



Doctoral summer school On sustainable ICT

INNOVATING THROUGH CONSCIOUSNESS A Responsible Uses (RU) approach

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Tutelles



Contextual elements And some insights

Nanosystems and Nanotechnologies Laboratory

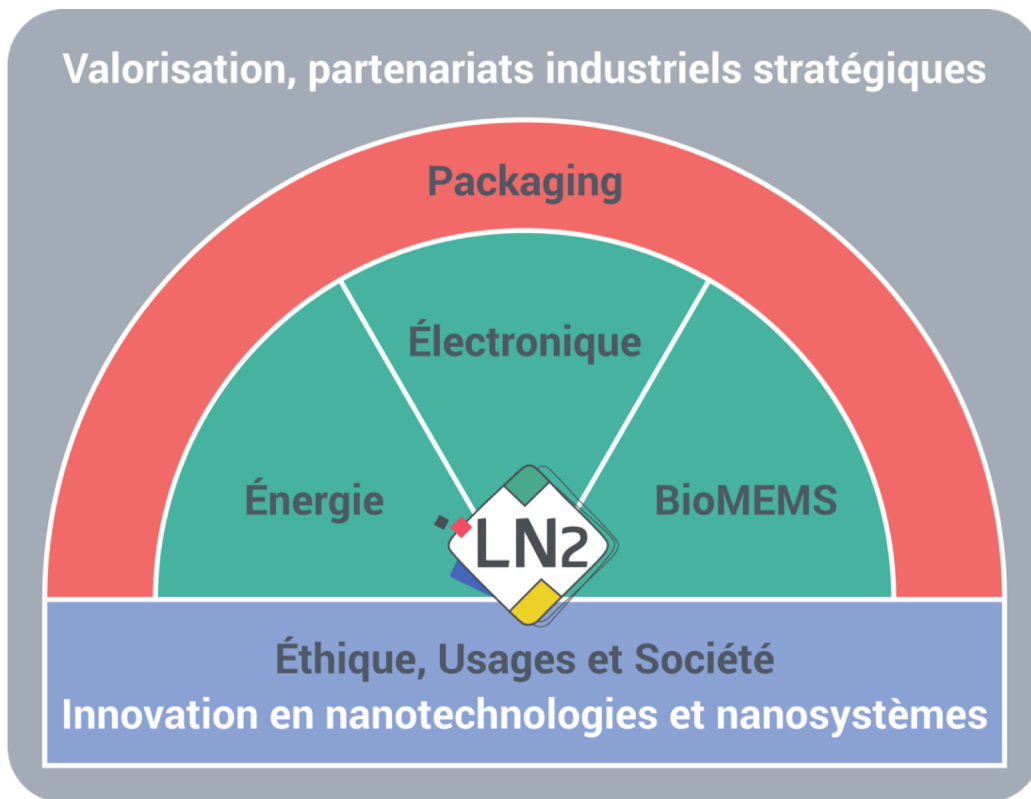
France-Québec

« Nanosystems et Nanotechnologies Laboratory » (LN2)

Based at Sherbrooke (Sherbrooke University)

+ 100 collaborators/staff

5 research fields; one is about « Ethics, social uses and society issues »



*5 axes de recherche, dont 1 axe transversal



Origin of my questioning

- A lot of technological developments... Are they useful? ... Relevant?
- Major societal issues were emerging with technological development...



- It is important to integrate the question of “the meaning of technological development”, as early as possible in innovation work (Verganti R., MIT press, 2017).

To design is to choose!



Mark Zuckerberg during one of his speeches; picture from his Twitter account (2017)

To design is to decide and to act.

