Living Labs: a systematic literature review

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Living Lab definition

Approach to innovation characterized by…

- Multi-method
- Real-life experimentation
- Active user involvement (co-creation)
- Multi-stakeholder (PPP-organization)

European Commission policy support

- European Paradox: exploration (research) vs. exploitation (market success)
- 2006: ‘big bang’ with the establishment of
Inconsistencies in literature

- Lack of systematic literature review
- Lack of theoretical foundations and anchoring to other innovation theories (Eriksson et al., 2005; Schaffers & Kulkki, 2007; Ståhlbröst & Bergvall-Kåreborn, 2008; Westerlund & Leminen, 2014)
- A (too) diverse usage of the concept ‘Living Labs’ in literature (Dutilleul et al., 2010)
  1. an innovation system
  2. real-life or ‘in vivo’ monitoring of a social setting
  3. an approach for involving users in the product development process
  4. organizations facilitating LL activity
  5. the European movement itself
# Methodology

<table>
<thead>
<tr>
<th>Sample/data</th>
<th>Research steps</th>
<th>Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open and User Innovation papers abstracted in WoS</td>
<td><strong>Literature review</strong> Open and User Innovation papers</td>
<td>Gather relevant <strong>concepts and frameworks from Open and User Innovation</strong> based on extensive screening of WoS papers containing ‘open innovation’ or ‘user innovation’</td>
</tr>
<tr>
<td>All Living Labs papers with 10+ references in Google Scholar</td>
<td><strong>Literature review and content analysis</strong> Living Labs papers</td>
<td>Assess whether Open and User Innovation are already used within the current state-of-the-art in the field of Living Labs and how the gathered key concepts and frameworks occur in the Living Labs papers</td>
</tr>
<tr>
<td>None</td>
<td><strong>Inductive theory building</strong></td>
<td>Construct an overarching <strong>theoretical model</strong> that incorporates and allows to differentiate the different conceptualizations of Living Labs and the key concepts and frameworks from Open and User Innovation</td>
</tr>
</tbody>
</table>
Literature review: Open Innovation

**Main idea:** Organizations benefit by opening up their innovation processes to exchange knowledge & technologies – **Company perspective**

**Key concepts:**

<table>
<thead>
<tr>
<th>OI processes (Lichtenthaler &amp; Lichtenthaler, 2009; van de Vrande et al., 2009)</th>
<th>Exploratio</th>
<th>Exploitation</th>
<th>Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Internal capabilities</strong> (Lichtenthaler, 2011)</td>
<td>Inventive cap</td>
<td>Innovative cap</td>
<td>Transformative cap</td>
</tr>
<tr>
<td><strong>External capabilities</strong> (Lichtenthaler, 2011)</td>
<td>Absorptive cap</td>
<td>Desorptive cap</td>
<td>Connective cap</td>
</tr>
</tbody>
</table>

**Research gaps:** blind spots prevent an easy-to-use and one-size-fits-all innovation management approach
Main idea: Given certain circumstances, users start innovating themselves or make valuable contributions to innovation processes – User perspective

Key concepts:

<table>
<thead>
<tr>
<th>Voice-of-the-Customer</th>
<th>User co-creation</th>
<th>Lead User methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAP</td>
<td>Shared locus of innovation</td>
<td>CAP</td>
</tr>
<tr>
<td>Design for users (evaluation)</td>
<td>Design with users (incremental)</td>
<td>Design by users (substantial)</td>
</tr>
</tbody>
</table>

Research gaps: barriers to and management of user contribution
## Living Labs literature review

<table>
<thead>
<tr>
<th>Publication year</th>
<th>Articles in total (Google scholar)</th>
<th>WoS articles</th>
<th>Articles in sample (Google Scholar + 10 citations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Until 2005</td>
<td>18</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2006</td>
<td>9</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>2007</td>
<td>15</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>2008</td>
<td>52</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>2009</td>
<td>69</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>2010</td>
<td>74</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>2011</td>
<td>65</td>
<td>6</td>
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</tr>
<tr>
<td>2014</td>
<td>74</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>563</td>
<td>50</td>
<td>45</td>
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</table>
Living Labs literature review

Lack of academic impact: practice-driven concept
Living Labs literature review

Lack of academic impact: practice-driven concept
Living Labs literature review

<table>
<thead>
<tr>
<th>Paradigm</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Innovation</td>
<td>11</td>
</tr>
<tr>
<td>User Innovation</td>
<td>17</td>
</tr>
<tr>
<td>UCD / Participatory design</td>
<td>19</td>
</tr>
<tr>
<td>None</td>
<td>18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paper type</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive papers</td>
<td>18</td>
</tr>
<tr>
<td>State-of-the-Art papers</td>
<td>4</td>
</tr>
<tr>
<td>Conceptual &amp; methodological papers</td>
<td>16</td>
</tr>
<tr>
<td>Empirical paper</td>
<td>7</td>
</tr>
</tbody>
</table>

