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OPEN INNOVATION MODEL



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1. Preface

The SPACE 4 COCREATE Model is one of the core outputs developed in the framework of the ERASMUS + Strategic Partnership project “Open and Innovative Spaces for Collaborative Working between VET Providers and Business Organizations” funded by the European Commission within the call of proposals 2016.

Nowadays organizations are facing very important and long-term changes that go further than the crisis we are undergoing and that have impact in all economic and social changes. These geo-political, economic and social developments are forcing companies to change their “ways of doing”, to make things better or differently, transforming their value proposals, their international presence and their organisation and management model. It is necessary to innovate permanently in the products and services companies offer and question the validity of the business models permanently. More and better investment and innovation will be needed to back their competitiveness and strengthen economic recovery. Innovation and creativity have to be increased in all levels of Education and Training¹.

Talent and innovation are key factors in the equation as guarantee of employability and competitiveness. In this complex and uncertain context, the concept of open innovation is used as an ally. *“Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology”*².

Although actual Vocational Educational and Training (VET) Systems are changing the way of doing and starting to collaborate with the business world, it is true that nowadays VET system are based on a traditional way of doing where the VET student has a passive role and is placed far from the real business world. Our challenge is to address the VET Innovation Systems to generate new opportunities and favour employment creation. Therefore, it is needed to anticipate the industry/company needs, identify proactively the opportunities to generate new products or productive processes, which improve the competitiveness in the companies and the young people’s employability.

¹ Council Conclusions of 12 May 2009 on a strategic framework for European cooperation in education and training (ET 2020) [Official Journal C 119 of 28.5.2009].

² Chesbrough, Henry (2006). Open Innovation: Researching a New Paradigm.

SPACE 4 COCREATE project plans to use all the possibilities and opportunities of the vocational training network, its closeness to companies (particularly the SMEs), to act as a booster for innovation in them, mobilizing the VET young people's talent. The SPACE 4 COCREATE project will use its own Open Innovation Model to develop and implement innovation projects within companies mobilizing the VET young people's capacities and talent and strengthening the connection VET–Company (Work Based Learning).

This document, SPACE 4 COCREATE Model, has been created as a handbook for the implementation of Open innovation (OI) Projects. It can be used as a core document by businesses, education and training providers and any other organisation involved in the implementation and development of Open Innovation Projects. For the elaboration of the model, stakeholders in the field of the Open Innovation, business and vocation and education representatives have taken part in different stages:

- Identification of successfully implemented Open Innovation good practices in Europe.
- Analysis of the good practices selected and selection of the criteria that helps for their success.
- Definition and validation of the framework of the Model according to the criteria selected.

This document is structured in five main chapters:

The first one introduces *Open Innovation concept*, what does it mean, which are the benefits, and its relations with the business models and vocational and educational training systems.

Second chapter *Collaborations and Synergies* makes reference to the different collaboration possibilities that could happen during the implementation process.

Third chapter defines the Structure of SPACE 4 COCREATE Model; which are the participants, their roles and the stages that the Model comprises. The methodology and proposed tools are also included.

Transferability aspects are contained in the fourth chapter; it describes different situations that could happen with the format of different scenarios with different trends.

The last main chapter includes *Successful Cases* that can help businesses, education and training providers and any other organisation to understand the use and implementation of Open Innovation in real life.

At the end of the document, you will find the *bibliography* and *references* used for the elaboration. Also the glossary and the abbreviations could be found at the last part of the document.

2. Open Innovation Concept

Open Innovation (OI) is a concept that is widely spread the last years, that it has been defined as “a paradigm wherein firms can and should use external ideas, as well as internal ideas, and internal and external paths to market, as they look to advance their technology” Chesbrough, et al (2006a). The notion that every organisation, despite its effectiveness, needs to engage deeply and extensively with external knowledge, networks and communities (European Commission, 2016), provides an extra space for creativity and utilization of unused internal ideas and technologies to go beyond the organisation’s borders.

This has been originated by large firms such as IBM, Philips and Unilever and it has been incorporated in their common practices since then. Open innovation has penetrated several pioneering industries, such as software, electronics, pharmaceuticals, biotechnology and telecommunication (Innovation Policy Platform, 2017). Not only large corporations but also SMEs are adopting Open Innovation, strategically using their intellectual property as their main competitive advantage in the market. De Jong (2006) who analysed determinants and barriers to apply Open Innovation in SMEs in the Netherlands, found that the trends towards Open Innovation is also observable in innovating SMEs which are in a way “forced” to apply such practices because of their limited size and resources creating pressures.

Although, it has its roots in corporations and large-scale businesses it can be applied to social sectors and governments. A successful example is NASA that uses OI to find insights into the biggest challenges and Emergencia Non-profit organisation that builds collaborative partnerships for crises management in conflict zones. Open Data and Open Cities initiatives are sharing useful knowledge with citizens, providing new ways to empower people to enhance their lives. With Open Innovation 2.0, new innovation policies are now developing to accelerate these trends (European Commission, 2016).

A deeper discussion arises about the concept when thinking about the costly and risky process of tradition approaches to develop innovation inside the company in its lab or its R&D department. Open Innovation can perform better when it assumes that knowledge is widespread and can be accessed by developing effective mechanisms and can then share this knowledge with others.

According to the European Commission (2016), a number of studies employing the Community Innovation Survey have found that organizations with more external sources of knowledge achieve better innovation performance than those with fewer sources, controlling for other factors. A recent survey of 125 large firms also found that firms that employed open innovation were getting better innovation results.

Open Innovation creates advantages for companies in order to advance and commercialise their technologies. It creates opportunities for effective cooperation, R&D consortia, strategic collaborations between firms in the same sector or partnering with educational organisations, universities, public research organisations and much more. That provides precedence over other companies because effective management of intellectual property combined with business acumen can assist companies in developing effective open innovation strategies.

2.1 Benefits of Open Innovation

Among the most obvious benefits of Open Innovation, is the large pool of technologies and ideas that companies and organisations can have access to in order to develop respond to a challenge. Particularly for companies, Open innovation is seen as a strategic tool that can minimizes the risks of investing and developing a new product, and provides more flexibility and responsiveness. Companies not only increase the speed of exploitation and capture economic value through inward licensing or spinning out unused ideas; they also create a sense of urgency about internally available technologies (“use it or lose it”) among internal groups (Innovation Policy Platform, 2017).

According to Docherty (2006), the main benefits of Open Innovation are:

- ✓ Ability to leverage R&D developed externally
- ✓ Extended reach and capability for new ideas and technologies
- ✓ Opportunity to refocus some internal resources on finding, screening and managing implementation
- ✓ Improved payback on internal R&D through sale or license of otherwise unused intellectual property
- ✓ A greater sense of urgency for internal groups to act on ideas or technology
- ✓ Ability to conduct strategic experiments with less risk and fewer resources, in order to extend the core business and create new sources of growth
- ✓ Over time, the opportunity to create a more innovative culture from the “outside in”, through continued exposure to and relationships with external innovators.

Open Innovation should not overshadow the internal R&D efforts but should be complementary to external ideas and technologies, otherwise it could increase dependency to external partners and can limit the control process or alienate the management of innovation and may result in the loss of some technological competences. Efficient management of intellectual property and potential linkage of knowledge developed during the Open Innovation process should be taken into consideration when those practices are being developed internally. The generalisation of spillover of proprietary knowledge via either compensation (licensing) or without compensation (open source model) (Gassmann et al, 2010) can also alter the process of Open Innovation if specific structures are not defined from the beginning.

2.2 Open Innovation & Business Models

Studying business models in the context of Open Innovation is important to understand Open Innovation. Before interrelate those two concepts, it would be helpful to define the role of a business model which “...describes the rationale of how an organisation creates, delivers and captures value” (Osterwalder & Pigneur, 2009:14). This could be a clear distinction between the concept of Open Innovation and open business models as sometimes both terms are used interchangeably (Vanhaverbeke & Chesbrough, 2014). Business models aim at providing a holistic representation of the company’s business and achieving better communication between different activities. They offer companies a comparison between different strategies (positioning and differentiation) and they are the foundation of competitive advantage.

