

CREATING COMPETITIVENESS LIVING LABS ROADMAP 2007-2010

RECOMMENDATIONS ON SYSTEMS FOR OPEN USER-DRIVEN RESEARCH, DEVELOPMENT AND INNOVATION

QUALITY STATUS: **DRAFT** VERSION: **0.5B**

CREATED BY THE LIVING LABS ROADMAP WORK GROUP
ON BEHALF OF THE LIVING LABS PORTFOLIO LEADERSHIP GROUP

To effectively target the Lisbon agenda, new wholistic innovative and powerful innovation approaches are needed. The approach suggested in this document, is to build systems - *Living Labs* - which will engage and empower large groups of citizens in open real-world experimentally driven innovation processes.

The increasing number of people and organisations behind this approach, are fully convinced that the proposed way to empower users in open cross-border collaboration, in groups/clusters of private and public organisations sharing the same *domain* interest, will become one of the strongest elements in a new European innovation system. The proposed networked system - the *European Network of Living Labs* – will be dedicated to generate significantly more competitive and sustainable products, services, content and societal infrastructures.

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GOOD LUCK! / Mikael Börjeson, CDT email: jmb@cdt.ltu.se mobile: +46 70 5299120

Disclaimer: This paper reports the consolidated ideas of many committed individuals but does not prejudice the individual opinions of any of its contributor or their employers.

| SECT. | CONTENT | PAGE |
|--------------|---|-------------|
| 1 | BACKGROUND AND POTENTIAL | 4 |
| 2 | DEFINITIONS AND PRINCIPLES | 6 |
| 2.1 | What is a Living Lab ? | 6 |
| 2.2 | CORE – The Living Labs Fundamental Pillars | 7 |
| 2.3 | Living Lab Types | 7 |
| 2.4 | Six views on a Living Lab - The harmonization cube | 7 |
| 2.5 | Experience and Application Research - ISTAG report | 13 |
| 3 | LIVING LABS RESULTS AND NEEDS FOR THE FUTURE | 14 |
| 3.1 | Policy, Business Models and Sustainability | 14 |
| 3.1.1 | European Innovation in the Context of Lisbon Strategy for Growth and Jobs | 14 |
| 3.1.2 | Service Creation | 14 |
| 3.1.3 | Governance | 15 |
| 3.2 | Users, Buyers, Citizens as Drivers of High-value ICT Research and Innovation | 15 |
| 3.2.1 | User Involvement | 15 |
| 3.2.2 | Innovation Outcomes | 16 |
| 3.2.3 | Network Synergies | 16 |
| 3.3 | ICT Research & Technology Development (RTD) | 17 |
| 3.3.1 | Infrastructure | 17 |
| 3.3.2 | Methods & Tools | 18 |
| 3.3.3 | Interoperability in different Domains | 20 |
| 4 | ROADMAP ACTIONS AND MILESTONES | 21 |
| 4.1 | Today – Current status of Living Labs | 21 |
| 4.2 | 2007 second half - Portuguese Presidency - ENoLL 2nd wave launch | 21 |
| 4.3 | 2008 first half - Slovenian Presidency - ENoLL 3rd wave | 21 |
| 4.4 | 2008 second half - French Presidency - Completion of ENoLL launch | 22 |
| 4.5 | 2009, first half - Czech Presidency | 22 |
| 4.6 | 2009, second half - Swedish Presidency | 22 |
| 4.7 | 2010 and beyond | 22 |
| 5 | COLLABORATION AND NETWORKING | 23 |
| 5.1 | The Living Labs Portfolio | 23 |
| 5.2 | From Regional Networks to Global Reach | 24 |
| 6 | STRATEGY AND RECOMMENDATIONS, INVESTMENTS AND BENEFITS | 27 |
| 6.1 | ICT Research and Technology Development (RTD) | 27 |
| 6.2 | Socio-economic research | 28 |
| 6.3 | Research infrastructure | 31 |
| 6.4 | Thematic networks for harmonisation | 32 |
| 6.5 | Application area specific approaches | 35 |
| 6.6 | Regional policy approaches | 35 |
| 7 | CONCLUSIONS | 39 |
| 8 | SUPPLEMENT | 40 |
| 8.1 | Abbreviations and Terminology | 40 |
| 8.2 | References | 41 |
| 8.3 | Main changes since previous version | 41 |
| 8.4 | Roadmap work group | 41 |

EXECUTIVE SUMMARY

#To be written later //Alvaro, MikaelB, Veli #

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| LIVING LABS ROADMAP WORK GROUP | | LIVING LABS ROADMAP 2007-2010 RECOMMENDATIONS ON SYSTEMS FOR OPEN USER-DRIVEN RESEARCH, DEVELOPMENT AND INNOVATION |
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1 BACKGROUND AND POTENTIAL

70-95% (investigations vary) of private and public investments in research and development of ICT-based products and services fail to produce business valid results. One major type of deficiency observed is that traditional ICT R&D projects are initiated and executed in a closed and/or artificial laboratory environment with too limited and too late interaction with, and understanding of, the potential market and its users. Today this is virtually a paradox from the perspective that modern ICT provides powerful communication means for individuals (e.g. users) to engage, interact and collaborate in large groups over large physical distances and across organisational borders (we all use the same Internet).

Growing industrial need for user-driven innovation and livinglabbing

In an array of industries, producer centred innovation is being eclipsed by user-driven innovation – the idea generation, concept development, prototyping, and even production of new products and services is done by users/consumers. These users aren't just voicing their needs to companies that are willing to listen; they're inventing and often building what they want.

Breakthrough medical-equipment innovations such as the heart-lung machine and the first automated drug pumps were developed by doctors at the leading edge of practice, not by firms that manufacture medical equipment. Novel food categories like sports energy drinks and gels were developed by sports enthusiasts.

ICT enabled service development is benefitting extensively of user-driven innovation. Excellent examples of that are for example that the most usable and stable Nokia 770 and Lego Mindstorm applications are developed by user-developer communities.

This process of users' coming up with products and services is increasingly well documented, but only few companies are actively trying to take advantage of it. Majority of Nordic companies do not yet exploit these possibilities and these new innovation platforms - Living Labs - are still under-used.

Industries understanding the benefits of Living Labs

The concept of Living Lab is relevant to the necessities of evaluating e.g. the mass deployment potential of ICT enabled solutions. Living Labs represent regional innovation environments focusing on user communities embedded within "real life". Besides technological aspects Living Labs allow insight on to the human dimension of technology, which is of paramount importance for a successful societal deployment of new technologies.

As a consequence of this potential, the Living Lab approach is considered as the natural candidate especially for the implementation of large scale evaluation, demonstration and validation activities related to ICT based products and services. From a market and industry creation perspective Living Labs offer a research and innovation platform which can help industries to apply user-driven innovation practices. Living labs can enhance economical, social and cultural systems cross-regionally and cross-nationally.

From the industry perspective there is still a need for clarifying the livinglabbing field of activities and a necessity to support industry to start and adopt new user-driven innovation practices. Industry wants to know how to take advantage of these new user-driven innovation and livinglabbing opportunities in their innovation processes. The demonstration of what LivingLabs is and what and how it could be used by industry and public sector in their user-driven innovation process must be seen as the major outcome of this project.

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Earlier user- involvement

Growth of testing is valuable, but there is a common need to involve users earlier, before testing starts, in order to support the early phase of innovation. This will ultimately decrease innovation costs and increase income. That happens because of higher hit ratio and spending less on developing bad ideas, and earning more because of getting better ideas.

Combination of these two starting points will be of great value for the business sector. Within ENoLL the Nordic tradition of early user-driven involvement is an asset and an advantage that should be developed into a ENoLL method for user driven-innovation i.e. livinglabbing.

When mature, a Living Lab has to provide services or instrument assets which add values both in industry (business relevance) and academy (research). In order to become sustainably successful, a Living Lab has to establish a valid "business model", including feasible means to get necessary (financial) resources.

Potential

Potential is within reach to make European R&D more business valid. However, to achieve this, advanced R&D is needed to form and integrate suitable methods, ICT and multi-media solutions, which empowers, at scale, individual *users* to engage in product and service development in users real life/work contexts, urban as well as rural, and through open environments and processes to avoid prejudiced assumptions about who will be the "typical users" of a certain product or service.

Even if the role of users in Innovation is increasingly recognized, especially after the seminal work of von Hippel, I would be rather cautious to base the rationale of Living Labs on the promise of better results in terms of products because of user involvement. Especially given the target audience of the report.

To be carefully considered:

What will be a success on the market is still elusive and probably because of the increase in complexity in some sectors (technological development can also reduce complexity) failures are still more common than successes even in the presence of market validation exercises as pilots or test markets with a heavy user involvement. Still many of the products that are a success have not been co-developed at all and are the product of small groups (Apple and Google products for example...) that introduce the product into the market in a fairly high state of development in order to reduce third party appropriability.

We may direct our attention to what has changed in Innovation with a few main vectors:

- The increasing value of experimentation in large users groups (March, 2006, Thomke, ...)
- Open Innovation and the need to user a market approach for innovation
- User involvement in different ways and forms depending on the product and especially true in product platforms and
- The need for societal involvement in Innovation in this new scenario. This probably is more in line to the understanding of Funding agencies than a higher bet on co-development (true in some sectors like open source but completely absent in many others).

See also the comprehensive "Aho-group report" [1] on how to reinforce EU research and innovation performance.

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2 DEFINITIONS AND PRINCIPLES

2.1 What is a Living Lab ?

This section can be improved significantly and more clearly define and describe the key Living Lab definition elements (listed by Ulf Dahlsten etd); “role”, “customers”, “need for R&D”, “network synergies” and “sustainability” // MikaelB, Karl, Miguel, Seija, Veli,

A Living Lab is a system enabling people, users/buyers of services and products, to take active roles as contributors and co-creators in the research, development and innovation process.