Minor connection to innovation theories & lack of empirical papers
Living Labs literature review

![Diagram with images of people speaking]

<table>
<thead>
<tr>
<th>Design...</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>For users</td>
<td>11</td>
</tr>
<tr>
<td>With users</td>
<td>34</td>
</tr>
<tr>
<td>By users</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exploration</td>
<td>45</td>
</tr>
<tr>
<td>Exploitation</td>
<td>15</td>
</tr>
<tr>
<td>Retention</td>
<td>7</td>
</tr>
</tbody>
</table>

However…
Open & User Innovation concepts present!
Inductive theory building: Living Labs as emanation of Open & User Innovation

Approach to innovation characterized by…

- Multi-stakeholder (PPP-organization)

Open Innovation network
Inductive theory building: Living Labs as emanation of Open & User Innovation

Approach to innovation characterized by...

- Multi-stakeholder (PPP-organization)
  - Innovation network where knowledge is exchanged

Real-life experimentation

Multi-method

<table>
<thead>
<tr>
<th></th>
<th>Pre-test</th>
<th>Intervention</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contextualization</td>
<td></td>
<td>Implementation</td>
<td>Feedback</td>
</tr>
<tr>
<td>Selection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concretization</td>
<td></td>
<td></td>
<td></td>
</tr>
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Pierson & Lievens, 2005

Innovation project structure
Inductive theory building: Living Labs as emanation of Open & User Innovation

Approach to innovation characterized by...
- Multi-stakeholder (PPP-organization)
  - Innovation network where knowledge is exchanged
- Real-life experimentation
- Multi-method

Active user involvement (co-creation)
- User co-creation as central process

Methods & tools to facilitate user involvement
## 3-way model for LL

<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
<th>Research paradigm</th>
<th>Time frame of interactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macro</td>
<td>Living Lab constellation consisting of organized stakeholders (PPP-partnership)</td>
<td>Open Innovation: knowledge transfers between organizations</td>
<td>Long term knowledge exchange between constellation actors</td>
</tr>
<tr>
<td>Meso</td>
<td>Living Lab innovation project</td>
<td>Open &amp; User Innovation: real-life experimentation, active user involvement, multi-method and multi-stakeholder</td>
<td>Medium-term knowledge exchange between project actors</td>
</tr>
<tr>
<td>Micro</td>
<td>Living Lab methodology consisting of different research steps</td>
<td>User Innovation: user involvement &amp; contribution for innovation</td>
<td>Short-term knowledge exchange between research participants/actors</td>
</tr>
</tbody>
</table>

*Schuurman, 2015*
# 3-way model for LL

<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
<th>Time frame of interactions</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Macro</strong></td>
<td>Living Lab constellation consisting of organized stakeholders (PPP-partnership)</td>
<td>Knowledge transfers between constellation actors</td>
<td>29</td>
</tr>
<tr>
<td><strong>Meso</strong></td>
<td>Living Lab innovation project</td>
<td>Medium-term knowledge exchange between project actors</td>
<td>15</td>
</tr>
<tr>
<td><strong>Micro</strong></td>
<td>Living Lab methodology consisting of different research steps</td>
<td>Short-term knowledge exchange between research participants/actors</td>
<td>20</td>
</tr>
</tbody>
</table>

Schuurman, 2015
LL as structural approach to DI

Distributed Innovation Processes

Open Innovation

Living Labs

User Innovation

Living Lab Constellation

Living Lab Project

Living Lab Methodology

Coupled Interactive Open Innovation facilitating User Innovation
Exploratory conclusions

• Living Labs are a **practice-driven** innovation concept, in need for more theoretical anchoring and foundations

• Evidence of knowledge transfers & user co-creation: Living Labs as an ideal ‘**playground**’ for Open Innovation & User Innovation studies

• ‘Living Labs as a service’-model as a **gateway to Open Innovation & User Innovation** for SMEs
## Future research

<table>
<thead>
<tr>
<th>Research questions</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>How can Living Lab networks yield value for all involved actors?</td>
<td>Open Innovation researchers</td>
</tr>
<tr>
<td>How can the different stakeholders be managed?</td>
<td></td>
</tr>
<tr>
<td>How to cope with knowledge retention?</td>
<td></td>
</tr>
<tr>
<td>Overall methodology</td>
<td>Living Lab researchers</td>
</tr>
<tr>
<td>Managing the knowledge transfers between the levels</td>
<td></td>
</tr>
<tr>
<td>Development of user innovation methods for real-life</td>
<td>User Innovation researchers</td>
</tr>
<tr>
<td>Insight in user motivation</td>
<td></td>
</tr>
<tr>
<td>Relation between characteristics and value of the contribution</td>
<td></td>
</tr>
</tbody>
</table>

*Validate LL model and first findings with a larger data set, broader set of evaluation & success criteria, develop insights on three levels*