did we pursue and what did we find?

Science2Society developed, investigated and assessed the design and functioning of interaction mechanisms through which higher education institutes, public research organisations, society and industry collaborate. The project has created value through an Open Innovation approach.

As part of Science2Society, seven pilots experimented with different University-industry-society interfacing strategies and methods: **Co-creation** (Pilot 1); **Co-location** (Pilot 2); **Collaborative R&D and Innovation** (Pilot 3); **Intersectoral Staff Mobility** (Pilot 4); **Big Research Data Transfer** (Pilot 5); **University Knowledge Transfer via coaching and training actions** (Pilot 6); and **Open Innovation Marketplace** (Pilot 7). Via surveys, the pilot participants were able to assess their experience-based views and insights on the design and performance of the pilots.

Overall, the participants expressed positive feedback on the pilots they were involved in. However, it appears that some collaboration-enabling factors (e.g. degree of commitment and mutual trust) have not improved as much as expected throughout the course of the project. In any case, the results of the seven pilots and their assessment, as well as the S2S project experience as a whole, are providing a wealth of information to support the ongoing innovation learning process.

The S2S consortium is aware of the need to provide the reader with detailed information on the many elements of the seven pilots, including their step-by-step process, enabling factors, the information emerging from the assessment and the most important conclusions. For this purpose, the reader of this policy brief can take advantage of the set of blueprints that the S2S team has produced and gain a more comprehensive overview of the innovation work completed. The blueprints can be downloaded from the S2S website here: http://science2society.eu/downloads/65.

The lessons from the pilot implementations

- Several of the S2S pilots have developed more than one Open-Innovation-based approach, such as Pilot 2, where Co-location was combined with co-operation and possibly also Intersectoral Staff Mobility. The community-building approach developed in Pilot 7, for example, can be deployed in other pilots, such as 1, 2, 4 and 5.

Therefore, the S2S experience confirms that university-industry-society interaction mechanisms investigated should not be considered as alternatives to one another, among which policymakers would need to select and implement the best one.

- Most of the S2S pilots, and in particular 1, 2, 4, 5, 6 clearly build on tailor-made Open Innovation approaches. The general innovation and Open Innovation approaches have always been turned into bespoke processes.

Therefore, the S2S experience confirms that whichever interaction mechanism is chosen, its design would need to be tailored to the specific characteristics of the Open Innovation projects and the innovating organisation.

- the outcomes of all pilots show that sharing, communicating and mutual understanding are key aspects of innovation processes in general, and open processes in particular. In all the seven pilots, the success of university-industry-society collaboration depends on the effective alignment of objectives and practices of all involved actors. It is also of key importance that their respective functioning has a compatible timeframe with individual strategies and agendas. The analyses clearly showed e.g. for Pilot 5 and 6, that extensive upfront information is a key aspect of success for the knowledge transfer process and the schedule of the innovation path.

- trust, risk management, time-efficient engagement processes and well-developed and effective cooperation were considered essential for all seven pilot teams. The survey-based assessment clearly supports this aspect.

- all pilot organisations, from Pilot 1 to 7, showed openness to knowledge inflows and outflows, the basis to open innovation success, which can be focused further and developed over time.

- a key success factor is an initial commitment by pilot partners. The survey showed that in particular for Pilot 1, Pilot 2, Pilot 4, Pilot 5, and Pilot 6 there are significant margins of improvement as far as this aspect is concerned.

- pilot teams confirmed that good communication was implemented for all pilots, with significant margins of improvement for certain categories of users (enterprises) and types of information (feedback on market innovative impacts). This specifically emerged from the assessment of the teams of Pilot 2, Pilot 3, Pilot 4, Pilot 6.

Therefore, the S2S experience confirms that innovators must commit themselves to collaboration and cooperation for problem-solving. Actions, like teambuilding activities, will greatly facilitate their success.

Therefore, the S2S experience confirms that it is important to have a common understanding of what the goals are, (including the timeline for their achievement) sometimes across large groups of participants. This common understanding relies on using familiar language (avoiding academic jargon and commonplaces where possible) and requires effective communication (preferably face-to-face or assessing the effectiveness of online tools). Intermediaries, like Technology Transfer Offices (TTOs), may also act as facilitators to create linkages between the different categories of actors and to stimulate their mutual understanding.

- All S2S pilot teams confirm that the key success factors for all innovation processes are:
  - people, their skills and motivations
  - flexible framework contracts and tailored agreements for different stakeholder needs (students)
  - embeddedness in each organisation's strategy

Therefore, the S2S experience confirms that the human factor is confirmed as the key success element and needs appropriate consideration from the organisational and individual point of view.

- Pilot 2 has demonstrated its success in facilitating science-industry cooperation through physical co-location, while Pilot 6 has successfully demonstrated the effective on-site cooperation of the academy and research with small and medium-sized enterprises.

Therefore the S2S experience confirms that, university-industry-science interactions could be facilitated by the establishment of dedicated infrastructures, i.e. incubators, physical platforms, and methodological support. However, the operation of these facilities, tools and the subject matter of the collaboration should be the sole responsibility of the innovating participants.

- Pilot 6 in particular, but also Pilots 1, 2, and 4 have demonstrated that creating clear, ad-hoc procedures results in major benefits for the success of the common Open Innovation venture, in particular focusing on: communication and understanding of the process; facilitator knowledge; time-efficient engagement processes; plan for activities and concrete outputs adjusted to the pace of the innovation recipients.

- Individual and organisational behaviour and cooperation attitudes, as well as their consistency with the strategic setup, are considered some of the most important success factors for the seven pilots.

Therefore, the S2S experience confirms that dedicated procedures and models for setting-up the Open Innovations eco-system are most useful for University-industry-society interactions and they should reflect the needs of various stakeholders. Their design must guarantee simplicity, time efficiency and clear decision-making in order to curb transaction costs.

- All seven pilots, and in particular Pilots 1, 2, 4, 5 have shown the importance of clear and flexible framework conditions. These require careful design and management throughout the course of the innovation initiative.

- Success is based on the creation of win-win models for all parties involved.

Therefore, the S2S experience confirms that more than any other innovative approach, Open Innovation requires conducive framework conditions and contractual arrangements. They should provide the necessary legal certainty on which these actors can build and develop their collaboration. The agreements on which the interaction mechanisms are based must define the roles and responsibilities of each participant. Special attention should be paid to intellectual property, as some related strategies focusing exclusively on the protection of rights may be detrimental to knowledge flows and collaboration.

- The overall success of the seven S2S Open innovation pilots, supported by the outcomes and opinions of the project participants, is confirmed: structuring Open Innovation processes benefits from such cooperation arrangements. It is important to maintain high commitment from academics and researchers throughout the initiative, who do not always have the motivation or incentive to be innovative, as their career prospects (primarily) depend on their research and academic performance.

Therefore, the S2S experience confirms that the implementation of University-industry-society interaction mechanisms for Open Innovation should be gradual, so the participants have time to change their culture and adapt their practices and procedures.

How can policy-makers 'make the difference'?

Policymakers can help identify the segments of the innovation process that can be 'opened'. These segments are those that should receive dedicated support, such as capacity building and innovation services delivered by experts, within a well-defined innovation policy framework.

ACTIONS FOR AWARENESS AND EDUCATION

- Prepare guidelines and organise dedicated events to raise awareness among participants of the potential and the challenges of Open Innovation and disseminating good practices. These include 'generic' good practices, such as the design of an Open Innovation strategy, as well as practical organisational measures to develop Open Innovation. Awareness-raising has been particularly beneficial in the cases of Pilot 1, Pilot 3, Pilot 5 and Pilot 6.

The S2S results indicate that general policies and implementation measures can support the diffusion of these strategic approaches and their implementation. Policymakers can play a key role in raising awareness and widening the reach of innovative approaches to new technologies, solutions and markets.

- Establish intermediaries with the mission to provide advisory services, to facilitate and reduce the costs of engagement in Open Innovation activities.

- Launch TTOs as Open Innovation 'facilitators', within the academia.

- Promoting the establishment of dedicated departments in universities will help them develop their orientation towards innovation and provide targeted support to the units and team members engaged in knowledge creation.

The S2S results indicate that the 'facilitation' effect was emphasised by the seven pilots, in particular Pilots 3 and 6 directly, and Pilot 5 indirectly. Intermediary bodies can have a key role in supporting academics, researchers and businesses to better cooperate.

- Launch support actions that target the improvement of skills and capabilities of the individuals and organisations (absorptive capacity skill and 'learning organisation'), promoting the uptake of knowledge.

- Stimulate an 'application' and 'commercialisation'-oriented attitude in those who produce knowledge and disseminate it, mostly non-enterprise innovators.

The S2S results indicate that policymakers can provide significant support to develop the skills and increase the absorptive capacity of all players, as demonstrated particularly in pilots 1, 2, 5 and 6. They can drive a stronger orientation of researchers towards the solution of market issues and a deeper understanding of R&D issues by enterprises.

ACTIONS FOR FINANCIAL INCENTIVES AND FUNDING

- Fund (parts of) the costs for conducting (Open) Innovation activities via 'Open Innovation grants' or financial support for specific activities deemed relevant for Open Innovation activities.

- Provide incentives for higher education institutes to move towards their 'third mission', which consists of increasing the benefits of science to society and therefore in accelerating knowledge transfers.

The S2S results indicate that an extensive case study and survey-based research on Open Innovation (Study on Knowledge Transfer and Open Innovation), carried out by JIIP in parallel to the Science2Society pilot project, has revealed that many small and medium-sized enterprises consider the Open Innovation

approach too burdensome in terms of human and financial resources. Furthermore, another hampering factor that has emerged, is the core focus of researchers and academics on their scientific production and their hesitance to partake in more applied activities.

ACTIONS FOR REGULATIONS AND FRAMEWORK SETTING

- Reinforce framework factors and their implementation and enforcement and the actors' awareness thereof, such as intellectual property right protection, financial support, and the relevant regulatory frameworks.

- Facilitate and support start-ups in Open Innovation ecosystems, also creating infrastructures to host innovators, research facilities, test facilities, power computing, as well as financial instruments and services. They could consist of physical and online platforms helping the relevant actors connect.

The S2S results indicate that the seven pilots have clearly shown that framework conditions, intellectual property rights protection and contractual arrangements are the focus of innovators from academia, research and business. Further external input and support are necessary to help innovators define and agree on the contractual agreements and project designs they need.

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Science2Society Consortium

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Impressum

In cooperation with the science2society consortium partners
www.science2society.eu

LAYOUT AND DESIGN
Spirit Design – Innovation and Brand GmbH

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 693651

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Blueprints

University – Industry Interaction Mechanisms 2.0

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 693651

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CONTENT LIST

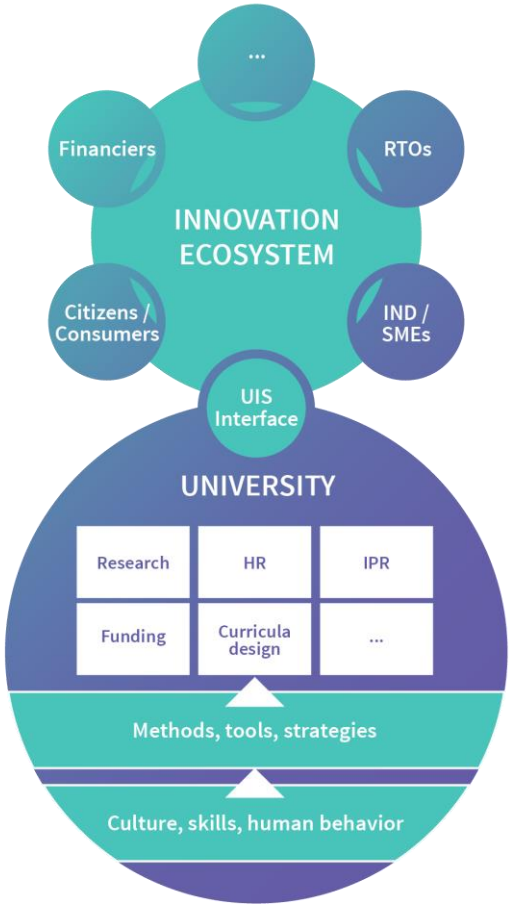
- Science2Society in a nutshell 3
- Approach 4
- Co-creation 5
- Co-location 17
- Collaborative R&D&I projects 32
- Intersectoral mobility 45
- Big research data transfer 58
- SME-University knowledge transfer 68
- Open innovation marketplace 88
- Editorial Team/Contact 99

Science2Society in a nutshell …

*The overall mission of Science2Society is to understand and improve the **efficiency** of the European **innovation system** and the ways it creates new businesses, turns technology into products and services, attracts financing and generally creates value from academic research.*

7 formats "OI applied"

- Co-Creation
- Co-Location
- Collaborative R&D Projects
- Intersectoral Staff Mobility
- Big Research Data Transfer
- University Knowledge Transfer
- Open Innovation Marketplace



Consume

Contribute

Be part of it

Start: March 2016 (36 months)
Beneficiaries: 18 (7 countries)
Budget: € 2.85M

Approach

*In the context of Science2Society, the blueprint represents a **step-by-step guide** for setting up a **University-Industry-Society (UIS) Interaction Mechanism** in the field of **Open Innovation**. This slide deck contains the blueprints of the seven most common and relevant UIS Interaction Mechanisms, which can be used for **replicability**, but also for **designing new innovation mechanisms**. The form of the slide deck should foster the dissemination of these results among the main stakeholders (research organisation, industries and intermediates).*

