



Co-funded by the
Erasmus+ Programme
of the European Union



UniverCity Action Lab

Module 3: Conceptual and practical tools of innovation



Co-funded by the
Erasmus+ Programme
of the European Union

The information and views set out in this presentation are those of the author(s) and do not necessarily reflect the official opinion of the European Union. Neither the European Union institutions and bodies nor any person acting on their behalf may be held responsible for the use which may be made of the information contained therein.





The reproduction, distribution, and utilization by third parties of the products and resources developed by the UCityLab project or part of them is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. It is attributed to the UCityLab Consortium.

*Third parties are free to **share**- copy and redistribute the material in any medium or format under the following terms:*



Attribution — *You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.*



NonCommercial — *You may not use the material for commercial purposes.*



NoDerivatives — *If you remix, transform, or build upon the material, you may not distribute the modified material.*



Conceptual and practical tools of innovation

The goal of the module is to **equip the students with an understanding of the innovation process, necessity of multi-stakeholder engagement, and techniques and tools to design and implement innovation actions and co-creation activities.**

By the end of this module students will be able to:

- ✓ Bridge between stakeholders: academia, urban authorities, organisations, citizens
- ✓ Intertwine research, theory, and methodology into practice-oriented, applied
- ✓ Grasp concepts and models that revolve around innovation
- ✓ Design and deliver co-creation activities
- ✓ Understand tools and techniques that support the innovation process within their team project.



1. Innovation theory

- Introduction to innovation theory, concepts and models
- Sources of innovation
- Additional concepts

2. Research and Innovation Practices

- Fields and approaches to innovation
- Innovation and applied research
- The role of research

3. Innovation Tools and Techniques

- Methods, techniques, or tools



3.1 research and innovation practices: innovation theories.



Different research methods



Types of innovation



Sources of innovation



Introduction to innovation theory, concepts and models

Why, how and at what pace do innovations spread?

Types of innovation that drive change:

- Sustaining- high-speed trains
- Disruptive- smartphones
- Architectural (radical)- sensor technology for agriculture
- Modular (incremental)- television

