

Guidelines



Living Lab Guide

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Abstract

This document explains what Living Labs are: the concept, their nature and varieties, the process of development, their uses and methodologies as well as other pertinent aspects for the creation of specific living labs to carry out pilot programmes within the MINDb4ACT project. The guide was created to enable MINDb4ACT partners to apply the Living Lab methodology to the 17 pilot projects that will be carried out in nine European countries (Austria, Belgium, Denmark, France, Italy, Poland, Spain, United Kingdom) throughout the project's life span. Pilot projects concerns innovative and ethical interventions (early detection, prevention/mitigation, and de-radicalization of violent extremism) in four key domains: prisons and judiciary system, schools and learning centers, local initiatives (cities and immigration hotspots), and the Internet and media.

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Executive Summary

- Living Labs are harnessed to facilitate technological, social and/or cultural innovation
- Open methodologies and collaborative methods are employed in Living Labs
- The experiences of their users are investigated in Living Labs for the purposes of person-centred innovation
- People with a wide range of professional and institutional profiles take part in a Living Lab and they work in an interdisciplinary way
- The MINDb4ACT Living Lab is a socially innovative Living Lab specialising in finding solutions to the phenomenon of violent radicalism
- A variety of pilot projects are coordinated from the MINDb4ACT Living Lab
- Methodological support is provided by the MINDb4ACT Living Lab to execute the pilot projects
- In order to set up the MINDb4ACT Living Lab it is necessary to establish a promotor group, an operating group and a community of users and to activate a process of research, design and validation of solutions
- The MINDb4ACT Living Lab needs to establish a mechanism for communicating between its members and a way of organising the documentation that is generated
- The MINDb4ACT Living Lab has the task of documenting and validating existing solutions to the problem of violent radicalism and designing and validating new solutions
- The MINDb4ACT Living Lab has the task of devising a plan for training professionals on the basis of the results obtained during the research and the process of creating and validating solutions
- The MINDb4ACT Living Lab has the task of designing the plan to scale up the solutions that have been found and demonstrated to be effective
- The activities of MINDb4ACT Living Lab need to be documented
- The impact of MINDb4ACT Living Lab needs to be evaluated by comparing the goals with the results using a suite of indicators

What is a Living Lab?

In the literature on Living Labs, the term 'living lab' is predominantly used to refer to one or more of the following attributes:

1. A **space for designing and validating** projects involving technological, social and/or cultural innovation
2. A type of **structure dedicated to Research, Development and Innovation (R&D&i)**.
3. A **legal entity** designed to make it possible to work on a single level with stakeholders from the public and private sectors and citizens (PPPP - People-Public-Private-Partnership)¹.
4. A variety of **participatory methodology** based on active collaboration and cooperation between the various agents of a system².
5. A set of fundamentally qualitative **research techniques**.

Living Labs as spaces for the coordination, research, design and validation of innovation projects

Living Labs are a type of space born of the information society. They originally emerged from the need to think about how technological innovations could be adapted to people and to society. Soon however they started to be used to coordinate innovation projects, from the collection and generation of ideas to their manifestation in the guise of new products and services, products and services that were subsequently introduced to the marketplace or society. A Living Lab gathers information together, generates and validates ideas, concepts and designs and innovates. It is an instrument created to assist innovation processes from start to finish. This capability of providing holistic support and follow-up is fundamental to Living Labs.

As a type of laboratory, Living Labs have a singular characteristic: they are set up to document, generate and experiment with ideas, concepts and/or prototypes of new products and services. They do this in real situations with real people who use prototypes or new version of products and/or services before they are formally inserted into the market or society. Taking this as their premise, Living Labs are not *closed*

¹ PPPP - People-Public-Private-Partnership. A concept that is used when public, private and social entities (e.g. NGOs, associations and citizens' networks) collaborate and cooperate in projects.

² In the world of Living Labs, the active participation of the various agents that form part of a system is a basic requirement. There is no possibility of any of the parties that might have something to say being excluded because what a Living Lab tries to create is precisely the conditions enabling distinct perspectives to come together and have the chance to share their experience and knowledge; hence the fundamental importance of the involvement, empowerment and participation of all the agents, especially those most implicated in the problem and the beneficiaries of a solution.

(cont.)

scientific laboratories where researchers conduct experiments under controlled conditions but rather *open* and flexible laboratories³ where users, designers, researchers, developers, entrepreneurs, associations, administrations, academics, etc. come together and cooperate to give impetus to innovation projects.

Living Labs are thus linked to the worlds of:

- User experience research
- **usability**⁴ research (to make products and services more user-friendly),
- **information technology**⁵ (to democratise access to and the use of new technologies),
- **creativity** (to generate ideas and ideas, creating designs and prototypes and validating them), and
- **innovation** in any of its *types* (technological, social and/or cultural), in any of its *forms* (innovation in products/services, in processes, in organisations, in business models or in the way of marketing products/services) or in any of its *degrees* (incremental, radical or disruptive innovation)⁶.

Within the framework of the MINDb4ACT project, we would be talking about a Living Lab specialising in the subject of violent radicalisation. Within this Living Lab focusing on violent radicalisation a series of investigations will be carried out in four specific and well-defined settings (schools, prisons, urban settings and settings involving the news media and the internet). The MINDb4ACT Living Lab needs to fulfil three functions:

1. To serve as a research space devoted to understanding the problem of violent radicalisation (by, for example, gathering information about its manifestations, its

³ Living Labs are related to the concept of Open Innovation (See, for example, the writings of Henry W. Chesbrough). This concept insists on the benefit of *opening up* innovation projects to the users who will be their beneficiaries to ensure that new products and services take into account users' real needs. In order to carry this operation out, activities are created in which designers, researchers, users and other stakeholders cooperate to come up with more people-centred products and services (User-Centred Innovation), which are consequently more adapted to their needs. The main argument for Open Innovation is that it helps to reduce the risks of new products and services being rejected by the market.

⁴ 'Usability' is a term that is particularly used by designers to determine whether a product, service or platform can be used easily by the people it has been designed for. A product is said to possess usability when someone is capable of using it easily from the first moment of coming into contact with it. 'Friendly' and 'intuitive' technologies are also referred to in this context. The ideal that usability aspires to is for there to be no need to explain to a user how to use a new product because its design proves to be completely understandable.