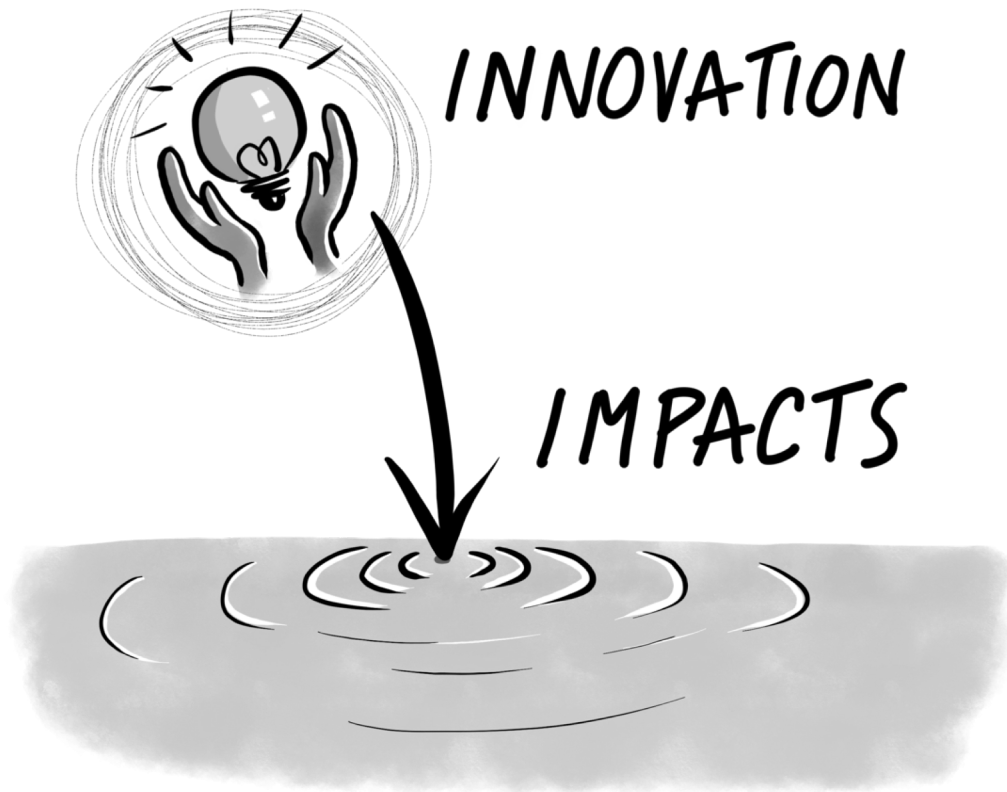
Why do innovators design?

- In whose name does an innovator act?
- The "why" often reveals the values at stake: we decide and act for a given reasons ... [i.e. values: as a better life, equity, environment, etc.]

Value may be defined as the "quality" of something considered important to a "desired way of life" ("a better life", more autonomy, etc.).

- The "given reasons" is what directs the action; and gives meaning to the action.
- **Deciding can be seen through the lens of "reasonable" more than "rational". It takes into account quality. The idea is therefore to increase, to qualitatively improve something ("I eat an apple => to be healthier").**