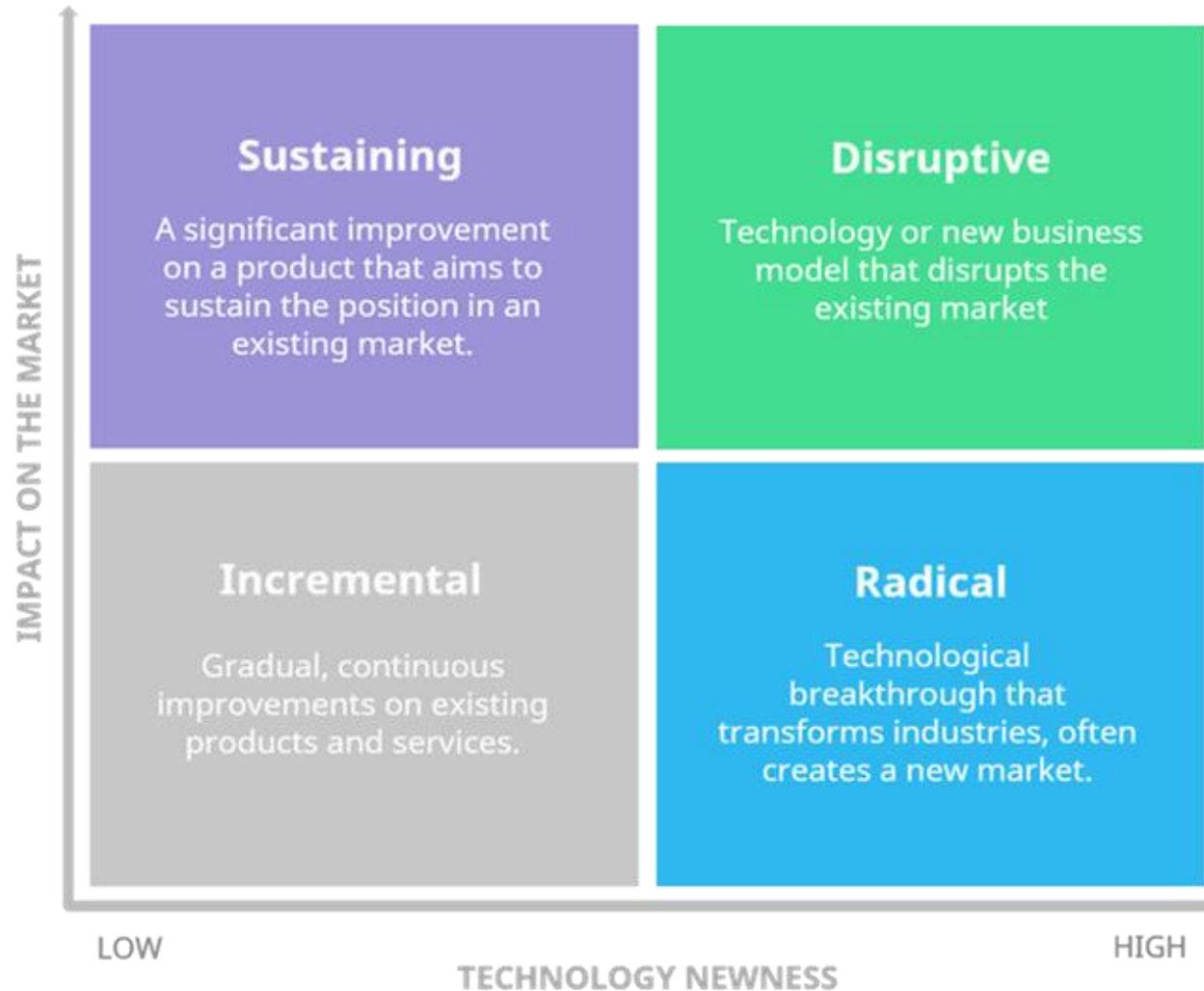


Thinking points:

1. Can you think of examples of innovations that fit into these categories?



Types of innovation that drive change:



Introduction to innovation theory, concepts and models

Quadruple Helix Model

Considers 4 actors as the most important for innovation to succeed:

Academia

- Research and knowledge transfer

Government/policy

- Regulation and control

Industry

- Exploration and exploitation

Society

- Engagement and participation



Thinking points:

1. How do these 4 work together? What is the relationship between them?
2. What advantages are taken from this collaboration?

Introduction to innovation theory, concepts and models

Open Innovation Model

Includes information exchange with 'outsiders'

- Obtained knowledge is integrated
- Generated knowledge is shared externally

Example of environments within the open innovation method:

Living labs:

- Networks where users and developers come together to share ideas
- Collaborative platform for research, development, and experimentation in real-life contexts

Thinking points:

1. Think back to the previous module. What types of innovation came from Urban Living Labs in the case studies?



Sources of innovation

Where does innovation come from?

Businesses

- Improving company processes

Science

- Discovery

Technology

- Technological change of products/processes

End-user innovation

- The consumer/user is the source of the innovation



Thinking points:

1. Can you name products/processes that were produced by each one of these sources?



Sources of innovation

There are several sources of innovation. Where does innovation come from?

Material things

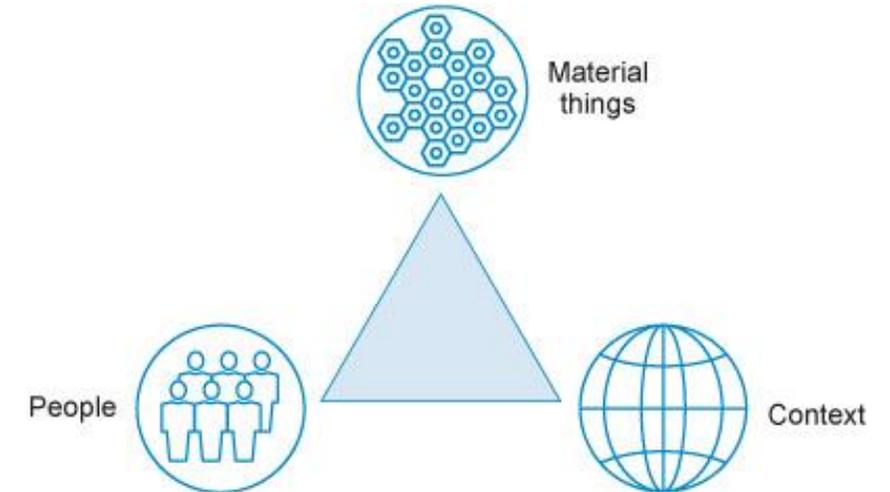
- introduction of new technologies to the discovery of new materials