⁵ Information technology or ICT (information and communication technologies)

⁶ In the literature on innovation, a distinction is drawn between three degrees of innovation according to what a new product changes compared to an earlier product that served the same purpose. Thus, *incremental innovation* refers to when the change is modest, aesthetic or cosmetic (for example, improving a video surveillance system in a prison by increasing the number of cameras, their definition or storage capacity). A *radical innovation* involves a substantial change relative to what already exists (for example, linking the cameras to an intelligent facial recognition system to locate and track the whereabouts of a group in real time). A *disruptive innovation* involves a change of concept (for example, instead of trying to recognise a prisoner, replacing the facial recognition technology with a new technology that requires the monitoring systems to be changed entirely by, for example, implanting a chip in the subject's body that ensures precise and continuous geolocation).

dynamics and processes, its social impact, its prevention, etc.) for the purposes of which it will need to assemble documentation (be they primary sources/documents or secondary/fieldwork) on the subject and analyse it (state of the art, case studies, interviews with professionals and specialists, fieldwork, etc.),

2. Secondly, and on the basis of the information assembled and analysed, to serve as a creativity space for the purposes of designing, trialling and validating new solutions, in this case with the aim of solving the problem and consequences of the phenomenon of violent radicalism. These solutions may be technological, such as a new automated monitoring device, or social, such as a new social procedure for identifying the phenomena of violent radicalism. A pilot test is a test that is carried out once various prototypes of products or services have been fine-tuned. When it seems that the last prototype is ready, a pilot test is set up to ensure that everything works according to plan. A pilot test is a test that is carried out on a small scale. If the result of the pilot is successful, work can be started on implementing a solution on a larger scale. For example, a system for the early detection of radicalisation in schools should, like all mechanisms, be fine-tuned until it works satisfactorily before being announced as a solution. It will then need to be adapted to the various places where it is going to be implemented.
3. And thirdly, once the new solution has been validated after carrying out the pilot test, Living Labs are also used to implement the innovation and conduct the follow-up process to evaluate their impact.

It is not imperative for a Living Lab to carry out these three functions (some living labs specialise in only one of the three) but 'complete' Living Labs offer this threefold service because combining research, development and innovation into a single space increases efficiency and reduces the costs of coordinating these complex processes.

Living Labs as structures dedicated to R&D&i

As **structures dedicated to R&D&i**, Living Labs can create and operate in specific premises or operate as a project that harnesses pre-existing structures. This does not need to be a newly-constructed framework. They can be run in facilities that are multi-use, subcontracted or adapted for the occasion, or in the same places where the fieldwork is carried out. The important thing here is the concept of the *in situ* laboratory. From the Living Lab perspective, the places/spaces where things take place are interpreted as laboratory spaces.

In the case of MINDb4ACT for example we could talk about prison-laboratories, refuge-laboratories, urban area-laboratories, school-laboratories as well as platform-laboratories. Such laboratory spaces act as focus points in terms of:

- 1) Organising research to document what already exists (for example, the state of the art for existing best practice in terms of rehabilitation programmes),

- 2) Creating designs and prototypes of new ways of doing, thinking about and communicating things (for example, an alternative intervention programme, a specific training programme, an association with a particular goal or a new social network to facilitate connections between institutions, companies and citizens), and
- 3) Trying out and validating the designs and prototypes that have been devised to give shape and robustness to what may exist (the new and innovative).

In other words, such laboratory-spaces are used to work in two areas:

- a) Conducting research to discover and document the solutions that already exist, and
- b) Devising, conceiving, trialling and validating new solutions and designs.

Operations in the first of these two areas are conducted from a scientific research perspective (involving finding out what is happening in the world). In the second they are conducted from the design perspective (which consequently involves creating something new for the world). From the scientific research perspective, for example, experiences of how the problem of violent radicalisation has been addressed are collected. From the design perspective of engineering change, ideas are generated, new concepts are elaborated and intervention models and prototypes are created and validated with users in real conditions and scenarios. This is a key aspect of the Living Lab methodology. In the course of these processes, the parts of the solution are first consolidated one by one and then, when it seems that the components are working (for example, a professional association has been created and is up and running, a platform has been developed, protocols have been established and a programme created) a general pilot test is carried out to ascertain whether each of the parts fits cohesively into the whole. If the pilot test proves satisfactory, the validation process is concluded, a report of the results is drawn up and the practical instructions for using the new solution are provided. If the pilot study gives negative results, shortcomings are remedied and the pilot is repeated. These instructions should serve to scale up successful experiences in an endeavour to change the actual state of affairs. In other words, they should provide information that, as well as helping in the task of making strategic decisions, serves to equip technicians with expertise and to implement change.

The important thing is that, whether it is a case of a Living Lab located at physical premises, or it lacks designated physical premises but everyone refers to it as a Living Lab, as in the case of MINDb4ACT, or it has a virtual base (for example, in the case of an online platform), what must be ensured is that MINDb4ACT Living Lab functions as a space for coordinating research, development and innovation (for the creation of new concepts, new products or social services, new ways of organising, new processes, new ways of communicating, etc.) deriving from the efforts expended.

Some Living Labs, as well as exploring and assembling the experience and knowledge of users, offer co-working⁷ spaces and showrooms⁸, host events, run training courses, offer spaces and technology to investigate users' experience both qualitatively and quantitatively, foster research, development and/or innovation projects and, among other practical functions, provide advice to projects and tendering processes, and foster entrepreneurs. A Living Lab that offered all these services would be a 'complete' Living Lab. There are some that at times only offer some of these services.

One of the elements that characterises and provides a rationale for Living Labs as user-focused R&D&i spaces are the *user communities* that are created around their activities and projects. A great effort is made at Living Labs to devise, create and catalyse user communities capable of taking part in the R&D&i projects. Such communities may be highly diverse. They may be made up of ordinary or specialised users, or made up of both professionals and ordinary users. These communities provide part (sometimes all) of the social and human capital needed in the user-centred design and innovation projects⁹. The communities are attracted and stimulated through content (for example, via a blog) and with activities (for example, involving the motivation and cohesion of the community, and involving experimentation).

