



D3.5 Definition of the conceptual basis of Module 2

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The 24h of innovation (module 2): Why, how and what?

Introduction

Why? From innovation to impact innovation

Innovation can no longer be solely defined in reference to the economist J.A. Schumpeter as “a new service, product, or process that finds its market and offers a competitive advantage to the company or organization that implements it.”

Returning to the very essence of innovation - which must constantly seek to improve what exists - our worldwide challenge is now to urgently explore a new approach of “impact innovation” that seeks to bring positive value to the planet, its current inhabitants, and future generations.

These "impact innovations" will henceforth be defined as "new services, products, or processes that meet economically viable markets to ensure the sustainability of their uses, while allowing to neutralize and even make positive their social and environmental impacts." To do this, we must mobilize and combine all the creative intelligences of this world, especially those who aspire to bring about this new paradigm.

Tomorrow, the current and next generations must more than ever become the experts of collective intelligence, which implies learning to work in the unknown, the undefined, to detect weak signals, to be interested in singularities, to work outside of one's comfort zone in the exploration of "non-art" domains and their uncertainties... And what if "Innovation became the art of making solutions accessible to all"?

The goal here is to promote, support, and disseminate decidedly creative ideas that are completely disruptive in order to bring about exceptional innovations that could now be described as "neutral or positive impact", that is, capable of reducing or even reversing environmental and social impacts.

Today, the generation of new solutions (products, processes, services...) and associated business model to both reduce the worldwide carbon footprint and the consumption resources without decreasing the usage experience and user's/citizen's requirements is a key point for many organizations with a sustainable development perspective. These organizations (industry, association, laboratory...) need to employ novice engineers, marketing, and management profiles with different skills (technical, individual, collective, cultural...) to help them to tackle the next

challenges. It is well known that entrepreneurs and innovators have commonly certain attitudes and characteristics that lead them to success, i.e., curiosity, passion and never giving up attitudes. In the literature we found many factors that influence the team's creativity and cohesiveness. Among them, the team diversity (of participant's profile, or school origin, or country...) is currently a major trend due to the globalization. Most of the companies in the world normally have several different branches in multiple locations. Most people believe that cultural diversity has immense impact on team performance, and it is necessary for teams to become multicultural (Stahl et al. 2007). It seems to be obvious that teams with diversity composed of different profiles and school's origin (engineering, design, marketing...) could be considered as a multiskilled team with a strong advantage to perform creative design task compared to a team composed of people coming from the same education organization.

During the 24h of innovation, the management of the teams are quite free, but we try to encourage the teams to follow a generic methodology based on the adaption of the Double Diamond design process (see figure 1). We encourage a learning by doing approach based on the use of all the different tools and methodology by a hybridization approach developed by ESTIA team since many years. This hybridization approach (see figure 2) based on (Legardeur 2009) highlighted that the use of combination of several methods, tools and techniques is a more flexible and agile approach to support complex creativity and innovation processes.

Module 2 builds directly on the outcomes of Module 1, reinforcing participants' prior knowledge of sustainability and environmental challenges. Participants who completed Module 1 arrive with a solid foundation, which enables them to engage more confidently in Module 2's creative and solution-oriented tasks. During Module 2, teams are encouraged to follow a flexible approach to the Double Diamond methodology while adapting it to their specific challenges and time constraints. To support them, a multidisciplinary coaching team is present throughout the event, offering guidance and practical tools tailored to the needs and dynamics of each team. Coaches focus on helping teams stay on track with their objectives and content rather than getting lost in process management. This agile coaching ensures that the Hybridisation Approach is applied efficiently, combining or simplifying tools and methods to optimize outcomes within the 24-hour timeframe.

