

CO-DESIGN IN THE **DIDY** SCENARIO

Toolkit and guidelines

The Digital Do-It-Yourself European Project develops a human-centric and multi-perspective approach to the scientific study of the transformations generated by the increasing social adoption of atoms-bits convergence (ABC) devices, in order to:

- 01** Establish a conceptual framework that will enable the analysis, exploration, and understanding of the impact of DIY in a human-centric digital age.
- 02** Produce well-founded transferable information, models, and guidelines to support both education and policy making on Digital DIY as it is forming. It is intended as an ongoing phenomenon that, while surely enabled by technology, should be driven and shaped by social and cultural strategies, not technology.

As a multidimensional phenomenon, Digital DIY will be studied from multiple perspectives in the project, including

- how it is reshaping **organisation, work, education, and research**
- how it impacts on **creative society and legal systems**
- how **creative design and ethics** are changing due to DiDIY itself.



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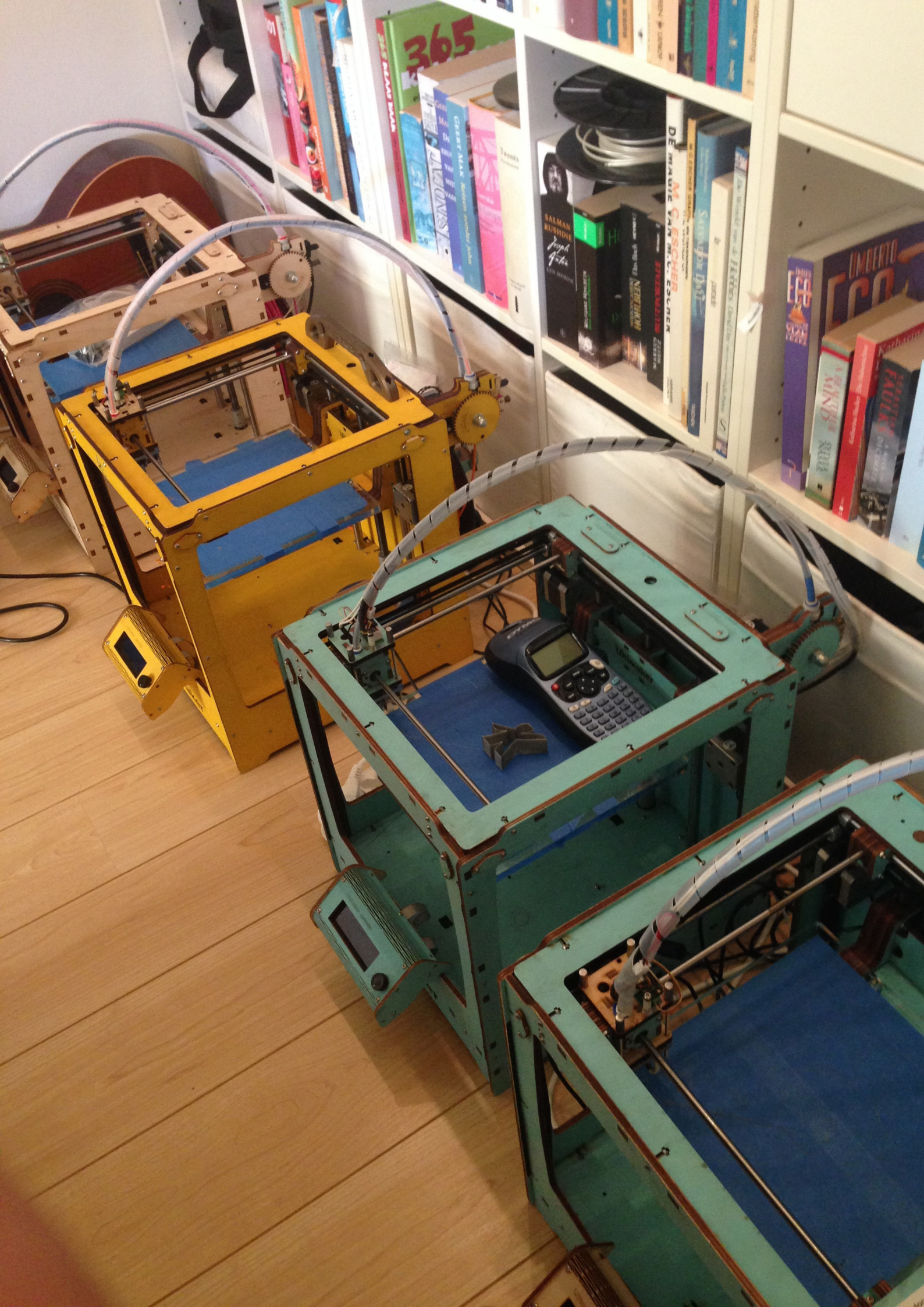
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INTRODUCTION

The background of Digital DIY

Digital DIY enables the shared production of creative content, and therefore provides greater opportunities for co-design and the creation of collaborative value chains.

Digital fabrication-based DIY, or simply **Digital DIY (DiDIY)** is an ongoing social innovation phenomenon, in which collaboration and knowledge sharing are creative practices through which people may increase their self-confidence, and empower themselves by developing new skills. It reflects the attitude of people improving their way of life, thanks to ubiquitous digital technologies connecting people on a global scale (Internet 2.0), and bringing production closer to consumption (digital fabrication and distributed systems). These practices and technologies have many potentialities that are changing the world on both personal and community levels. Indeed, collaborative engagement opens the way to potentially providing creative solutions to local, social, and environmental problems.

This social phenomenon allows an increase in diffused creativity, which represents the intangible substrate for innovation. In this context, where Digital DIY plays a leading role in developing a more creative society and where everyone designs, it is fundamental to facilitate the creative process of making, and to create innovative digital solutions in different fields of application.



The origin of the Toolkit

Through co-design workshops we've involved both laypeople and DiDIY practitioners in the testing and refinement of the Digital DIY design process, creating tools that speak in a language that is simplified, clear, and easily understandable.

The 'Toolkit and Guidelines' is the result of 16 human-centred co-design workshops held in Italy and Spain by a research team from **IDEActivity Center, within the framework of the EU funded project 'Digital Do-It-Yourself (DiDIY)**. Through the workshops, IDEActivity Center has tested and validated a specific *design process* and the related tools, focusing on the importance of creativity in achieving innovation, and identifying a **design and creativity based model able to generate innovation** in different areas (education, society, work, etc) through the exploration of digital DIY as a mindset and a social practice. **The IDEActivity method used for the workshops is a human-centric participatory methodology**, applied in contexts where innovation is pursued (e.g. companies, institutions and organisations), applying the potential of creativity and Design Thinking while co-creating with the people involved in the project.

The research team joined experts from the DiDIY field with professionals from the areas investigated by the project, in order to identify the DiDIY enabling elements which they think are fundamental, according to their own experience and knowledge. Co-design workshops' participants were identified and selected on the basis of well-defined profiles: educators, primary school teachers, makers, craftsmen, lawyers, policymakers, digital experts, representative from companies, and FabLab managers. In this way, we gave the opportunity for such an approach to be adapted and used as an empowerment tool by people of different Digital DIY communities. Empowerment tool is meant here as something that allows people to 'take control' of their ideas in a participative and pro-active way, in a system where self-improvement through the development of new skills and actionable knowledge is pivotal.

The experiences in each workshop have contributed to continuous experimentation, verification and implementation of project-building processes, and of specific activities and related tools, which have been utilized to produce the 'Toolkit and Guidelines'.

This 'Toolkit and Guidelines' has been developed by IDEActivity Center (a centre for Excellence in Creativity and Design in the Department of Design, Politecnico di Milano), whose aim is to give value to all aspects of creativity, promoting innovation through design, as well as to activate and re-enforce all phases of the 'creative process' within any given context. For more information, please visit <http://www.ideactivity.polimi.it/>

ARE YOU INTERESTED IN DEVELOPING A DIGITAL DIY PROJECT?...

Discover it!

This toolkit enables collaborative actions aimed at identifying and solving problems through the direct involvement of users. Read the Five Ws and H toolkit questions to understand if the DiDIY design toolkit fits your needs.



1 WHAT IS THE POWER OF THE TOOLKIT?

People are the experts. They are the ones who know best what the right solutions are.

Through the toolkit you can gain confidence with Digital DIY, explore the fundamental elements of DiDIY, and launch and solve design challenges by including the DiDIY elements.

Therefore, this toolkit has been specifically created to provide support to people generating innovative solutions in their professional field, by applying the fundamental features of Digital DIY. The toolkit provides a guide to applying a strategic design approach to the use of digital technologies of production and sharing, which then becomes a means to activate new innovative opportunities and ideas.

Co-design helps people to work collaboratively, triggering their creativity, and enhancing their visions of possible futures. This cultivates a deeper understanding of each other, their real needs and desires, leading to real benefits.

The toolkit doesn't offer solutions. Instead, it offers creative techniques, methods, tips, and worksheets to guide everyone through a design process that gives a voice to communities, and allows their desires to guide the creation and implementation of solutions.

2 WHO CAN USE THIS TOOLKIT?

LAYMEN AND DIDIY PRACTITIONERS: You can use the toolkit to familiarise yourself with a typical process that designers use when developing products and services. By using it, you will have the opportunity to know and apply the innovative aspects of digital technologies of production and sharing, to develop innovative ideas and projects in a collaborative way. You will have the chance to collaborate with other experts in your field, and others, sharing experiences, information and knowledge.

DESIGNERS: You may already be familiar with the co-design process and tools, but you will learn a process specific to Digital DIY, and the fundamental aspects of this phenomenon. You may find this document useful for explaining the phenomenon and the design methods to others who are new to them, and also for applying it to your personal work, spreading innovation through DiDIY.

3 WHEN IS IT USEFUL?

You can use the toolkit to improve a service or a strategy in your organisation, to innovate some working modality, to activate new forms of collaboration, and also to solve social, environmental and even political challenges.

You can use it when there is a large amount of data that would be best dealt with through a structured process with a collaborative and empathic approach, or when it is necessary to gain knowledge from different specialists involved in a project. It is very useful for moments of gridlock, when new insights about ideas are needed. It is possible to apply co-design in a creative work session where participants are invited to interact by generating ideas collaboratively.

Examples of challenges you could overcome with this toolkit are:

*"**HOW** can we organise and manage an educational community of Digital DIY?"*

*"**HOW** can we help companies to exploit the knowledge created by sharing projects, and knowledge in a DiDIY context, in order to generate concrete and real business opportunities?"*

*"**HOW** can we create a legal culture in DiDIY that is accessible and understandable to everyone?"*

4 WHY WORK WITH IT?

You can use it to:

DIDIY DEEP DIVE. Immerse yourself in the social and cultural context of Digital DIY. Digital DIY has a strong sharing and collaborative dimension, so we consider co-design as the mindset for DiDIY practices. By applying the design processes, you are enabled to generate innovation through the use of DiDIY.

UNDERSTAND PEOPLE. The close relationship with the final user of the co-designed solution makes this toolkit a powerful instrument for accessing and identifying both expressed and tacit needs, desires, and aspirations for the construction of new possible futures.

COLLABORATE. Collaboration, both with peers and experts, is a golden opportunity to acquire knowledge and develop skills, to strengthen social bonds and to make an impact on a wider level.

BE CREATIVE. Creativity enables a person, or a group working as co-creators, to generate new ideas and outcomes, such as original or inventive projects at different levels. The use of creative techniques enhances competitiveness, and the efficiency of the organisation or group production process. These kinds of playful activities are intended to stimulate people's creative potential, while preventing negative emotions. They promote active

and creative relationships on both cognitive and relational levels and have proven to be, in our experience, a very effective means of knowledge transfer.

DEVELOP WINNING IDEAS. An idea which represents the driving force that stimulates people to maintain their active participation in a project. This idea can be an engrossing vision represented by three keywords: stimulate, motivate and coordinate, for a common objective.

5 WHERE TO DO IT?

You have to provide an easy-going environment, where the participants are invited to relax and reconsider their work or interests in relation to digital technologies, DIY mindset, collaboration and social impact.

It's not necessary have technology on hand.

The toolkit can be used anywhere, in different contexts, according to your professional profile: local institution (private and public), small or medium enterprises, large organisations, local hubs, FabLabs.

6 HOW TO USE THE TOOLKIT?

This toolkit document provides guidelines, tools and background information to guide you through the process of co-design within Digital DIY.

Print the 'Toolkit and Guidelines' for a successful co-design session. The toolkit contains all the activities, techniques, and tools to be performed throughout the process. The guidelines include tips and instructions on setting up the co-design session, and how to use the tools to activate participants, and facilitate the session.

REMEMBER: Design processes and the toolkit are like recipes from your favourite recipe book. Just as merely following the instructions does not guarantee a perfect dish, merely following the steps does not automatically ensure the success of the project or service.

The process and tools provided in creative commons will aid in following a path which is structured in such a way as to recall the essential steps, to work efficiently, to reach the goals without too many deviations, and to explore the complexity of digital DIY without suffocating in the complexity of project building.

This toolkit can be distributed freely. For more questions or guidance, please contact IDEActivity Center.

IF THIS TOOLKIT IS FOR YOU, THEN GO AHEAD!

Involving people using a codesign approach gives you the opportunity to have meaningful conversations with people, collect their ideas and elicit their creativity through collaborative activities and specific materials.





DIGITAL DIY SCENARIO

Digital DIY scenario introduction

The factors and the inspiring scenarios identified, include all the knowledge and the nuances that have emerged from the specific professions involved.

The elements, and some inspiring scenarios, are presented here in a system. This system has emerged from the workshops by combining and pairing numerous concepts, in order to identify the common aspects and potentialities of Digital DIY, as recognised by the participants. During the workshops, participants analysed case studies in the DiDIY field, to discover the most common significant elements underlying them. This systematisation is made up of various repeated phases of processing, in order to achieve complete results that include all the wealth and knowledge produced by the participants, and the nuances that have emerged from the specific professions involved.

The factors are the output of the integration of the workshops' results and the literature review carried out by the IDEActivity Center.

The elements identified represent fundamental factors that must be taken into consideration when designing a solution in the Digital DIY field.

They are aspects that are present in all the significant case studies in this phenomena. It is important to know that it is not the single factor itself that generates a meaningful solution, but that **the integration of all of them in a project creates the innovation.**

The inspiring scenarios are challenging areas to possibly work on, opened up by the phenomena of Digital DIY.

You can use these as inspiration for starting your own project, or you can even decide to pick a specific one and make it the area that you will work on, using this toolkit.



Digital DIY fundamental factors

The integration of all the factors in a project, creates the innovative solutions.

All factors that are indispensable for the current movement linked to digital technologies in DIY, as recognised by numerous participants, are explained here. However, some of them don't represent fundamental elements that can be transformed into design tools. These aspects were not converted into fundamental factors, as they cannot be designed as elements themselves. For example, the human-centred perspective, the mindset, the process of learning and the idea leader described in these guidelines refer to a positive attitude and an approach to deal with a project in this context, but cannot be transformed into elements.

The ones turned into design tools (see DiDIY Factors Tool in Desirable Outcomes step) are identified here through an icon.





DO IT FOR YOURSELF PERSONAL MOTIVATION

The DiDIY practice follows a different logic from the traditional work-related, and creates a new paradigm based on openness and sharing. This scenario introduces matters such as understanding how to trigger and maintain people's motivation through a remuneration system that is not necessarily based on money.

One fundamental factor of DiDIY is the personal motivation of the people involved. **Motivation is indeed the factor needed to activate interest in taking part in a community project**, and to keep involvement constant. **Motivation can be intrinsic**, therefore linked to an innate predisposition of the individual **and/or extrinsic**, linked to external factors of reward and satisfaction. The different elements on which emphasis can be placed to get people involved, and activate their continued participation, are described as follows:

-> **To acquire skills:** people take part for self-enrichment, to acquire new skills and gain knowledge.
-> **To reinvent themselves:** people take part because they have an opportunity to refresh and improve certain aspects of themselves. DiDIY gives the possibility to play, act and experience multiple identities, and to express oneself in

different identities influenced by cultural and social aspects.

-> **Long term vision:** people who participate in the initiative feel the need to invest in themselves by building a future career or company. The participation provides the achievement of institutional approval.
-> **A sense of belonging to a community:** people take part because they feel part of a large community made up of people who share similar interests. People have the possibility to get to know other like-minded people and build up a network.
-> **Hedonism/Reputation:** people take part to be recognised by a community that is considered cool and trendy.
-> **Showcase/Visibility:** people take part for promotional purposes.
-> **Remuneration:** people take part because they have something to gain.
-> **Sense of intrinsic confidence:** people take part to increase their self-confidence.



DO IT TOGETHER COMMUNITY AND SHARING

This factor refers to a community of individuals who share common interests, vision and ethical values. Individuals who actively take part in the collaborative construction of an ecosystem in which sharing represents a new way of operating, and a new attitude.

The members of the community are active users who share ideas, knowledge, skills, spaces, and tools. **Inside the community, people are encouraged to work together in a collaborative model, in which everyone is a peer.** This allows for the creation of a global network of individuals and communities who share problems and issues, and grow together.

In this sense, **the concept of Do It Together can sometimes switch into Solve It Together (SIT)**, which is the attitude of facing a challenge through the use of collective knowledge and active, dynamic participation of the community. In some cases the community is characterised by a set either explicit or tacit **guidelines**

which correspond to the manifesto by which the community identifies itself.

As a member of the community, the individual has to be responsible for his/her own actions with regard to the other members, and in turn has to be able to trust the knowledge shared internally.

In the community, the presence of an activating element is necessary. This can be a person, a place, or an institution. The activator supports constructs and reinforces the relations within the community. One example is the FabLab, or the community manager. Moreover, in order to create a network of communities there is the need for both a digital and a physical hub that connect, facilitate and feed existing networks of communities and individuals. The network shares knowledge and solutions.



ACCESSIBILITY

One fundamental factor of the DiDIY is the possibility of **easy access to technology, knowledge and skills, both online in the virtual world, and offline in the real one.**

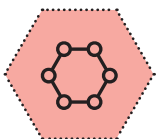
Accessibility is understood not only as the physical possibility of reaching points of access to technology, but also the need to simplify technical and scientific languages, which will make consulting the content easier for a vast public of peers, men and women, of different ages.

Accessibility is also translated into a simplification of the normative languages which regulate the use of the communities' shared ideas. The ease of access to technology allows individuals and organisations to draw upon skills, consequently allowing their growth and the development of

determined skills. Accessibility also means the need to understand how to utilize the available resources, by applying a strategic approach to accessibility.