People

- driven by people's needs

Context

- Production and consumption in a certain area
- regional regulations, globalisation challenges



Discuss the questions in small groups:

1. What are the main differences and similarities among the different models of innovation?
2. Find 5 innovative products/processes developed to tackle urban challenges, from the last 5 years, and match them to a type of innovation (i.e. sustaining, disruptive...)
3. What role would each member of the quadruple helix play in the development of the innovations chosen in Question 2 of this activity.



Game-based learning:

1. Using the Six-Hats game-learning approach, students from different backgrounds/fields should come with innovative ideas/solutions to an existing urban problem within their community and adopting different mindsets to the issue.

Key Resources

Readings

- Carayannis, E.G. and Campbell, D.F.J. (2009). 'Mode 3' and 'Quadruple Helix': toward a 21st century fractal innovation ecosystem. *International Journal of Technology Management*, 46 (3/4), 201–234.
- Chesbrough HW (2006) 'Open Innovation: A New Paradigm for Understanding Industrial Innovation'. In *Chesbrough HW, Vanhaverbeke W, West J (eds) Open innovation: researching a new paradigm*. Oxford University Press.
- Kylliäinen, J. (2020). Types of Innovation – The Ultimate Guide with Definitions and Examples. Retrieved November 06, 2020, from <https://www.viima.com/blog/types-of-innovation>
- Miller, K., McAdam, R., McAdam, M. A systematic literature review of university technology transfer from a quadruple helix perspective: toward a research agenda. *R&D Management*.
- Schütz, F., Heidingsfelder, M., & Schraudner, M. (2019). Co-shaping the Future in Quadruple Helix Innovation Systems: Uncovering Public Preferences toward Participatory Research and Innovation. Retrieved November 06, 2020, from <https://www.sciencedirect.com/science/article/pii/S2405872618301394>
- The Open University. (2016). Innovation through representation. Retrieved November 06, 2020, from <https://www.open.edu/openlearn/science-maths-technology/innovation-through-representation/content-section-1.3>
- Von Hippel, E. (1988). *The Sources of Innovation*. Oxford University Press.

Videos

- [The Quadruple Helix Model](#)
- [The Open Innovation Model](#)



Research and Innovation Practices



Fields and approaches to innovation



Innovation and applied research



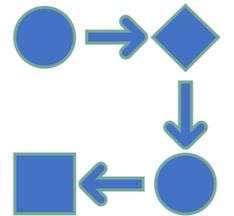
The role of research



Fields and approaches to innovation

Here we delve into innovation practices and approaches:

- Human-Centred Design
- Design Thinking
- Design Anthropology
- Participatory Design



Fields and approaches to innovation: Human-centred design

The Human-Centred Design is a disciplinary approach

- focusses on the users' needs
- generated by the users themselves
- moves onto other relevant stakeholders for later implementation

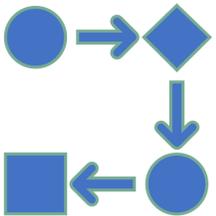
Three phases:

Inspiration – *grounded on the desire of the people you design for*

Ideation – *generation of ideas*

Implementation – *getting the ideas out into the world*

Benefits: positive effects for users as long as it stays focussed on the users and their needs