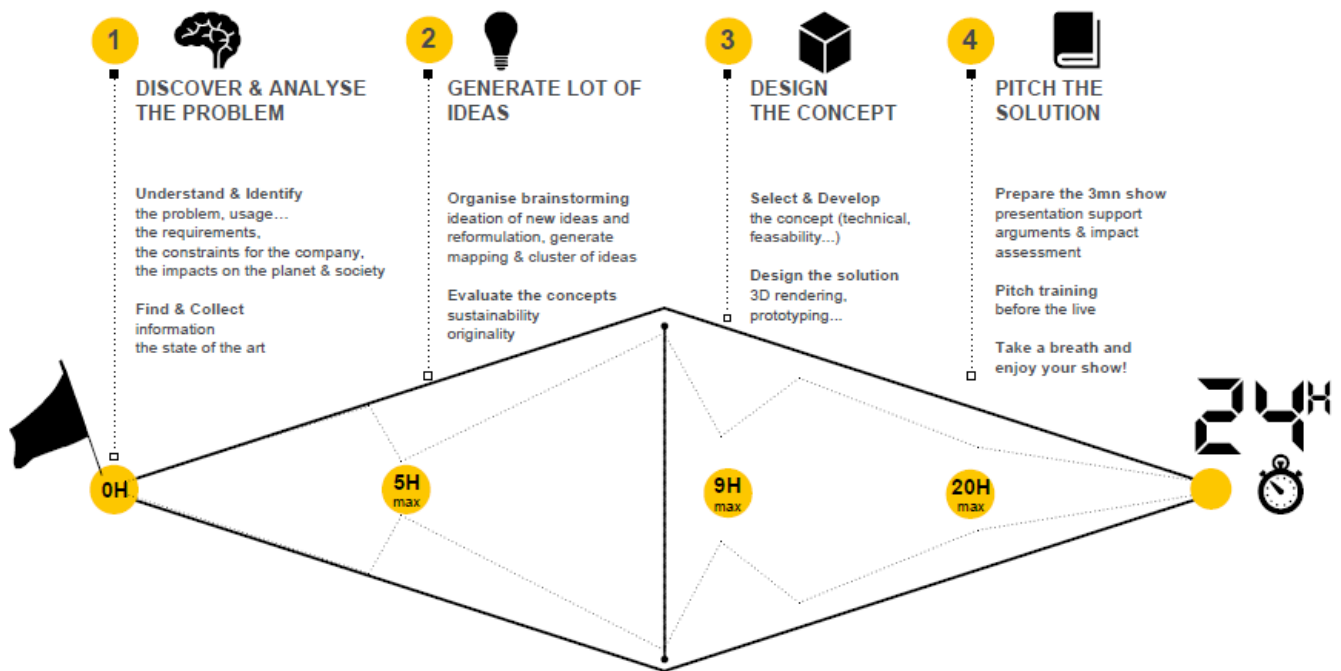


Figure 1. The 24h of innovation design process

(adapted from the Double diamond developed initially by the British Design Council in 2005)

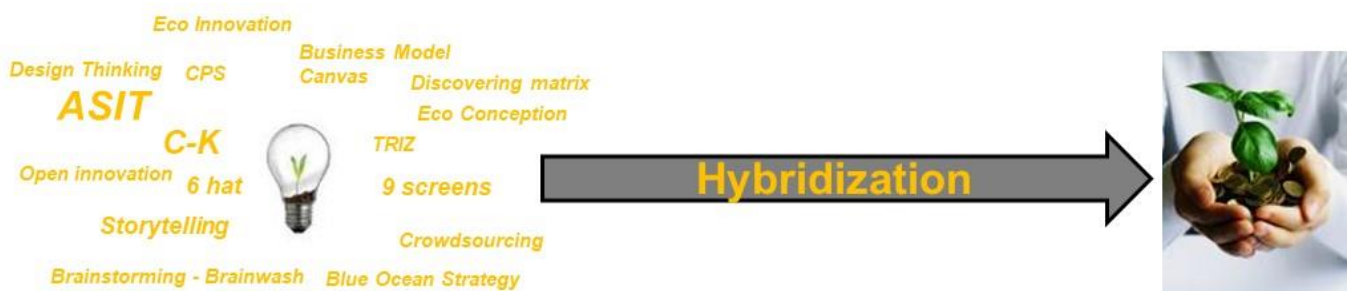


Figure 2. illustration of the "hybridization approach"

Our main objective with the module 2 based on "The 24h of innovation" concept is to contribute to the questions of mindset and characteristics of a team in order to foster creative and innovative thinking with a sustainable perspective. Since 2021, we are now organizing "The 24h of innovation - For the planet", to stimulate the generation of new solutions (products, processes, services...) and associated business model to both reduce the worldwide carbon footprint and the consumption resources without decreasing the usage experience and user's/citizen's requirements with a sustainable development perspective.

Presentation of “The 24h of innovation” as module 2

How to stimulate the new generation to generate impact innovation?

Creativity and innovation student’s skills training are one of the most complex learning processes for any university and school. The new generations will, as always, be at the heart of our attention and concerns with “The 24h of Innovation®”, because we are convinced that we must assist them in their mission to invent and overturn today's models. However, today there is a big challenge for most of educational institutions to propose multiskilled environment to develop the soft skills of their students (Legardeur et al. 2008). During their teaching program, it's not easy to immerse students to experiment and practice such diversity. Indeed, most of the time, the young people are separate in different schools or university with specific teaching program according to their orientation for engineering, design, marketing, sales, administrative...

Created by ESTIA in 2007, “The 24h of innovation®” (<http://24h.estia.fr>) is a 24 hour nonstop challenge to develop creative and innovative concepts of products (mechanical, electronic, software...) and services. The concept of this event is simple: projects and topics are proposed by companies, labs, associations, and they are unveiled at the beginning of the competition. Teams are freely composed of a mix of any volunteers (students, researchers, teachers, consultants, free-lances, employees...). After 24 hours of development, teams present their results in a show of 3 minutes in front of a jury of professionals in the field of innovation. The winner teams receive the “24h of innovation” awards and they receive prizes offered by the sponsors of the event.