A Living Lab has one main **role**, and this is to engage and empower *users* to participate in the generation of valuable and sustainable assets towards objectives set-up by its partners and **customers**.

Primarily, a Living Lab should be capable to;

- Form an appropriate organisation and partnership
- Motivate and empower large scale user engagement
- Establish adequate tools and infrastructure
- Form and execute case-dependent processes and manage IPR
- Disseminate a wide variety of results

As of today (2007), even the most advanced Living Labs are rather immature. There is a significant **need for R&D** to gain knowledge how to manage the Living Labs and the significant complexity and flexibility which is inherent to innovation in general and with engaging users (which can not be easily controlled) in particular.

Living Labs have started to exchange experiences and best practises such as within the European Network of Living Lab, www.openlivinglabs.eu. However, very little operational and practical collaboration ha been established so far. Obvious and expected synergies and expected values with a Living Lab network are of course the opportunities from sharing knowledge and resources. Other very **important synergies** from operating as a network, (with extensions into different markets and cultures) are to be able to engage a larger and more diversified community of users and the opportunity to understand similarities and differences between users and customers in different marketplaces.

It is already clearly recognised that these fundamental **network efficiencies** in particular attractive to global industry. Hence, when these network capabilities are in place and a appropriate inter-network business model is agreed, it will contribute significantly to the **sustainability** of the individual Living Labs being contributors to the network efficiency.

Wider approach should be considered. User engagement is only one side of Living Labs (facilitating SMEs involvement in innovation providing validation facilities or other services is one of the important ones, articulating public demand, orchestrating and promoting innovation lines are others ...).Also user engagement should be open to many forms besides generation of innovation assets.

Obviously a Living Lab provides a clear service of validation of pre-commercial products or platforms and this type of service has a meaning because the innovation landscape has changed but besides this main service (well represented in its name) we can find other additional services that can be described in terms of connection, fostering, matching, orchestration, etc

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2.2 CORE – The Living Labs Fundamental Pillars

The general mission of a Living Lab, and of ENoLL, is to be a supreme environment for innovation of market valid ICT based products, services, contents and societal infrastructures. Its most important role is to facilitate innovation based on large scale collaboration between users and business stakeholders.

The fundamental pillars of a Living Lab are Continuity, Openness, Realism and Empowerment of users – **CORE** (a notion established by me - Mikael B ☺).

Continuity – Creativity is strengthened by a multitude of views originating from broad experience and cross-border collaboration. Experiences are gained and views are broadened over time. Good cross-border collaboration is built on trust and building trust between people from different backgrounds and work/life cultures take time. Business opportunities can only be finally validated through real market experiments. Capability to plan and run such experiments is built on practical experience, carried by people working, in continuity over time, in the Living Lab environment. Users and partners build trust and context unique knowledge over series projects, innovation cases and business experiments.

Openness – The innovation processes must be as open as possible
5-10 line description why // Jo, Karl, Claire

Realism - Realistic behaviour of users and stake-holders is necessary in order to generate results which are valid for real (realistic) markets. A Living Lab must be experienced by its users and stake-holders as a “natural environment” – today or in the near future.

Empowerment of users –
5-10 line description why // Annika, Jo, Kari, Marita, Roberto

2.3 Living Lab Types

Though all Living Labs have a main role to facilitate user engagement in innovation, Living Labs come appear and emerge in great variations. Some Living Labs have geographical or demographic focus like rural or urban areas or young or elderly people. Other Living Labs are closely connected to a branch or industrial value chain such as healthcare or “automotive”. Yet another category focus on a particular type of person-centric contexts such as “being mobile” or “daily life”. Analysis of existing and emerging Living Labs is in progress and there is a lively discussion whether there is a need for, and a feasible way to, divide or map Living Labs according to a “classification or categorization scheme”.

2.4 Six views on a Living Lab - The harmonization cube

Introduction of Living Labs and Open Innovation is missing in this context - Why they arise and where they fit. This could contribute to understand why Living Labs are important now and were not in the past century and where they fit.

Moreover, a high important view from the perspective of Innovation agencies is how LL are going to contribute to regional innovation processes and ultimately to its success. This has in many ways more to do with LL spillovers than to its core activities, things like matchmaking, scouting, articulation of public demand, etc... (in the case of Catalonia, for example i2Cat & 22@ play an important role in diffusion and creation of public awareness because of the size and visibility of the validation exercises that we are able to put in place, absolutely beyond the reach of any SME or even big companies – the LL neutral position in the market makes far more easier to seek complicities bt companies, universities and administrations).

In order to define a shared reference towards a harmonization of methods and tools for use in a European Network of Living Labs an interoperability cube for harmonizing Living Labs has been developed (Mulder, Fahy, Hribernik, Velthausz, Feurstein, et al., 2007). The interoperability cube (Figure 1) builds on the assumption that the focus on synergies and those elements that Living Labs want to exchange with each other forms an appropriate basis for the harmonization of methods and tools. The cube identifies these exchange possibilities and explicitly defines interoperability elements from organizational, technical and contextual perspectives in which different standards are relevant.

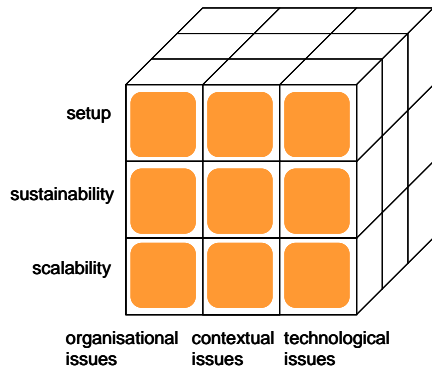


Figure 1. Harmonization Cube

The process of setting up refers to the hardest work in setting up and running a Living Lab. Sustainability comes after this, when a Living Lab is kept operational and becomes permanent, or put differently: self-sustainable. A next step could be that all practices are scalable, useful in other contexts, more extended etc. As said before, it is obvious that not all components of the standardization framework need necessarily be interoperable from organizational, technical or contextual points of view. Evaluations within Living Labs are usually done in a real world context and this includes some complications such as the contexts influence on the evaluation results. Standardization is imperative in order to support seamless collaboration in each of these dimensions. The more elements that match, the better Living Labs are harmonised. Best practices, lessons learned and other topics that were wishful to be exchanged could be clustered in the following topics: user involvement, service creation, infrastructure, governance, innovation outcomes, and methods & tools. Besides dealing with harmonization of methods and tools, the cube can be used as a way to structure and access the repository and other online resources resulting from the CoreLabs project. For that reason, we propose the topics included on the sides of the cube to be focus of ENoLL and the open innovation community. Maybe even a reason for a Living Lab to become part of ENoLL or member of the Open Innovation Community. The six sides of the cubes are described below.

User Involvement

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User involvement is one of the key elements of a Living Lab, and as such should be a focal point of mature Living Labs. In creating usable systems it is generally accepted that they should be designed according to an iterative approach, and that user involvement is crucial, see e.g., Mulder (2004). The focus is on finding out what the relevant experiences, methods, tools that Living Labs benefit from are. Users are important to define context-aware services, think for example of cultural differences. Organisational issues include questions like How to organize user involvement? How to find the right users? What about the validity? How to motivate the users? From a technological point of view: How to get access to large user groups? How to analyse large amounts of data? In order to enable scalability, the use of grid technology can be seen as a possible solution, as the volume of data generated within the Living Lab could become extremely large. Analysing social context data, application usage data and user experience data collected in real-life settings presents new challenges - it's not clear a priori which data is relevant. Therefore, new analysis and reporting modules might be needed along with scalable, flexible storage and computing resources to cope with large amount.

Service Creation

Service creation with relevance to the Living Labs describes the value added components that Living Labs can bring to innovation and validation. 'Value-added' implies we are 'bringing something new and needed to the table'. Historically, the development of Living Labs has been stimulated by the cross-regional need to improve innovation and competitiveness. Service creation within ENoLL should have pan-European relevance as opposed to that national or regional relevance. The resultant objectives of such an environment provide us with three underlying categories of required services (Ballon, Pierson, & Delaere, 2005): services supporting collaborative innovation, services supporting validation and demonstration, and services specific to stakeholder requirements. On a more operational level of Living Labs and ENoLL, three types of horizontal services structure the service matrix (Ballon et al, 2005): technical services – communication, collaboration, demonstration, prototyping, validation, product deployment etc., customer services – innovation, idea generation, community services, training, specific service needs, business support, market customisation, and thirdly, intra-network services (within ENoLL) – governance, management, training.

Infrastructure

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Within this context, a simple definition of infrastructure can be given as the basic facilities, services, and installations, or underlying framework or features required for the operation of a Living Lab. In order to harmonise the infrastructures used and/or developed in the different Living Labs, infrastructures can be categorised by their use during the entire life cycle of the Living Lab. The first set of criteria determines which infrastructures are chosen to be used at the establishment of the Living Lab. Infrastructures will be chosen depending on the environment in which the Living Lab is to be deployed and the objectives which are to be achieved. The second category includes criteria defining which infrastructures are candidates to achieve the Living Labs' self-sustainability. The key ones in each Living Lab will be shared within the network. The third set of criteria will determine infrastructures are more apt to evolve and adapt than others. These are the ones that will be considered with a higher level of scalability. Central to this categorisation is to describe the 'evolution' performed in the different infrastructures used in the establishment of the Living Lab in order to achieve sustainability or in order to be scalable. This means that the most important added value to be detailed in the scalability and sustainability phases is the transformation or improvement of the infrastructures established in the first phase (setup). The cross-cutting categorisation is made in terms of the use of infrastructure. The aim is to describe the use of infrastructures in each of the three phases of life of a Living Lab, from three different perspectives. The organisational perspective describes the infrastructures used in each Living Lab with the purpose of supporting the organisation of the Living Lab. The contextual perspective describes the infrastructures used in each Living Lab in the context of the Living Lab. Finally, the technological perspective describes the infrastructures used in each Living Lab as the technology backbone of the Living Lab.