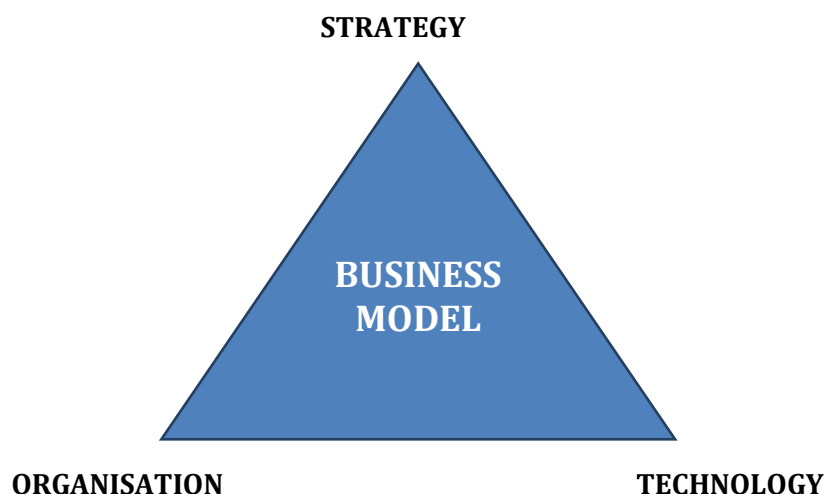


Fig 1. Position of the business model in the company

Source: Osterwalder, 2011

Business models are successful when respond to customer needs in a new or more complete way and contain key elements that competitors are unable to imitate (profitably). Good business models can be made public without a concern for competitive imitation. An aspect to consider is that business models are not static, even good business model need criticism, revision and development. Changes may apply due to changes in competition, changes in customer needs or in the market environment and even technological progress or breakthroughs.

An open business model is thus a powerful organizational model of innovation. Open business models may lead to better financial performance by reducing the costs of innovation, generating extra revenues by monetizing technologies through licensing agreements and spin-off activities when the technology cannot be adopted profitably in the product markets of the company (Chesbrough & Vanhaverbeke, 2014: 53). That is reflected on the interconnection between business models and innovation activities of a firm or its external innovation partners. As Chesbrough & Vanhaverbeke (2014) describe in the book *New Frontiers in Open Innovation* [It is not by accident that the open business model is also called “open innovation business model” or “new business model of open innovation.”] Therefore, Open Innovation and open business models can be considered separately. It is viable for a company to engage in an open innovation but follow a closed business model.

Differentiation between open innovation and open or linked business models helps to understand the connection and relation between them. Using external technologies and setting collaborative deals in open innovation is usually temporary because collaboration stops once a common research or challenge is finished. With linked business models partners usually team up during the whole product lifecycle according to the agreements at the start of the cooperation.

Creativity Levels in Open Innovation

Inbound creativity:

When the company does not know what to innovate, inbound creativity can inspire the R&D department with answers based on researching the external resources such as the customer feedback and needs. This external knowledge is used to guide the innovation process inside the organization to develop innovative products and services that meet with end consumer expectations (Strazdas & Cernevičaitė, 2015).

Outbound creativity:

Many innovated products or technologies developed by the R&D departments fail to achieve success in the market (Yström, 2014) or fit into the existing business model of the company. The failed products are replaced with new ones and considered a loss in the innovation budget (Liao et al, 2014). Chersbrough (2010) indicated that projects that fail inside the company's business model can find their way to success outside the company through marketing them through using an innovative business model differently than the currently implemented model inside the company of origin.

Coupled creativity:

Coupled creativity works in a similar way to the inbound creativity model. The difference is that coupled creativity aims to build a partnership that is used to collect information from the operating environment. This partnership can be either formal or informal.

2.3 Open Innovation & Vocational Training Education

The main question raised when discussing about the connection between Open Innovation and Vocational Training Education is the supportive strategies existing in national level and the level of governments building upon innovative policies that could be incorporated in education. Innovative policies should be focused on competence building (education, training and skills) when are being designed to reflect the needs of the local market (Borras & Edquist: 2014). Open Innovation at educational level are mostly connected with how to apply innovative methods within education and not how to bridge educational organisations such as VET with companies and organisations in order to create “co-products” of innovation.

One of the main difficulties identified in an effort to create a connection between Vocational Training Education and companies or organisations was building trust between VET institutions and other partners on using them as an external source of information and ideas. The difficulty lies on the fact that while connections between Higher Education Institutions and companies exist in many countries, and research institutes also consist the main source of ideas for companies applying Open Innovation in their practices, VET organisations could not be perceived as valuable partners for outsourcing external ideas. That is a challenge that should be taken into account when trying to build valuable relations that may lead to Open Innovation Challenges solving.

Therefore, partnering with VET organisations has great advantages for multiple reasons that could benefit both, companies and educational institutions, active in providing vocational training.

Benefits for companies bridging with VET for Open Innovation:

Some of the main advantages for considering VET organisations and VET students as a source of external and new ideas is that are more connected to the market. In reality, VET curricula are usually designed to respond directly to the market needs and are combined by compulsory period of internships and work-placements, which connect the students to the labour market in an immediate and direct way. That is a great advantage that differentiates them from the theoretical knowledge and courses designed and taught at university levels where knowledge is more abstract and based on theoretical applications.

VET organisations create an environment that is linked with real working conditions, where students can see in an everyday basis the functional problems and possible solutions that can be applied. They learn practical skills and how to use tools and apply knowledge for practical applications. That provides space for thinking and creativity as well as gives the opportunity for taking initiatives and developing skills that are required in the labour market. Hence, teachers of VET organisations are professionals who have long working experience on the field and can apply practical knowledge as well as transfer it to the students directly from the working environment.

Moreover, VET students are directly associated with using products for professional purposes or for personal use, so they have experience on product demand and the open market and can identify possible gaps and opportunities for new product creation. Yet, they are also consisting the customers of tomorrow, so taking into consideration their opinion can lead to product creation that could have great success in the product market.

Benefits for VET organisations to participate in Open Innovation:

In VET organisations, Open Innovation structures could be incorporated in the VET systems producing many benefits for the students. The main benefits to participate in Open Innovation is that VET organisations can be involved in a network of institutions that could exchange information about best practices that could be applied in VET education. Modernization of curricula and teaching methods, especially in countries where education is still based on traditional methods, can be seen as a direct benefit. Incorporating practical challenges in the curricula can further help students to learn in a pragmatic way

and work within deadlines. In addition, students should learn how to cooperate and work in teams, network with other students and teachers as well as company professionals and respond in a semi-professional manner to the working environment.

For solving OI challenges, students will need to use their technical skills, ICT skills and apply new practical knowledges under the supervision of a teacher. Establishment and use concrete incentives for innovation like country innovation units and/or innovation prizes that would enhance participation for VET organisations and students in solving challenges (OECD/CERI, 2007:5)

Cooperation with companies on Open Innovation can also be beneficial for capacity building of stakeholders in specific areas and for developing relation between VET organisations and the private sector. That could lead to partnerships with the private sector that would be beneficial for establishing synergies for teacher training and for student internships. Relations with companies can start in the form of Open Innovation challenges where students can learn by doing in a practical way and through solving an assigned challenge but also the prize can involve internships in a real working environment and within the businesses.

3. Collaborations and Synergies

3.1 Introduction

Collaboration and synergy are key components of the Open Innovation model. Collaboration is required to achieve synergy needed for the stimulation of innovation. The importance of horizontal and vertical partnerships between different organizations (e. g. local and national government, schools, universities, NGOs, local and international companies, etc.) was highlighted through all of the best practice examples collected. in the SPACE 4 COCREATE project.

Synergy achieved through collaboration enables innovation, pooling of resources, knowledge, know-how and expertise transfer.

This chapter will try to discuss some different types of collaboration and synergies known from the business and education sector and will try to rethink them in the context of Open Innovation Model for collaborative working between VET providers and business organizations.

Based on a review of literature and the collected good practice examples, some types of collaborations will be explored in order to find a suitable collaboration model for the Open Innovation projects of collaboration between VET and business organizations, addressed primarily to VET centre professionals, mainly teachers and mentors, to develop innovation projects with companies through young VET teams, stimulating VET young innovation and supporting synergies between education and the business world. It is interesting that the field of Open Innovation also demonstrates the changing role of teachers, as it is no more limited to teaching in schools, which is enabled by these collaborations.

3.2 Definitions

Collaboration is the action of working with someone to produce something, while synergy is where the whole is greater than the sum of its parts. In other words, when two or more people or organizations collaborate, they can accomplish more together than they can separately.

In exploring positive examples of collaboration between education and business sector in the field of Open Innovation, we could see the examples of collaboration between academia and industry, which are considered “a critical component of efficient national

innovation systems” (Guimón, 2013). It is necessary to raise awareness and develop a model for collaboration between VET organizations and businesses as well.

Collaboration is the core of Open Innovation, as “the basic premise of Open Innovation is to open up the innovation process to all active players so that knowledge can circulate more freely and be transformed into products and services that create new markets, fostering a stronger culture of entrepreneurship” (Directorate-General for Research and Innovation, 2016). Collaborations are especially useful because they necessitate the overcoming of cultural bias. Firms and entrepreneurs are required to think outside the box and challenge their traditional ways of doing things. In order to achieve this, “employees need to overcome the “not invented here” mind-set. In other words, they must abandon their reluctance to further develop and commercialize others’ solutions” (Lichtenthaler, 2011). All of these changes in attitude help to create fertile ground for the development of new innovations. VET organizations have to be further recognized as an important link of Open Innovation.

