Living Labs for SMEs

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Abstract: Interactive, co-creative relation of consumers, users and producers is quickly developing recently. Living Labs (LL) have a bridging role between market pull and technology push. They realise concurrent innovation. LLs are approaches to realise an interactive search for new products/services in real life milieus together with users/consumers, without mediation of marketing experts. Our presentation highlights LLs first as providers of a collaborative working environment for users. It emphasises that LLs have a strong methodology and describes and assesses the „LL Harmonization cubes". It outlines then what LLs can bring advantages for SMEs. Main added value of LLs for SMEs is that they provide for innovation services by integrating SMEs in a collaborative working environment that would otherwise not available for them.

Keywords: open innovation, Living Lab, Harmonization cube, SME involvement

1   Introductory remarks

According to some description of history of innovation, in a big part of the 20th century, the dynamic of innovation was 'linear', in-house, 'closed' innovation. Today innovation is conceptualised as some networked phenomenon where the main issues happen in a globally connected world at the most various intersections, for example at interactions among disciplines, interactions with the suppliers, consumers, etc. The innovation dynamic is with this full of feedbacks, often unavoidable restarting of the circles before iterativity is reached. Innovation is getting more and more somehow open. By now, linear innovation in the sense that a firm just realises a (scientific)-technological push to offer it to imagined, 'virtual users' could not be successfully realised by the biggest firms either. It is so just because it would need too much financing, time and risk taking, meanwhile giving up the utilisation of the recently recognised huge new possibilities. Everybody moving on the innovation scene has to try to explore and exploit the immense knowledge base outside any firm in the globalising environment. As

Henry Chesbrough describes it (1), in issues of R&D&I the walls of the firms are getting more and more interpenetrable. Firms regularly outsource their R&D&I tasks and make marketable their unrealised innovative ideas and development alternatives, looking that way for some additional revenue.

Chesbrough introduced the happy term 'open innovation' in his pathbreaking book in 2003. He concentrated on the specificities of the globalising R&D&I market in which outsourcing the tasks, buying and selling ideas, prototypes or semi-final products becomes decisive constructed advantage in the global competition race. Perhaps his main message was of unique importance that an appropriate business model is essential to realise this possible advantage. Chesbrough concentrated on product and production development and conceptualised the open market as B2B interaction, interaction among firms. Both limitations made by him that time are already over for analysis too. Chesbrough himself turned his attention from product innovation to service innovation by now (2). While product development may be up to a limit imagined for 'virtual users', only, services innovation scarcely may work without interaction with real users, costumers. On the other side, also open innovation aiming at product development typically includes interaction with the users/consumers already.

It is a commonplace in management literature in the last twenty years that 'the customer is the king'. One way to learn about the customer is getting as much information as possible, or better to say, getting the appropriate information about her behaviour, through observation and experimentation with her. The customer is to be made object of (in developed form: interactive, participative) observation so that s/he herself gives the needed answers. We all know the mighty development, a strong revolution of marketing and marketing research in the last ten years both in terms of the utilised social sciences and economics disciplines and the changing enabling technological base already by turning to the systematic exploitation of the Internet. There are some unsurmontable limits here, nevertheless. Gathering information needs mediation by the marketing researchers. They have to translate what they got as input. The difficulty can be indicated by the stickiness of the main bulk of knowledge users have. And of course, observation situation preserve some sort of artificiality. The question may be raised what else can be better basis for learning about the customer that can overcome, substitute or add to the information gathering process developed by marketing researchers.