Some Living Lab infrastructures might be considered in the three perspectives defined, however it is foreseen that some others may be dedicated to a subset. Again, it is not so important to mention the infrastructure used, but the real added value is mentioning the different important aspects of the use of each infrastructure in these perspectives.

GOVERNANCE

The governance structure of a Living Lab describes the way it is organised and managed at different levels such as the operational or strategic ones. These (organisational, contextual or technological) aspects are related to the life cycle of the Living Lab. The strategic level deals with issues like: the way Intellectual Property Rights and exploitation of results are dealt with; the way stakeholders are involved (financial contributions, commitment, responsibility, influence), financing: public-private-partnership, commercial; ownership of the Living Lab, i.e. its services, infrastructure, and the responsible entity for Living Lab (dedicated organisation or consortium); the management structure, e.g. director, steering board, (technical) program committee, user committee; driver and nature of the Living Lab, e.g. community-driven, research driven, business/industry driven, technology driven, open/closeness: sharing resources/network; Living Lab development: consortium dynamics (e.g. additional partners, user groups), subsidy/funding policy and the definition and adjustment of the agenda. The operational level includes aspects like: working practices for the day to day management; execution & monitoring of the living lab goals regarding the synergy, quality and progress monitoring, internal communication; the way new software and services are introduced and validated, responsibilities and liabilities; the definition of user group/ awareness of being part of Living Lab; dissemination and external communication: national and international consolidation; the way projects are organized and funded.

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INNOVATION OUTCOMES

Per Eriksson, Director at the Swedish Agency for Innovation systems stated ‘research is making knowledge out of money – innovation is making money out of knowledge.’ This implies a relation between research and innovation. The problem is that the processes of research and innovation don’t simply appear automatically. Current research presents a view of a sociological perspective of innovation and a change from a linear process — from research to innovation — to a user centric approach where technological research and sociological aspects are equally addressed. Innovation is the process by which new ideas are put into practice and can be seen as a learning/knowledge process within a community. Independent of innovation type, a Living Lab needs to be set up from an organisational point of view to guarantee specific Innovation Outcomes. One of the major factors is the involvement of qualified personnel to guide and assist the innovation process. Additionally, the Living Lab should be able to involve all necessary stakeholders in the innovation chain, specifically in the area of user centricity and user knowledge. As such institutions are scarce [1] this can be identified as a primary focus of ENoLL synergy.

From a contextual point of view, considerations regarding Living Labs’ strategic market position need to be taken into account. This can be guided by the consideration which is the target market for innovation outcomes – examples are creating value for industry, specific industry sectors, SMEs, society, etc. The degree of flexibility the Living Lab can handle with regards to these target markets also signify its scalability in this area. Here, synergies can be created utilising the ENoLL network effect to expand or focus innovation contextuality. Technological systems, mainly ICT, need to be set up to facilitate the innovation processes. These necessarily support interaction and communication which empower creativity. These technologies can range from simple conferencing tools via telepresence to virtual, game-like environments. Virtual marketplaces can be employed for example for the brokerage of ideas and patents. Organisationally speaking, a suitable approach to IPR must be adopted to guarantee the financial sustainability of the Living Lab’s innovation outcomes. The outcome, a successful innovation, depends on the input given in the beginning of the innovation process, the idea. This early phase of innovation processes is also called Ideation. Ideation is the process of forming and relating ideas. It is described to be the process of discovering what to make, for whom, understand why to make it and define the success attributes including the development of insights for answering these strategic questions [4]. This definition shows the relevance of the early-stage of the innovation process for the product. The knowledge regarding the product and its features/definitions may be limited in the early phase but the product definition is strongly influenced in this period. During this phase it is easy and inexpensive to change the product and product features meanwhile it gets more expensive the later changes — during the phase of development and production — are done. From a contextual point of view, an optimal degree of interaction is necessary for the Living Lab to sustainably produce innovations [1]. This also extends to the technologies employed to facilitate such interaction.

METHODS AND TOOLS

The CoreLabs project has investigated methods and tools for Living Labs and established a respective taxonomy. The current Living Labs are using a diversity of technologies, infrastructures and applications and some host specialist technology providers and research institutes. Best Practices have been analyzed in order to ensure interoperability by either defining the use of de-facto standards or suggesting extensions to existing ones where applicable. The methods & tools category within the interoperability cube describes different methods and tools used within the existing European Living Lab at all stages.

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Integration of the project in the Living Lab infrastructure. A full Living Lab service offering not only requires product and service development and evaluation methodologies but also a mechanism for the integration of the customers' product or service into a Living Lab to provide it to the users. The efficient, transparent and smooth integration accomplished by the Living Lab provider is the key for trust and convenience of the customer. It also can work as a first product/service testing depending on the level of development (market launch testing).

Co-creation. The core service of the Living Lab is to facilitate the co-creation of a product, service or application development. This co-creative product development process can be decomposed into four phases: Product Idea, Product Concept, Product Development, and Market Launch. The methods are divided into traditional market research methods and internet based methods allocated to the process phase they are most appropriate.

Data preparation. To fulfil the customers' expectations regarding the results and to reduce the complexity of the evaluated data, the Living Lab provider offers a standardised data preparation. The great advantage of the standardisation is the comparability with the results within other Living Labs in the network and the confirmation of the expected output in the run-up to the usage of the Living Labs.

Figure 2 shows how these all map into a harmonization cube. a first attempt to communicate the essentials of a Living Labs including applications. The Harmonization Cube illustrates synergies between Living Labs that can be exploited. The interoperability cube as well as the Corelabs taxonomy and repository for methods and tools enable the harmonization of methods and tools in the European Network of Living Labs, i.e., in multiple domains and across several living labs and hence facilitating a common ground for sharing.

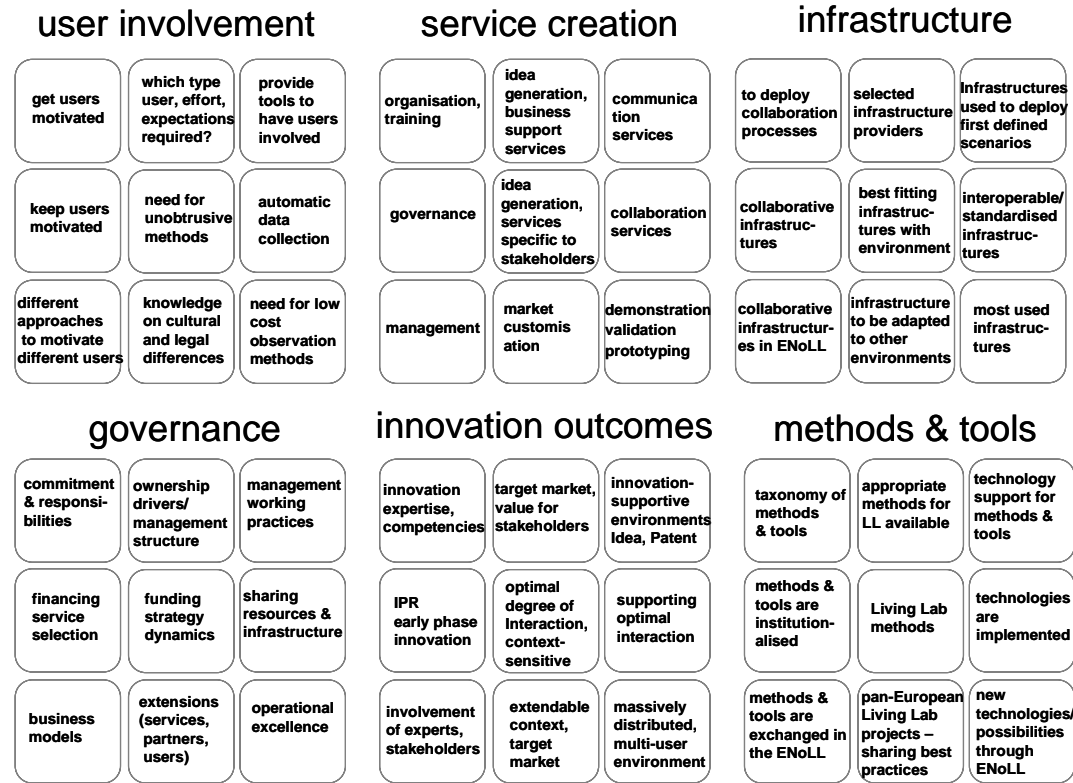


Figure 2. the six sides of the harmonization cube

2.5 Experience and Application Research - ISTAG report

One key to a living labs approach is what might broadly be termed user involvement in iterative development of new systems and also user-centred design. In addition, the ISTAG report (ref [8]) on Experience and Application Research (EAR) “Involving users in the development of ambient intelligence” defines stages for science and technology development (or centres), feasibility and usability testing (or centres), demonstration and evaluation testing (or centres) and field trials, in order to support the real involvement of real users in design, starting from the identification and incorporation of their needs within the development. The EAR approach, or at least what it indicates has been regarded as good practice in human factors and user-centred design for a number of years.

