

Exploring Business Models for Open Innovation in Rural Living Labs

Hans Schaffers¹, Mariluz Guerrero Cordoba², Patrizia Hongisto¹, Tünde Kallai³,
Christian Merz⁴, Johann van Rensburg⁵

¹*Helsinki School of Economics, Fredrikinkatu 48A, FIN-00100 Helsinki
{hans.schaffers,patrizia.hongisto}@hse.fi*

²*Tragsa Group, Julián Camarillo 6B, 28037 Madrid, Spain, mgco@tragatec.es*

³*University of Szeged, Szeged, Hungary, tkallai@t-online.hu*

⁴*SAP AG, Vincenz-Priessnitz-Strasse 1, 76131 Karlsruhe, Germany, christian.merz@sap.com*

⁵*CSIR Meraka Institute, Meiring Naude Rd, Pretoria 0001, South-Africa, JvRensbu@csir.co.za*

Abstract

Living Labs are user-centric environments for open innovation characterized by early and continuous involvement of users and by user-driven rapid prototyping cycles. Establishing sustainable partnerships of stakeholders with a shared set of values is a strategic step in the planning and preparation phases of Living Labs, setting the conditions for the subsequent phase of full operation. As Living Labs are instances of open innovation but also need to establish mechanisms to protect IPR, business models coping with various aspects of partnering is critical. Little theoretical and practical guidance is available on how to design and implement such business models. Based on current work in launching Living Labs for rural development, this paper identifies critical aspects of business models and pre-conditions for business models design. These first findings are relevant to understand how to arrive at successful business models for open collaborative innovation fostering rural and regional development.

Keywords

Innovation, Living Labs, Collaboration, Business Models, Rural Development, Policies

1 Introduction

Living Labs can be understood as user-centric environments for open innovation. Such environments are characterised by early involvement of end-users in the actual process of creating innovations, and by the establishment of rapid prototyping cycles where users are driving the innovation process and closely working together with developers and other stakeholders. A useful description of this concept is given in [Eriksson et al 2006]: “The Living Lab concept refers to a R&D methodology where innovations, such as services, products and application enhancements, are created and validated in collaborative, multi-contextual empirical real-world settings”. This human-centric approach considers humans as the source of innovation, not just as an object for testing and feedback. Additionally, the Living Labs approach is characterised by close cooperation of users and technology and application providers, by a focus on the vertical value chain, by openness and neutrality towards technologies and partners, and by involvement of the public. Although there is not, and cannot be, one single approach to Living Labs, the concept should be distinguished from more common approaches such as test beds for testing of a technology or application in a laboratory environment and field trials for testing in a limited but still real-life environment, see [Ballon et al 2006].

A particular interesting aspect of the Living Labs concept is that it provides a concrete setting for forms of open and collaborative innovation. The concept of open innovation has been introduced by [Chesbrough 2003, 2006] focusing on business models structuring value propositions and partnerships to exploit the opportunities of technologies. The concept of ‘democratic innovation’ [Von Hippel 2005] adds the element of public participation and communities to innovation. As [Thomke, Von Hippel 2006] show, the idea of customers as innovators is not unrealistic. Many companies are introducing new approaches to develop customized products providing customers the tools to design and develop application-specific parts of products and services.

This paper addresses the relation between Living Labs and open innovation in a setting of rural development by focusing on the role of business models to establish collaborative partnerships as a trigger for rural innovation communities. The paper is based on preliminary findings of the C@R Integrated Project (www.c-rural.eu) in the 6th Framework Programme. This project aims to boost the introduction of collaborative work environments as key enablers catalyzing rural development. To that end, C@R is launching and developing a network of seven Rural Living Labs which are understood as human-centric rural innovation environments in order to test and validate forms of collaborative working.

The purpose of this paper is to understand the practical challenges and bottlenecks of establishing business models in Living Labs fostering rural and regional development. There is a need to identify the key factors underpinning successful business models to support the development of Rural Living Labs resulting in innovative services. Therefore the actual Living Labs preparation process in selected sites is studied to identify the strengths and weaknesses of the approaches which are now evolving. Developing viable business models to establish partnerships and catalyze innovation communities is a strategic step in planning and preparing such Rural Living Labs. Based on current work in C@R, a first analysis is provided of key characteristics of open collaboration business models related to Rural Living Labs.

