

Sustainability of Users' Commitment to Living Labs: an Exploratory Research

Catherine Elsen¹, Lara Vigneron² and Alessandro Acconcia²

¹ LUCID-ULg, University of Liège, Belgium

² WeLL, Wallonia e-health Living Lab, Liège, Belgium
catherine.elsen@ulg.ac.be

Abstract. This paper investigates why end-users sometimes find difficult to fully invest themselves in a Living Lab initiative, at least on the long run. The paper builds insights on the basis of users' feedback about four projects currently managed by the Wallonia e-health Living Lab (WeLL) and pave the way for renewed models of collaboration that could lead to sustainable satisfaction and long-term commitment of end-users.

Keywords: Living Lab, End-users' Commitment, End-users' satisfaction, community.

1 Context of the Research

As any other health care complex system, the Belgian one faces multiple and intertwined problems that require innovative solutions [1]. According to the Organisation for Economic Co-operation and Development annual report, Belgium has spent in 2013 10,2% of its GDP in healthcare, that is 1,3 % above the OECD average of 8,9% [2]. Most of these costs (78%) are supported by the public authorities, and yet Belgian patients rank high in the European barometer for self-supporting another 17,9% of the remaining costs. Confronted to these excessive expenses, the Belgian healthcare system is slowly undertaking major reforms such as progressive decrease of hospital beds or decrease in the average length of hospital stay.

In response to these challenges, the Walloon government launched in 2015 the first living lab concerned with health and e-health and called it the "WeLL" (for "Wallonia e-health Living Lab"). The Living Lab methodologies and ecosystem were chosen as the most promising path to deal with these challenges, mainly because of the involvement of end-users that would, supposedly, enrich the point of view of healthcare expert stakeholders and lead to more adequate, socially acceptable solutions. This hypothesis had been since supported by research done by Vanweerbeek et al. [3] that looked into the specificities of 20 Living Labs around the world, and showed that the living lab approach is indeed particularly valuable for projects aiming at creating social value and acceptability (in contrast with those aiming at creating rather economic value). The WeLL, in operation for almost two years and a half, today gathers

a community of around 700 members active in 13 on-going projects. This paper builds on four of these projects and focuses on one of the key issues of managing a Living Lab that is insuring community satisfaction and long-term commitment.

2 State of the Art

2.1 Innovation in the Health and Care System

Aside from the expenditure issues mentioned above, Herzlinger summarized the most blatant challenges health-care systems have to deal with worldwide [1]. In her research, she points out that health-care systems are highly complex systems involving many stakeholders, each with their own sphere of influence and personal agenda. These stakeholders often gather in closed groups and disciplines that sometimes pursue competing interests, especially when it comes to get a hold on funding and/or demarcating new-generation medical devices. Considering the management of change inside such structures, one has to observe that the multiplicity of policies and government regulations sometimes aids innovation, but most of the time hinders it, and that growing interest for ethics and privacy, especially when it comes to consumers' data, adds to the overall complexity of sharing experiences at a national scale.

As a concluding remark, Herzlinger suggests that health-care “consumers” are more and more engaged and in control of their personal health record (far from the “passive patient” that increasingly becomes an anachronistic model) and that solutions might lie in the empowerment of those patients. Research in various disciplines indeed points out the fact that customers and end-users are no longer willing to undergo a whole process simply as external observers. Considering themselves as “part of a team” where professionals no longer hold positions of omniscient experts, these always better-informed users expect to have their say all along the collaborative decision-making process. This “client-led revolution” testifies of how increasingly users want part of the control on the process, how they don't hesitate anymore to lead radical changes and decisions [4] and what kind of active role they are ready to tackle, by suggesting new ideas for instance, all along the process [5]. As Heylighen and Bianchin already underlined for the field of design, qualitative assessment of a design process is nowadays related to a “deliberative cooperation between designers and users”, where “stakeholders will not just happen to converge in their attitude, but come to converge by virtue of the justification they get through dialogue” ([6], p. 14).