The individual has, through the practice of DiDIY, **the opportunity to access personal resources to experiment with his/her own capabilities, which may lead to reinvention both in professional life, and in daily practice.**

Even if information is available online and everybody has access to it, the initiative remains an elitist one, limited only to a certain kind of people, since it is linked to the actual accessibility of facilities and economic resources.



SYSTEM ECONOMY

One fundamental element of DiDIY is System Economy, where system means a set of elements that are interconnected with one another by reciprocal relations, but behave as one. **This refers to the different elements which contribute to making a project in the DiDIY context sustainable, such as: business models, social impact, economic sustainability and planning.**

DiDIY, according to the participants, can generate two business approaches: the first is translated into new markets of reference for the world of traditional production, the second creates new models that did not exist previously. The companies that understand their own potential can utilise DiDIY to create new hybrid forms of

production and communication, not merely using the tool at a basic level, but applying it at a strategic level. In the second case, **the technologies qualify new forms of innovation**, which can also appear on alternative unnamed markets.

As far as economic sustainability is concerned, in addition to the traditional forms of financing, one factor deemed fundamental is the presence of business models based on a new logic of gain, with emphasis on open and diffused knowledge, and on the active participation of communities that process this knowledge (e.g., open source). All this allows **the birth of a new currency of exchange which corresponds to values, information, visibility and knowledge.**



GLOCALITY

One fundamental factor of DiDIY has been defined as Glocality. The glocal factor refers to the **interrelation between local demands, resources, actions and flow of global skills.**

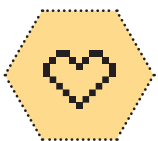
The motto is **“Think global, act local”**. The thought originates mainly from the idea that a problem or a need comes into being at local community level, encouraging the creation and increase of the need itself.

From a need that originates locally, there is then diffusion of an idea at global level. The force of this element is that a local problem (and relative solution) can be common in different situations, in different countries, and shared globally. Therefore, there is a **reciprocal influence between local and global**. The local area is seen as a stratifier, and as simplifier of contents. The contents, collected in global virtual spaces, are initially produced at a local level and fill the needs and requirements identified locally.

These contents are then shared in global virtual spaces, without overlooking their local production.

In the enormous mass of data, thinking of one's local reality can guide the choice of useful contents. For this reason, **the local area becomes a stratifier of the collective knowledge, but at the same time a simplifier**. The close bond with the local area allows continued use of local human and material resources, generating benefits for the community.

Other important aspects linked to local and global are: the possibility that a local need is solved by shared skills and multi-channel, or the contents which are enclosed in a single virtual space have been conceived in multiple local physical spaces (e.g., FabLab, home, park etc.). Local is understood as multi spatial and Global as a single online container where knowledge is conveyed.



DIGITAL TECHNOLOGY AS A MEANS FOR INNOVATION

Digital technology allows access to production technologies, in order to make the manufacturing process easier and cheaper. Thanks to digital technology, it is possible to realise artefacts valuable to human life, lowering prices and skipping various production steps. **Technology allows for customisation of products based on human needs.**

Digital technology is a way to break down borders, and allows global expansion of different local communities' ideas and projects, readapting the solutions to meet their local needs according to their culture

and geographical area of reference. **Digital technologies are intended also as social process facilitators.** Digital skills are spreading in our society and need to be guided in order to stay relevant and keep up with the times. The DiDIY practice has the potential to bring innovation to different fields. This provides the **opportunity to produce technology not as the innovation itself, but as a vehicle for generating innovation** that must be connected to other dimensions (such as new scenarios, new product/service offering, new business model and so on).

HUMAN-CENTRED PERSPECTIVE

In the DiDIY scenario, society is no longer in alignment with the classic lifestyle, in which economic power and consumerism define the position and role of individuals.

The new society puts the human at the centre, it takes care of his/her needs, and is based on the resourceful attitude of the collective to generate change. This opens up an opportunity to explore the ways in which a new culture can be developed, one that takes care of the individual, while encouraging collaboration.

MAKER MINDSET/ OPEN ATTITUDE

The current movement of DiDIY sees the change in mindset from individualistic to collaborative. **The DIY mindset**, also defined as a “Geek Mindset”, **is the intrinsic strength that pushes people to be self-driven and passionate about technology**. It inspires them to become proactive creators of executable results, and enables perseverance through applying a learning-by-doing approach. The DIY mindset also implies an open attitude, which is essential when creating an open-ended project. It is not the final result that is important, but the process itself.

P2P (PEER TO PEER) DYNAMIC LEARNING

One particular consideration is the concept of P2P Dynamic Learning. The DiDIY practice introduces a new way to approach learning: **advancement through trial and error, and regarding failure as a learning objective**.

Rather than a linear, isolated way of learning, the new way, enabled by the DiDIY, takes place exponentially by activating knowledge acquired from each project carried out by the community (and the other way around).

LONG TERM PLANNING

In order to act in a DiDIY perspective **the individual needs to plan what he/she needs in the long term**, in order to have the time needed to start a self-production, which is slower than traditional production. This requires finding a way to support individuals in the mental shift towards new, more time-consuming production.

IDEA LEADER

An important feature of DiDIY is **the necessity of having an idea leader, who acts as the stimulating driving force to maintain high levels of project participation**. Leadership is therefore defined here as the motivating force to reach the objective. This driving force can also be represented by a leader figure identified as a super guru, i.e. a charismatic person with a strong and engrossing vision, even someone who doesn't necessarily have technical skills. The three key words which identify this element are: **stimulate, motivate, and coordinate, for a common objective**. In order to create a community, or to maintain high levels of participation in a community project, it is essential to have an idea leader, or positive figure, who can stimulate the creativity and motivation of the participating community.

SENSE OF RESPONSIBILITY

In the DiDIY scenario people share self-generated content, without boundaries and limitations. This opens up issues in understanding **how to trigger a sense of responsibility in people, and encourage them to share valuable and high quality content**.

CO-DESIGN MINDSET

The learning process in DiDIY is not an individual one, but rather **a shared practice among the educational or working community**. This creates the opportunity to come up with ideas on how to create a basis for a collaborative way of working, overcome individual structures, spaces, evaluation and so on. Furthermore, the co-design mindset can be fostered through a system that prompts the active participation of people.

TRUST

Mutual trust among the members of a creative community **is a crucial element, since it ensures the use of shared knowledge and information**. This opens up issues in understanding how to design trustworthy environments (both online and offline) where people can trust each other's contributions.

Field of inspiration in Digital DIY scenario

During the generative workshops, starting from a challenge launched in the explorative workshop, the participants generated different ideas through brainstorming sessions. We grouped them in order to identify a few main areas of opportunities. Different fields were identified as the most meaningful ones in which to develop opportunities, given the huge influence brought to them by digital DIY: education, work, creative society and the legal system. They are identified by tags to guide their use. Therefore, the opportunities identified are connected to a specific field or to a combination of more fields, in case they could potentially influence both.

NEW RELATIONSHIP BETWEEN TEACHERS AND STUDENTS

Tag:

Education

1



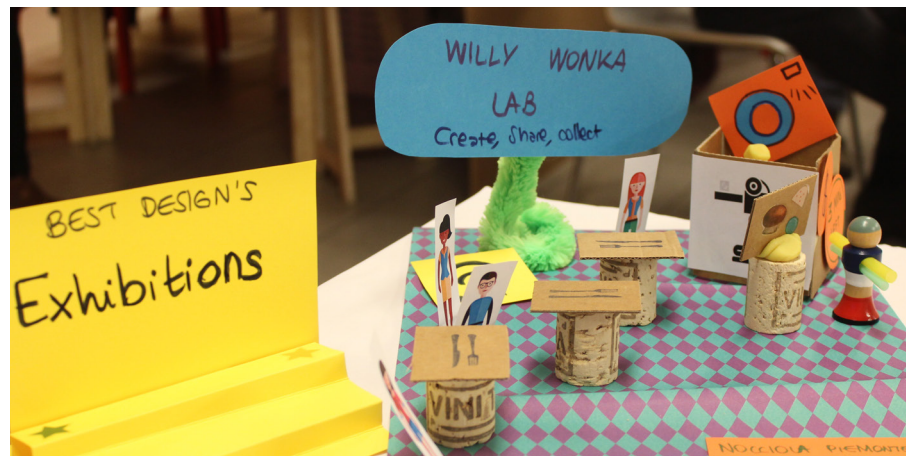
The Digital DIY practice and the self-learning possibility for learners open up the opportunity of generating a new kind of benefit in the relationship between teachers and students, as well as meaningful new roles. DiDIY is identifiable as a typical Constructionist learning environment, in which learners use technology to build projects and **teachers act as facilitators of the process**. Teachers will need to shift from transmitting technical skills as an added value, to transmitting visions and objectives, and providing learning experiences. In this way, the prospective for teachers is to become tutors and facilitators. In this context, teachers have to design a learning environment to support students in their exploration, to scaffold learning, and to provide engaging materials for students to manipulate in order to make concrete projects to share with other community members. Moreover, in the DiDIY scenario, **education is triggered**

by a **strong leadership figure** who can attract and motivate students with fame and charisma. He/she has indeed developed a vision, has skills, but does not develop the technical part. These are people within the community who have a good reputation, sense of respect and responsibility. This raises the topic of how to create reputation mechanisms in communities.

Effective facilitation involves:

- Specific skills and knowledge of the materials, tools, processes, and practices of making
- Strategies for facilitating students' development of accurate knowledge, ability, and continuous engagement in the learning practices of the making community
- Understanding the student as a learner, his or her prior experiences, interests, purposes, and behaviour.

On the other hand, the **active participation of students** also becomes crucial. Here is an opportunity to explore the ways of fostering a system that encourages the active involvement of students in the definition of teaching programs, the design of the learning spaces, the definition of the interesting topics and so on.



The shared projects and knowledge available online could bring about many business opportunities for companies. This raises the question of understanding how to capitalise on this possibility, while maintaining an ethical and responsible attitude. An example is Instructables Restaurant, the first restaurant in the world where everything built and eaten has been downloaded from instructables.com. Instructables Restaurant is an experiment in "digesting free internet culture".

Furthermore, the shared projects based on local needs are a great litmus test of the market needs of specific geographical areas. The same function can be seen in places like FabLabs or Makerspaces. For companies, this could create invaluable opportunities to derive market insights from these projects.

**FORMATIVE MODEL
OVER TECHNICAL
KNOWLEDGE**

.....→

Tag:

Education

Work

Creative society

3



Making encourages a deep engagement with content, critical thinking, problem-solving and collaboration, while sparking curiosity. Research in learning processes has suggested the importance of making and doing as the most effective way to acquire competence and skills, especially creative ones. As a consequence, it is agreed that making fosters lifelong learning by encouraging learning by doing.

This modern concept of competence, often called 21st-century competencies, comprises not only relevant **knowledge and skills, but also a range of personal qualities to face the complexity of contemporary age**, and to perform adequately and flexibly in both familiar and unknown situations.

In these competencies, creativity and the ability to produce ideas, knowledge and innovations are key players. It represents the intangible substrate for innovation. However, its management requires the development of specific techniques and educational programmes.

The Digital DIY scenario opens up the need for an education and training system that doesn't transmit only technical knowledge, but instead allows learning how to learn and how to adapt to the current fluidity and dynamism, where there is no clear separation between the various specialised skills. Thus, the role of soft skills becomes crucial. Two issues that could possibly be addressed here are: how to evaluate soft skills, and how to develop new improvement strategies for them.

CREATION OF AN INTERDISCIPLINARY LEARNING COMMUNITY

Tag:

Education

Creative society

4



The learning process in DiDIY is firmly anchored in the context and is based on concrete projects. This could facilitate the shift from theory to practice. Connecting making with existing practices creates more powerful and equitable learning experiences. Building onto students' familiar practices, and adding a layer of expressive technologies, has the potential to improve, rather than replace, familiar and powerful practices that students already possess. In this way, they can recognise their own previous expertise in the lab, rather than acquiring a whole new identity altogether.

The learning path in DiDIY is not a strict one, but it is based on an organic acquisition of knowledge, which welcomes input from various disciplines, breaking down boundaries between them. Interdisciplinarity is a potential benefit of making as an educational practice. In fact, disciplinary boundaries are "inauthentic to Makerspace practice". The blending of traditional and digital tools, arts, and engineering can create a learning environment with multiple entry points that foster innovative combinations, juxtapositions and uses of disciplinary content and skill.

Both the individual and the community (including families, local area of reference, neighbourhood and city) need to participate in the learning process of students by providing help and contents. **Making creates a supportive community of trainers and learners that can leverage the interests and skills of each member of the group towards shared goals.** This concept is based on the practice of taking an active part in building an educational ecosystem in which sharing, collaboration, co- planning and, more in general, the activities that unite the community, are qualifying factors. Building this community becomes a new skill/objective for the teacher.

This could give rise to the building of an educational environment that takes advantage of the specific knowledge of different people and context, rather than narrowing it down to categories of professionals, yet, at the same time, supports the individual in tracking improvement.

OPEN SOURCE EDUCATION

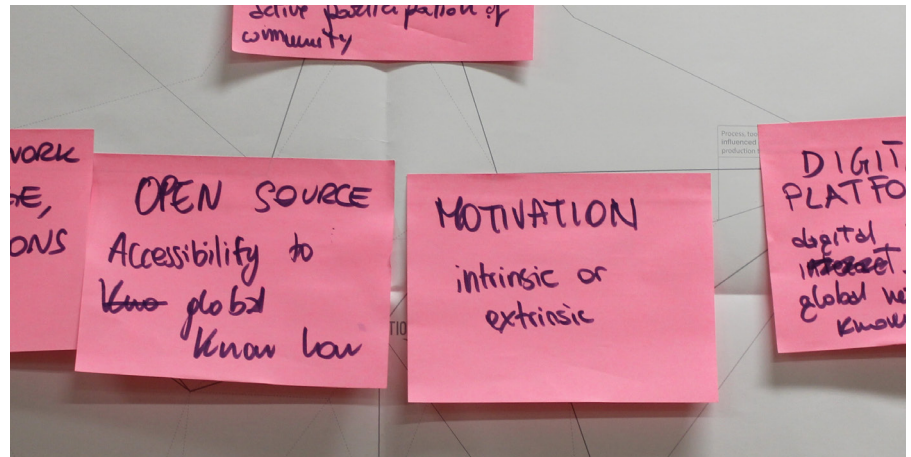
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Tag:

Education

Creative society

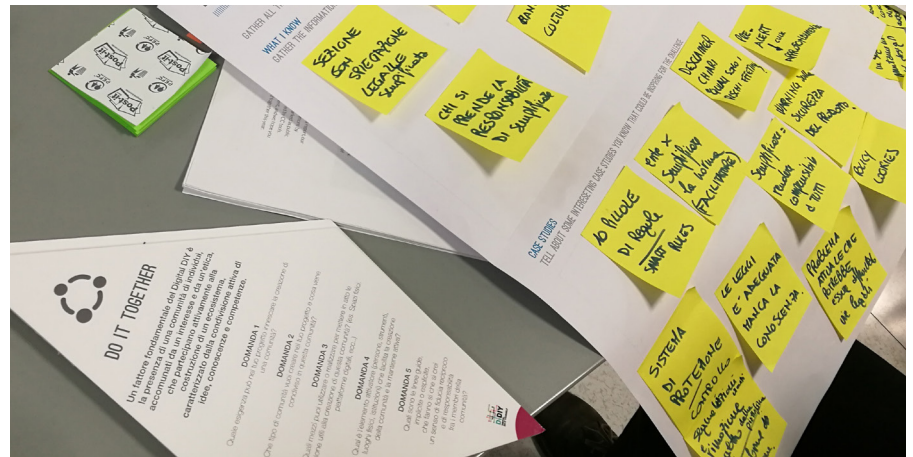
5



Digital DIY offers educational opportunities to global communities, which should also be connected to local initiatives. Digital learning through online platforms has proved to be more effective when supported by offline sessions. The most important matter here is to find the right balance between online and offline learning practice, taking into consideration the need to build a community.

The content of learning is created by the global community. This opens up reputation issues, as well as questions on how to adapt the educational content to different languages, formats and cultures. In this context, everyone can use knowledge generated by other people, everything is open and accessible. An important subject matter here would be understanding how to ensure the quality screening of the educational contents, and how to help and support the average users to distinguish between qualitative and less qualitative content. Moreover, it's important to make the responsibilities of each person clear in respect of the projects/idea that he/she shares, in order to cultivate conscious control of their actions, and create a safe environment.

The vast amount of educational inputs generated opens up the issue of tracking and connecting knowledge. Learners will increasingly need to get an overview of what they have learned and of the inputs coming from different fields. In this learning journey, tracking and connecting is not only the prerogative of schools, but also of all the other places that form the new learning ecosystem.



People working in Digital DIY under the collaboration perspective are characterised by sharing ideas and projects, helping others, making and connecting. Indeed, in the Digital DIY scenario it is fundamental to encourage **the practice of working and creating together, learning with and from each other, and sharing experiences and knowledge**. The presence of digital technologies that enable information sharing may lead to a higher degree of openness. Topics to consider could be the use of Digital DIY practices and activities to support the shift from an individual mindset to a collaborative one (through both online and offline tools and facilities), and how to foster team building and innovation by introducing higher levels of openness and cooperation in the working environment.

Furthermore, the ease of access to technology allows individuals and organisations to draw upon knowledge and skills, consequently qualifying their growth. This creates the opportunity to include and empower individuals and organisations in the processes of creating and generating knowledge, taking advantage of the vast range of materials already available in companies, and creating a virtuous system.

The new attitude needed in the DiDIY scenario is not acquirable in the traditional corporate context, in which working methods are usually inflexible, and do not facilitate the growth of the individual as an individual worker who is capable of producing concrete results in little time and with few resources. Here the spirit of the FabLabs or Makerspaces can be taken as inspiration and be an example of how to change the mindset of the employees and managers. It is therefore important to find a solution to organise and provide residential and immersive experiences for employees.