The concept of Open Innovation is constantly evolving and is moving from linear, bilateral transactions and collaborations towards dynamic, networked, multi-collaborative innovation ecosystems. (...) This means that a specific innovation can no longer be seen as the result of predefined and isolated innovation activities but rather as the outcome of a complex co-creation process involving knowledge flows across the entire economic and social environment. This co-creation takes place in different parts of the innovation ecosystem and requires knowledge exchange and absorptive capacities from all the actors involved, whether businesses, academia, financial institutions, public authorities or citizens (Directorate-General for Research and Innovation, 2016).

3.3 Key aspects

Generally, there are some aspects that need to be clearly defined when starting a collaboration project:

1. purpose of collaboration;
2. identification of stakeholders;
3. identification of participants;
4. participation – open/closed (see figure 2 for examples);
5. governance – hierarchical/flat (see figure 2 for examples);

6. level – local/regional, national, transnational, international; in team, in community, network;
7. dimensions of partnership functioning - leadership, administration and management (connected to 3 and 4), partnership efficiency, nonfinancial resources, partner involvement challenges, and community-related challenges;
8. assessing the success of collaboration – developing measures for the assessment

3.4 Stakeholders

There are some key actors in Open Innovation, as suggested in literature on the subject (Directorate-General for Research and Innovation, 2016), that can also be considered in the context of VET-business Open Innovation projects:

- ✓ the public sector (creates regulatory environment, a demand for innovation etc.; 2 questions emerge in connection to the public sector, whether institutional framework is needed and that of the role of public policy in fostering such collaborations);
- ✓ the financial sector (building more innovation-friendly financial instruments and institutions, as accessing funding is not easy, innovation potentially being a risky business);
- ✓ businesses;
- ✓ academia (universities, higher education institutions and public research organization/research and technology organizations, playing a key role in the innovation eco-system, not only as knowledge producers, but also co-creators and generators of skilled human capital);
- ✓ citizens;
- ✓ intermediary organizations.

It is important to raise awareness also about the future skilled workers coming from the VET system – trends show that the present and especially future worker (will) obtain(s) knowledge, hard and soft skills and general comprehension of the work process and therefore is an important link in the process of Open Innovation as well. As some emphasize, citizens, users and civil society organizations have a central and transversal role in bringing innovation to the market (Directorate-General for Research and Innovation, 2016). Open Innovation intermediaries are responsible for facilitating the open innovation activity that companies are undertaking, focusing on fully exploiting the

benefits of the mutual action and thoroughly mitigating the disadvantages and risks for all of the companies.

3.5 Participants

SPACE 4 COCREATE Model considers that the participants for the implementation of Open Innovation projects could be:

- *Facilitating organisations.* These organizations (people) help business organisation and students/teachers during the OI process. They will boost the process and will act as connection in different steps. They have an independent role, with a clear link only with the SPACE 4 COCREATE Model and its criteria and requirements.

Depending on the degree of maturity of the students involved:

- ✓ Tutored model aimed at young people between 16 and 20 years. It requires the figure of a tutor during the process. It will be a person who guides the students in the different phases of the process, ...
 - ✓ Facilitated model for more mature young people over 19 years old. It requires the figure of a facilitator during the process. It will be a person accompanying the students helping them to achieve a result.
- *Business organisations:* These organizations will propose the challenge to face. Within the organization, there are at least two profiles that have to know and be involved: legal representative of the organizations (the decisions have to be supported by him/her); at least one person representing the company during the OI development.
- *Vocational and Educational Training Centers:* they are the organizations that will provide the students for working on the challenge and support teachers/educators for the students.

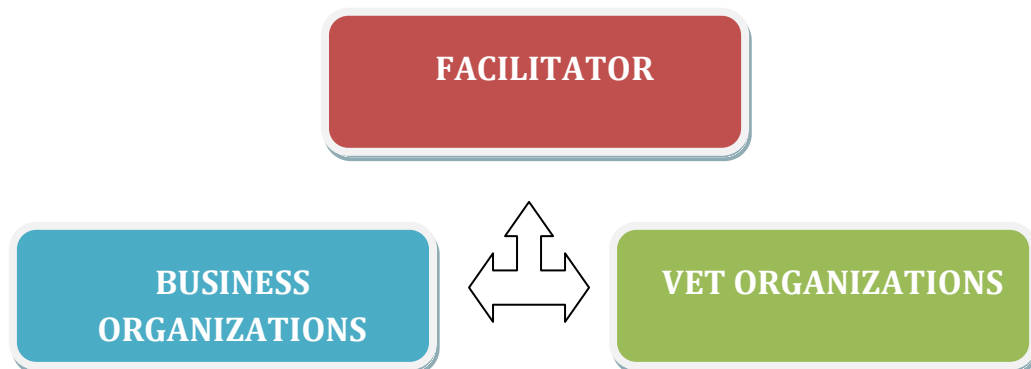


Figure 2. Participants in open and collaborative innovation project

Innovation Mall A place where a company can post a problem, anyone can propose solutions, and the company chooses the solutions it likes best. <i>Example:</i> InnoCentive.com website, where companies can post scientific problems.	Innovation Community A network where anybody can propose problems, offer solutions, and decide which solutions to use. <i>Example:</i> Linux open-source software community.	Participation	Open	Advantage: You receive a large number of solutions from domains that might be beyond your realm of experience or knowledge, and usually get a broader range of interesting ideas. Challenge: Attracting several ideas from a variety of domains and screening them. Enablers: The capability to test and screen solutions at low cost; information platforms that allow parties to contribute easily; small problems that can be solved with simple design tools, or large problems that can be broken into discrete parts that contributors can work on autonomously.
Elite Circle A select group of participants chosen by a company that also defines the problem and picks the solutions. <i>Example:</i> Alessi's handpicked group of 200-plus design experts, who develop concepts for home products.	Consortium A private group of participants that jointly select problems, decide how to conduct work, and choose solutions. <i>Example:</i> IBM's partnerships with select companies to jointly develop semiconductor technologies.		Closed	Advantage: You receive solutions from the best experts in a selected knowledge domain. Challenge: Identifying the right knowledge domain and the right parties. Enablers: The capability to find unspotted talent in relevant networks; the capability to develop privileged relationships with the best parties.
Governance				
Hierarchical	Flat			
Advantage: You control the direction of innovation and who captures the value from it. Challenge: Choosing the right direction. Enablers: The capacity to understand user needs; the capability to design systems so that work can be divided among outsiders and then integrated.	Advantage: You share the burden of innovation. Challenge: Getting contributors to converge on a solution that will be profitable to you. Enablers: Processes and rules that drive parties to work in concert to achieve common goals.			

Figure 3. Example of different types of participation and governance in OI projects³

³ Pisano, G. P., & Verganti, R. Which kind of collaboration is right for you?. Harvard Business Review. 12 (2008). URL: <https://hbr.org/2008/12/which-kind-of-collaboration-is-right-for-you> (30.6.2017).

Collaboration or synergy will be natural if all partners involved gain some kind of benefit out of the process. The Open Innovation process should be transparent, workable and well explained, especially if underage students are involved.

This cooperation should be focused on the dual benefits both for VET students and for companies. What is most needed is to raise awareness about the concept of Open Innovation and to emphasize on the motivation and incentives that need to be used to motivate both sides to develop a successful collaboration.

Collaboration schemes for VET centre-business necessitate that all partners contribute their knowledge and available resources. A list of the things that each stakeholder can bring to the table has been composed.

VET centres:

- ✓ can provide students with the possibility of participating in different challenges under economic incentives, or to design a learning scheme through this process;
- ✓ can incorporate such methods into its curricula;
- ✓ can build cooperative structures and provide training combined with internships on those companies or challenges to enhance interaction between VET students with company representatives;
- ✓ involve trainers in the motivation process.

Companies:

- ✓ must be open-minded, creative and outsourcing, as well as open to new ideas;
- ✓ must be interested in cooperation or are already cooperating with VET centres;
- ✓ can be provided with incentives, such as a “recognition” of excellence or innovation;
- ✓ can have access to the needs of majority of population and can involve students in the designing process as potential consumers;
- ✓ are prepared to allocate a budget for solving a company’s challenge through it.

It is necessary to add that the levels of motivation for this type of collaboration need to be high. Moreover, trust among stakeholders in such partnerships is crucial. Although the existence of patents and other measures that aim to protect intellectual property minimise the chance of appropriation risks, some scepticism continues to exist among enterprises

and, to a lesser extent, among other members of the “quadruple helix model” (government, academia and civil participants).

Open Innovation collaboration projects between VET centres and companies would seek a combination of most of the aforementioned types of collaborations, as well as being open and flexible enough, as this is intrinsic to the open innovation itself. Collaboration itself is highly dependable on the context of each respective project and the project developments.

3.6 Additional thoughts

It is also important for these collaborations to capitalize on trends such as digitalization and mass participation. If firms want to succeed, then they must be prepared to participate actively with the community (consumers). One only has to think of firms such as Twitter, Flickr, or Wikipedia, which, even before 2010, had started garnering considerable recognition and success – to the point that “these open innovation communities have become media darlings” (Germonoprez & Warner, 2012). Some have even gone so far as to write that pursuing openness and adaptability has replaced the demand of entrepreneurs and employers to strictly maintain management and control in firms (Kelty, 2009).