*Each blueprint includes a detailed **process overview** of the interaction mechanism, followed by relevant **insights** (e.g. characteristics of the innovation actors, enabling elements, challenges & tips) and the most important **findings** and **recommendations**.*

*The blueprints are the results of an in-depth **pilot activity** carried out for 18 months during the project and also the results of an extended **literature review**.*

Product development with future users in a virtual idea-laboratory

PROJECT TEAM – CO-CREATION PILOT

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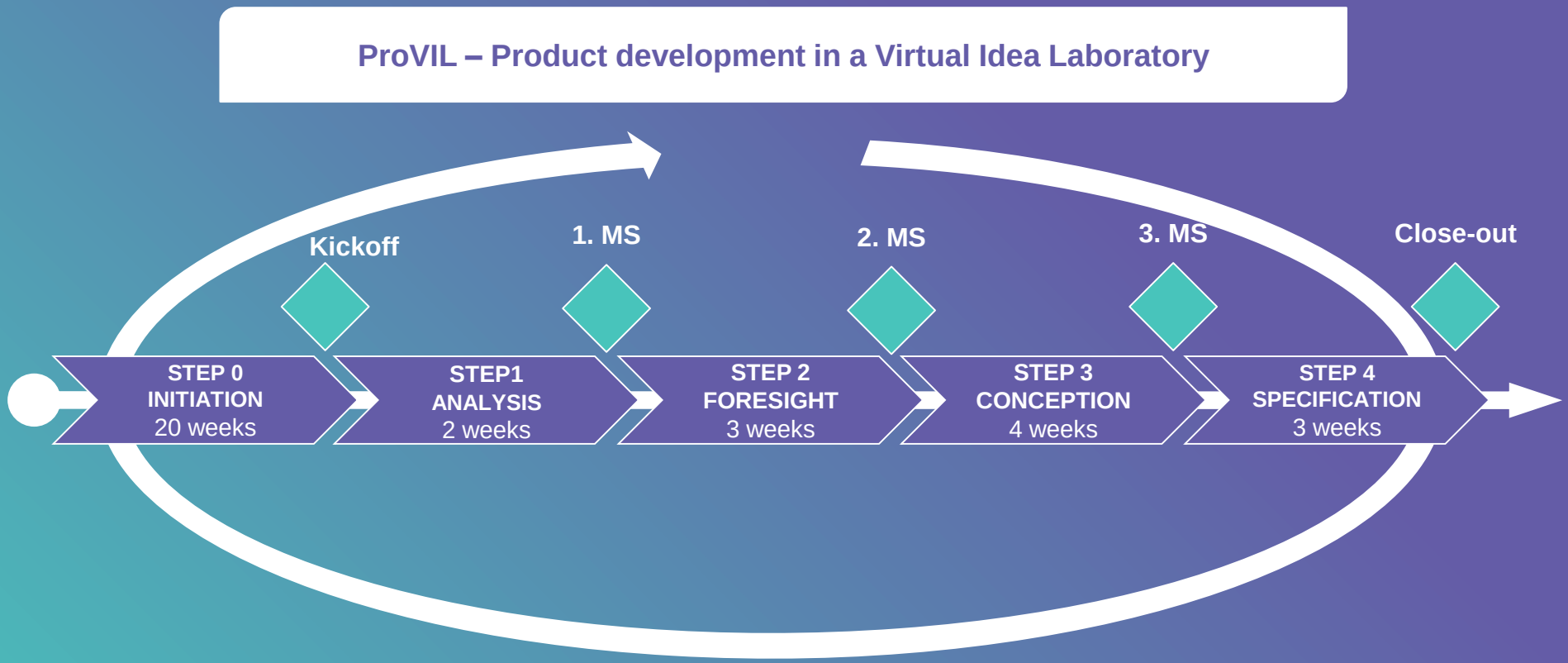
**This blueprint is based on the in-depth activity carried out within Pilot 1.*

Co-Creation (Definition)

*Co-creation is about collaborative product / service development between **universities** and **industry**, while **engaging society** in terms of (future-) users **during the whole product development process**.*

*The subsequent blueprint, to support the implementation of this interaction mechanism "co-creation", is based on an analysis of the process of systematically combining the **huge creative potential of mechanical engineering students** with the **strong product development process of industrial companies**. The objective is to create **relevant product concepts with high innovation potential**, to better match society's future needs with the relevant research.*

Process overview



Including students in innovation projects, ***using innovation platforms*** and other virtual communication tools enables ***co-creation*** across locations and organisational borders in order to develop relevant products with big innovation potential.

STEP 0

Initial engagement

- **Potential analysis for a joint co-creation project**. University and Industry (project partner) start a preliminary conversation considering several common advantages:
  - **For the industry:** expanding the innovative product ideas; agile development process and better analysis of the customers needs through support of the students which represent future users.
  - **For the students:** learning and acquiring competences in a practical industrial environment.
  - **For the university:** optimise didactic concepts and build-up network with project partner.
- **Define the structure** of the product development tasks .
- **Define the contractual terms** between University and project partner (non-disclosure-agreement, IP issue dealing with inventions and patents, etc..).

CHALLENGES & TIPS

- Early initiation of the process to clarify the legal framework at an early stage.
- Thoughtful selection of the co-creation team: highly motivated students and industrial partners willing to share innovation experience and knowledge.
- Industry must provide sufficient vision, commitment, guidance and resources.

MAIN ACTORS

- University (the university is responsible for providing communication tools)
- Project partner
- Software partner (provision of the functionality of the innovation platform is important)

ENABLING ELEMENTS

- Preliminary talks by phone & pelcos & webcos between university and industry
- f2f meetings to emphasise trust
- Previous final events

TIMEFRAME

~20 weeks

STEP 0
Kickoff

- **Welcome package** for students (with confidentiality agreement, Kick-off slides, project arrangements, tandem division, Inno-Coach division, platform login).
- **Project development task**. The students must have the goal clearly in mind and motivation must be generated.
- **Introduction to process and methodology and software**. Innovation project as Live-Lab in order to evaluate new methods for virtual teams in the area of product development.
- **Get together event** after introduction. Each student team meets their innovation coach. The innovation coaches are students with an economic background and they support the teams with their knowledge about the process and giving feedback.

CHALLENGES & TIPS

- Clearly defined process model to run the co-creation.
- Co-creation in a virtual environment requires high commitment of partners: early interaction and harmonisation between all stakeholders and high mutual trust to be implemented.
- Weekly survey with students for continuous improvement and identification of the motivation.

MAIN ACTORS

- University
- Project partner
- Software partner
- Innovation coaches
- Students

ENABLING ELEMENTS

- Motivational speeches from the head of the institute and the project partner
- f2f meetings

TIMEFRAME

~3 hours

STEP 1

Analysis Phase – Collection of information

Students:

- Understand **challenge** of the task assigned.
- Get to know platform and participants.
- Conduct research.
- **Generate future scenarios.**
- **Present research results.**
- **Methodology support** from research.

Deliverables at 1. Milestone with project partner:

- Presentations (research results, scenarios, user stories).

CHALLENGES & TIPS

- Clearly defined process model and questions. A good understanding of the goals to be reached.
- Timeline well structured.
- Motivation of all stakeholders.

MAIN ACTORS

- University
- Project partner
- Software partner
- Innovation coaches
- Students

ENABLING ELEMENTS

- Innovation platform
- f2f meetings
- Support methodology for students to get through the innovation process
- Access to knowledge platforms

TIMEFRAME

2 weeks

STEP 2

Foresight Phase – Understand customer & identify market potential

Students:

- Talk with (future) customers.
- **Generate product profiles.**
- **Validate benefit of customers, users and providers.**
- Combine and evaluate product profiles within **online community.**

Deliverables at 2. Milestone with project partner:

- Market podcast / Online survey / Interviews.
- Product claims (define what is needed in one sentence).
- Presentation.

CHALLENGES & TIPS

- Create a stakeholder panel that will analyse and evaluate generated product profiles to ensure potential
- Consider economic and technical feasibility of generated product profiles
- Use creativity to generate product profiles

MAIN ACTORS

- University
- Project partner
- Innovation coaches
- Students

ENABLING ELEMENTS

- Innovation platform
- f2f meetings
- Support methodology for students to get through the innovation process
- Creativity methods

TIMEFRAME

3 weeks

STEP 3

Conception Phase – Find alternative solutions

Students:

- **Develop product ideas.**
- Get **feedback from experts from the industrial partner.**
- Deepen understanding of **market potential.**
- **Select the best product idea.**

Deliverables at 3. Milestone with project partner:

- Product video.
- Product profiles (use case, first technical solution, benefits …).
- Milestone presentation.

CHALLENGES & TIPS

- Methodology to support the selection of best idea with great innovation potential.
- Use experts to validate solutions. Students can integrate external knowledge.
- Force students to think differently/innovatively to exploit their full creativity potential.

MAIN ACTORS

- University
- Project partner
- Students

ENABLING ELEMENTS

- Innovation platform
- f2f meetings
- Support methodology for students to get through the innovation process
- Supporting software for product videos

TIMEFRAME

4 weeks

STEP 4

Specification Phase – Specify solutions

Students:

- Implement product idea into **technical concept.**
- **Generate mock-ups** or **product models.**
- **Validate** mock-ups or product models.
- **Prepare final presentation** and **stand.**

Deliverables at 4. Milestone (final) with project partner:

- Mock-ups / models / (prototypes).
- Product show / (exhibition stand).
- Final presentation.

CHALLENGES & TIPS

- Validation with given criteria of project partner.
- More detailed look at feasibility (economically and technically).

MAIN ACTORS

- University
- Project partner
- Students

ENABLING ELEMENTS

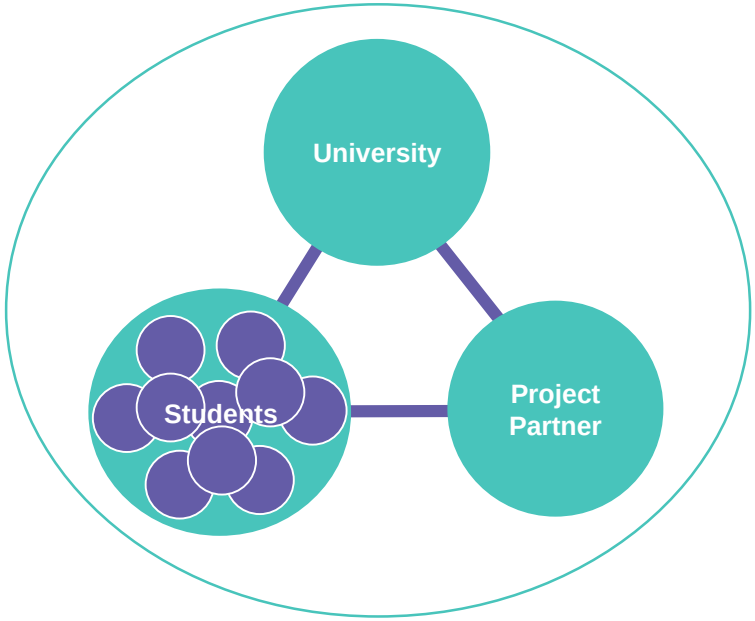
- Innovation platform
- f2f meetings
- Support methodology for students to get through the innovation process
- Possibilities for generating mock-ups and prototypes

TIMEFRAME

3 weeks

Elements to ensure a successful co-creation collaboration

- **Working software** for co-creation (innovation platform)
- **Early planned process** and dates
- **Suitable methods** to use in a co-creation environment



- **Motivation**
- **Team building events**
- **Talented students** with high motivation

- **Conviction and support**
- Involvement in **decision-making** process
- Give **appropriate tasks** to the students
- **Contact** possibilities for students

Learning points

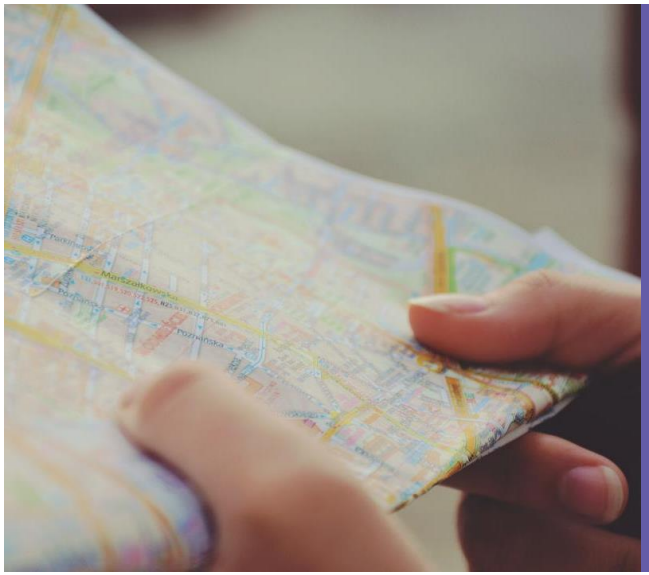
- **Most important findings**
  - The combination of **methodological support** and **selection of talented students** results in a highly customer-relevant products / concepts in a very short period of time.
  - **Team building activities** for the students, which are organised in small teams (~6 people), enable **better results and accomplishments.**
  - The participation of **local and international students** can help overcome some barriers (e.g. language barriers) and reach a bigger audience (international) for surveys and questionnaires.
  - **Meetings in a non-virtual environment** are obligatory between all stakeholders but not very easy to organise due to the different countries of universities and industries.

