

# A living lab at CERN: a few reflections



## Living lab – what it is, what it is not

A living lab is a research concept. A living lab is a user-centered, open-innovation ecosystem, often operating in a territorial context (e.g. city, agglomeration, region), integrating concurrent research and innovation processes within a public-private-people partnership

**A living lab is not similar to a testbed** as its philosophy is to turn users, from being traditionally considered as observed subjects for testing modules against requirements, into value creation in contributing to the co-creation and exploration of emerging ideas, breakthrough scenarios, innovative concepts and related artefacts.

Hence, a living lab rather constitutes an experiential environment, which could be compared to the concept of experiential learning, where users are immersed in a creative social space for designing and experiencing their own future.

## Living lab – how it works

1. Co-creation: bring together technology push and application pull (i.e. crowdsourcing, crowdcasting) into a diversity of views, constraints and knowledge sharing that sustains the ideation of new scenarios, concepts and related artefacts.
2. Exploration: engage all stakeholders, especially user communities, at the earlier stage of the co-creation process for discovering emerging scenarios, usages and behaviours through live scenarios in real or virtual environments.
3. Experimentation: implement the proper level of technological artefacts to experience live scenarios with a large number of users while collecting data which will be analysed in their context during the evaluation activity.
4. Evaluation (?): assess new ideas and innovative concepts as well as related technological artefacts in real life situations through various dimensions such as socio-ergonomic, socio-cognitive and socio-economic aspects; make observations on the potentiality of a viral adoption of new concepts and related technological artefacts through a confrontation with users' value models.

## Living lab – the challenge

A key issue today is that health-related/-relevant data is siloed... whether its personal data, data inside an organization, or data sharing across different organizations, they are burdened by sociotechnical debts that prevent citizens/users to rip the benefit of their generation and permanence, whilst several aggregation strategies are becoming increasingly available to data “wardens” to formulate low-value high-impact decisions concerning entire groups.

Fine granularity data tracking/discovery and integration is difficult and presents complex technical, organizational and policy challenges. A Living Lab would allow CERN to become an access point to the microcosm of many big data efforts, making it possible to include very early on stakeholders value in the design conversation.

Data for the people who produce them first, or at least “as well”... for data driven decision/policy making to become negotiable by the very subjects of the process, to produce education opportunities, and an entry to truly shared decision making and personalization.

## Living lab – value proposition

Living lab will offer:

1. a scalable data management platform, allowing us all to access and manipulate multiple types of data including personal data or “small data” (collected by smart phones, activity tracking devices, or new wearable sensors); “CERN” data (wifi data, campus maps, event data, exposures, accesses, etc); as well as external data types (transportation data, weather, dietary data, medical data etc).
2. a formal interface to foster a deeper integration of the medical services within the CERN R&I structure, building the modes and governance for it to test new tools for communication and community engagement in care, to run epidemiological studies in safety and occupational health, and to eventually join forces at the front of exploring medical applications of HEP derived/inspired technologies.
3. opportunities of connection with external experts, to discuss current theories and conjectures about human health and disease, and to form partnerships or research on relevant ideas, and technologies.
4. means and methods to trace and govern bottom up innovations emerging from community interactions with the tools and platform of the living lab, and especially to maintain accountability and reward participants with fair crediting of IP
5. a governance structure interfacing the data officer, legal offices, external ethical authorities, and (eventually) disciplinary advisory boards, to guarantee all mechanism would be in place to detect and respond to near misses, and to mitigate black swan events

## Living lab – pillar #1

### Design and deployment of the e-infrastructure

Based on Be-Studys Anonymizer© , DataCapsule, and Research Data Lab (?), then an evolution of the widely adopted (by EU funded large research projects, e.g. Human Brain Project) GnuBila Pandora FEDEHR, the infrastructure will offer an exploration of how to transfer CERN medical service data out of the siloed paradigm within the full respect of the most updated EU norms on privacy and data protection.

A sandbox for 3<sup>rd</sup> party applications should be included, to monitor and qualify the practices and associated risks that would emerge from opening APIs to the communities engaged from CERN employees/users and allowing them to develop and test their own ideas about how to interact with their data.

## Living lab – pillar #2

### **“Occupational health and safety” groundshot**

Working with users and the medical services to run multiparty testing of assumptions and policies against simulated scenarios informed by data (demographics, medical data, building blueprints, exposures, ...) to negotiate and update new measures to mitigate tail risks for the employees/users.

Offer near real-time feedback about new policies' (e.g. changes to restaurant menus, or logics of the elevators) on users' behaviours and target outcomes, to empower multiparty negotiations on new measures and adaptations.

## Living lab – pillar #3

### **Population lab**

Leveraging the vast biological and cultural/heritage diversity embraced by the population at CERN, and their direct engagement in the project, designing match making opportunities between devices and services on one side and users on the other, embracing the «you make it, we break it » ethos at the roots of CERN openlab.

Running interdisciplinary workshops and data-hackathons, to tackle individually relevant questions, to rethink definitions of health and disease, and to qualify the effect of personal experimentations (dieting, different training regimes, ...) on health trajectories.



## Living lab – pillar #4

### Health communication and sense making

Health in EU is under threat by fringe movements attacking otherwise apparently accepted medical evidences, anti-vaxxers having made it to the top10 of global health threats...

Fake news seem to be at the core of many such threats, and a race for solutions has started, mostly focusing on technological tools (e.g. AI detection of fake news, ...)

However, hype in scientific news reporting, scandalistic/click-bait title/extract editing, and changing dynamics of consumptions of information mediated by socials are all universally recognized as factors of vulnerability to fake news, if not their very roots.

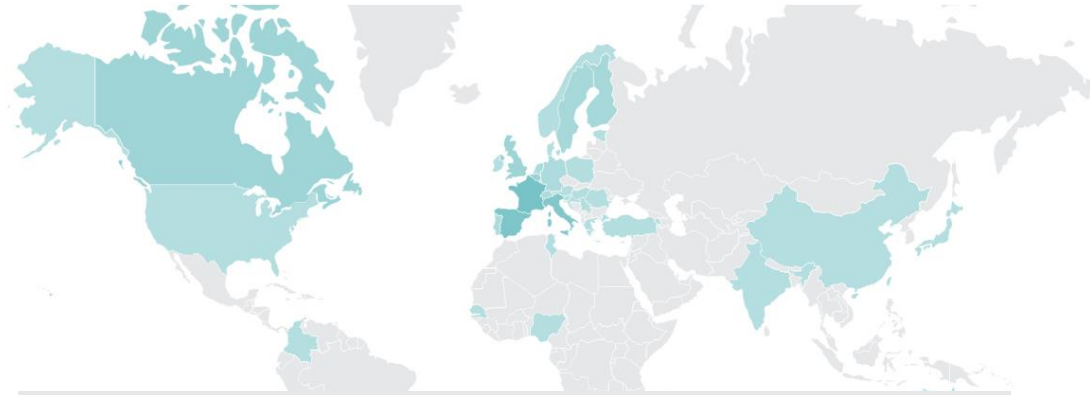
The living lab will offer a model of multichannel engagement, with hands-on session, walk-in laboratories, and decentralized communication, that will offer ethnographers and communication scientists the opportunity of studying new modalities and recommendation for a sustainable communication of science and health matters.

Thank you 😊



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