Living Labs as a space for collaboration between the public and private sectors and citizens

As a **legal entity** some physical and permanent Living Labs are constituted as foundations. Others operate as associations, as research centres and some as private companies. The structures of such foundations are chosen in accordance with the types of interest they represent. These types of interest in the world of living labs generally fall into four categories:

a) those of public administrations (the public sector)

⁷ Co-working spaces are a new generation of facility fundamentally aimed at creative workers. In such spaces, desks are rented out, workstations and services are supplied to entrepreneurs, micro-businesses and SMEs. The advantage of co-working is that in the same workspace professionals with distinct specialities may be found, professionals who may need each other to cooperate on some of their projects. Co-working provides cost-effective workplaces. They reduce the cost of renting the workplace. They offer proximity and rapid access to knowledge. Although one of the benefits that this service provides is access to a range of professionals, specialist co-working spaces have also emerged.

⁸ Showrooms are places that are used to display new products and services. They operate as interactive showcases. For example, a company has developed a biometrical recognition system which it displays in a showroom: whoever is interested in finding out about the system can go to the showroom to try it and decide whether it is what they are looking for and can be applied to meet their requirements.

⁹ User-centred innovation and people-centred design are two ways of referring to a type of approach that emphasises that in order for new products and services to work, they must be designed in such a way as to satisfy the real needs of users. In other words, they must be usable and user-friendly products. User-centred design contrasts with technology-centred design. In the former, technology is adapted to the user. In the latter, it is the users who have to adapt to the technology and because this proves to be an inconvenience, they tend to reject or distance themselves from the product, which restricts its spread; hence the tendency to favour user-centred designs. They are more convenient and the market and society accept them more readily.

(cont.)

- b) those of the industrial and business world (the private sector),
- c) those of the academic and research world (public and private), and
- d) those of civil society and the general public (people).

Note that these four patterns correspond to the four fundamental institutional sectors. This is known as the Quadruple Helix¹⁰ model and underlies the form of association known as PPPP (People-Public-Private-Partnership), which is typical of Living Labs (at least those recognised by ENoLL – the European Network of Living Labs).¹¹

In the **context of a project such as MINDb4ACT, geared towards coordination, research and the execution of pilot studies limited by a specific timeframe, the foundation model is difficult to apply**. In these cases, the very consortium that makes up the project acts as a living lab consortium. In the future however, based on the experience gleaned from the MINDb4ACT project and as an added-value aspect of the results, one can foresee the possibility of harnessing the accumulated experience for the creation of an international structure specialised in the design and validation of solutions to combat violent radicalism.

For practical purposes therefore, what a Living Lab requires in the context of the MINDb4ACT project is that all the actors who are going to participate in one way or another in the pilot projects envisaged share a social space in common, a tool for communicating with each other and protocols for arranging cooperation between them. The group needs to be designed bearing in mind that, as far as possible, the various agents who make up the system should be included such that all (or the majority) of the active agents' viewpoints, values and perspectives can be represented. An example might be a school-laboratory where an attempt is made to develop a mechanism for the early detection of radicalisation. In a case such as this, participation should include the management, the coordination and teaching staff as well as parents' associations, possibly the supervisors of after-school activities (if this makes sense within the system) and the library staff (if it is felt they should be included on the grounds that the library is a place of exploration), the psychologists and the social workers attached to the school. But the group should also include those who, from the perspective of security and public administration, are going to be connected to the project to enable

¹⁰ The Quadruple Helix model emerged as a response to the limitations of the Triple Helix model. These models offer two ways of catalysing the innovation process. In the Triple Helix model, cooperation takes place between the public administrations, businesses and universities/research centres. From the 1990s, the Triple Helix model served to inspire the founding of a whole new generation of science and technology parks (see the publications by Loet Leydesdorff and Henry Etzkowitz at <https://www.leydesdorff.net/lists/th.htm>). The Quadruple Helix model emerged with Living Labs and added users/consumers/citizens and their organisations, associations and networks to the earlier model (see, for example, *Using the Quadruple Helix Approach to Accelerate the Transfer of Research and Innovation Results to Regional Growth* at <https://cor.europa.eu/en/engage/studies/Documents/quadruple-helix.pdf>). Five-Helix models are now being mentioned. The fifth helix seeks to tease apart the complexity of the helix that encompasses people and organised civil society.

¹¹ The ENoLL, European Network of Living Labs, is an international network founded in 2003 bringing together the Living Labs of Europe and other continents. It acts as a lobby to promote living labs. See <https://www.openlivinglabs.eu>

the detection mechanism to connect the scholastic world with the prevention and security world.

It should be borne in mind that a laboratory-space is an instrument designed to intervene in complex systems and improve the existing state of affairs and processes. In order to work it will require the motivation, flexibility, understanding and tolerance of the people involved. Conceiving, designing and organising a new laboratory-space in the context of the fight against violent radicalisation requires a major coordination effort because it will have to negotiate a series of highly rigid structures and regulations. The leader of the project or the Living Lab is the person who will need to be connected to the various stakeholders to ensure that the efforts invested in the Living Lab reap dividends.

It should be noted that what is envisaged by a Living Lab is a systemic approach to problems. To improve a system (an incremental innovation), change a system (a radical innovation) or replace one system with another (a disruptive innovation), the various parties that may have a bearing on the process of conceiving, conceptualising, trialling, validating and implementing the change need to coordinate with each other. This entails locating the appropriate interlocutors, establishing a common language between them that is free of prejudices and cooperating to jointly design solutions aimed at improving, changing and replacing one thing with something else.

Living Labs as a methodology

Living Labs employ a range of resources as a research **methodology**. The literature on Living Labs uses expressions such as Open Innovation, User-Centred Design, People-Centred Innovation and User Experience Research.¹² These expressions are linked to a singular way of perceiving innovation processes, characterised by being open and being focused on the experience of users. The aim of pursuing innovation processes in this way is to minimise problems (for example, by making technological inventions more usable, more desirable, more feasible, more viable, more attractive and, among other things, safer).

By extending technological innovation to the social realm, as occurs in the case of MINDb4ACT, we are talking about social innovation in the sense of new solutions to the problems of security, coexistence, wellbeing and, among others, the quality of life of members of society. Technology may or may not have an involvement at this point, depending on the projects that are brought to fruition. The possibilities offered by technology are manifold. The problem is in deciding upon the most suitable option in terms of the actual needs.