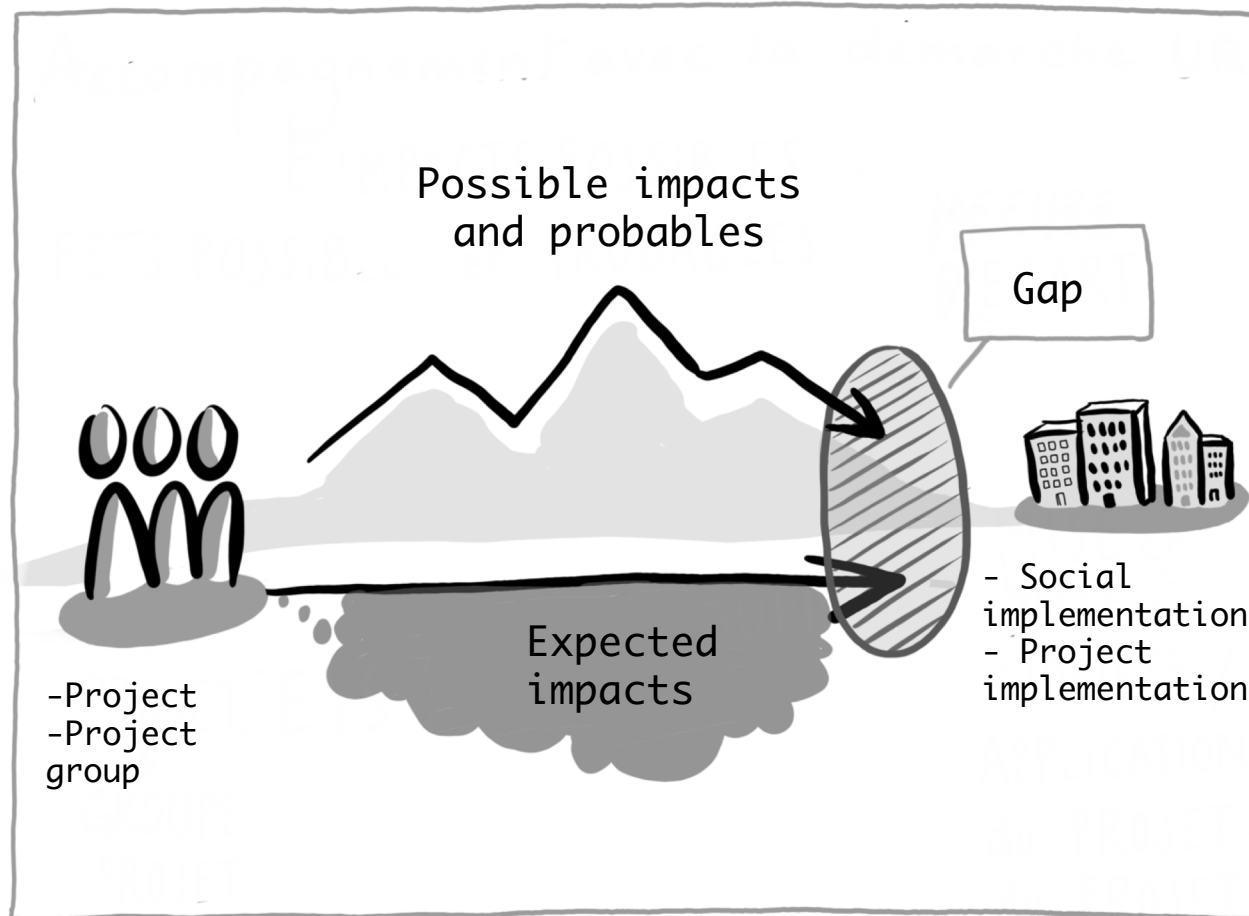
An innovation has effects: it generates impacts.



- *The impact is the effect, consequence, result that arises from the actions; impact is on a given environment;*
- *The effects may be intentional or not, immediate or medium-long term, direct or indirect;*
- *The effects can be positive (bringing gains) or negative (producing losses).*

➤ **We need to deconstruct what is taken for granted: impact mainly - and implicitly – expected**

The gap between the projected impacts (the intended or desired effects) and the ones that will be realized

