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APInno Guide for collaboration between business and academia

Connecting Innovation Syllabus with Business Challenges

This project was financed by the EU programme ERASMUS+. The information and views set out in this publication are those of the authors and do not necessarily reflect the official opinion of the European Union.

This Guide *"Connecting Innovation Syllabus with Business Challenges"* has been designed to enable an active collaboration of higher education institutions with businesses in the area of Innovation Management Education. It signposts a partnership model that takes maximum advantage of the enormous potential universities have to support innovation in businesses, whether large, small, or medium-sized. Through the six learning modules students, mentors and business representatives are working in a close and scheduled way to create and bring new, potentially innovative solutions into the market. The different creativity, team building and design exercises after the modules enable students to draw on first-hand experience while examining the creation of both economic and technical value. The programme consisting of 180 hours learning is not meant to be exhaustive, but it focuses on innovation areas that are of greatest value. It is meant to help industry and students understand each other's needs and its testing in two countries, UK and Bulgaria, has proven highly successful in terms of the number of applications received, the performance of the students and positive feedback received from the participating companies.

The Action project for innovation - APInno Project was financed in 2014 by the EU programme ERASMUS+. The information and views set out in this publication are those of the authors and do not necessarily reflect the official opinion of the European Union.

This guide should be used as integral part together with the supporting outputs – students', trainer's, challenger's handbooks, methodology and syllabus.

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1 Teaching Approach

The APInno methodology provides a holistic model of learning that merges experience, perception, cognition, and behaviour. Although that the project combines different educational approaches, it puts a special emphasis on Experiential Learning. Unlike cognitive learning theories, which tend to emphasize cognition over affect, and behavioural learning theories, which do not allow much space for consciousness and subjective experience in the learning process, experience plays a central role in Experiential Learning's process.

The open nature of experiential learning means that it can often be difficult to define what is and is not an experiential activity because there are many activities that have the potential to be experiential, but may not be depending on the execution. Therefore, it is recommended to use a list of characteristics that should be present in order to define an activity or method as experiential[1]:

- **Mixture of content and process:** There must be a balance between the experiential activities and the underlying content or theory;
- **Absence of excessive judgment**: The mentor must create a safe space for students to work through their own process of self-discovery;
- **Engagement in purposeful endeavours:** In experiential learning, the learning activities must be personally relevant to the student;
- **Big picture perspective:** Experiential activities must allow the students to make connections between the learning they are doing and the world. Activities should build in students the ability see relationships in complex systems and find a way to work within them;
- **Reflection:** Students should be able to reflect on their own learning, bringing "the theory to life" and gaining insight into themselves and their interactions with the world;
- **Emotional investment:** Students must be fully immersed in the experience, not merely doing what they feel is required of them. The process needs to engage the learner to a point where what is being learned and experience strikes a critical, central chord within the learner;

[1] Chapman, S., McPhee, P., & Proudman, B. (1995). What is Experiential Education?. In Warren, K. (Ed.), The Theory of Experiential Education (pp. 235-248). Dubuque: Kendall/Hunt Publishing Company.

- **The re-examination of values:** By working within a space that has been made safe for self-exploration, students should begin to analyse and even alter their own values;
- **The presence of meaningful relationships:** One part of getting students to see their learning in the context of the whole world is to start by showing the relationships between learner to self, learner to teacher, and learner to learning environment.
- **Learning outside one's perceived comfort zones:** Learning is enhanced when students are given the opportunity to operate outside of their own perceived comfort zones in terms of physical environment as well as social environment.

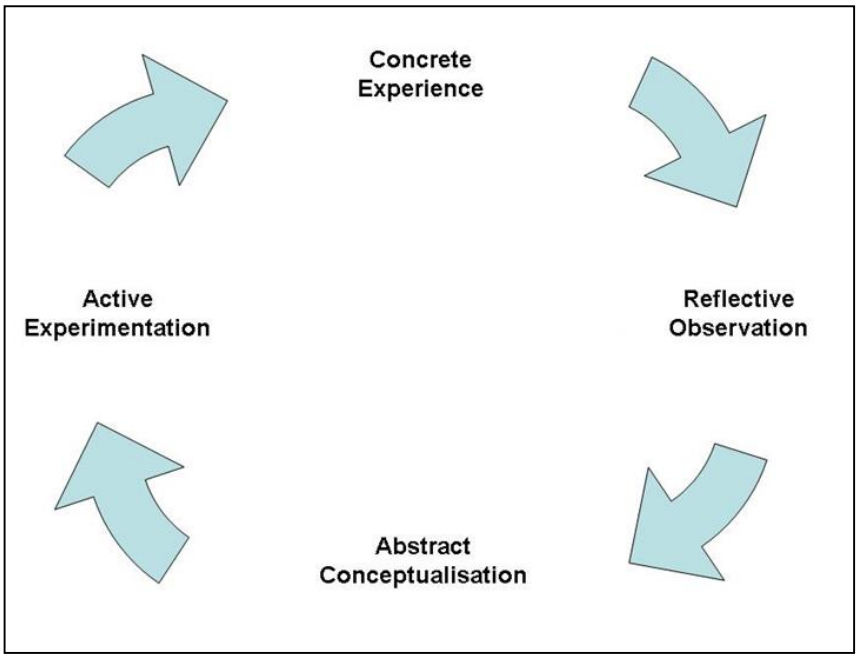
1.1 Experimental learning theory and styles

The first theories of experiential learning arose in the mid-nineteenth century as attempts to move away from traditional formal education, where teachers simply presented students with abstract concepts, and toward an immersive method of instruction. The concept of experiential learning was first explored by John Dewey and Jean Piaget, among others, but it was made popular by education psychologist David A. Kolb. Kolb created Experimental Learning Theory (1974) to unify the contributions and insights of different scholars into an explicit and coherent framework. Kolb's theory represents a four stage learning cycle in which the learner touches all the bases:

- **Concrete Experiences:** Being involved in a new situation
- **Reflective Observing:** Analysing the experience and thinking about the problem
- **Abstract Concept-Making:** Forming theories and new ideas
- **Active Experimenting:** Testing of theories by implementing them and verifying the results

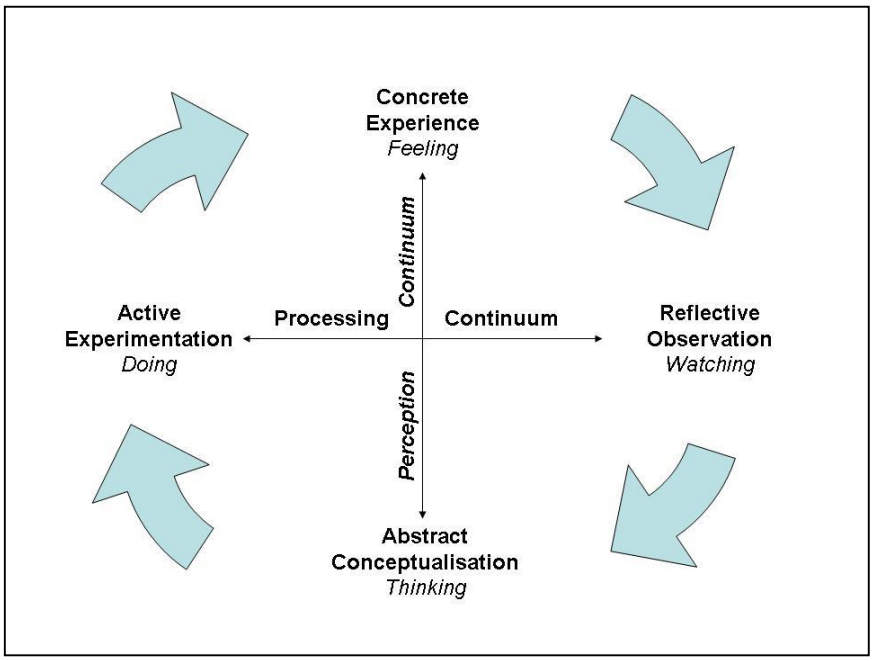
Based on this four-stage cycle Kolb's learning theory sets out four distinct learning styles, which are the combination of two "conflicting" axis (continuums) - **Processing Continuum**, how we approach a task, and **Perception Continuum**, our emotional response, or how we think or feel about it. According to Kolb, these activities are conflicting as we cannot perform both at the same time. Thus, when confronted with a new learning situation we internally decide whether we wish to do or watch, and at the same time we decide whether to think or feel. Various factors may influence a person's preferred style, such as social environment, educational experiences, or the basic cognitive structure of the individual. Whatever influences the learning style, the result is always a way of "grasping the experience", which defines our approach to it, and we choose a way to "transform the experience" into something meaningful and usable, which defines our emotional response to the experience.

Fig. 1 *Experimental Learning Cycle*



Source: Kolb, 1974

Fig. 2 Experimental Learning Cycle with axes

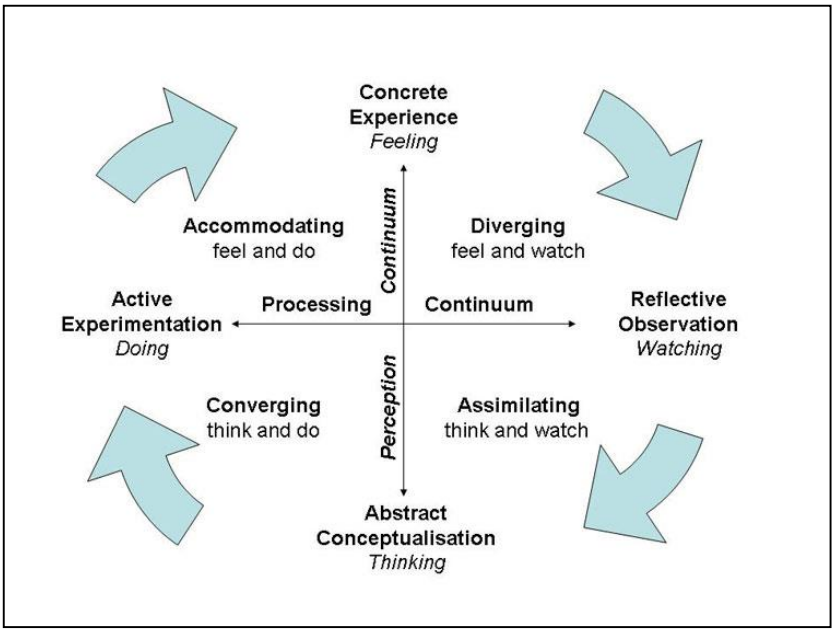


Source: Kolb, 1974

Kolb argues that the four combinations of perceiving and processing determine one of four learning styles of how people prefer to learn:

- **Diverging** (concrete, reflective): Emphasizes the innovative and imaginative approach to doing things. Views concrete situations from many perspectives and adapts by observation rather than by action. Interested in people and tends to be feeling-oriented. Likes such activities as cooperative groups and brainstorming.
- **Assimilating** (abstract, reflective): Pulls a number of different observations and thoughts into an integrated whole. Likes to reason inductively and create models and theories. Likes to design projects and experiments.
- **Converging** (abstract, active): Emphasises the practical application of ideas and solving problems. Likes decision-making, problem-solving, and the practical application of ideas. Prefers technical problems over interpersonal issues.
- **Accommodating** (concrete, active): Uses trial and error rather than thought and reflection. Good at adapting to changing circumstances; solves problems in an intuitive, trial-and-error manner, such as discovery learning. Also tends to be at ease with people.

Fig. 3 *Experimental Learning Cycle and Styles*



Source: Kolb, 1974

These learning styles are relatively stable patterns of behaviour and most people exhibit strong preferences for a given learning style. Switching between different styles doesn't come naturally and people will tend to learn more effectively if learning is orientated according to their preference. For example people who prefer the "Assimilating" learning style will not be comfortable to work on a project without notes and instructions, while learners with "Accommodating" learning style are likely to become frustrated if they are confronted with lots of instructions and rules. The experimental learning is major determinant of human development and that how individuals learn shapes the course of their personal development.