This concept is as an original way to generate creative ideas for organizations in a few time, considering that the participants have 24 hours to work on innovation developments (such as new products and services, new business model, new communications...) proposed by industrials coming from different sectors, research laboratories, associations, and private persons.

The event is organized as follows: a call for project proposal, for participation, and for sponsors is sent out before the event, and the most interesting topics, participants, and sponsors are selected. At the official opening of the event, the topics are revealed, and the teams are formed (with a maximum of 10 persons per team). The team constitution is free and open and is not imposed by the organizers. We just strongly encourage the team-building compound with different profiles: 1st, 2nd, 3rd years, master, different schools and universities...

Teams are free to choose their subject among the projects proposed by the inventors and applicants. The topics are communicated during the opening ceremony of the 24h of innovation and the team will then be allowed to choose them. Several teams may work on the same subject.

Then, each team has 24 hours to develop creative solutions (innovative concepts or prototypes) corresponding to the project proposals. At the end of these 24 hours period, each team presents its propositions during the short time of only 3 minutes in front of all the participants and a jury formed by innovation professionals. This jury then awards the best teams with prizes offered by the event sponsors. The classification of the projects may be made from the documents and prototypes proposed during the presentations.

The assessment process in Module 2 goes beyond evaluating the final design and presentation. While the jury considers factors such as originality, feasibility, potential impact, and sustainability, the 24-hour event also emphasizes the importance of teamwork and creative processes.

Through pitch preparation and group presentation, participants demonstrate various key competencies:

- **Public Speaking:** Ability to express ideas clearly and concisely under time constraints.
- **Team Collaboration:** Working effectively in diverse groups to produce tangible results.
- **Prototyping Skills:** Developing digital or physical prototypes within a limited timeframe.

These elements are core to the participants' learning experience and align with TEAMIT+'s broader objective of fostering innovative and adaptable future leaders

Participants are expected to gain the following (see figure 3).

The skills covered by the modules from the ESCO classification are the one reflected in Table 6.

Table 6. Skills acquired in the TEAMIT+ training programme from the ESCO classification

	Module 1	Module 2	Module 3
Green skills			
Evaluate environmental impact of personal behaviour	x	x	x
Adopt ways to reduce negative impact of consumption	x	x	x
Environmental policy	x		
Circular economy		x	
Environmental legislation	x		
Promote environmental awareness	x		
Environmental engineering		x	
Measure companies' sustainability performance			x
Digital skills			
Creatively use technologies		x	x
Collaborate through digital technologies	x	x	x
Browse, search and filter data, information and digital content	x	x	x
Develop digital content	x	x	x
Resilience skills			
Work in teams	x	x	x
Solve problem		x	x
Show entrepreneurial spirit			x
Intercultural competence			x
Think innovatively		x	x
Promote ideas/products/services			x

Figure 3. TEAMIT+ ESCO skills

What are the characteristics of “The 24h of innovation”?

The 24h of innovation event is a good opportunity to generate new ideas, to increase the creativity for the benefits of the company. Since 2007, the concept of the 24h has been exported in other places in the world. Since 2007, 26195 participants coming from more than 355 schools & university of 40 different countries have attended one of the 99 editions organized on 5 different continents: European (24h in France, Spain...), American (24h Canada...), Asian (24h Thailand, India...), African (24h Burkina Faso, Morocco...), Oceania (New Caledonia). More than 1680 projects have been developed for 1320 organisations/companies.

Students are generally motivated to work in team and to share a real problem faced by a company. The goal of the 24h of innovation is to foster the socio-technical practices (Subrahmanian et al. 2001) of the young engineers and students that are involved in a short but intensive collaborative period with the use of creativity and design tools, marketing and communication methods... We think that this situation helps the young modern engineers (Kurfess 2001) to be integrated more easily in the socio-professional networks. This interest is justified with good feedback from such an event. Indeed, the companies propose a subject (e.g. an idea, a requirement, or a research theme) simply explained by a single title with a short descriptive phrase. The companies receive then, quickly and for free, concepts of innovative solutions, virtual models, or prototypes. Moreover, by the restrictive but stimulating format for the students, most of the teams produced results with an achievement level that revealed to be quite surprising for a work realized in the short 24 hours period. Thereby, many subjects developed during the first editions, are now being industrialized and about to be launched on the market by companies.