2.2 Living Labs as a New Model of Innovation

In response to this pressing need to involve and empower end-users, most design, engineering or related disciplines have progressively introduced notions or methodologies such as “co-design” or “open innovation”. These models of innovation anchor in practice in two ways: either in an institutionalized way or in an “horizontal” way. The institutionalized way calls for end-users that consciously decide to integrate and take part to participative, bottom-up initiatives organized for instance by their government or local communities' representatives [7]. The horizontal way, on the other

hand, is the sole innovative consequence of practical problems end-users decide to tackle by their own means [8].

The Living Lab approach somehow navigates in between: end-users indeed consciously decide to take part to it, but in the meanwhile the Living Lab also stimulates and supports bottom-up innovations in response to in situ observations of problematic situations end-users face in their real living or working environments. Considering the specific challenges end-users encounter in the context of their own private health, the Living Lab consequently, and adequately, provides both institutionalized, multidisciplinary creative guidance as well as space for self-creative exploration. In light of this, multiple Living Labs dedicated to health have been founded lately (90 as identified by the European Network of Living Labs).

More specifically, the “Living Lab” concept often refers to “both the methodology and the instrument or agency that is created for its practice”, be it physical or immaterial [9]. Living Labs provide structure, governance and creative methodologies to support user participation in the collaborative innovation process [10], considering end-users as co-creators of artifacts, side by side with actors from the public or private sectors [11-14], artifacts that will be experimented in real-world settings.

3 Users’ Involvement as One of the Key Challenges

Stahlbröst *et al.* lately researched how users’ motivation, as well as the perceived usability of social software to maintain connection between these users, might impact productivity and creativeness [15]. In terms of motivational factors, they found that interest in innovation was a better predictor of co-creativity than implicit benefits of the study (i.e. desire to be socially engaged, stimulated, recognized) or explicit benefits of the study (i.e. rewards such as study incentives).

Aside from fully involving users *while* they take part to workshops, the WeLL more importantly experiences difficulties in users’ long-term engagement and commitment. While online community management and social software certainly are ways to sustain interest, this paper investigates additional underlying reasons for users’ involvement or non-involvement to such long-term collaborative process. What are the various factors impacting participants’ return rate? Do users value their participation? And if they do, in which terms?

4 Design, Methodology and Approach

Questioning users’ satisfaction and long-term commitment, the methodology consisted first in confronting our research gap to Living Labs experts’ point of view, and later to reach out to Living Labs’ participants to test factors of (un)involvement. We organized our research in three steps. We first interviewed members of the WeLL consortium, experts in Living Labs’ methodologies, in order to grasp what they thought the more pressing challenges were. We then analyzed the satisfaction surveys each participant was asked to fill-in directly after each WeLL’s workshop. We finally

conducted phone interviews with some of the participants wishing to keep contributing weeks after their participation to a workshop.

For the first step, we interviewed 10 experts gathered during the first WeLL consortium meeting (around 6 months after the launch of the living lab). This panel was composed of a various range of profiles (academics, private and public sectors experts) and various backgrounds (lawyer, business consultant, health professional, researcher, marketer, ...). Those experts have various degrees of implication in the living lab (from day to day work to mission related interventions) and all develop specific work/research related to living labs' ecosystems (IP challenges, living lab business models, ...). These interviews lasted around 40 min. and were primarily focused on the difficulties related to innovation in an e-health living lab environment.

For the second step, we collected the satisfaction surveys that participants were asked to fill-in after every workshop organized during the first year of the living lab (from January 2015 to December 2015). The table 1 below presents the repartition of participants by project. In total, we gather data issued from 13 workshops, either organized in the context of 3 main projects or organized as one-shot projects.

Table 1. Name, number of workshops organized and number of participants for each project.

