

Chapter 2: Introduction to the Living Lab Approach

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Abstract: This chapter considers the living lab concept and reflects on its use in ITAIDE. The idea of living labs is presented as a framework for studying and acting in living settings such as organisations, work places, public spaces and the wider environment. Living labs are also suggested as promising infrastructures for developing innovation.

Key words: Living laboratory; organisational theory; inter-organisational systems; innovation networks.

1 The Living Lab research design

The active involvement of practitioners and researchers in complex live settings characterized as networks is not yet well understood; living labs attempt to address this. Live settings populated by human actors present certain challenges for aspiring researchers and innovators. Broad and specialized bodies of knowledge distinguish the activities of studying, and acting in living social or organisational settings. Research driven interventions in live settings need to involve a range of methods: from ethnography through to economics. Furthermore, research and action strategies should accommodate practices and systems of innovation, spanning invention or creative processes through to industrial engineering, market forces and politics.

The notion of a living lab has constantly been extended and redefined in recent years. Most recently, the emphasis has shifted towards the active role of users as co-innovators. Users working in real world environments are actively solicited in order to inform technology development and innovation. In these cases, living labs have been positioned as platforms for user-driven innovation. However, as the numbers of users and organisations involved expanded to larger social entities, such as local or regional communities, they became more open-ended as more stakeholders became involved. It is thus important to distinguish between those who are centrally involved as users, developers, or beneficiaries, and those who show interest but are peripheral to the innovation (Figure 1).

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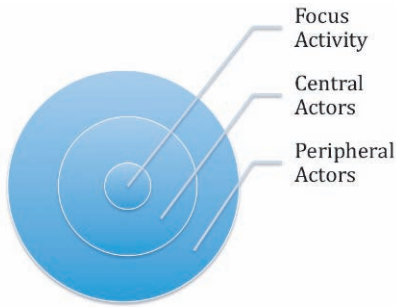


Figure 1: Focus of involvement in complex technology mediated innovations

New interorganisational innovation initiatives align with concepts such as ‘open innovation’, as they generate a levelling between technology providers, business and public organisations, users, and researchers. Indeed, in these situations it may be unclear who in fact generates the creative dynamic and who owns the intellectual content. The human (user, citizen) is now recognised as a source of innovation and not just as a user or consumer in a narrow sense, as being an object for R&D activities.

2 Living Lab methodology

Living labs are a new methodological approach – building on and adding distinctive features to the tradition of action research. The Living Lab Research Approach (LLRA) takes a developmental view of innovation and studies novel technologies in complex real world settings. The following discussion provides a sketch of the LLRA, how, where and when to employ it (for a comparison of research approaches see [Table 1](#)).

The developmental view of innovation research must deal with many practical issues – most significantly the issue of acting in real world settings. Usually those involved jointly define the scope of a living lab and the living lab is itself oftentimes subject to ongoing discussions and negotiations of sense-making and scope refinement among the parties. Furthermore, given the scope of LLs as diverse, multi-location, multi-stakeholder environments; teams of researchers from different backgrounds (e.g. technical and organisational backgrounds) must also collaborate across various sites to collect information and do the analysis. Representatives of research institutions may also play a particular role as brokers or facilitators of Living labs in multi-stakeholder environments. In such settings, academics take the role of neutral, impartial or honest brokers to initiate and indeed facilitate negotiations among the relevant parties. The broker role continues as the social, organisational and political dynamics unfold in the living lab.

Table 1: Comparison of research approaches

Lab research (user labs)	Action research	Living lab
Controlled environment	Real world setting, yet typically confined to an organisation or department	Real world setting, involving multiple stakeholders from multiple organisations and their interaction
Limited, clearly assigned role of users	Not specific about user role	Active role of users as co-innovators; exposing technology to the creative & destructive energies of the users; facilitating dynamics of collective action
Designed for replicability	Active (social and political) role of researcher in the research setting	Multi-disciplinary research teams actively involved in the research settings, confronted with the technical, social and political dynamics of innovation, at times even driving the agenda
Designed for observation of outcome	The researchers observe and take part in the creation of an outcome	Joint collaboration to create a desired outcome

Inviting the respective parties to engage in the living lab's real-world *experiment* is a promising option because public authorities, companies, and others can be more willing to overcome established attitudes and obstacles as long as it is 'only' in an experimental setting. The very idea of living labs may therefore enable the establishment of forums and supportive environments for innovators within the respective organisations, that is, organisations which are otherwise often stuck in existing adversarial relations, hierarchies and traditional practices. The experimental setting also encourages a critical attitude and the search for creative solutions. Moreover, the Living Lab itself can give a symbolic meaning to the process of facilitating broader collective action. The lab can signal commitment, momentum of change, and the opportunity to act and take charge of developments that are critical for the development of the participating parties.