1.2 Team formation

Considering the importance of the learning style, participants are asked to undertake psychometric assessment based on the Carl Jung's[2] and Isabel Briggs Myers'[3] (MBTI) typological approach to personality. This test helps to identify the role students are most likely to take when working in a group and it has been selected because of its strong

2 Jung, C. G. (1971): Psychological types (Collected works of C. G. Jung, volume 6)

3 Briggs Myers, I. (1980, 1995): Gifts Differing: Understanding Personality Type

relationship between the Kolb´s learning styles and Jung´s psychological type[4]. This assessment is designed to help create balanced groups of different personalities, where each person's individual strengths can be utilized. There are a number of websites where the assessment can be performed online and for free and the test takes around 15 minutes: http://www.truity.com/test/type-finder-research-edition. As a result, there are four possible pairs of personality traits and each one of these eight preferences make up a person's MBTI® type, also called psychological or personality type:

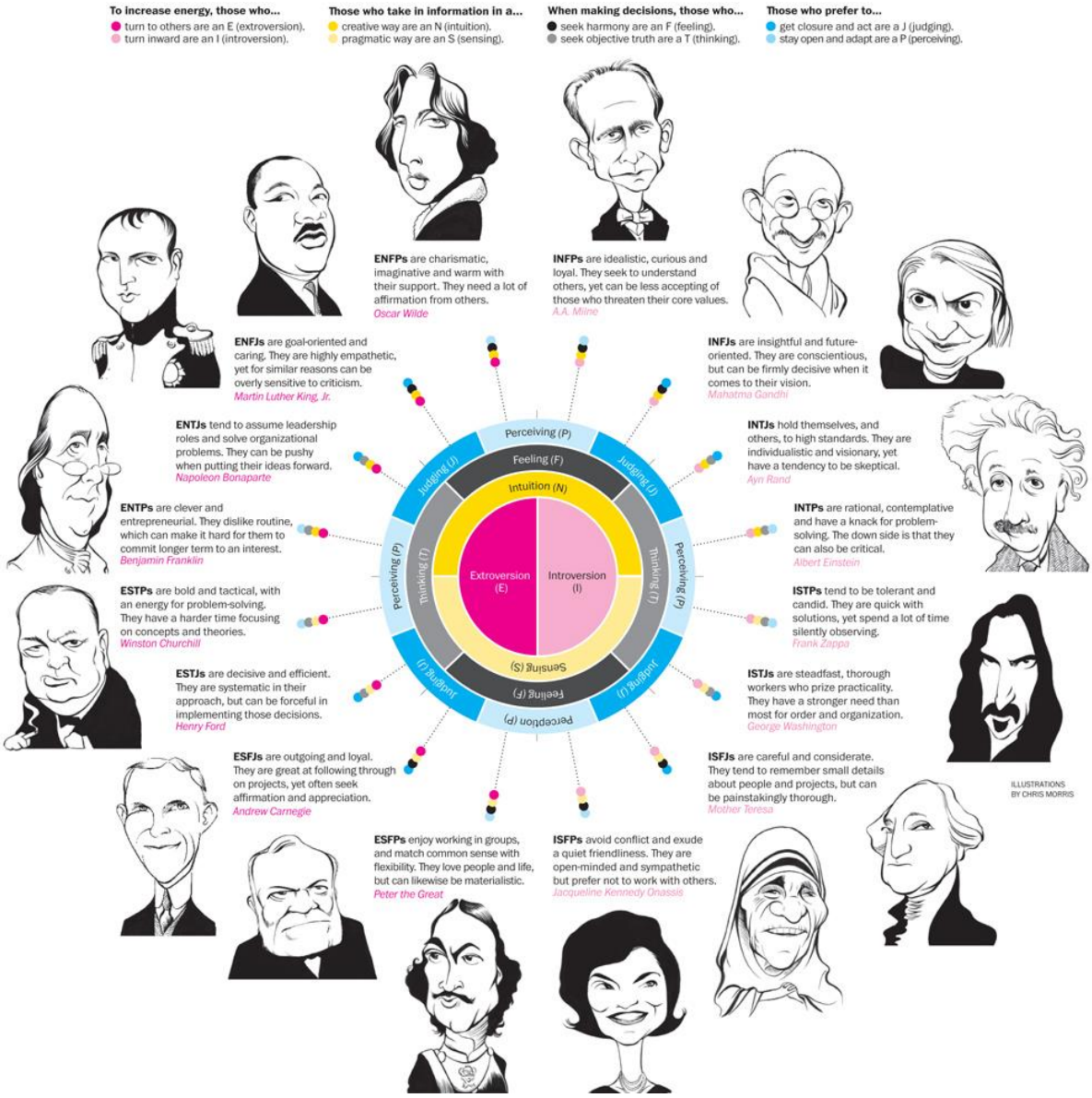
- Introversion (**I**) or Extraversion (**E**)
- Intuition (**N**) or Sensing (**S**)
- Thinking (**T**) or Feeling (**F**)
- Judging (**J**) or Perceiving (**P**)

To create balanced teams trainers should consider that some types are more common than others (ISFJ, ESFJ, ISTJ for example) and in one group there shouldn't be too many individuals of any one style. Awareness of differences between types gives students a foundation for understanding the theory of personality and how their teammates may be different. The MBTI assessment is ideal for a wide range of applications, including:

- **Team development**: Helps ease communication among team members, identify team strengths and weaknesses
- **Leadership development**: Deepens leaders' understanding of their personality type and the types of those they are leading to help them manage better, give more meaningful feedback, and improve individual and team performance
- **Conflict management**: Improves skills in identifying sources of conflict and intervening early to prevent underperformance, disruption, and disengagement
- **Stress management**: Builds resilience and increases productivity
- **Career planning**: Guides students on career choice and development

[4] Kolb, D. A. (1984): Experiential learning: Experience as the source of learning and development (Vol. 1). Englewood Cliffs, NJ: Prentice-Hall.

Fig. 4 Visual breakdown of Myers-Briggs test



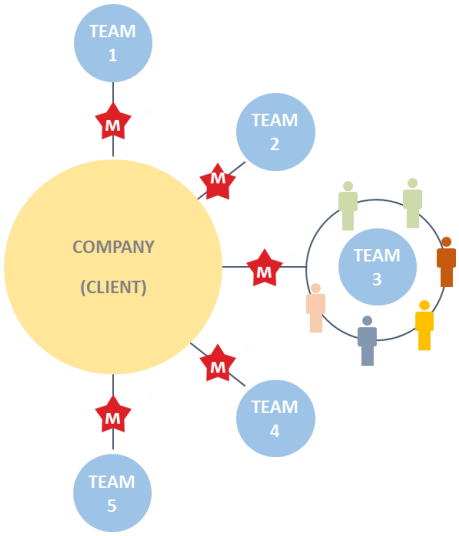
Source: http://www.ritholtz.com/blog/2012/12/know-your-myers-briggs-type-indicator-type

When people first come together in a group they go through a number of stages as they come together and work out what is required. These stages are known as Forming, Storming, Norming and Performing[5]. This is the first stage of the APInno program where the content and the learning objectives are introduced to participants. More recent

[5] Tuckman, B. W (1965). "Developmental sequence in small groups". Psychological Bulletin. 63 (6): 384–399.

research shows that this process is not quite as linear as first thought and groups often move back and forth between the different stages.

Fig. 5 Team work structure



1.3 Team Structure and Roles

Students are divided into multidisciplinary teams consisting of 3 to 5 students (Fig. 5 Team work structure). It is recommended to work with up to five teams. Each team has an academic mentor to support the work throughout the course. The teams are supervised simultaneously by a Business Challenger, who is a senior company representative and presents to the students a problem to be solved in the area of growth and innovation. The teams compete to solve the business case and hold regular sessions for discussion and feedback from the representative. Independently from the ranking, all students who have successfully completed the training receive credits for their participation.

1.4 Business Challenger Involvement

Throughout the programme the Business Challenger will review, guide and ultimately rank and provide feedback to the student teams as if in the real world. At the end of the programme the winning solution will be selected by the Business Challenger. The total programme consists of a 180 hours learning during which there are seven to eight weekly sessions of four hours each when the students will work on the Challenge. An overview of the programme is shown below with times when the Business Challenger is required to brief the students, deal with on-going queries and receive final presentations. The Challenger needs to attend the programme on five occasions for a maximum of two hours in order to meet with the students. The purpose of these meetings is outlined as follows

- Meeting 1:
    - Outline the Challenge/business problem
    - Provide background material about the company

- Detail consequences of not finding a solution
- Identify any known constraints/ limiting factors to resolving the challenge/ business problem

- Meetings 2, 3:
  - Discuss the progress of the students' work
  - Make corrections if needed
  - Provide clarifications/ additional information if needed.

- Meeting 4:
  - Official presentation by the student teams of their results/proposed concepts
  - Challenger to provide feedback to students
  - Challenger to select most suitable solution for their business

The Challenger would also be asked to be available for one hour each week to communicate via email with Trainer/ Mentor to deal with any student queries/ questions that may arise outside the timetabled sessions. The below table 1 Business Challenger Attendance is recommended but not mandatory. These regular sessions are necessary for the success of the final results. However the minimum number of meetings can be limited to 3 – **introduction, mid-term, final**. In the meanwhile all *other sessions* could be done off site – online, phone, emails, etc.

Table 1 *Business Challenger Attendance*

Workshop	Content	Challenger Attendance
1	READY Module 1: Introduction and course overview; working in groups	
2	Module 2: Innovation and innovation management introduction	Present the challenge
3	STEADY Module 3: Preparation, innovation drivers; case for innovation	
4	Module 4: approach to innovation; ideation, business opportunity map	Discussion of the ideas
5	Module 5 Specification and prioritisation of Business concepts	Presentation of innovation concepts
6	Module 6: Business model, Action and implementation plan	Final presentations
7	Review of course; feedback session with all participants	Feedback session

The challenge or business problem can come from any source and will not be restricted to businesses. The Challenger is to provide to the students with a synopsis that represents a problem the challenger's organisation is facing and that requires a solution. The suggested selection criteria for the problem are:

- The degree of complexity needs to be at the level that the students are able to grasp
- The challenge/business problem needs to be culturally sensitive to the students' cultural aspirations
- It needs to be a real and genuine issue that is impacting on the viability and/or growth of the organisation presenting the challenge/business problem
- It should be related to development of innovations
- The Challenger must not have already solved the challenge /business problem, although they may be working on a solution independently of the programme.

The information for the challenge needs to cover the following points:

- Overview of the organisation
- Overall vision for the future of the organisation
- Overview of the challenge/ business problem
- Consequences to the organisation of not finding a solution to the challenge/ business problem
- Details of any constraints/ limiting factors that might impact on ability to resolve the challenge/ business problem (e.g. Budget limitations/ access to finance/ skills gaps)

A template for a prospective challenge can be found at Appendix 1 Proposal for a Challenge/Business Problem. After completing the programme feedback and recommendations from the Business Challenger can be gathered though a simple questionnaire (Appendix 2 Challenger Data Capture Form.)

2 Training Scheme

The course is practical and grounded in the real world, designed to be is complementary to academic education and traineeship in companies. In fact, the APInno Innovation Management training is an outgrowth of both as it aims to facilitate collaboration between business and universities by developing an innovative approach and methodology for teaching Innovation Management (IM). The APInno programme is designed to become part of any university curriculum as a course with relevant credits. Within the 180 hours of training it allows students to immerse themselves in real-world innovation projects and to get a head start on future career development before they graduate. It furthermore introduces the fundamentals needed for Innovation Management, so that in an engaging and playful way students familiarize with important theoretical concepts.

At the same time it is a good opportunity for the participating businesses to get a fresh perspective on the challenges being faced. APInno´s main focus is on disruptive innovation, as disruptive innovation tend to be produced by outsiders, rather than existing market-leading companies. In fact, when companies are looking for truly disruptive innovation seeking out the "superiors" or experts in their organization, or even their industry is not the wisest move[6]. Great ideas increase with one's level of expertise, but the problem with experts is that the relationship between expertise and great insight isn't linear. It looks more like an upside-down U, reaching its peak and then beginning to decline6. Therefore, many organizations are realizing the power of outsiders for bringing up innovation and the APInno methodology paves the way for a structured and tested collaboration with high school students. The APInno methodology offers a number of benefits for business and students, however to create appropriate expectations from both sides, it is important to define clearly what it is and what it is not:

[6] Burkus, D. (2014): Why Innovation Needs Outsiders, Forbes, Feb.4th, 2014, available online: http://www.forbes.com/sites/davidburkus/2014/02/04/why-innovation-needs-outsiders/#db8350d288ee

Table 2 Definition of expectations

WHAT IS IT?	WHAT IT ISN'T?
▪ A real cooperation between real business and current students/recent graduates ▪ Application of all acquired knowledge during university studies, as well as acquiring new knowledge ▪ Solving of simple cases are in the area of innovation and business development ▪ Testing "in a safe environment" of the students' readiness for realisation at a real job, as well as of their team work skills and other key competencies	▪ It is not meant to present the specifics of a particular business area and/or industry ▪ It does not provide a job – there is only the option of limited time internships in case the client agrees ▪ It does not provide thorough detailed information from and about the client ▪ Students cannot choose the team and mentor they will be working with

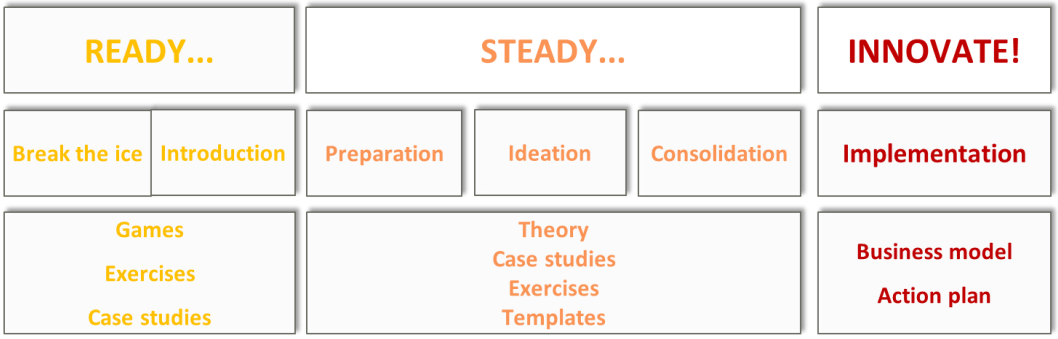
The course follows a consistent structure for each module providing the necessary resources for students, mentors and companies, such as theory content, case studies to connect theory to real world, activity to practice theory and template to collect information during exercises. The PDF slides are available in the form of power point presentations separately from this guide.

The 180 hours training course is organized as a face-to-face on-site workshop combined with e-learning support (optional). The program combines face-to-face training sessions with on-line knowledge building and assessments, self-help and guided study. Blended learning is ideal for learners who need greater flexibility in their studies. It offers the convenience of home study with the ability to learn directly from trainers and interact with peers.

2.1 Training Modules

The training scheme is organised in three stages – Ready, Steady, Innovate - and six training modules (units): Break the ice, introduction, preparation, ideation, consolidation, and implementation.