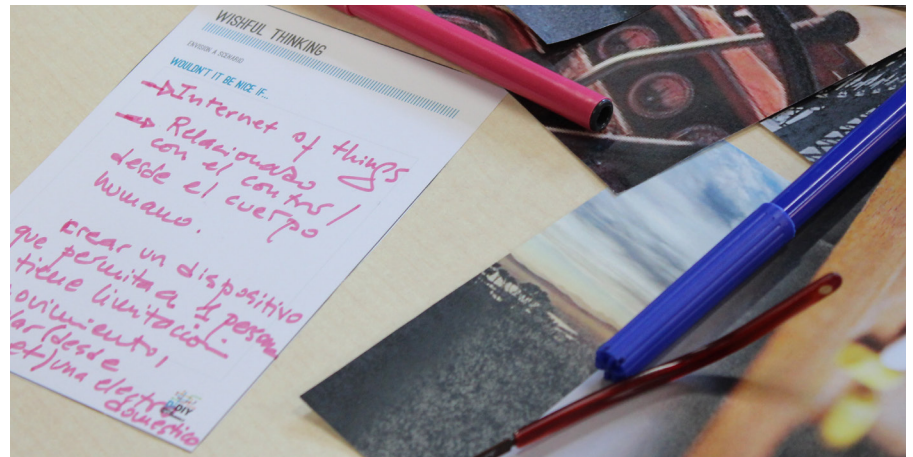
DIGITAL SKILLS

Tag:

Work

Creative society

7



The levels of adoption and use of digital technologies among Pre-Millennials and Millennials are very different, both privately and professionally. The Digital DIY practice needs digital skills that are not always present in companies already. This opens up issues on how to use the digital skills necessary to identify the knowledge needed, and how to manage and carry out meaningful projects within the DiDIY scenario.

On one hand, it is fundamental **to fill the generation gap within a company, to spread the use of digital technology**, even within the Pre-Millennial generations, and **to create awareness of the potentialities of digital making and its applications at work.**

On the other hand, external know-how points, such as FabLabs, Makerspaces, and research centres, become very important for the growth of companies. There is an opportunity to start new forms of collaboration and outsourcing.

Companies own and preserve specific knowledge that is often linked to manual skills and craftsmanship, fundamental to the DiDIY practice. Therefore, it is important to understand how to spread this knowledge on a global and shared dimension, and how to enhance it through digital technology.

REVIEW OF PROFESSIONAL ROLES

Tag:

Work

Creative society

8



The access to resources allows the individual to develop both **specific technological competencies and soft/life skills that enable people to follow their own interests, and to experiment with new capacities.** Often, people build valuable projects in the DiDIY practice without realising their innovative potentiality. The important consideration here is how to support them in the self-reinvention process at both professional and private levels, making them more conscious about the potential of their work.

In a world of rapid and profound transformation, everyone's a designer. This refers to the ability and need of untrained people to create what they need, even without the support of professional designers. Consequently, it is possible to assume that the DiDIY practice carries the risk that the role of some traditional professionals could get discredited.

The democratisation of technology, tasks and skills previously only available to experts, opens up issues regarding the meaningful renewal of these professions.



In the DiDIY scenario, people create various innovative projects that are shared with the community, often without considering any kind of protection in terms of intellectual property. The laws and regulations around the topic of DiDIY are many and complex. Understanding the legal implication of users' sharing actions and the regulations on the use of shared knowledge are often not clear to the medium users.

It is of utmost importance to help creative people to protect their ideas, or at least to be aware that they lose some rights through online sharing and publications. Moreover, it's important for users to understand the kind of innovation they are creating, in order to identify the most-needed legal protection they require, and to involve them in this identification process.

There is a need for **creating widely communicated rules that can translate regulations into simplified terms, and explains responsibilities and legal implications clearly**. As such, effective communication initiatives should be put into place, in order to spread awareness about legal implications.



PROCESS

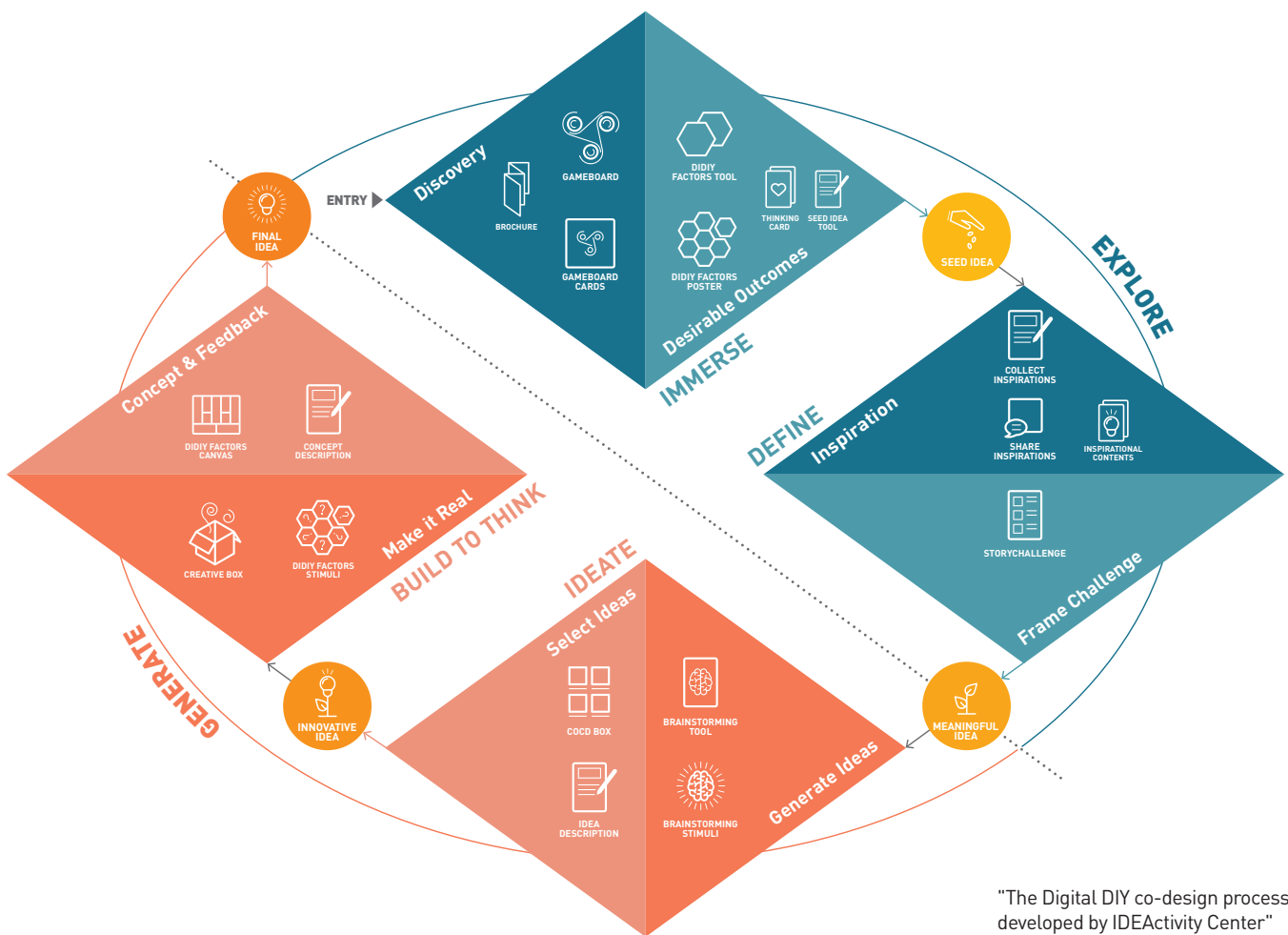
Process

This specific co-design process invites you to the development of ideas or strategies through Digital DIY.

The **DiDIY co-design process** is a human-centred design process that, using the potential of creativity and the approach of Design Thinking, invites you, and other professionals from different backgrounds, to actively contribute with your experience to the development of ideas or strategies, using **the fundamental elements of DiDIY**.

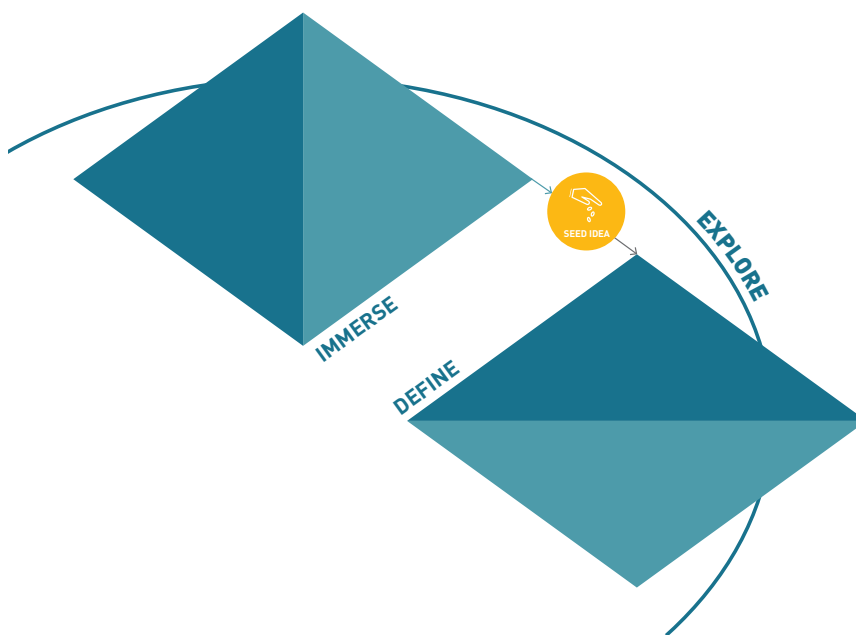
Co-design sessions are spaces for experimentation, and trying out possibilities in collaborative and creative ways. During the sessions, a set of creative techniques is used to inspire the design process.

The DiDIY co-design process, is a simplified, yet exhaustive version of the creative design process, focusing on two main stages, **EXPLORE** and **GENERATE**.



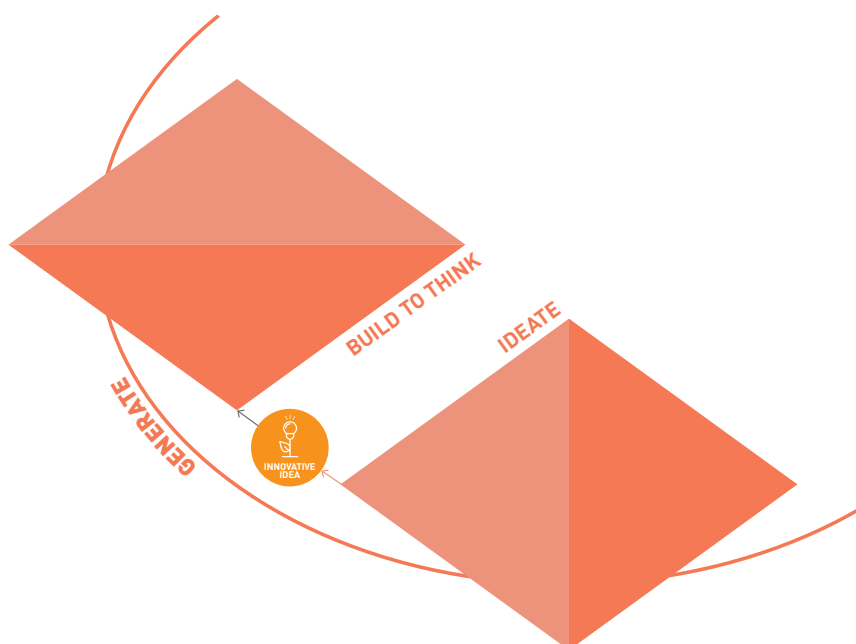
"The Digital DIY co-design process developed by IDEActivity Center"

The stages described are subdivided into four main steps: Immerse and Define (within the Explore stage), Ideate and Build to Think (within the Generate stage).



1. EXPLORE

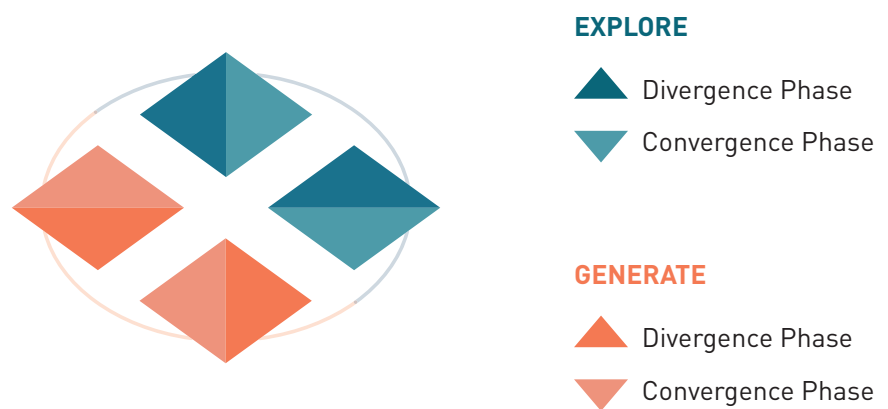
The first stage – Explore – aims at the identification of a significant objective and its possible development in relation to a given context. You should structure a common vision in relation to a problem or challenge, together with the actors involved in the creative process. Reciprocal understanding of needs, hopes, and aspirations is crucial, and an analytical process of information interpretation is fundamental to identify opportunities.



2. GENERATE

The second stage – Generate – aims at delivering and prototyping ideas. This is done through creative sessions based on a series of tools, designed to stimulate your creativity and generate suitable concepts in line with the given context and objective.

Each of the main steps of the creative design process has two phases: **Divergent** and **Convergent**. In other words, each step starts with a divergent phase, which refers to the 'creation' or 'widening' of a field of possibilities. This includes collecting and generating facts, problem statements and ideas, without criticism. Then, resultant solutions are clustered and categorised during the Convergent phase, in which there is a narrowing of choices, based on criteria of what is useful and relevant.



- During the **Divergent phase** of the creativity process, a large number of alternatives are identified. At this stage the most important rule is: 'quality is quantity', in order to generate as much information and as many new ideas as possible. Divergent thinking typically occurs in a spontaneous, free-flowing, 'non-linear' manner, such that many ideas are generated in an emergent cognitive fashion. Many possible solutions are explored in a short amount of time, and unexpected connections are drawn. Free association plays an important role during this stage. In addition, the rule of not judging inputs is essential. When confronted with new inputs, ideas or concepts, it is important to take a constructive stance.
- After the divergent phase has been completed, information and ideas are organised and structured using convergent thinking. In this **Convergent phase**, all input and ideas have the benefit of the doubt, but the alternatives chosen are then evaluated and selected through meaningful criteria. This phase allows you to arrive at one concrete answer or solution, following a particular set of logical steps.

Explorative stage

To explore means being open to new opportunities and gaining inspiration to generate innovative ideas.

This phase allows the creation of a basis from which a significant and potentially viable goal can be defined.

A point of view is established with regard to a specific topic/issue, taking scientific material and structured research into consideration, but also considering the target user and the market.

By visualising information through images, photographs and key words, the material can be analysed and organised, creating easily identifiable mental pathways, and locating unexpected connections.

It is important to go beyond an impersonal analysis of the material, interpreting it with an open attitude.

The tools used during this phase are aimed at understanding the context of DiDIY, and identifying problems and opportunities to be dealt with.

SPECIFIC OBJECTIVES

The specific objectives of the explorative stage are:

- Acquisition of knowledge of the DiDIY phenomenon through the analysis of case studies, and a clear understanding of the context
- Identification of the underlying DiDIY fundamental factors that need to be taken into consideration when creating solutions, and then transferred into the design of an idea
- Collection of project-building challenges, based on personal experience, and enriched by the preceding knowledge acquisition.

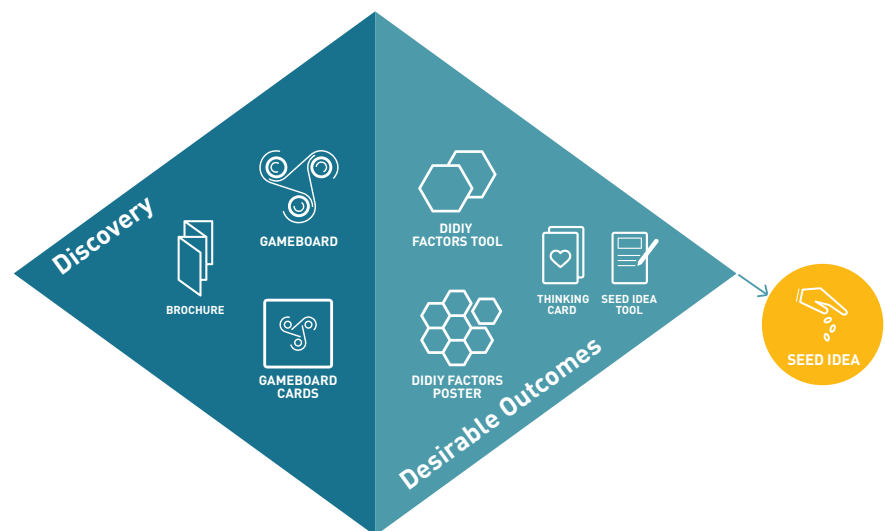
The selected exploratory stage outputs (integrated with the identified fundamental factors), are the inputs for the generative stage.

The generative stage deals with solving the project-building challenge. In order to reach these objectives, you are guided through a structured pathway made up of various activities to perform.

Therefore, the explorative stage is divided into 2 sections. Each step uses co-design methods and tools, specifically planned for the DiDIY scenario.

1. IMMERSE

The Immersion step is broken down into two parts: Preliminary Immersion and In-Depth Immersion. Preliminary Immersion seeks an initial understanding of the DiDIY social and cultural context. In-Depth Immersion aims to identify the needs of the people involved in the DiDIY, and the opportunities that are likely to arise from an understanding of their experience, regarding the issue under close scrutiny.



TOOLS

Discovery

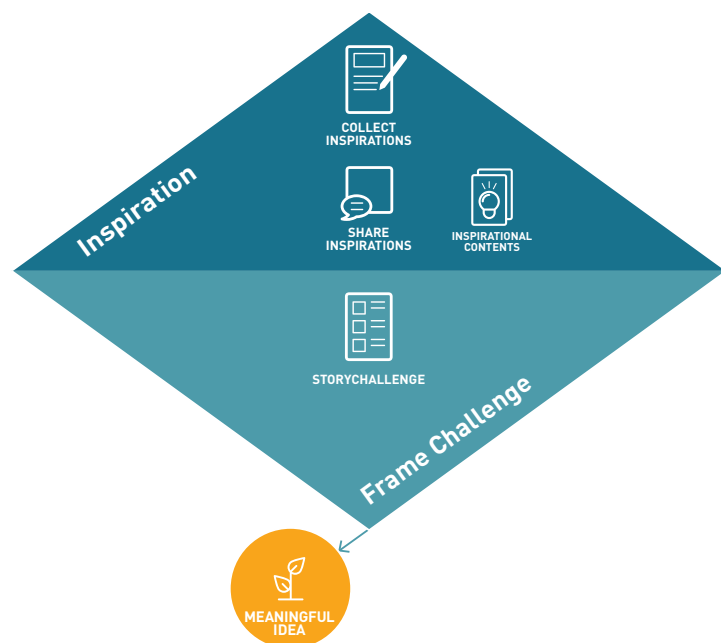
- Brochure
- Gameboard
- Gameboard cards

Desirable Outcomes

- DiDIY Factors tool
- DiDIY Factors poster
- Thinking card
- Seed Idea tool

2. DEFINE

The Define step is essential for the project scope to be fully understood. Through different approaches, research can reveal valuable information, providing potential opportunities in ways that are, at times, unexpected. This practice trains your intuition and awareness, using tools that prompt new avenues for consideration, and gives shape to the project's scope, providing relevant and viable opportunities.