3 The case of ITAIDE's five living labs – learning in action

The ITAIDE research programme is faced with the challenge of developing and demonstrating approaches to introducing innovations surrounding the notions of trusted trader or trusted trade lanes vis-à-vis public authorities, such as customs, taxation, and health authorities. The broader themes for ITAIDE's innovation scope reflect a public policy agenda of simultaneously addressing trade facilitation and secure trade. At the core of ITAIDE's research agenda is the design of information infrastructures encompassing; document standards, systems interoperability, process modelling and network redesign.

The EU's vision for eCustoms innovation has provided the empirical context for the ITAIDE research programme. The eCustoms innovation vision aims to transform a broad coverage of critical industries and regions. ITAIDE has started this process in defined areas with limited resources but with the goal of continued development through a self-sustaining momentum beyond the funding period. In response, the ITAIDE research team has focused on four industries – pulp and paper, food (dairy products), excise goods (beer), and pharmaceutical products (drugs) – each with a broad range of different, albeit partly overlapping commercial, customs, security and regional issues:

- Green lane exports
- Excise and excise fraud
- Single Window
- Secure trade lanes
- Supply chain visibility
- Anti-counterfeiting

Moreover, the individual labs have been designed in order to form an ensemble of partly overlapping, partly sequential cases of continuous learning and expanding of knowledge (Figure 2).

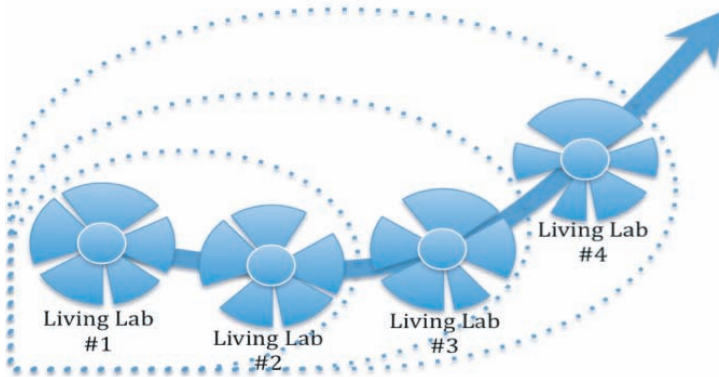


Figure 2: Learning expands from multiple living labs

Learning from one living labs can inform learning across other living labs. For example, the Living Labs provide an ideal environment for exploring the potential to more tightly integrate new EU member states as connecting points for increased trade linkages going west to east, as well as north to south. Paperless trade routes may extend from China to Ireland, or Finland to India, creating challenges and opportunities for creating innovative organisational, procedural and technological solutions, as well as yielding benefits such as improved competitiveness for the common market both internally and on the international stage. Taken over a long period of time, we anticipate that the influence of innovations originating from living labs will gradually expand to impact or encompass other environments.

ITAIDE's multiple living labs represent concrete real-life settings in which technology prototypes, demonstrations, and novel organisational structures can be developed, used and observed, and then refined. Open experimental systems are necessary in these cases because results from closed environments where artificial constraints are imposed on human relationships and communication are weak indicators for adoption dynamics in and between organisations. Moreover, these research environments are unmanageably complex, comprising, for example, TAXUD, EU member state's national taxation and trade regulators, and industry and market groups. Often these actors' interactions are ambivalent, at times cooperative, and at other times competitive where the willingness to compromise is limited. For example, the relationship between tax authorities and traders is often perceived as antagonistic (compliance with regulation is costly and cumbersome, regulation is complicated and not sufficiently harmonized across member states) and yet cooperative interaction is needed to facilitate trade.

The environment for each living lab is demonstrably complex and difficult to control; they are open systems, impinged by the direct influence and actions of surrounding stakeholders (Figure 1). In the case of national customs and taxation offices, the actors include other national agencies, international agencies, citizens and, of course, business users. Peripheral actors impacting on the development and adoption of innovative e-government include: national and international policy formation, the networks of affiliate organisations that actors operate within, as well as societal and market forces.

The core challenge for innovative eGovernment solutions is to facilitate a system of innovation that breaks the tradition of sequential models of innovation, development, implementation and adoption. Given the complexity and the inter-organisational nature of the problem focused on, a new type of innovation system has to be developed. In such an innovation system, the innovative developments are put into living settings in order to create an environment where the implications of the designed solutions can be studied, requirements can be solicited, institutional support can be mobilized, and the feedback can be channelled right back into an ongoing 'research to development to innovation' process.

4 Conclusion

ITAIDE's research sites are pilot projects with an emphasis on trialling and learning; however, the idea of a living lab takes real world contexts into account more deeply and incorporates them into the research design. The LLRA addresses issues such as:

- Technical components that may work independently but are untested in complex ensembles.
- Testing assumptions of the set-up, availability, affordances or requirements of infrastructures,

- Learning to address diverse economic and administrative realms with their own political processes, language games, systems of goals and aspirations that are prone to misunderstanding and conflict.
- Exposing (previously) unknown conditions and unintended, unforeseen consequences of action.

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