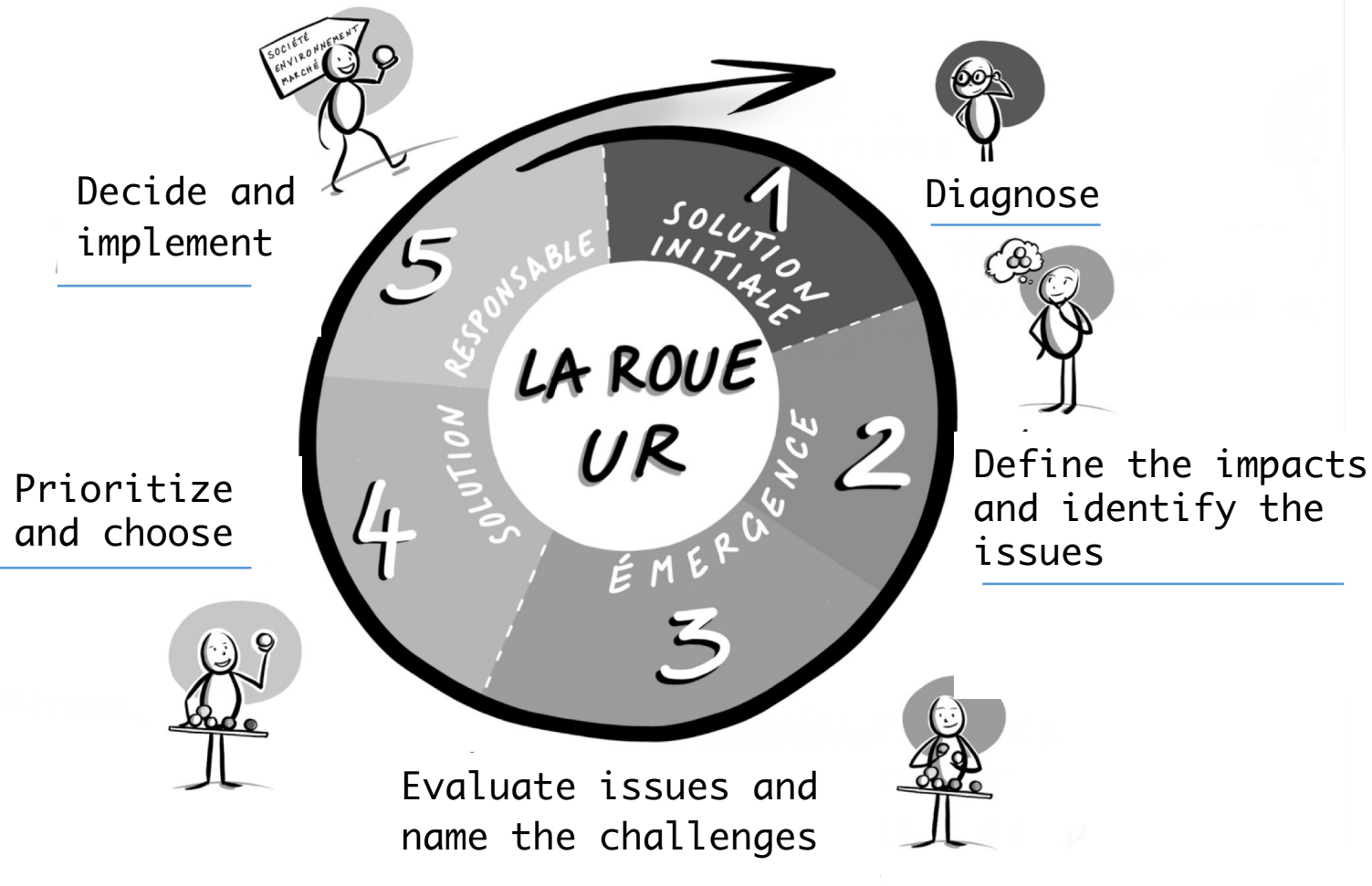


- Any kind of innovation can generate not only desired impacts, but also undesired ones
- This is all the more true if the economic dimension is the single point of focus: one can literally miss out on the other potential impacts that can generate the device.

➤ **Impacts or consequences are not entirely predictable. This element of unpredictability should not prevent an upstream analysis, on the contrary.**