TOOLS

Inspiration

- Collect inspirations
- Inspirational contents
- Share inspirations

Frame Challenge

- Storychallenge

Generative stage

Divergence and convergence are what make ideas and visions possible.

This stage allows the generation of innovative ideas, pertaining to the challenge identified during EXPLORE. Generative design effectively begins once the problems have been analysed, and the opportunities defined. The idea generation phase usually happens through creative sessions. This activity is carried out with the support of different tools, used to stimulate creativity and create suitable solutions, consistent with the context and the goals to be achieved.

The tools used during this phase are aimed at the creation and construction of a well-defined concept, which includes the fundamental factors, and that meets the challenge in an innovative way.

SPECIFIC OBJECTIVES

The specific objectives of the generative stage are:

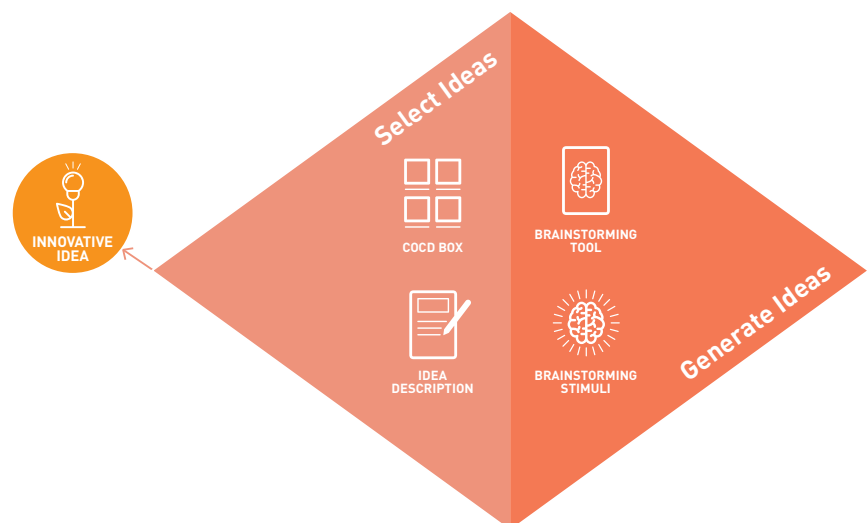
- Collection of project-building challenges, based on personal experience, and enriched by the preceding knowledge acquisition.
- Generation of many new solutions for the problem, or ways for the objective to be achieved.
- Identification of the most interesting ideas and keeping the one with the most potential.
- Tangible visualisation of the idea through the creation of “rough prototypes”.
- Inclusion of the fundamental factors in the idea.

In order to reach these objectives, you are guided through a structured pathway made up of various activities to perform.

Therefore, the explorative stage is divided into 2 sections. Each step uses co-design methods and tools, specifically planned for the DIDIY scenario.

1. IDEATE

The Ideation step aims at generating innovative ideas geared towards the context of the issue at hand, using techniques that help to identify opportunities and solutions for design. The generated ideas are then clustered and selected, in order to find the best concrete idea for the challenge to be tackled.



TOOLS

Select Ideas

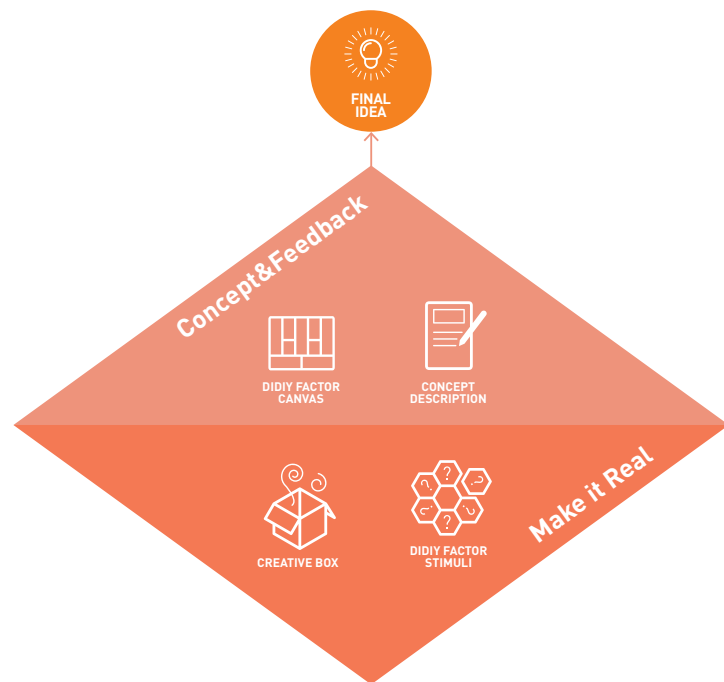
- CO-CD Box
- Idea description

Generate Ideas

- Brainstorming Tool
- Brainstorming stimuli

2. BUILD TO THINK

The Build to think step aims at enriching and refining the idea, through the development of tangible artefacts that make it concrete. This provides a continuous learning approach, and leads to an eventual validation of the idea. In the end, the idea is described concretely.



TOOLS

Make It Real

- Creative box
- DiDIY Factors stimuli

Concept & Feedback

- DiDIY Factors canvas
- Concept description

STER
FARE

ELF-
DEFENSE

Toaster
Included
on student
bags

Quick Activation
for self-heating

MAKES TOAST THAT
CHANGES THE UNIT
OF PRODS
(Water drops fall up)

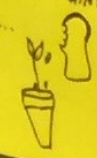
CREATES FRESH
BREAD BY ITSELF
(TOAST)



INFRARED CONTROLLED
TOASTER

TOASTING
BREAD

USE THE LEFT OVER
GRAINS FOR PLANTING
AGAIN...



FLYING
TOAST
Dropper
for Africa

UTILITY

OTHER
TECHNIQUES

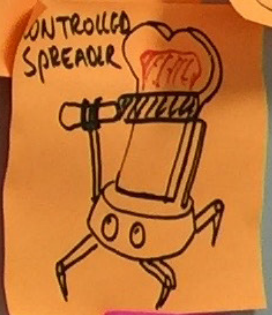
Space



LAZER-
DRAWINGS
+
TOASTING

JUST + CUT THE BREAD FOR
EGGS OR FRUITS

SUSTAINABILITY



CONTROLLED
SPREADER

ENERGY

wireless
toaster

MORE
INGREDIENTS

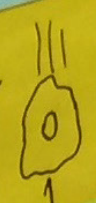
TOASTER
OF THE
FUTURE

TASTE
ingredient
flavor

Medicine
food with
bread.

Bread is made
in toasts and
washed instantly
(choose ingredients for
bread type)

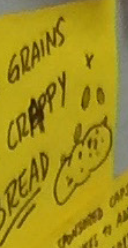
IT
LY FOR
EAD!



SELF-
SPREADING
TOAST



ADD GRAINS
TO CRISPY
BREAD



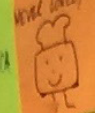
Customized
tastings +
Imaging

ALL-IN-ONE
Machine (All etc)

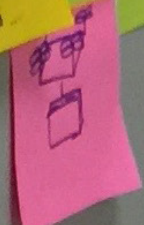
SURPRISE
Just put the
bread and
get a surprise
sandwich

CHOCO
MILK
SHOULD BE ADDED
HEALTHY INGREDIENTS
BREAD FLAVOR
CHOCOLATE FLAVOR
SUN

MY BEST FRIEND
TOASTER
MORE IDEAS!



HOW GRASS
GROWS
(1) SOIL
(2) SUN
(3) WATER





GET STARTED!

Mindset

To use this toolkit most effectively, you are invited not only to follow the guidelines that will be provided, but also to adopt a mindset that will help you take advantage of it in the best way.

The mindset you are suggested to adopt is a mix of the maker mindset, typical of the DiDIY phenomena, and the creative mindset, coming from the field of design.



IMMERGE IN THE CONTEXT

The first characteristic of this mindset is the capability of immersing in the context you are working in. This means, for example, visiting a FabLab, a Makerspace, or any other place that could be useful for you to gain **a deep understanding of the field of interest** for your project.

In this sense, **talking to people** and **interacting with them** is particularly meaningful, since it will provide you with a wider perspective of the phenomena. It is a great practice to talk to different roles and personalities within the DiDIY field, as to gain different points of view.



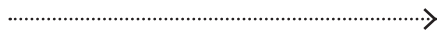
BE COLLABORATIVE

Working as a maker and as a designer means embracing the idea that collaboration is a key element for dealing with complex problems. Always being open and collaborative will help everyone to **achieve goals**, since you will have the opportunity to discuss the project in depth and take advantage of each other's ideas. You will often be unable to find solutions by yourself, but **bringing together other people's experiences** and attitudes will definitely help you to achieve excellent results.





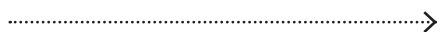
PRACTICE OVER THEORY



As the name suggests, makers are people who make, and embracing a maker-creative mindset means **to keep on making tangible outcomes**. Tangibility is a great help when you need to find ideas or when you get stuck during the project. You don't need to be technologically skilled: being able to visualise ideas or concepts through simple materials like cardboard is enough to improve your work.



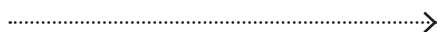
STAY PLAYFUL AND CONFIDENT



The solution you are searching for in the project isn't provided automatically, so you might find yourself thinking negatively and losing confidence in yourself. Don't do it! Embracing the maker-creative mindset means **staying positive** and believing that you will be able to come up with a great solution, as long as you follow the process.



BE CURIOUS



Even if you think you already know the field you are working on, stay curious. Curiosity is a key aspect of the maker-creative mindset, since it will let you see the world as a beginner - someone who isn't stuck in pre-existing paradigms, but can find or create **new ones** instead.



Set up

Applying this toolkit means setting up various elements, in order to structure the process at best.

The elements to be considered are:

 TEAM 1	 FACILITATOR 2
 PROJECT PLAN 3	 ENVIRONMENT 4
 MATERIAL 5	 PLAYFUL ATMOSPHERE 6



1. TEAM

The first thing you need to do when using this Toolkit, is **to set up a team of people** who will work with you throughout the process. Teams should preferably be made up of **four to six people**.

If your team is made up of a higher number of participants, it will be very difficult to manage it, while a smaller group misses out on the potential for teamwork.

The best teams are **multidisciplinary** ones, as having different backgrounds can help you discover how digital technologies can be used in new ways to design new social applications and practices.

Multidisciplinary teams provide diversity, enabling the creation of new associations and interactions.

In a group, the free flow of ideas can be stimulated by including open-minded group members from different disciplines, who are not afraid of asking 'stupid' questions.

Therefore, identify and select team members on the basis of well-defined profiles, in order to involve both experts in the field of digital making and professionals from the field you want to investigate.

For example, if you are interested in the education field, you could create a group with mixed skills: experts in digital technology and experts in education, who nevertheless had a strong interest in both areas. In this way, the phenomenon of education can be seen from **different points of view**. Here, the experts could be: primary and secondary school teachers, high school and university professors, makers interested in education, educators that run educational programs outside of schools using digital making (inside museums or Fablabs), professionals in different departments of the school system, and people who already apply digital technologies at school or who use alternative education methods.

The participants all have specific areas of knowledge, but at the same time, **share broad interests in DiDIY**.

By being open to new developments, you will absorb external knowledge, find new questions, and share new, outside knowledge within the team. Therefore, make sure you find people with an open attitude, who have the desire to learn, and deal creatively with new knowledge. Choose group members who listen to their intuition, and are willing to explore and expand their own boundaries.

Moreover, make sure you build up a team mixing both empathic and creative people. The activities are there to gather information and insight, create an understanding of them, materialise ideas, make and explore early solutions, evaluate and enhance the result.



2. FACILITATOR

.....>

One of the key elements to make your group work at its best, is to create an environment where everyone can be productive and successful in achieving their goals. Therefore, it is important to identify one team member as the facilitator.

Facilitate means “to make easy.”

The job of the facilitator is **to make the collaboration easier for the participants**. His or her main task is to help the team increase its effectiveness by improving its processes.

A facilitator manages the method of the meetings, rather than the content. The facilitator is concerned with how decisions are made rather than which decisions are reached.

A few facilitation challenges are:

- Continuously focusing on, and attending to the group
- Being comfortable with ambiguity and information overload
- Processing and managing misperceptions and emotional reactions
- Focusing exclusively on process rather than content
- Helping the group develop so they can, eventually, work without facilitation.

When the team meets, the facilitator should only guide the session, and not let his or her own opinions interfere with the expression of other peoples' opinions. It is very helpful if the facilitator has a good general knowledge of the subject and tools being used.

The facilitator has to keep track of time and allow everyone to express an opinion on both individual and team levels.

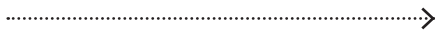
Teamwork is fun: it can be inspiring and stimulating, it motivates you to give your best, and there are others who can support you, and from whom you can learn.

But it doesn't always work that well: teamwork can also be very demanding if you have different perspectives, and it can be frustrating and unfair if you have to sacrifice good ideas for an unhappy compromise, or if everyone is not contributing equally.

Teams can be less effective than an individual, and they could develop very unproductive dynamics. These dynamics can especially appear when the people do not know each other, therefore the facilitators have to be ready to change strategy when they occur. Planning also includes working out a couple of reserve techniques, and initiating team-building when needed. The facilitator should **manage conflict**. Conflict can be healthy in a team, since it shows that members are taking ownership and sharing their ideas honestly. However, there are times when healthy conflict escalates and ceases to be constructive. Since emotions resulting from conflict tend to intensify over time, it is important to address the conflict as soon as it starts being unconstructive. You can decide either to be the facilitator yourself, or to assign this role to one of your team members. Choose the facilitator according to the information provided above.



3. PROJECT PLAN



The team you've created will work most effectively if you provide everybody with a clear project plan, scheduling all the moments in which they will be asked to contribute, in advance.

According to the availability of team members and spaces, you can decide to schedule more activities in the same work session. At least **2 main work sessions** are recommended, one for the explorative stage and one for the generative one. Alternatively, you can decide to organise more work sessions, distributing the different activities over a longer period of time. However, it is not advised to use this Toolkit for longer than a 6-months project, since the team might risk losing momentum, and working with obsolete information. In order to set expectations and prepare at best, each team member should be informed about the scope of every work session. For this reason, it is good practice to compile and share a detailed **agenda of the activities** to be carried out during the work session, in advance.





4. ENVIRONMENT

Working in the right environment is a key element for the success of the team. To foster collaboration and to limit any potential mental barriers, make sure your team can meet in a space that is conducive to creativity and collaboration, and that makes them feel comfortable. This kind of space usually has:

- One work table, big enough to let the group gather around it, but not too wide, in order not to lose eye contact. In this sense, a business meeting room table won't work properly. Instead, a warehouse table is the best choice.
- Free walls or any kind of panel is needed in order to have a vertical work area. In this way, you can hang posters or papers and let your team stand and gather them freely.
- One chair for each participant. Also in this case, choose chairs that are comfortable but at the same time easy to stand up from. For example, the typical office chair won't work that well, because it is designed for prolonged periods of sitting. Bar chairs could be a good alternative, and help you to create the right atmosphere.

At the same time, make sure you are not surrounded by a crowds, where there are external people who are not participating in the session. Privacy and intimacy is very important.



**5. MATERIAL**

Any work session with your team will need some work material.

In this toolkit you will find all the material you need to print for the different phases of the process, so make sure you print them out before starting each session with your team.

At the same, make sure you gather all the other materials needed, such as: post-its of different colours and dimensions, markers, pens, scissors, and tape.

The more material you have, the more successful each work session will be.





6. PLAYFUL ATMOSPHERE

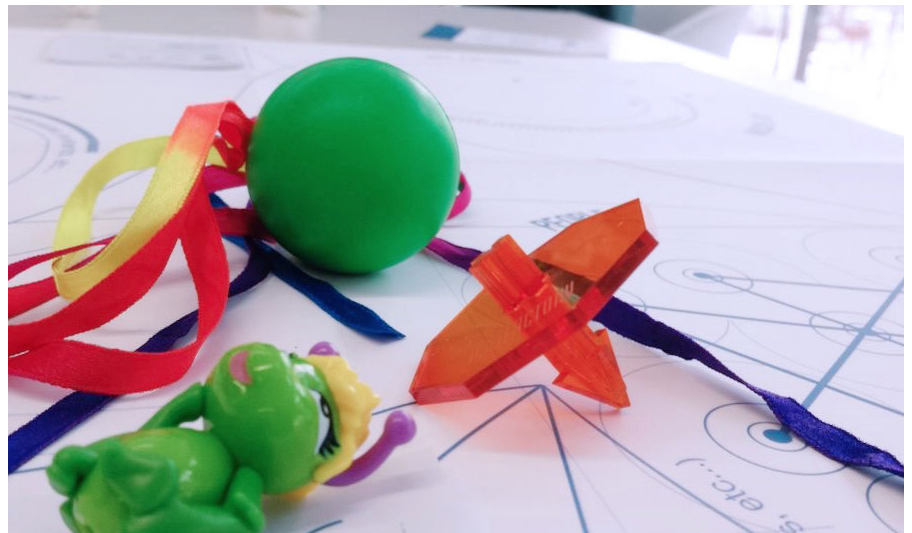
In order to nurture a group of people and enable them to become a well-established and **cohesive creative team**, they must familiarise themselves with their surroundings and all their team members.

In this context, the transfer of know-how should be accompanied by short activities, designed to facilitate the creation of a **favourable creative climate**, which encourages team spirit and sharing of objectives.

For this reason, the use of icebreaker and energiser activities that are intended to overcome the initial resistance and preconceptions (possible barriers to teamwork), can be particularly useful during your creative sessions.

Check these links to learn some energiser activities: <http://bit.ly/2rvbQ7Q>
<http://bit.ly/2s0ieLh>

Provide the work tables with small games that help to maintain a creative atmosphere during the activities (tops, bells, etc.).