Fig. 6 Training Modules Content



- Module 1 **"Break the ice"** has the purpose to introduce the participants, form student teams, and prepare students to work together with their trainers, mentors and the challenger.
- Module 2 **"Introduction"** has the aim to familiarize students with the main terms related to the Innovation management
- Module 3 **"Preparation"** will teach students define growth objectives, innovation portfolio and investment profile (risk level and time interval)
- Module 4 **"Ideation"** deals with problem analysis, definition of Business Opportunity Maps (BOM) and creative idea generation – "create dots"
- Module 5 **"Consolidation"** is about "connecting the dots", identifying of synergies, screening and prioritizing innovation concepts
- Module 6 **"Implementation"** deals with elaboration of the prioritized innovation concepts to create business model and Action plan for the implementation and test for sustainability and initial due diligence.

2.2 Learning objectives

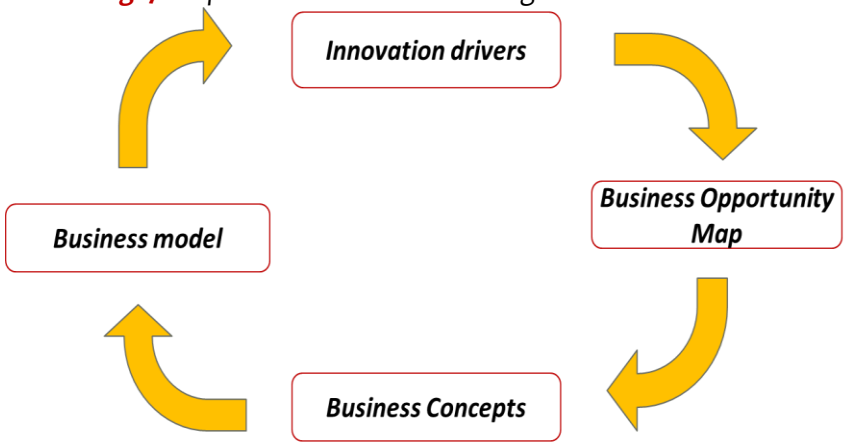
The training scheme takes students to a journey through innovation management concepts, theories of idea generation, selection, strategy formulation and implementation. In it, students learn and practice the tools for executing innovation projects themselves, guided simultaneously by academics and practitioners. They gradually develop an innovative mindset and expertise in how firms and other organisations successfully create new ideas for marketing new products. The syllabus also includes sessions about innovation strategy and idea management.

During the APInno course, they also learn how to:

- Use the main innovation management terminology and concepts
- Explain what an innovation strategy is and why it is important
- Explain the innovation portfolio and strategy at the company level
- Create business concepts and develop hypotheses
- Prepare action plans, alternatives and implementation plans
- Explain how innovation projects should be selected and managed
- Explain the importance of teams and team roles

As a result, upon completion of the course students will be prepared to understand and manage the main stages of the business innovation process:

Fig. 7 Acquired Innovation knowledge and skills



As students interact directly with businesses they develop new ways of doing things that are theoretically sound. They have the opportunity to question the veracity and value of the theories as they try to put them into practice. In this process they enrich not only their theoretical knowledge, but also their cognitive and soft skills, as well as team abilities.

Knowledge and understanding of:

- Theoretical perspectives, methods and techniques of innovation management;
- Key features of success when developing an innovation strategy;
- Financial and risk assessments of an innovation strategy;

Cognitive skills in being able to:

- Researching and developing an innovative solution to a problem;

- Evaluate the relevant skills needed to manage innovation at a variety of levels;
- Identify and evaluate elements of an innovation strategy;
- Analyse and synthesis information from multiple sources to reach justifiable conclusions;
- Use conceptual skills to create and implement decisions;

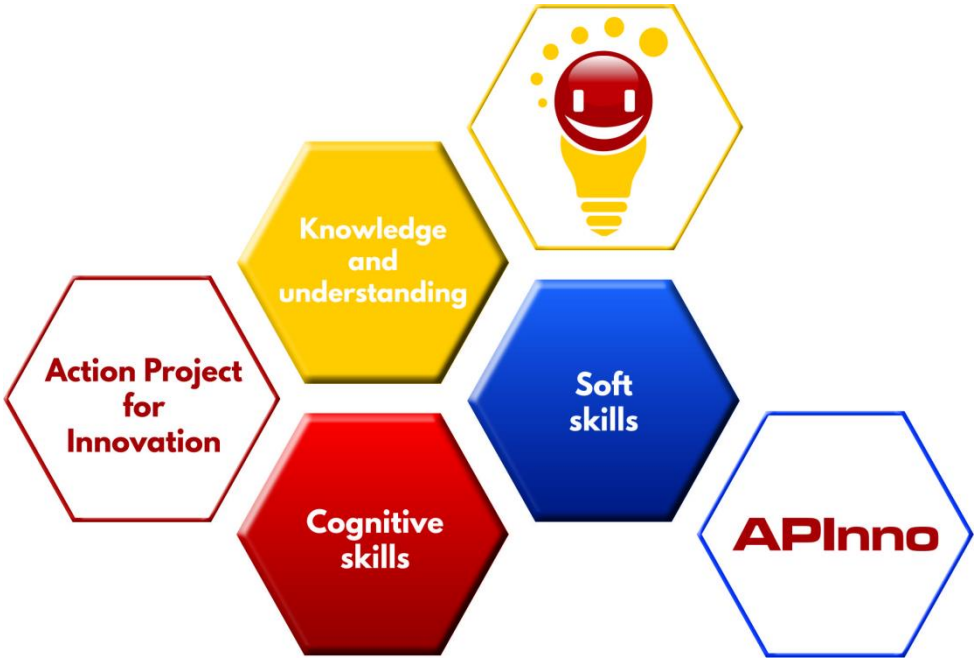
Soft skills:

- Project management and critical components of the process;
- Preparation of basic project management chart;
- Leading a project that develops innovative solutions to problems;

Team work:

- Leadership and communication and negotiation;
- Conflict resolution in a team setting while under pressure.

Fig. 8 Acquired other skills



At the end of the training course the participants receive a certificate ("has successfully participated"). Monitoring and evaluation of the course is organised in the following way:

- Regular assessment by trainer/training team and participants during and at the end of each training module/training day
- Written evaluation by the participants at the end of the course.

Assessment is done three-fold:

- By mentors – 60%
- By the company representative – 25%
- By peers – 15%

3 Innovation Management Syllabus

The 180 hours training course is organised in six training modules, which are designed to take into account the high value of student engagement, expert facilitation, and application of experimental methods and techniques. The syllabus provides a deep grounding in the field of innovation management and combines lectures, case analyses, visiting experts and student presentations. The readings are drawn from research in the management of technological innovation and technology-based entrepreneurship as well as from economics and organizational theory. The cases provide an extensive opportunity for students to integrate and apply these tools in a practical, business context.

The material moves deliberately between strategic issues (What should you do?) and organizational and managerial issues (How should you get it done?), though the focus of the course is more on examples of process and implementation. As such, students will get acquaint with the relationship between processes and structures for innovation in firms, the strategies for exploitation and the environment in which these must be designed e.g., competition, sources and limitations of innovation.

Readings, assignments, and cases are used to highlight issues and problems that face students as they define processes and structures to strategically manage their solutions. Special materials and sheets are also available for business challengers to facilitate their interaction with students and their academic mentors.

3.1 Module “Break the ice”

The first module starts with the formation of groups on basis of the psychometric assessment by Myers-Briggs described in 1.2 Team Formation. Students are asked to do the test before the first training session and submit the results to their mentor. Once the groups have been set up trainers need to introduce themselves and provide practical information such as availability and contact details. Creativity games and exercises can be organized to warm up and get participants comfortable with each other.

3.2 Module Introduction

This is the second module of the stage **Ready.** It aims to get students familiar with key theoretical concepts, terms, frameworks and best practices.

The word to innovate comes from the Latin word *innovare*, which means to change. There are many myths and misunderstandings of what innovation is and is not. One common myth is the idea that people have a sudden insight to a solution to a problem. However, research shows that in fact big insights occur after a long and deep period of incubation, often when we are thinking of other things. An epiphany is only the very last moment when all the pieces come together. Another myth is that innovation can solve everything. There are problems and there are problems. Some problems are not necessarily easy to solve because there are no enough pieces of the puzzle yet. They are connected to the myth of the epiphany, you have the epiphany because all the pieces are in place. Other problems are easy to solve because the pieces are all there. What these myths suggest is that while you cannot innovate out of every situation you can use innovation in a structured way to find solutions to problems.

It is critical to not confuse innovation with science. The goal of science is to understand the world around us. Innovation is a process of value creation, which consists in changing the composition of a set of variables describing a system.

To successfully implement a process that uses aspects of innovation management to resolve a problem, trainers need to understand five critical elements of the course:

Table 3 *The Five elements of the APInno Innovation Management Syllabus*

Experiential learning	The course is designed as a real experience where students act as advisors to real business and other organisations to help them innovate
Mentor support	Students work in teams supported by mentors and trainers whose roles are clearly defined in the beginning – they combine business and academic background
Innovation Challenge	The course is based on solving real challenge provided by business (or other) organisation
Innovation management	Students learn about the process of innovation and its management and not only generating new ideas
Work process	Following a proven approach, process and instruments the teams focus on developing business model and present to the management team of the "client" organisation

3.2.1 Importance of innovation

Innovation is of critical importance for the business development and when looking for new solutions to existing problems. Organisations that engage in innovative practices do so to enable greater shareholder returns, more loyal customers, better partners and employees of higher quality. Innovation is a strategic imperative for most companies, but most CEOs are dissatisfied with their execution on innovation.

APInno´s main focus in on disruptive innovation, as disruptive innovation tend to be produced by outsiders, rather than existing market-leading companies. These innovations occur normally as technology disrupts traditional business models. For example:

- The world's largest public transport business owns no vehicles (Uber)
- The world's largest accommodation provider has no buildings (Airbnb)
- The world's largest phone companies have no telephone infrastructure (Skype/WeChat)
- The most valuable retailer has no inventory (Alibaba)
- The most popular media content providers do not create content (Facebook/Youtube)
- The fastest growing bank has no cash deposits (SocietyOne)
- The world's largest movie house has no cinemas (Netflix)
- The largest software vendors do not to write apps (Apple/Google)

Increasingly, innovations are achieved through the convergence of scientific fields and technologies. The interaction of research disciplines often leads to new research areas. For example, "nanoscience" research has arisen from the interaction of physics and chemistry and is interdisciplinary in character. "Nanoscience" is also somewhat attracted to the life sciences, both directly and indirectly, as measured by co-citation links. While interactions between nanoscience and life sciences are not yet strong enough to establish a research domain, the space between them may become the ground for a new area, e.g. bio-nanoscience.

Organisations that engage in innovative practices do so to enable greater shareholder returns, more loyal customers, better partners and employees of higher quality.

Case study: Facebook investing in virtual reality[7]

[7] http://www.ft.com/cms/s/0/feee4a1e-63aa-11e5-a28b-50226830d644.html#axzz3qcXw9EyE

Activity: Significance

Thinking about your daily life can you identify a change that has enhanced either a product or service that you use in the last 2 years? An example may be the introduction of an electronic ticketing system for public transport, or the introduction of touch and go payments using your debit card.

Each person in your group needs to identify at least one product or service then you should answer the following questions. Finally create a table that shows the relationship between your answers.

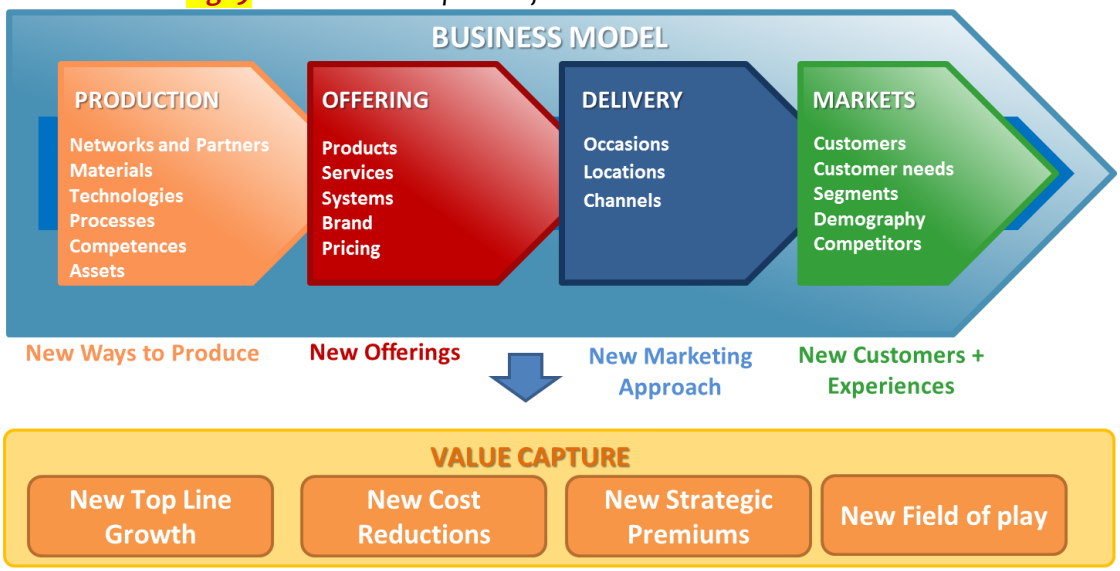
- ⇨ What is the change?
- ⇨ Who does it impact on (everyone, only people who use the product or service)?
- ⇨ What are the wider implications of the change (who may be indirectly affected)?