Collaborations and subsequent synergies among partners are not something that should be taken for granted. In fact, numerous factors might make different partners hesitant about cooperating with others. Certainly, the disclosure paradox (Arrow information paradox) plays an important role here. As mentioned before, enterprises might express concern about managing intellectual property across their boundaries. Some other successful firms are inward-looking, which implies that Open Innovation is not necessarily the key to success. For instance, Apple is set on maintaining its competitive advantage.

However, it is more often the case that firms cannot collaborate with others, not because they don’t want to, but because they must have sufficient absorptive capacities that allow them to identify, integrate and exploit valuable external information. Furthermore, companies need to ensure that they are capable of paying high-cost transaction costs, some of which include the need to engage in efforts to find the right partners, to coordinate exchanges, and to manage complexity and risk (Gassmann & Chesbrough, 2010). Investments are needed to build routine and trust with partners over time (Pénin, Hussler & Burger, 2011), the importance of which was evoked previously.

4. Structure

The implementation of the collaborative and Open Innovation projects which involves the participation of different organisations requires the definition in advance of a clear and practical working structure. Considering that there are organisations with different profiles, roles and objectives, it is a key point to have everything defined and agreed in order to avoid difficulties or problems during this implementation.

The structure of OI projects makes reference to all these aspects that are needed for a real implementation, from the description of all the participants involved to the detailed information of the stages that are included.

4.1 Organisations and people involved

The Collaborations and Synergies chapter includes a description of the different organisations that could be involved, their profile and roles. In this chapter, there will be analyzed the characteristic and skills that they have to fulfil to participate in the Open Innovation projects.

Training centers will:

- ✓ be flexible.
- ✓ be innovative.
- ✓ be open to new possibilities.
- ✓ have a group of trainers motivated, active, participative, .. who promote the participation of the others.

There are some skills that the students are required for the participation in the projects:

- ✓ Motivation
- ✓ Volunteer
- ✓ Creativity
- ✓ Innovative
- ✓ Initiative
- ✓ Autonomy
- ✓ Teamwork
- ✓ Conflict resolution

Business will:

- ✓ be bold.
- ✓ be innovative.
- ✓ have a clear knowledge of what Open Innovation means and doesn't mean. Keep in mind that Open Innovation is not a "low cost" consultancy.
- ✓ know how to define their "challenge". Make it interesting and motivating to attract students.
- ✓ have a team sensitized to the challenge and involved with an available budget. If these two conditions do not happen, it could not being successful.

Facilitating organizations will:

- ✓ be dynamic
- ✓ be analytical
- ✓ be able to manage groups
- ✓ be able to motivate participants in OI projects
- ✓ solve problems or conflicts
- ✓ motivate
- ✓

Participating in Open Innovation projects is not for all companies, not for all training centers, not for all the students, ... It is something VOLUNTEER and must be MOTIVATOR.

4.2 Methodology to follow

The development and implementation of OI Projects requires the use of a collaborative methodology. These projects are based on a trust relationship between the parties involved.

Open-mind, flexibility, innovative, creative, and collaborative and team work are skill necessities for an effective development of the project. The success of the OI project will be achieved only from the understanding of all the parties involved about: what is an Innovation project; which are the role of the different participants (organizations, students, facilitators,); what is a OI challenge; and which are the different possibilities of the results that can be obtained (successes or failures in the achievement of a solution).

The development of an OI Project is divided in 4 stages, which are at the same time structured in steps with specific aims, tasks and tools to use.

4.3 Stages for the implementation of a Social Innovation Project

The stages for the implementation of a Social Innovation Project will include from the “analysis and diagnosis” (early stage) to the “validation and closing”, going through the planning and implementation phases.

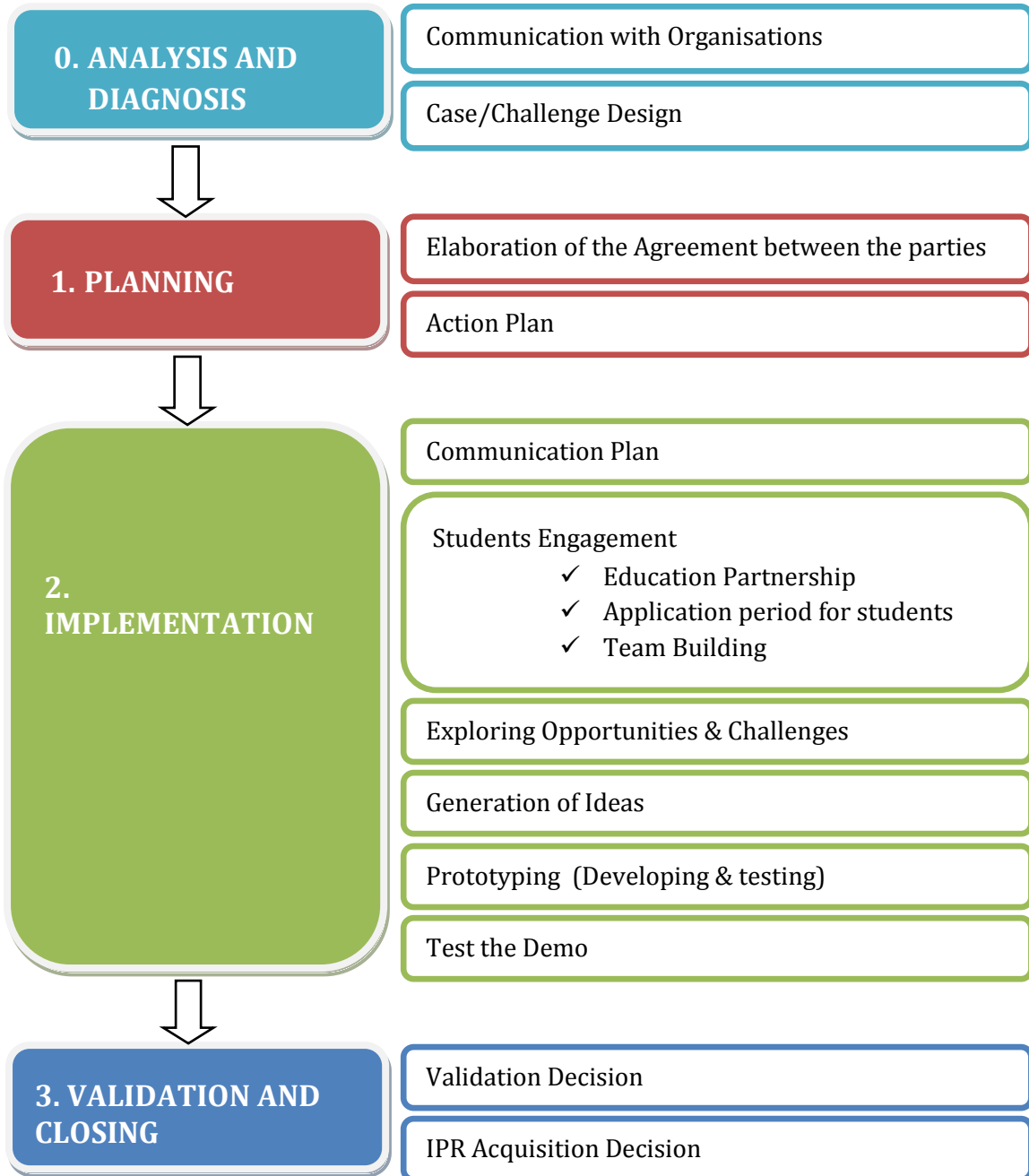


Fig. 4: Diagram about the stages of a Social Innovation Project

Stage 0: ANALYSIS AND DIAGNOSIS

The “Analysis and Diagnosis” stage will be necessary for getting the challenges/cases that will be approached through the implementation of OI projects.

Step 1: Communication with Organisations

The aim is to contact with different organisations that will be involved in the implementation of the OI project. In case of a facilitating organisation that will promote the implementation of the OI project, the objectives are:

- disseminate the possibilities of OI between the organisations.
- attract businesses interested in implementing OI project within its organisation.
- disseminate the development and implementation of the project.

Useful and helpful tools

Recommended tools for the implementation of this stage:

- Digital and physical communication tools as; press releases, facebook, twitter, website,...

It will be interesting to plan the activities before doing them in order to get better results.

Deadlines or time needed

One month is needed for this step.

Outputs

At the end of this step, a dissemination dossier (summary report) with all the dissemination activities will be obtained.

Step 2: Challenge / Case design

The aim is to identify the organisations that are interested in participating in Open Innovation projects. It is required an specific profile for the organisations that participate in this programs, and people from organisations that will be active during the implementation have also to have a concrete skills and competences, as it is described in the previous pages (*Organisations and people involved* section).

Once the organisations are selected, facilitating organisation with the business organisation will work together to identify and design the case/challenge to work on.