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3 LIVING LABS RESULTS AND NEEDS FOR THE FUTURE

#This chapter give important results examples, describes current status and what is needed for the future (Focus: next 3 years. Vision: next 10 years) // Annika, Jo, MikaelB, Veli #

3.1 Policy, Business Models and Sustainability

General Considerations

See example in section 0 // Alvaro, Kari, Paolo, Seija

3.1.1 EUROPEAN INNOVATION IN THE CONTEXT OF LISBON STRATEGY FOR GROWTH AND JOBS

*Model for sustainability is highly needed.
This model is of course mixed but comes from providing services (being the most obvious validation of pre-commercial proposals but not the only one), probably in a co-financing regime. For that to be possible, these services have to be clearly defined, specified and provide substantive value to companies.
Of course an important point on the ENoLL is to extend these services to an European level. Devoting a point to the creation of this service network is basic if we want that any agency could buy on the sustainability of the network.*

Introduction

See example in section 3.3.1 // Alvaro, Kari, Paolo, Seija

Examples and Experiences

See example in section 3.3.1 // Alvaro, Kari, Paolo, Seija

Needs, challenges and questions

Workshop questions:

- How do you bring the human and societal aspects into technology creation and application? Will LLs help this process? How?
- Why do some societies, regions, sectors and organizations stagnate while others are able to change and evolve their structure? (What metamorphism? What mentality changes?)
- What are social and structural changes required to achieve a culture for user-driven open innovation (new organization structures, removing barriers and walls, horizontal management, self-organizations, Web 2.0 models)?
- What can policy makers do to facilitate smooth and proactive change processes to achieve the LL innovation paradigm (e.g. LL user-driven innovation)? What should they do to facilitate the innovation environment: lead markets, funding, taxation, better education and entrepreneurial culture)? There are many parameters they can leverage.

See example in section 3.3.1 // Alvaro, Kari, Paolo, Seija

3.1.2 SERVICE CREATION

Introduction

See example in section 3.3.1 // Alvaro, Kari, Paolo, Seija

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Examples and Experiences

See example in section 3.3.1 // Alvaro, Kari, Paolo, Seija

Needs, challenges and questions

Workshop questions:

- Are there differences in services needed in large and small & medium sized (SMEs) (and very small – micro) organizations? Why?
- Which services are most urgently needed for SMEs? Are there differences between different industries? Which major stake-holders can be indicated (tech.providers, chambers, bank associations)?
- In which area(s) may a common service provisioning contribute most to an accelerated competitiveness of the companies, SMEs in particular, in the EU? For example; eInvoicing, eProcurement?

3.1.3 GOVERNANCE

Introduction

See example in section 3.3.1 // Alvaro, Kari, Paolo, Seija

Examples and Experiences

See example in section 3.3.1 // Alvaro, Kari, Paolo, Seija

Needs, challenges and questions

Workshop questions:

- Is a legal entity needed to ensure the European Network of Living Labs (ENoLL) sustainability? What type?
- What type of governance body will ensure participation and effectiveness in decision-making? Steering Committee? Task force? Scientific Committee?
- What kind of mechanisms should support co-ownership of results? Soft IPR?
- How to achieve ENoLL financial sustainability? Are you prepared to pay membership fees? Sponsorship? How can public bodies provide finance support? Paying for services?
- What should be the transition to the final sustainable ENoLL structure? How to get there?# See example in section 3.3.1 // Alvaro, Kari, Paolo, Seija #

3.2 Users, Buyers, Citizens as Drivers of High-value ICT Research and Innovation

General Considerations and Questions:

Workshop questions:

- How to create sustainable user engament?
- How to develop network efficiencies both from user community and customer sharing?

3.2.1 USER INVOLVEMENT

Introduction

See example in section 3.3.1 // Veli, Kari

An interesting point is made in “Wikinomics” by Don Tapscott and Anthony D. Williams when talking about the sustainability of systems established to support co-creation and co-ownership: “One could envision a “digital-age co-op” with peer-rating systems that dynamically apportion shares to contributors based on the community’s assessment of the value added by individual contributors. Annual profits from sales and services could then be distributed across the community of contributors. Whatever the precise arrangement, it’s clear that the future of peer production lies in hybrid models where participants share and appropriate at the same time”. → ref. [9] page 283

Examples and Experiences

See example in section 3.3.1 // Veli, Kari

Needs, challenges and questions

Workshop questions:

- How to drive from User Involvement to User engagement? (From users as passive objects to become users as designers, creators, and producers and even to become micro entrepreneurs?)
- What are the challenges of user involvement? (Over exploitation, feedback mechanisms, high failure rates etc?)
- How to improve user sampling and representability? (From face validity to content validity and process validity?)

3.2.2 INNOVATION OUTCOMES

Introduction

See example in section 3.3.1 // Veli, Kari

Examples and Experiences

See example in section 3.3.1 // Veli, Kari

Needs, challenges and questions

Workshop questions:

- IPR questions and levels of openness?
- What are the living lab service outcomes in relation to paying customers?
- Which internal processes are critical for high customer satisfaction?

3.2.3 NETWORK SYNERGIES

Introduction

See example in section 3.3.1 // Veli, Kari

Examples and Experiences

See example in section 3.3.1 // Veli, Kari

Needs, challenges and questions

Workshop questions:

- What are the key User community management issues? (cross sites, cross country, cross border virtually, cross Europe/globally)

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|-----------------------------------|--|---|
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- Which kind of Public-Privat-Citizens partnership models are tested in Living Labs? (Roles of different PPC actors like: universities, smes, public, citizens etc.)?
- How to collaboratively enhance market creation within ENoLL community? How to support innovation service provider (SMEs etc.) networking in Europe?

3.3 ICT Research & Technology Development (RTD)

General considerations and questions

RTD targeted to enable user-driven innovation (Living Labs) must support and be applied so that the innovation contexts are maintained as realistic - for now or for the near future - as possible. In order to make new products and services valid for a real world “market”, innovation processes must take place in a real world (or very close to) → “Realism” in section 2.2.

RTD must target or appropriately support the key security and integrity issues in a Living Lab environment, which is entirely dependent on rich and ambient cross-border collaboration and information sharing. Unauthorized, as well as unintentional, access, replication or modification of information must be actively prevented. In particular, user-centric security and integrity should be carefully considered, since trust-building between Living Lab parties are fundamental. If users do not feel secure (when expected, such as at home), they will not behave naturally. Hence, privacy and integrity must be the appropriate in all circumstances. Security, trust and integrity issues are not only technical and physical; they are also very much psychological. Participant’s perceptions are equally important as the factual circumstances.

Workshop questions:

- What kinds of technologies can be anticipated in the next 20 years that will enable large-scale user engagement and collaboration in the innovation of products and services?
- What kind of ICT should we invest in tomorrow, in order to improve the services provided by Living Labs?

3.3.1 INFRASTRUCTURE

Introduction

Related to Living Labs, infrastructure issues can be divided in several different categories, depending on the different “roles” that the infrastructure may have:

- **Infrastructure being created as a result of Living Lab processes.**

This means infrastructure in the role of being the target for user-driven creation, such as specifically targeted urban/rural living/societal areas (of buildings, roads, green-areas etc) (example Helsinki/Arabienranta LL), the “Intelligent Road” of infrastructures supporting inter-vehicle communication (example Botnia LL) and the community owned wireless mesh network (Homokhat Rural Living Lab/Hungary).

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|-----------------------------------|--|---|
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| | | STATUS: DRAFT VERSION: 0.5B |

Infrastructure supporting Living Lab cross-border collaboration, tools and methods.

This means infrastructure in the role to enable the digital communication needed to appropriately support Living Lab tools and methods based on cross-border communication with/between groups of distributed users and other Living Lab stake-holders.

Since the ENoLL wishes to lower the threshold of communication as much as possible within a collaborative environment, the use of standard protocols has to be encouraged to allow interoperability across potentially heterogeneous platforms. A guarantee of interoperability is difficult to make, due to the proliferation of standards and technology platforms. In an environment such as the Living Lab, interoperability across applications, networks and devices needs to be supported. The use of open standards will endeavour to provide common interfaces that enable interoperability.

- **Infrastructure for networking and collaboration between several Living Labs.** Infrastructure in the role of enabling several Living Labs to exchange information and operate together, with purpose to offer more competitive and advanced services for user-driven research, development and innovation.

Examples and Experiences

Infrastructure; results, status, experiences and needs being identified and described in CoreLabs deliverables and with highlighted examples by LL's such as:

- Belgium/Hasselt – Hasselt LL
- Finland/Helsinki, Helsinki (Arabiensranta) LL
- Sweden/Luleå – Botnia Living Lab
- Hungary/Morahalom- Homokhati Rural Living Lab -

Needs, challenges and questions

Workshop questions:

- What type of infrastructure elements could inspire and support users, individually or in group, to become more innovative?
- What infrastructure is missing to enable several Living Labs to operate together in order to provide more competitive and advanced Living Lab services?
- In order to perform advanced RTD on next generation Internet technology and architectures - Which are the most interesting real life environment RTD infrastructures today (where large user-groups may be engaged to further boost the RTD)?

3.3.2 METHODS & TOOLS

Introduction

Related to Living Labs, methods and tools issues can be divided in several different categories, depending on the different “roles” that the methods and tools may have:

- **Methods and tools as results, being created in Living Lab processes.** This means methods and tools in the role of being the target for user-driven creation, such as <examples>.
- **Methods and tools to engage and activate users.** This means infrastructure in the role to enable the digital communication needed to appropriately support Living Lab tools and methods based on cross-border communication with/between groups of distributed users and other Living Lab stake-holders.
- **Methods and Tools to support cross-border collaboration.** As such the ENoLL enables a shared space for information and knowledge sharing. Support for the discovery, sharing, creation and modification of knowledge within the collaboration process must be provided. Knowledge interfaces specific to the information that is shared across the network need to be implemented, an example of such an interface might be the use of HL7 in e-Health

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| | | STATUS: DRAFT VERSION: 0.5B |

applications. Ontologies, semantic descriptions and folksonomies can be applied across resources to enable seamless integration of all forms of knowledge. The proliferation of “social” technologies adds another dimension to knowledge sharing with applications such wikis and blogs becoming popular.

Presence is an important enabling technology for collaboration since it allows a partner to determine the status of other entities, and their availability for collaboration and communication. More sophisticated presence mechanisms can even give status information regarding their whereabouts and allow seamless ways of communicating with them (e.g. automatically routing communications to the closest station of the user). Presence also refers to the discovery of suitable services for re-use and new service composition across an architecture.