The question is of highest importance, for the consumer is really to become the decisive factor in the innovation race recently and innovation capability is conceptualised as the decisive strategic factor in the global economic competition. Trusted by the European Commission to assess the global competition race, the Aho report (3) makes the call for the EU to concentrate the whole societal-economic dynamic around innovation. In this, demanding consumer is one of the essential elements in the production-consumption circle. There is a growing general bad feeling in the most developed countries in the last decade that by the widespread scientific availability of basic scientific knowledge and the

unstoppable process of outsourcing of labour based on law wage into countries where labour is cheap results in loosing the leading position of the recently most developed countries in global economic growth. We could add that the changing relation between the recently still leading countries and the BRICS in the innovation race too is getting to make another most important factor worthwhile to be worry about. The typical suggestion to the challenge still is to improve on the R&D supply capabilities. Chesbrough moves attention to turn to domination of service innovation. Amar Bhidé (4) tries to moderate the starting panic and suggests as consolation turning more attention to the 'mid-level innovation' and advantage of innovating for the 'venturesome consumer'. He also assesses that the race in outsourcing is decided but the main issue concerning global economic growth remains the competition in the markets of the most developed countries. A decisive turning to the 'venturesome' consumer is a decisive driver to preserve the position, he suggests. Consumers have needs, 'venturesome consumers' may have readiness to develop brand new, costly needs requiring intensive R&D&I on the supply side. All this means a most important feedback as driver in the 'innovation chain'. That is the need for inputing of the real needs of the customers inside the 'innovation chain', as soon as possible. With this we have the task to find one adequate microeconomic and management answer to the macroeconomic challenge of global economic growth.

Eric von Hippel believes that most innovative product ideas in history have been recognized not by producers and professional developers but by users. (5) (A historical outlook makes it rational to think that concerning domestication of the mass products, accomodation of them to local conditions, users have been constrained to make their steady improvement efforts. But Hippel also turns attention to a special group of users, the 'lead-users'.) That means that history of innovation in the period of mass production should be seen as a period when the innovation dynamic leading to mass products was dominated by professional inventors whose activity were subjected to and regulated by the supply side and the 'closed' form of innovation is to be seen as the trial by the firm to get under control the innovation capability for producing mass products. The recent overarching technological revolution strengthens the capability of professional inventors to provide for growing stream of innovations for 'virtual users'. There is a very quickly growing trend to explore and exploit application possibilities. But costs, time to realise, and risks are also very quickly growing. Breakthrough innovation possibilities multiply and with this innovation are turning to be a high risk (also high benefit) enterprise. With this the decisive challenge, the bottleneck problem, may become to meet the 'customer'. First because s/he may be irresponsive to the offerings because s/he may not want to change her consumption in the directions the supply side suggests. Second because those offerings may not meet existing or emerging (real) needs of (possible) users.

A double process emerges quite quickly. Importance of professional researchers and inventors inside the firm gets balanced by those, incomparably bigger number

of professional researchers and inventors who are outside but ready to utilise spin-offs of their efforts. (This is recognized by Chesbrough in his first book.) This process strengthens the supply side but may threaten by overproduction of not really needed and so by consumers refused new products. The performances of both groups together are challenged by the need for essential inclusion of (possible) users, consumers in a new, integrated mechanism of research and innovation. Herewith we have the challenge to realise the integration of the demand oriented R&D&I in the innovation chain to balance the innovation dynamic. The figure made after Donald Stokes 1997 (6) represents the place of 'use-inspired research' as result of some integrating 'concurrent' activity.
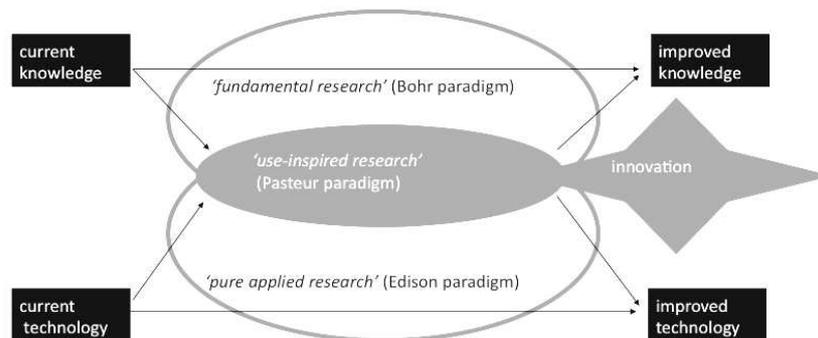
Figure 1.