Rules of a great work session

The climate that is generated during the session is one of the factors that guarantee its success. Therefore, it is crucial to generate the right mindset, which can deal with all the proposed activities during the workshop. Approaching the co-design session, one should be as open-minded as possible and try to avoid criticism of the ideas that are generated, as this could eliminate potentially useful ideas. **A positive attitude** is the strong foundation of any successful creative session. The following rules can facilitate the creativity process:

- 1 Group members should be able to express themselves freely and openly without censorship, and should operate with appropriate respect towards others.
- 2 Group members should be able to express themselves freely and openly without censorship, and should operate with appropriate respect towards others.

The rules of the day (see Creative Rules tool) have to be shared with participants, and also hung on the wall in the space, so that participants can keep the right mindset.

Design Tool Collection: existing tools and technique usable for DiDIY

The DTC collects a series of **existing tools and techniques** from co-design, design thinking and, more in general, participatory design. It is an open database of tools for DiDIYer, designer, facilitator, etc. that can be used in the digital DIY realm during project development. This collection has also helped us to design new ad hoc tools and techniques for the design of the workshop structure and tools, and for the development of the final design toolkit. You will find references to these in the various sections, indicating which tools and techniques are being used.

The design tool collection is presented as a catalogue. For each page, each tool or technique is recorded as follows:

- Source
- Phase of design process in which the tool/technique is used
- The reason why the tool/technique has been selected for the DiDIY project
- How the tool/technique has been included in the DiDIY workshop process

The Design Tool collection is available on the project website www.DiDIY.eu or <http://www.ideactivity.polimi.it/>



STEPS, ACTIVITIES AND TOOLS

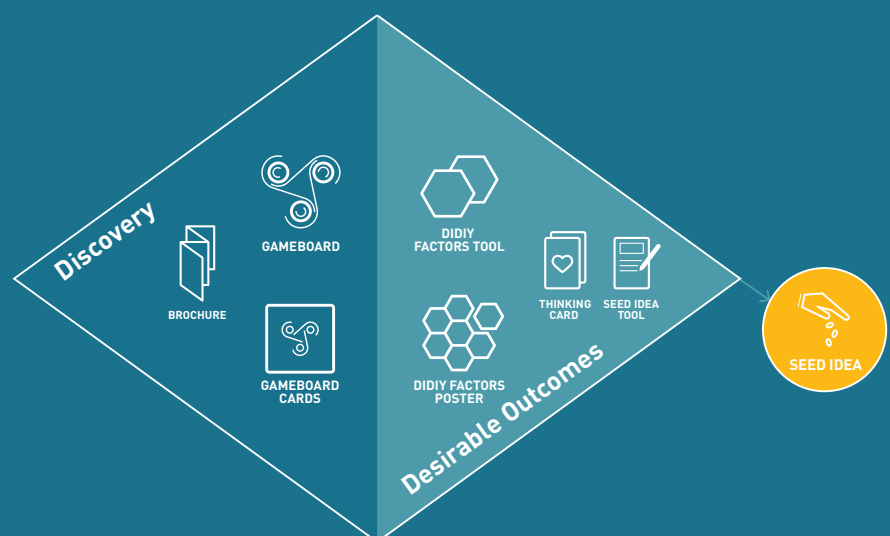
IMMERSE

The first step of the Digital DIY co-design process is called **Immerse**. The aim of this step is to deeply engage with the social and cultural context of the Digital DIY phenomenon.

The Immerse step is broken down into two parts: Discovery and Desirable Outcomes.

The first is a preliminary immersion in the context that seeks an initial understanding of the main elements that enable the phenomenon. The second is an in-depth immersion that aims to identify the needs of the people involved in the DiDIY, and the opportunities that are likely to arise from an understanding of their experience regarding the issue at hand. This “plunge into context” frequently generates a mass of information so vast that it becomes necessary to organise the data visually, in order to indicate patterns that will help to provide an understanding of the whole, and identify opportunities and challenges.

The output of the Immerse step is the Seed Idea.





Immerse > Discovery

Discovery description

This activity is fundamental for both expert and the people that are unfamiliar with the phenomenon. It allows a deeper understanding through analysis of the context.

Through the analysis of significant DiDIY projects, the Discovery activity helps the team to explore the phenomenon, to comprehend the context of DiDIY, and to highlight the potentialities, the benefits and the innovative features of DiDIY. Each DiDIY project will be analysed according to three main aspects that are usually considered during a design project: people that enable the project with their roles, motivation and relationships; key components such as technology, activities, tools, and processes that enable the project; the positive and negative impact of the project.

This activity is fundamental for both the expert and the people that are unfamiliar with the phenomenon, because it allows a deeper understanding through analysis of the context from different points of view. The activity is to be regarded as a moment of discussion to share different views and initiate a flow of ideas, to reach a common understanding among the working team.

The connections between some aspects of the analysed case study and personal/professional experience leads to content enrichment.

For example, the analysis from the point of view of a teacher could easily cause reflections related to learning aspects. The Discovery activity requires a good deal of time to be developed, and it can be concluded when a satisfactory level of analysis is reached.





Immerse > Discovery

Discovery steps

TIME
60-90 mins



LEVEL
Medium



MODE
Reflective



MATERIAL
Gameboard, card gameboard, brochure caso studio cartacea, device per la consultazione digitale, post it, pennarelli e giochi ludici.



Discovery helps the team to explore the phenomenon, to comprehend the context of DiDIY, and to highlight the potentialities, the benefits and the innovative features of DiDIY.

01 ANALYSIS. Start the exploratory iterations by selecting and analysing a DiDIY project in depth, presented as a case study in the "Brochure Tool". In order to have a better understanding, the project's website can be consulted. The activity is performed by reading the case study together, in order to create a common understanding.

02 MAPPING. After the exploration of the case study, start the discussion through sharing information, experience, and knowledge. The involvement of the team members and their active sharing is guaranteed by the introduction of the "Gameboard cards" tool, which stimulate reflections on diverse subjects. There are 3 question topics on the cards: people, key components, and impact. The team members identify and map them on post-its, and position them according to the areas on the "Gameboard" tool. The connections between some aspects of the case and personal/professional experience written on post-its, shared on the "Gameboard", enrich the content. The activity ends when all the topics of interest have been addressed, and you feel that a good degree of detail has been obtained.

TIPS

- ▶ After the analysis step, make sure that the team has understood the main features of the project clearly. It may be useful to make **a short summary**.
- ▶ If you notice that the team has gotten stuck during the mapping step, **help them to document the thoughts on post-its**. It's important to save all the information that has arisen from the discussion. You can also elect a note keeper inside the team.
- ▶ It's important to write **one single and clear concept on each post-it**. Avoid meaningless single words and lists of concepts on the same post-it. In case of multiple answers, use more post-its.
- ▶ If the team is quiet and shy, involve individual members by letting them, one at a time, **pick a card from the deck and read the related question** to the team. This will let them feel more involved in the process. When analysis is almost at an end, you can also distribute the cards on the table and let the team choose the aspects on which to focus the discussion.



Immerse > Discovery

What to keep in mind



Suggestions that must read for:

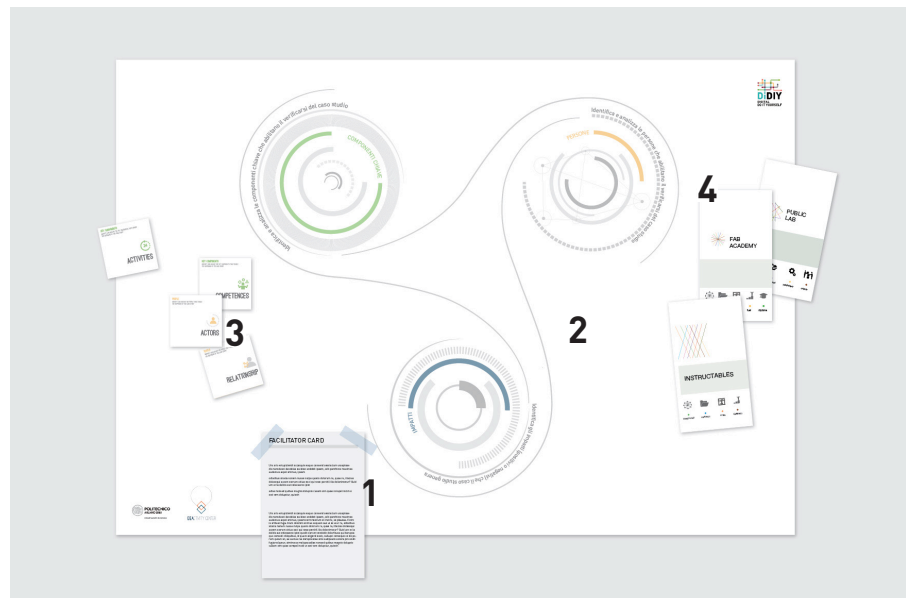
- 1** During the **Analysis step**, it's important that people can create connections between some aspects of the analysed project, and their personal and professional experience. This generates interesting discussions which lead to richer content. It also increases the involvement and active participation of team members.
- 2** The **"Card boards"** are the starting point for a rich flow of thoughts. Their use is mandatory and they should generally be read in this order: people, key components and impact. Throughout the mapping step, feel free to reiterate, and move through the three areas.
- 3** **"Card boards"** can be used in different ways, according to the level of energy and involvement of the working team. If the discussion is flourishing, don't interrupt the flow by introducing a card. Instead, try guiding the discussion towards the topics indicated on the card.
- 4** Make some multimedia content available to the working team, such as project websites, or videos that allow in-depth understanding of the project. **The combination of paper and digital material could meet the needs of different types of users.** You can provide laptops or tablets, or invite the team to use their own devices.
- 5** **It is fundamental that all the team members contribute to the activity** and are free to express themselves openly without censorship, while operating and behaving respectfully. Make sure that all the team members are involved.

Immerse > Discovery

Settings and Tools



Set up the activity by downloading and printing the tools listed below. Organise the tools as shown in the Discovery tools scheme.



- 1 FACILITATOR CARD:** Print this tool in A5 format. It is a useful reminder of the most important aspects of the relevant activities during the work session.
- 2 GAMEBOARD:** Print this tool in 70x100 cm format. Since there is a colour code to follow, use a colour printer. To have a board game effect, you can print the tool on a 5mm foam board, or glue the poster on a blank one.
- 3 GAMEBOARD CARDS:** Print the three different decks of cards. Since there is a colour code to follow, make sure to use a colour printer. You can even decide to place the cards in a box to keep it tidier.
- 4 BROCHURE:** Select a DiDIY project from the selection provided and print it in a 50x70 cm format. These projects have been taken from many other DiDIY projects. They are not the best cases ever, but each of them is different, and presents threads related to different fields such as education, open source, society, work, etc. If you are not happy with them, or if you want to analyse a different project, you can create your own brochure by using the available Brochure Format Tool.



STICKY NOTES:

- NEW TECHNOLOGIES
- LESS ONLINE
- NEW ENVIRONMENTS
- NEW WAYS OF WORKING
- NEW SOCIAL EFFECTS
- NEW WAY OF THINKING
- BENEFICIARIES
- SHARING TECHNOLOGIES
- KEY COMMENTS
- NEW CULTURAL IMPACT
- CULTURE
- LEARNING
- ACADEMY
- STRUCTURE OF A LEARNING TO IMAGINE
- PRODUCTS OF A LEARNING TO IMAGINE
- LESS ONLINE
- NEW ENVIRONMENTS
- NEW WAYS OF WORKING
- NEW SOCIAL EFFECTS
- NEW WAY OF THINKING
- BENEFICIARIES
- SHARING TECHNOLOGIES
- KEY COMMENTS
- NEW CULTURAL IMPACT
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- LEARNING
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- STRUCTURE OF A LEARNING TO IMAGINE
- PRODUCTS OF A LEARNING TO IMAGINE

NEW ENVIRONMENTS

NEW WAYS OF WORKING

NEW SOCIAL EFFECTS

NEW WAY OF THINKING

BENEFICIARIES

SHARING TECHNOLOGIES

KEY COMMENTS

NEW CULTURAL IMPACT

CULTURE

LEARNING

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STRUCTURE OF A LEARNING TO IMAGINE

PRODUCTS OF A LEARNING TO IMAGINE

LESS ONLINE

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ACADEMY

STRUCTURE OF A LEARNING TO IMAGINE

PRODUCTS OF A LEARNING TO IMAGINE

ACTIVITY CARD - GAMEBOARD

AT

ize the case study using guided questions.

activity helps to enter in empathy with the context of DDV and

the key aspects of the case study presented.

collator and the conciliator together with all the group

ers.

collator, the conciliator and all the group members

dy presented in the booklet. Additional

to the back page. After reading, the all

group members pick one card, flip it and read the

card. There are 3 topics of questions, people

cts. All the group answer each single question

on posters. The facilitator stimulates the conversation

people are taking one at a time. To get a useful result, it

it to write a single thought on each post-it, in order not to

em afterwards. Each member writing a thought on

places it on the board, in the related topic area. The same

repeated for the cards.

conversation gets stuck in talks that are not useful for the

analysis. The conciliator understands it and proposes to

get back to more meaningful considerations.



Immerse > Desirable
Outcomes

Desirable Outcomes description

The divergent activity of Immersion flows into the convergent one called "Desirable Outcomes".

The activity is divided into two steps that correspond to the two main objectives of the activity: understand the fundamental factors of DiDIY, and define a Seed Idea.

The first collaborative clustering step helps the team members to reflect on the DiDIY fundamental factors, and to eventually identify new ones in order to build a common understanding of the topic, according to the prior analysis.

The second step aims to collect desirable future outcomes among the team, one of which can be elected as the Seed Idea, commonly shared by everybody.

Since the clustering activity is a moment of discussion and reflection, it could easily generate some desirable outcomes that can be noted on the "Thinking Card" by each participant, which will be shared and evaluated by the team afterwards.





Immerse > Desirable
Outcomes

Desirable Outcomes steps

TIME

90-120 mins



LEVEL

High



MODE

Reflective



MATERIAL

Post-its, felt tip pens, tape.



The two main objectives of the activity are understand the fundamental factors of DiDIY and elect a shared Seed Idea among the team.

01 CAPTURE. Before the clustering activity, hand out “Thinking Cards” to all team members. Explain that they can use the card to annotate all the sparks, inspirations and future desirable outcomes during the next clustering activity.

02 READ FUNDAMENTAL FACTORS. Together with the team, read and discuss the fundamental factors of DiDIY presented in the “DiDIY Factors Poster”. Make sure that all the team members have a good understanding of all of them.

03 INTEGRATE FUNDAMENTAL FACTORS. Suggest taking a step back, and looking at the Gameboard’s results holistically. Together, decide if and how to integrate the presented fundamental factors with the considerations that have emerged from their analysis. When identified, move and replace the post-its containing similar thoughts to the specific area of the “DiDIY Factors Tool” that corresponds with the factor to integrate.

04 OPTIONAL CREATE FUNDAMENTAL FACTORS. The team can add new clusters if new concepts emerge from the analysis. If you add new clusters, a title and a description should be provided to each one, in order to identify the meaning that it has for the team. This cluster represents a fundamental factor of Digital DIY.

05 WISHFUL THINKING. At the end of the clustering activity, through the “Thinking Card”, each team member envisions a desirable future scenario or outcome, taking inspiration from the material collected and the discussions that went on during the analysis and clustering phases. In order to help the envisioning process, the team members can decide to either write, or sketch the outcome.

06 SEED IDEA. At the end of the clustering activity, the team members share their own desirable future outcomes. Facilitate a conversation about the most interesting ones. The aim of the conversation is to identify a single desirable outcome, which could be either the selection of one of the available ones, or a mix of more of them. Use the “Seed Idea Tool” to document the final shared Seed Idea.



Immerse > Desirable Outcomes

TIPS

- ▶ The clusters are made up of similar thoughts, and express the same concept. When clustering, **group the ideas that have emerged**, by similar aspects, in order to identify the elements that can integrate the factors of DiDIY, or create new ones.
- ▶ When clustering, **encourage reflection on wider concepts**. It's important to find a key to read the analysis, in order to identify new shades of pre-existing factors, or new ones. It's not a mechanical exercise of moving and removing post-its.
- ▶ During clustering, as facilitator you have the role of identifying and taking the most interesting reflections, and **turn them into visions**.
- ▶ As facilitator, you must make sure that the selected Seed Idea is not too broad in scope, but try to be **more specific**. To make an efficient selection of the Seed Idea, go for the one that better represents **a shared objective among the team**.



Immerse > Desirable
Outcomes

What to keep in mind



Suggestions that must read for:

- 1** The final goal of the clustering activity is **to synthesise** all the information gathered into interesting findings, creating insights which will enrich the existing clusters, and inspire future challenges
- 2** **Each area within the tool contains a different cluster.** As you place items in each cluster you may realise that there are some correlations between groups. Try one set of grouping, discuss the findings, and after, create a new set of groups.
- 3** In case the clustering activity highlights new concepts that are not included in the "DiDIY Factors Poster", the team members can decide to add **additional areas**, thus a new fundamental factor to be included in the whole process. The group members should spend some time reflecting on it, in order to properly name the cluster and come up with a complete definition. The definition should include the questions needed for the "Make it real" activity, which will help the group to reflect on how to include the DiDIY fundamental factors in their project.
- 4** The clustering activity usually gives rise to positive discussions among the group. As facilitator, you have to involve all the participants, in order to **achieve rich and stimulating conversations**. These can inspire many "Thinking Cards", and as a result, the Seed Idea.
- 5** After clustering, please dedicate some more time for the **"Thinking Card" activity**, in case someone has not written down any desirable ideas. Inspire them by reminding them of some interesting topics or ideas that emerged during clustering.
- 6** The chosen Seed Idea should be shared and agreed to by all team members. Therefore, as facilitator, you should listen to all the collected desirable future scenarios and guide the team in a **common direction** that best represents the group's shared objective.