Projects	Workshops' names				Participants
Happy mum	Happy Mum Mother	Happy Mum Father	Happy Mum Professionnal	Happy Mum co-design	24
Médecins sans frontières (Doctors without borders)	MSF Idéematon 1	MSF Idéematon 2	MSF 3D printing		16
Mens Sana	Mens Sana Exploration	Mens Sana Co-design			25
One-shot projects	Idéematon 1	Idéematon 2	"Image et Moi"	Hospitals	93

They were two different surveys with different questions. The first survey was used during the first 6 months of the living lab while the other was used after that. The change occurred because the living lab wanted to focus on a more qualitative feedback in order to better understand why the participants decided to take part to these workshops. The first survey was used on 53 participants and was primarily composed of quantitative questions, while the second one was used on 105 participants and consisted mostly of qualitative questions. From the first one we compiled figures about a detailed appreciation of the workshop on several criteria (usefulness, originality, appropriateness of the form, appropriateness of the content, willingness to come back and willingness to recommend the WeLL and its activities to friends). From the second survey, we collected and analyzed answers to some of the open questions that are meaningful to the context of this specific paper (e.g. do you think you'll keep in touch with some participants and, if yes, how many? what did you learn during this workshop (about the project, the technology or the methodology)?, would you recommend a workshop to some of your friends/colleagues?,...).

Regarding the third step, we asked the participants by mail if they were available for an additional phone interview, in order to collect a more in-depth feedback. The interview consisted of 10 open questions distributed in three main categories: “workshop”, “project” and “living lab”. We tried to understand how participants perceived their contributions during the workshop (e.g., what would you say about the workshop after several weeks?), as a whole for the project (e.g., what did you learn? did you feel you really contributed to the project?) and if they feel involved in the living lab (e.g., have you talked about the living lab? Have you met again some participants later on?). Out of the 158 participants, only five answered the contact email and out of these five persons, only four eventually answered the interview. Two of those participants went to the same workshop. Each interview lasted from 20 to 35 minutes.

5 Main Findings

5.1 Step 1: Testing our Hypothesis with Experts

The experts interviews enabled us to identify obstacles considered as the main bottlenecks of the current living lab model, seen here both as an ecosystem for collaborative innovation and as a methodology. We clustered these obstacles in 6 main categories: valorization, field, users, technology, process and relevance.

Valorization is directly related to intellectual property questions: what happens to ideas created by users and who owns them? The experts (mainly lawyers) were questioning the intellectual property strategy that the living lab should adopt in order to provide a fair space for the participants, the project leader and the living lab itself. *Field* incorporates all uncertainties specific to the WeLL, that is the relationship to the health and e-health sector. The main questions were mainly about ethics, such as “how can a living lab be profitable to the health sector while being respectful of patients, for instance in regard to future involvement with a specific insurance system?”. *Users* refers to user involvement in the short and long-term, and questions their interest in the living lab process: what should a living lab do to keep them involved in the long run? *Technology* refers to the paradox between user-centered innovation and the fact that most of the “e-health” innovations often tend to reduce the implication of human being in favor of the technology. It also appears that the cost of the technology is a point of concern, especially because of the WeLL willingness to make each technology as affordable as possible. *Process* is about the difficulty to involve end-users in complex research and development fields. For example, which role can end-users play in the field of pharmaceutical industry? Experts mainly questioned the suitability of the living lab approach given various types of innovation fields. Finally, *relevance* refers to all the questions related to the quality of the innovation produced using living lab methodologies, and in particular in regard to potential impact for our society. These questions were mostly related to innovation in general and to the capacity for a living lab to keep producing considerable and continuous innovation in the long term.

Beside concerns related to the specific field of e-health, the experts underlined challenges directly related to end-users, be it respecting their rights as co-creators or considering their input hand-in-hand with high-level, technological developments.

More importantly, experts spontaneously underlined users' involvement and long-term commitment as one of the concerns for Living Labs' sustainability, this way confirming our starting hypothesis as valid from a global point of view.

5.2 Step 2: Evaluating Users' Satisfaction through Short Surveys

The first survey, used during the first six months, was composed of seven questions: four questions were based on a five-points Likert scale, two were fixed-alternative questions and the last one was open. The first four questions were: did you find the workshop useful? original? were the format and the content appropriate? Out of the 53 surveys, the "usefulness" mean level was assessed at 3.94 (out of the 5 points of the Likert scale), while the "originality" mean level was 4.06, "appropriateness of the format" mean level was 4.32 and the "appropriateness of the content" mean level was 4.34. Most of the participants therefore considered the workshops as meaningful for the project, original in its methodologies and appropriate both in form and content.