Fields and approaches to innovation: Design Thinking

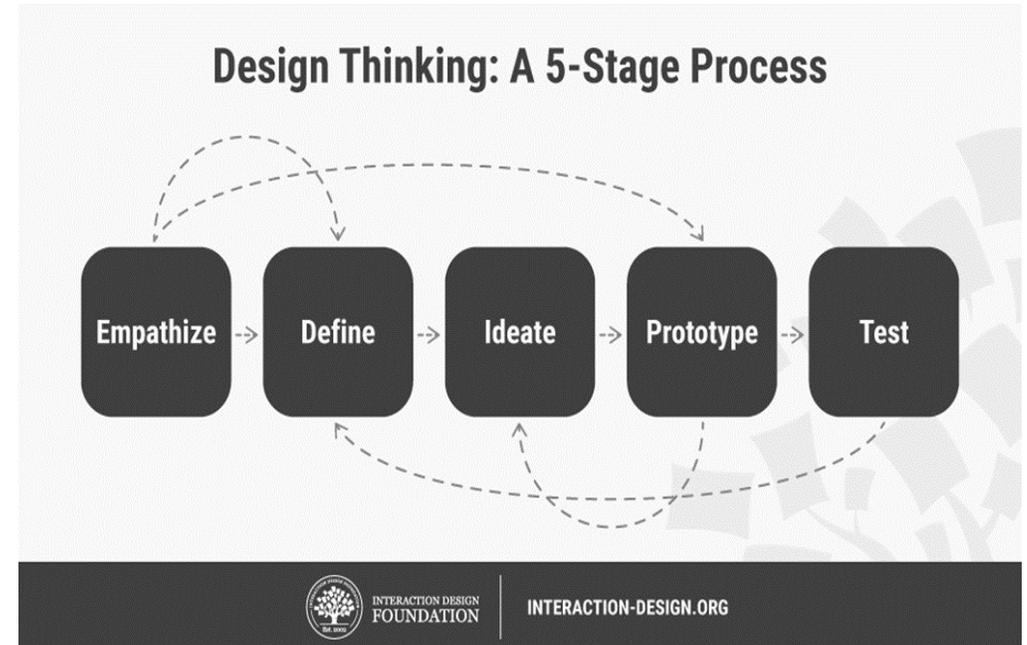
Design Thinking is an interdisciplinary approach used by teams from many backgrounds to redefine users' problems.

Characteristics:

- non-linear
- iterative
- requires understanding of users
- comes up with innovative solutions to a problem

This approach is used by high tech giants (such as Google or Apple) and it comprises five different stages that contribute to design the project.

Benefits: positive effects for users as long as it stays focussed on the users and their needs



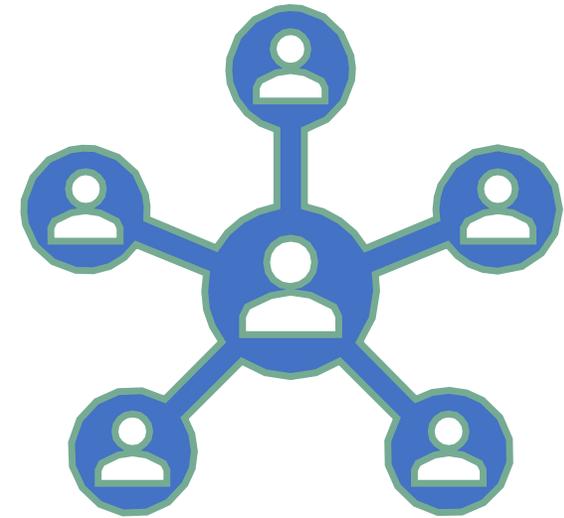
Thinking points:

1. What do each of the stages of Design Thinking stand for?

Fields and approaches to innovation: Design Thinking

These “modes” include:

- **Empathise:** research and gain an empathetic understanding of your users’ needs.
- **Define:** state and define your user’s needs and problems. This stage is achieved with
- **Ideate:** look for alternative ways to view the problems and identify alternative solutions.
- **Prototype:** start creating solutions (or prototypes) of your best ideas for new solutions
- **Test:** try your solutions out. This mode is often used to redefine further problems with the current solution.

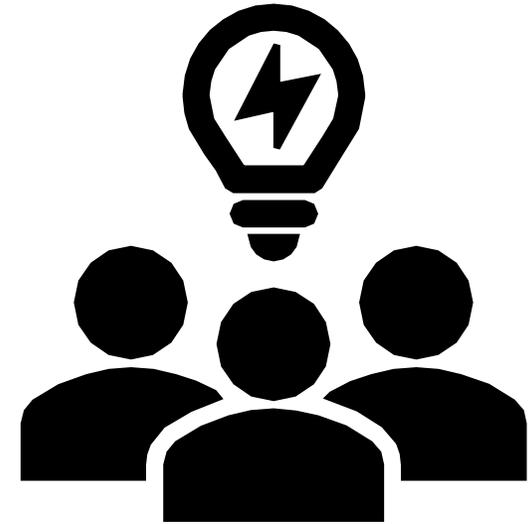


Fields and approaches to innovation: Design Anthropology

Design Anthropology is an interdisciplinary approach

Characteristics:

- similar to design thinking, but focus on anthropological ethnographic research
- anthropologists conduct research on (potential) users
- design team members draw on the findings to develop innovative products/processes



Thinking points:

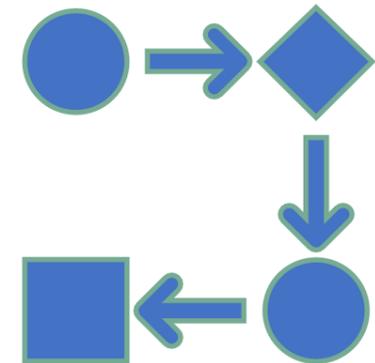
1. When would Design Anthropology be useful as an approach to innovation?

Fields and approaches to innovation: Participatory Design

Participatory Design is a transdisciplinary approach

Characteristics:

- involves different stakeholders, namely businesses, HEIs, government and society
- use of stakeholders attempts to better understand and meet societal/users needs



Activity

Discuss the questions in small groups:

1. Looking at the case studies below
 - Who is involved? Are there stakeholders missing?
 - What are the aims of the project?
 - How will the objectives been met? Include the specific approaches that will be taken.
2. In general, what are the similarities and differences among the different approaches that we have looked at?

Case Studies

1. [Drive Green innovation case study](#) – an innovative phone app, which was built through a interdisciplinary effort, that contributes to the transition to a low-carbon society.
2. [Projet Collectif](#) – a Master’s programme in “Regional and Urban Strategy” that features courses that integrate real life scenarios.



Key resources

Readings

- Cefkin, M., ed. (2009). *Ethnography and the Corporate Encounter: Reflections on Research in and of Corporations*. New York and Oxford: Berghahn Books.
- Elizarova, O., Briselli, J., & Dowd, K. (2017). *Participatory Design in Practice*. Retrieved November 06, 2020, from <https://uxmag.com/articles/participatory-design-in-practice>
- Gunn, W., Otto, T. and Smith, R. C., ed. (2013). *Design Anthropology: Theory and Practice*. London, New York, New Delhi, Sydney: Bloomsbury.
- Hanington, B. M. (2010). Relevant and Rigorous: Human-Centered Research and Design Education. *Design Issues*, 26 (3): 18-26.
- Sanders, E. B. N. and Stappers, P. J. (2008). Co-creation and the new landscapes of design, *CoDesign*, 4(1), 5-18.
- Wasson, C. (2016). Design Anthropology. *General Anthropology*, 23(2):1-11.



Videos

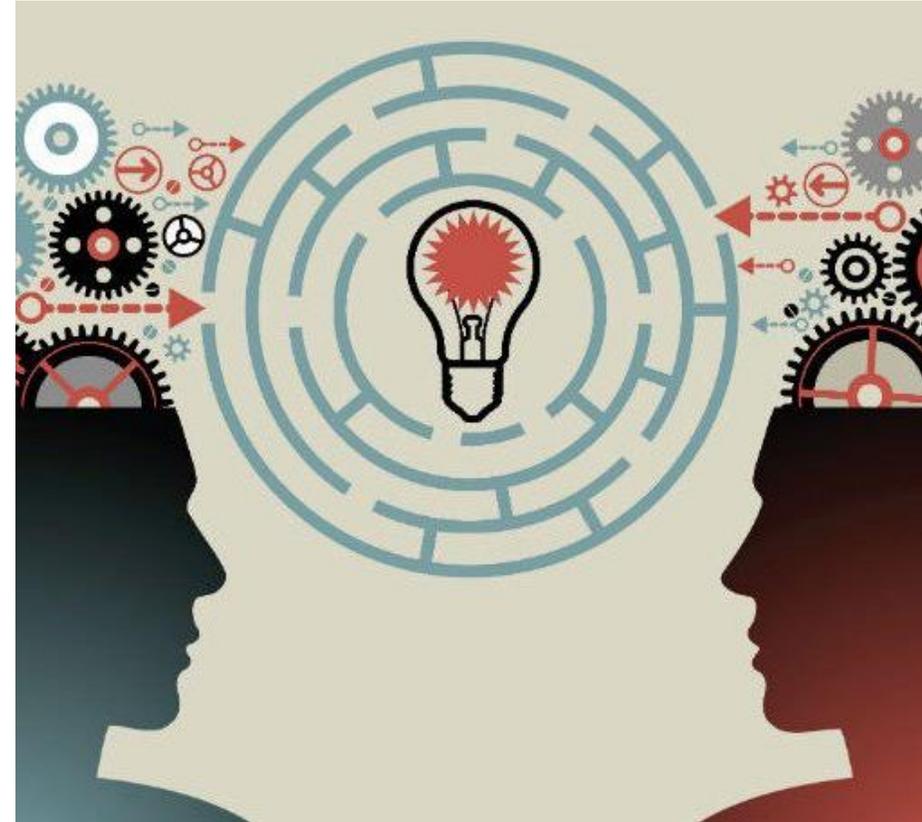
- [Human-centred design](#)
- [Design thinking](#)