3.2.2 Innovation definitions

Clear definitions of Innovation and Breakthroughs are critical – the innovation is a process, the breakthrough is a result. Innovations generally take place within an organisations business model. Typically a business model consists of four components: Production, Offering, Delivery and Markets (Fig. 9 Creation and capture of new value in the Business Model**Error! Reference source not found.**). Each of these components is made up of critical features that organisations resolve. It is to the resolution of these components that innovation is most widely applied. Thus, Innovation is a process of resolving a problem in a way that has not necessarily been used before. Innovation leads to innovation breakthroughs that present the retention or an increase in value for the organisation. This can take the form of:

- New networks and partners – this can lead to new relationships
- New pricing strategies – this can lead to new ways of bundling your product or service
- New ways to deliver – this can lead to new ways of accessing your customers
- New business models – this can lead to new ways running a business

Fig. 9 Creation and capture of new value in the Business Model



Source: Adapted from IXL Center

There are several types of innovation (Fig. 9 Creation and capture of new value in the Business Model0) although the most popular and common ones are innovative products and services. Often the resulting innovation is a combination of different types, for example organisational and marketing innovation. Business model innovation brings more premiums and sets barriers to the competition, as it is much harder to replicate. Companies can succeed not by battling competitors, but rather by creating "blue oceans" of uncontested market space[8]. This strategic move creates a leap in value for the company, its buyers, and its employees while unlocking new demand and making the competition irrelevant.

3.2.3 Blue Ocean Strategy – six paths framework

Blue oceans are defined by remarking market boundaries. There are six basic approaches which comprise "six paths framework". These paths are applicable across industry sectors, and they lead *companies into the corridor of commercially viable blue ocean ideas*[9].

- Path 1: Look across alternative industries

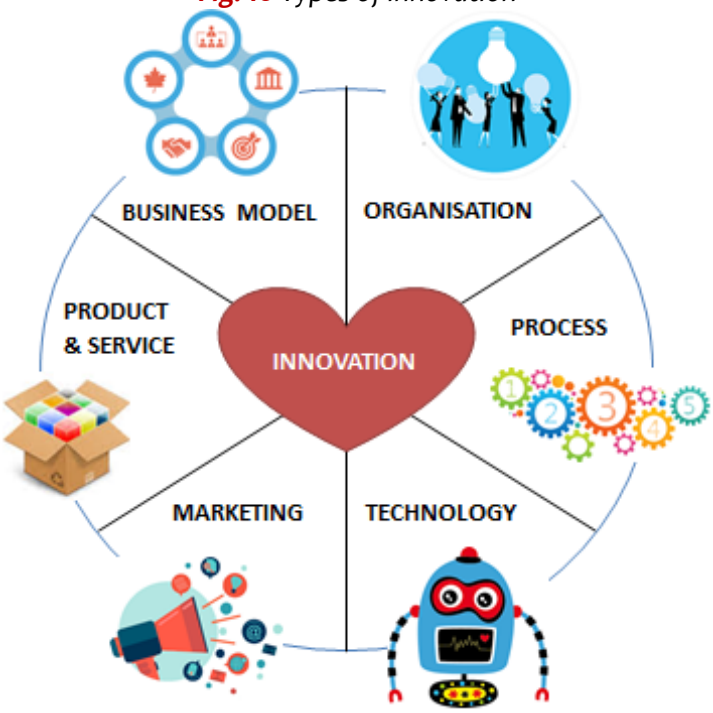
[8] Kim, W C, and Mauborgne, R. (2005): Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant. Boston, Mass: Harvard Business School Press

[9] Kim, W C, and Mauborgne, R. (2005): Blue Ocean Strategy: How to Create Uncontested Market Space and Make the Competition Irrelevant. Boston, Mass: Harvard Business School Press, p. 47-49

- Path 2: Look across strategic groups within industries
- Path 3: Look across the chain of buyers
- Path 4: Look across complimentary product and service offerings
- Path 5: Look across functional or emotional appeal to buyers
- Path 6: Look across time

Blue oceans are achieved by thinking across conventional boundaries of competition and require reconstructing current market boundaries. The process of discovering them is not about predicting or preempting industry trends. It is not about implementing new ideas but rather a structured process just like any other innovation. It requires a very holistic and disciplined approach across the whole organisation. Blue ocean strategy is about reordering market realities in fundamentally new ways.

Fig. 10 *Types of innovation*



Activity: Innovation Type

In your groups identify three innovations that are neither a product/service nor a technology and explain why it is innovative. What type is it?

Resources: Gassmann, O., Frankenberger, K., Csik, M., (2014) The Business Model Navigator: 55 Models That Will Revolutionise Your Business

The book is about 55 business models that are responsible for 90% of the world's most successful businesses. These 55 models - from the Add-On model used by Ryanair to the Subscription model used by Spotify - provide the blueprints that revolutionise their industries and drive powerful change. As well as providing a practical framework for adapting and innovating a business model, the book also includes each of the 55 models in a quick-read format.

Video: https://www.youtube.com/watch?v=B4ZSGQW0UMI

3.2.4 Business model innovation case

39 Clues books: Reading Experiences That Go Beyond the Book. The 39 Clues is a ground-breaking multi-media adventure series for children ages 8-14 that spans at first 10 adrenaline-charged books, hundreds of collectible game cards, and a website that allows readers to play a role in the story and compete for prizes.

Innovation occurs at different levels so it varies also according to the level of change. The magnitude of change the innovation causes is reflected in the degree to which the change takes place. This gives rise to four distinct zones/types of innovation[10]:

- **Incremental innovations** involve modest changes to existing products and services. These are enhancements that keep a business competitive, such as new product features and service improvements.
- **Breakthrough innovation** refers to large technological advances that propel an existing product or service ahead of competitors. This is often the result of research and development labs (R&D), who are striving for the next patentable formula, device and technology.
- **Disruptive innovation** bring to a market a very different value proposition than had been available previously

10 Kalbach, J. (2014) Clarifying Innovation: Four Zones of Innovation, available online at: https://experiencinginformation.wordpress.com/2012/06/03/clarifying-innovation-four-zones-of-innovation/

- **Game-changing innovation** transforms markets and even society. These innovations have a radical impact on how humans act, think and feel in some way

Example: https://www.youtube.com/watch?v=mbPiAzzGapo

It is important to acknowledge also the sources of innovation, where managers can systematically look through to identify opportunities[11]:

- An unexpected event which could be unexpected success or failure of the own company or of a competitor/participant in the industry
- A dissonance between the reality and the assumptions of this reality
- A process need within a business or an industry
- A change in the market structure
- A change in demographics
- A change in perception
- New knowledge

Activity: Innovation breakthroughs

In your group identify three products or services you use on a daily basis. Discuss in your group how the four innovation breakthroughs components are evident. Chose two items from your groups list and develop a table that contrasts and compares the two items across the four components. Identify the levels by either low, medium or high.

Resource: Kim, C., Mauborgne, R. (2005) "Blue Ocean Strategy: How to Create Uncontested Market Space and Make Competition Irrelevant", Harvard Business Review

The abovementioned sources reflect on the interaction between the internal and external environments of an organization as they are inseparable in the development course. This constant interdependence often makes it difficult for organizations to create their own unique innovations that could deliver them sustainable advantages11.

Innovation managers need unique sources of inspiration specific for their companies and often these are inspired by human emotional and physical necessities. In this case empathy with the user is a powerful tool for innovation. It gives insight into the problem, but even more important, it makes innovation managers care about the outcome. Good

[11] Drucker, P. F. (1985): Innovation and entrepreneurship: practice and principles. New York: Harper & Row

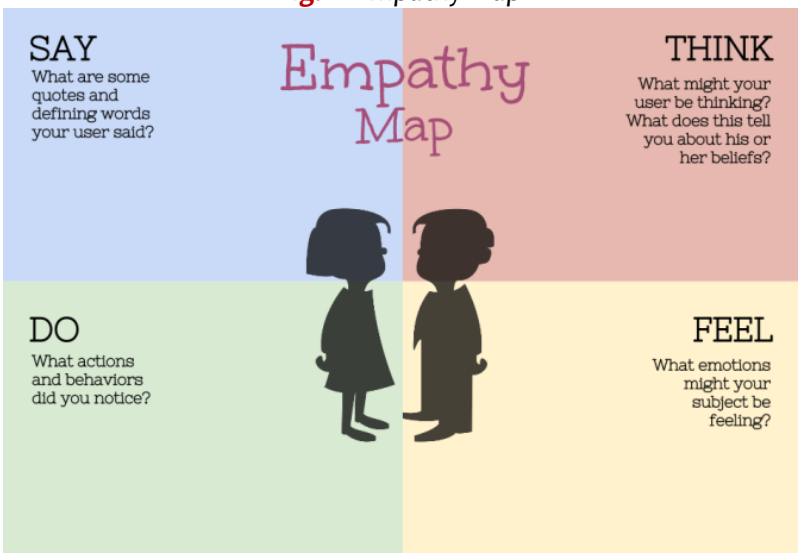
user research is not a questionnaire that asks customers what they want; it is rather a path for developing empathy.

- ⇨ Therefore, the end innovation result isn't just a set of new products and services, it's an internal understanding of what that user is like: The challenges (s)he faces each day, the things that excite and concern him/her, his/her motivations and values.

When creating an Empathy Map it is important to keep track of the following:

- Say: Quotes and defining words from the person
- Think: Actions that the person takes
- Do: Thoughts or personal beliefs that the person holds
- Feel: Emotions that the person feels

Fig. 11 *Empathy Map*



Source: David Leech Tech inspired by Ideo

Activity: Empathy map

Create a four quadrant layout on paper or a whiteboard for a concrete example. Clara is a 31 year old vegetarian who likes to travel. She usually travels with her friends, and arranges trips on her own, preferably at a low cost and in Peer-to-Peer Accommodations. Populate an empathy map for Clara by taking note of her main traits Say, Do, Think, Feel.

Resource: https://dschool.stanford.edu/wp-content/themes/dschool/method-cards/empathy-map.pdf

3.2.5 Innovation Challenge

Innovation is exciting because the process starts with an intended outcome but often the actual outcome is very different from the intended one. Launching a challenge for a company means opening up to a wider public to take full advantage of the proposals made by participants. In this context the challenge is a "strategic theme" which also involves breaking with the culture of secrecy and revealing more about the future projects of the company or its current difficulties. Thus innovation challenge is a call for ideas to all participating students to answer a specific question. The goal of the APInno competition is to help students exercise their minds and creativity. The participants are challenged to think about new ways to address that question, while in return the company is providing opportunities to test and validate some of the best ideas. In a nutshell, the businesses are looking for original ideas or concepts that answer the challenge in a compelling way, but are not yet commercially available.

Activity: Barriers to Innovation

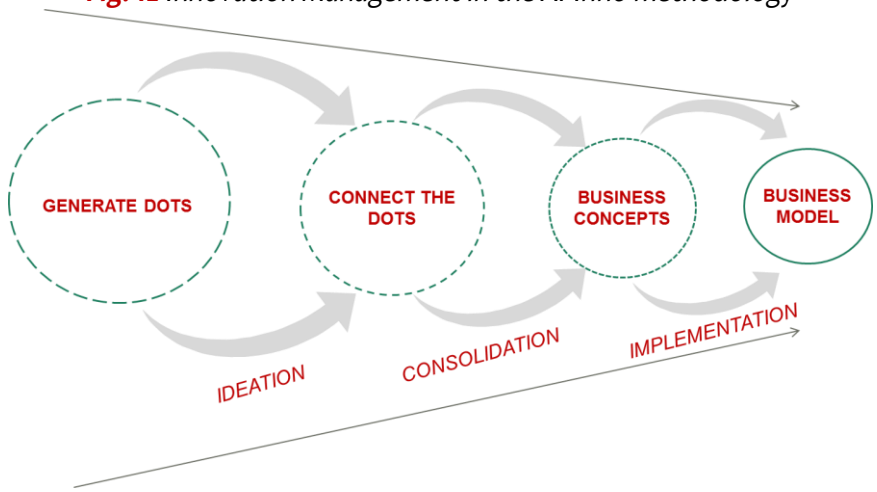
In your teams discuss the statement "Everybody is an innovator in the innovative companies" – true or false, why? List and debate all obstacles that could occur to innovation in organizations. What are the key and most common barriers you have identified?

3.2.6 Innovation Management

Innovation and Innovation Management are related but distinct – the focus of this course is on Innovation Management. Innovation is an outcome of innovation management, thus Innovation management is a business function that enables organisations to identify and develop innovations in consistent and repeatable ways. Despite the fact that innovation is popular as a creative process that is unconstrained by rules and plans, to be successful, it must be managed in a proper way. Many companies adopt innovations without clear strategies or defined processes, which results in high project failure rates. Therefore, all activities, no matter what they are should follow some level of discipline and an underlying set of processes. Project management methods should be used to maximize return on innovation and make this process more reliable and certain instead of high-risk varied attempts of trial-and error. Innovation management is a process, which needs to be managed as any other process as it does not depend only from the level of novelty, but also from production, marketing, sales, distribution and human resources. This process includes the whole range of decisions, activities and measures to be taken to

enable conversion of an idea/invention into business value/innovation. Innovation project could be defined as a mechanism of the transition from idea or invention to commercially successful innovation.