The first of the two fixed-alternative question was "Would you come back to a future workshop?". It is worth noticing that although 94.34% (50 out of 53) of the participants answered yes, only one came back to another workshop. The second one was "Would you recommend a workshop to your friend?". Here again, although 98.11% (52 out of 53) said yes, none of the later participants mentioned recommendation by friends as the reason for their participation.

The second survey, distributed to 105 participants in total, consisted mostly in open questions concerning the workshop and the living lab (did you learn something in terms of methodology, technology or about the project?, did you feel you could participate and express yourself freely? with how many participants do you think you will keep in touch? to whom would you recommend a workshop?, would you like to tell us something?). The single five-points Likert scale question aimed at evaluating global appreciation about the workshop in general.

Table 2 summarizes the number of participants that at least answered one word to each of the open questions. The first question was about whether participants would keep in touch with other participants (and possibly, how many). About 60% of the participants answered they would maintain contact with at least another participant. To the question "did you learn something during this workshop about technology/methodology and/or the project?", 76% of the participants answered positively. Most of them underlined learning about the creative methodology used during the workshop and a few pointed out learning something about the project. None of the comments concerned technology. The third question asked them if they feel they could express themselves enough and freely during the workshop. 92% of the participants considered they could express themselves as freely as wished and mostly, in their opinion, because of the animation method and the workshop atmosphere. The next question was about whether the participants would like to recommend the living lab's workshops. Only 29% of the participants wrote one or several names for the staff to contact for future workshops. The vast majority (60%) didn't answer the question. Regarding the final question, it is interesting to notice that most open comments were related to the continuation of the project and the materialization of the work-

shop's results (e.g., "What is the follow up of the project?", "What will be the tangible results of this workshop?", "Interesting but now we wanna see what this workshop will result in", ...).

Table 2. Proportion of participants answering at least one word by open question.

	Keep in touch ?	Learn something ?	Freedom to participate	Further recommendation ?
Yes	60%	76%	92%	28,6%
No	11%	14%	6%	7,6%
Maybe				3,8%
No Answer	29%	10%	2%	60%

Finally, it is worth noticing that the return rate was again quite limited. Out of the 105 surveys distributed, only seven participants came back to another workshop. All seven came back in a follow-up workshop for the project they primarily came for, in other words none of the returning participants came for a workshop dedicated to another project or topic.

5.3 Step 3: In-Depth Phone Interviews for Feedback and to Test Long-term Commitment

Out of the 158 participants contacted by email for in-depth interviews, only four eventually agreed to answer our questions and give some feedback.

They were asked to express again their global appreciation of the workshop they took part to, sometimes up to several months earlier. Their appreciation didn't change, even after several months. One of the participants explained: *"I think I gave it a 4 or a 5. And no it didn't change, I keep good memories. I even contacted the WeLL regarding a [personal, editor note] project I'd like to develop"*.

When asked what they thought they brought to the project, they mostly felt like they contributed thanks to their experience and expertise, especially when the workshop was related to technological matters. One participant comments: *"I think I brought the experience of what is more important and less important. My experience as an user, but also the experience and the needs of others that I hear about"*.

Participants essentially kept in touch with the project through the WeLL newsletter. None of them contacted the WeLL nor any project leader to have an update about the project they took part to. Neither did they try to find information on the internet: *"I read your newsletter. I read something like 15 days later that the project leader explained what she did since the workshop but nothing more. However, if there is a final report I would gladly read it"*. Regarding the living lab itself, the newsletter seems to be their main source of information. They all read it frequently but not thoroughly. They were a bit more interested by the project they contributed to, but found the rest of the information relevant and interesting: *"Yes, from time to time. Depend-*

ing on my workflow and on my time. I may take a deeper look at some subjects”; “If, for instance, from time to time there is a project you don’t mention, it doesn’t matter. I’m more in a passive consumer mode.”