¹² In the design world and as part of the effort to achieve more user-friendly designs and products, the expression User Experience Research is used to refer to the suite of practices and techniques employed to ascertain users' experiences and exploit them to ensure that products are more robust and comprehensive. User experience research harnesses both qualitative and quantitative methods.

In order to generate ideas, concepts, proposed designs and projects, as well as the involvement of specialists, Living Labs work with *communities of users*. In the technology context, such communities help to validate ideas, concepts, designs and prototypes, providing feedback on their experiences of using new products and services, and collectively passing on their intelligence via all manner of consultations on creative proposals. If no such community is available however, it must be devised, recruiting its members, motivating them and managing their contributions. It is necessary to have an administrator of the community and to devise a programme featuring content, debates and events, and to equip its members with information, knowledge and tools. (See Step 3 in the Process of Developing a Living Lab section below).

As a methodology, Living Labs provide a way of doing things based on: the active participation of the people involved; the proviso that the results should take into account the experiences and needs of the users; and the assumption that the creative process is a complex, recursive and collaborative process. Reference is often made to the notion of co-design in the sense that designs are not the product of a specialist but rather that the specialist coordinates and synthesises the efforts of many people who address a shared challenge and contribute to solving a problem by joining forces.

Living Labs as a suite for research techniques

Although **quantitative research** plays an important role in user experience research in terms of analysing data provided by mobile app users, data generated by sensors and cameras as well as all manner of wearable technologies,¹³ which collect signals from users' bodies, **qualitative research** plays a major role in ascertaining how users communicate their experience. It is not a case of two opposing methodologies however, but rather two ways of approaching reality in order to appreciate distinct aspects of the same thing. In the context of the MINDb4ACT pilot projects however, the qualitative approach turns out to be particularly pertinent due to the experiential and interpretative manner of the information provided.

The techniques used by qualitative research can be grouped into four large families:

1. Those based on in-person observation (In-person observation is enriched in Living Labs by the active participation and interaction of the researchers with those being researched).
2. Those based on different ways of asking questions (whether casual or programmed questions, one-off or lengthy; whether structured, semi- structured or open, or questionnaires; whether directed at one, two or three people or a group).
3. Those based on dramatisation and roleplays.

¹³ Wearable technology refers to a new generation of devices worn by users that monitor some of their functions, behaviour and reactions.

4. Those that involve activities or workshops in which textual, graphic, audio-visual or tangible materials are used to facilitate the emergence of experiences.

The term **ethnography** is particularly significant in the world of Living Labs. It is a way of finding out what is linked to the qualitative research. It may be understood in two senses: narrow or broad. In a narrow sense, ethnography is direct observation carried out on the ground. The researcher is present where the events take place. What is seen is what is reported. In a broad sense, during ethnographic research, given that researchers are already working on the ground, they take the opportunity to take part in community activities and interact with the research subjects in all possible ways that help to understand their culture. In this broad sense, when ethnographers engage in ethnography, as well as observing, they take the opportunity to ask, interact and foster all manner of situations that add to the researchers' knowledge of the experience. The researchers may be users, consumers, clients or play any other of the roles being researched.

The purpose of ethnography is to explore and discover a culture. Cultures are systems of values and norms that communities use to coordinate between themselves. In the context of MINDb4CAT it is possible to refer to the culture of violent radicalisation and to treat violent radicalism as a cultural phenomenon. The culture of an organisation (for example, that of a prison, a rehabilitation centre, a refuge, an online community or a school in a problematic district) may be studied. Similarly, an ethnographic study may be conducted of a rehabilitation process, a training programme or a scholastic activity aimed at identifying emerging violent radicalism. In other words, an ethnographic study may be organised on the basis of subjects, on the basis of organisations or on the basis of processes. All three cases involve dealing with people who possess knowledge and experience that the researcher will need to document.

Understanding a culture means knowing what the people who identify with a certain set of norms, values, beliefs, symbols, etc. say, do, have and think. For example, the importance they place on the hierarchy of their members, authoritarianism, being in possession of the truth, the division of the world into the strong and the weak, etc. From the ethnographic perspective, violent radicalism has a narrative and conventions that can be discovered by researching people and the scenarios and situations that they experience in the world of violent radicalism. From the point of view of social and cultural anthropology, sociology or social psychology, violent radicalism has its own behavioural algorithms and its own interpretive keys. The goal of ethnographic research is to understand this culture of violent radicalism. A violent radicalism Living Lab should be used to conduct ethnographic research in order to understand the culture of violent radicalism. 'Understand' here means, at least, 1) identifying its members' motivations, 2) identifying the knowledge, values and norms they use to order their world and live in it in accordance with what they think, do and feel, 3) identifying the spaces, objects and technologies they use to find each other, interact and communicate with each other, 4) identifying their strategies and 5) identifying the ways they carry out their activities.

Process of developing a Living Lab

It is not easy to design, create and consolidate a Living Lab. If a Living Lab is conceived as an exercise in collaborative research however, as has been envisaged for MINDb4ACT, in order to carry out a specific number of pilot projects involving social innovation and public participation, it may prove to be significantly easier to develop (although still not exempt from difficulties).

It is possible to identify a series of steps in the process of developing a Living Lab:

STEP 1. *Establishing the group promoting the Living Lab.* Prior to anything else it is necessary to create a lead group. This should be a mixed group that is easily capable of coordinating. This group takes ownership of the problem to be investigated and includes representatives of the institutions involved – public, private, companies, universities, NGOs, associations and so on, as may be the case. The group should be designed taking the Quadruple Helix model into account (see note 10). This group operates as the promotor of the Living Lab (See: *Living Labs as spaces of collaboration*).

STEP 2. *Establishing the group operating the Living Lab.* Secondly, the operating group has to be set up to design and carry out the research, create content, perform analyses and draw up appropriate reports and documents. This group plans the investigation, analyses the results and reports on the outcomes of the experiences. Given that the purpose of this Living Lab is to generate scalable models, the various versions of the solutions will continue to be designed and validated as time goes on. In order to design and validate solutions, Living Labs conduct research with and for users. (See *Living Labs as a suite of research techniques*.)

It needs to work therefore bearing in mind that the resulting report, in addition to the executive summary and the main body of the document, ought to contain at least two annexes:

- a) A route map to guide implementation in other places and by other research teams (this should also include a guide to content to be incorporated into a training regime).
- b) An action plan proposal on how to scale the pilot up regionally. To ensure that the relationship between the executive and operating groups remains fluid, some people in the promotor group should take part in a secondary, more operational way, or at least participate in its meetings.