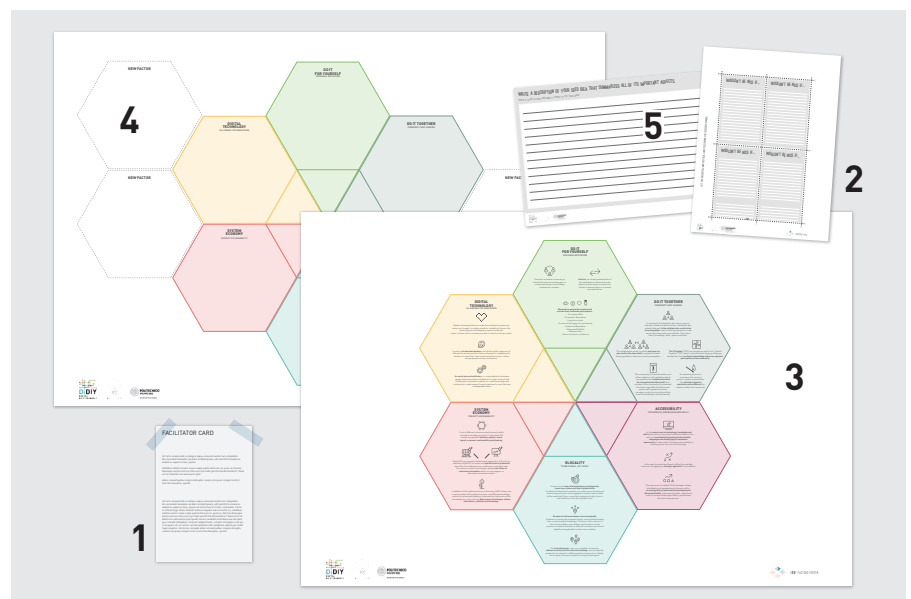


Immerse > Desirable
Outcomes

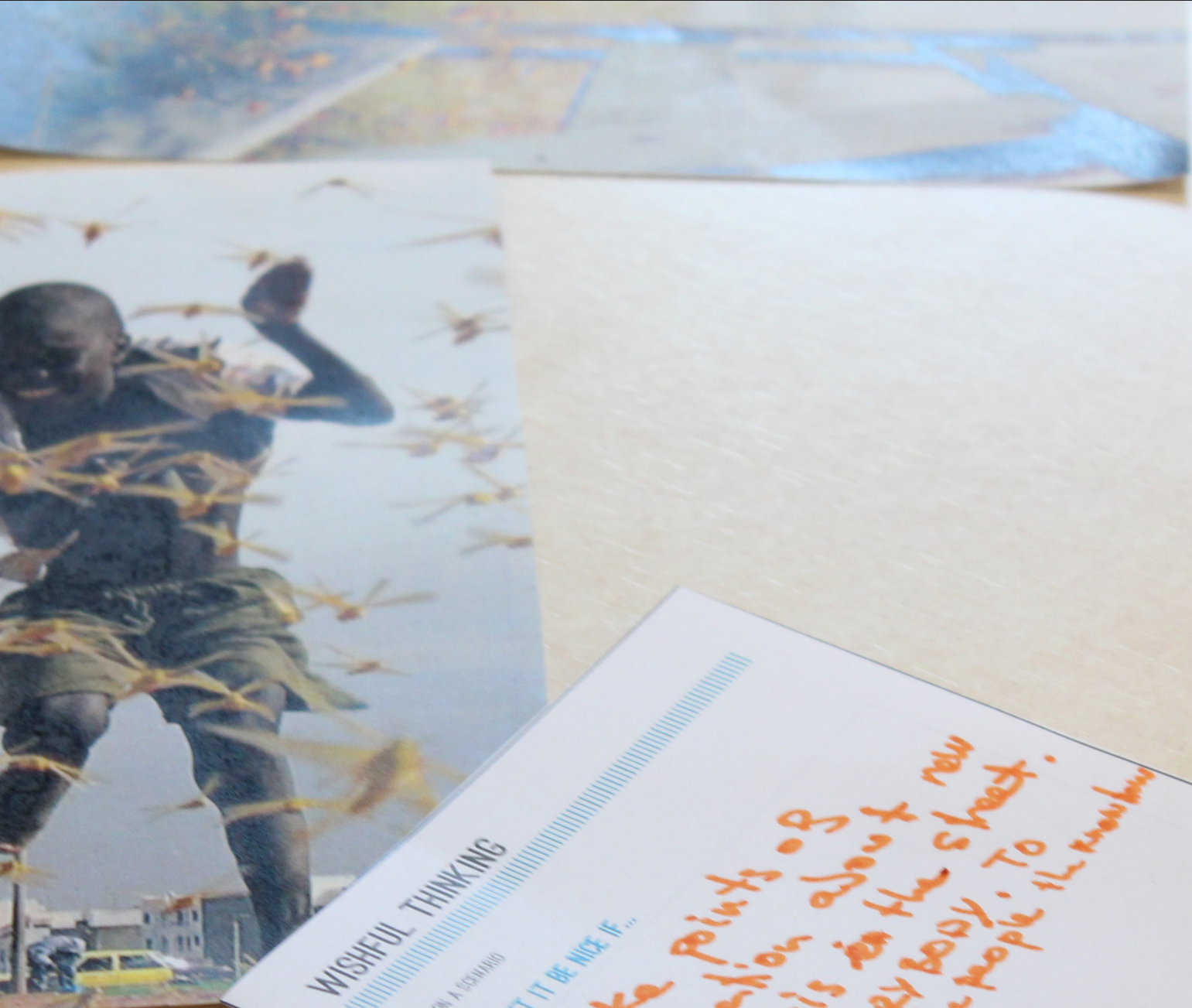
Settings and Tools



Set up the activity by downloading and printing the tools listed below. Organise the tools as shown in the Desirable Outcomes tools scheme.



- 1 FACILITATOR CARD:** Print this tool in A5 format. It is a useful reminder of the most important aspects of the relevant activities during the work session.
- 2 THINKING CARD:** Print the card file in A4 format. The team members should receive at least 2-3 cards each.
- 3 DIDIY FACTORS POSTER:** Print the tool in 70x100 cm format. Use a colour plotter to enable the colour code. Hang it on the wall before starting the activity.
- 4 DIDIY FACTORS TOOL:** Print the tool in 70x100 cm format. Hang it on the wall before starting the activity.
- 5 SEED IDEA TOOL:** Print the tool in A4 format. Make several copies, you might need them!



WISHFUL THINKING

ENVISION A SCENARIO

WOULDN'T IT BE NICE IF...

- Make Points of Information about new technology in the street.
- FOR EVERY BODY TO give to all the people the information

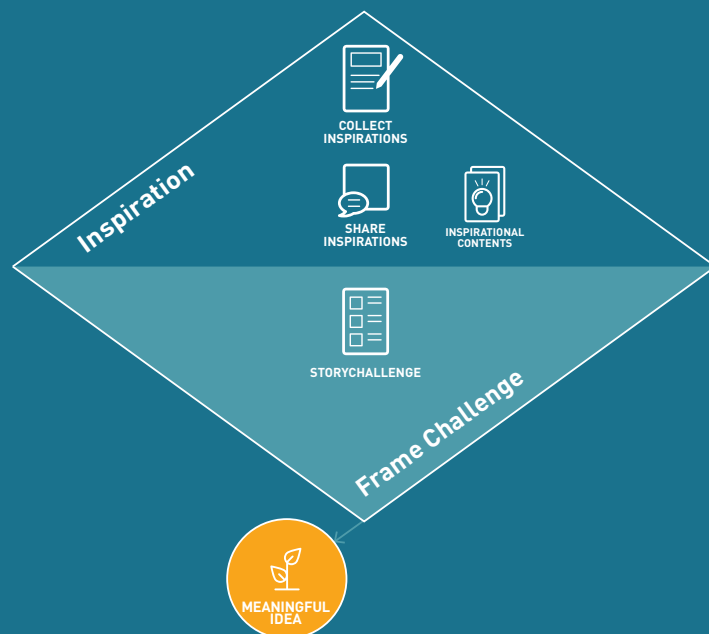
DEFINE

The second step of the Digital DIY process is called Define. The aim of this step is to explore the field of the "Seed Idea", in order to identify a meaningful matter to be addressed and to be framed into the definition of a challenge.

The Define step is broken down into two parts: Inspiration, and Frame Challenge.

Inspiration stimulates the gathering of information regarding the topic, in order to create a common and deep understanding of it among the team. Frame Challenge is the analysis of this information and the further identification of a single and concise challenge to work on for the rest of the process.

The output of the Define step is the Meaningful Idea.





Define > Inspiration

Inspiration steps

The goal of this activity is to gather inputs, such as stories, case studies or experiences and then share it with the team so that they become part of a collective consciousness.

01 COLLECT INSPIRATION. This activity is carried out individually and in a variable period of time, ideally between 1 and 2 weeks. Send the "Collect Inspiration" tool to all your team members. Each of them conducts individual research, and collects the information through desk research, interviews with people or visits to places related to the topic of the "Seed Idea". To enrich the research, also send the "Inspirational contents" tool to them, this will provide some initial inspiration. The tool contains a set of sources to start from. Feel free to add sources to this tool if you feel that there's something in particular you would like to share with the rest of the team. After this collection of information, each team member summarises and reports them, using the given tool.

02 SHARE INSPIRATION. After collecting inspirations, they will be shared among the team through a collaborative session. All the team members bring the completed "Collect Inspiration" format, and, one by one, share all the useful information or interesting case studies they have collected that can enrich the Seed Idea. The most relevant inputs are written by the facilitator on post-its and attached to the related area of the "Share inspiration" tool.

TIME

Individual part: 1, 2 weeks
Collective part: 60 mins



LEVEL

Medium



MODE

Hands on, Reflective



MATERIAL

Post-its, felt tip pens, tape, glue.



TIPS

- ▶ It may be that your team members lack some inputs to start the inspiration research. Try to stimulate this research by providing specific tips about sources, websites, places, people to interview and so on. Encourage this sharing of information between the team members, in order to let them make the best out of the individual research.
- ▶ Make sure that each single piece of information provided by your team members gets written on a single post-it. It is important that the information isn't mixed up, but kept in pieces, in order to be better placed on the shared tool.
- ▶ It might happen that different team members present the same content. In this case, combine the content, creating clusters of information.
- ▶ During the sharing moment, some team members could get inspired by the content presented by others and then come up with new inspirations. Don't lose them, instead write them on post-its to put in the "Share Inspiration" tool.



Define > Inspiration

What to keep in mind



Suggestions that must read for:

- 1** Inspirations are useful to create a deep understanding of the topic, and it provides an opportunity to reflect on them and discuss. It is important not to judge any of them, since they are all inputs that could generate a meaningful discussion.
- 2** Inspirations can be taken from case studies, data, facts, emotions, risks, or added values you have identified. They could be collected in the form of notes, pictures or even objects. In case they are pictures, stick them on the "Share information" tool with the post-its during the sharing session. In case they are objects put them next to the tool.
- 3** Look at the inspirations you have gathered from different perspectives, think about how they could potentially influence the field of interest of your "Seed Idea". For the sake of further idea generation, it will be very useful to have as many inspirations as possible, which will lead to more brilliant ideas.
- 4** If some information is particularly inspiring or interesting to your group, also consider the possibility to do more in depth research (during the work session or through another individual activity), by looking for additional information, meeting more people or visiting more places.

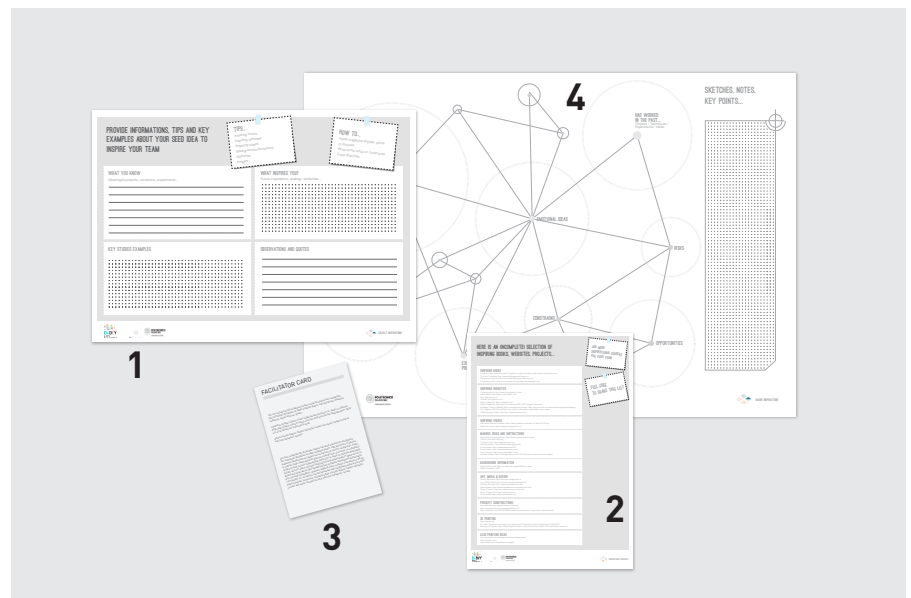


Define > Inspiration

Settings and Tools



Since the Inspiration phase is divided into 2 parts, the preparation required differs for each of them. The individual part doesn't need to be set up, since it is to be carried out individually by each team member, and merely requires downloading and printing of the individual tool. Setting up the collective part consists of downloading and printing the tools listed below, and organising them, as shown in the scheme. Place the material on the work table.



- 1 COLLECT INSPIRATION:** Send this tool to all the team members. Afterwards, each team member must print it out individually, in A3 format.
- 2 INSPIRATIONAL CONTENTS:** Send this tool to all the team members. You can decide either to keep it as it is, or to add the contents you feel are important to be shared among the group.
- 3 FACILITATOR CARD:** Print this tool in A5 format. It is a useful reminder of the most important aspects of the relevant activities during the work session.
- 4 SHARE INSPIRATION:** Print this tool in 70x100 cm format. Prepare the work session by hanging it on the wall.





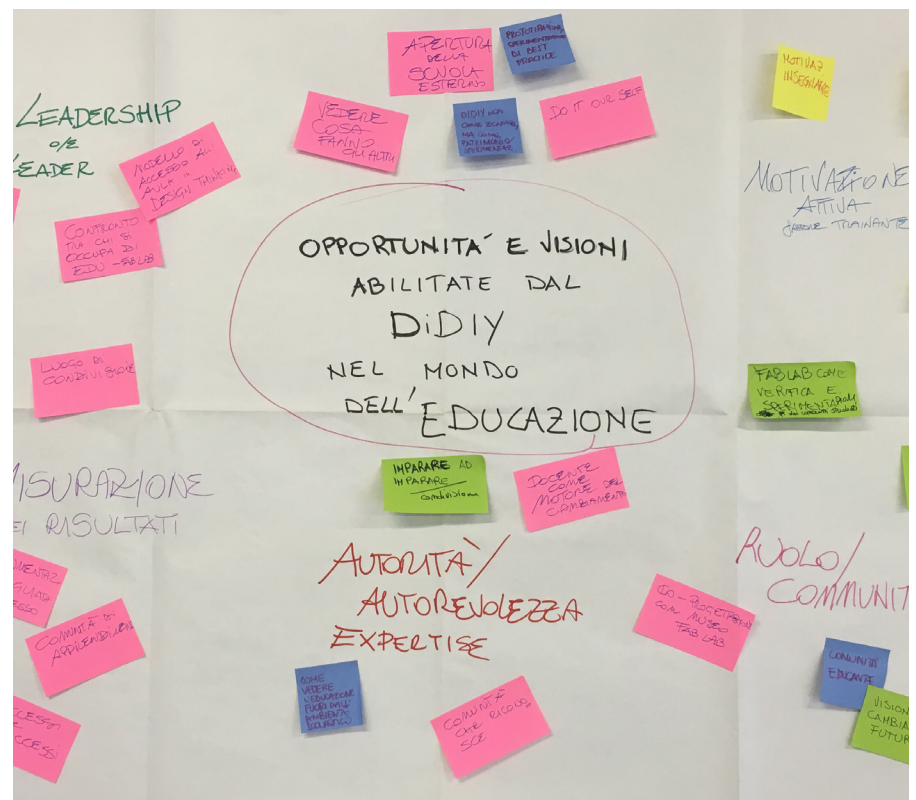
Define > Frame challenge

Frame challenge description

The proper framing of a challenge is a fundamental step of the process that will help the team to start off on the right foot.

After the broad activity of Inspiration, the Frame Challenge activity helps to narrow down a specific issue from the broad topic related to the Seed Idea you have explored, and to identify and commonly agree on a single challenge statement that will guide your team throughout the rest of the process. The information you gathered during the Inspiration activity revealed issues and possibilities that can be turned into potential challenges. A challenge is the statement of a specific issue to be solved, intended as a design opportunity. You don't have to investigate them all, rather concentrate on the aspects that are the most relevant and promising. This synthesis will be enhanced by your intuition and awareness, and by the attitude of looking for new avenues of consideration.

Properly framing the challenge is a fundamental step of the process, since it will help you and your team to start off on the right foot, and stay focused on a specific issue during the further Ideation step. The challenge you identify will also be a constant guide that, in further moments of ambiguity or confusion, will help clarify the direction that needs to be taken.





Define > Frame challenge

Frame challenge steps

The goal of the activity is to identify and commonly agree on a single challenge statement that will guide your team throughout the rest of the process.

01 RE-EVALUATE INFORMATION. The activity starts with an analysis of the information shared beforehand. Take a step back, re-read the material you gathered, and look at it holistically. The aim is to identify how to potentially match information, and to find some meaningful patterns of possibilities and issues that can be turned into challenges. Use your intuition to identify the most relevant matters of the topic you've explored.

02 MEANINGFUL CHALLENGE. Once you've identified relevant matters through analysis, point out the following elements: subject, action and object, using the "Storychallenge" tool. These elements will help you to properly frame the challenge, taking into consideration all the necessary ingredients. Once you've identified the elements, combine them, forming a question that begins with: How might...? How to...? In what ways...?

03 STORYBOARD. If visualised, the challenge will be more powerful and useful. Identify the main steps of the ideal vision in which you want to take on your challenge. Determine what you want to visualise. It doesn't have to be the entire vision, but try to tell a story by describing its main components. You are not required to develop professional drawings, but rather do simple frames of the key moments of your vision, which are commonly agreed on by the team.

TIME

60-90 mins



LEVEL

High



MODE

Hands on, Reflective



MATERIAL

Felt tip pens, tape.





Define > Frame challenge

TIPS

- ▶ Defining a proper challenge is not an immediate task and it could require some iterations. Therefore, try to develop more versions of the challenge, also consider different matters to be addressed. Having more possibilities will guide your team discussion, and will help you to make a better decision about which single challenge to keep for the rest of the process.
- ▶ Keep a real and tangible focus. A good challenge is broad enough to allow the further exploration of different solutions, but at the same time narrow enough to allow you to stay focused and manage it concretely. If the matter to be addressed is too abstract, the solution will be superficial or invalid.
- ▶ In this phase of the process you are still searching for matters to be solved, rather than concrete solutions. Therefore, remember that a challenge doesn't already contain a specific answer. Concentrate on framing the right opportunity, rather than worrying about the solution. It will be natural to start suggesting ideas. Instead of losing them, write them on paper or a Post-it, to be used at a later stage.
- ▶ It is very important to bring the goal into focus clearly - as a goal that is not fully understood cannot be met. Use sentences and words that are clear to the whole team, and easy to remember.