Useful and helpful tools

- Template challenge design: this tool works to both open a problem up – presenting it in a way that can be examined from a number of angles – as well as helping to define the wider context and associated issues involved.

Deadlines or time needed

One month is needed for this step.

Outputs

At the end of this step, the challenge is designed and ready to go up at the market.

Stage 1: PLANNING

Step 1: Elaboration of the Agreement between the parties

The objective is to establish the framework (rights, duties, ..) for the implementation of the OI project and individual agreements between the parties: facilitating organisation; and organisations that present the challenge/case.

Useful and helpful tools

- Agreement Framework: This document includes the aspects; rights and duties that each participant organisation has to fulfil during the implementation of the Open Innovation projects.
- Individual agreements: This individual framework agreement is signed by the facilitating organisation; and organisations that present the challenge/case. This document specifies the aspects that the organisations must meet during the implementation of the OI project.

Deadlines or time needed

One month is needed for this step.

Outputs

At the end of this stage, the following output will be obtained:

- Individual Agreement signed between the parties.

Step 2: Action Plan

The aim is to define the activities, tasks and time/deadlines for the implementation of the OI project. This planning has to be agreed by all the participants involved.

Useful and helpful tools

- Gantt Diagram: It illustrates a project schedule. Gantt charts illustrate the start and finish dates of the terminal elements and summary elements of a project. Modern Gantt charts also show the dependency relationships between activities.

Deadlines or time needed

One month is needed for this step.

Outputs

The planning is agreed between the participants involved, specifying activities, tasks and time dedicated for each activity. This planning has to be followed for a successful implementation of OI projects.

Stage 2: IMPLEMENTATION

Step 1: Communication Plan

The aim is to disseminate the OI project. The objectives of the wider dissemination are:

- attract students for taking part during the implementation.
- make the OI project known through the media.

Useful and helpful tools

- Digital and physical communication tools as; press releases, facebook, twitter, website,..
- Visits to Educational centers (VET centers, Universities) to disseminate the OI projects or challenges among the students and teachers.

It will be interesting to plan the activities before doing them in order to get better results.

Deadlines or time needed

One month is needed for this step.

Outputs

At the end of this step, a dissemination dossier (summary report) with all the dissemination activities will be obtained.

Step 2: Students Engagement

The aim is to involve students to take part in the solution of the challenge/case proposed by the leading organisation. It is important to attract students from the thematic areas of the challenge.

This stage includes:

- Application period for students. The students have a period to apply and be selected.
- Team building. Between 5/6 students are selected to participate in the implementation of the project. The participation of student from different thematic areas (multidisciplinary teams) enriches the solution of the challenge/case.

Useful and helpful tools

- Marshmallow challenge: Technique used for demonstrating the importance of creativity, innovation and collaboration between team members in the workplace.
- Appreciative inquiry: it is a fundamental shift in the overall perspective taken throughout the entire change process to 'see' the wholeness of the human system and to "inquire" into that system's strengths, possibilities, and successes.

Deadlines or time needed

One month is needed for this step.

Outputs

At the end of this step, it will be defined the team of students that will work on the challenge.

Step 3: Exploring Opportunities & Challenges

The aim is to understand the challenge/case proposed by the organisation. The students have to know in depth all the aspects of the challenge: origin, people/areas involved, desired results, ..

Students will have different tools for this step but also a literature review will give them the theoretical contents needed for the identifying new opportunities.

Useful and helpful tools

- Problem Tree: Problem tree analysis (also called Situational analysis or Problem analysis) helps to find solutions by mapping out the anatomy of cause and effect around an issue.
- Stakeholder analysis: Analysis to visualise all the stakeholders involved in the open innovation process. It might include individuals, organisations, companies, institutions, networks and all the actors that contribute to the OI project.
- Personas: Create imaginary user profiles, after an exhaustive study of the groups of people who make use of a product or service. Personal characteristics such as physical

description, age, gender, culture, tastes, routine, habits, etc. will be defined for each person. These archetypes will serve to sustain possible ideas or future solutions.

- Empathy Map: Organize the information collected in an interview according to the different groups: What does he/she say? What does he/she do? What actions and behaviors do you notice? What do you think? What do you feel? What emotions have you identified? It is important to be alert to non-verbal language, behavior and contradictions about the information you are giving us.

Deadlines or time needed

One month is needed for this step.

Outputs

At the end of this step, all the causes and effects of an specific challenge are identified.

Step 4: Generation of Ideas

The aim is to get different ideas regarding to the challenge. The students work together to obtain ideas that can solve the challenge proposed. Not all the ideas obtained are going to arrive at the final stage.

Useful and helpful tools

- Thinking Hats: designed by Edward de Bono describes a tool for group discussion and individual thinking involving six colored hats. The premise of the method is that the human brain thinks in a number of distinct ways which can be deliberately challenged, and hence planned for use in a structured way allowing one to develop tactics for thinking about particular issues.

- Fast idea generator: This tool allows a team to generate ideas by looking at a problem or opportunity from a range of perspectives. It helps to frame ideas, problems or opportunities in relation to different scenarios.

- Creative workshop: it is an opportunity to bring together and collaborate with a number of different people involved. They might include the people you're trying to reach, the partners you're working with, experts brought in from similar fields, or any combination of these (and other) groups who would benefit from talking to each other.

Deadlines or time needed

One month is needed for this step.

Outputs

At the end of this step, an idea or set of ideas will be obtained for developing in next steps. The viability of the ideas obtained using the different tools is analysed and only the appropriate one(s) will be developed.

Step 5: Prototyping (developing & testing)

The aim is to elaborate a prototype based of the idea(s) obtained in the previous step. Prototyping is an essential phase to build something that can quickly be tested by interacting with real users (and potential clients), to acquire knowledge on a interaction in a precise situation of time and space, to begin to estimate costs and benefits, to improve the solution before implementing it.

The organisation that promotes the challenge maintains a contact with the students and has periodical meeting with them to solve of the questions and to get a solution close to the challenge.

Useful and helpful tools

- Experience Map: it shows the work through the eyes of the people receiving, benefitting or even funding it. It lays out the different routes and points at which these people become aware of, connect with, and feel about what you do – especially at the points when they come directly into contact with your work.
- Prototype Testing Pan (Prototype framework): it gives a basic, but useful overview of the different ways in which you can test your work, as well as when to test it.
- Improvement Triggers: it provides a collection of questions which can help to look at the work a bit differently. Inspired by the tool ‘SCAMPER’⁴, these questions are designed to provoke into new ways of thinking, and are structured in a way that lets you approach either your existing offering or a potential new solution.

Deadlines or time needed

⁴ Eberle B. 1997

Three months are needed for this step.

Outputs

Demonstrate that the idea developed works or get evidences to support a reworking of the idea.

Step 6: Test the Demo

The aim is to assess the sustainability of the prototype. It necessary to know if the “demo” created is a product that has identity and can be included in an economic context.

Useful and helpful tools

- Focus group: Identify opinions, behavioural habits, social dynamics, and social needs through focus groups. It creates a space for social reflection, as sharing experiences leads to better understanding.
- Business Model Canvas: the plan needs to articulate the problem the business proposes to solve, a vision for how that will be accomplished, and what is needed to do it.. The plan should also include an introduction to the management team, a marketing plan, an operations and financial plan, and any other requirements.
- Value Creation Proposition: Developing a value proposition is based on a review and analysis of the benefits, costs, and value that an organization can deliver to its customers, prospective customers, and other constituent groups within and outside the organization.

Deadlines or time needed

One month is needed for this step.

Outputs

An implemented and sustainable innovation regarding to the challenge /case proposed by the organisation leading of the Open Innovation project.

Stage 3: VALIDATION AND CLOSING

Step 1: Validation Decision

The aim is to validate the product obtained during the implementation of the Open Innovation project. The organisation leading the OI project has to analyse the prototype according to the criteria defined at the beginning. This analysis has to be based on impartiality and objective criteria.

The students that participate in the OI project get the feedback from the organisation and know if the product is valid for them or not.

Useful and helpful tools

- Critical tasks list: It is a dynamic and professional project management tool. The Critical Task list is a first step to develop a routine in the organising. List all the activities to be carried out, together with who they are assigned to, the budget available, the deadline for completion and the process for final sign off.
- Learning Loop: It is a tool that helps to define how the work you do now informs what you do next. This tool can help understand the different phases involved when trying to implement your ideas. By reflecting on the process involved, it can help you to understand what to do next.
- Target group: This tool is a quick and easy way to work out an overview and develop an understanding of the different people your work might reach, and the resources you need to do so.

Deadlines or time needed

One month is needed for this step.

Outputs

Evidences derived from formal evaluations made to the prototype obtained from the Open Innovation implementation.

Step 2: IPR Acquisition Decision

The aim is to establish in a formal way who is the owner of the Intellectual Property Right (IPR). Since the beginning of the development and implementation of the OI project, the ownership (IPR) of the product developed is known, agreed and respected by all the participants.