Use-inspired research

Source: Stokes 1997, Ingrid Mulder, Pieter Jan Stappers: Co-creating in Practice: Results and Challenges, 2008

Research dynamic involving 'use-inspired research' is the furthest element of inclusion of the 'demand side', and also the (possible) users along the whole 'innovation chain'. It is important to see that with emerging innovations attributing the usual role to the demand side, representing 'the visible demand of buyers' (Ingrid Mulder, Pieter Jan Stappers 2008, (7)) will often be misleading. It is rational to say that in the context of early involvement of possible users a 'contextual push' based on needs and dreams of possible future users (Ingrid Mulder, Pieter Jan Stappers 2008 (7)) evolves that is different from the market pull, especially when the market is still very unripe. This 'contextual push' provides for substitute for the still missing demand side and turns to be market demand with ripe products. The challenge we concentrate on is to realise the contextual push, as fully as it is meaningful, as early as possible.

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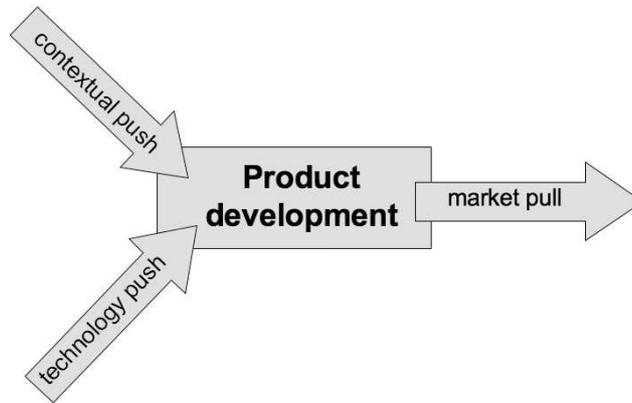
Figure 2.

Product development and the relation of technology and contextual push and market pull innovation

Ingrid Mulder, Pieter Jan Stappers 2009

There is a growing belief that chance of successful innovation moves from setting the task of innovating 'for the consumer', through moving to innovating 'with her', to the level of innovating 'by her'. The role of the firms is then to provide for an evolutionary environment in which possible users may develop their needs and find instruments to make solutions to satisfy them. In this respect we have the common denominator with lead user driven innovation, with open source based innovation, or the famous pioneering issue with the LEGO Mindstorm issue. But it is important to see that there are rather different types of users. They can be differentiated not only according to their needs, but also according to their possible roles in the innovation dynamics.
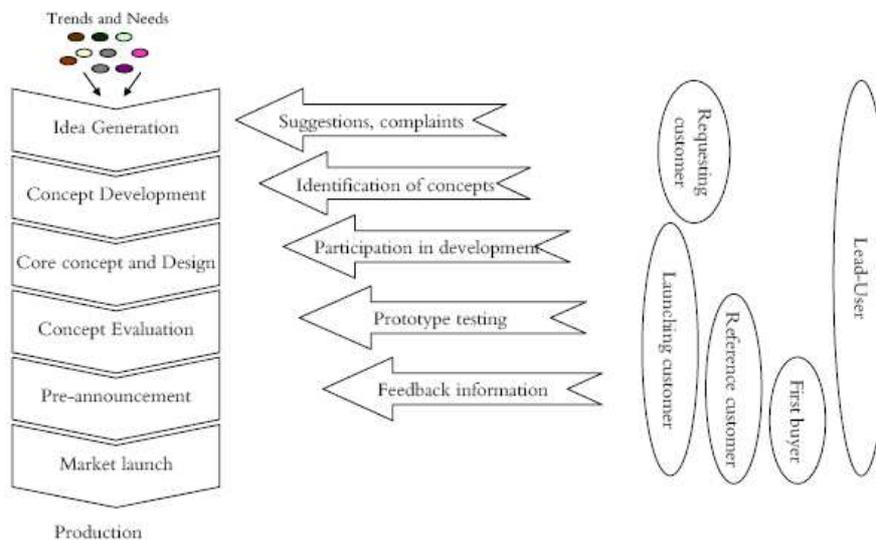
Figure 3.
Possible levels and forms of user participation in the technological adaptation cycle.
(Stahlbröst (2008:13)