2Relation to Existing Theories and Work

2.1 Business design and Living Labs value network

The basis for strategic development of a rural Living Lab is in establishing a sustainable stakeholder partnership. A useful starting point is the business design concept [Slywotzky 1996]. This concept is looking at the totality of actors and resources needed to implement the partnership and create value. Users, policy makers, companies, researchers enter into agreements on the basis of which they may engage in longer term collaboration. This concept allows us to look at a Living Labs innovation system from the perspective of a value system and the cooperative roles of actors including users. Business design creation captures elements such as:

- Assumptions about user behaviour and priorities. A Living Labs setting widens the scope to include the full set of stakeholders; users are no longer passive objects providing feedback but partner in co-creation.
- Selection of target groups and value proposition; definition, scoping and differentiation of products and services.
- Value capture model. In a Living Labs setting, collaboration of stakeholders in the value network is a necessity to capture value.
- Configuration of partner resources, and responsibilities allocation among partners in the value system.

The business design concept allows a focus on value generation and distribution in a network of cooperating partners, including users. In investigating our Living Labs cases, our emphasis is to identify how this approach is useful to enable the establishment of public-private partnerships in rural environments. Using this general definition, a business design underlying a Living Lab marks the specific base of service functions that express the value proposition of that Living Lab to its stakeholders (rural network), and it describes the processes through which the Living Lab generates value for stakeholders. A successful Living Labs business design can be expected to be highly affected by the specific context of the Living Lab rural environment and by its specific objectives and ambitions.

2.2 Open innovation models

Business design thinking of innovation value systems is closely related with a relatively new development in innovation literature: open innovation [Chesbrough 2003]. This concept focuses on collaboration between companies to exploit a technological innovation. Not much different from business design thinking, a business model encompasses six functions; 1. Articulate the value proposition, 2. Identify a market segment, 3. Define the required value chain, 4. Specify the revenue generation mechanism, 5. Describe the position of actors within the value network, 6. Formulate a competitive strategy. [Chesbrough 2006] proposes a categorisation of business models in six types of varying levels of integration and adaptive capability. In particular the advanced Type 6 business model which is capable to adapt to the market is interesting for Rural Living Labs business model thinking as the nature of Living Labs is to bring users in the leading role.

Whereas this work concentrates on business innovation environments and only to a certain extent brings in the collaborative value system thinking, the role of innovation communities and of the public domain has been stressed by [Von Hippel 2006]. The value of that approach from the perspective of Living Labs and rural environments is to promote a focus on decentralized systems of innovation which at the same time might need a context of regional clusters and collaborative networks to be effective and sustainable. Comparable approaches such as “creation nets”, flexible and temporary business networks at a wide geographical scale, have been suggested by [Seely Brown, Hagel III 2006]. Collaboration and participation tools such as Web 2.0 oriented shared workspaces, blogs, presence and awareness functionalities and wiki’s [Tapscott, Williams 2006] will probably be a key condition to implement such models of mass collaboration.

The open innovation concept in a wider sense is closely related to Living Labs thinking as it focuses on the agreements between different partners, including customers, researchers and companies, in developing and exploiting a Living Lab innovation environment. This concept is powerful to identify the opportunities for partnerships in collaborative innovation contexts, focusing also on often problematic issues like venturing and IPR. Therefore we take a closer look at the relevant concepts in relation to actual Living Labs development work, especially with respect to incubator-related Living Labs.

2.3 Systemic instruments of innovation

The concept of open innovation at business level has now widely been accepted as an important paradigm, and empirically-based studies are becoming available focusing on key issues such as IPR and patenting strategies. As concerns Living Labs, there is still a lack of empirically grounded studies into their design parameters, the adequacy of underlying business models, and the effectiveness of Living Labs as systemic instruments for innovation. In order to provide better guidance to attempts to conceive, initiate, launch and operate Living Labs in the future it is important to start a programme of empirically-based research in key factors determining the success or failure of Living Labs.

This means there is a need to identify and validate the criteria that can be used to assess the quality and impacts of Living Labs designs as instruments for systemic innovation. [Smits, Kuhlmann 2004] identified general criteria playing a role in assessment of systemic instruments for innovation policies. Such criteria include how systemic instruments prevent tunnel vision, embody the capability to build and organise innovation systems, provide opportunities for learning and experimenting, establish strategic intelligence, and stimulate demand articulation. We use that as a point of departure, and taking in account the specific aspects of Living Labs versus more general instruments of innovation policy, we focus on a new set of systemic criteria: how the Living Labs business model stimulates the creation of sustainable partnerships, provides an environment for new business development, and exploits opportunities for network synergies.