Useful and helpful tools

- Intellectual Property Right agreement framework: It refers to the creations of the human minds for which exclusive rights are recognised. Intellectual property rights (IPRs) are the protections granted to the creators of IP, and include trademarks, copyright, patents, industrial design rights, and in some jurisdictions trade secrets.

Deadlines or time needed

One month is needed for this step.

Outputs

Intellectual Property Right is signed, specifying the ownership of the result.

STAGES	STEPS	TOOLS	RESULTS
ANALYSIS AND DIAGNOSIS	Communication Organisations with	Digital and physical Communication tools: Discussion forums, open space skype, twitter ,facebook, website, newspaper....	Summary report, e-mails, insights at web site and social Networks.
	Case/Challenge Design	Template Challenge Design	Challenge designed ready to go up at the market.
PLANNING	Elaboration of the Agreement between the parties	Agreement Framework and Individual Agreements	Agreements signed
	Action Plan	Gantt Diagram	Planning agreed
IMPLEMENTATION	Communication Plan	Digital and physical Communication tools: Discussion forums, open space skype, twitter ,facebook, website, newspaper.... Visits to Educational Centers	Summary report, e-mails, insights at web site and social Networks.
	Students Engagement	Marshmallow challenge, Appreciative Inquiry	Students team built (5/6 students)
	Exploring opportunities & Challenges	Personas, Problem Tree, stakeholder analysis, literature review, Empathy Map	Overview of all the known causes and effect to an identified problem

	Generating Ideas	Thinking Hats, Fast Idea Generator, Creative Workshop	An idea or set of ideas for the proposed challenge/case
	Prototyping (Developing & testing)	Experience Map, Prototype Testing Plan, Improvement Triggers	A prototype with cost and benefit projections developed through practical trials and experiments, involving potential users
	Test the Demo	Focus Group Business Model Canvas Value Creation Proposition	An implemented and sustainable innovation regarding to the challenge /case proposed
VALIDATION AND CLOSING	Validation Decision	Critical Tasks List Learning Loop Target Group	Evidences derived from formal evaluations made to the prototype
	IPR Acquisition Decision	Intellectual Property Right Agreement Framework	IPR signed

Figure 5: Summary of the stages, steps and tools for the implementation of OI projects

4.4 Timetable

STAGES	STEPS	M1	M2	M3	M4	M5	M6	M7	M8
ANALYSIS AND DIAGNOSIS	Communication with Organisations								
	Case/Challenge Design								
PLANNING	Elaboration of the Agreement between the parties								
	Action Plan								
IMPLEMENTATION	Communication Plan								
	Students Engagement								
	Exploring opportunities & Challenges								
	Generating Ideas								
	Prototyping (Developing & testing)								
	Test the Demo								
VALIDATION AND CLOSING	Validation Decision								
	IPR Acquisition Decision								

Figure 6: Timetable for the implementation of the OI projects

5. Transferability

To ensure the transferability of the Open Innovation model in all partner countries, it is crucial to consider the different political and economic structures as well as the individual cultures. On one hand, the transferability of an open innovation model depends highly on project funding. On the other hand, it needs to be considered that each partner country has a different level of awareness of open innovation processes. While some countries like e.g. North Spain and Austria are already used to the subject and developed an open innovation culture, other countries are just beginning to learn about the possibilities and benefits of open innovation. Due to those different systems and structures across Europe, the transferability of an open innovation model is characterised by a high level of complexity and many, many differences – sometimes there are even differences on regional level within a country. And on top of that, we are living in a time where tremendous changes could appear rapidly, not only due to digitalisation processes. To face these ever-changing variables, a sustainable model is needed. A model that is as flexible as it is specific. A model that is able to be transferred into different cultural and economic contexts. For the transferability of this open innovation model, one key aspect can be identified in all countries at all times: financing. There can never be a project without some kind of funding and that is why this aspect will be used as the main focus. This chapter will deal with two simple questions:

- How can Open Innovation between VET institutions and companies look like?
- What benefits come to those who participate?

To answer these questions and to deal with the high level of complexity, a specific method will be used: The scenario planning method. This method allows the development of different scenarios as they might happen in the future. In the following chapter, these scenarios show three different forms of how Open Innovation between VET centers and companies could look like in different funding systems, what will need to be achieved alongside and what benefits there will be. At the end of this chapter, a conclusion will be presented.

5.1 The Scenario Planning Method

"Scenarios give us lenses that help us see the future prospects more clearly, make richer judgments and be more sensitive to uncertainties."

Jeremy Bentham,
head of scenarios, strategy and business development⁵

The scenario planning method is a complex instrument in the development of business strategies and it is used to discover and describe important stakeholders and system requirements⁶. It is a way to prepare for future developments and events that can't be predicted accurately until they happen. Because there are an infinite number of possible futures it is crucial to consider multiple futures all at once, hence finding a way to prepare for a handful of plausible scenarios that may happen. The point is to single out the most relevant events that will occur and will have an impact on the performance of the company.

Initially, the scenario method was a military instrument which was developed by Herman Kahn in the 1950s and famously adapted by the Royal Dutch Shell Company in the Seventies to prepare for unpredictable but possible challenges in their global supply chain⁷. Circling around the assumption that the future is not only an extension of present tendencies, the scenario planning method is used to prepare for surprising, uncertain and discontinuous situations. The future is not set in stone, choices of today influence the path a company or a country will take and economic, political or social tendencies will have an impact as well⁸. To face this challenge and to describe future situations, main actors and stakeholders as well as their interests, scenarios are identified.

At first it is necessary to analyse current trends on which these scenarios can build (see also figure 7). Scenarios are specific stories that explore possible paths to different future conditions. Additionally, Scenarios are a creative way of developing strategies, because they don't need to be scientifically accurate. The conversations and maybe even choices initiated by the creative ideas developed in process of scenario planning are the real benefit of this method⁹.

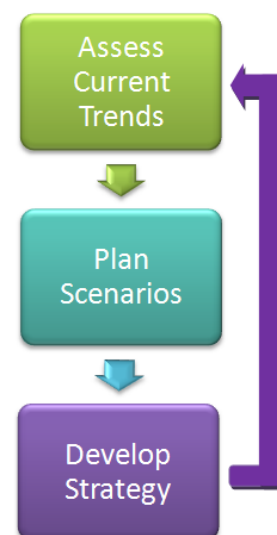


Fig. 7: The Scenario Planning Process in a Nutshell

⁵ Royal Dutch Shell 2012, p. 5.

⁶ Alexander & Maiden, 2004

⁷ Meinert, 2014

⁸ Royal Dutch Shell, 2012

⁹ Royal Dutch Shell, 2008

There is much more to say about the scenario planning method, but for the context of this chapter and the SPACE 4 COCREATE model, the method will be simplified and adapted to the needs of an open innovation approach. The different contexts of the partner countries involved in the SPACE 4 COCREATE project were assessed during dedicated workshops. As announced in the introduction of this chapter, one main aspect for open innovation project is funding. Therefore it is essential to identify funding possibilities to ensure the sustainability and transferability of an open innovation model in a medium-long period. The question is, how open innovation can be achieved, be reproduced in a continuous way and be maintained over years? In some EU countries financial restraints are reality, hence the search for a possibility that works even with limited financial support. Even a combination of financial sources is thinkable.

To tackle these thoughts and for the purpose of the open innovation model, three scenarios were developed (see also figure 8). Despite the fact that there are different political systems, economic structures and innovation trends observed in each partner country, they have been compressed and clustered into possible scenarios for the future. Each scenario revolves around a different style of project funding – public, private or co-financed. For each of these scenarios, three trends are presented. For the purpose of comparison, there will be a “no change” trend for each scenario, even if it is very unlikely that literally nothing will change in the future. But since there are many regional and national differences now, this trend postulates that everything stays the same – no matter where you are. The other two trends presented deal with two possible developments out of an infinite number of possible future conditions. After the description of these scenarios, a conclusion will be presented.