STEP 3. *Establishing a community of users.* Having established the organisational structure of the Living Lab, one of the first things it will need to do is to create a community of users. This community will be essential to validate the solutions model put forward. It should be emphasised that the creation and activation needed to ensure that the activity of a community of users proves productive is arduous.

Management of user communities

One of the keys to ensuring that a community of users works properly is the care put into its design, its gestation period, its growth and its consolidation as a productive community (in other words, that it generates experiences and knowledge in a regular fashion).

In order to attract users, they will need to be offered some incentive, for example, content (some type of information with which they can provide feedback to the designers, researchers, etc.). Entries in blogs (texts, videos, provocative or suggestive images) and getting debates going can be good tools. This requires a *content creator* and a *community manager*. Another solution, simpler and less expensive, comprises using email groups. A more dynamic method involves organising events and periodic consultations (crowdsourcing). All these strategies are designed in accordance with the problem for which people are being asked to help. The ideal profile for running these tasks is that of a *researcher-catalyst*; a person who, as well as researching, devotes part of their time to catalysing the relationship with the researchers.

To start catalysing a community of users, content and activities are required to attract people. For this however it is important for there to be a particularly motivated group of users in each campaign of consultation (Von Hippel calls them 'Lead Users'¹⁴). This lead group may need a boost of additional coordination from the community administrator. This group is engaged in a parallel manner and operates as an animating, encouraging and motivating group for the general group's activity. This ensures that less effort is spent in getting debates going and the group's participation is greater.

STEP 4. *Activating the process of consultation.* Having planned the exploration (which methods and techniques will be used to carry out the research?), the operating group will have to execute the research (how, by whom, when and where is the information going to be gathered?) and subsequently process the results (how will the information generated, amassed, ordered and analysed be turned into knowledge?).

Activating the process of consultation is just one more step in the research process. Since it is a case of professional research however (aimed at transforming reality) and not academic (aimed at understanding the world), the research should be carried out bearing in mind that the results of the research effort should be capable of being applied to transform the existing reality. To this end the report should have an eminently practical approach, bearing more resemblance to an instruction manual and an implementation guide than a description of the results obtained. Setting out the results

¹⁴ Lead users are highly motivated users who are so involved in an innovation project that they at times end up knowing more about a product than those who have created or are promoting it. For more information see the publications of Eric Von Hippel at <https://evhippel.mit.edu/>

is only the preliminary step in order to elucidate how the desired change is to be brought about. In practical reports such as these the annexes (or supplements) are highly valuable, since they provide the empirical evidence (illustrations) for the instructions being recommended for carrying out the changes.

Timings and requirements of a Living lab

Time management in a Living Lab is fundamental. Budgets are generally tight and it is therefore desirable for time management to be as strict as possible. As a general rule, it will always be necessary to institute multilinear planning, in other words doing varying things at the same time, and trying to build unforeseen eventualities into the phases that have been planned. Since it involves relations with people and institutions, delays typically occur. The work must therefore be organised with the ongoing awareness of the need to gain time because, when they are least expected, unforeseen circumstances will arise.

In major projects where pilot tests are planned, such as EU projects, a paradox tends to arise that can lead to frustration and plunge the project into crisis. Tests are planned and a budget is drawn up assuming that the validation tests of the pilot study will provide positive results. But what happens when the pilot study is negative (the invention does not work as expected)? What resources will be used to remedy the situation? And what resources will be used to carry out a second pilot study to ensure that the tweaks have been successful and the solution can now be scaled up? Administratively, matters have been conducted as they were supposed to be. In other words, all the participants have acted correctly and, on the face of it, everything has been duly explained. The results however have left the door open to 'future research'. This is a lost opportunity. A living lab needs to change these dynamics on the basis that solutions are not always positively validated and it is sometimes necessary to incorporate unforeseen changes, changes that may be substantial. It is therefore necessary to accept that the pilot studies may prove complicated, and that budgets will have to be managed creatively as a result.

Worse still, what happens if, once the users are appointed, they ask for things that go beyond the remit of the project? What happens if instead of incremental changes (which the project is likely to be able to accommodate without undue difficulty) they ask for radical or even disruptive changes? What capacity does the project have to respond to such proposals? Was it not supposed to be a person-centred innovation project? As with the previous scenario, a Living Lab ought to be capable of resolving such dynamics.

One solution is to work on anticipating unplanned events. Users often surprise researchers with their proposals. Let us include time and resources for the unforeseen. Such events may account for 10, 25 or even 50% of the time and resources. The problems in the case of MINDb4ACT may even be more complicated. In interactions with individuals who have strong convictions, consensus in the context of democratic institutions may give rise to serious problems in terms of cooperating in the search for solutions that, in the final analysis, run counter to their beliefs. Persuading such people to cooperate may take up a great deal of time.

In other words, the duration of research depends on its complexity. It is always possible however to adapt it to the agreed deadlines. Everything depends on the use that is made of resources, on the time and on the people involved. Three, six, nine or 12 months give

enough time to resolve problems. One can do an ethnographic study or one can do a rapid ethnographic study and, if time is short, one can cut corners with a collaborative ethnographic study. There are many flexible ways of conducting research. What take up most time in such matters however are the initial partnerships between agents.

Personnel to be involved in a Living lab

Organisation chart for a Living lab

In general terms, the structure of a Living Lab devoted to technological innovation projects has a complexity that the MINDb4CAT Living Lab does not require. A 'complete' Living Lab has a board and an advisory council (a committee or board of trustees), and a three-pronged research, development and innovation management that may be in the hands of one, two or three people). It has a head of projects and then project coordinators and researchers, developers and research and innovation support staff. It may also have community developers and trainers. There may be staff devoted to communication, IT staff and people with specific expertise depending on the speciality of the living lab.

Since the MINDb4CAT Living Lab operates more as a research group however and originates from the structure of an EU project, its organisation chart should feature a group of promoters exhibiting a wide range of institutional and professional profiles, with a head and a spokesperson, and an operational group made up of the heads of the pilot studies and with at least a coordinator and an assistant of the Living Lab, and with one person responsible for overseeing and advising on methodology.