When asked about what the living lab should undertake to make them want to come back, none of the participants gave a specific answer. They were all quite happy with the experience, and didn’t find it lacked something in particular in terms of feedback or community follow-up. They mostly pointed out the lack of time for the main reason not to take part to another workshop: *“It’s not like there is something missing. I lack time. If there were more users, we could rotate. Everyone has his own calendar. It could be 4 or 5 persons who would agree on coming, and we could come in alternately to give our opinions.”*

Finally, they recognized they never really talked about the living lab after the workshop, and when they did it was to a very strict number of people (close friends or colleagues). Moreover, one of the participants told us she wouldn’t come back because she thought she would stop bringing fresh information if she came too often: *“I wonder if a newcomer isn’t more suited than someone that already came several times. If it’s always the same people who work on the projects, the solutions might end up looking alike”*. It is worth noticing that during these interviews, the participants all agreed that diversity in profile is beneficial for the project although it can lead to various problems (such as users having difficulties to keep an open mind when it comes to their own field of expertise). These results are in accordance with Berger [16] who found that the integration of different profiles is key to the user engagement.

6 Discussion

We see that the experts pointed users’ involvement as one of the main concerns for the effective and sustainable operation of a living lab. Indeed, the community surrounding a living lab is one of its most precious value but also one its most intricate aspect. Out of the six categories experts referred to, the last four directly relate to end-users’ involvement into the Living Lab model and how the Living Lab can lead to ideas and propositions that will really impact end-users’ everyday life while remaining respectful of ethical aspects.

As shown by the surveys, users often express their willingness to keep participating to workshops. They do believe these workshops provide value to the projects. In practice, however, we observe quite the opposite. The two main causes identified are the time participants accept to invest to such workshops, and the perception of their own usefulness in regard of a specific subject. Our research suggests that users need to feel relevant in order to be willing to participate in projects led by a living lab methodology.

Our in-depth phone interviews revealed another possible explanation: some participants believed that if they come too often, the effectiveness and creativity of the final solutions would be impacted. Of all people, one could believe that users involved in a living lab process would understand and appreciate the necessity of feedbacks. It is important to note that we deliberately chose to make only one mailing in order to

assess the primary interest of the WeLL community in such an in-depth feedback interview. The fact that, out of the 158 participants, only four agreed to the phone interviews is a quite revealing indication that the WeLL community is currently not yet fully involved in the living lab philosophy.

7 Conclusion

This study first reveals that the form and content of the workshop, although considered appropriate, are not enough to convince users to participate to further living lab collaborative workshops. Living labs, more fundamentally, should keep informing their community of users very specifically on how they contributed and could continue contributing to their projects. They should be clear on what is expected from the users, from one project to another. As underlined by Bergvall-Kareborn and Stahlbröst: “inherent in being a partner, from an end-user perspective, is the power of choice. People always can choose if, when and to what extent they want to participate” ([17], p. 367). But to give them the power to choose, the living labs must first provide them with options to choose from. This can be achieved in being accurate about what is expected from participants, what are the profiles needed and why these profiles are fundamental to the project. Our research reveals that if users don’t feel they are relevant enough to be useful to the project, or feel they don’t have the adequate profile (anymore), their willingness to come reduces accordingly.

Secondly, most of the users interviewed in this sample didn’t adopt a proactive stance when it comes to innovation in a living lab environment, even when it was related to projects they already participated to. If they didn’t receive information about upcoming workshops, they would not likely search it by themselves. It appears that most of the time they were expecting to be asked to come back by the living lab itself, and didn’t feel integrated in the innovation process as a whole. Once again the key remains in the hands of the living lab staff: it is its responsibility to constantly reach out and keep the users in the loop of on-going processes.