- **Methods and tools to extract and aggregate important elements from “background noise”.** This means...
- **Methods and tools needed to manage IPR and create new (business) values and models.** The living labs fosters the formation of online communities and provide existing rural communities with technical support. For geographical and demographical reasons the Internet penetration in rural areas is far from that in larger cities. It seems that current business models and technologies cannot achieve breakthrough in this area. Therefore we need new business models which are closer to real life situations in rural areas, villages. For example, in a small community people know each other and they try to solve any arising problems in much closer cooperation than in larger towns and cities. From the aspect of technology and business models the Wireless Mesh Network solution fits perfectly into this picture. Utilizing this solution a community can achieve wireless network coverage for a small town or village. The network infrastructure is managed by volunteer citizens. As the whole system is self-healing and self-tuning, the system can be expanded in a plug and play manner without special knowledge. With this solution the whole community will have network access and will be able to communicate with each other through this data network. The Internet access can be provided by volunteers sharing their already existing wired connections. As a free source for the community, the mayor’s office may provide the whole village/town with several broadband wired gateways. The WMN can be used to extend the range and the services of an already existing WiFi based ISP (W-ISP) or ISP’s.
- **Methods and tools harmonisation to enable collaboration between Living Labs.** Methods and tools in the role of enabling several Living Labs to exchange information and operate together, with purpose to offer more competitive and advanced services for user-driven research, development and innovation.

Principles

It is important that the methods and tools as far as possible support the overall context being as realistic as possible and enables users to explore new opportunities but doing so in the “real world”. A Living Lab must not be experienced by users as an unnatural laboratory environment.

Examples and Experiences

Methods and Tools; results, status, experiences being identified and described in CoreLabs deliverables and with highlighted examples by the following LL’s:

- Hungary/Morahalom- Homokhati Rural Living Lab

Needs, challenges and questions:

Workshop questions:

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| LIVING LABS ROADMAP WORK GROUP | | LIVING LABS ROADMAP 2007-2010 RECOMMENDATIONS ON SYSTEMS FOR OPEN USER-DRIVEN RESEARCH, DEVELOPMENT AND INNOVATION |
| | | STATUS: DRAFT VERSION: 0.5B |

- What type of method and tools could inspire and support users, individually or in group, to become more innovative?
- What methods and tools are missing to enable several Living Labs to operate together in order to provide more competitive and advanced Living Lab services?

Complementary questions:

- How we can measure and identify the roles associated with the open and permanent innovation process, locally?
- How the generic observation and measurement check-list should be developed as an operational instrument to acquire quantitative and qualitative information, which is used in actual process of information gathering:
 - Living Labs report production (data, observations): first interim monitoring and assessment reports
 - Living Labs evaluation (assessment and conclusions).
 - Comparative analysis of results across Living Labs, and over-all evaluation of results.

3.3.3 INTEROPERABILITY IN DIFFERENT DOMAINS

Introduction

See example in section 3.3.1 // Hank, MikaelB

Examples and Experiences

See example in section 3.3.1 // Hank, MikaelB

Needs, challenges and questions

Workshop questions:

- Which domains are important to consider in terms of interoperability?
- Where has interoperability between domains proven successful (and with which technologies)?
- Which technical aspects of interoperability between domains need to be considered in future research?

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| | | STATUS: DRAFT VERSION: 0.5B |

4 ROADMAP ACTIONS AND MILESTONES

<For sub-sections 3.2 – 3.6, Propose milestone(s) related to "Policy, Business Models and Sustainability"(ref section 0), "Users, Buyers, Citizens as Drivers of High-value ICT Research and Innovation"(ref section 0) and "ICT Research & Development" (ref section 0)>

4.1 Today – Current status of Living Labs

//Annika, Jo, Klaus-Dieter, Karl, Miguel, Veli

Over the last few years, a diverse multitude of Living Lab systems/environments have been initiated across Europe. As of 17 Oct 2007, when the "second wave" of Living Labs enter the network, altogether fifty-one Living Labs will be members of the European Network of Living Labs (ENoLL).

Most of the Living Labs in Europe are not separate legal entities themselves, but are rather entities hosted by non-commercial bodies (typically a university or municipality).

A majority of the observed Living Labs, have a focus on user-driven development of ICT intensive services.

In its nature most existing Living Labs are based on business-citizens-government-academia partnerships.

The driving power comes from a combination of investors (financing LL build-up), customers (buying services) and partners (engaged in LL federation). One organisation may of course take a combination of roles (e.g. both investor and customer). By nature benefits are both recognized and anticipated by all drivers (being the reason for their engagement).

Several large countries outside Europe (China, Brazil, South Africa etc) are already active as well. These nations/regions, represent large populations and key markets, which is of fundamental importance for European industry.

4.2 2007 second half - Portuguese Presidency - ENoLL 2nd wave launch

// Alvaro

- Oct Draft Living Lab Roadmap presented
- Oct ENoLL 2nd wave Launch Event
- Nov ENoLL 3rd wave preparatory event in Slovenia
- Nov 30 Living Lab Roadmap – 2nd version available
- Dec 15 CLOCK Coordination Action project ends

4.3 2008 first half - Slovenian Presidency - ENoLL 3rd wave

// Joze

ENoLL's own organisation and support functions developed by the LLs by them selves should be ready before 3rd wave launch in Spring 2008. We should give the floor to the individual LLs and let them to decide how to progress.

- Feb 27 CoreLabs Coordination Action project ends

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| | | Page: 21 (42) | |

June ENoLL 3rd wave Launch Event (timing tbc)

4.4 2008 second half - French Presidency - Completion of ENoLL launch

List of milestone specifications // Olivier

4.5 2009, first half - Czech Presidency

List of milestone specifications // Karel

4.6 2009, second half - Swedish Presidency

List of milestone specifications // Annika, MichaelN, MikaelB

4.7 2010 and beyond

List of milestone specifications // MikaelB, Karl

5 COLLABORATION AND NETWORKING

5.1 The Living Labs Portfolio

There is an emerging collaborative structure, directly associated to the increasing interest for user-centric experimentation and validation in general and the European Network of Living Labs in particular. Currently (Oct 2007) this structure comprises:

- European Network of Living Labs,
- Living Labs Open Innovation Community
- Living Labs Partner Network (emerging)
- Living Labs related projects
- Living Labs Portfolio Leadership Group
-

These elements of the collaborative structure are described further below:

EUROPEAN NETWORK OF LIVING LABS

As of 17 Oct. 2007, the European Network of Living Labs (**ENoLL**) will comprise more than 50 different existing or emerging Living Labs, which have committed to exchange experiences and develop ways to collaborate which aims to enable net-based services for user-driven research, development and innovation.

Map to be published 2007-10-17 // MikaelB

LIVING LABS OPEN INNOVATION COMMUNITY

At the same time a “Living Lab Open Innovation Community was Launched giving any person interested in Living Labs a mechanism to get information and connect into on-going activities.

What can we write about this ? // Annika, Kari

EMERGING LIVING LABS PARTNER NETWORK

What can we write about this ? // Kari, Hank

LIVING LABS RELATED PROJECTS

Currently the Living Labs related projects include eight (8) EU-FP6 projects;

- CoreLabs (CA)
- CLOCK (CA)
- Collaboration@Rural (IP)
- CoSpaces (IP)
- Ecospace (IP)
- Laboranova (IP)
- WearIT@Work (IP)

- OpenFutures (SSA).

LIVING LABS PORTFOLIO LEADERSHIP GROUP

The Living Labs Portfolio Leadership Group (**LLP-LG**) is currently acting as the main body for coordination of plans and activities (including this roadmap).

| Family Name | First Name | Country | Organisation | Role |
|---------------|--------------|--------------|-------------------|------------|
| Almirall | Esteve | Spain | UPC / I2CAT | |
| Boronowsky | Michael | Germany | TZI | |
| Börjeson | J. Mikael | Sweden | CDT | vice chair |
| Charvat | Karel | Czech Republ | Inform CZ | |
| Fusco | Luigi | Italy | Frascati | |
| Gricar | Joze | Slovenia | Univ. of Maribour | |
| Hribernik | Karl | Germany | BIBA | |
| Kallai | Tünde | Hungary | PROMEI | |
| Katzy | Berhard | Germany | CETIM | |
| Kulkki | Seija | Finland | CKIR | |
| Mikkela | Kari | Finland | CKIR | |
| Kune | Hank | Netherlands | Educore | |
| Merz | Christian | Germany | SAP | |
| Navarro | Mariano | Spain | TragsaTec | |
| Niitamo | Veli-Pekka | Finland | Nokia / CKIR | chair |
| Oliveira | Alvaro | Portugal | Alfamicro | vice chair |
| Pierson | Jo | Belgium | VUB / IBBT | |
| Ponce de Leon | Miguel | Ireland | WIT / TSSG | |
| Prinz | Wolfgang | Germany | FIT | |
| Santoro | Roberto | Italy | ESoCE-Net | |
| Schumacher | Jens | Austria | FHV | |
| Sällström | Annika | Swden | CDT | |
| Thoben | Klaus-Dieter | Germany | BIBA | |
| Velthausz | Daan | Netherlands | Telin | |

5.2 From Regional Networks to Global Reach

REGIONAL AND NATIONAL COOPERATION

Importance, Driver(s) and Examples: Activities on national basis are important and should be complementary to the initiatives taken on European an International arena. LL experience exchange help to identify national demands on Living Labs and for SMEs, initially targeting a rather homogeneous (no barriers such as language, legislation and culture etc) domestic market, it is easier to work with a national LL network. Expected and already visible main driver in this dimension are national funding agencies such as Swedish innovation agency VINNOVA which recently (April 2007) launched a two year Living Labs pilot programme which invest in build-up of five new Swedish Living Labs connected in national Living Labs network. Other examples are; Finnish ICT SHOK LLs&Testbeds, Portuguese, German (big program in progress?), Dutch and Belgian initiatives.