2   What is a Living Lab (LL)?

One possibility of the answer is that a LL is an interactive, co-creative search for new products/services in real life milieus together with users/consumers, without mediation of marketing experts. Its working cycle ends in a mutually enabling change leading to some new 'product' (product or service) and some societal infrastructure. They are embedded in the reproduction dynamic of aliving network. To get a more detailed view it is worth wile to turn to some historical comparison. In an often cited article Pieter Ballon et al. (8) speak of a TEP, the set of testing and experimentation platforms. They cover with their description the multiplicity of different test and design facilities. Among the different elements of TEP there are real life user contexts, imagined by experts, and with the purpose to observe the behaviour of those who are put in this environment. The observation aims at getting knowledge of the social and economic changes related to ICT developments. This knowledge is first of all expected to be used for making decisions among technological alternatives by diminishing the uncertainty surrounding their application in real life milieu. "In addition to technological and innovation support, these facilities are set up for understanding and guiding the social and economic changes related to digital technologies and ICT developments. This refers to experimental settings, often imitating real life user

contexts, where ICT developers and users interact and exchange views for optimal technological introduction." (8, Introduction.) In the interpretation of Ballon et al. TEP provides the needed correction for some so called system failures. „In order to get a better grip on the innovatory use and how this can contribute to the technological landscape, these users are more and more investigated in direct contact with the technological prototype or service (that is being developed). The 'virtual user' (Flichy, 1995) is replaced by the 'real' user in the innovation process." (Ballon et al. 2005, Introduction (8)) We have here the user as still an object for learning by experts when s/he interacts with developers in an as far as possible real milieu.

This type of interaction is realised in a research milieu to learn from the interactive behaviour of the user by her observation. It may raise to co-creation and it aims at improving the innovation dynamic for scaling up: involved possible users are serving for production purposes.

Recently LLs may realise much more in direction of co-creation with the users. An LL may offer some sort of service for possible users so that they can solve their existing problem by integrating themselves in this service milieu and use its service for their own purposes. This way they can produce first customized 'products' (in the overarching meaning of 'product' i.e. product or service) and second the process of that customisation gives possibility for generalisation too, for the LL as 'producer', first of all to identify prototypes. LLs may provide here not for a learning milieu for their interactive behaviour with the service providers to serve for generalisation, first of all, but for a qualified collaborative working environment to realise some individualised 'product'. Better to say two subclasses may perhaps be differentiated. In one subclass of realising LL type collaboration in the 'concurrent' innovation dynamic provides for over-bridging the pre-commercial gap, or improving any other elements of the 'innovation chain' for the producer. In the other subclass realising a co-creation process first ends up in a customized product such as a changed city milieu like that realised in the Arabianrata project in Finland. (Arabianrata is a district of Helsinki that was reconstructed based on a LL project)

LLs are complex systems with a range of different levels in terms of user co-creativity. It is most natural that numerous configurations recently classified as LLs are on a quite low level. Concerning the phases of the 'innovation chain' LLs are most important perhaps in over-bridging the precommercial gap. LLs spread rather quickly. There are over 200 by 2011, mostly in Europe, and it can be expected that the number of them may grow over even perhaps 300 following the announcement of the fourth wave of ENoLL, the European Network of Living Labs membership enlargement in Budapest, in May 2011. Membership in ENoLL has a very important function by providing for possibilities of synergistic effects. Developing a flexible but well developed set of methodologies is sine qua non for the lasting success of LLs, just as providing for a stable quality of the services LLs

can offer. Methodologies and quality assurance measures work for keeping and raising the quality of any LL as well as interoperability of different LLs.