- **Most important recommendations**
  - In general, it is important to **keep the students highly motivated. More details about the application outcomes** of the project would be useful. The students want to see the prototype (result) of the product that they are developing and contributing to the future.
  - **Project partners need to stay interested!** Interest towards project results is especially necessary for the students. This goes hand in hand with the quality of the developed products (project results).
  - **Feedback from industry has to be from "one voice"** so that the students don't have to face divergent opinions, leading to problems in decision-making.
  - **Project timeline needs to be communicated well in advance** to avoid overlaps with other big projects and several parallel engagements for the students.

References

- Walter, B., Albers, A., Benesch, G., & Bursac, N. (2017): ProVIL–Produktentwicklung im virtuellen Ideenlabor: Anwendungs-und Implementierungsmodell eines Live-Labs. In Stuttgarter Symposium für Produktentwicklung.
- Hahn, C., Albers, A., Stöckner, M., Niever, M., Walter, B., Kerres, R., & Bursac, N. (2017): Innovation Coaching in Foresight Processes for Distributed Product Development at Collaborative European Research Conference (CERC).
- Walter, B., Wilmsen, M., Albers, A., Bursac, N. (2017): Zukunftsmanagement in Zeiten der Digitalisierung: Die Szenario-Technik als Innovationsmethode in der standortverteilten Produktentwicklung.In 13. Symposiumfür Vorausschau und Technologieplanung, Berlin, Germany
- Heimicke, J., Reiß, N., Albers, A., Walter, B., Breitschuh, J., Knoche, S., & Bursac, N. (2018): Agile Innovative Impulses in Product Generation Engineering: Creativty by Intentional Forgetting.
- Albers A., Bursac N., Heimicke J., Walter B., Reiß N. (2018): 20 Years of Co-creation Using Case Based Learning. In: Auer M., Guralnick D., Simonics I. (eds) Teaching and Learning in a Digital World. ICL 2017. Advances in Intelligent Systems and Computing, vol 716. Springer, Cham. doi: https://doi.org/10.1007/978-3-319-73204-6_69
- Walter, B., Dühr, K., Bursac, N., Albers. A. (2018): A project monitoring methodology for distributed product generation engineering. In: 12th International TMCE Symposium

Establishing industry innovation labs within universities



PROJECT TEAM – CO-LOCATION

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**This blueprint is based on the in-depth activity carried out within Pilot 2.*

Co-Location (Definition)

*Among all the collaborative schemes between University and Industry, co-location provides a unique opportunity to achieve benefits at all levels. Co-location is a partnership that involves "The **purposeful combination** of industry and university **personnel** in a **dedicated space** in which costs are shared for **active collaborative or independent research,** with the strategic intent of **encouraging idea exchange** by **reducing communication and cultural barriers** that accompany the physical challenge of being located in different facilities".*[1]

1 *«Co-Locating Industry Personnel on University Campuses: A Guide for Navigating the Complexities of Co-Location». University Industry Partnership Demonstration, 2017.*

Co-location

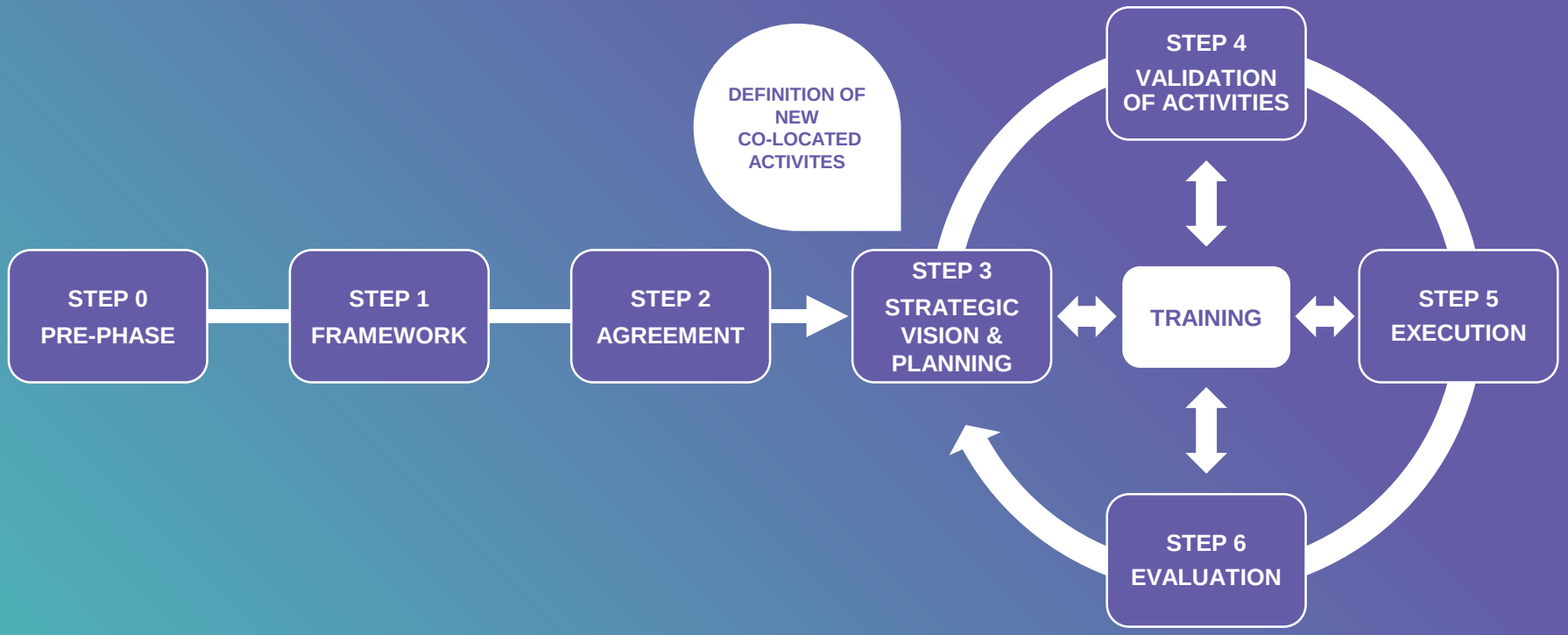
MOTIVATION

- After several short-term collaborations, University and Industry may decide to go a step further and agree to foster a long-term partnership. Co-location includes additional elements and faces new challenges, as compared to the previous relationship:
  - **The co-located team**, formed by both university and industrial staff, requires time to accommodate.
  - **The long-term objectives** of both parties should be aligned in the framework of the partnership.
  - **A framework agreement** should be defined to fit the long-term nature of the co-location, reducing the need to re-discuss contractual issues as the collaboration grows.
  - **A dedicated contact point** should be defined in order to facilitate the partnership and take maximum advantage of the collaboration.

GOAL

- The university-industry co-location scheme allows for a more efficient **ideation of new products and research lines** by increasing the permeability and insight into each other's activities through proximity. This is made possible through:
  - The **efficient use** of industry and university personnel and resources in a **shared space**.
  - Enabling a **daily basis interaction** and reducing communication and cultural barriers.
  - The definition of an **agreed long term strategic vision** supporting collaborative research.

Process overview



I. BACKGROUND

Previous collaboration on research projects is the ideal starting point to achieve the trust level required for a long-term partnership.

II. EXECUTIVE DECISION & CONTRACTUAL TERMS

Co-location is a **long-term strategic collaboration**, framework, where contractual terms must be carefully considered and agreed (intellectual property, legal issues, financial provisions, duration, logistics, teams, contact points). Flexibility and mutual understanding are required to take into account the particularities of both organisations.

III. IMPLEMENTATION OF THE CO-LOCATION

Implementing a co-location involves the definition of a **well-trained and highly motivated co-located team**. The team jointly generates and executes research projects, whose output is assessed to improve performance. **Building team trust** and motivation are key factors for a top-performing co-located team. Creating an **evaluation framework** based on a **clear strategic vision** is also a key element to succeed.

STEP 0

Pre-Phase

- A company and a university have built a relationship of trust through previous joint research.
- The company and the university are considering formalising a research collaboration. After analysing the different possibilities, they decide to co-locate and work together in a shared space. This decision is normally based on one or several common benefits:
  - **Educational:** to jointly train future workforce.
  - **Product innovation:** to boost market-validation of research-based innovations.
  - **Financial:** to share costs of research and equipment.
- **Decision:** both organisations agree to start conversations to formalise a long-term collaborative research partnership through co-location.

ENABLING ELEMENTS

- Organisational trust built with previous joint collaboration(s).
- Mutually beneficial topics of research with impact on the university and business.

TIMEFRAME

5 to 10 years

STEP 1
Establishing the co-location framework

- First conversations on co-location: **upper management** from both organisations discuss all relevant topics in the co-location framework:
  - IP and other legal issues, financial provisions, duration, logistics (shared space and infrastructure), areas of knowledge, human resources assigned, etc.
- Preliminary intentions, research lines and resources are summarized in a **Memorandum of Understanding**.
- Agreement is written and reviewed by both **legal departments.**

STEP 2
Agreement

- Agreement is signed to establish a co-location collaboration framework.

MAIN ACTORS

- **I** Research Coordinator (Step 1)
- **I** Legal & finance (Step 1&2)
- **I** Program Manager (Step 2)
- **U** Government Council (Step 1&2)
- **U** Technology Transfer Office & legal (Step 1)

ENABLING ELEMENTS

- Trust from previous collaboration.
- Transparent communication.
- Clearly identify and accept a win-win situation.
- Agree on a shared long-term strategy.

ESTIMATED TIMEFRAME

Step 1: 4 – 10 months

Step 2: 1 month

STEPS 1 & 2

Establishing the co-location framework & agreement

CHALLENGES & TIPS

Insights

CO-LOCATION FRAMEWORK

- Understand the complexities of each organisation and build expectations and commitments according to them.
- Sign a Non-Disclosure Agreement before starting in-depth discussions.
- Start conversations on Intellectual Property (IP) and other legal issues, financial provisions, duration, logistics (shared space and infrastructure), areas of knowledge, etc. before drafting an agreement.
- Use a broad framework contract and then addenda for special circumstances (each specific activity) for easy collaboration. Anticipate conflict of interest.
- Co-location should be part of each organisation's strategy/roadmap and should be deeply rooted within the organisation. Changes in management should not interfere in or damage the co-location framework.
- Appoint the co-location team: university and industry teams for research activities, management team for contractual terms and a contact point to accelerate and facilitate interactions and get the best out of the relationship.

STEPS 1 & 2

Establishing the co-location framework & agreement

CHALLENGES & TIPS

Insights

INTELLECTUAL PROPERTY

- Be flexible on IP terms. Do not overestimate the economic potential of joint patents. Analyse in depth the exploitation and access rights of both parties. Train your staff on IP.
- Take into account and find a balance of each organisation's interest: research dissemination and IP protection. Time between idea protection and dissemination should fit both parties.

STAFF AND RESOURCES

- High level stakeholders should prepare and communicate a highly motivating plan.
- Ensure organisational support to co-located team. The co-located team needs support from other units in the organisation.
- The operational structure of the co-located team should embrace differences between both organisations. Training and team building activities may help.
- Develop and communicate overall evaluation methods.
- Define and regulate the dedicated resources and equipment to be used by the co-location team.

STEP 3
Vision and planning

- A shared strategic research vision and goals are agreed.
- Different activities to implement the co-location are defined:
  - Individual projects, organisation of joint events, participation in courses or activities at the university, joint submission of project proposals, etc.

STEP 4
Validation of co-location activities

- A formal meeting is scheduled to validate the research vision and planning of activities by university and company upper management.
- **Decision**: joint research vision and planning is accepted by both organisations.

MAIN ACTORS

- **I** Program Manager (3 & 4)
- **I** Co-located team (3)
- **U** Professor (3 & 4)
- **I** Upper management (4)
- **U** Government Council (4)

ENABLING ELEMENTS

- Transparency from both organisations on goals.
- Key Performance Indicators.
- Presentations of activities and ideas (elevator pitch).

ESTIMATED TIMEFRAME

Step 3: 2 – 4 months
Step 4: 1 – 2 months

STEPS 3 & 4

Vision, planning & validation

CHALLENGES & TIPS

Insights

- Define the strategy and goals, ensure they are understood by all stakeholders.
- Keep a continuous improvement mindset, communicate changes at all levels.
- Plan follow-up meetings to evaluate progress and market potential, involving potential customers of the research in the planning.
- Continuously align research outcomes with stakeholders' expectations: be ready to steer and terminate ongoing projects.
- Define dedicated Key Performance Indicators (KPIs) to assess each activity to predict long-term performance of the collaboration. The number of patentable results detected and associated prototypes validated by Business Units are early indicators of the number of patents with market utility.
- Allocate the appropriate resources needed by projects and activities.

STEPS 5 & 6

Execution and Evaluation of co-location activities

CHALLENGES & TIPS

Insights

- Make frequent presentations and meetings with stakeholders to ensure alignment with corporate strategies.
- Tools and methods to evaluate framework and co-location activities:
  - Define KPIs to assess performance.
  - Those KPIs should fit with the goals of the collaboration.
  - Some KPIs apply to the co-location framework, and a subset of KPIs apply to each specific activity.

STEP 3 - 6

Training

- Training is a central element on co-location to ensure teams understand each other at all levels, enabling a good performance and ensuring the optimal exploitation of their respective knowledge.

- Activities to build team trust and motivation are part of these training activities.