Define > Frame challenge

What to keep in mind



Suggestions that must read for:

- 1** The framing of the challenge and its formulation has a great impact on the results of the further generation of ideas, so try to identify a challenge that you intuitively feel might hold potentialities.
- 2** Frame a challenge that motivates your team, and that you find interesting and exciting to work on. If you don't immediately find something that captures your team's interest, keep on looking for alternatives until you come up with a challenge that convinces all the team members.
- 3** The three elements you need to identify in framing the challenge are all equally important, and the framing of all of them is fundamental for creating a meaningful challenge. If you feel you are not solid enough in the identification of one element, deepen the team discussion, investigating the information gathered and the personal experiences and knowledge, until you feel you've reached a common understanding and a meaningful result.
- 4** During the realization of the Storyboard, your drawing capabilities is not the main focus. Drawings are to be seen as merely a tool to help your team visualise, and find a common vision to agree on. Drawings are not intended to be beautiful, but rather useful and effective for the team discussion.

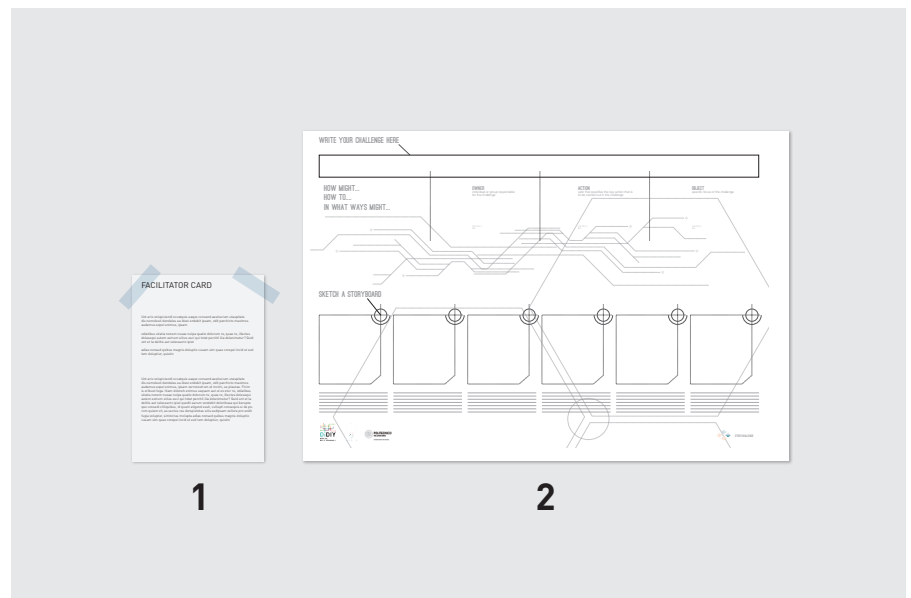


Define > Frame challenge

Settings and Tools



Set up the activity by downloading and printing the tools listed below. Organise the tools as shown in the Framing Challenge tools scheme.



- 1 **FACILITATOR CARD:** Print this tool in A5 format. It is a useful reminder of the most important aspects of the relevant activities during the work session.
- 2 **STORYCHALLENGE TOOL:** Print this tool in 70x100 cm format. Prepare the work session by hanging it on the wall.

SENSIBILITY
EMOTIONAL

BACK TO
ARTISAN
DIMENSION

ESTHETICS

EMERGENCY

CULTURAL
CHANGING

THE
SEED
OF
EDUCATION
CHANGE
SYSTEM

OBSOLETE
LEARNING
MODELS

ETHICS / AESTHETICS

SENSIBILITY

↳ perceptions and its elaboration

BALANCE
REAL
RELATION TO
LOCAL PLACES
AND WORK
SPACE

...
...

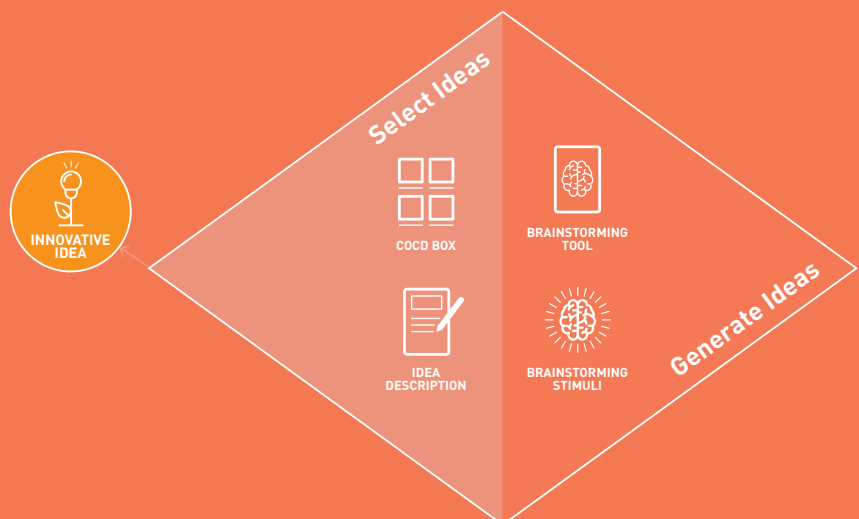
IDEATE

The third step of the Digital DIY process is called Ideate. The aim of this step is to generate a meaningful solution for the challenge framed.

The Ideate step is broken down into two parts: Generate Ideas and Select Idea.

During Generate Ideas, a creative session is organised and brainstorming techniques are used to stimulate creativity and come up with as many ideas as possible, in a free and non-judgmental way. During the Select Idea, the ideas generated are clustered into affinity groups, evaluated according to feasibility and originality criteria, and then selected in order to converge into a single, strong idea to be worked on for the rest of the process.

The output of the Ideate step is the Innovative Idea.





Ideate > Generate Ideas

Generate Ideas description

It is important not to concentrate on the quality of each idea, but to strive for quantity in order to explore different possibilities and come up with unexpected solutions.

Starting from the challenge identified, this phase of the process focuses on finding ideas that could potentially turn into concrete solutions. The aim of this activity is not to immediately come up with a single good idea, but instead to generate as many ideas as possible, using the brainstorming technique. Brainstorming is a highly effective technique for eliciting the generation of a great number of ideas within a short time span. It lets the team shift into a generative mindset to generate dozens of ideas, without any kind of limitation.

The main principle of brainstorming is “suspended judgement”, since the creative solutions that arise should not initially take an idea’s viability or possible implications into account. All these aspects will be considered in later steps of the process. Since in this phase every idea is potentially a good one, it is important not to concentrate on the quality of each idea, but to strive for quantity, in order to explore different possibilities and come up with unexpected solutions.

This technique requires a cooperative and easygoing environment in which everyone in the team feels comfortable, and is not afraid of saying something wrong or inadequate. Freewheel thought associations is encouraged, as well as so-called cross-pollination, which is the concept of transferring knowledge from one field to another.





Ideate > Generate Ideas

Generate Ideas steps

The aim of this activity is to generate as many ideas as possible, using the brainstorming technique and tools.

01 BRAINSTORMING STIMULI. Brainstorming is more effective if enriched with stimuli. For this reason, it is useful to collect some before starting the brainstorming session. Distribute the "Brainstorming stimuli" cards to the whole team. There are two kinds of cards: "Character" and "Inspiration of the last week", one each for every team member. On the "Character" card, everyone writes the name of a politician, an actor, a singer, an activist, a journalist and so on, who is inspiring and has a strong personality. In the "Inspiration of the last week" everyone writes an inspiring anecdote, a story or a situation from the last week. Once all the cards are ready, collect them and mix them up.

02 PRESENT THE CHALLENGE. Hang the challenge you will brainstorming about on the wall, so everyone can see it. Make sure that everyone is on the same page, and that all the questions about the meaning of the challenge are answered.

03 BRAINSTORM. The whole group gathers around the "Brainstorming Tool" in a semi circle. Start by reading the brainstorming rules and make sure everybody that agrees on them. Then all the team members take a few minutes and write down on post-its the first idea that comes to mind. Each group member reads his/her idea out loud, and gives the post-it to the facilitator, who sticks it on the "Brainstorming Tool". While ideas are popping up, everybody is invited to come up with additional ideas or to add onto the ideas being discussed. It is important to write one idea at a time and to write just one idea on every post-it.

04 INSPIRE IDEAS. The energy level of the brainstorming session must be kept high until the end. Every time the team is stuck and lacks input, use the brainstorming stimuli that you created before the session. The brainstorming stimuli will bring some elements into the discussion that could be inspiring, and allow the team to come up with new ideas. For example, the team could think with the mind of the selected character, or could take inspiration from last week's anecdotes.

TIME

60-90 mins



LEVEL

Medium



MODE

Hands on



MATERIAL

Post-its, felt tip pens, tape





Ideate > Generate Ideas

TIPS

- ▶ The brainstorming session works best when everyone is contributing and giving ideas. Make sure all the team members have the opportunity to express themselves, and when somebody is not participating as expected, try to stimulate him/her by asking opinions or giving them a "Brainstorming stimuli" card.
- ▶ All the ideas must be listened to by all team members, so that everybody can get inspired and the flow of ideas more effective. Make sure every idea is shared by reading out loud, not just written on post-its.
- ▶ At the end of the session, it is important that all ideas that have been raised during the brainstorming session are written on post-its and collected together on the "Brainstorming Tool". Therefore, make sure every idea is documented and that all the post-its are stuck together.
- ▶ It may be useful to set a goal for how many ideas you want to generate in total. The goal will stimulate the team not to stop after the first ideas, but rather to keep looking for alternatives. If you reach the goal but you feel you can explore further, don't stop the conversation - keep it active.



Ideate > Generate Ideas

What to keep in mind



Suggestions that must read for:

- 1** Make sure the atmosphere is welcoming and others' ideas are not criticized. All ideas should be welcomed and encouraged. Moreover, stimulate the team to use each other's ideas as a starting point from which further ideas may be generated and developed. To create this atmosphere, make sure the brainstorming rules are understood and shared among the team members.
- 2** Don't be limited by generating ideas that are usual and logical. Explore as many alternatives as possible, even wild ones, including aspects that may look impossible but could stimulate brainstorming. There are no wrong ideas in brainstorming!
- 3** However, stay focused on the topic to be addressed. Even if it is a divergent activity in which wild ideas are encouraged, keep the challenge you are working on in mind, in order not to lose sight of the brainstorming goal.
- 4** In a brainstorming session, all the generated ideas belong to everyone. Since it is a collective activity, and building on each other's ideas is fundamental, make sure nobody feels jealous or protective of his/her ideas.
- 5** Visualising the ideas that are emerging is a good way to make them tangible and recognizable to everyone. Stimulate this practice among the group, and encourage everybody not to just write on post-its, but also to draw on them.
- 6** Before starting the brainstorming session, it could be useful to show the team some images or videos. These images or videos can be chosen freely, and are intended to be stimuli to trigger the creativity of the team and get inspired. At the same time, they can help keeping the focus on the topic to be addressed.

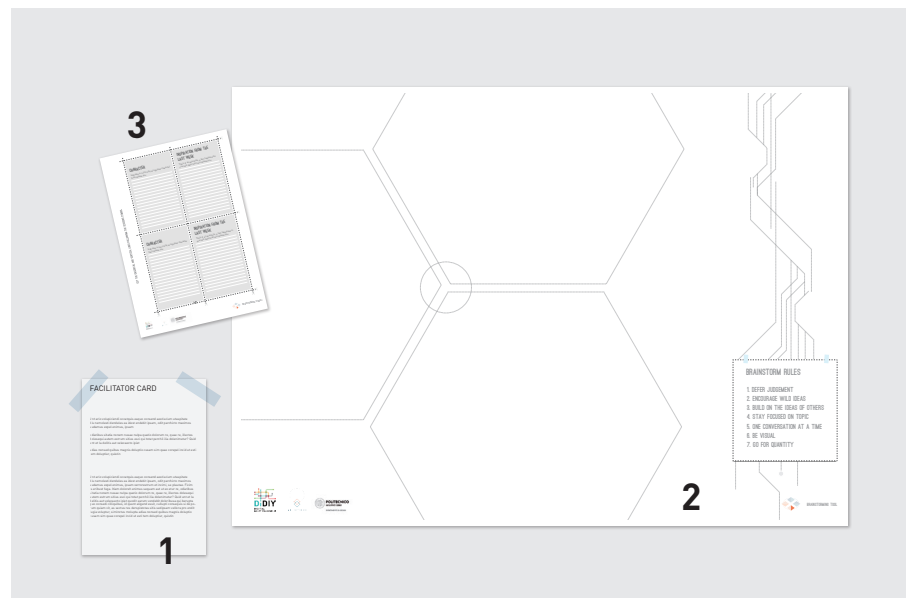


Ideate > Generate Ideas

Settings and Tools



Set up the activity by downloading and printing the tools listed below. Organise the tools as shown in the “Generate ideas” tools scheme.



- 1 FACILITATOR CARD:** Print this tool in A5 format. It is a useful reminder of the most important aspects of the relevant activities during the work session.
- 2 BRAINSTORMING TOOL:** Print this tool in an 70x100 cm format. Prepare the work session by hanging it on the wall.
- 3 BRAINSTORMING STIMULI:** Print this tool in a A4 format. This tool is composed of two kinds of cards: "Character" and "Inspiration of the last week". Print one each for every team member. At the beginning of the session, distribute the cards to the team members.



Ideate > Select Ideas

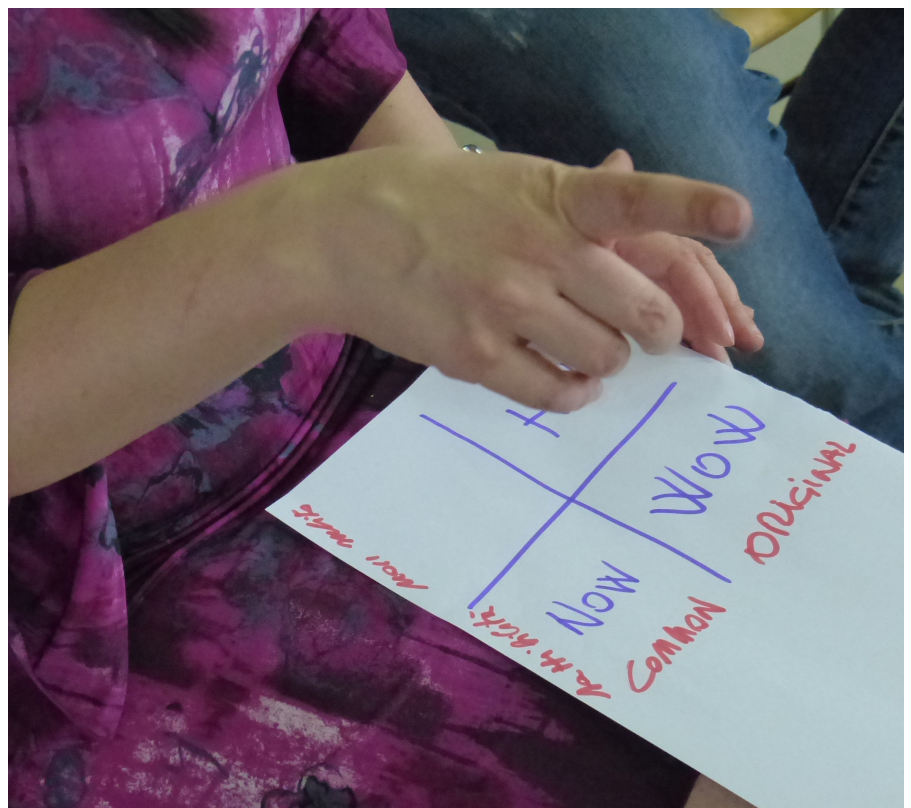
Select Ideas description

The ideas generated are clustered into affinity groups and then evaluated according to feasibility and originality criteria.

After having generated many ideas, and the exploration of different alternatives, the aim of this activity is to converge all ideas into a single, strong and commonly approved one.

First, the generated ideas are clustered, in order to form groups with strong connections, with the end goal of putting the best parts of several ideas together to create more complex concepts.

To get to the selection of a single cluster, they are examined and evaluated according to feasibility and originality, in order to get an overview of the multitude of early ideas. Given the evidence shown by the evaluation, you are able to judge quickly whether ideas are immediately feasible or not, and whether they are highly innovative or not. Consequently, a single cluster of ideas is chosen. This idea is the one to further build upon throughout the rest of the process.





Ideate > Select Ideas

Select Ideas steps

TIME
60-90 mins



LEVEL
High



MODE
Reflective, Hands on



MATERIAL
Felt tip pens, tape, big post-its



The aim is to converge all ideas into a single shared one.

01 CLUSTER THE IDEAS. Move and replace the post-its containing similar ideas in order to form some clusters. The clusters are groups of ideas that are linked to each other, or inputs that are not proper ideas, but could add specifications to the cluster itself. Once the clusters are formed, a title is given to each cluster and written on a bigger post-it.

02 POSITION IDEAS. Take the clusters one by one and review them, discussing their level of feasibility and originality with the team. Place each cluster's title into the CO-CD box in one of the four quadrants, according to the evaluation criteria.

03 VOTE IDEAS. Once all the cluster's titles have been placed in the CO-CD box, the most promising ones can be identified and worked on, while the less promising ones can be dropped (not feasible and not original). The goal is to narrow the choices down to just one. To do so, each team member will have the possibility to express 3 preferences, by crossing (with a marker) the ideas that in his/her opinion are the best ones. After all the team members have voted, the idea with the most preferences is the elected one to be worked on for the rest of the process.

04 DESCRIBE THE IDEA. After the selection of the cluster, the idea is structured into a more concrete concept. The "Idea Description" tool is a support tool to rewrite and define the selected idea.

TIPS

- ▶ In the process of clustering it is natural to think that many ideas can be matched into a single cluster. It is important not to mix them up too much, but to focus on the key points of difference between the ideas, in order to get more clusters - each of them with a stronger connection.
- ▶ There are two ways to form clusters. On the one hand, they could be formed by similar, connecting ideas. On the other hand, they can be a mix of ideas and some elements that are not ideas themselves, but that can add or define some specific aspects.
- ▶ The title given to the cluster is important, since it has to describe, in just few words, the essence of the cluster itself. In this sense titles should be evocative and meaningful, in order to identify the cluster in a unique way.
- ▶ Once you have identified the selected idea, be as specific as possible in its description. In this phase, ideas are not clear and defined yet, so take the chance to use the "Idea description" tool as a means to clarify the idea better within the group.