3 The harmonization cube methodology and quality assurance

European Living Labs have been unified by ENoLL with the aim to strenghten collaboration and utilize complementarities and resources among the members. There is a common methodology to harmonize and exchange best practices of LLs developed by Mulder in 2007 (10) as the so called harmonization cube. In the Helsinki manifesto, which has been communicated during the launch event of the first wave of Living Labs (November 2006), it is stated that "This approach should ensure that common methodologies and tools are developed across Europe that support, stimulate and accelerate the innovation process." "It can be said that harmonization of Living Lab methods and tools is key." (Mulder 2008 p., 11)

The harmonization cube defines the main interoperability elements from organizational, technical and contextual points of view, and by the stages of Living Lab maturity. It details the main elements of the evaluation methodology divided by the development stages - and direction of further development- the stages of setup, sustainability and scalability put on the vertical axe, in this order.
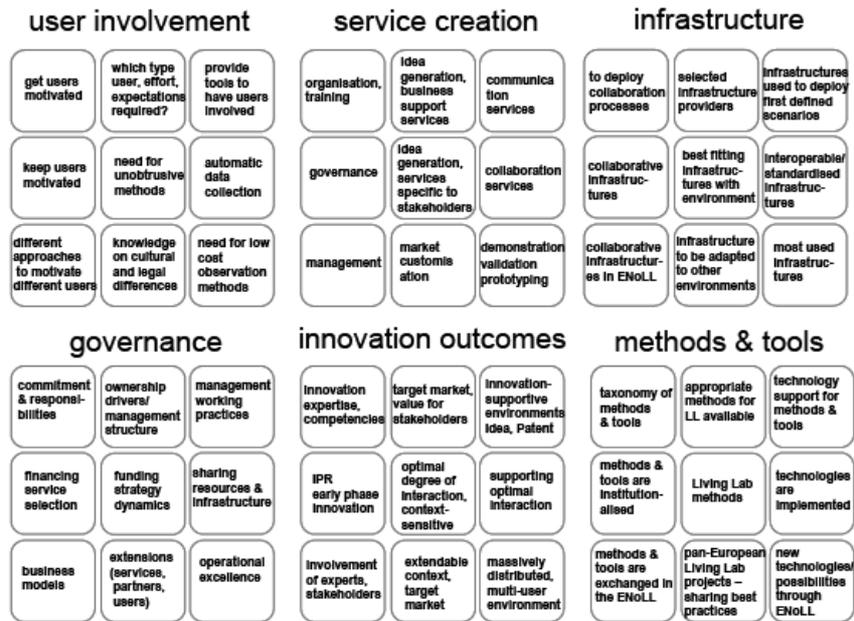
Figure 4
The elements of the harmonization cube
Source: I. Mulder, D. Velthausz, M. Kriens (2008)

Not all of the elements of the cube can be put in work by harmonization, but the different stages of maturity provide a direction for development. Harmonization details the main elements that should be focused on in order to realise a more effective way of operation, interactive value creation, and interactive co-development for new products/services in the user's real life milieus.

The Harmonization cube methodology focuses on the main elements that should be analysed by the evaluation of LLs. Maturity of each element can be measured on a scale. The six main elements of the harmonization cube is charted in the frame of a spider diagram, and according to improvement of the methodology introduced in the frame of the CO-LLABS project[1] it is extended with an additional seventh element, referring to SME innovation.