- Training should be given on:
  - IP and classification of information.
  - Technical areas.
  - Co-location management and processes.
  - Open Innovation.

MAIN ACTORS

- **I** Program Manager
- **I** Co-located team
- **I** HR
- **U** Professor
- **U** Researchers
- External trainer

ENABLING ELEMENTS

- Motivational speeches
- f2f meeting & workshops
- Specific training
- Team building activities
- Training materials

TIMEFRAME

Continuous training

STEP 3 - 6

Training

CHALLENGES & TIPS

Insights

The co-located team should be aligned in terms of strategy, vision, processes, etc. This is particularly relevant in a team with staff from different backgrounds. The following points will help:

- Set clear roles and expectations in the co-located team. Explain the conditions of the framework clearly.
- Plan team building activities, build team trust and motivation.
- Increase familiarity with industrial/academic cultures. Team members need to understand each other's organisational cultures.
- Explain the operational structure to ensure processes are clear and easy to follow.
- Communicate organisational expectations from co-location to ensure team members understand the importance of their activities.
- Increase knowledge on IP protection to avoid conflicts.
- Create an environment of openness.

Learning points

- **Most important findings**
  - At a time when technological companies are facing a shortage of highly skilled employees, co-location provides them with a **valuable source of tailored workforce**. Co-location allows companies to identify and train their future workers in a dedicated collaborative space, thus reducing the time and risks of finding adequate candidates.
  - **CIT UPC** (UPC's Technology Transfer Office) – who was the contact point between CA Technologies and the UPC – played a key role in setting up the co-location by understanding both industrial and academic realities, and dealing with the contractual terms.
  - Co-location **accelerates and reinforces** the validation of academic research lines and encourages the ideation of potential innovations with a sound market impact. This living ecosystem boosts the bidirectional communication and generates an extra motivation for both partners.

- **Most important recommendations**
  - IP covered in the agreement between CA Technologies and the UPC was too open, forcing research activities to be delayed several months until reaching an agreement on specific IP conditions.
  - Framework conditions made it difficult to include students in the co-location activities executed within the framework of the co-location.
  - In general, academics are less motivated by applied research, as they are normally not rewarded by conducting applied research. In fact, it hinders their academic progression as research throughout is significantly impacted due to the increased workload.

References

Networks

- **University-Industry Partnership Demonstration**
  - «Researcher Guidebook: A Guide for Successful Institutional-Industrial Collaborations», 2012.
  - «Co-Locating Industry Personnel on University Campuses: A Guide for Navigating the Complexities of Co-Location», 2017.
- **University-Industry Innovation Network**
  - M. Dahlgaard, «Taking responsibility for growth and job creation; Co-location for co-creation», 2014.
  - A. Meerman, «Fostering university-industry relationships, entrepreneurial universities and collaborative Innovation», 2014.
- **Science|Business**
  - G. Edmondson, «Making industry-university partnerships work: Lessons from successful collaborations», 2012.

Scientific publications

- S. Ankrah, «Universities–industry collaboration: A systematic review», Scand. J. Manag., 31, 3, 2015.
- J. Moultrie, «Innovation Spaces: Towards a Framework for Understanding the Role of the Physical Environment in Innovation», *Creat. Innov. Manag.*,16, 1, 2007.
- N. Lakemond, «Co-locating NPD? The need for combining project focus and organizational integration», *Technovation*, 26, 7, 2006.

Collaborative R&D&I projects between universities, industries, RTOs, SMEs and public sector entities

PROJECT TEAM – COLLABORATIVE R&D&I PROJECTS

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**This blueprint is based on the in-depth activity carried out within Pilot 3.*

Collaborative R&D&I Projects (Definition)

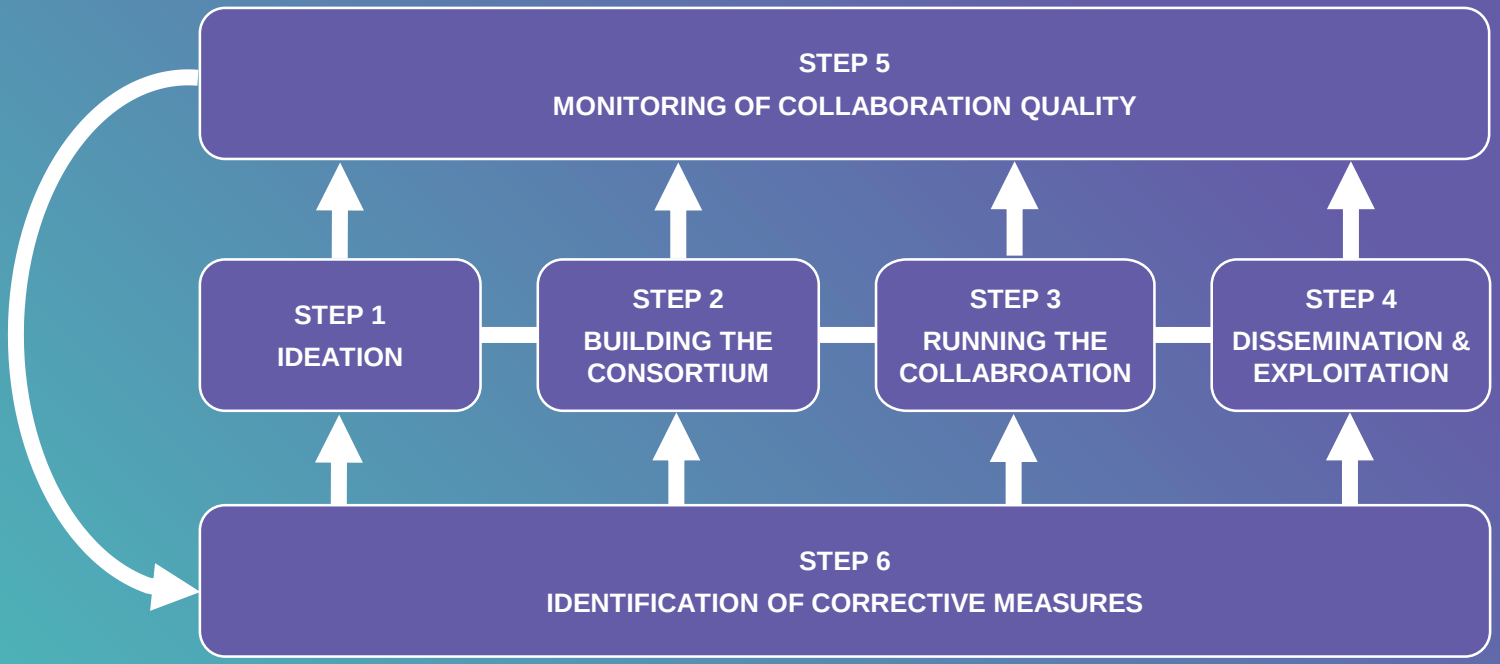
The term "collaboration" can be defined as ***the process of shared creation****: two or more individuals with complementary skills interacting to create a shared understanding that none had previously possessed or could have come to on their own."* [1]

Collaborative R&D or innovation projects, when performed effectively and efficiently, provide the benefits to **create highly innovative solutions** and **to capture the value of (public) money invested**.

The subsequent blueprint to support the implementation of this interaction mechanism "Collaborative R&D&I Projects" is based on an analysis of the process of initiating and executing H2020 EU projects.

[1] *Schrage, M. (1990). Shared Minds: The New Technologies of Collaboration. Random House*

Process overview



STEP 1

Ideation

- Develop a clear project idea within a small core team.
- Find a consensus between core team partners on project scope.
- Communicate project idea to other partners.
- Ensure a common understanding of project mission.
- Align project objectives and research goals (e.g. call topics).

MAIN ACTORS

- Coordinator
- Core Team Partners

ENABLING ELEMENTS

- Creativity techniques (e.g. brainstorming)
- One-Page-Proposal
- Graphical representation of idea
- Continuous communication: frequent conference calls

CHALLENGES & TIPS

- Form an agile core-team of domain experts (max. 3-5) to effectively develop the idea.
- A very clear graphical representation of the project idea is useful.
- A One-Page-Proposal facilitates the communication of the idea.

STEP 2

Building the consortium

- Ensure that partners complement each other.
- Get the commitment of partner organisations.
- Clearly define the partner's role in consortium.
- Compose an adequate core team.
- Build/maintain trust & motivation among in the consortium.
- Build common ground in consortium regarding project scope.

MAIN ACTORS

- Coordinator
- Core Team Partners

CHALLENGES & TIPS

- Reflect on how the partner's expertise will be combined to address the project's objectives.
- Consider level of knowledge, competencies and qualification of partners.
- A legal basis is necessary to build trust among partners (e.g. CA; NDA).
- Maintain the commitment of partners: e.g. constant access to project results. explicit individual exploitation plan /added value.

ENABLING ELEMENTS

- Conference calls
- f2f meetings
- Develop a „Map of Expertise"
- Draft of consortium agreement (CA)
- IPR principles
- Draft of exploitation plan

STEP 3

Running the collaboration

- Foster partners' trust and motivation.
- Choose a proficient project coordinator.
- Maintain a good cross-organisational relationship.
- Use appropriate communication tools with good usability.
- Ensure a continuous flow of information (decisions, project status, problems).
- Force immediate resolution of misunderstandings.

MAIN ACTORS

- Coordinator
- Core Team Partners
- All partners

CHALLENGES & TIPS

- Foster responsible behaviour, honesty, respectful communication and honourable behaviour.
- Meet project team members in person.
- Ensure a full commitment of the project coordinator to the project – he/she has immense impact on the project success.
- Project Coordinator needs a good conflict resolution and mediatorial capabilities, responsiveness and good project management skills.
- Know and respect individual working styles and personalities.
- Hold interactive and conversational meetings.

ENABLING ELEMENTS

- f2f meetings
- Social events
- Conference calls
- Email
- Online collaboration tools
- Definition of one responsible person per partner
- Transparent organisational structure of project

STEP 4

Dissemination & exploitation

- Ensure access to project results for all partners.
- Plan exploitation of project right from the start of the project.
- Define external communication channels.
- Promote your project externally.

MAIN ACTORS

- Coordinator
- Core Team Partners
- All partners

ENABLING ELEMENTS

- Online collaboration tools
- Open innovation platforms
- Exploitation plan
- Dissemination Plan
- Social networks
- Conferences
- Journals

CHALLENGES & TIPS

- Making use of online collaboration tools facilitates the dissemination of detailed results.
- Keep the exploitation plan updated during the whole project.
- Open innovation platforms help to disseminate the project‘s results.

STEP 5

Monitoring of collaboration quality

- Use an online survey to gain insights into the satisfaction level of your collaborative project
- Translate the satisfaction levels into a KPI for measuring the collaboration quality.

MAIN ACTORS

- Coordinator
- Core Team Partners
- All partners

ENABLING ELEMENTS

- „LimeSurvey“: online statistical survey

CHALLENGES & TIPS

- Let a neutral/external person perform the interviews to gather project feedback

STEP 6

Identification of corrective measures

- Collect a set of DOS AND DON'TS to identify actions improving the satisfaction level of your collaborative project.

MAIN ACTORS

- Coordinator
- Core Team Partners
- All partners

ENABLING ELEMENTS

- Collecting DOS AND DON'TS by interviews or workshops

CHALLENGES & TIPS

- Satisfaction level as key success factor for successful collaborative interaction.

Learning points

- **Most important findings**
  - Most important aspects for facilitating collaborative interaction:
    - Responsible behaviour of the persons involved.
    - Global view on project by the project coordinator.
    - Face2Face meeting(s) as a communication method.
    - Consortium Agreement between all partners to organise the cross-organisational relationship.
  - Least important aspects for facilitating collaborative interaction:
    - “Strategy of the coordinating Partner” and “Strategy of the Individual Partners”.
    - The reason why to collaborate is not that important for the collaborative action itself.
  - In general, **Capabilities and Skills of Project Coordinator** play an important role, together with **Trust and Motivation** within the collaborative team.

- **Most important recommendations**
  - The following issues were reported to hinder collaborative interaction:
    - Not complying with deadlines.
    - Lack of a common understanding of the project mission and no clear project objectives for the project.
    - Poorly prepared meetings.
    - Poor usability of online collaboration tools (e.g. failures in document versioning).
    - Technical problems and IT restrictions of partners when using online collaboration tools.

References

- EIRMA, EUA, EARTO, ProTon Europe: Responsible Partnering - Joining Forces in a World of Open Innovation, A Guide to Better Practices for Collaborative Research and Knowledge Transfer, 2005. http://www.eua.be/Libraries/research/2005_Responsible_Partnering_rp-2005-v102_2.pdf?sfvrsn=0
- Hill, Graham: Ten Principles that Drive Effective Collaboration, 2011. https://customerthink.com/ten_principles_that_drive_effective_collaboration/
- Bammer, G. (2008): Enhancing research collaborations: Three key management challenges. In: Research Policy (37), S. 875–887.
- Melin, G. (2007): Pragmatism and self-organiation Research collaboration on the individual level. In: Research Policy 29, S. 31–40.
- EUIMA U-B Tool: http://ubtool.eua.be/Account/Login?ReturnUrl=%2f
- Saaty, T. L.: Fundamentals of Decision Making and Priority Theory with the Analytic Hierarchy Process (1994). Pittsburgh: RWS.

Further details – Examples of the qualitative survey Template using LimeSurvey

How important are the following aspects and statements concerning **"Interpersonal Relationship"** in the context of collaborative interaction?