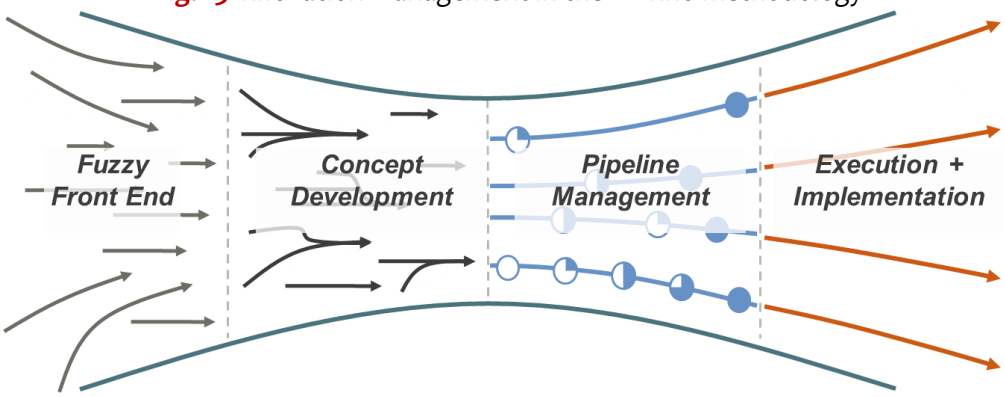
Fig. 12 Innovation Management in the APInno methodology



The work process in APInno is fast simulation of the real process of creating and implementing innovations in business and other organisations. It is iterative and repetitive process of divergent and convergent thinking starting with simple ideas and ending with outline of a business model to be implemented.

The successful innovation process has open front and back end – depicting the concept of pursuing various ways for implementation and prioritization of innovation concepts in order to create a balanced innovation portfolio.

Fig. 13 Innovation Management in the APInno methodology



In this transition there are four product stages - Fuzzy Front End, Concept Development, Pipeline Management, and Execution:

1. The **Fuzzy Front End** is the starting point where opportunities are identified and concepts are developed prior to entering the formal product development process. This is the stage where it is discussed what the product should do to meet the perceived market or business need and when the most exciting breakthroughs are created. In this stage students set up their first pieces of the innovation puzzle.
2. The **Concept Development Stage** involves synthesizing the information collected at the first step; visualizing customers using the product, prototyping and evaluating the concept. In this stage students "diverge" and "substantiate" the team ideas, they determine what pieces worked, which need adjustments, and what aspects are still missing. They expand on the top ideas and generate a bit of business rigor around them.
3. **The Pipeline Management** goes further into the development process and assesses the realistic properties of each idea — whether or not they match the company's needs set — and what it would take to execute on them. It's relatively inexpensive to fail in the earlier stages of this process, but it can be damaging — in expense and reputation — to fail in the latter stages. Therefore this selection stage is important as it prevents wasting resources and time in the future. Students have to address questions as "How will the customer in the target market benefit from the product?"; "Is it technically feasible to manufacture the product?"; "What is the current competitive landscape for this potential product?". The answers of these questions will help students substantiate and converge their ideas into improved concepts and prototypes.
4. **Execution** in real terms is about launch and commercialization of the product on the market. In the APInno methodology students have the chance to map out with the company their winning idea and advocate for its implementation as a pilot in the real business world.

To facilitate the cognitive process in innovation, the APInno Methodology applies the Six Thinking Hats concept created by Dr. Edward De Bono. It is a framework for thinking that encourages focused, parallel thinking among teams rather than argumentative discussion and debate. Within the framework, six types of thinking are established and each is represented by a different color imaginary hat (see *Fig. 14 Six Thinking Hats).*

When the Six Hats framework is used in teams, the team members are asked to use the same type of thinking (i.e. thinking in parallel) throughout the meeting. As a result, less

time is wasted in argument and drift, leading to better decisions in less time, as it facilitates a much faster and more complete exploration of the issue/subject. Six distinct thinking directions are identified and assigned a color.

- **Managing Blue**: What are we thinking about? What is the innovation challenge? What is our goal? Student teams look at the big picture.
- **Information White**: Considering purely what information is available, what are the facts?
- **Emotions Red:** Intuitive or instinctive gut reactions or statements of emotional feeling. No justifications are needed.
- **Discernment Black:** Logic applied to identifying reasons to be cautious and conservative. Being practical and realistic.
- **Optimistic response Yellow**: Logic applied to identifying benefits, seeking harmony. Sees the brighter, sunny side of situations.
- **Creativity Green**: Statements of provocation and investigation, seeing where a thought goes. Thinks creatively, out of the box.

Fig. 14 Six Thinking Hats

Thinking Style	Description	Associated "Thinking Hat"
Organised, controlled	Organises thinking & actions, lays out and controls objectives, purposes & processes	Blue Hat
Creative, new thinking	Puts forward new ideas, lays out options and alternatives, modifies & improves ideas	Green Hat
Optimistic, positive	Focuses on capturing the opportunity, seeks out value, reasons for taking chances	Yellow Hat
Cautious, critical	Focuses on detecting risks and faults, reasons for caution	Black Hat
Analytical	Focuses on information and facts required and how to obtain them	White Hat
Emotional	Expresses feelings, emotions and intuition	Red Hat

When applied to the APInno Learning Modules, different Thinking styles are required for the different innovation stages.

Activity: Six thinking hats

Step 1: The mentor presents a problem/issue to be discussed and passes out a worksheet with descriptions of the Six Hats to each group member. There are six types of thinkers - those who are in those roles will only address the issue from that particular perspective. It is possible pair complementary hats, such as White/Red, Yellow/Black, Green/Blue. It's often useful to begin and end with Blue. Hats can be repeated. The facilitator explains to the participants that they are going to view the problem in six different ways and each hat represents a way of thinking.

Step 2: The mentor determines an order to use the hats and a time limit for each hat. Times can vary from 2 minutes to 10 minutes or longer per hat. The Red Hat (feelings) is typically shorter because it's about gut response. The Green Hat (creativity) might be longer because it about possibilities, alternatives, and new ideas.

Step 3: The mentor then leads the group through each hat, reminding the group of each hat's focus and keeping time. The mentor may need to remind participants to contain their responses to the parameters of the hat.

Innovation projects should be balanced between short-term exploitation of current resources and longer-term exploration of opportunities or discovery efforts. By their nature innovation projects differ significantly from conventional projects in several aspects[12]:

- **Objectives**. Conventional projects tend to have clearly defined goals and targets while innovation projects often do not. Innovation is often intangible end goals and the commercial success of an innovation project can be highly uncertain. In fact, innovation is often a result of trial-and-error.
- **Risk-taking** is low in conventional projects since the objectives are clearly defined and processes are established. In innovation projects, objectives are loosely defined and ambiguous, and processes are more experimental and exploratory, hence the risk taking is high.
- **Expenses** for innovative and research activities are characterized as long-term, with increased insecurity regarding the eventual amount of generated earnings.
- **Project teams** leading innovation projects are made up of people with diverse backgrounds.

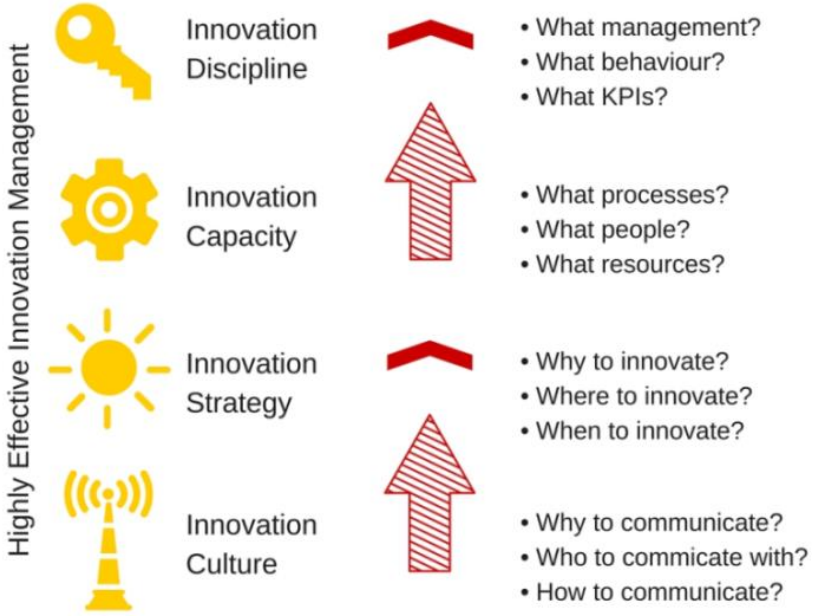
Innovation requires research, divergent thinking, and willingness to take risks and to devote the necessary resources. Project management methods used in combination with

[12] Filippov, S. and Mooi, H. (2013), "Innovation Project Management: A Research Agenda", Elft University of Technology, Huizingh

complementary techniques for ideation and creativity management can thus provide the best chance of reaching successful outcomes. In the mid- and long term companies need to build structures, cultural and normative patterns around the activities to ensure that the activities remain focused but also flexible. These comprise of the following main components:

- **Innovation culture:** Encouragement and support for innovation activities; environment to foster innovation
- **Innovation strategy:** A strong justification for engaging in innovation processes; Clear goals and targets for growth through innovation
- **Innovation capacity**: Resources such as skills, time, finance and facilities
- **Innovation discipline:** Management of the process through control of participants' actions against clearly defined outcomes and metrics to sustain the innovation process in the organization

Fig. 15 Four aspects of the innovation management



Activity: Company case presentation

This module ends with introduction of the company and the case to be solved by the student teams. During the last session the company representative presents the case and has a discussion with students in order to answer their questions and clarify what is expected throughout the course. On this first meeting the business challenger should:

- Outline the Challenge/business problem
- Provide background material about the company
- Detail consequences of not finding a solution
- Identify any known constraints/ limiting factors to resolving the challenge/ business problem

To facilitate the collaboration with the business challenger mentors can provide business challengers with a Challenge/ Business template problem Template available in Annex 1.

3.3 Module Preparation

This is the first module of stage 2 Steady. At this stage of the APInno students focus on the definition of innovation strategy and the particular strategic innovation goals presented by the company. As explained in the previous module, innovation doesn't happen in vacuum and organisation's capacity for innovation stems from a coherent set of interdependent processes and structures. A strategy is a commitment to a set of coherent, mutually reinforcing policies or behaviours aimed at achieving a specific competitive goal. Good strategies promote alignment among diverse groups within an organisation, clarify objectives and priorities, and help focus efforts around them. Companies regularly define their overall business strategy (their scope and positioning) and specify how various functions—such as marketing, operations, finance, and R&D—will support it.

Activity: Innovation Landscape

In your groups define the changes in the landscape of the company we are working with: What is happening with the competition, the demand, the customers.

- Why do we need to change? How much and what needs to be changed?
- Try to develop a case/imperative for change, i.e. innovation and present it in a compelling way to your peers.
- Look at a variety of key strategic drivers and consider how extensive they are: knowledge and technologies, new and better services and products, lower prices, better operational execution, better understanding of customers and markets, unmet and unknown customer needs.
- Develop a simple financial and risk assessment

Case study[13]: A good example of how a tight connection between business strategy and innovation can drive long-term innovation leadership is found in Corning, a leading manufacturer of specialty components used in electronic displays, telecommunications systems, environmental products, and life sciences instruments[14]. Over its more than 160 years Corning has repeatedly transformed its business and grown new markets through breakthrough innovations. When judged against current best practices, Corning's approach seems out of date. The company is one of the few with a centralized R&D laboratory. Because novel materials often require complementary process innovations, heavy investments in manufacturing and technology are a must. And by keeping a domestic manufacturing footprint, the company is able to smooth the transfer of new technologies from R&D to manufacturing and scale up production.

Case study[15]: Buckman Laboratories International Inc., a Memphis, Tennessee-based specialty chemicals manufacturer operating in more than 90 countries, is a company that has been able to do this successfully. Since 1945, Buckman has gone through three phases of strategic transition. Originally, the company competed on product leadership, aiming to manufacture the most effective microbicides and to sell them competitively. It didn't focus on market segments. It did focus on broadly acquiring knowledge of chemistry and chemical engineering associated with microbicides, hiring people with advanced degrees in these areas. The company focused on internally driven innovation — advancing its products' chemical properties. Then, as its industry became more competitive, Buckman found many of its key products becoming commoditized. Prices went down and margins began to shrink. So the company shifted its strategic focus from a product-oriented position to a knowledge-based one. It decided to learn more so that it could create leading-edge products. The company also began to move away from selling products alone to selling value-added services based on showing customers how to use its products to greatest effect. Finally, Buckman began to narrow its market focus, identifying pulp and paper, water treatment and leather manufacturing as its three primary segments, so that it could focus on the knowledge and innovations needed to serve those markets best. In essence, Buckman's innovation position shifted from internal, chemistry-driven product innovation to external, customer service-driven innovation.

[13] Source: https://hbr.org/2015/06/you-need-an-innovation-strategy

[14] Bowen H. K. and Purrington C.(2008) :"Corning: 156 Years of Innovation," by 2008 HBS, https://hbr.org/product/corning-156-years-of-innovation/608108-PDF-ENG

[15] Source: http://www.innovationmanagement.se/imtool-articles/innovation-strategy-thinking-beyond-positioning/

3.4 Module Ideation

The objective of this module is to teach students how to create a field for idea generation, consider the ideas from different perspectives and analyse potential risks.

Porter states that a company can outperform rivals only as if it can establish a difference it can preserve. It must deliver greater value to customers or create comparable value at a lower cost, or do both. However, Porter[16] argues that most companies today compete on the basis of operational effectiveness. Similarly Kim and Mauborgne[17] claim that most companies try to outdo one another and they end up competing solely on the basis of incremental improvements in cost or quality or both. The authors suggest that businesses should systematically pursue value innovation by looking across the conventionally defined boundaries of competition—across substitute industries, across strategic groups, across buyer groups, across complementary product and service offerings, across the functional-emotional orientation of an industry, etc. The idea is that key insights into new market spaces rarely come from projecting the trend itself. Instead they arise from business insights into how the trend will change value to customers. By looking across time—from the value a market delivers today to the value it might deliver tomorrow—managers can actively shape their future and lay claim to new market space. It is not about predicting the future, but about finding insight in trends that are observable today. (See *Fig. 16 Shifting the focus of Strategy*).