The “DC10” UK Living Labs initiative seeks to create greater knowledge of, and commitment to, the Living Labs approach and focuses on nine main themes:

| | |
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| 1. User Centred Design & Production | <i>e.g. How will users be integral to all phases of the project? How will the project give incentive to real world participation in its design, delivery and sustainability? Discussion of examples will be provided at the Living Lab workshop.</i> |
|-------------------------------------|--|

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| 2. Open and Creative Innovation Processes | <i>e.g. How will the project demonstrate that it is responding to demand-driven requirements in real world settings? How will the project ensure that it is flexible enough to maintain an open and creative approach to new ideas throughout all phases of the project?</i> |
| 3. Demonstrate social innovation | <i>e.g. Where is the step-change in patterns of behaviour (of living and/or working) occurring?</i> |
| 4. Value Creation | <i>e.g. employee/organisational value, citizen/user value, alliance partner value, societal value etc</i> |
| 5. Scalability | <i>e.g. What is it about the work-stream/project which is likely to scale? What's the process for how this might be achieved?</i> |
| 6. Commitment to share information and experience | <i>e.g. provide an overview here of main approaches</i> |
| 7. Genuine cross-sector collaboration | <i>e.g. What is it about the structure and process of the project which will encourage genuine collaboration across sectors?</i> |
| 8. Inclusion | <i>e.g. How will the project contribute to improving social inclusion and the empowerment of users through a more open and creative approach to innovation?</i> |
| 9. Collaborative networking | <i>e.g. How will the project ensure that its work is made available and accessible to other related projects and networks, including what form of licensing arrangements, such as Creative commons, would be used to support this?</i> |

EUROPEAN CROSS-BORDER COOPERATION

Importance, Driver(s) and Examples: Nordic Innovation Centre (project: ENoLL/Nordic), NordForsk (project: NoriaNet), Central European (Slovenian based), IberNoLL (tbc)

Example – EnoLL/Nordic

Special Nordic role within European Living Labs Network is missing

| | | |
|-----------------------------------|--|---|
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Nordic Living Labs can - as integral elements of the European Network of Living Labs (ENoLL, www.openlivinglabs.eu) - create Nordic-scale experimentation platforms and pilot user groups for new services, business and technology and thus enhance new market and industry creation. By applying Living Lab thinking and methodology also for public sector, complementary opportunities can be explored.

Besides a user centered innovation processes the time span to market adaptation should be as short as possible, in particular for ICT products and services. One way to obtain this is concurrent interaction between all parties involved in the value network: from the end-users to producer and basic research communities.

ENoLL/Nordic, a Nordic Network of User-Driven Innovation and Livinglabbing was established in May 2007 with support of the Nordic Innovation Centre's (NICE). This regional Living Lab network promotes user-driven innovation and "livinglabbing" through national, Nordic, European and International networking and active awareness rising among industry, academia and public sector.

The critical success factors (Living Lab services and assets) as well as proofs of concept (examples of added values for industry and academy) will be collected and described in the "Living Lab Toolbox" and "Industry guide".

The Toolbox will be co-compiled by the project consortium and the Nordic Network for User-driven Innovation and Livinglabbing in collaboration with the other NICE UDI projects.

It is also of utmost importance that the Living Labs are connected and linked together. Through the Living Labs network a regional customer who needs access to Living Lab services somewhere else (e.g due to a specific product launch) can involve pilot users and potential customers in a specific part of the globe. Services and products of today often must be developed for an international market in the first attempt.

ENoLL/Nordic will organize 10 workshops during 2007-2008 and compile two guides for open delivery: one for Living Lab service providers and one for of their customer organisations. EnoLL/Nordic supports the rest of the NICE funded innovation projects as a test environment.

GLOBAL COOPERATION

Importance, Driver(s) and Examples: < Key markets for European industry. Identified areas: China, South Africa, Brazil] >

6 STRATEGY AND RECOMMENDATIONS, INVESTMENTS AND BENEFITS

Current content of section 5.1-5.2 is a direct cut/past from a first draft "Objective Proposal". Clearly room for improvement, so please also comment and amend these (priority-wise very important) sections. In the following sub-sections, "strategy and recommendations, investments and benefits" are described in more details from six (6) different perspectives.

We need more R&D on productized LL-tools and new test equipment used in real-life contextes: let's develop new ICT based tools for LL field work tc. (when testing e.g. ICT products you need several new test-equipment with which you can follow remotely how users behave in different usage situation (wearable field R&D tools etc.)

Phsyco-physiological (also basic) research approaches should be developed further as part of the work done with users (for example we use in CKIR as part of our research EEG an fMRI equipment to better understand what happens in user's brains when they are using new products and services (I was last week 2 hours in a functional MRI system playing economical games and the researchers looked which kind of blood flows this thinking made on different areas of my brains - if any;-). They haven't told that to me yet.

Open living labs approach urge capabilities of orchestrating innovation ecosystems around livinlabs. Thus orhestration technologies and new service models should be developed for use of the individual living labs: Tools to manage user, customer and innovation support communties,

6.1 ICT Research and Technology Development (RTD)

To be improved //MichaelB, Karl, MikaelB

TARGET OUTCOME

ICT in support for large scale user engagement and collaboration in distributed communities:

- Support for cross-border creative activities in large distributed groups
- Tools supporting collective "wisdom of crowds" (e.g. "Innovation Jams")
- Tools for gathering user interaction and experience on large groups.
- User-contribution recognition and promotion
- Tools for natural (open controlled) evolution of (special interest) communities
- ICT for open and easy access/edit media which instruments adequate fraud/misuse control
- Integration of mass collaboration environments and current company R&D platforms (i.e. connecting with e-science approaches, in sectors like medicine, new media and manufacturing)
- Integration of emerging technologies regarding Web 2.0 and Next Generation Internet into trusted collaborative environments

ICT in support for open research, development and innovation processes

- Source/path tracking of created items and heterogeneous service composition
- User data in innovation processes: what data and how to manage it
- Framework for intelligent and adaptable user interfaces to enable user-driven improvement of the open innovation environment itself
- Co-ownerships IPR management, and billing architectures

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- Access and authority evolution based on different community trust and security approaches
- Discussion/dialogue info-mining for automatic topic classification and clustering
- ICT standards for information and process interoperability at network and services layers
- Federated solutions for fully inclusion of rural and regional areas
- Rapid and thorough transitioning of the new innovations to open and competitive markets
- Virtual environments and markets for open innovation of real world market services and products

FUNDING SCHEMES

DG INFSO F (F4: New Infrastructure Paradigms and Experimental Facilities), FP7 2009-10 (tbc), ...

To be further defined later in the writing process

MAGNITUDE OF INVESTMENT NEEDED

To be defined later in the writing process

6.2 Socio-economic research

TARGET OUTCOME

Formal modelling and Best Practise Analysis of ICT-enabled natural contexts and environments for user-driven research, development and innovation (“Living Labs”)

- Networking and Early stage innovation processes
- Successful Regional, Theme/Sector Collaborations
- New paradigms for IPR in socio-technical environments
- New cluster/partnership formats and cooperation formulas
- Events and other innovation triggers

Studies of short term and long term impacts from Living Labs

- Full life-cycle impact on services/products
- Impact on individuals and organisations (e.g. innovation capability)
- Socio-economic impact

EXPECTED IMPACT

The expected impact of the Living Lab approach can be visualized through the analysis of the existing eleven Living Labs based on the comprehensive interviews supported by extensive questionnaires. The results of these interviews can be summarized in the following two tables :

on the left hand side, the five evaluation criteria for Living Labs are identified;

on the right hand side, the comparative performance of Living Labs against the “conventional” validation methodologies, highlighting the cases where this can be clearly detected is presented.

| Evaluation criteria | Living Labs | Laboratory Validation |
|---------------------------------|-------------|--------------------------|
| Relevance ^(a) | | |
| Prior Technology Mapping | Yes | Yes |
| Socio-economic Analysis | Yes/No | No |
| Purposeful Panel Selection | Yes | Yes |
| Ex-post Statistical Control | Yes | Yes |
| Direct Analysis Techniques | Yes/No | Yes/No |
| Indirect Analysis Techniques | Yes | Yes |
| Efficiency ^(b) | | |
| Reusability of results | Yes/No | Yes/No |
| Stakeholders involvement | Yes | No |
| Payoffs to Stakeholders | Yes | No |
| Charges to Stakeholders | Yes | No |
| CWE based methodologies | Yes/No | Yes/No |

Table xx : Comparison of alternative user centred methodologies

Legenda:

(a) the appropriateness of a project/programme design to the needs/tasks addressed and to the assumptions made and/or context parameters

(b) the extent to which the project/programme inputs were supplied and activities organised in the most appropriate way and at the least cost to generate the final results

| Evaluation criteria | Living Labs | Laboratory Validation |
|---|-------------|--------------------------|
| Efficacy / Effectiveness ^(c) | | |
| Publicity of results | Yes/No | No |
| “Returning Customer” | Yes | Yes |
| Increasing number of panellists | Yes | No |
| In situ evaluation | Yes | No |
| Product/Service ideation | Yes | No |
| Product/Service conception | Yes | No |
| Product/Service development | Yes | Yes |
| Product/Service launch | Yes | Yes |
| Sustainability ^(d) | | |
| Dependency on external funding | Yes | Yes |
| Ethical Issues | No | No |
| Privacy Issues | Yes | Yes |
| Security Issues | Yes/No | No |
| Gender Issues | No | No |
| Replicability | Yes | Yes |
| Impact ^(e) | | |
| Time to market | Yes/No | Yes |
| New/Improved products/services | Yes | Yes |
| Patent applications | No | Yes/No |
| Creation of new companies | No | No |
| Improved functionalities | Yes | Yes/No |
| Better reliability of products/services | Yes | No |
| Reduced complexity of products/services | Yes | No |
| New or increased demand | Yes | No |
| User satisfaction | Yes | No |
| User empowerment | Yes | No |
| Local community | Yes | No |
| National/International community | Yes | No |

TABLE

YY :

COMPARISON OF ALTERNATIVE USER CENTRED METHODOLOGIES (CONT'D)

Legenda:

(c) the degree of achievement of a project/programme results in terms of benefits actually received by the stakeholders involved;

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(d) the attitude of a project/programme to generate positive effects even after its end (or the exhaustion of external funding);

(e) the extent to which the overall objectives of the project/programme were achieved, and the contribution of the project to their achievement.