	Not at all important	Lowly important	Slightly important	Moderately important	Rather important	Very important	Extremely important	No answer
Meet project team members in person	○	○	○	○	○	○	○	●
Physical distance between partner organization(s)	○	○	○	○	○	○	○	●
Interpersonal skills of project team members	○	○	○	○	○	○	○	●
Personal compatibility of project team members	○	○	○	○	○	○	○	●
Team building session in Face2Face meeting(s)	○	○	○	○	○	○	○	●
Opportunity for informal conversation in Face2Face meetings	○	○	○	○	○	○	○	●

Further details – Examples of DOS AND DONTS

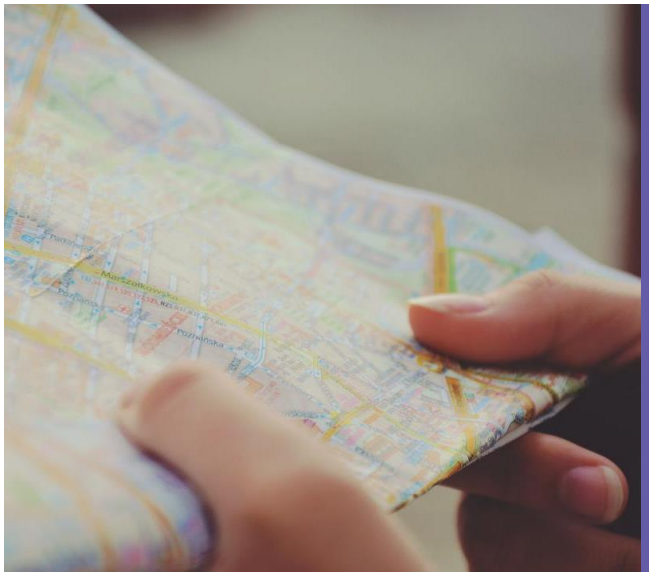
1 Develop a clear project idea within a core team

DOS	DON'TS
• Organize several group meetings to discuss the project idea (e.g. telephone calls, face to face) • Use an online data storage service for sharing documents and possibly make collaborative editing (e.g. Office365, Google Docs) • Perform live brainstorming sessions (black/white board, break-out sessions) with a strong moderation and consolidated conclusions. • Build the proposal based on formal agreements and consensus • Keep a small core group until project idea has been sufficiently detailed • Write down the targets of the project • Perform a System Analysis (legal, market, technology, Environment), Trend Analysis, Competitor Analysis • Identify target groups and user positioning	• Have only email communication • Not sharing the agreed contents among partners • Keep concepts or ideas that are not shared by most of the core partners • Just start with ideas • Use telephone conference for first ideation phases • Come unprepared (from any side) • Fail to wrap up discussed/presented concepts • Take for granted that ideas are self-explanatory.

2 Find a consensus between partners on project scope

DOS	DON'TS
• Set the goal for the consensus: successful project is priority 1 • Start working from the more general (big picture) into the details (work packages, tasks, etc.) • Use lean methodology: first agree on a general abstract, then scale to more details... • Understand strategies of individual partners • Align project targets • Define roles that fit the partner strengths • Stimulate open communication between the partners • Perform live meetings	• Starting with discussions on work packages, tasks and individual contributions before having an agreed concept for the project. • Let one partner design the project, that does not have to deliver the tasks. • Try to reach a democratic solution if finding a consensus takes too long.

Intersectoral mobility as an enabling tool for Open Innovation/Science



PROJECT TEAM – INTERSECTORAL MOBILITY

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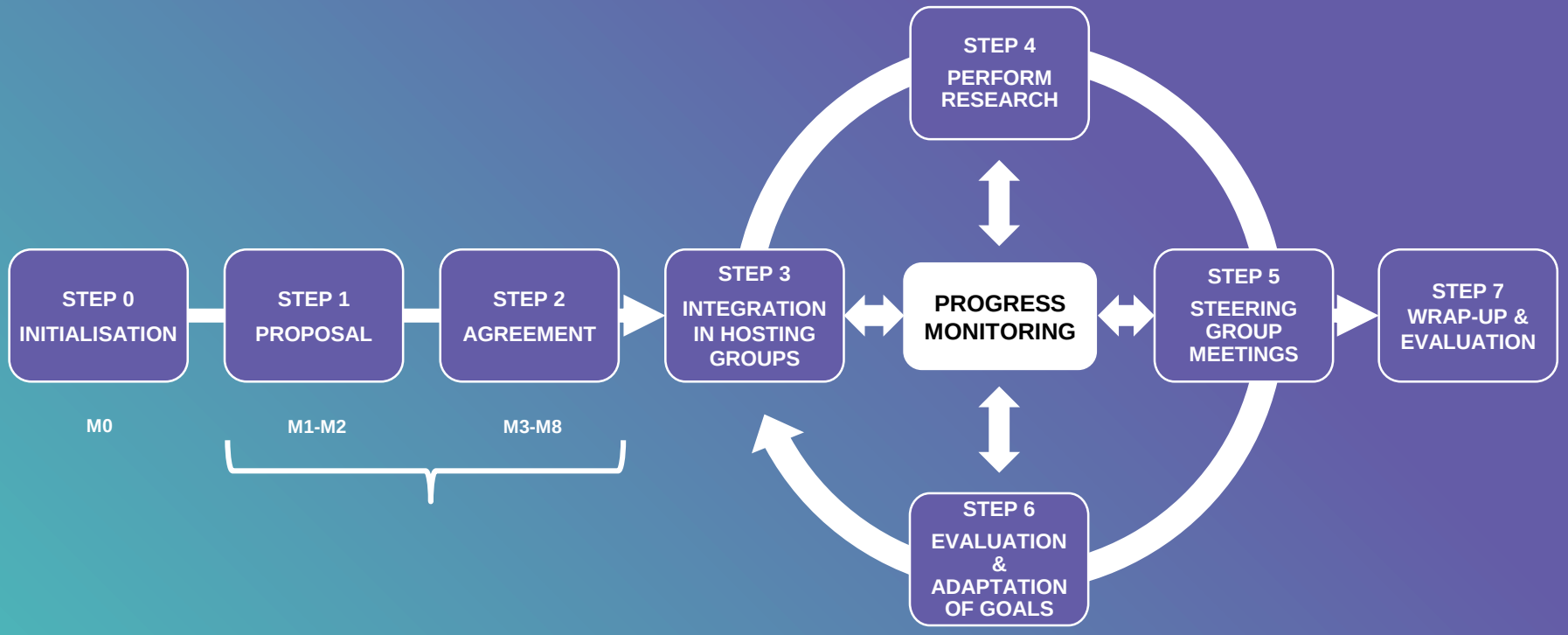
**This blueprint is based on the in-depth activity carried out within Pilot 4.*

Intersectoral mobility (Definition)

"Intersectoral mobility" (ISM) is defined as the temporary or permanent mobility from one sector to another, mainly from the public (academia/research technology organisation) to the private sector (industry/social sector) and back. [1]

1 Intersectoral mobility and knowledge transfer. Preliminary evidence of the impact of intersectoral mobility policy instruments. (https://rio.jrc.ec.europa.eu/en/library/intersectoral-mobility-and-knowledge-transfer-preliminary-evidence-impact-intersectoral)

Process overview



STEP 0

Pre-Phase

- A company and a university share a common interest in a scientific research goal.
- The company and the university consider formalising a research collaboration in which a researcher can be mobile between the two organisations.

STEP 1

Establishing the mobility framework

- Investigation of the kind of funding schemes available.
- Alignment of vision of the research goals, duration, logistics, etc. between the partners.
- Discuss on the commitment, IP, financial provisions, etc.
- Drafting a project proposal.

MAIN ACTORS

- Academic supervisor
- Research team leader
- Academic legal and HR department
- Company legal and HR department
- Funding agency
- Mobile researcher

ENABLING ELEMENTS

- Experience with ISM schemes
- An existing research relationship with the other party
- Fixed administrative and contractual procedures

TIMEFRAME

2 months

STEP 1

Establishing the mobility framework

TIPS

Insights

- Long term: fostering trust by gradually building up the frequency and depth of interaction through different projects.
- Short term: reducing risk by agreeing on a gradual project with increasing cost for industry to keep participating as results become more interesting.

STEP 2

Agreement between all partners

- The project proposal is accepted by all parties, including the funding agency, if applicable.
- The framework agreement is signed by all parties.
- The mobile researcher is selected.

MAIN ACTORS

- Academic supervisor
- Research team leader
- Academic legal and HR department
- Company legal and HR department
- Funding agency
- Mobile researcher

ENABLING ELEMENTS

- Experience with ISM schemes
- An existing research relationship with the other party
- Fixed administrative and contractual procedures

TIMEFRAME

6 months

STEP 2

Agreement between all partners

TIPS

Insights

- Careful selection of candidate with an eagerness to collaborate.
- Easing administrative load by having fixed administrative and contractual procedures.

STEP 3 - 6

Continuous evaluation and monitoring

- The mobile researcher is immersed in both the academic and industry environment and builds up a social network with his/her peers.
- The researcher performs his/her research in collaboration with both research groups.
- Fixed steering group meetings with both supervisors are foreseen to evaluate progress and understand each others points of view.
- The agreed upon KPIs to assess the specific activities (e.g. conference participations or the deadline for finishing an experimental campaign) are monitored and steering action is taken, if required.

MAIN ACTORS

- Academic supervisor
- Academic research group
- Research team leader
- Industrial research group
- Mobile researcher

ENABLING ELEMENTS

- People with academic and industry experience at both sides
- Fixed evaluation meetings with all stakeholders

TIMEFRAME

Duration of project

STEP 3 - 6

Continuous evaluation and monitoring

TIPS

Insights

- Construct a culture of collaboration by educating researchers on Intellectual Property (IP) so they know what they can share.
- Include people with intersectoral mobility experience around the table to increase mutual understanding.

STEP 7

Wrap-up and evaluation

- Mobile researcher returns to original organisation.
- Secure knowledge transfer: text, models, algorithms.
- Evaluate project KPIs.
- Initiate follow-up projects.

MAIN ACTORS

- Academic supervisor
- Research team leader
- Mobile researcher

ENABLING ELEMENTS

- f2f meetings

TIMEFRAME

Last month

Learning points

- **Most important findings**
  - Having experienced intersectoral researchers on both sides, improves mutual understanding and the ability to see the partners' points of view.
  - Having a step-wise approach to let small companies build an innovative DNA: start with small projects with part-time person/months from universities and gradually build to larger projects or have gradual projects.
  - Having strong interwoven relationships with universities: bidirectional student exchanges for small projects and lectures, enabling the inclusion of industry representatives on university boards to discuss curricula. As mutual understanding grows, this is how academic research and industrial needs can be better matched.

- **Most important recommendations**
  - The following issues were reported to hinder mobility research collaboration:
    - Confidentiality and IP strategies resulting in people that cannot disclose certain things, or are not certain about what they can disclose.
    - Lack of a collaboration culture with people of different backgrounds or lack of innovation culture; an unwillingness to try novel approaches.
    - The difference in time horizon between industry and academia.

References

- The mobile academic: A survey of mobility among Marie Skłodowska-Curie doctoral fellows (http://www.e-pages.dk/aarhusuniversitet/1644/)
- Intersectoral mobility Report from the 2014 ERAC mutual learning workshop on Human Resources and Mobility: (https://cdn1.euraxess.org/sites/default/files/policy_library/report-intersectoral-mobility.pdf)
- Intersectoral mobility and knowledge transfer. Preliminary evidence of the impact of intersectoral mobility policy instruments. (https://rio.jrc.ec.europa.eu/en/library/intersectoral-mobility-and-knowledge-transfer-preliminary-evidence-impact-intersectoral)
- Collaborative Doctoral Education: University-Industry Partnerships for Enhancing Knowledge Exchange (http://www.eua.be/eua-work-and-policy-area/research-and-innovation/doctoral-education/doc-careers/)
- DOC-CAREERS II - Promoting collaborative doctoral education for enhanced career opportunities (http://www.eua.be/activities-services/projects/past-projects/research-and-innovation/doc-careers-ii.aspx)

Developing sustainable business models

PROJECT TEAM – BIG RESEARCH DATA TRANSFER

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**This blueprint is based on the in-depth activity carried out within Pilot 5.*

Open Science and Big Data

(Definitions)

"Open Science can be defined as a movement to make scientific research, data and dissemination accessible to all levels of an inquiring society." [1]

"Big data can be defined as an information asset characterised by high volume, velocity and variety to require specific technology and analytical methods for its transformation into value". [2]

1 FOSTER (2016) About Foster. Available at: https://www.fosteropenscience.eu/about#theproject

2 De Mauro, A., Greco, M., Grimaldi, M. (2016). A formal definition of Big Data based on its essential features, Library Review, Vol. 65 Issue: 3, pp.122-135, https://doi.org/10.1108/LR-06-2015-0061

Process overview

Generic process to research data exploitation

STEP 1

Opportunity identification

- In the first step, you identify the underlying opportunity associated with the big research data transfer.
- Key goals:
  - Understand who would be the potential users (academia, industry, government) for research data and what opportunities they have in relation to the data.
  - Clarify what are the specific requirements that the potential users have towards the research data and their willingness to pay for access.
  - Estimate how many users there would be and the competitiveness of the research data (value, uniqueness, imitability) and to assess the market potential.
  - Identify possible other benefits for opening research data e.g. increased visibility for the data owner.
- Outcome: Opportunity specification and the assessment of market potential.