[16] Porter, M. E. (1996): What is a strategy? Harvard Business Review (November-December), p. 61-78

[17] Kim C.W & Mauborgne, R. (1999): Creating new market space , Harvard Business Review, available online: https://hbr.org/1999/01/creating-new-market-space

Fig. 16 *Shifting the focus of Strategy*

The Conventional Boundaries of Competition	HEAD-TO-HEAD COMPETITION	CREATING NEW MARKET SPACE
Industry	focuses on rivals within its industry	→ *looks across substitute industries*
Strategic group	focuses on competitive position within strategic group	→ *looks across strategic groups within its industry*
Buyer group	focuses on better serving the buyer group	→ *redefines the buyer group of the industry*
Scope of product and service offerings	focuses on maximizing the value of product and service offerings within the bounds of its industry	→ *looks across to complementary product and service offerings that go beyond the bounds of its industry*
Functional-emotional orientation of an industry	focuses on improving price-performance in line with the functional-emotional orientation of its industry	→ *rethinks the functional-emotional orientation of its industry*
Time	focuses on adapting to external trends as they occur	→ *participates in shaping external trends over time*

Source: Kim C.W & Mauborgne, R. (1999)

Activity: Shifting of Focus Strategy

To understand and practice the Shifting of Focus Strategy, students should study the evolution of change in the business environment of the studied company, and discuss the following:

- **Looking Across Substitute Industries:** A company competes not only with the companies in its own industry but also with companies in those other industries that produce substitute products or services. Research other products or services that could perform the same function as the company's own. Discuss how the space between substitute industries provides opportunities for value innovation.
- **Looking Across Strategic Groups Within Industries:** Strategic Groups refers to a group of companies within an industry that pursue a similar strategy. In most industries, all the fundamental strategic differences among industry players are captured by a small number of strategic groups. Most companies focus on improving their competitive position *within* a strategic group. Discuss in your group what factors determine buyers' decisions to trade up or down from one group to another. Debate how the company can create new market space by

offering the decisive advantages of different strategic groups built on two dimensions, price and performance.

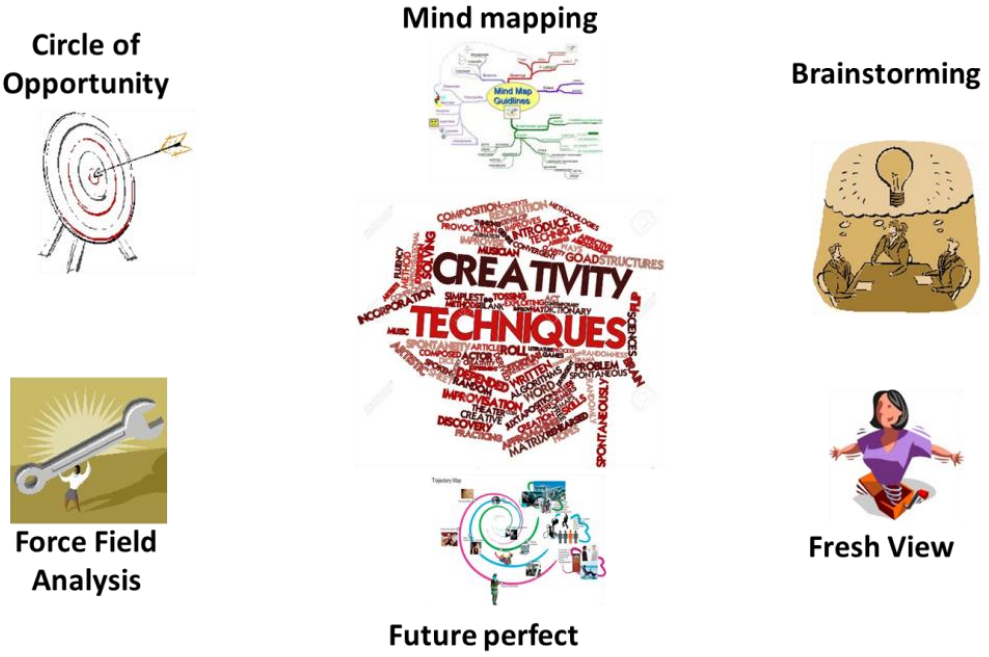
- **Looking Across the Chain of Buyers:** Challenge the industry's conventional wisdom about which buyer group to target and discover of new market space. Remember that *purchasers* pay for the product or service may differ from the actual *users*, and in some cases there are important *influencers*, as well. By looking across buyer groups of your company students can gain new insights into how to redesign its value curves.
- **Looking Across Complementary Product and Service Offerings:** In most industries, rivals converge within the bounds of their industry's product and service offerings. For example the ease and cost of getting a babysitter or parking the car affect the perceived value of going to the cinema and influence the final demand. Discuss the untapped value is hidden in complementary products and services of your company.
- **Looking Across Functional or Emotional Appeal to Buyers**: Some industries compete largely on feelings, their appeal is emotional. Try to find new market space by challenge the functional-emotional orientation of the company´s industry.
- **Looking Across Time**: By looking across time—from the value a market delivers today to the value it might deliver tomorrow—managers can actively shape their future and lay claim to new market space. Discuss the current trends and analyse which of these will be decisive to your business. Try to look across time and ask yourself what the market would look like if the trend were taken to its logical conclusion (Use table 4).

Table 4 Trend Analysis

Global Trends Social, technological, economic, environmental, political	Competitors & Substitutes
Changing Capabilities Competences, technologies, suppliers, partners & networks	Changing needs and Customers Consumers, clients, distribution channels, influencers

In order to refine and further develop their ideas students can research on and try different techniques for creating, thinking, organizing, note taking and brainstorming. They should select the best tools that work for them apply them in the design process.

Fig. 17 Tools for Analysis and Divergence



The next step of the development process is the development of a Business Opportunity Map[18] which helps to identify potential untapped areas for market expansion. The Business Opportunity Map can be created by answering some on the following questions in Fig. 18 Development of a Business Opportunity Map. The Business Opportunity Map is a tool that allows structuring of the big variety of information into five key categories:

- Market – trends, customers, needs, behaviours, segments, competitors, etc.
- Offering – products, services, customer experience, brands, applications (ICT)
- Delivery – distribution channels, communication, logistics, location, etc.
- Production – equipment, technologies, competences, processes.
- Business model – pricing strategy, revenue model, partners, marketing, etc.

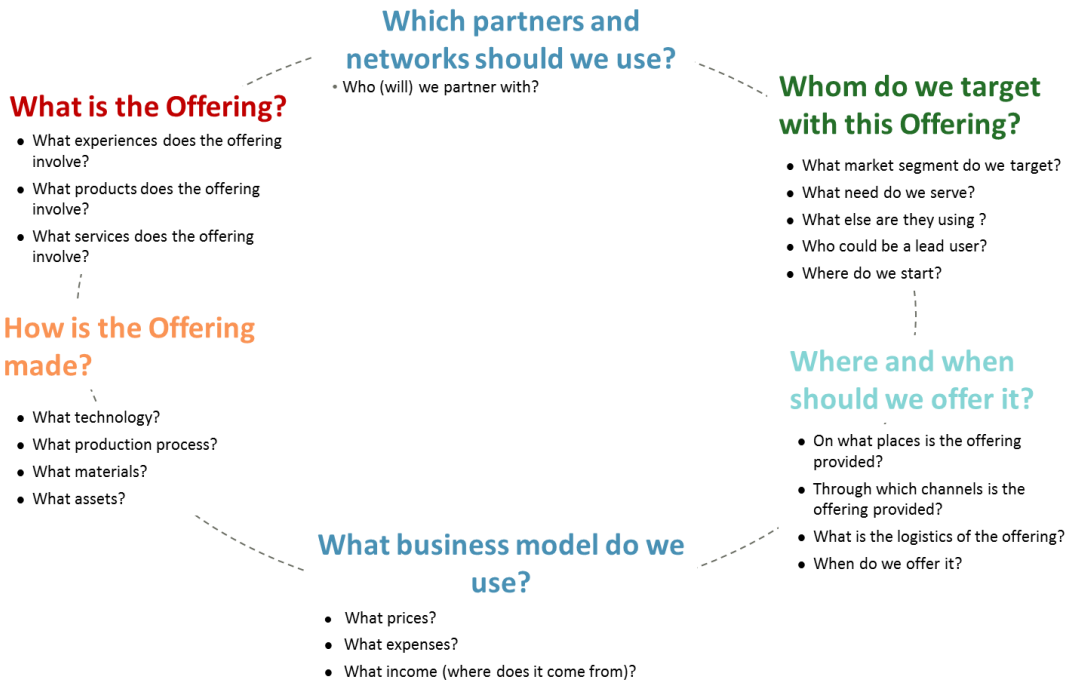
It helps understand the market from a more detailed perspective together with the diverse range of niche players who have varied needs and business drivers. The opportunity map provides managers with a deeper understanding of market needs, identify where their best odds opportunities exist, and find out who their real competition is in relation to those opportunities. The Opportunity Map furthermore[19]:

- Provides structure and **organizes disparate and complex information**, into a simple understandable format
- Integrates market and capability perspectives from **inside and outside the organisation**
- Functions as a visual communication tool for discussing **new opportunity areas**

[18] As introduced by the Center for innovation, excellence and leadership, www.ixl-center.com

[19] https://www.linkedin.com/pulse/20140804004732-33705437-an-effective-way-to-map-business-opportunities

Fig. 18 Development of a Business Opportunity Map



Source: IXL Center

To map the identified environment's forces in a structured and tangible way students are advised to create their own Business Opportunity Maps by modifying the APInno Template **Fig. 19** Business Opportunity Map Template. The map should be used during conversations with the business challenger to raise his/her awareness on environmental forces and create a shared understanding across the teams. It will uncover insights, associations and patterns that ultimately lead to new business model ideas. The BOM model has been adopted to the needs and purposes of APInno.

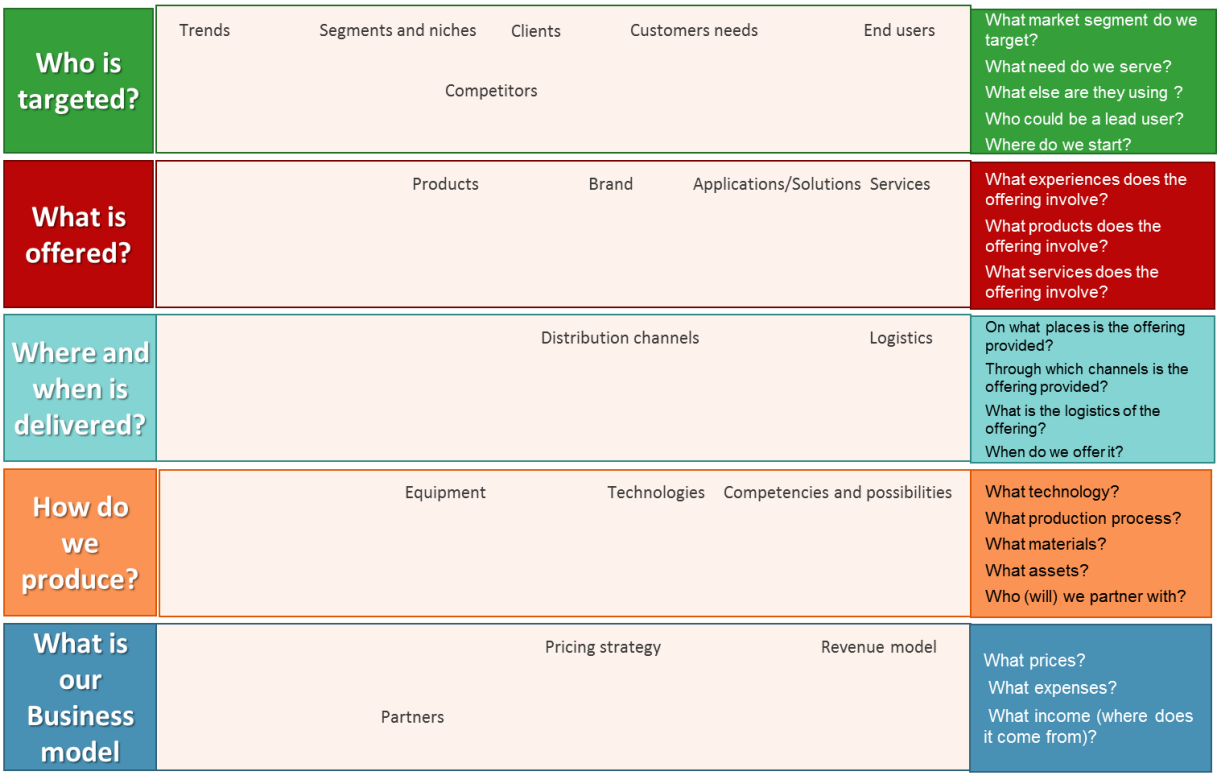
How to conduct effective research?

- Conduct primary research: go out and talk with people.
- Conduct secondary research: read book, newspapers, research and all the material that can help you deepen your understanding of a specific topic.

How does a Business Opportunities Map (BOM) look like?

It consists of the five key elements of a business: market, delivery/distribution, offerings (products and services/customer experience, production, business model.

Fig. 19 Business Opportunity Map Template



Source: IXL Center, www.ixl-center.com

Activity: Business Opportunity Map (BOM)

Each team of the creates a BOM of the (1) Current business and industry (2) Based on a "future perfect scenario" – what would be wishful future situation for our business and (3) From a different point of view – choosing one of the Shifting of Focus Strategy outlined before. The three mini BOMs are then combined into the master BOM with all generated dots, i.e. ideas and information.