The team constitution is not imposed by the organizers of the 24h of innovation. We strongly encourage the team-building composition with different profiles (students from different schools and universities, employees from different companies, background, etc.). The organizer has to decide on the maximum number of people per team in relation to the number of projects available. However, we are limiting to a maximum of 10/12 people per team. As organizers, we do not impose the topics on the teams. We manage the registration of the teams and projects according to the “first-come, first-served” principle. As organizers, we can choose whether or not several teams are allowed to work on the same subject.

The team formation process naturally encourages diversity through the challenge selection mechanism. Each topic is presented at the beginning of the event, and participants must quickly secure their place within a team working on the challenge that most interests them. Since team

spots are limited, this process fosters diverse team compositions as individuals are drawn to challenges based on interest rather than existing relationships.

To ensure teams fully leverage their diverse expertise and creativity, a structured support system is implemented:

1. **Multidisciplinary Coaching Team:** Coaches from various disciplines (technical, innovation, communication) guide teams, helping them identify individual strengths, manage time effectively, and solve problems creatively.
2. **Tool Utilization:** Specific tools and strategies are provided to facilitate collaboration and brainstorming, maximizing team potential within the limited 24-hour period.

To further ensure that all perspectives are valued within the limited 24-hour timeframe, coaches are trained to actively encourage participation from every team member. This involves specific strategies such as:

- **Balancing Contributions:** Coaches monitor group interactions to ensure that quieter individuals are given opportunities to share ideas, while managing overly dominant voices.
- **Structured Brainstorming:** Teams are encouraged to use collaborative brainstorming techniques, such as idea clustering or time-boxed rotations, where everyone contributes within a defined framework.

By combining these strategies with the diverse challenges presented, the module creates an environment where participants can maximize their creativity and problem-solving abilities.

From a practical and theoretical point of view, the goal of the 24h of innovation is to foster the socio-technical practices of the students that are involved in a short but intensive collaborative period with the use of creativity and design tools, marketing and communication methods...

The 24h of innovation event is also an opportunity for research experimentations involving students' teams. For example, Innovation measurement and evaluation are one of the key points for the development of any innovative projects in their early phases. So, in the scope of the 24h challenge we face also the problem of judgment and evaluation by the different stakeholders of a creative work produced in 24h. In (Choulier and Legardeur 2009), (Legardeur et al. 2009) (Legardeur et al. 2010), we propose a comparison of different evaluation methods that were tested during the presentations that were made by the teams during the 2008 edition. The research output is to examine the criteria and the means of evaluation of inventive design, at the concrete example of the "the 24 h of innovation" contest. We have also described how the MIM© matrix could be used in order to evaluate the potential of the results obtained during one project of the 24h of innovation 2009 edition.

Moreover, the organization of students' teamwork during the execution of short-term innovative projects implies numerous questions and dilemmas. The organization of students' teamwork

during the 24h event have been analysed by others researchers (Jimenez-Narvaez et al. 2010), (Jimenez-Narvaez et al. 2011a), (Jimenez-Narvaez et al. 2011b), (Jimenez-Narvaez et al. 2012), (Legardeur et.al 2013), (Jimenez-Narvaez et al. 2013), (Arikoglu et al. 2013), (Jimenez-Narvaez et al. 2015), (Adorjan and Maturro 2017), (Wang and Gomez 2018). Some methods & tool for innovation or ideation have been also tested during the 24h edition: (Cherifi et al. 2016), (Dammak 2018), (Dammak et al. 2020). In (Legardeur et al. 2020), we collected the data of profile's participants of the we have 14 French 24h's editions in order to characterise the team's diversity during the period 2007-2019. In the literature we found many factors that influence the team's creativity and cohesiveness. Among them, the team diversity (of participant's profile, or school origin, or country...) is currently a major trend due to the globalization. Most of the companies in the world normally have several different branches in multiple locations. Most people believe that cultural diversity has immense impact on team performance, and it is necessary for teams to become multicultural. It seems to be obvious that teams with diversity composed of different profiles and school's origin (engineering, design, marketing...) could be considered as a multiskilled team with a strong advantage to perform creative design task compared to a team composed of people coming from the same education organization.

Conclusion

From a practical point of view, the goal of the 24h of innovation is to foster the socio-technical practices (Subrahmanian et al. 2001) of the students that are involved in a short but intensive collaborative period with the use of creativity and design tools, marketing and communication methods... Our main objectives with the 24h of innovation are the following:

- ⊕ A privileged moment to reveal talents for stimulating impact innovation
- ⊕ An opportunity to fully express and free one's creativity
- ⊕ An opportunity for atypical pedagogy and collaboration between companies, teachers, and students
- ⊕ A catalyst for the creation of innovative and sustainable projects, research & development...
- ⊕ A generator of professional opportunities, internships for students...

We think that this kind of event helps the young generation to be more creative and more easily integrated in the socio-professional networks that will address more and more sustainable challenges in the future.

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