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[1] CO-LLABS (Community-Based Living labs to Enhance SMEs Innovation in Europe) project focuses on describing Living Lab best practices, but modes of their operation and methods of user-involvement are analyzed focusing on the viewpoint of SMEs.
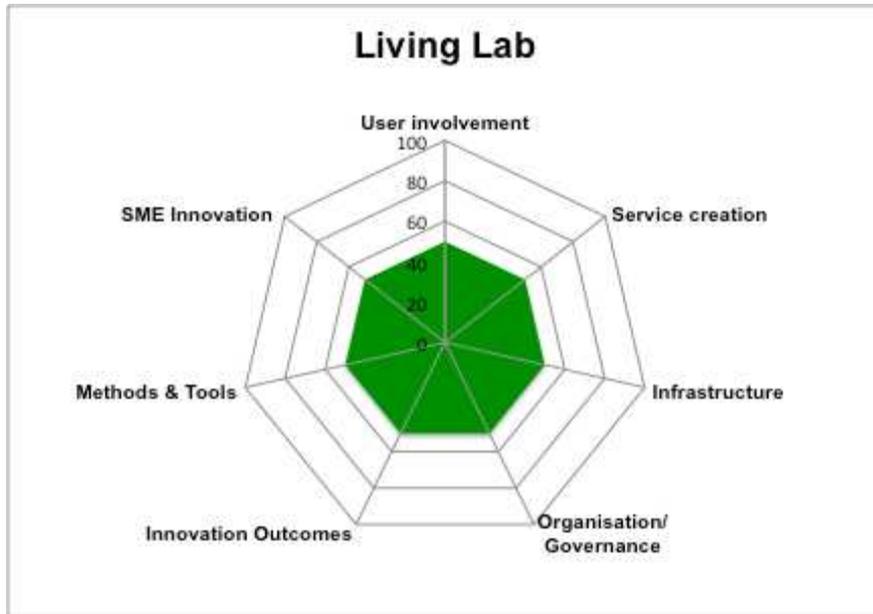
Figure 5
Spider-diagram of Living Lab evaluation
Source: CO-LLABS Technical Report

SMEs can have different roles related to the LL collaboration form, as they may be on user as well as on manufacturer side. Already existing LLs may provide the opportunity for SMEs to interactively test their products in advance, early in the development phase, by providing the service of customized testing according to the SMEs unique requirements. As EC INFSO stated: "The underlying motivation is that Living Labs provide services to SMEs that would otherwise not be available to them. Focus is on how SMEs and their business partners can be involved in Living Labs in the best way in order to collaborate in open innovation, and on sharing experience among Living Labs initiatives and beyond as regards SME involvement in co-creation of Living labs practices…." (12). The mentioned methodological pillars affect therefore SMEs business models. The main elements of the interoperability cube analysis of the LL processes in details focusing on the main elements are (7):

The key element of a LL is interactive, co-creative user-involvement, iteratively involving all key actors across the stages, and the methodology focuses on the analysis – and therefore provides the development opportunities - of interactive, co-creative user-involvement methods. User involvement has different aspects that should be focused on according to the maturity level of LLs. Methodical user involvement means firstly identification of interests of participating users, their behaviour, their roles, identification of the motivations of users, user incentives,

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selection methods of users e.g. by main segments. When user-involvement in initial phases is successfully realised, then maintaining users' interest and managing the community are the main focus of LL management and further development of the LL.

The service creation concept aims to analyse the services for collaboration and communication between the LL stakeholders, idea generation services and training services and management. The aim is to create a common and efficient communication for stakeholders, strong partnerships between actors, and organize Living Labs coherently and effectively.

The well developed, enabling infrastructure, especially the ICT infrastructure is a key element in order to realise user involvement and Living Lab management effectively. The issues of ownership, IT infrastructure architecture and its efficiency are the focus of measurement.

The governance pillar of the methodology consists of realizing the co-operation and interoperability between stakeholders, enhancing the level of openness and creating stability and balance in funding.

The methodical analysis of a LL consists of determining and enhancing the adaptation possibilities of worldwide applicable innovation methodologies and their possible related collaboration methods, user involvement tools, standards and best practices.

The final results of a LL activity are measured by modifications on product development processes, lifecycle shortening, IP agreements, the ability to respond interactively to continuously changing user needs.

4 SME Involvement – as an additional pillar to the harmonization cube

The harmonization cube detailed above has six sides, but building on this concept the spider diagram was introduced by the so called CO-LLABS project. To match its importance it adds an additional pillar focusing on the SME involvement into Living Labs.

SMEs have a key role related to the LL. LLs should be important for economic development policies for which tools to develop SMEs are important. The creation of a Living Lab can be executed by SMEs and of course with collaboration of other stakeholders. Then involvement of users into SME development process indicates changes in the SMEs business model by harmonizing business processes to the harmonization cube methodology. The main changes in business models derive from the adaptation of user feedbacks and changing in the development

processes in order to achieve a more effective and easily variable infrastructure and working method.

Acknowledgement

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