Typical profiles in interdisciplinary work

Social scientists, designers, communication experts, specialists in marketing, entrepreneurs, large companies, institutions, NGOs, industrial and software engineers as well as specific personnel appropriate to each context and community administrators may all converge in an R&D&i project. The magnitude and scope of the project determine the roles. In the case of MINDb4ACT, the personnel involved will depend on each specific pilot project. But **all the agents truly involved in a process, organisation or problem** ought to be included in the management and research process. For example, it could include civil servants, collaborators, designers of public policy, communicators, service providers and civil society associations, among other possibilities.

The important thing is that in designing the working group for each project the various agents comprising a system are represented and that, in one way or another, they are there to contribute to its dynamism. It might be the case of a prison, a refuge, a school, a training course, a rehabilitation programme, a new form of collaboration between institutions or a programme for the early detection of violent radicalisation in secondary schools. In all cases the system needs to be mapped out in such a way that is comprehensible (in other words, is easy to understand). To this end the relevant potential participants need to be identified, contacted and offered the Living Lab as a space of communication, coordination and cooperation for carrying out the pilot projects.

Cultural intelligence and the management of interculturality

One of the first tasks facing a group in which a range of varying professional viewpoints are going to be coming into contact with each other (in the sense of differing

organisational, institutional, sectoral, professional and work cultures) is to create a shared language between the participants. This can be achieved by applying cultural intelligence. Cultural intelligence is a competence that can be acquired. It is based on the premise that the conflicts stemming from communication between people arise as a result of their cultural differences. Cultural intelligence provides a suite of tools that aid understanding of these cultural differences and also enable them to be managed effectively during the interaction. A culturally intelligent person recognises the existence of cultural differences, is motivated to identify such differences, has the knowledge needed to identify them and is capable of designing strategies to minimise communication problems with people, groups, organisations and communities that possess different norms and values and consequently think and act in a different way. The value that is contributed by a culturally intelligent person to a group made up of varying profiles is his or her capacity to meta-communicate with the others. Meta-communication is communication about communication. For example, in some cultures, when it is necessary for one person to give negative feedback to another, it is delivered in a direct or very direct way. Being direct is generally regarded as 'normal' by members of this culture, and hence they do not beat about the bush when they convey their views. People in other cultures on the other hand prefer to be more subtle when giving negative feedback and prefer more indirect language so as not hurt the other person's feelings. When a disagreement arises between two people who have two different ways of conceiving negative feedback (one is annoyed because the other is 'too direct' in verbal communication, while the other is also annoyed because the former fails to 'call a spade a spade'), one of the ways of resolving the conflict is to engage in meta-communication: talking about how they are communicating and what they are taking for granted when they communicate with each other in order to realise that both think differently about how to give negative feedback. Meta-communication is important in order that the various constituents of a diverse working group are able to understand one another better when they communicate and are able to establish an agreed manner of proceeding.

This involves understanding that, for example, there are ways of communicating that can be adamant or flexible to varying degrees, direct as well as indirect ways of communicating, strict or more flexible ways of dealing with time, individualistic or more collective approaches, cooperative or more competitive approaches, people that are more geared towards being than to doing, synchronic rather than diachronic in their conception of time, people capable of tolerating uncertainty to varying degrees, etc. From the perspective of intercultural communication studies, or from a sociological or anthropological point of view, it is assumed that none of these preferences is 'better' or 'worse' than any other. They are simply different and each has social and historical reasons for occupying the position they do. Cultural intelligence helps to maintain fluid and inclusive communication with the other because it is constantly trying to understand how the other person thinks and the reasons for thinking in the way he or she does.

Cross-cultural studies, analyses of cultural intelligence and studies looking at the scope of intercultural communication provide clues to the resolution of intercultural conflicts in projects involving participants with as many nationalities as there are

professionals. The findings and observations of Richard Lewis in *Leading across cultures*, Fons Trompenaars in *Riding the waves of culture*, Geert Hofstede in *Cultures and Organizations* and Erin Meyer in *The culture map*, although applicable in the first instance to the business world, serve as an excellent introduction to this field. The summary provided by David Livermore in *Ten Cultural Clusters* also provides a good introduction.

Cultural Intelligence

According to David Livermore in *Leading with Cultural Intelligence*, there are four major factors in cultural intelligence:

- *Drive*. The degree of interest and motivation to understand the other
- *Knowledge*. The knowledge acquired about cultural dimensions for understanding similarities and differences between cultures
- *Strategy*. The skill needed to recognise what is happening in intercultural situations and the capacity to design strategies to improve the state of communication
- *Action*. The ability to know how to negotiate (in other words, how to adapt to the other or to require adaptation) in intercultural situations.

Cultural Dimensions

According to David Livermore in *Expand yours borders: 10 Cultural Clusters* these are:

- *Tendency towards individualism*
- *Tendency towards collectivism*

- *Low power distance. Tendency towards egalitarianism*
- *High power distance. Tendency towards hierarchical relationships*

- *Low uncertainty avoidance*
- *High uncertainty avoidance*

- *Tendency towards cooperation*
- *Tendency towards competitiveness*

- *Tendency towards short-term orientation*
- *Tendency towards long-term orientation*

- *Tendency towards direct, explicit communication (Low context communication)*
- *Tendency towards indirect, vague communication (High context communication)*

- *Tendency to address oneself towards the person, the being, the meaning of things, the emotional dimension, ascribing people to their reference groups (Being)*
- *Tendency to address oneself towards action, tasks, content and pragmatism (Doing, Doer)*

- *Linear, diachronic or monochronic outlook in relation to activities*
- *Multilinear, synchronic or polychronic outlook in relation to activities*

Audience to be involved in a Living Lab

The contribution that Living Lab methodology makes is essentially to include a diverse range of active participants in a system. Specifically, it includes an actor that has traditionally been viewed as having a passive role: the user, consumer, customer, patient, citizen or simply the people on the receiving end of something. In other words, those who are going to benefit from using a product, service, app or platform, the recipients of innovation of whatever type, form or degree this may take (see Living Labs as spaces for the coordination, research, design and validation of innovation projects).