The next step is assessing risk of the selected business model which is important because helps to determine if an investment is worthwhile. Students should brainstorm about possible risks and create a simple risk management plans to estimate the impact of various risks and outline possible responses if a certain risk happens. There are four basic ways to handle a risk: Avoid, Mitigate, Transfer and Accept. The risk management plan tells you how you're going to handle risk in your project. It documents how you'll assess risk and who is responsible for doing it. Some risks are internal like a component that might turn out to be difficult to produce, availability of servers, software, and IT support. Others are external, like changes in the market or in the values of society.

Activity: Risk identification

Identify the sources of risks to your innovation project/portfolio. Some examples of potential risks categories include the following:

- Technical
- Cost
- Schedule
- Client
- Contractual
- Financial
- Political
- Environmental

After the exercises you should research available solutions to develop in order to execute the innovation strategy. They clarify the strategic goals of the company as well as the specific goals to solve in the particular case. Therefore within their teams they:

- Define where the company should or should not innovate
- Determine the extent and type of innovation and innovation portfolio

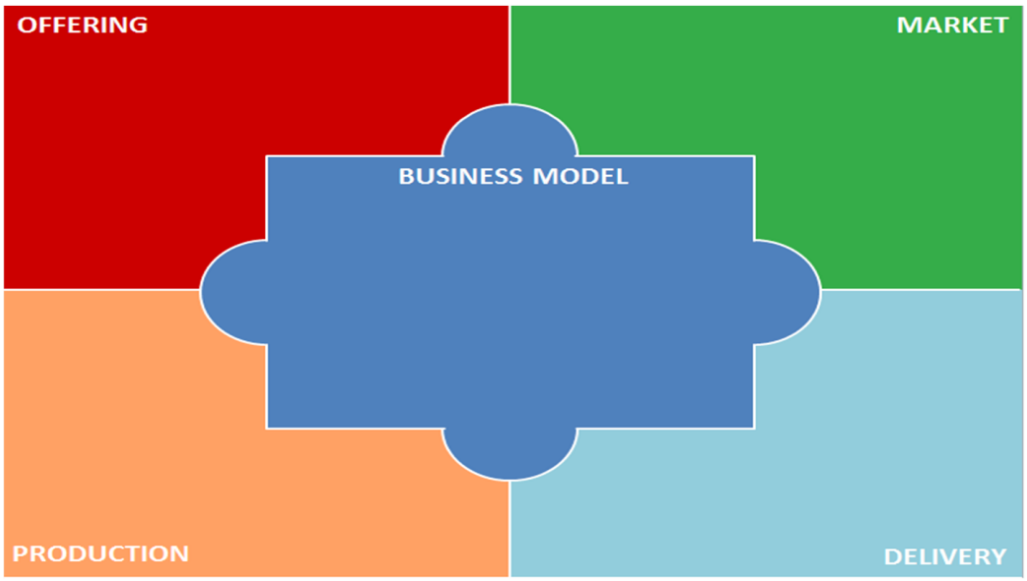
- Determine the investment profile including the risk level and the time interval

3.5 Module Consolidation

This module has the aim to teach students identify a range of emerging opportunity spaces based on the BOM scenarios and the risk analysis. At this stage students "connect the dots" generated in the previous module, prioritise those with highest potential and develop them further. The key objective is to identify new spaces to innovate in, not just individual ideas to implement and invest in. Students create innovation concepts across the BOM fields.

This stage involves the refinement and testing of the innovation solution as identified, conceptualised and decided upon during the previous stages. It includes the detail project planning and management of the design and implementation projects. In the real world after the detail design, an implementation gate is used as a final design review before implementation. Implementation of the design involves the development and roll-out of the new innovation. Initially the new implemented solution will not function optimally; therefore it should be monitored, measured, evaluated and refined until it functions satisfactorily according to specifications. End-users are the best source of information, and testing can be as simple as a free questionnaire or having a friend or colleague use or give an opinion about the designed product. The more types of testing and more actual end-users you test the more accurately you will shape the usability of your product. Once the solution is "tested" and refined, it can then be formalized by completing the Final Design Form (Fig. 20).

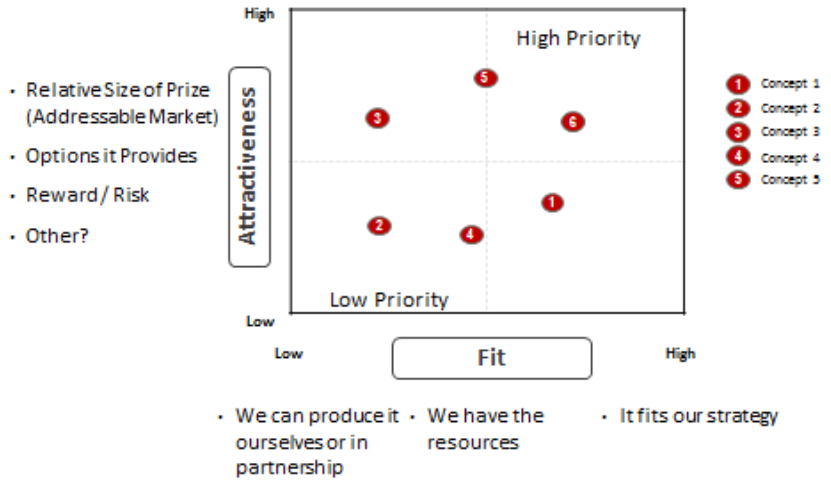
Fig. 20 Final Design of the Innovation Solution



Once students have identified and refined their concepts they should learn how to go through a prioritization or "screening" process. Having a focused, structured prioritization process is central to the successful implementation. When prioritizing the most suitable concepts students can apply the following criteria:

- How "insightful and exciting" in terms of emerging trends internally and externally
- How "significant and meaningful" in terms of impact on customer purchase behaviour and potential size/scale?
- How "leverageable and differentiated" in terms of company's assets and capabilities
- How "winnable and sustainable" in terms of the potential investment requirements and business model?

Fig. 21 Attractiveness and Fit of Concepts



The results for each concept can be summarized into a standardized template (Table 5)

Table 5 Prioritisation of concepts

Insights or Drivers for Opportunity	
Key Market Segments & Competitive Dynamics	
Assets and Competences	
Value Proposition	
Why will we win?	

After the screening student teams should decide upon the future path of each concept:

- **GO:** The idea has merit, meets all criteria and should move forward. The GO ideas can further be presented to the Business Challenger
- **NO GO**: Thanks but no thanks! Give a clear, objective reason why the idea should not move forward and discard accordingly.
- **MODIFY**: The idea has merit but needs to address some of the criteria issues – resubmit to Business Challenger after adaptation
- **WAIT**: If market conditions change then this idea may be valid. Mention it to the Business Challenger

Activity: Identification and Prioritisation of innovation concepts

Individually identify 3 ideas from your business opportunity map that you like and write them down on the notepad.

Form into groups of two or three and select one idea to build into a template filling out all sections in Table 5**Error! Reference source not found.**.

Repeat above step with a different group at least two more times in order to propose 4-5 concepts.

Screen and prioritize according to the proposed criteria.

The module ends with a meeting for discussion of each team with the company representative. As a result one innovation concept is defined in order for students to proceed with the business model and plan for implementation.

Although this innovation process model appears to be a linear staged process, there are many iterative loops and overlaps between the steps within the different stages that occur concurrently. Activities such as portfolio management and the managing of information occur throughout the process and should be constantly updated and revised.

Activity: Concepts Refinement and Testing

Each team ensures the innovation solution meets the needs of the users by testing it in the real world. The obtained feedback and improved features are presented to the company thereby reducing development and support costs after the launch. Different product characteristics such as attributes, physical and esthetical properties can be evaluated on a scale of 1 to 5 for Attractiveness and Feasibility (**Fig. 21** Attractiveness and Fit of Concepts). When presenting their product students are encouraged to use photos, infographics and other media to give as concrete descriptions as possible. Their explanations should also narrow down the different characteristics, for example the appearance attributes could be specified as vintage, classical, frilly, kitsch, retro, functional, simple, plain, playful, unusual, round, oval, minimalistic, sleek, futuristic, modern, timeless, etc.

3.6 Module Implementation

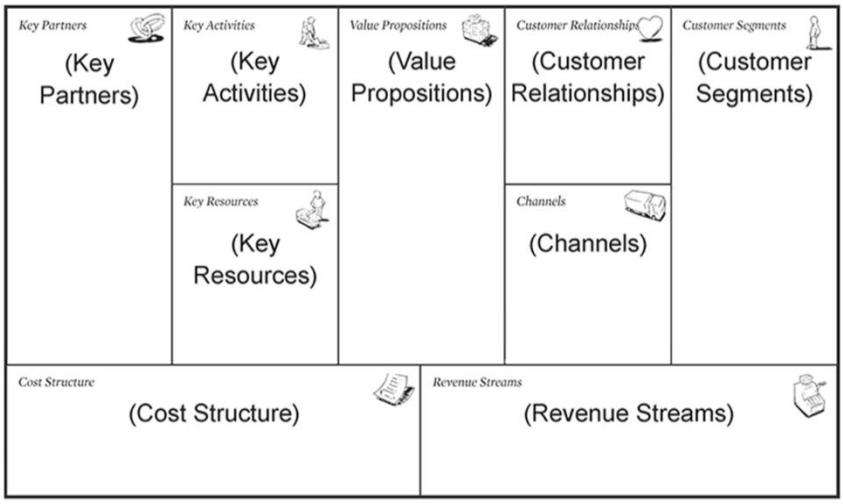
This is the last, sixth module and the final stage 3 Innovate. In this module student teams outline a business model and Action and Implementation Plans which will describe every

step the business company should take, how long each step will take and what should be achieved. When preparing the plans students should incorporate the conclusions gathered through the previous stages and also consider the following recommendations:

- **Define priorities:** All of the goals and strategies in the plan cannot be implemented and accomplished at the same time. Spread activities out over the life of the plan. Review the strategies and determine the best places to start. This may be influenced by opportunities for quick successes, by a logical ordering of strategies that depend on actions completed in earlier strategies, or by an annual cycle of organisational activities. A matrix that shows when each strategy will be started and how long it will take to complete may be a useful attachment to the plan.
- **Set milestones:** Develop sub-plans and milestones for individual initiatives within the plan.
- **Set responsibilities:** Determine who is responsible for what, when it will be started and completed, and what intermediate accomplishments are needed to achieve final results. Determine when and with whom to partner.
- **Identify measures:** Measures and clear expectations make it possible to see how you are doing, what progress you've made on a strategy, what successes you have had, and when you have accomplished a goal. The plan should be data informed, not data driven - data is a means to an end, not an end in itself.
- **Communicate**: Create a communication plan for within and outside of the organization. Use multiple formats, adapted to the audience - the Web, brief brochures, and detailed action plans.

It is very important for the teams and the challenger to have a clearly defined business model which ensures economic gains. The framework that teams use is the popular business model canvas which provides clear structure and guidance on how the business will implement the innovation and gain the economic results.

Fig. 22 Business model canvas



Additional information that should be included in the final presentation is how the missing competencies, resources and other elements will be acquired in order to overcome barriers. There are three main options for an organisation to acquire the needed competencies, assets, technologies, etc.:

- Make
- Collaborate
- Buy

These options help the company reduce cost and risk, increase speed and get better ideas – thus it produces "cheaper, better, faster" and reduce the time-to market. A good understanding of what competencies, assets, resources, know-how, etc. are necessary for the successful implementation of your proposed concept.

Fig. 23 Partnership model

(Open) Innovation Options	Partnership Key Parameters
1. Internal	1. Risk/Reward
2. Contract Research	2. Amount of collaboration
3. Licensing	3. Type of Relationship
4. Single Purpose Partnership	4. Partner's Decision Power
5. Co-development Partnerships	5. Governance Structure
6. Development Consortium	6. Intellectual Property Ownership
7. Multi-prong Venturing	7. Type of Project Portfolio
8. Crowd Sourcing	8. Interaction with other partners

Activity: Action plan

Each team should develop an action plan covering the above issues. If possible simple artefacts, prototypes, images, other tools should be used in order to make the proposition real. Teams should answer the following questions and propose:

- What does your company need in order to successfully implement your proposed concept?
- How can you work with potential stakeholders and sponsors to secure their support and needed resources?
- What barriers to implementing this concept do you foresee within the company?
- What early wins can you design into the implementation to excite people around your concept?

The module ends with final presentations to the company representative. Prior to this mentors should prepare teams to make professional presentations as if in real world. Both creativity and insightfulness should be encouraged. Common set of criteria should be in place before this module in order for the evaluation to be objective and clear. There should be a jury at place as well so that the winning team is chosen.

4 Viability and limitations of the APInno Methodology

The proposed model was tested at two Universities - The University of Library Studies and Information Technologies - Sofia and at Middlesex University - London. The mentors participating in the programme were trained for five days in order to become acquaint with the innovation tools and approaches used in the APInno Project. Before the implantation all documents and other teaching material were revised completely in order to determine if they were at a stage where they could be used to trial the programme. The reviewers consisted of people directly involved in the delivery of the content and also independent academics. A number of issues to be resolved were identified and necessary changes were introduced. In the APInno Innovation Programme participated in total 77 Students from different disciplines, 24 from the Middlesex University and 53 from the The University of Library Studies and Information Technologies of Sofia. For the promotion of the programme to students a number of different methods were used, such as personal emails, internal social media and academic staff advertising.

4.1 Pilot at the Middlesex University London

For the recruitment of Business Cases the UK APInno team received twenty expressions of interest and five completed forms. Out of the five forms two were rejected as they contained insufficient information and another one was rejected as the problem offered was very basic and not deemed sufficiently challenging. The trainers opted for two cases, one fairly complex and the other fairly simple. As a result, the students with the more complex case struggled far more that those with the simpler case. The business case handbook was given to the business case presenters. The presenters attended five sessions where they worked with each group to answer questions. One of the presenters received two emails with questions, while the other did not received any emails.