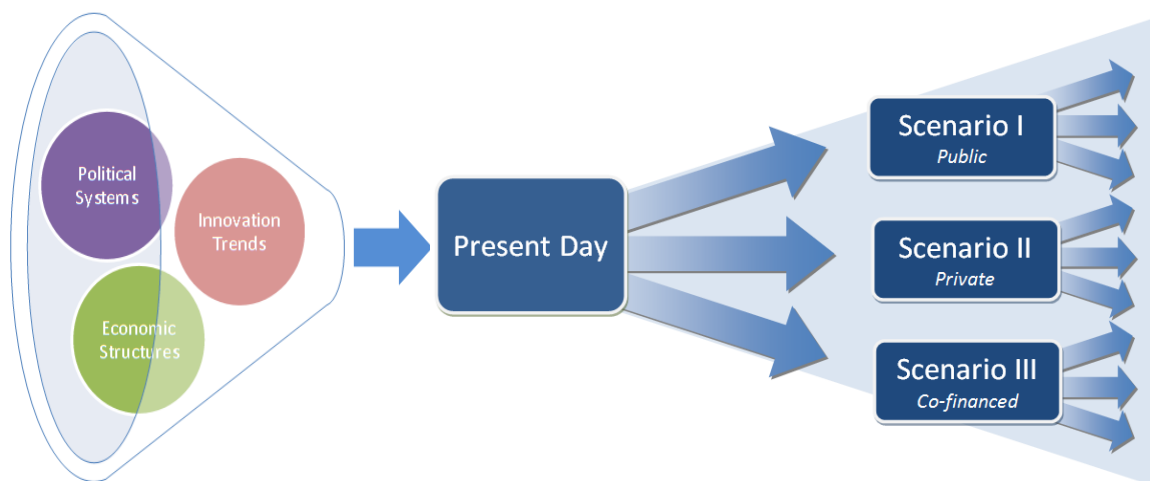
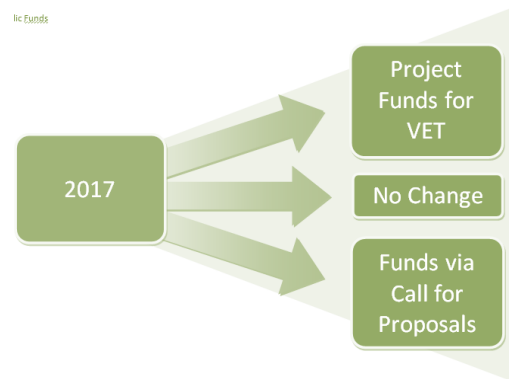


Fig. 8: Development of the Space4Cocreate Scenarios

5.2 Scenario I: Public Funding

The first scenario will focus on the possibility of public funding for open innovation projects. As announced, there are three trends within this scenario. The “No Change” trend postulates that no matter what the circumstances of public funding are at the moment, they will be the nearly same in the future.



The second trend describes a path, where open innovation projects will be financed directly with public funds. Open innovation will be a very interesting issue for young people and companies that strive for product or service innovations. The national or regional government will be the motivator in this case, offering financial support for VET centres and tax reduces for companies, if they collaborate in open innovation projects. Companies will contact the vocational education centres to collaborate in tackling a special challenge concerning product or service innovation, while co-financing the project up to a certain amount. Then VET centres will apply for project funding and they will get lump sums from the government, most likely on regional level, which they can use up to a previously defined amount. However, the funds will never cover 100% of the project costs, since the companies are required to invest in their projects as well. There must not be an immediate financial profit, only the results of the projects may be lucrative for the company. The focus stays on the educational aspects of the open innovation process.

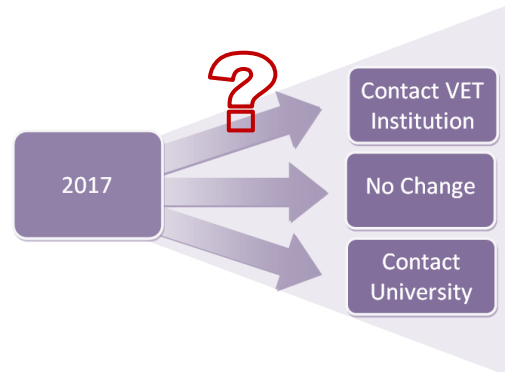
The third trend concerns a slightly different approach. The main spotlight will still be on public funding, but there will be a regional call for proposals. VET centres as well as companies are allowed to apply for the temporarily position as “Regional Innovation Leader”. The regional government will grant this title and project funds to 1-2 applicants in different fields of open innovation, e.g. product or service innovation. However, the main focus should shift from an exclusive economic funding program to an educational approach. VET centres or VET departments of companies will hold the power and govern the financial funds. There will be a lot of publicity for the “Regional Innovation Leaders”, boosting their image and public perception.

In both cases, there will be a need for a person dedicated to managing and monitoring the open innovation processes. This person will also moderate and ensure the communication

between VET institutions and companies, but also between them and the government responsible for the project funds.

5.3 Scenario II: Private Investments

In this scenario there will be no public funding. All financial support will be provided by companies and businesses. Again, three trends are thinkable and again, there is a “No Change” trend postulating the circumstances concerning private investments for open innovation project will stay nearly the same over time.



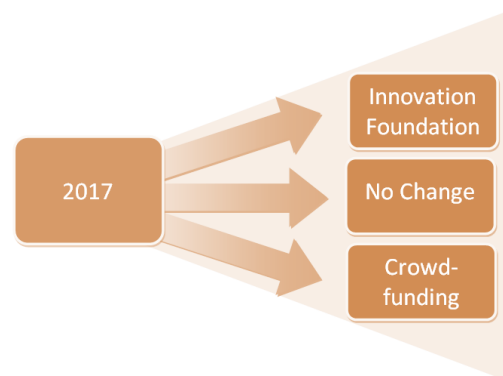
If companies and businesses are responsible for financing the whole project and thereby for contacting an educational institution in order to collaborate in an open innovation project, there are two major possibilities, besides tackling the challenge internally. One that is heavily observed in the present is that especially medium and large companies will contact mainly institutions of higher education like universities when they need support or want to realise an open innovation project.

However, for the purpose of the Space4cocrete open innovation model the spotlight will be on the other possibility – companies contacting VET centres for collaboration in open innovation projects. The main question is why businesses should choose VET institutions over Universities and what needs to be done to promote this path. In order to motivate companies to finance open innovation project, the public opinion needs to be shaped by raising awareness. This could be achieved with an impulse or an informative campaign sponsored by the regional or national government because open innovation is important to a country as a whole as well as for individual companies. Even the EU could be the initiator of such campaigns. Closely linked to the raising of awareness, there should be non-material rewards like awards or patches for companies that are willing to realise open innovation project with VET centres. These rewards should boost the publicity and reputation of companies, supporting them in marketing and disseminating their brand. Companies will be named in best practice projects and their projects may become a flagship project for future open innovation approaches. This idea would also work on European level, intensifying the international networking opportunities for VET centres and micro & small companies all over Europe. Open innovation projects will also be promoted at fairs and at a high level of public relation activities in online and print media. The awareness of companies and the public should be raised towards the immediate

benefits of collaboration with VET institutions. These include not only the opportunity to scout for future employees and to deepen the commitment of present employees, but also the fact that research and development activities of VET centres happen close to real life practices. Communication and cooperation between VET students and companies take place on an equal footing and are characterised by the focus on application and by a high level of creativity. Therefore, especially micro and small companies are the target group of this open innovation approach.

5.4 Scenario III: Co-financed Sponsoring

This third scenario introduces the possibility of co-financing between different actors. Again, there is a “No Change” trend, indicating that even over time any circumstances in relation to open innovation in a country will stay the same.



The second path postulates the establishment of a foundation dedicated to open innovation between VET centres and regional companies.

This “Innovation Foundation” will focus mainly on educational aspects as well as on offering a regional networking platform. The idea is that anybody who would like to participate is welcome to do so. Private individuals are able to offer sponsoring for open innovation projects as well as banks, telecommunication facilities or other private companies of any size and sector. Even public bodies are allowed to take part in this Innovation Foundation; however this does not mean that all the funds will be public. It will be possible for companies to sponsor peculiar projects that are of individual interest as well. Anybody who participates in sponsoring open innovation projects should be rewarded in some kind and this reward should correlate with the amount spent on the project funds. Rewards could be awards or certificates or a seat on the foundations council for extraordinary donations. This foundation council will need to be established and its task will be to select the projects that qualify for funding. It is possible, that this council will also call for proposals.

In this scenario, a facilitator is heavily needed. The facilitator promotes the project funds available, mediates the communication between VET centres and companies and grants the funds to definite projects. Due to the high level of flexibility in this scenario, this kind of project funding could be installed in nearly any environment and at any level – regional,

national or even international. The rule of thumb here is that the more sponsors are available, the more funds are available.

The third trend in this scenario is the possibility of project funding via crowd funding. Crowd funding has become popular recently and there is very much the opportunity to use this trend for open innovation purposes. Especially micro and small companies could be interested in funding their project with financial resources of private citizens that are willing to sponsor open innovation projects. There are many platforms available that reach thousands of people and with the right innovative project idea there will be enthusiasts who would love to participate. They will be rewarded with goodies, name publication and even the offer to play leading roles at the realisation of a project, if they are willing to spend an extraordinary sum on the project. This crowd funding approach can be easily implemented anywhere because it does not depend on any national or regional structures.

5.5 Conclusion

The transferability of an open innovation model is highly dependent on the economical structures and system requirements that are present in a certain environment. This is why this chapter presented different scenarios on how open innovation could play out in different funding systems. The main idea was to think out of the box, to play with thoughts and to spark a discussion about these scenarios. They don't need to be perfectly realistic, because they are stories about what might be possible. Some aspects are practiced already, some maybe never will. But as the famous case of Royal Dutch Shell, who thanks to their scenario technique predicted the oil crises in the 1970's years before its happening¹⁰, the Space4cocrete model serves the purpose of preparation and offering an orientation guideline. The three scenarios and thereby six trends should spark discussions about the implementation of open innovation projects in different European countries. Because there is a truth in the common saying freely adapted from Ralph Emerson: thoughts become words, words become actions, and actions become habits¹¹. This Space4cocrete model should be a step towards the development of a European open innovation habit and thereby showing different ideas on how to develop an open innovation culture.