Reference is made in the world of Living Labs to Person-Centred Innovation and User-Centred Design. The message conveyed by these approaches is that, in order to be accepted by the public, innovations need to satisfy the expectations of the public. Otherwise, the risk of innovation being rejected after it has been introduced into the marketplace or society is greater. Designing and innovating bearing in mind the needs, concerns and perceptions of the people who will make use of the innovation enables proposals to be moulded and modified to meet people's requirements. Moreover, given that the methodology of this approach is a participatory one, during the process of exploring the needs, brainstorming, conceiving, designing and trialling prototypes of the products and services, users contribute their experience and knowledge to the design process and consequently the design ends up being a more inclusive one, more tailor-made to the people who are going to use it. In other words, by inviting people to participate in open innovation processes, they popularise the innovation (whether it is technological or social in nature) in such a way that they enrich the initial proposals and contextualise them. This helps to minimise the risk of innovations failing.

Having emphasised the importance of involving the people who are going to be the users or consumers of a product, service, process, device or platform, etc., in the context of MINDb4ACT, the audiences are all those groups of people involved in processes of the deradicalisation, or the democratisation, of society. Strictly speaking however the audience should also include those agents who encourage radicalisation as well as the voice of radicalised communities. Analysis of their inputs could prove highly revealing.

Evaluation

Factors and indicators

The performance of a Living Lab is evaluated in the same way as the performance of any project, business, programme or strategic plan is evaluated. Objectives are established at the outset that need to end up delivering certain results. In order to be able to evaluate the degree to which the initial objectives have been achieved it is necessary to create a set of indicators. The state of these indicators needs to be recorded at the start of the research and again once the project has concluded and in light of the results. Depending on the duration of the project it is also advisable to gather partial data in case it is necessary to take executive decisions about the way the project is proceeding. Comparing the initial and final state of the indicators enables the effect of the changes carried out during the project to be ascertained. These indicators are established at two levels: for the Living Lab as a whole and for each of its pilot projects taken individually.

The indicators should be defined during the design of the research proposal and in accordance with the previously-established objectives. For example, suppose that prior to an intervention to discourage radicalism among young people belonging to specific groups we have identified a pertinent series of blogs, Twitter accounts, YouTube profiles or specific debates on Facebook and we have monitored the rate that content is produced over a period and its impact on social media; this figure will serve as a baseline reference enabling us, after the intervention, to repeat the monitoring and compare the increase or decrease in the digital content. Reductions in publication or the reproduction of this content will, in normal conditions (something that does not always pertain), indicate that the interventions carried out have had a dissuasive effect to a greater or lesser extent and help us to determine the impact of the initiative. Consequently we will be able to say that, by reducing the visibility or the presence of such content on the internet, it also reduces their capacity to influence. This type of factor should serve to evaluate the quality of the interventions carried out. A list of indicators may be very long or very short, depending on the number of the current project's specific and concrete objectives. For example, if the aim is to assess the results of the Living Lab, some of the indicators such as those that are set out below may be used.

Example of indicators for the performance quality of Living lab

- Has an effective consortium been created? [Identify coordination needs and delineate the consortium's successes and failures]
- Was the exploration carried out by the established deadline, with the personnel and the resources planned? [Compare the original planning to the actual execution]
- To what extent has a dynamic and participatory community of users been created? [Compare the goals to be met to the community and the final attainments, identify conflicts arising and contributions generated, etc.]
- Have the insights stemming from the research been duly expressed in materials, guides, graphs, diagrams and other documents that enable the scalability and transfer of the acquired knowledge?
- Has a realistic intervention plan been designed that has given rise to observable changes? [Compare its goals to the results obtained]
- Has evidence been collected of a change in the state of radicalism? [Compare the figures for the indicators before and after the intervention]

Personnel involved and timing

From the commencement of research there should be a person following the development of the Living Lab and each of its pilot projects. This person should be responsible for documenting the entire research process, from the conception of the intervention project to its final results. This person has the twofold task of documenting and chronicling the project and also identifying the problems that arise along the way and trying to connect the parties to the conflict to facilitate coordination.

Validation of the process

How will we evaluate the efficacy of the MINDb4ACT project, the violent radicalism Living Lab and the pilot projects that are going to be carried out? Above all we have some pilot projects that are going to provide information about the phenomenon of radicalisation across a range of aspects and contexts. Given that the purpose of the project is enhance capacities to prevent and mitigate violent radicalisation processes, the validation of the project will need to take into account the success or failure of the initiatives carried out in each setting as well as the transfer of knowledge and the scalability of solutions.

These initiatives will depend on intervention models originating from the explorations carried out in the pilot projects. The execution of these interventions should go through the stages typically followed by this kind of process and be duly documented, as has already been set out:

- *Brainstorming*. This ranges from the identification of existing solutions (through documentation, consulting experts), to the generation of new solutions (via crowdsourcing¹⁵, and/or workshops employing creativity techniques). This stage concludes with a longlist of ideas. The watchword for generating ideas is "anything goes".
- *Evaluation and selection of ideas*. This is the stage when the ideas are filtered and candidate ideas for project proposals are chosen. This is generally on the basis of originality, social desirability, economic viability, technological feasibility and security.
- *Conceptualisation*. This is the stage for developing the most promising ideas emerging from the evaluation filter and developing the concept (a prison-laboratory, for example, is a concept, a virtual tutor would be another concept). The concept will shape the design. Concepts should be validated and enhanced (improved) by the agents involved.
- *Design and prototyping of solutions*. Once the concept is established it is then drafted (blueprints) and laid out for the subsequent construction of a prototype of the product or service. There is not just one prototype but several, as many as are needed to ensure that the product or service is robust. The prototypes are validated with the help of the users and agents involved. As many prototypes of the product, service,

¹⁵ Crowdsourcing is a type of consultation generally aimed at ordinary people who cooperate to come up with a solution to a problem, put forward new ideas or contribute criticisms, experiences, knowledge, etc. Such consultations may be carried out in many ways but they are normally conducted by joining a large group of people and carrying out various group activities. One of the main authorities in this field is Jeff Howe; see his book *Crowdsourcing*, 2006. Other authors prefer to talk about exploring the Collective Intelligence. The methodology is the same: joining people together and proposing activities so that they share experiences and generate knowledge.

model, platform or app are made as are needed to reach an agreed level of satisfaction among the parties involved.