MAIN ACTORS

- Research organisation
- Potential/existing users

ENABLING ELEMENTS

- Contacting potential users by survey, interview or open discussion to clarify their needs and wants

TIMEFRAME

1-2 months

STEP 2

Identifying and addressing potential barriers

- In the second step, you analyse the potential barriers to open the big research data and identify ways to overcome the barriers.
- Key goals:
  - Understand what legal, confidentiality, IPR, technical issues there may be that hinder the opening of research data and how to overcome them.
  - Analyse how to fulfil the needs and criteria of potential users e.g. what additional functionalities or modifications are needed and the related costs of implementation.
  - Ensure usability (e.g. metadata, organisation) and reachability of the data.
- Outcome: Solutions to overcome the potential barriers to open the research data.

MAIN ACTORS

- Research organisation
- Potential/existing users

ENABLING ELEMENTS

- Discussing with topic experts in e.g. legal, IPR, technical aspects for data sharing

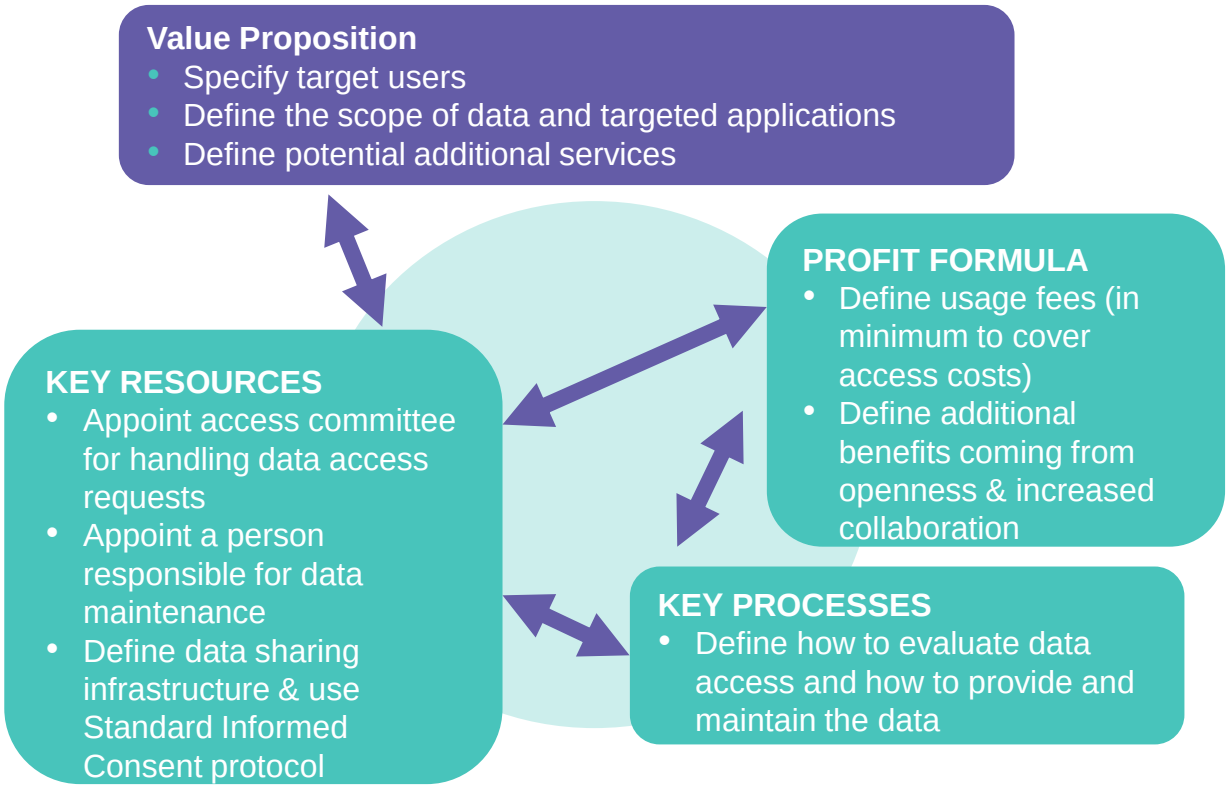
TIMEFRAME

1-2 months

STEP 3

Definition of business model

- In the last step, you defined the business model associated with your big research transfer and test it with potential users.



- Outcome: Definition of business model for opening research data.

MAIN ACTORS

- Research organisation
- Potential/existing users

ENABLING ELEMENTS

- Collecting feedback for business model [3] from potential users andalso third party by survey, interview or discussion.

TIMEFRAME

1-2 months

[3] Adapted from Johnson, M.W. at al (2008) 'Reinventing Your Business Model'. Harvard Business Review

STEP 1 - 3

Challenges and tips for implementation

CHALLENGES & TIPS

Insights

- There needs to be a sound business case for opening big research data to justify the cost and effort.
- Also, sufficient resources need to be allocated for data maintenance and handling user requests.
- Quality and the completeness of the data is the key factor for its attractiveness for external users to exploit.

STEP 1 - 3

Best practices from GCAT case

ISSUE	BEST PRACTICE
Openness through access control, management through a data access committee	Calls for projects to reuse data to select only the best, and therefore decreasing the need for resources to support collaboration.
Standardised Informed Consent Protocols with categorised ontologies and NDA agreements to achieve clear collaboration rules	These agreements provide an opportunity to effectively control the access to sensitive data.
Standardised access to data through near cloud infrastructures	These infrastructures may act as single entry points for those looking for research data, providing a marketplace-like functionality.
Quality of data is paramount to ensure usability	Force publicly funded projects to devote part of the budget to data management activities and access through open public infrastructures beyond the project life cycle.
Completeness of data will reinforce the confidence for collaborations	Any barriers to access sensitive data needed to proceed to further research or innovations, should be solved before opening the data.

Learning points

- **Most important findings**
  - Open research data doesn't mean giving away everything for free - there are sustainable business models abound.
  - In addition to commercial benefits, there are possibilities to increase collaboration and recognition of the research group, and thus to enhance the research output and quality.
  - Joint research can be made as a requisite for externals to access the research data.

- **Most important recommendations**
  - The funding agencies should utilise the contents of research data management plan (how widely research data is shared) as a key criteria for the funding decision.
  - Sharing research data should be used as promotion criteria for scientists (e.g. in tenure track and hiring of new professors).
  - If the research data published by a researcher is used by others, it should be equally merited as references made for peer-reviewed articles.

References

- League of European Research Universities. (2018). Open Science and its role in universities: A roadmap for cultural change. Available at: https://www.leru.org/files/LERU-AP24-Open-Science-full-paper.pdf
- McKiernan, E., et al. (2016). How open science helps researchers succeed, eLife, 5(JULY), pp. 1–19. doi: 10.7554/eLife.16800
- OpenAIRE (2016) What is the Open Research Data Pilot. Available at: https://www.openaire.eu/opendatapilot
- Pampel, H. and Dallmeier-Tiessen, S. (2014) Open Research Data: From Vision to Practice, Opening Science, pp. 213–224. doi: 10.1007/978-3-319-00026-8.
- RISE Group (2017). Europe's future: Open Innovation, Open Science, Open to the World. Available at: https://publications.europa.eu/en/publication-detail/-/publication/527ea7ce-36fc-11e7-a08e-01aa75ed71a1
- Roman, M., Liu, J., Nyberg, T. 2018. Advancing the Open Science movement through sustainable business model development. Industry and Higher Education 32(4): 226-234.https://doi.org/10.1177/0950422218777913
- Sadiku, M. N. O., Tembely, M. and Musa, S. M. (2016) Open Data : Opportunities & Challenges, Journal of Multidisciplinary Engineering Science and Technology, 3(11), pp. 6006–6008.
- Tenopir, C., Van Der Hoeven, J., Palmer, C. L., Malone, J. and Metzer, L. (2011) Sharing data: Practices, barriers, and incentives, Proceedings of the ASIST Annual Meeting, 48(1). doi: 10.1002/meet.2011.14504801026.
- Thomas, L. D. W. and Leiponen, A. (2016). Big data commercialization, IEEE Engineering Management Review, 44(2), pp. 74–90. doi: 10.1109/EMR.2016.2568798.
- Viseur, R. (2015) 'Open science: Practical issues in open research data', DATA 2015 - 4th International Conference on Data Management Technologies and Applications, Proceedings, pp. 201–206. doi: 10.5220/0005558802010206
- Johnson, M.W., Christensen, C.M., and Kagermann, H. (2008) 'Reinventing Your Business Model'. Harvard Business Review (December Issue)

Improving 1-to-1 knowledge transfer between Universities and SMEs

PROJECT TEAM – SME-UNIVERSITY KNOWLEDGE TRANSFER

IfM-ECS

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**This blueprint is based on the in-depth activity carried out within Pilot 6.*

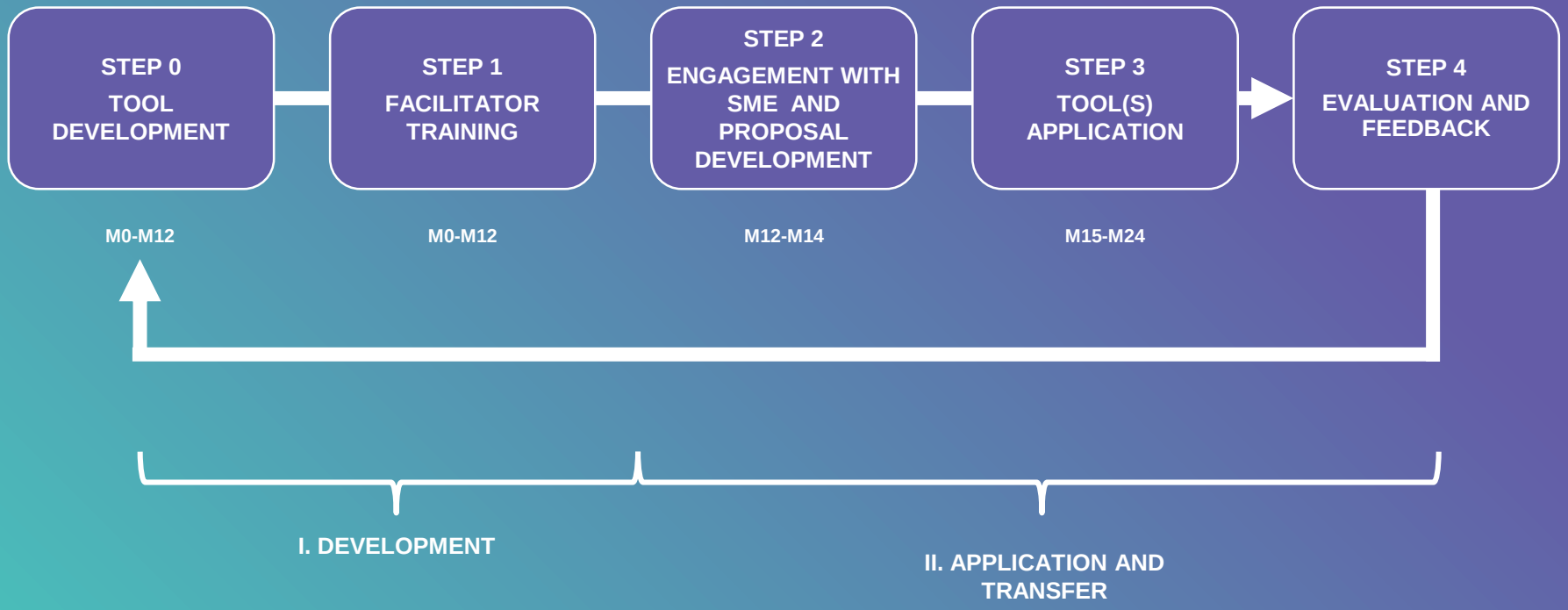
University Knowledge Transfer

(Definition)

*SMEs play a very important role in the EU economy. Boosting **direct knowledge transfer** from **universities to SMEs** can improve an SME's business excellence and substantially contribute to EU competitiveness. SMEs have particular requirements from any intervention. The methods used need to be **resource-** and **time-efficient** and SMEs usually need to see a direct financial return on any investment. If these criteria are met, this classical open innovation approach can be successfully applied.*

*This pilot seeks to understand the **relevant factors influencing the direct knowledge transfer process** (e.g. simplicity of methods, time efficiency of process, trust in facilitator) and find ways to refine them.*

Process overview



STEP 0

Tool development

- Academics conduct extensive research and generate knowledge in terms of publications, case studies etc.
- RTOs work together with academics to codify this knowledge in the most appropriate form (tool) e.g. questionnaires, management frameworks, charts, workshop processes, training courses etc.
- RTOs work together with academics to pilot this tool to several SMEs (3-5) to test and refine it [1].
- RTOs and academics validate the applicability of the tool in multiple sectors and types of companies (with additional 3-5 pilot applications).
- **Decision:** RTOs and academics agree for the readiness of the tool to be applied wider.
- RTOs draft training material for facilitators and supporting documentation to enable the wider application of the tool.

MAIN ACTORS

- University
- RTO
- SMEs

ENABLING ELEMENTS

- Clear problem statement
- Academic theory
- Charts
- Learning outcomes
- Case studies etc.