3 Research approach

3.1 Rural Living Labs pilots

The C@R project has launched rural Living Labs in seven rural areas in six countries, covering four broad areas of collaborative innovation:

1. Rural enterprise incubation. Four Living labs in this category aim to create business innovation ecosystems and support new businesses in their start-up phase and existing companies to grow irrespective of their remoteness to markets. Different models are studied, such as the Infopreneur model supporting micro-service enterprises (Sekhukhune), the SME incubation model (Frascati), public-private collaborative business model and citizens e-integration (Soria) and the Turku Archipelago model of WLAN-enabled business communities and distributed business incubator.
2. Open communities. The Homokhátság Living Lab in Hungary focuses on the introduction of peer-to-peer infrastructures and production management applications supporting farmer communities in rural areas.
3. Collaborative governance. The Vysocina region Living Lab in the Czech Republic addresses stakeholder participation and collaboration in governance processes such as spatial development planning.
4. Collaborative fishery. The Cudillero Living Lab, located in Asturias in Spain, targets the domain of fishery business processes and auctions. It allows the investigation of new business models tailored to the fishery industry.

A first overview of approaches to Living labs business models and creation of open innovation partnerships through capturing and formalising lessons learned is presented, by focusing on the 'pain points' experienced. The approach is based on a systematic analysis of the policy and business context of open innovation in the rural areas. This analysis reveals the key characteristics of the collaborative innovation issues at the particular rural environment and suggests key conditions that should be met to result into successful rural innovation systems. One of the questions being analysed is in how far the creation of business innovation environments requires not only the creation of business partnerships but also of policy innovations. Cross-analysis of Living Labs allows us to compare the different approaches and to conclude on business model approaches.

3.2 The role of business models in different phases of development

As was discussed focus is on how the Living Labs business model: 1) stimulates the creation of sustainable partnerships; 2) provides an environment for new business development through service innovation; 3) exploits opportunities to capitalize on network effects. It is of key importance to distinguish between different phases of Living Labs development and to focus on how in each phase particular aspects of the business model are addressed. These aspects of business models as related to key phases in Living Labs evolution are introduced in Table 1:

- Initialisation and preparation. In this phase, creating the partnership based on the need to enhance the scope of the regional network and on some form of business plan is crucial and will enable the longer term viability of the Living Lab. Conditions for future business development in later stages are being set in this initial phase.
- Living Labs operation. This phase is closely connected with the provision of user-centric innovation services that enable new business development. Relations between Living Labs in a network could be established, to generate economies of scale and scope and benefit from larger user communities and complementary innovation services.
- Upscaling and commercialization. This phase embeds the Living Lab into the regional innovation system. Strategies to capitalize on network effects will become more mature.

	Phase I Initialization	Phase II Operation	Phase III Commercialization
Living Lab partnership creation	Establish rural Living Lab partnership and shared value system User groups creation	Service provision models, configuration of resources, value capture strategies	Embedding the Living Lab into the regional innovation system
New Business development	Establish product and service offering and value capture	Service provision mechanisms Core managerial processes	Commercialization of service provision

Synergies and network effects	Synergies in utilising common know-how, methodologies, technologies	Design synergies in providing services in a network of Living Labs	Upscaling in untapped markets; models for IPR exploitation
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Table 1: Business model aspects in different phases of Living Labs development

When Living Labs are part of a network, which is the case in C@R, synergies between the different Living Labs can be identified and actively exploited. Such strategies already could be part of the business design. C@R constitutes a portfolio of Living Labs in different stages of development, emphasizing different objectives, and in different contexts. However the Living Labs represent a collection of “assets” that can be shared: knowledge, business networks, user communities, partnerships, policy innovations, infrastructures, technologies, user experiences. The portfolio exhibits similarities and provides opportunities to utilize the assets in different settings. The following sources of synergies and similarities can be considered:

- Rural economic and social environment. C@R Living Labs mostly address environments of remote scarcely populated areas, ageing population, and poorer populations. Policies are being developed to cope with these issues. Synergies can be reached in developing strategies for rural development building on Living Labs, that draw from common policy objectives and experience, and that are applicable in many other contexts.
- Living lab objectives and ambitions. All Living Labs are dealing with rural development as a primary objective. Living Labs are understood as an environment for innovation which supports rural development. Within the set of seven C@R Living Labs, four are dealing with business incubator services, promoting entrepreneurship for SMEs. The similarity in objectives and ambitions across the Living Labs means that experiences and strategies can be exchanged more easily and more effectively.
- Technologies and infrastructures. The seven C@R Living Labs are using a diversity of technologies, network infrastructures and applications such as wireless networks, fixed networks, GIS and collaboration tools. Some of the Living Labs host specialist technology providers and research institutes. Such technologies can be tested in particular environments and can be deployed more easily elsewhere. C@R is actively exploiting these exchanges to create synergies based on economies of scale and scope.
- Rural innovation stakeholder network and knowledge base. All the Living Labs host their specific rural stakeholder network (policy makers, companies, research institutes, users, agencies, NGO's). The Living Labs' rural innovation network hosts valuable knowledge and know-how, which can be shared with other Living Labs.

These sources of synergy within the C@R Living Labs network, and between C@R and other projects, can be exploited to create innovative Living Lab business models, to accelerate the provision of innovative Living Labs services, and to re-use methodologies for user-involvement, Living lab deployment and user roll-out.

4 Findings and discussion

Table 2 presents illustrative characteristics of strategic business model development in a selection of four C@R Living Labs. For the purpose of this paper we will focus on the role of business models related to the initialisation and preparation phase of the Living Labs.

	Living Lab partnership creation	New business development	Exploiting synergies and network effects
Sekhukhune (South-Africa)	Franchising model; Enhancement of SMME networks; Integration of local communities; Trusted local partnerships	Leverage public funding to initiate sustainable value chains and business models; Bridging 1 st and 2 nd economies	Networked economies (cross-continental supply chains, R&D); Sharing of best practices; Large-scale validation
Soria (Spain)	Role of local action groups to represent user groups; Catalyzing role of public bodies; Benefits distribution strategies	Link Living Labs service provision and needs of rural economic development in targeted sectors	Establish synergies in sharing technologies and know-how across Living Lab network
Turku Archipelago (Finland)	Strengthening existing regional networking relationships; Balancing and extending network functions, establish user group involvement.	Generating pilot projects to develop conditions for strategic action and to arrive at innovative, sustainable business models	Living Lab service provision benefiting from similarities/differences of communities and user groups participating in the Living Labs network

Homokhátság (Hungary)	Formal agreements to establish longer term consortium partnership	Farming network to establish direct user interaction and validation	Farming network enables reaching critical mass and learning effects
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Table 2: Business model aspects in selected Rural Living Labs

4.1 Sekhukhune Living Lab, South Africa

The Sekhukhune Living Lab focuses on small, medium and micro-enterprises (SMMEs) which are regarded as important growth engines. Several barriers are inhibiting rural entrepreneurship and access to mainstream or global supply chains and markets. Long distances, high transport/transaction costs and low economies of scale are the consequences of typical rural conditions such as physical remoteness and low economic activity levels. The problems associated with these barriers worsen dramatically if roads are poor, telecommunications bandwidth is limited or expensive, and many rural entrepreneurs have limited computer literacy and do not own a truck, motorcar or computer. These are the typical complexities faced by rural entrepreneurs in most developing countries, and in South Africa's "deep rural areas" such as Sekhukhune.

Sekhukhune Living Lab therefore introduces a range of services through the facilitation of so-called Infopreneurs which are micro, self-sustainable service enterprises that channel and deliver services for local SMMEs and citizens into the community. These Infopreneurs are the 1st tier target SMME group of the work and interventions of the proposed C@R Living Lab. They provide knowledge-based services such as cross-organizational business process enabling, SWOT analysis and logistics brokerage to help start-up, grow and cluster other SMME's in various sectors (e.g. health, mining, construction). Infopreneurs are being deployed in already available infrastructure and benefit from ongoing local initiatives supported by the South-African government. Franchise-like agreements are shaping the collaboration between partners. Focus of Living Lab development is on provision of collaboration tools and processes, in particular addressing the accessibility of knowledge-based services that are relevant to local SMME businesses, on harnessing of increased mobile connectivity and on enabling rural service channels that enhance effective collaboration amongst SMMEs in communities and between first and second economy enterprises. The ubiquitous infrastructure shortcomings of South-Africa (e.g. limited bandwidth) is taken into account when setting up these knowledge service agents. By forming clustered enterprises via Infopreneur services, consolidation of supply chain volumes is achieved to lower transaction and transportation costs. The strategy is to create Infopreneur service bundles to enhance local business and geo-economic intelligence that will help SMMEs to seamlessly interoperate amongst each other and with first economy enterprises.