It is quite evident from the above comparison that the “added value” of Living Labs over traditional (user centred) validation methodologies, especially lies in the efficiency (2), efficacy (3) and impact (5) evaluation criteria.

Regarding efficiency, in spite of the absence of meaningful reporting in terms of costs, it can be stated that the presence of a higher number of stakeholders, apart from the Living Lab owner, interested in the running of the pilots (with respect to the traditional, “laboratory” case where this is limited to a single organisation) may reduce the overall cost of the trials, perhaps in exchange with a wider and more timely publicity of results.

While it might be expected that the cost of gathering a few people in a laboratory may be lower than a large scale, “real-life” panel conducted over a whole population, the use of even simple IT-supported methods (like log analysis for example) or solutions (like tools for collective decision making or consensus reaching) can positively affect this evaluation criterion. Furthermore, it seems possible to conclude from the survey performed that a Living Lab can offer a cost-effective methodology for earlier incorporation of users in the product/service creation cycle, so that more expensive product/service changes in the later phases can be prevented.

However, it is in the efficacy (or effectiveness) area that Living Labs seem to show their most significant performance. By making reference of a real, and reportedly growing in number, community of people, it is not just that the unit cost of the trial scales down, but a wider scope of analysis is allowed (including ideation and conception of products and services, not very often implemented in the traditional approach), and, what is mostly important, the benefits of “in situ” validation are gained.

This reflects into a list of impact indicators where most user-related features like better reliability, reduced complexity, satisfaction, empowerment and even consumer demand are reportedly enhanced and contextualised, with implications to both the local and the (inter)national community.

Whether or not this can be enough to justify an increased use of Living Labs by e.g. the ICT industry, it is partly a matter of compared costs and benefits, partly perhaps a result of the specific subject matter of validation. In other words, the larger is the potential or actual scale of distribution/consumption for the targeted good or service, the more useful can eventually prove the recourse to Living Labs methodology.

FUNDING SCHEMES

DG INFSO and/or RTD, FP7 2009-10 (tbc), ...

To be further defined later in the writing process

MAGNITUDE OF INVESTMENT NEEDED

To be defined later in the writing process

6.3 Research infrastructure

Description of the research infrastructure // Bernhard, Klaus-Dieter, Miguel, Wolfgang

TARGET OUTCOME

Text

EXPECTED IMPACT

Text

FUNDING SCHEMES

FP7 Capacities programme (2008)/ Research Infrastructure, ...

#To be further defined later in the writing process #

MAGNITUDE OF INVESTMENT NEEDED

#To be defined later in the writing process #

6.4 Thematic networks for harmonisation

TARGET OUTCOME

<Text>

EXPECTED IMPACT

<Text>

STATUS OF EUROPEAN LIVING LABS

Generally speaking, we can allocate the European Living Labs into three basic groups:

Mature Living Labs, or the real success stories of the pan-European movement, started a fairly long time ago and holding a successful track record of activities;

Maturing Living Labs, or the fastest movers to this respect, that were initiated later or in parallel and are now showing a promising scorecard of results;

Beginners, a sort of a “bridge” built between the 1st and the 2nd/3rd wave of Living Labs, that were both late in their introduction and not so wealthy in terms of activities performed / results obtained.

The following diagram plots the 14 experiences we could get in touch with and collect information from, during the two subsequent surveys within the CoreLabs project; it is likely however that the group of “Beginners” may include additional 1st wave Living Labs that were not responding to our questionnaires.

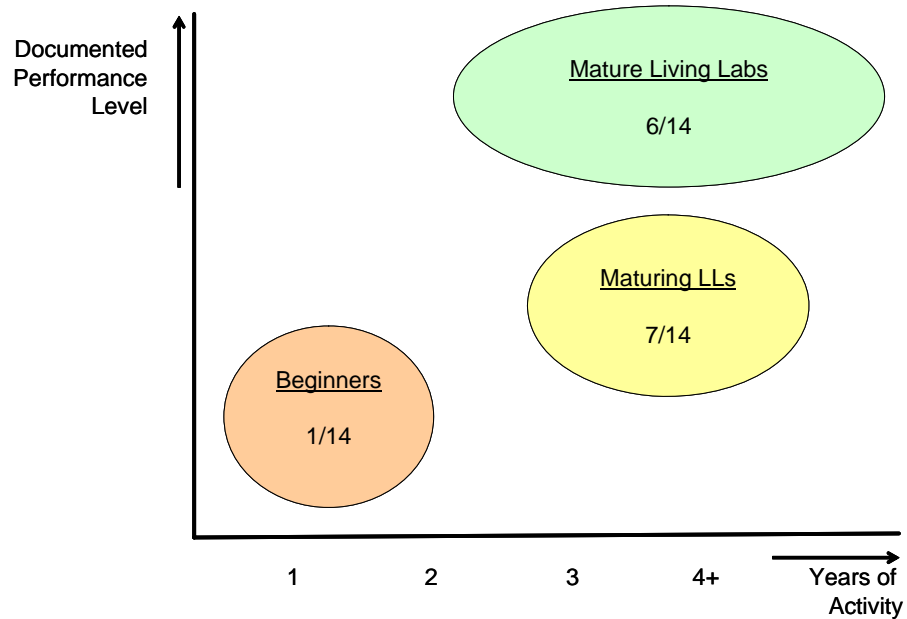


Figure xx: Living labs status (assessment results)

The above diagram should not be intended in absolute terms, but as a reflection of the information gathering activities from the Living Labs contacted during the course of our evaluation study. Further documentation of past and current performances can lead to possible changes in the composition of each “cluster” of Living Labs, and the need for that should be stressed also in view of the harmonization and networking of existing experiences.

LIVING LABS DESIGN, STANDARDISATION AND CERTIFICATION

In light of the growing diffusion of Living Labs in the European system of innovation, it is worth focusing on the performance measurement approach for a successful take-up of Living Lab methodology.

The intuition is here that more support is needed to the process of Living Labs design (for beginners), standardization (for maturing Living Labs) and certification (for the mature ones).

At each of these three levels, the theoretical and empirical apparatus developed in this study can prove useful, namely:

at the **design level**, to clarify what are the necessary **components** of a new Living Lab, and in particular:

the Owner

| | | |
|-----------------------------------|--|---|
| LIVING LABS ROADMAP WORK GROUP | | LIVING LABS ROADMAP 2007-2010 RECOMMENDATIONS ON SYSTEMS FOR OPEN USER-DRIVEN RESEARCH, DEVELOPMENT AND INNOVATION |
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the stakeholders

the **ICT** infrastructure, solutions and tools

the user-centric, co-creative validation **approach**

at the **standardisation level**, to analyse those operational aspects of a maturing Living Lab that may need further improvement, and in particular:

the extent of use of the “ideal”, 5-steps trial **configuration** methodology

the quality and quantity of the reported **results**

the comparison of performances by means the **benchmarking** indicators

at the **certification level**, to justify the reasons why a (mature) Living Lab can also deserve a recognition of “excellence”, with special respect to:

the conformance to standards

the five evaluation criteria of impact assessment

the **compliance with the “human factor”** in a similar way as documented in our evaluation questionnaire¹.

LIVING LAB METHODS/TOOLS/INFRASTRUCTURES

The extreme variation and heterogeneity of infrastructures, tools and methods currently employed and deployed by the examined Living Labs should not be considered *per se* as a topic of evaluation.

However, it seems relevant from our prior analysis to consider the two following aspects:

the need for an underlying ICT infrastructure that can really ensure, not just a stable connection from remote to the Living Labs members, but also an effective interaction and collaboration between the users;

the potential of “CWE-based” methods and tools, not only for their inherent level of innovation, but especially with respect to the efficiency (value for money) and efficacy / effectiveness of the trials, two very important components of our overall impact assessment exercise.

CONCLUDING REMARKS

Based on the analysis of the existing Living Labs , it is evident that the Living Lab approach is a successful one and should be further adopted by the different actors of European industry and society. The strength and potential of Living Labs and the benefits they can bring to the European system of innovation are extremely high .

There is a strong need to create a standardised, networked innovation framework, that is transferable to other RTD initiatives at a European level, whilst unifying the disparate existing ones.

Further work should focus at:

The development of **harmonised standards** to benchmark the Living Labs performance, based on the methodology developed in the corelabs project ;

¹ That seems of course a logical implication of the user centric approach followed in the Living Lab trials.

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The implementation of these Living Lab standards in a perspective of **quality certification of procedures/methods/tools**.

FUNDING SCHEMES

Competitiveness and Innovation Programme (2007-8), ...

To be defined later in the writing process

MAGNITUDE OF INVESTMENT NEEDED

To be defined later in the writing process

6.5 Application area specific approaches

TARGET OUTCOME

To be written

EXPECTED IMPACT

To be written

FUNDING SCHEMES

DG INFSO H: (for eHealth, eInclusion, Transportation & Logistics), ...