TIMEFRAME

6-12 months

[1] K.W. Platts (1992). A process approach to researching manufacturing strategy. Research paper

STEP 0

Example of new research co-developed and converted into a tool

Developing scoring criteria for prioritising innovation projects

Opportunity criteria
Can we make more money?
Can we sell it?
Synergies across business
Size of market
Market growth potential
Market profitability (margins in the market)
Competitive intensity in the market
Opportunity to enter new market
Industry maturity / readiness
Exclusivity
Clear customer need
Platform for growth
Future synergies with other operations
Sustainability of competitive advantage
IP – can we protect / exploit it?
Cost reduction
Cannibalise existing business
Business simplification
Learning
NPV>0 or other mutually exclusive alternative
Where the company can offer a differentiated product

Opportunity criteria
Synergies across business
Size of market (available to us)
Market growth potential
Market profitability (margins in the market)
Competitive intensity in the market
Opportunity to enter new market
Industry maturity / readiness
Learning
Clear customer need
Platform for growth
Future synergies with other operations
Business simplification
Cost reduction
Cannibalise existing business
Additional contribution to the same customer
Adding value to service offering

Opportunity criteria		
DIMENSION	FACTOR	DEFINITION
VOLUME	Market size	Size of potential market, or number of potential adoptions, reasonably available to us.
	Our sales potential in a given time	Sales volume or number of adoptions anticipated in a defined time (say, 5 years)
	Synergy opportunities	Possible additional benefits to other projects or activities; or the possibility of new opportunities in combination.
	Customer benefit	Identifiable benefit to customers (internal or external) or potential adopters
	Competitive intensity in Market	Number or significance of the competition
MARGIN	Margin, or benefit per unit	Improvement in product margin (e.g. by cost reduction or price premium) compared to existing products; or benefit to us per adoption
	Business cost reduction or simplification	Facilitates cost reduction or simplification of business processes
	Industry/market readiness	How easy will it be for customers or adopters to take up the product; do they have to change their behaviour or processes?
PLATFORM FOR FUTURE BENEFIT	Market growth	Anticipated growth rate of market
	Future Potential	Product is a platform for future products or could open new markets in future
INTANGIBLES	Learning potential	Will improve the knowledge or competence of the business
	Impact on Brand Image	Effect on B rand image or staff morale
	Impact on key customer relations	Importance for relations with key customers

9 companies - 215 data points → **8 companies - 224 data points** → **27 companies - 433 data points**

Reference: Mitchell et al, 2014

STEP 0

Tool development

CHALLENGES & TIPS

Insights

Tool development is an iterative process that:

- Requires both the researcher and the practitioner to work together over a period of time;
- Requires a minimum of 5-10 company pilots to test a tool's stability and effectiveness;
- It needs to demonstrate a clear logic about the inputs required and the outputs delivered; When a tool contains a series of different steps or is composed of different, independently developed tools this becomes critical;
- Often requires changes to the tool structure or delivery process to make it useful and effective.

STEP 1

Facilitator training

- Facilitators attend an in-house course led by the academic and/or the lead practitioner from the RTO who co-developed the tool with the academic.
- The course highlights the key research and theory behind the tool and the steps to be followed when applying the tool.
- A facilitator supports the lead practitioner into real company engagements (minimum 2 engagements where the lead practitioner leads and the facilitator supports).
- The facilitator leads a real company engagement (minimum 1 engagement where the facilitator leads and the RTO lead practitioner supports).
- **Decision:** The RTO lead practitioner agrees if the facilitator is ready to lead new engagements or additional practical experience is required.
- Regular in-house courses are established for all trained facilitators to update their knowledge with new practices and theory.

MAIN ACTORS

- University
- RTO

ENABLING ELEMENTS

- Facilitators‘ guide including theory
- Sequence of application steps with notes
- Case studies, examples etc.

TIMEFRAME

6-12 months

[1] K.W. Platts (1992). A process approach to researching manufacturing strategy. Research paper

STEP 1

Facilitator training

CHALLENGES & TIPS

Insights

Facilitator training is a continuous process that aims to:

- Enhance a facilitator's knowledge of the key aspects of the background research, engagement method and tool application.
- Ensure facilitator's neutrality and objectivity by reducing or removing any bias and assure SME that any action plan relates directly to the company's most important needs.
- Ensure that a facilitator follows a clear Quality Assurance process that maintains the integrity of the research and enhances the SME's experience and engagement in the process.

STEP 2

Engagement with SME and proposal development

- Start conversations with an SMEs management team.
- Understand the issue(s) an SME may be facing and discuss an appropriate engagement process and suitable tools.
- Draft a proposal for the engagement.
- **Decision**: Proposal is accepted by both organisations.

MAIN ACTORS

- RTO
- SMEs

ENABLING ELEMENTS

- NDA (if applicable)
- Proposal including scope of work and timeline

TIMEFRAME

2 months

STEP 3

Tool(s) application

The tool application and the sequence of applying different tools depends on the particular issue(s) the SME is facing. Some of the most commonly used tools have been the following:

- **Business diagnostic** – assessing the company's performance, prioritising the most important issues and delivering an action plan.

- **Business strategy** – understanding the company's ambitions, competitive position and core capabilities, different operating options and develop and action plan for achieving an agreed "chosen future".

- **Innovation for SMEs**– generating and prioritising innovation options and associated projects plans for growth.

MAIN ACTORS

- RTO
- SMEs

ENABLING ELEMENTS

- Specific tools

TIMEFRAME

10 months

STEP 3

Company examples of tool(s) application

FOOD MANUFACTURER

PROBLEM

On-time delivery performance typically 50%

STEPS TAKEN

- Analyse pattern of demand for each product
- Create production schedules to match this demand
- Introduce ongoing reviews of sales forecasts

RESULTS

- 99.5% on time delivery
- Reduced overtime costs
- Dramatically reduced stress levels

SHEET METAL BUSINESS

PROBLEM

Lack of coordination between sales and shop floor on due dates and priorities for work-in-progress

STEPS TAKEN

- Created a schedule showing plan and progress of all jobs
- Schedule available to office and shop floor
- Orders received are loaded into schedule

RESULTS

- On-time delivery improved significantly
- Newly-arrived urgent jobs completed more reliably

HOSPITALITY BUSINESS

PROBLEM

Company just breaking even – needed to grow but unsure how to do this

STEPS TAKEN

- Strategy workshops identified different customer groups with varying needs
- Range of product solutions created to suit each customer group with appropriate price and service levels
- Internal processes restructured to channel most effort into premium customer

RESULTS

- Revenue doubled in one year
- New staff taken on
- Profits increased

CONSTRUCTION MATERIALS COMPANY

PROBLEM

Company operating in declining industry, forcing closure of one of its production plants

STEPS TAKEN

- Assessment undertaken of the company's skills, facilities and technical abilities
- Strategy workshops identified potential new markets
- New market chosen and appropriate product development using existing skills and facilities

RESULTS

- New product launched
- Land acquired for new facilities
- Staff numbers expected to grow

STEP 4

Evaluation and feedback

- Normally feedback is collected from the SME immediately after the engagement.
- The feedback is typically in the form of a questionnaire that contains questions around the pre-engagement activities, the value to the participant and the organisation, the delivery process and the logistics.
- Occasionally, feedback from the SME is asked after a period of time (12+ months), where actual business results (revenues, number of employees, innovations etc.) are collected.

MAIN ACTORS

- University
- RTO
- SMEs

ENABLING ELEMENTS

- Questionnaires

TIMEFRAME

12-36 months

CHALLENGES & TIPS

Insights

- RTOs employing facilitators who combine both academic credentials and understand the research methodologies and industrial experience.
- Developing time-efficient engagement processes.
- Creating user-friendly tools with minimum academic jargon to facilitate the knowledge transfer.

Learning points

- **Most important findings**
  - Providing all participants the opportunity to express their views in a neutral environment.
  - Having facilitators who have industry experience and can relate to real business issues. They also have the ability to offer several examples to clarify concepts and provide insights.
  - Having an engagement process that is time efficient, has a clear logic between data input, data output and decisions and requires minimum pre-work from the participants.
  - Minimisation/elimination of academic jargon and terminology.

- **Most important recommendations**
  - Communication with the SME in explaining upfront what is required in terms of data and time and examples of potential outputs.
  - Emphasis needs to be placed on the tool design, and ease of use, without expecting users to follow complicated instructions.
  - Manage the company's expectation on time required to achieve tangible outcomes after the process is completed.
  - Allow reflection time in order to gain insights.

References

- Braun & Hadwiger, (2011) Challenges of Knowledge Transfer to SMEs. Trends in Food Science & Technology, 22 (SUPPL. 1), pp. S90-S96.
- Bruneel, J., D'Este, P., & Salter, A. (2010). Investigating the factors that diminish the barriers to university-industry collaboration. Research Policy, 39, 858–868.
- Grunert et al. (2008) User- oriented innovation in the food sector: relevant streams of research and agenda for future work. Trends in Food Science & Technology, 19. 590-602.
- Santoro, M. D., & Gopalakrishnan, S. (2000). The institutionalization of knowledge transfer activities within industry–university collaborative ventures. Journal of Engineering Technology Management, 17, 299–319
- Carayannis et al (2006) "Technological learning for entrepreneurial development (TL4ED) in the knowledge economy (KE); case studies and lessons learned", Technovation, Vol. 26, pp 419-4432006.
- J.-F. Quillien and M. Vidal (2003) "Flair-Flow 4: bringing European food research to the end-users" trends in Food Science and technology, Vol. 14, issue 1-2, pp 32

Further details - Example of new research integrated into an existing tool (step 0)

Indirect External Forces IDENTIFIED BY AN SME – BEFORE INTEGRATION OF NEW RESEARCH			
	1 Year	2-4 Years	> 4 Years
Social			
Technological			
Economic			
Ethical	THREAT: Behaviour of supermarkets- Retail ethics		
Political			
Legal			
Environ-mental		OPPORTUNITY: Falling oil prices dropping through to energy prices	

Indirect External Forces IDENTIFIED BY AN SME – AFTER INTEGRATION OF NEW RESEARCH			
	1 Year	2-4 Years	> 4 Years
Social	THREAT: Disaffected youth leaves skill gap	THREAT: Regular wage rises	
Technological		OPPORTUNITY OR THREAT: Development of new machinery	OPPORTUNITY: Automation Lowers labour dependency
Economic		OPPORTUNITY OR THREAT: • Retail Polarisation • Exchange rate changes	THREAT: Return of Eastern European workers
Ethical	THREAT: Behaviour of supermarkets- Retail ethics		
Political	THREAT: Absence related to family responsibility legislation	OPPORTUNITY: Leaving the EU would present an opportunity for onion and root suppliers	
Legal		THREAT: Removal of pesticides	
Environ-mental		OPPORTUNITY: Falling oil prices dropping through to energy prices	

Further details - Example of new research integrated into an existing tool (step 0)

Policy & Government
- Regulation /Legislation
- Public Sector Spending
- Pro-Manufacturing Policy
- European Union (EU)
- Taxes
- 'Green' Policies
- Political Elections
- Unemployment
- Health & Safety

Society
- Ageing Population
- Population Growth
- Health & Obesity
- Social Media
- Diversity Intolerance
- Disaffected Youth
- Consumerism
- Materialism

Disruptive Technologies
- Bio-technology
- Additive Manufacturing
- Open-source IP
- Cloud Computing
- Automation
- Internet of Things
- Big Data
- Machine Learning (AI)
- Electric Vehicles

Natural Environment
- Sustainability
- Pollution
- Carbon
- ISO 14001
- Climate Change
- Circular Economy
- Land-use Conflict
- Natural Disasters

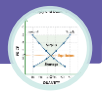
Labour Resources
- Skills Gap
- Minimum Wage
- Retirement / Pensions
- Apprenticeships
- Foreign labour
- Maternity/Paternity

Non-Labour Resources
- Energy / Electricity
- Oil prices
- Materials / Commodities
- Waste
- Water
- Recycling
- Disposal

Global Issues
- Trade Blocs
- Viruses or Diseases
- Rise of BRICS
- Land 'grabs'
- War / Terrorism

Economy
- Recession / Recovery
- Exchange Rates
- Interest Rates
- Access to Capital
- £ vs €

Market Forces
- Competitors
- Suppliers
- Customers
- Collaboration
- Outsourcing/Reshoring
- Localisation



- A PhD research was integrated into the SME Strategy workshop toolkit as an additional step.
- This step added 10 min to the overall process but considerably enhanced the output (see next slide).
- It encouraged SMEs to consider external forces that may have an impact on the company strategy.
- This considerably enhanced the strategic actions the SME put in place.

Further details - Benefits at a glance (MTP programme)

Company sector	Length of project	Revenue £		Employees		Revenue per employee		Other
		Before	After	Before	After	Before	After	
Industrial electronics	9 months	1.2m	2.2m	11	14	109k	157k	Other new market opportunities leading to growth
Refrigeration	18 months	750k	2.1m	8	10	94k	210k	New practises released production capacity
Food	18 months	3m	4.8m	70	70	43k	69k	Delivery performance increased from 50% on time to >99% on time full
Chemical Treatment	12 months	1.7m	3.5	25	45	68k	78k	Defects halved in <6months
Laboratory equipment	12 months	5m	6.2m	32	32	156k	194k	Profits doubled
Smart metering	6 months	2.3m but falling	2.3m but raising	20	20	115k	115k	Defects halved in 4 months
Materials handling	4 years	10m not profitable	16m profitable	140	150	71k	106k	Moved into new markets
Food	18 months	6.8m	8.4m	75	75	91k	112k	Moved from breakeven to significant profitability
Packaging	18 months	3.2m	4.1m	48	48	67k	85k	Net profit more than doubled
Capital equipment	2 years	12m	35m	70	70	171k	500k	Growth in UK supply chain

Further details - Benefits at a glance (PrISMS program)

IfM ECS worked with 120 companies over three years during the PrISMS programme. The results from this programme were:

- Help create **126 new** jobs.
- **Safeguard 246 jobs**.
- Increase the **cumulative turnover** for 60 SMEs by **£18.8m (14%)** by improving the business strategy and capability development of these companies.
- **Reduce energy consumption** and minimise the environmental impact of manufacturing processes.
- Provide **feedback for new academic research** and develop new business support tools
- Transfer knowledge and skills to the SMEs to enable the companies to continue to improve after **PrISMS**

Further details

A recent article from the food sector (Braun & Hadwiger 2011) refers to EC/EU documents and lists challenges of knowledge transfers to SMEs (see Table 1) and suggests that this results in sub-optimal exploitation of publicly-funded research in Europe.

