



Frameworks and heuristics for understanding and supporting innovation processes

Challenges in design processes in agroecosystem living labs

The case of an agroliving lab dedicated to digital technologies for agroecological transition

LINDDA
project
(22-PEAE-0004)



Jean LARBAIGT (INRAE AGIR, CNAM CRTD), jean.larbaigt@inrae.fr
Flore BARCELLINI (CNAM CRTD)
Moustafa ZOUINAR (CNAM CRTD)
Véronique BELLON-MAUREL (INRAE ITAP)

Introduction: an initial dichotomy

- **Promizing** and **promoted** Agroecosystems Living Labs (ALLs) to support the agroecological transition
- ALLs = **transdisciplinary** and **open innovation socio-systems** to create/develop/validate/test a diversity of **artefacts** to a specific problem

⇒ **Design** is at the core of ALLs



(Bagoudou Labo et al., 2024; Berberi et al., 2023; Bergez et al., 2022; Cascoie et al., 2024; Doidge et al., 2024; Gobrecht et al., 2023; Hossain et al., 2019; Lévesque et al., 2023; McPhee et al., 2021; Metta et al., 2022; Mollen, 2024; Ryan et al., 2024; Toffolini et al., 2021)

Introduction :

The OccitANum ALL described with SSM

2020-2028



OccitaNum

P
Q
R

- PQR formula for describing/formulating a system of interest : Do **P** by a **Q** in order to achieving **R** :

To transform farming practices

By creating/developing/validating/testing digital technologies (DTs)

In order to accelerate the transformation toward more sustainability

C
A
T
W
O
E

- CATWOE mnemonic

Customers (beneficiaries): farmers

Actors: 6 clusters of stakeholders

Transformation process: design of DTs

Research and education

Local authorities

Agricultural development and training

Innovation facilitators

Private companies

Users groups



Introduction :

Activity-Centred Ergonomics to look at DP

- I. Design as cyclical processes aiming at thinking and making artefacts, **appropriable by users in their activity** (health and performance stakes)
- II. Activity as actual **mobilization of humans**, resulting from the dynamical product between **them and the context**
- III. Three main interlocking steps: **analysis, “solutions”, deployment**
- IV. DP involve stakeholders in:
 - **problem-solving activities** (simultaneous construction of the problem and the artefact)
 - **representations-building activities** (between stakeholders, about the design process, the artefact, the users' activity)



(Barcellini et al.2024; Béguin, 2004; Bourmaud, 2013; Cerf & Meynard, 2006; Chadoin, 2016; Cheyrouze, 2021; Chizallet, 2019; Cahour et al., 2016; Couillaud, 2018; Daniellou, 2005; Daniellou & Rabardel, 2005; Darses & Reuzeau, 2004; Darses, 2016; De Keyser, 1991; Dutier, 2021; Visser, 2009)

Methods : data collection

2 studies



(Larbaigt et al., 2024)

Object	Request	Methods
Collective workshop 7 participants (1 facilitator, 2 farmers, 2 employees from two companies in digital agriculture, 2 water managers, 1 researcher)	Analyze a workshop to improve it	<ul style="list-style-type: none"> ✓ Video observation ✓ Thematic analysis of design activities nature (<i>generation, synchronization</i>) ✓ Self-confrontation interview (facilitator)



Nature of the design activities during the workshop ?

Goals pursued by the facilitator ?

Facilitator management and experience of the workshop ?

Object	Request	Methods
Consideration of farmers' needs in DP	Analyze how needs arise	<ul style="list-style-type: none"> ✓ Observations ✓ Interviews ✓ Documents analysis



Definition of the farmers' needs ?

Identification of farmers' needs ?

Barriers for the consideration of farmers' needs ?

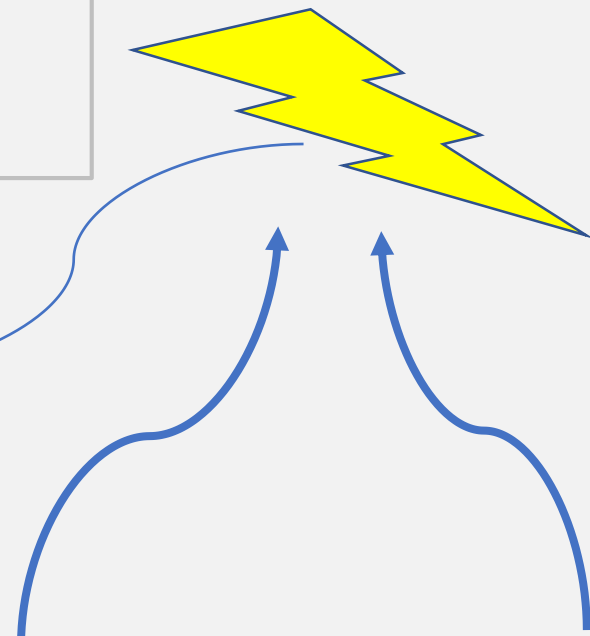


Main results and discussion



Facilitator expectations
= **design generating activities**

Actual course of the workshop
= **synchronization activities**
(representations-building activities)



Uncomfortable experience

- Facilitator explanations of the gap:
- ✓ short duration of the workshop
 - ✓ participants diversity
 - ✓ differences between reasoning modes

Lack in framing the design problem to solve
(**problem-solving activities**)



(D'Astous et al., 2004; Folcher, 2015; Larbaigt et al., 2020; Visser, 2009)

Main results and discussion



❑ Challenges in the **definition** and the **identification** of farmers' needs:

- Seen as something **expressible**
⇒ Latent and unconscious needs excluded
- **No shared** definition:
 - ⇒ No clear needs to guide the solutions searching
 - ⇒ Socio-cognitive gaps between actors about the notion of needs
- Confused with **solutions**:
 - ⇒ Blurring between the analysis and the solutions stages

❑ Challenges **determinants** :

- **Complexity** of such participative design processes
- **Resources** available to stakeholders (time, skills, funding, interactions with farmers)
- Integration of ALL activities **in the existing activities** of the actors



(Bagoudou Labo et al., 2024; Cahour, 2002; Couix, 2012; Couix et al., 2012; Daniellou, 2005; Dubé et al., 2014; Folcher, 2015; Lévesque et al., 2023; Loup Escande et al., 2013; Martin et al., 2021)

Conclusion and perspectives

Challenges in **problem-solving & representations-building** activities

The importance **to design the design processes** within ALLs

Act with **user-centered approaches** (methods, intervention scales, possibility and willingness for actors to get involved...)





Thank you for attention, lets talk !

Jean LARBAIGT (INRAE Agir, CNAM CRTD), jean.larbaigt@inrae.fr

Flore BARCELLINI (CNAM CRTD),

Moustafa ZOUINAR (CNAM CRTD),

Véronique BELLON-MAUREL (INRAE ITAP)

LINDDA project
(22-PEAE-0004)