To be further defined later in the writing process

MAGNITUDE OF INVESTMENT NEEDED

To be defined later in the writing process

LIVING LAB THEMATIC/TOPIC SUB-NETWORKS

- Establish ENoLL sub-networks related to specific themes and topics (Health, Inclusion, Public transportation, Tourism etc)

6.6 Regional policy approaches

TARGET OUTCOME

“Innovation can enhance regional development and a regional approach can foster good innovation”, said Commissioner Hübner, the European Commissioner for Regional Policy, in her common press conference of 13th of September with Commissioner Potocnik, the European Commissioner for Research. ”The capacity of those making decisions about their regions to turn knowledge into growth will have a decisive impact on the future. So we need to use all means that we have to make this positive relationship between regions and research flourish.”

The EU has complementary policies in place to support research, innovation and entrepreneurship in Europe's regions and Member States. Providing the basis of excellent research and innovation in Europe is the precondition for maintaining the EU model of sustainable development. Cohesion policy can help all regions to build up research and innovation capacity, to stimulate and support innovations in the social area, and to exchange good practice through trans-national and inter-regional co-operation

The Commission on 13 July.2007 adopted two key proposals in order to help national and regional authorities make the most efficient use of the €308 billion EU money that was allocated to Cohesion policy under the December 2005 budgetary deal for 2007-2013. This comes only days after the European Parliament vote on the package of regulations that will govern Structural Funds operation from January 2007. The Commission invites Member States to improve the arrangements for coordinated preparation and use of the Structural Funds, FP7 and CIP and to include information on these in the National Reform Programmes.

Complementing the regulations, the **Community Strategic Guidelines** are prepared by the Commission to set out the political priorities for investments to be made at national and regional level. Emphasizing investments in knowledge and information society, innovation, entrepreneurship, the environment and "creating more and better jobs," the Community Strategic Guidelines play a crucial role in "lisbonising" the future Cohesion policy. The guide is due to be published by the end of the year.

The DG Regio communicated also by his report recently to find synergies in the EU programmes that support regional development through research, development and innovation: the Structural Funds, the Seventh Framework Programme for R&D (FP7) and the Competitiveness & Innovation Programme (CIP).

EXPECTED IMPACT

To facilitate complementary funding from Community, national and regional instruments, the Commission will regularly inform national/regional authorities on organizations established in their respective territories which have benefited from FP7 and CIP grants. Such information will be provided via the existing governance structures set out for each of these instruments.

The European Commission is also planning a series of actions to help Member States and regions make better use of funding. By the end of the year, the Commission will produce a guide to help research organisations and businesses identify the most appropriate source of funding.

The Commission will hold regular events bringing together the relevant stakeholders in research, innovation and regional development to share ideas and exchange best practice.

The Commission will report in spring 2009 on the progress made at national and regional level in co-ordinated use of the Community's instruments and on examples of good practice at national and regional level;

FUNDING SCHEMES

At the Community level, the Union possesses three key support instruments:

- Cohesion policy which is funded under the Structural Funds
- Cohesion Fund
- Research Framework Programme and

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|-----------------------------------|--|---|
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- the Competitiveness and Innovation Framework Programme.

This Communication aims to show the synergies of design of the funding instruments of the European research, innovation and cohesion policies. In order to increase the effectiveness of the three instruments, these synergies should now be translated into synergies of action by national and regional authorities as well as regional actors. The Communication takes stock of the current situation and calls on Member States and regions to make more effective use of the EU Research, Innovation and Cohesion policies and instruments.

The Commission will prepare by the end of 2007 a practical guide looking at the funding opportunities through the eyes of a research institution or a company wishing to use EU funding to undertake research and innovation activities. The guide will also examine how to set up mechanisms at national and regional levels to foster coordinated access to the different instruments, and explain Article 54(5) of the Council Regulation (EC) No 1083/2006 on the use of funding from two different Community sources for the same set of eligible costs;

MAGNITUDE OF INVESTMENT NEEDED

Similarly, while Cohesion Policy does not set specific minimum allocations for RTDI, or indeed for any sector, both the Regulations and the Strategic Guidelines on Cohesion give a clear impetus to raise research and innovation capacity in the regions by funding productive investment together with help for initiating strategies for R&D and innovation based on local assets. Indicative figures are that Member States have "earmarked" around €45 billion of cohesion policy funding for investments in research and development and innovation, including investment in human capital. This is more than three times the amount that was invested in these areas in the period 2000-2006.

Outside the Convergence regions, the **Regional Competitiveness and Employment objective** aims at strengthening competitiveness and attractiveness, as well as employment, through a two-fold approach. First, development programmes will help regions to anticipate and promote economic change through innovation and the promotion of the knowledge society, entrepreneurship, the protection of the environment, and the improvement of their accessibility. Second, more and better jobs will be supported by adapting the workforce and by investing in human resources. In EU-27, a total of 168 regions will be eligible, representing 314 million inhabitants. Within these, 13 regions which are home to a total of 19 million inhabitants represent so-called "phasing-in" areas and are subject to special financial allocations due to their former status as "Objective 1" regions. The amount of EUR 55 billion – of which EUR 11.4 billion is for the "phasing-in" regions – represents just below 16% of the total allocation. Regions in 19 Member States are concerned with this objective.

Links:

- Commission (RAPID Press Release): [Commission adopts key proposals to help European regions make the most of new Cohesion policy](#) (13 July 2006)
- Commission (RAPID): [A reformed Cohesion Policy for a changing Europe Regions, Cities and Border areas for Growth and Jobs - 10 Questions and Answers](#) (13 July 2006)
- Commission (RAPID Press Release): [Regions and Cities for Growth and Jobs: An overview on the Regulations 2007-2013 for Cohesion and Regional Policy](#) (13 July 2006)
- Commission (DG Regio): [Community Strategic Guidelines for Cohesion policy](#) (13 July 2006)
- Commission (DG Regio): [Communication on cohesion policy and cities](#) (13 July 2006)

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- Commission (DG Regio): [Fact sheet on the new structural funds regulations 2007-2013](#) (13 July 2006)
- Commission (DG INFSO & Media and DG Regio) http://ec.europa.eu/information_society/activities/policy_link/documents/regions.pdf (14. September.2007)
- Commission (DG INFSO & Media)
- Commission (DG Regio) The Community Strategic Guidelines on Cohesion 2007-2013 (11.September 2007) http://ec.europa.eu/regional_policy/sources/docoffic/2007/osc/1_29120061021en00110032.pdf

7 CONCLUSIONS

General conclusions on key roadmap elements and recommendations Alvaro, MikaelB,
Veli #

8 SUPPLEMENT

8.1 Abbreviations and Terminology

Terms and notions which are used with a particular meaning in this document is listed below:

| | |
|-------------|---|
| CA | Coordination Action (FP type of project) |
| CORE | Continuity, Openness, Realism and Empowerment of users. → section 2.2 |
| DG | Directorate-General (European Commission organisational entity), such as: |
| DG AGRI | DG Agriculture and Rural Development |
| DG ENTR | DG Enterprise and Industry |
| DG INFSO | DG Information Society and Media |
| DG REGIO | DG Regional Policy |
| DG RTD | |
| DG Research | |
| Domain | A shared area of interest among Living Lab actors. There are different type of areas like: Application areas (automotive, eHealth, public transportation etc), geographical areas (Urban, Rural etc) or demographic areas (young people, elderly people, kids in school etc). → Ref “LL Types” in section 2.3 |
| EAR | Experience and Application Research -> section 2.5 |
| EC | European Commission |
| ENoLL | European Network of Living Labs → www.openlivinglabs.eu |
| FP | EU Framework Programme for Research and Technological Development (FP6 = 6th Framework Programme: 2003-2006; FP7 = 7th Framework Programme: 2007-2013, etc) |
| Innovation | An asset or asset generation process, which has a well defined and recognized value and is an evidence of significant novelty and creativity. |
| IP | Integrated Project (FP type of project) |
| LL | Living Lab |
| LL-Open | Living Labs Open Innovation Community → www.openlivinglabs.eu |
| Living Lab | A Living Lab is a system enabling people, users/buyers of services and products, to take active roles as contributors and co-creators in the research, development and innovation process. |
| LLP | Living Labs Portfolio, including ENoLL, LL-Open, emerging LL Partner Network, and LL related projects → section 4.1 |
| LLP-LG | Living Labs Portfolio Leadership Group |
| SSA | Strategic Support Action (FP type of project) |
| UDI | User-driven Innovation |

User In context of “Living Labs”, a **user** is an individual person who works with, and depends on, the entity being created in the Living Lab. This means that notion **users** includes persons in many different positions such as “developer”, “seller”, “support person”, “buyer” and “end user”. It is of vital importance that a Living Lab engages and facilitates collaboration in-between users from different parts of the value-chain.

8.2 References

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8.3 Main changes since previous version

Changes since last version (0.5a):

- Everywhere: Remarks (purple, italics) added in many sections
- First page: Text modified. Guidelines amended.
- Section 1: Content added
- Section 2.3: improved
- Chapter 6: Amended. EC are moved from “Drivers” into “Funding Schemes”
- Section 8.4: Amended

8.4 Roadmap work group

AUTHORS (SO FAR):

- Almiral Esteve (Esteve): Various sections: Improvements and comments
- Börjeson, Mikael (MikaelB): Structure, writing coordination and authoring
- Carter, David, (David): Various sections: suggestions&supplement, UK DC10 initiative
- Kallai, Thunde (Thunde): Section 6.6

- Luotonen Olavi (Olavi): EC organisation and terminology etc
- Mikkela, Kari (Kari): Various sections
- Mulder, Ingrid (Ingrid): Section 2.4
- Nilsson, Michael (Michael): Various sections approved
- Ponce de Leon (Miguel): Sections 3.3.1, 3.3.2
- Santoro, Roberto (Roberto): Sections: 6.2, 6.4
- Velthausz, Dan (Dan): Sections 2.4