When it comes to the perception of their own value to the collaborative innovation process, this research eventually shows that most of the participants perceive their involvement as positive for the project. However, our results also underline that this perception seems insufficient to make them want to keep contributing to other workshops. The main reason preventing them from being part to a recurring pool of participants seems to be the time available for such events. A renewed model of interaction, as suggested by one of the participants, might be to organize sub-groups of participants that would rotate and take part alternately to the workshops, while remaining connected and aware of the project current state of progress.

One of the limitations of this study is the small amount of phone interviews granted by the participants. Further in-depth feedback should be collected to confirm our preliminary results, even though the single fact that such a few number of people agreed to such an interview by itself reveals the state of involvement of the community.

Aside from collecting feedback from a larger range of participants, further research could expand towards the reasons why participants initially decided to take part to

their first WeLL workshop. A better understanding of these reasons might increase their return rate, long-term commitment as well as interest of newcomers.

References

1. Herzlinger, R.E.: Why innovation in health care is so hard? Harvard Business Review, Harvard Business School Publishing Corporation, May 2006, 11 p. (2006).
2. OECD (2015). OECD Health Statistics 2015. Country Note: How does health spending in Belgium compare ? <http://www.oecd.org/belgium/Country-Note-BELGIUM-OECD-Health-Statistics-2015.pdf>, Last Accessed April 05, 2016.
3. Vanmeerbeek, P., Antoine, M., Delvenne, P., Roskamp, B., Vigneron, L.: Involvement of end-users in innovation process: toward a user-driven approach of innovation. A qualitative analysis of 20 Living Labs. Unpublished report - CRIDS (University of Namur) & SPIRAL (University of Liège) (2015).
4. Cole-Colander, C.: Designing the customer experience. Building research and Information, Vol. 31(5), pp. 357-366 (2003).
5. Luck, R., McDonnell, J.: Architect and user interaction: the spoken representation of form and functional meaning in early design conversations. Design Studies, 27, pp. 141-166. (2005).
6. Heylighen, A., Bianchin, M.: How does inclusive design relate to good design ? Designing as a deliberative enterprise. Design Studies, 34 (1), pp. 93-110. (2013).
7. Chesbrough, H., Vanhaverbeke, W., West, J.: Open Innovation. Researching a new paradigm. Oxford, Oxford University Press (2006).
8. Cardon D.: Innovation par l'usage. In Ambrosi, A., Peugeot, V., Pimienta, D (Eds) Enjeux de mots. Regards multiculturels sur les sociétés de l'information, Caen, C&F Editions (2005).
9. Almirall, E., Lee, M., Wareham, J.: Mapping Living Labs in the landscape of innovation technologies. Technology Innovation Management Review, 2(9): 12-18 (2012).
10. Almirall, E.: Living Labs and open innovation: roles and applicability. The electronic journal for virtual organizations and networks, Vol. 10, Special Issue in Living Labs (2008).
11. Kristensson, P.,A. Gustafsson, T. Archer: Harnessing the creative potential among users. Journal of Product Innovation Management, 21 (1) : 4–14. (2004).
12. Vargo, S. L., Lusch, R. F.: Evolving to a new dominant logic for marketing. Journal of Marketing, 68, 1–17, (January), (2004).
13. Lusch, R. F.: The small and long view. Journal of Macromarketing, 26, 240–244, (2005).
14. Dubé, P., Sarrailh, J., Billebaud, C., Grillet, C., Zingraff, V., Kostecki, I.: Le livre blanc des Living Labs (1st ed.). Montréal: Umwelt (2014).
15. Stahlbröst, A., Bertoni, M., Fölstad, A., Ebbesson, E., Lund, J.: Motivational factors influencing user co-creativity in Living Labs, Proceedings of the 4th ENoLL Living Lab Summer School in Manchester, (2013).
16. Berger, W.: CAD Monkeys, Dinosaur babies, and T-shaped People: Inside the world of design thinking and how it can spark creativity and innovation. Penguin group, 352 p. (2010).
17. Bergvall-Kareborn, B., Stahlbröst, A.: Living Lab: an open and citizen-centric approach for innovation. Int. Journal of Innovation and Regional Development, 1(4): 356-370, (2009).