4.2 Soria Living Lab, Spain

The Soria region, middle-north of Spain, is one of the most depopulated and ageing regions in Europe. The product and service concept of the Soria Living lab is to provide innovative e-learning services, applications that promote the tourist sector, and exploitation of mycological resources through licence management systems and value chain product management. The Living Lab aims to contribute to rural development and attract business activities through developing a business incubator platform. The activity is strongly supported by Adema, a local action group serving also as linking pin with users and entrepreneurs. Soria Living Lab is open for other participants e.g. other local action groups, small businesses in mycological and tourists sectors, and local ICT providers. The strategy concerning the business model is to discover potential future business, analyse the feasibility and sustainability studying the potential associated business models, and design the common services that will be offered by the platform to be developed in this Living Lab. Public-private collaboration has evolved on the basis of collaboration between public bodies (TRAGSA, local municipalities and regional government) who are taking the role of catalyzing organisations of the Living lab environment, contacting with technology providers (Telefonica, University of Madrid), groups of small business and users (Adema) and user roll-out experts (Oxygen Foundation) to create a sustainable and durable Living Lab organisation that in this first phase is supported by the C@R project. However on the long run a business plan is necessary to let Soria Living Lab be sustainable beyond the initial funding.

4.3 Homokhátság Living Lab, Hungary

Homokhátság is a typical agricultural area, strongly dependent on agricultural production. Key to the business model is a successful so-called “new type co-operative”, the Mórakert Purchasing and Service Co-operative Mórahalom, which is active in the fruit and vegetable sector. As the case of Mórakert shows, co-operatives can be a solution for farmers to cope with problems arising from incomplete pricing mechanisms. Transaction costs can be reduced, at least at regional level. The Hungarian Homokhátság Rural Living lab fosters online ad-hoc communities and provides existing rural communities with technical support. For geographical and demographical reasons, Internet penetration in the Hungarian rural areas is far less than in larger cities. It appeared that current business models and technologies cannot achieve a breakthrough. Therefore a new business model is in construction, which is closer to real-life situations in rural areas and villages. The Hungarian Living Lab undertakes to solve the cooperation among wireless ISPs on basis of a common access network. Wireless ISPs are cooperating using a single partly voluntary maintained access network.

4.4 Turku Archipelago Living lab, Finland

Turku Archipelago is characterized by a large number of islands, a diminishing population and difficulties to retain the inhabitants on remote islands due to lacking job opportunities. In this situation, local authorities must be innovative in resolving the challenge of maintaining equal standards of basic services (e.g. schools, healthcare). Important actors for innovation are present, such as Region Åboland regional development agency, municipalities, the SparkNet and OpenSpark wireless community initiatives, and a publicly owned network. A well established wireless network infrastructure is available. Region Åboland is jointly owned by the eight municipalities in Åboland and owns the local telecommunications operator Skärgårdsnäten which provides Wireless Broadband Services to inhabitants, fiber-optic connections to the municipalities and businesses, and develops services and applications adapted to the extreme local conditions. At the same time tourism is increasing with demands for new services taking in consideration mobile needs of tourists and visitors at sea as well as the needs of e-professionals inhabiting the region during their free time and summer season. The Turku Living Lab is in a preparatory stage which has included municipal investments in wireless networks (WiMax) and constant adaptation to specific needs of connectivity for citizens’ basic services or entrepreneurial activities which are spurring usage of such networks. Mobile applications and eServices, including WiMAX networks supported by local communities are needed to maintain the integration with the mainland cities, services and economic development. Issues span from basic connectivity to specific devices to managing distributed workspaces. On a social level there is a need for support of community building and management of user groups.

5 Conclusions

The key message of this paper is that a Living Labs business model is not just a product and service concept, financial agreement or agreement about IPR but includes the various dimensions of partnership creation and operation across the different Living Labs development stages. The various business models discussed demonstrate the key characteristic of designing and shaping the various partnership designs. The paper suggests different factors determining the specific characteristics of such partnership designs and identifies the situational parameters determining adequate open and collaborative business innovation models. These in turn allow synergies and the crucial components of business model that are identified may lead to general guidelines that can be applied elsewhere.

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