Ideate > Select Ideas

What to keep in mind



Suggestions that must read for:

1 The idea you select in this phase is the idea you will work on for the rest of the process. Therefore, it is important that the whole team agrees on it and is proud to work on it. Make sure the team believes in the selected idea. If they don't, discuss other ideas with many votes that could bring more consensus.

2 To position the ideas in the CO-CD box, the criteria that are given are: feasibility and originality. It could be useful to take the time to discuss the meaning and level of acceptance that you want to use for these criteria.

3 During the positioning of the ideas, try being as realistic as possible. A good evaluation in accordance with the criteria is a key element for the success of the selection. Taking that into account, many ideas could be interesting at first sight, but then get re-evaluated.

4 To continue with the process, it is necessary to select just one single idea. This doesn't mean that the "dropped" ideas are not interesting or don't have any potential. For this reason, you can document and keep track of them, as they could become useful for future projects.

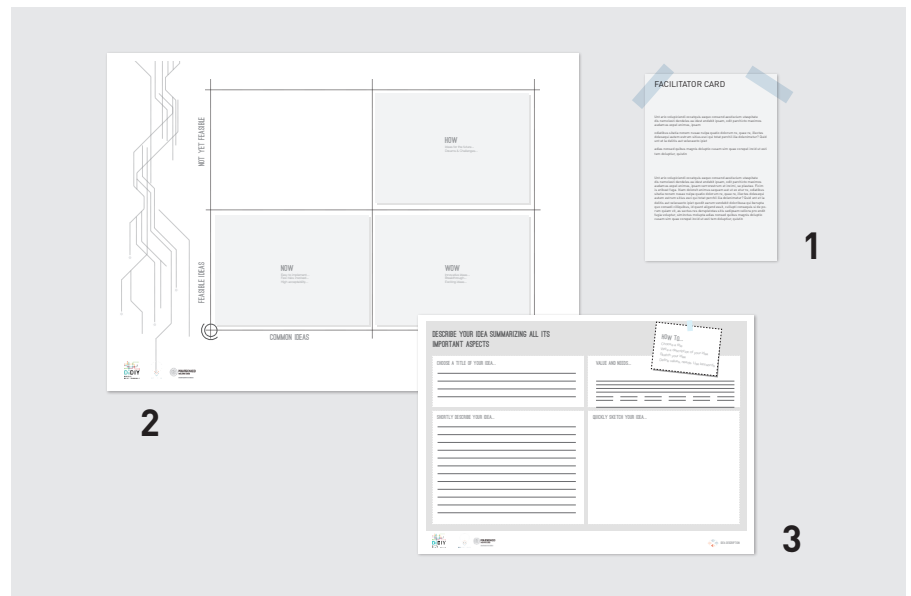


Ideate > Select Ideas

Settings and Tools



Set up the activity by downloading and printing the tools listed below. Organise the tools as shown in the Select idea tools scheme.



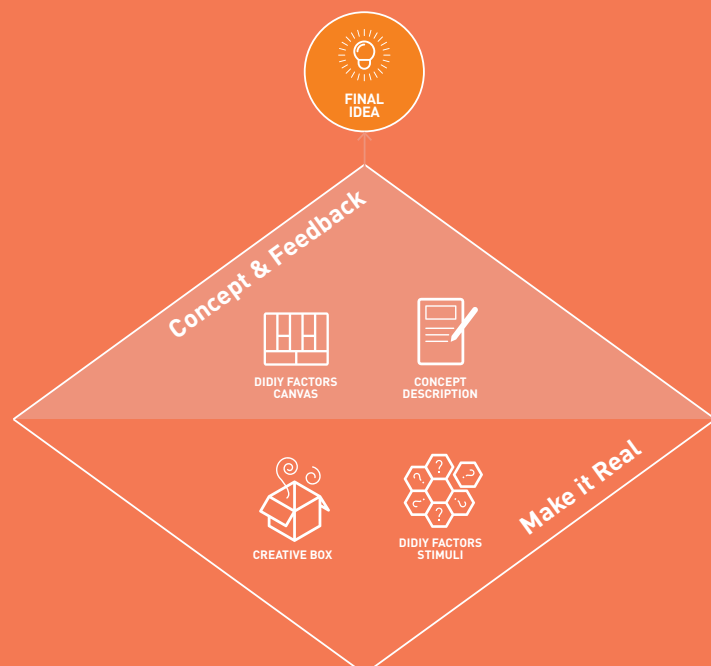
- 1 **FACILITATOR CARD:** Print this tool in A5 format. It is a useful reminder of the most important aspects of the relevant activities during the work session.
- 2 **CO-CD BOX:** Print this tool in 70x100 cm format. Prepare the work session by hanging it on the wall.
- 3 **IDEA DESCRIPTION:** Print this tool in A3 format.



BUILD TO THINK

The third step of the Digital DIY process is called Build to Think. In this step, the selected idea is designed and implemented with the DiDIY fundamental factors. **The goal of this step is to make ideas tangible through prototyping, so as to provide continuous learning, and validation of the Innovative Idea with a collection of feedback for further development.** The team is provided with a series of raw materials (string, cardboard, games, toothpicks, Styrofoam, sticky tape, etc.), with which they produce “rough prototypes” that visualise the selected idea tangibly. The use of tangible resources enables the involvement of the team on multiple levels and through multiple sensory perception. The activities designed for this step give way to constant reinterpretation throughout the prototyping activity, in order to continuously re-establish priorities and achieve a collective product. By manipulating and assembling materials three-dimensionally, people are able to assess the quality of their idea, and immediately ascertain its success within the group.

The output of the Build to Think step is the Final Idea.





Build to think > Make it real

Make it real description

Through prototyping the ideas become tangible so as to provide continuous learning.

The selected idea is made tangible through a prototyping activity, in which a conceptual prototype is built with simple materials that are easy to manipulate.

Prototyping is a way of thinking and designing through the physical construction of an idea. This allows visualisation, which in turn aids the discussion among team members, the comprehension of the idea itself, and its further development.

Prototyping is about building and making the idea real whilst thinking. Tangibility can reveal much more than simple theory. It also helps to communicate and share the idea with others, in order to enrich and improve it. When the goal is to get impactful solutions, it is necessary to make them real, and not just abstract concepts.

The activity is divided in two parts: In the first part, the team can freely prototype their idea, during the second one they are invited to implement and expand on their idea, integrating the fundamental factors by using the "DiDIY Factors Stimuli" tool. The tool provides questions that help people to design and enrich their project by using the DiDIY factors, to make it more innovative.





Build to think > Make it real

Make it real ideas steps

TIME
90-120 min



LEVEL
Medium



MODE
Hands on



MATERIAL
Felt tip pens, tape, creative box



The aim is to expand the selected idea, integrating the fundamental factors of DiDIY.

01 RAPID PROTOTYPING. Invite all the team members to a 15 minutes prototyping session to start building their ideas, using the material given (see "Creative Box" tool). To prototype at best, it is important to keep an open and unprejudiced mindset. Make the "Creative Box" tool available to the team, and use the materials to start visualising the idea and make it tangible. Pick a material that inspires you, modify it and position it to start giving a shape to the idea. Try to represent the idea as complete as possible, indicating the people involved in the idea, the context, the tools and the key components that enable the project.

02 ENRICH THROUGH FUNDAMENTAL FACTORS. After the initial prototyping phase, invite the team members to expand the idea design by using the DiDIY fundamental factors identified in the exploration phase. Each area of the tool that identifies the fundamental factors must be picked up one by one, the questions and definitions read. All the team members answer the questions or get inspired by the description, continuing to build the prototype by adding details or by redesigning some aspects of their project.

TIPS

- ▶ Start building something, it doesn't have to be perfect or complete. Just pick up a material and imagine what it could represent and how it could be used to envision even just a part of the idea.
- ▶ The activity needs a great deal of initiative, especially when the team is stuck. Try to encourage them by picking a material and building a part of the idea. This will stimulate all the team members to keep on prototyping.
- ▶ While you and the team are building the idea, it's important to create and tell a story around it. This will increase the team's involvement in the activity, creating a shared imaginative environment that allows easy visualisation and envisioning of materials and objects as real components.
- ▶ Feel free to use all the given materials in any way you'd like: a pen could turn into a magic wand, a straw with some coloured stickers could turn into a traffic light, etc.
- ▶ Have fun and keep on building with an open mindset, refraining from any kind of judgment.



Build to think > Make it real

What to keep in mind



Suggestions that must read for:

- 1** Don't be concerned with the aesthetic quality of the result, it doesn't need to be perfect. Just make it good enough to get the idea across, and concentrate on using the prototype as a means to help making the idea tangible.
- 2** The prototyping activity is very effective because it helps to solidify the project concepts which, until now, have only been stated orally.
- 3** Make all the prototype components clearly understandable. Assign a label to the elements that are not instantly visually recognisable. For example, a toothpick with a label indicating the name of a city can represent a physical environment.
- 4** During the second part of the activity, when combining the prototyping with the fundamental factors, make sure that all their implications are visualised and built. Stress how important it is to be careful and accurate during this step. The activity can be iterative, and there isn't a specific order for the introduction of the DiDIY fundamental factors. Repeat it as many times you feel is needed to obtain a successful and satisfying result.
- 5** The "DiDIY Factors Stimuli" tool can be used in different ways, according to the level of energy and involvement of the team. You can either elect one of the team members as a speaker, or ask each member to read, in turn, a fundamental factor's description and questions. This will make them feel more involved in the co-design process.

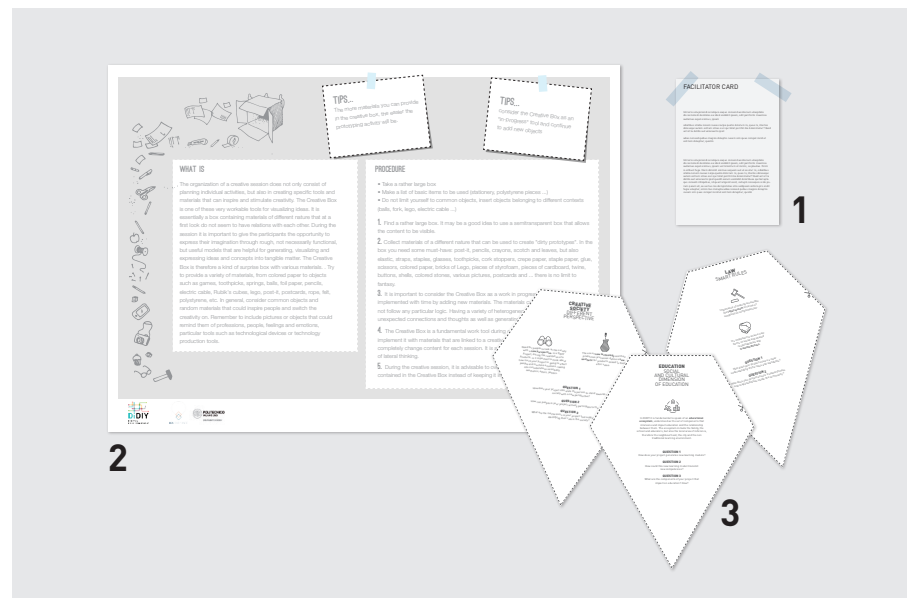


Build to think > Make it real

Settings and Tools



Set up. Prepare the activity by providing the team with a box containing various materials to facilitate the production of prototypes and three-dimensional sketches. Allow participants to freely express and represent their ideas. This is a very dynamic activity, in which all the members have to be able to move freely within the space.



- 1 FACILITATOR CARD:** Print this tool in A5 format. It is a useful reminder of the most important aspects of the relevant activities during the work session.
- 2 CREATIVE BOX:** The more materials you can provide in the creative box, the easier the prototyping activity will be. Print the creative box card in A5 format. Try to provide a variety of materials, from coloured paper to objects such as games, toothpicks, springs, etc. In general, consider common objects and random materials that could inspire people and switch the creativity on. Remember to include pictures or objects that could remind them of professions, people, feelings and emotions, particular tools such as technological devices or technology production tools.
- 3 DIDIY FACTORS STIMULI:** Print each page of this tool in A3 format. Cut each area to have a more dynamic tool. To have a game effect, you can print the tool on a 5mm foam board, or glue the printed material on a blank one.



Build to think > Concept
& Feedback

Concept & Feedback description

A further step to evaluate how the fundamental factors have been integrated in the concept.

The aim of this activity is to document the fundamental factors of Digital DIY as a continuous reference point for all the team members, to reflect on it and to collect observations, criticism and comments about the developed idea.

This is a fundamental step to clearly define the concept that has emerged, and how the fundamental factors have been integrated. It helps to rationalise all open thoughts, and to further clarify the idea through further convergence.

The activity ends with a reflection on the idea that was built, and a collection of feedback from each team member about the viability of the idea and the aspects that need to be improved.



Build to think > Concept
& Feedback

Concept & Feedback steps

TIME
60 mins



LEVEL
Medium



MODE
Reflective, Hands on



MATERIAL
Felt tip pens, post-its



The aim is to validate the Innovative Idea with a collection of feedback for further development.

01 DESCRIBE THE CONCEPT. After the idea enrichment through the fundamental factors, the concept should be described. The “Concept Description” tool is an aid to rewrite, define and solidify the defined concept.

02 DIDIY FACTOR CANVAS. Together with all the team members, write some keywords or some short sentences that summarise how the fundamental factors are expressed in the idea inside each area of the “DiDIY Factors Canvas” tool. Each area of the canvas is dedicated to a single DiDIY factor.

03 COLLECT FEEDBACK. Dedicate the last part of the activity to listen and collect criticism and comments by each team member regarding the resulted idea or the performed activity. This will help the team to think about how to bring the idea to the next level, how to improve some aspects, or how to perform some activities better in order to obtain better results.

TIPS

- ▶ Make sure that the description of the project and the sentences that summarise the fundamental factors are written as clearly as possible. This will help when you have to refer to it after a period of time.
- ▶ If the team has difficulties in summarising a factor, this could mean that it was probably not well defined in the project. In this case, you should invite the team to go back to the project and define the missing aspects better.
- ▶ When collecting feedback, you should be able to start and moderate a discussion, and gather as many comments as possible. You can collect the feedback by yourself, or ask participants to write it on post-its.
- ▶ Don't block or influence the comments in any way. The team should be inspired and stimulated.

Build to think > Concept
& Feedback

What to keep in mind



Suggestions that must read for:

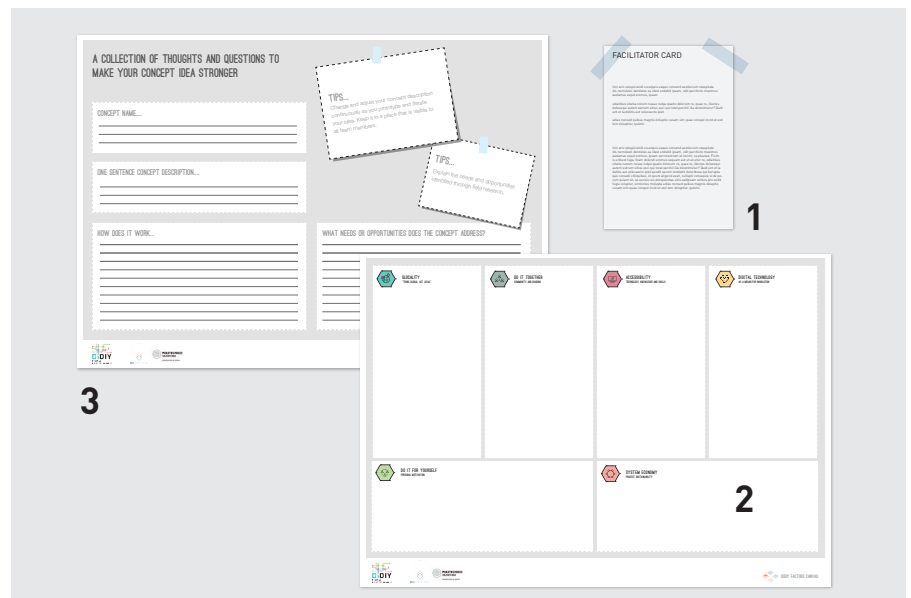
- 1** This activity is relevant because it helps to make a resume of the designed idea, and verifies that all the DiDIY factors were considered and included in the idea. If you notice that some aspects should be implemented, it's important to bring the team back to the previous step to explore the factors that were not well integrated. Stimulate the group to reflect on it and integrate it.
- 2** At the end of the activity, ask the team to make a pitch of their project, in particular, explaining how the factors have been developed. Film it or register a voice track to have a clear documentation that can be referenced at later point in time. It also helps when you have to show the idea to other stakeholders.
- 3** You can decide on how to collect feedback and comments from the team. You can ask each one to write a comment on a post-it and then read it, or you can directly write it yourself. You can even decide to play a game. The important thing is that each team member participates in the feedback collection, and that it is done face-to-face. For this reason, it is usually better to use a circle configuration.

Build to think > Concept
& Feedback

Settings and Tools



Set up the activity by downloading and printing the tools listed below. Organise the tools as shown in the Concept&Feedback scheme.



- 1 FACILITATOR CARD:** Print this tool in A5 format. It is a useful reminder of the most important aspects of the relevant activities during the work session.
- 2 DIDIY FACTORS CANVAS:** Print this tool in A3 format. Print more copies, you might need them!
- 3 CONCEPT DESCRIPTION:** Print this tool in A3 format.



This toolkit is the result of 16 co-design workshops held by a **IDEActivity Center** within the framework of the EU funded project “**Digital DIY**”.

Ideactivity Center

A RESEARCH CENTER FOR CREATIVITY DRIVEN INNOVATION THROUGH DESIGN

The IDEActivity Center is a Center for Excellence in Creativity and Design, whose aim is to give value to all aspects of creativity, promoting innovation through design, as well as to activate and re-enforce all phases of the ‘creative process’ within any given context. IDEActivity believes that a creative approach can be stimulated, cultivated, expanded and channelled on specific themes. In this sense, a methodology has been defined for the creation of new custom and flexible tools aimed to support innovation techniques and processes in a scientific way.

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WORKSHOP VENUES

Polifactory - Milan
Ateneu de Fabricació La Fàbrica del Sol - Barcelona

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*For more information on what you can do with the content and ideas contained in this guide, **contact us**. If you will be an experimenter or facilitator, please let us know your feedback or improvement.*





YOU CAN DOWNLOAD ALL THE ACTIVITY TOOLS AT:
ideactivity.polimi.it/toolkits/didiytoolkit



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