¹⁰ Royal Dutch Shell 2012

¹¹ Boyes & Watts 2009

6. Successful cases

A New Boat for Saving Lives

The story

The Red Cross Bizkaia is a voluntary humanitarian organization, deeply rooted in the society that provides comprehensive responses to vulnerable people from a human and community development perspective, reinforcing their individual capacities in their social context.

The Red Cross has carried out rescue activities in the Basque coast since 1970. Rescue people or tow boats activities require manoeuvrability skills and different propulsion response by the boat depending on the situation (situation of the sea, closeness to people, type of rescue,...). Nowadays, boats have difficulties to face different phases of the rescue, as well as the different conditions of the sea. There are still not options in the market that gives answer to their requirements.

The challenge

The creation of an hybrid propulsion and the adaptation of the characteristics of a ship to its needs are two of the distinctive ones that make this project unique. Through an unprecedented boat, the project aims to create a multipurpose boat capable of responding adequately to any extreme situation, safeguarding the integrity of all who take part in it.

The solution

The only way to solve the need that the Red Cross has, was by combining the two main types of propulsion (known worldwide) that a rescue boat should have, in a single turbine and propellers. It is about getting advantages of both types of propulsion and overriding the disadvantages that each entails. Each propulsion has its advantages and disadvantages, being able, in this way the pattern, to choose the type of propulsion that fits better according to the circumstances.

The student team was formed by Gorka Aurre Montes, Industrial Technologies Engineer, Mechanicals and Paul Aurre Gerediaga, Sports Sciences.

The final demo was a Mock up of the boat made of wood. The mock up was modular and gives the opportunity to remove all the pieces completely.

Makers@School

The story

In this project mainly funded by the Austrian Research Promotion Agency (FFE), five partners of educational background joined forces with three companies and three university institutes. Together with the facilitator Practical Robotics Institute Austria (PRIA) their mission is to increase the interest of students in the field of research, development and innovation. Over the time span of two years, students encounter many activities in different setting, always aimed at joining together to create something new with modern technology. They are the inventors, designers and producers of their own products. At the end of the project they will write a paper and present it to their peers at school.

The challenge

How is it possible to prepare students for the challenges related to industry 4.0? Sparking interest in students for issues like robotics, mechatronics and 3D-printing is the easy part. But to keep them interested is the challenge! Gaining new skills in connection with innovation, problem solving, engineering and operating with newest technology is the main aim of this project. Positive side effect: as a company you may win competent and highly motivated future employees!

The solution

Give the students a chance to experience innovation processes for themselves! In this project students are able to create new things using 3D-printing technology or in the framework of workshops and so-called “makerspaces” which are laboratories. Students encounter maker-activities which require teamwork, problem solving competences as well as creativity, preparing them for a possible career path in this sector.

Source:

https://www.ffg.at/sites/default/files/images/programmlinien/kurzbeschreibung_makersschool.pdf

Smart Olli!

The story

Local Motors is an American motor vehicle manufacturing company focuses on low-volume manufacturing of open-source motor vehicle. Local Motors activates its open community through its Co-Create platform. The designed vehicles are manufactured through, for example, 3D printing. So, the key part in Local Motors' product development is its completely open innovation platform. You don't even need to be registered to their platform-site to see the new designs that the community has envisioned. Like in most other open innovation companies, the innovations are coined through open innovation challenges, like the LITECAR challenge.

The challenge

In 2015 Local Motors had an Urban Mobility Challenge: Berlin 2030, the aim of which was to envision the future of transport in Berlin. Now, one year later one of the envisioned transport solutions has already seen daylight. It's one of the most known Local Motors Co-Creation products, Olli, the self-driving smart bus.

The solution

Olli, is a self-driving smart bus that aims to change the way that transportation is. Olli is the example of a smart, safe and sustainable solution to future environmentally-friendly transportation. Apart from being self-driving, Olli also works through mobile phone. Creation of new routes or choice of existing is possible through Olli.

Olli is not just some envisionment of the faraway future, it's actually already hitting the streets of Washington D.C. Like other designs, Olli has been developed through the Co-Creation site after the initial design. You can, in fact, see the conversations and ideas that the community has posted there.

Source: VIIMA

Revolutionising Disaster Relief Services Using Robots

The story

On March 11th 2011, a tsunami initiated by the Tōhoku earthquake led to what would later become known as the Fukushima Daiichi nuclear disaster, an incident so great that it was called the worst nuclear accident since Chernobyl. Due to high radiation levels, workers at the power plant who had tried to limit the damage (primarily by manually venting accumulated hydrogen) soon realised that they needed to retreat. This led to the building-up of hydrogen, which in turn led to explosions that resulted to a destruction of facilities and environmental contamination. The nuclear disaster highlighted the need to develop alternative ways of tackling such crises, given that certain tasks are simply too dangerous for humans to carry out (and which can culminate in death, increased chances of thyroid or other forms of cancer and other illnesses).

The challenge

Due to all of the challenges faced by those who must deal with the catastrophic effects of natural disasters, DARPA (Defence Advanced Research Projects Agency), an agency whose aim is to make crucial investments in breakthrough technologies for national security, launched the DARPA Robotics Challenge (DRC). The DRC, an open innovation contest, aimed to accelerate progress in robotics which would eventually result in robots being able to work alongside responders in disaster areas, sometimes even allowing them taking on tasks that would prove to be perilous for ordinary employees. Participants were additionally motivated to participate in the event due to substantial financial rewards (for example, the winning team received \$2 million).

Revolutionising Disaster Relief Services Using Robots

The solution

The DARPA Robotics Challenge was held between 2012 and 2015, with participants hailing from some of the most advanced countries in the world in the field of robotics (such as the Germany, Italy, Japan, the Republic of Korea or the USA). The two-day finals event saw 23 teams competing amongst each other in a series of challenges. For instance, the robots had to compete on an obstacle course that comprised several tasks, all of which simulated working in a disaster area. The tasks included climbing a flight of stairs, drilling a hole through a wall, opening a valve, dealing with rubble and driving a car, and a number of measures were put in place in order to avoid cheating via pre-programming. The open innovation competition's first prize was eventually awarded to Team KAIST from the Republic of Korea, whose DRC-Hubo robot successfully completed the entire course in the least amount of time. However, tackling detrimental effects of nuclear disasters is only one of the things that a robot could do. Besides this, agriculture, construction and other fields have much need for such innovations. DARPA was one of the first organisations to kick start the process of creating a new generation of robots. Now, it is time for others to join in and contribute to creating safer working conditions for those who are the first to go and combat the devastating effects of natural and man-made disasters.

Rescue Robot for Disaster Relief Wins Open Innovation Challenge. (2017, January 23). Retrieved June 30, 2017, from <https://www.ideaconnection.com/open-innovation-success/Rescue-Robot-for-Disaster-Relief-Wins-Open-Innovation-00625.html>
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8. Glossary

Term	Meaning of term/short description
Open Innovation	<p>Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology.</p> <p><i>Chesbrough, Henry (2006). Open Innovation: Researching a New Paradigm.</i></p>
Business Model	A business model describes the rationale of how an organisation creates, delivers and captures value.
Inbound creativity	When the company does not know what to innovate, inbound creativity can inspire the R&D department with answers based on researching the external resources.
Outbound creativity	Innovative product that failed to achieve success in the market and has produced internally by R&D department can succeed outside the company through external marketing channel and innovative business models different than the ones implemented within the company of origin.
Coupled creativity	Coupled creativity works in a similar way as outbound creativity but it aims to build a partnership that is used to collect information from the operating environment. This partnership can be either formal or informal.
Consortium	A private group of participants that jointly select problems, decide how to conduct work, and choose solutions.
Elite circle	A select group of participants chosen by a company that also defines the problem and picks the solutions.
Innovation community	A network where anybody can propose problems, offer solutions, and decide which solutions to use.
Innovation mall	A place where a company can post a problem, anyone can propose solutions, and the company chooses the solutions it likes best.

National innovation System	The flow of technology and information among people, enterprises and institutions which is key to the innovative process on the national level.
Open collaboration	“Any system of innovation or production that relies on goal-oriented yet loosely coordinated participants who interact to create a product (or service) of economic value, which they make available to contributors and non-contributors alike” (Levine & Prietula, 2014).
Open Innovation Intermediaries	These are companies that help other companies implement various facets of open innovation.

9. Abbreviations

Term	Meaning of term/short description
R&D	Research and Development
OI	Open Innovation
VET	Vocational Educational and Training
IPR	Intellectual Property Rights



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