Responsible Uses (RU) approach

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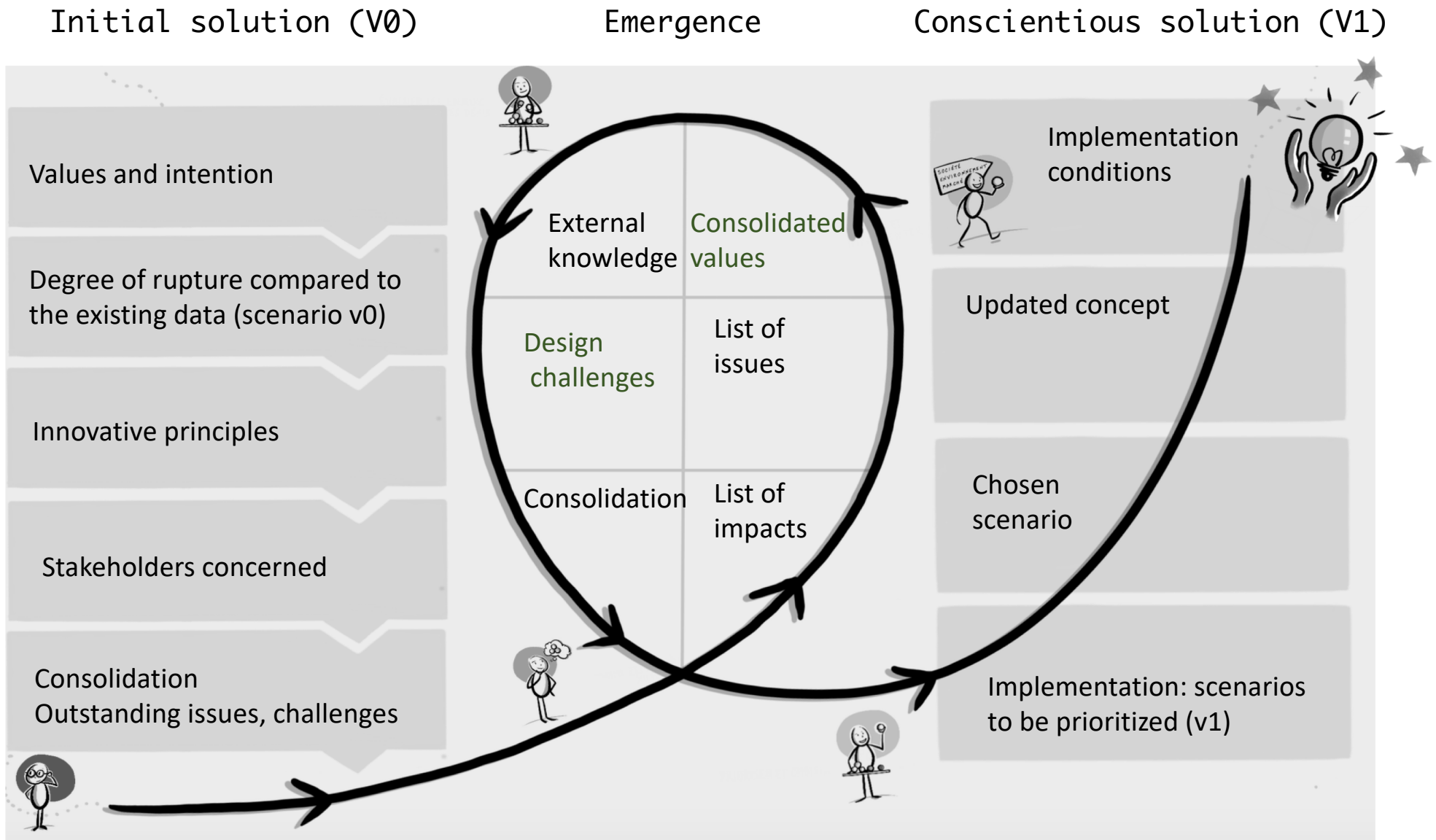


Five steps in order to improve decision-making when making design choices.

Coherence between the initial question, the project's intent and the given results

- **A path that integrates the question of impacts and the issues that are related to innovation processes.**

Generic Responsible Uses canvas



Examples of applications

Bibip project*: some analysis and results (start up, Québec, 2019)



Designer's intention (the « FOR »)
"Prototype machine for sorting plastic on beaches"
Aims to: "reduce plastics to restore ecosystems"



* Existing project – Name project has been changed for this presentation

Bibip project*: some analysis and results (start up, Québec, 2019)



- *A priori*, we could think: "what a beautiful project in terms of environmental impact..."
- *BUT ... after going through an « RU » perspective, many problems appear:*
 - In relation to the initial question: Is the beach the best place to start solving this problem (shouldn't it be treated directly from the oceans)?
;
 - In regards to "Restore ecosystems"? : the machine does not distinguish the plastic from the animals on the beach, it carries everything ...;
 - Nothing has been planned about how to recycle the plastic (= global environmental impact?);
 - Finally, from an economic perspective: to be sold, the solution requires that the problem remains (without plastic: no sale of machines!). In short term, it is a so-called "reactive" solution – and not a long term solution.

« Autonomous houses » Project*: some analysis and results (start up – France, 2019)