- *Pilot.* The validation tests conducted on the prototypes are partial tests. The content, the structure, the design, the acceptability, etc. may be validated. When it becomes evident that all the partial tests with the prototypes have been passed the next step is the pilot test. In a Living Lab, the pilot test is a test carried out in real conditions with real people and real risks and consequences. If the result of the pilot test is positive it is deemed that the project is ready and it is possible to move on to its manufacture or implementation in society. If not, any faults are remedied and the pilot test is repeated until the results are positive.

Next, the intervention needs to be planned and the content created that will serve to train the technicians who will carry out interventions and so that resources are subsequently available for the effective implementation of the solutions. The evaluation of this part involves examining the plan for training technicians and the documentation supporting the training process and for the subsequent intervention.

Risks involved in running a Living lab

The risks implicit in a Living Lab depend on its nature. In the case of the MINDb4ACT project, these depend on the types of pilot project established. In general terms, risk management is determined by the type of task. In a technological Living Lab the measures are defined by the requirements of the work and the resources employed; in the same way that an architect establishes the safety requirements that must be carried out in a construction project and the site engineer acts as a foreman of works, ensuring that the work is carried out in accordance with what has been established and the safety measures are observed to minimise the risk of accidents. The risks implicit in a Living Lab focused on radicalisation, if one is referring to occupational risks, will be those of working in the field and the places where it is implemented. In this sense, the management of occupational risks will be the same as that for the people involved in the activities of the pilot projects, and it will be necessary to identify the pertinent regulations.

The true risks implicit in certain Living Labs however (including MINDb4ACT) are the difficulty of creating the consortiums (in the sense of the profiles that will need to cooperate to make the pilot project possible), that the consortium once created will not be effective, that cooperation between the parties is restricted by legal or security imperatives, that it proves impossible to carry out the explorations within the deadlines due to bureaucratic or other hurdles, that the legal system in force prevents (or impedes) the execution of certain actions by certain people at certain times and places, that access to the users proves excessively difficult or that the relationship with the users turns hostile. The list of risks may become a long one.

A contingency plan should be established for each of these risks. This however does not ensure that the potential impediments to the research can be resolved. However, the presence of the consortium and the influence of its members should be able to ensure access to facilities, to people, to institutions and to groups. The consortium is created specifically for this, to ensure that each of its members is capable of 'opening doors' for the Living Lab and the pilot projects.

For example, if MINDb4ACT is contemplating a prison-laboratory or an immigration centre-laboratory, some of the members of the consortium should be people linked to the world of prisons, to the security forces or to the immigration centres in agreement with this concept and project, and with the ability to ensure that a prison or an immigration centre will work as a laboratory in which it will be possible to carry out the exploration. A list of potential risks is as follows:

- Potential difficulty in the creation of the Living Lab consortium (the group of people who cooperate to ensure that the pilot projects can be brought to fruition and scaled up) with the ability to exercise influence in the research contexts. Solution: the members of the consortium must be selected strategically to ensure that they can facilitate the research.

- The potential for conflict to arise within the consortium over ideological differences. For example, in the definition of what constitutes a 'terrorist' or a 'violent radical' according to the law, the sociological perspective, political viewpoints, the news media, intellectuals, etc.
- The possibility of cooperation between the parties being restricted by security imperatives. Solution: the pertinent authorisations will need to be anticipated beforehand.
- The possibility that due to bureaucratic or other hurdles it proves impossible to undertake the established explorations or that that they cannot be carried out within the deadlines that have been set. Solution: such problems will need to be anticipated and managed prior to the research.
- The possibility that the legal system in force prevents (or impedes) the execution of certain actions by certain people at certain times and places. Solution: the necessary authorisations will need to be sought.
- The impossibility of accessing key users.
- The possibility of users refusing to take part.
- The possibility of the relationship with the users turning hostile.
- Others

Selected bibliography

Bódi, Zsuzsanna; Garatea, Jokin; García Robles, Ana; Schuurman, Dimitri (2015) (Eds) *Living Lab Services for business support & internationalisation*. ACE / ENoLL at http://europeanace.eu/index.php/guides/item/download/87_e8c26b6c3bf3f8aa442fe901cf6a77cc

Cavallini, Simona; Soldi, Rossella; Friedl, Julia; Volpe, Margherita (2016) *Using the Quadruple Helix Approach to Accelerate the Transfer of Research and Innovation Results to Regional Growth*. Progress Consulting S.r.l. consortium & Fondazione FORMIT at https://www.researchgate.net/publication/313251488_Using_the_Quadruple_Helix_Approach_to_Accelerate_the_Transfer_of_Research_and_Innovation_Results_to_Regional_Growth

Eskelinen, Jarmo; García Robles, Ana; Lindy, Ilari; Marsh, Jesse; Munte-Kunigami, Arturo (Eds) (2015) *Citizen Driven Innovation. A guidebook for city mayors and public administrators*. The World Bank / ENoLL at https://openknowledge.worldbank.org/bitstream/handle/10986/21984/Citizen_Driven_Innovation_Full.pdf?sequence=

Molinari, Francesco (2011) *Best practices Database for Living Labs: - Overview of the Living Lab approach - Living Lab Best Practice Database Specification*. Alcotra Innovation project at <http://www.alcotra-innovation.eu/progetto/doc/Best.pdf>

OECD (2000) *The Creative Society of the 21st Century* at <https://www.oecd.org/futures/35391171.pdf>

Ruijsink, S.; Smith, A. (2016) WP 4 | *CASE STUDY Living Labs*, TRANSIT: EU SSH.2013.3.2-1 Grant agreement no: 613169 at <http://www.transitsocialinnovation.eu/content/original/Book%20covers/Local%20PDFs/245%20TRANSIT%20Case%20Report%20-%20Living%20Labs%20-%20Final.pdf>

Ståhlbröst, Anna; Holst, Marita (s.f.) *The Living Lab Methodology Handbook* at https://www.ltu.se/cms_fs/1.101555!/file/LivingLabsMethodologyBook_web.pdf

Von Hippel (2006) *Democratizing Innovation*. The MIT Press at
<https://web.mit.edu/evhippel/www/books/DI/DemoclInn.pdf>

Wakeford, Nina (Ed) (2004) *Innovation through people-centred design – lessons from the USA*. University of Surrey at
<https://ideasbazaar.typepad.com/peoplecentreddesign.pdf>