For the recruitment of mentors the UK APInno received five expressions of interest, of which two were selected primarily for their experience in innovation. The mentors attend for two hours each session alternating between them on different weeks.

The trial at the Middlesex University was launched as a complementing element of the existing employability initiative and it was not it was not a credit bearing programme. Although students were recruited from across the University, priority was given to students from non-business programmes. At the start of the trial 24 students from across the university and at different levels enrolled. They included one PhD student, two Masters and twenty one undergraduates. Ten students were business students and the

rest was from diverse areas such as nursing and theatre. Sixteen students attended the first day and over the course of the programme the attendance varied. Six students dropped out for various reasons. One because it was not a credit bearing programme, one was ill and the others generally because they did not realize how much work and the programme required. Four students attended every class. During the programme the three groups functioned well with the exception of one group. This group had serious difficulties working together and one member refused to participate.

The post-trial review revealed that the initially provided materials Programme syllabus (Slides, Trainers' handbook, Students' handbook, Business case handbook and recruitment, Student recruitment process and participation, Mentor recruitment process and participation) are not sufficient to be used as a stand-alone programme. Therefore, after the pilot all these documents were revised and published in this guide after being significantly enriched with more explanations, teaching materials and graphs in each module.

4.2 Pilot at the University of Library Studies and Information Technologies, Sofia

In the 2 testing courses participated 53 students, divided in two groups: 29 and 24, each divided in 3 competitive teams. They were studying in the ULSIT, but also invited colleagues from other universities and colleges – Sofia University "St. Kliment Ohridski", Technical University of Sofia, University of National and World Economy, University of Chemical Technology and Metallurgy, MT&M college, "Todor Kableshkov" University of Transport. The main criteria were: personal motivation, secondary level of education completed, level of understanding of English (at least B2), each of them showing their language skills level B1 in English, and presenting short motivation to participate in the course. After the completion of the testing, the students studying at ULSIT were granted 6 credits for it, and their academic records include the discipline they followed.

Their areas of specialisation were: ICT, Economy, Transport and logistics, Industrial chemistry, Electronics, Mechanics, Industrial engineering, Biotechnology, Computer Aided Design and Manufacturing, Micro and nano- technology engineering, Software engineering, Marketing, Management and Entrepreneurship.

The course was successfully completed by 45 out of 53 enrolled (85% success rate). The reasons for leaving the course were: placement in other country (2), starting new job (2), lack of time for tasks preparation (3), health issues (1).

4.2.1 Presentation of the challengers

In the testing participated two entities, as follows:

1. Trelleborg Sealing Solutions Bulgaria is a leading global supplier of sealing solutions. Their range of products includes O-Rings, hydraulic seals, rotary shaft seals, oil seals, static seals, pneumatic seals, mechanical face seals and many more. The company has 5,550 employees; research and development centers in Europe and America; 24 manufacturing plants worldwide; 54 marketing companies offering global engineering support; ISO 9001:2008 and ISO/TS 16949:2009 quality certifications; In-house elastomer, polytetrafluoroethylene (PTFE) and polyurethane (PU) development; More than 2,000 proprietary materials engineered for specific industry requirements; Wide range of patented product designs for static and dynamic sealing applications; Worldwide Supply Chain Management (SCM) network.

2. Sofia Development Association (Sofia – DA) was established to promote and encourage the constant dialogue between civil society, business, public institutions and municipal administration for creating social environment which supports the development of Sofia as a modern European city, aids the sustainable development, entrepreneurship and initiatives of Sofia and its citizens, and fosters the interconnectedness between education, science, and business.

The Sofia Development Association was established with Resolution 348/08.07.2010 of the Sofia Municipal Council and was registered as a not-for-profit legal entity with the Sofia City Court on 16.08.2010, company case No. 495/2010. Governing bodies of the Association are its Managing Board and Executive Director, appointed by the Sofia Municipal Council. Members of the Managing Board are municipal councillors from different political parties and representatives of the municipal administration.

The Sofia Development Association was appointed to coordinate the activities related with its candidature for European capital of culture with Resolution 677/2.12.2010 of the Sofia Municipal Council.

4.2.2 Short description of challenges, the proposed and the winning solutions

1. Trelleborg – new products / area for development for Trelleborg

During the training period the students determined three strategic fields with concepts:

- Medical / Life Science
- Electronics / Automotive
- 3D technologies / Fast prototyping

The three teams offered as follows:

- Medical / Life Science – develop better/new specific for the company elements for autoclaves; medical surgery lasers. The final presentation included financial data, information on potential partners/producers of medical equipment in the country, technical schemes and video demonstration of the suggested equipment;
- Electronics / Automotive – modules for drones – the presentation included information on the specific regulations for aircrafts safety and suppliers' requirements, short information on the different types, sizes and application of this type of aircraft, with links to related industries and professions. The team also presented model of drone where the suggested items to be produced were shown.
- 3D technologies / Fast prototyping – this team presented different usage of the 3D printing while rapid prototyping the new products for new customers, with time and resource calculations, and also brought to the final presentation a potential partner to cooperate with Trelleborg.

The big winner was team 2 – Electronics / Automotive

2. Sofia Development Association – the case was how to enlarge their scope of activities as NGO

During the training period the students determined three key strategic fields with concepts:

- Sport city
- Green city
- Smart city / Online citizens support

The final presentations were:

- Sport city – the Sofia Municipality to promote citizen's projects for sport facilities in the regions of the capital, and the local communities to build with this financial support and their own resources sport facilities. Some financial calculations and health data were presented.
- Green city – their idea "Green skills for green jobs" was linked to the Intelligent Specialization of Sofia, and included detailed information on the priorities, goals and social impact. The target group of the suggested project for series of trainings

is the specialists in national and local administration, as well as business representatives, so that to upgrade their existing knowledge and skills with green element and to construct new capacity by green skills. The team also presented some idea for financing of the trainings.

- Smart city – the team presented an on-line app (prototyped), as a link to the foreign visitors / national guests to Sofia, that included all the links to interesting places, museums, theatres, restaurants, with links to the city transportation system and other useful links, with feedback form, etc. The team also presented financial calculations and timetable for implementation of the project, with partners' map and general idea for cooperation.

The big winner was team 3 – Smart city / Online citizens support.

The post-trial review revealed that the initially provided materials Programme syllabus (Slides, Trainers' handbook, Students' handbook, Business case handbook and recruitment, Student recruitment process and participation, Mentor recruitment process and participation) are sufficient to be used as a stand-alone programme, including all the additional videos and soft-skills games to form the teams. Because of the feedback from the UK testing results, after the pilot all the documents were revised and published in this guide after being significantly enriched with more explanations, teaching materials and graphs in each module. Modifications were made also in the process shortening the modules and restructuring them with additional elements that proved to be more efficient. So as a final result the programme was divided into three sections (stages) in total to be easier for implementation with the respective modules.

As a result of the project, the newly developed course on Innovation Management, was presented and approved by the Academic Council of the University and included in **four MSc courses**, offered by ULSIT.

Appendix 1 *Proposal for a Challenge/Business Problem*

Thanks you for offering a Challenge/Business Problem for our students look for a solution. Can you please complete the form below? Please try not to exceed the word limit for each section. There are notes at the end of the form that you can use to assist you in completing the form. Please be aware that the students will be given access to the information below with the exception of your contact details

Name of organisation	Contact person	Contact details
Overview of the organisation (300 words)		
Overall vision for the organisation's future (200 words)		
Overview of your problem (500 words)		
Consequences of not resolving this problem (200 words)		
Are there any specific restricting factors such as finance or skills that impact on this problem?		

Notes

Overview of the organisation: What industry are you in, what products or services do you sell/provide, target market, approximate market size, specific factors impacting on the organisation

Overall vision for the organisation's future: Where do you see the organisation in five years' time?

Overview of your problem: what is the problem, what factors have cause this problem to emerge, what barriers are there to you solving the problem, are you currently working to solve the problem?

Consequences of not resolving the problem: if you do not resolve the problem what you do anticipate happening to the organisation?

Specific restricting factors: what factors are you aware of that restrict solutions such as finance?

Conditions:

If your case/problem is chosen there are a number of conditions that we would expect you to agree to.

You can be working on a solution yourself, but you should not have already resolved the problem.

You agree to attend five sessions a maximum of 2 hours each to engage with the students/participants. The first meeting would be to provide an overview of the problem and subsequent meetings will relate to progress and provide further information required by the students/participants.

The organisation inviting you to present your business challenge will reimburse out of pocket expenses at a fixed rate determined by the organisation.

Appendix 2 Challenger Data Capture Form, UK

Please indicate whether each topic area is satisfactory and add additional comments where required

1. Support Materials

Question/Topic	Satisfactory (Y/N)	Comments
Business Challenger Guide		
What Additional Information should be included in each?		
Was any information not relevant?		

2. Participants

Question	Satisfactory (Y/N)	Comments
Are students appropriate for the Programme? **(If No Add Comment)**		
Did business mentors provide sufficient levels of support during time spent working on the challenge? **(If No Add Comment)**		
Are any enhancements needed e.g. more/less time/greater knowledge?		

3. Support Materials

Question/Topic	Satisfactory (Y/N)	Comments

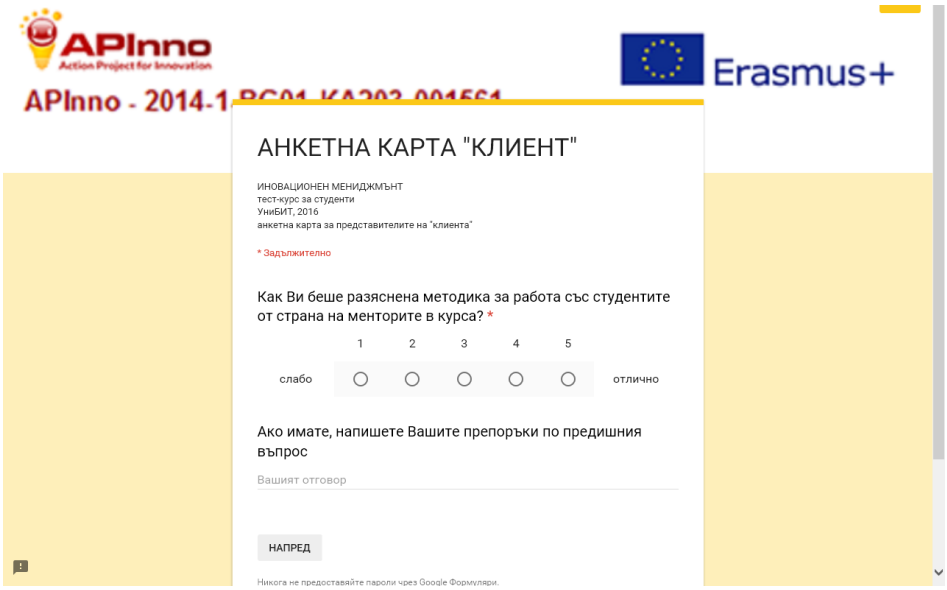
Business Challenger Guide		
What Additional Information should be included in each?		
Was any information not relevant?		

4. Participants

Question	Satisfactory (Y/N)	Comments
Are students appropriate for the Programme? **(If No Add Comment)**		
Did business mentors provide sufficient levels of support during time spent working on the challenge? **(If No Add Comment)**		
Are any enhancements needed e.g. more/less time/greater knowledge?		

Appendix 3 Challenger Data Capture Form, BG

Fig. 24 Preview of the challenger's data capture form



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SURVEY "CHALLENGER"
INNOVATION MANAGEMENT
test course for students
UNIBIT, 2016
questionnaire for representatives of the "challenger"

***** Mandatory field

1. **How good was the methodology for working with students clarified by the mentors in the course?***

	1	2	3	4	5	
week	○	○	○	○	○	excellent

If you have some, please write your recommendations on the previous question

Your answer

2. **How do you evaluate the students participating in the solution of your case? ***

	1	2	3	4	5	
week	○	○	○	○	○	excellent

If you have some, please write your recommendations on the previous question

Your answer

3. How do you evaluate the benefits of the teamwork for the students? *

	1	2	3	4	5	
week	○	○	○	○	○	excellent

If you have some, please write your recommendations on the previous question

Your answer

4. What was the level of support while working on the case by the mentors? *

	1	2	3	4	5	
week	○	○	○	○	○	excellent

If you have some, please write your recommendations on the previous question

Your answer

5. How do you evaluate the work of the students during: *	1	2	3	4	5
1. The introductory meeting	○	○	○	○	○
2. The presentation of the results "case for change"	○	○	○	○	○
3. The presentation of the results "Strategic fields of concepts"	○	○	○	○	○
4. The presentation of the results of the "concept"	○	○	○	○	○

If you have some, please write your recommendations on the previous question

Your answer

6. What was most difficult for you during the testing of the course? *

Your answer

7. What you liked most during the testing of the course? *

Your answer

Appendix 4 Recommendations and remarks from the Challenger Data Capture Form, BG

Q 1:

- The mentors have a high level of understanding the innovation management methodology and explained the concept and details for our work with the students clearly.
- Although the important aspects of the methodology were brought clearly and consistently, it would be helpful to have it explained in a simpler way.

Q 2:

- The team members completed each other in terms of characters and knowledge and did a very good job on the case.
- A great opportunity for the students to learn team work while working on a real case.

Q 6:

- Fitting the explanation of our case to the students in a way to ease their following of the methodology.

Q 7:

- The work with the students.
- The unexpected way to put lots of raw ideas into a systematic process bringing them to a final commercial product.
- The final presentation of the students.
- The way everything looked structured at the end.
- The sincere enthusiasm of the students.