DONOR SIDEMost common barriers met when intending to transfer knowledge	RECEIVER SIDEMost common barriers met when intending to receive knowledge
Assumed benefits of possessing knowledge exclusively (Bruneel, D'Este & Salter 2010)	Lack of trust (Bruneel et al 2010; Grunert et al 2008; Santoro & Gopalakrishnan 2000)
Lack of ability to transfer knowledge to a non-specialist (Quillien & Vidal, 2003)	Lack of structures for knowledge processing (Santoro & Gopalakrishnan, 2000).
Lack of face-to-face contact to industry partner (Bruneel et al 2010)	Lack of knowledge concerning the know-how transfer process (Santoro & Gopalakrishnan 2000)
Language and culture barriers (Braun & Hadwiger, 2010; Quillien & Vidal 2003)	Language and culture barriers (Braun and Hadwiger, 2010; Carayannis et al 2006; Quillien & Vidal, 2003).

Table 1: Challenges of Knowledge Transfer to SMEs (from Braun & Hadwiger 2011)

Open Innovation Marketplace for Universities to facilitate direct connections between University researchers and external partners

PROEJCT TEAM – OPEN INNOVATION MARKETPLACE

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**This blueprint is based on the in-depth activity carried out within Pilot 7.*

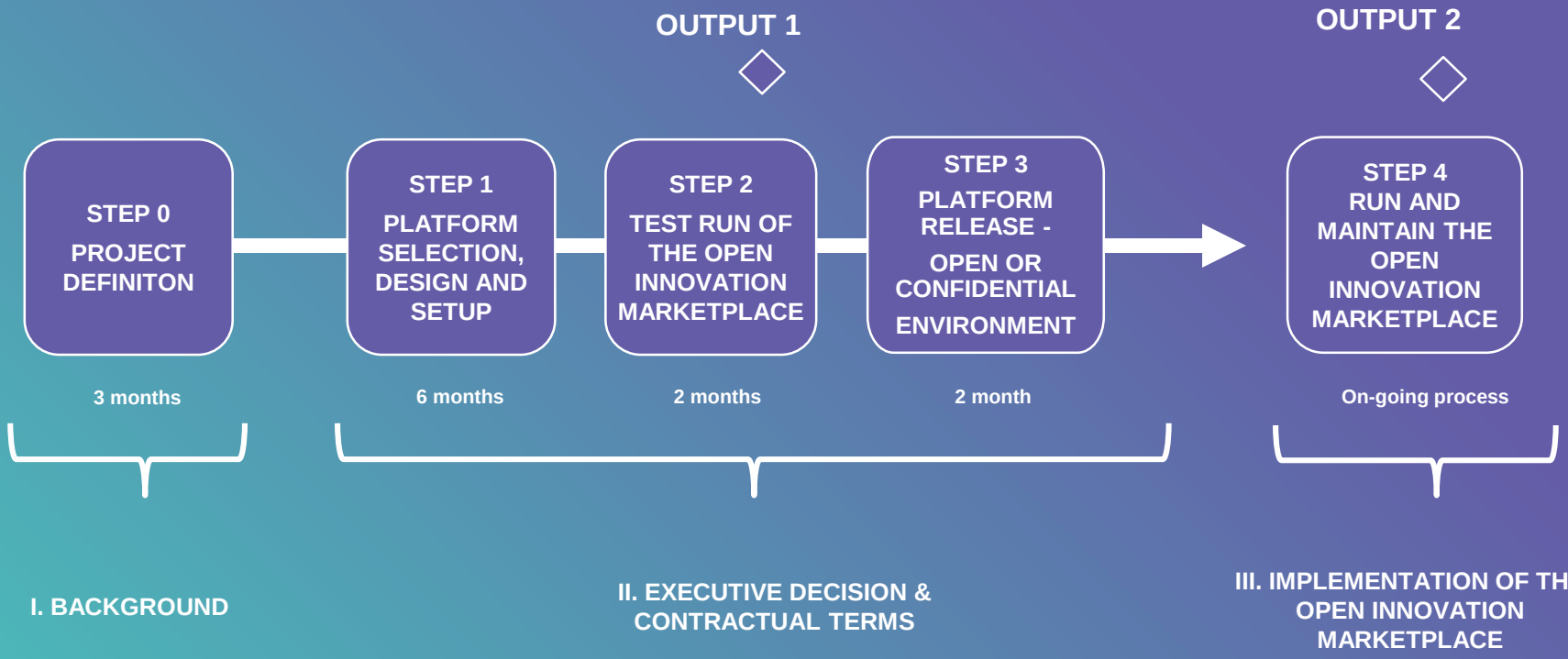
Open Innovation Marketplace(Definition)

An **online university Open Innovation Marketplace (OIMP)** is a technology-transfer-oriented online platform, facilitating **direct connections between university researchers and trusted external partners.**

If successfully implemented, university and industry can connect with new partners around the globe for their innovation and research projects, get **unique online collaboration opportunities** and **share knowledge** about technologies with **guaranteed protection of their intellectual property and confidentiality**.

*Pilot 3.7 is focusing on the design and development of a process to implement an **OIMP at TU Darmstadt** for **technology transfer,** to facilitate direct connections between university researchers, research groups and external partners (the Industry, RTOs, SMEs and Startups).*

Process overview



STEP 0

Project definition

- Align the objectives & actors' roles.
- All actors believe that collaboration in R&D mostly happens between trusted partners.
- Actors want to create a process backed by an open innovation platform to share innovations with external stakeholders and easily make trustworthy contacts, encouraging them to join R&D projects.
- Set up platform requirements and functionalities.
- KPIs and user satisfaction questionnaire definition (e.g. number of technology calls and technology offers posted, time to first response, number of platform members, etc.).

CHALLENGES & TIPS

- Actors' goals and objectives alignment.
- Competing goals between the actors; reach out consensus on how to operate the OIMP and the engagement level.
- Active communication between partners.
- Compromises; actors' active involvement.

MAIN ACTORS

- Technology transfer office
- University's core external stakeholders
- Platform provider & IT support

ENABLING ELEMENTS

- Webex
- Telephone calls
- Regular e-mails
- f2f meetings

TIMEFRAME

3 months

STEP 1

Open Innovation Platform selection, design approval and setup

- Open Innovation Platform selection and setup of the platform by technology transfer office and platform provider.
- Draft design of Open Innovation platform and platform demo for all actors.
- Agree on how to invite users to the platform and formulate an invitation text by technology transfer office.
- Choose a person from the University to be trained as a platform administrator.
- Harmonise the platform's design and features with the University's corporate design and research output management needs.
- Select and prepare initial content (technology offers and innovation needs) to be presented to platform users.

CHALLENGES & TIPS

- Clear message to researchers' community about the OI Marketplace benefits (R&D funding, collaboration opportunities with the industry, showcase your R&D output,..).
- Align OIMP features to University research output information management needs.
- Reliable server to host the OI Marketplace.
- Responsibilities and milestones .

MAIN ACTORS

- Platform provider and IT support
- Technology transfer office
- University's core external stakeholders
- Platform administrator

ENABLING ELEMENTS

- Webex
- Telephone calls
- Regular e-mails
- OI platforms market research
- f2f meetings

TIMEFRAME

6 months

STEP 0 — STEP 1 — STEP 2 — STEP 3 — STEP 4

STEP 2

Test run of the Open Innovation Marketplace (OIMP)

- Invite actors to join the OIMP.
- Post initial content for testing the platform (technology offers and innovation needs).
- Monitor matchmaking process and analyse matchmaking results.
- KPIs and users questionnaire analysis.
- Decision on confidential or open environment for information exchange among OIMP users.

Output 1:

Results of the KPIs.

Results of the questionnaire (user satisfaction).

Report on OI Marketplace implementation process, recommendations, DOs and DON'Ts, new platforms requirements.

CHALLENGES & TIPS

- Quality and quantity of technology calls and offers.
- Active support of the OIMP by the platform provider and the administrator (e.g. invitations, new technology offers).
- Handling of confidentiality and intellectual property issues.
- Activating partners to provide technology offers/calls.

MAIN ACTORS

- Platform provider and IT support
- Technology transfer office
- University's core external stakeholders
- Platform administrator
- Research groups

ENABLING ELEMENTS

- Email alerts to OI platform users on new postings
- Chat messages from platform users
- Webex
- Regular e-mails
- KPIs dashboard & questionnaire

TIMEFRAME

2 months

STEP 3

Platform release

- Agree on how to invite users to the platform and formulate an invitation text.
- Invite research groups, individual researchers and external industry, RTOs and other stakeholder partners to join the Open Innovation Marketplace.
- Organise a workshop to present the features and capabilities of the new Open Innovation Marketplace.
- Help users who have difficulties in using the Open Innovation Marketplace.

MAIN ACTORS

- Research groups
- Science manager and Innovation manager from Industry, RTOs and other external stakeholders
- OIMP administrator

ENABLING ELEMENTS

- Invites send by OIMP administrator
- Workshop to research groups
- Help center
- Information desk e-Mail

TIMEFRAME

2 months

CHALLENGES & TIPS

- Write the invitation messages in the language spoken at your university. Avoid spam type mail.
- Keep the invitation message short and simple.
- Try to adopt an existing community in order to have the “critical mass” of users right from the start.

STEP 4

Run and maintain the OI platform

- Evaluate user satisfaction and adapt the platform.
- Benchmark analysis.
- Review of technology offers and calls based on KPIs during step 4 to identify areas of improvement.

Output 2:

Results of the KPIs.

Results of the questionnaire (user satisfaction).

Report on OI platform implementation process, recommendations, DOs and DON'Ts.

Full operative OI platform.

CHALLENGES & TIPS

- Quality and quantity of technology calls and offers control
- Critical mass on technology offers and calls.
- Good user experience/ user satisfaction (reaction time, established cooperation).
- Active support of the platform by the operator (e.g. invitations, new technology offers).
- Connect the OIMP to already existing online networks to increase flow of content and number users.

MAIN ACTORS

- Research groups
- Science manager and Innovation manager from Industry, RTOs and other external stakeholders
- OIMP administrator
- OIMP provider

ENABLING ELEMENTS

- Email alerts to OIMP users on new postings
- Chat messages from OIMP users
- Webex
- E-mail
- Questionnaire

TIMEFRAME

As long as the OIMP is used

CHALLENGES & TIPS

Insights

- The volume, accuracy and quality of content created (technology calls and technology offers).
- Handling of confidentiality and intellectual property issues.
- The size and engagement of the Open Innovation Marketplace community.
- Provide SotA OI platform that allows process and framework implementation.
- Ability to engage university researchers to actively participate (content creation, responsiveness, trust, ..).
- Building a legal framework that allows actors to freely operate (e.g. restrict information exchange to non-confidential information only, integration of online NDAs, MTAs, etc.).
- Industry/ SMEs, RTOs, and startups to set-up a clear technology roadmap that can be easily transformed into research and innovation programs.

Learning points

- **Most important findings**
  - The opening of the platform for companies strongly correlated with the confidentiality of the platform environment.
  - The first impression of a new online platform determines whether the idea is well-received or not. A well-designed and intuitive user interface needs to be provided.
  - From an industrial perspective, the tool could evolve into the best place to identify centres-of-excellence, startups etc., which are currently performing state-of-the-art research and/or developing new concepts that could be converted into real product innovation opportunities.

- **Most important recommendations**
  - Distributed postings of technology calls or offers among several people didn't work out. There had to be one person in charge to coordinate the platform activities within the whole organisation.
  - The participation of both technology providers and seekers needs to be as wide as possible, (as is the case with any internet-based search and comparison tool; the wider the forum, the more effective the tool). Conversely, restricting participation of either side directly leads to limitations in the effectiveness of the tool.
  - Controlling user access to the OIMP under the principle of a "managed community" hampered the motivation of new users to join the OIMP. This was due to delays in gaining access approval from the platform administrator.

References

- Technology Transfer Program with integrated marketing coaching of researchers and organized pitch events to bring together academic technology providers and industrial companies (http://www.mttc.org/programs-and-events/platform-program/)
- The Innovation Policy Platform (IPP), developed by OECD and the World Bank (https://www.innovationpolicyplatform.org/content/technology-transfer-and-commercialisation)
- The Market for Open Innovation by Frank Piller and Kathleen Diener https://www.researchgate.net/publication324920020_The_Market_for_Open_Innovation
- Anderson, T. R., Daim, T. U., and Lavoie, F. F. (2007), Measuring the efficiency of university technology transfer, Technovation, Vol. 27, No. 5, pp. 306–318.

Impressum

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 693651