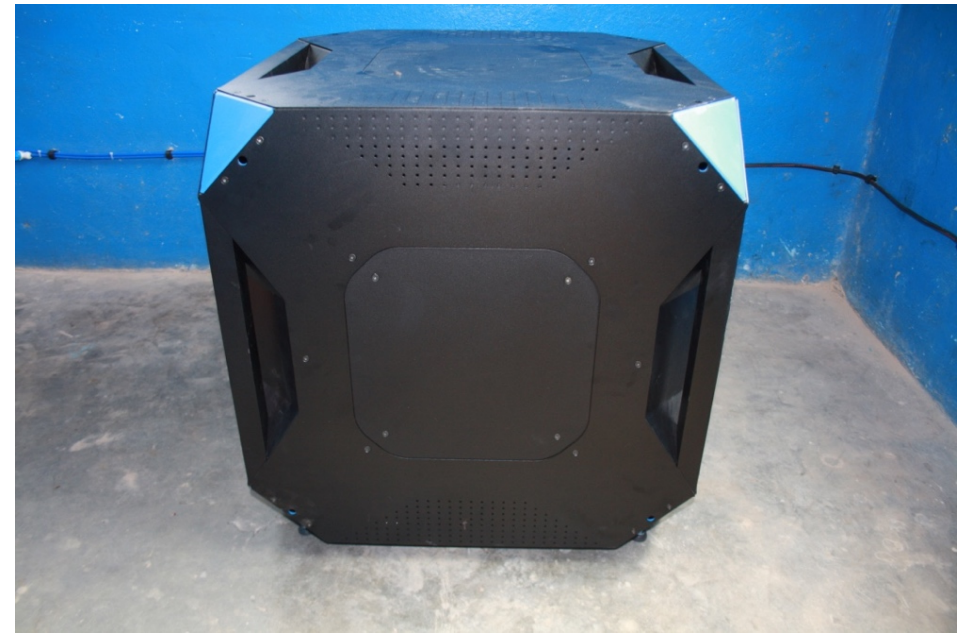


Designer's intention (the « FOR »)

"An ambitious dynamic to boost environmental and societal commitment"

"Find and implement the most respectful solutions for people, territories, landscapes and our ecosystem".

"Live independently, live free"



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« Autonomous houses » Project*: some analysis and results (start up – France, 2019)



- Problem with the product life cycle (environmental issue) => choice of materials and R&D orientation needed;
- Problem with the use of Artificial Intelligence (AI) in the project: data processing and uses of data (tension between increasing the system reliability and user acceptability) => choice of how data will be used and sold
- Tension between the promise of independence and the system's inherent dependence with the environment => marketing and communication

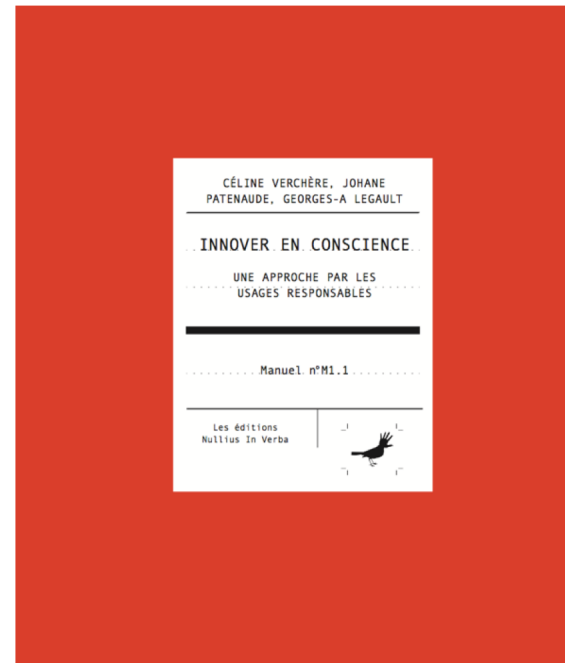
Conclusion and discussion

- The question of impact is inseparable from the notion of reflexivity, critical thinking and responsibility (accountability...)
 - Discipline of applied ethics, SHS, philosophy

In the field of innovation: Ethics by design, Socially responsible Design, Ethical Design, Values in Design, Design for Values, Value-Based Design, Value Sensitive Design, Human-Centered Design, Participatory Design, Design Critique
- Researchers alone cannot address all the issue of accountability and impact; there is a limit to regulations that can be made at the researcher's level (responsible science vs. responsible governance);
- If the Universities wish to contribute to the transformation of society, then they have to equip themselves with resources and to highlight the researchers who take the lead on this...
 - Place and the role of the university in connection with the political system and government agencies.

Thanks for your attention!

- **To find more information:**
- Academic research:
Legault G., Verchère C., Patenaude J., 2017, "Support for the development of technological innovations: Promoting responsible social uses", Science and Engineering Ethics, ed. Springer.
http://link.springer.com/article/10.1007/s11948-017-9911-5?wt_mc=Internal.Event.1.SEM.ArticleAuthorOnlineFirst
- Coming next (end of 2020):
A practical guide



Thanks for your attention!
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