Research and Innovation Practices

Practical tools/techniques for the implementation of innovation practices/approaches:

- Lead user
- Prototyping
- Experience prototyping
- Focus groups
- Shadowing
- Rapid ethnography
- Personas
- User journeys
- Card sorting



Lead user

An individual, expert or organisation involved in the innovation process.

- contributes by designing the innovation (may be along with manufacturers)
- provides an idea (or product) before its commercialisation in the market
- based on Human Centred Design

Benefits:

- anticipates future trends and needs



Prototyping

Allows a team to investigate their generated ideas.

- comes up with a scaled-down version of the product/idea
- often used within the Design Thinking Approach

Benefits:

- helps identify the best possible solutions to an issue
- helps the team to focus and come up with more concrete proposals



Thinking points:

1. What are the disadvantages of Prototyping?
2. Are there other advantages?

Experience prototyping

A representation, that is designed to understand, explore or communicate what it might be like to engage with the innovation (Buchenau 2000).

- often used within the Design Thinking Approach

Benefits:

- To test an idea/product with active participation of the users
- To collect further input from the users



Focus groups & Shadowing

Focus group → debates the innovation in question.

- aims to gain different attitudes and responses about an innovative idea/product.

Benefits:

- Gain users' insights over an idea/product
- Transdisciplinary insights (involving different stakeholders)

Shadowing → a researcher shadows a user for a period of time

- gain a better understanding of how a product or a service works in a natural environment.
- often used within the Design Thinking Approach.

Benefits:

- gain hands-on experience
- helps to design & develop better solutions to problems



Rapid ethnography

Focusses on a “quick and dirty” collection of data that aims to provide a reasonable ethnographic understanding (meaning an understanding of the peoples and their cultures), in a relatively short amount of time.

Benefits:

- It provides a quick insights about users and their costumes
- It helps the team to get a more realistic picture of the issues and come up with better solutions.



Personas & User Journeys

Personas → fictional characters that are created to represent different potential users/target of the innovative idea.

- often used within the Design Thinking Approach.

Benefits:

- helps the team understand users' needs, experiences and behaviour.
- identifies users for whom the innovation is designed according to their experience and needs.

User journeys → several events/experiences that user might face when using a service or product.

- they are mapped to better understand the flows of a service/product

Benefits:

- helps the team to correct flows in a product/service design.

Thinking points:

1. What are the main differences between these two methods?



Activity

Discuss the questions in small groups:

1. What are the some tools and techniques used for the creation of new innovations? Give their main characteristics.
2. Identify potential solutions to urban challenges and determine which of the techniques would best suit their implementation.



Case Study:

1. [Amsterdam Urban Living Lab](#) – a clear example of a co-innovative setting, in which multiple stakeholders jointly test, develop and create metropolitan solutions.
2. [La Marina Living Lab](#) – another clear example of a co-innovative setting from our UCityLab Project



Key Resources – sustainable urban solutions

Readings

- Buchenau, M. (2000) “Experience Prototyping” Retrieved November 06, 2020, from <https://hci.stanford.edu/dschool/resources/prototyping/SuriExperiencePrototyping.pdf>
- Buchenau, M. and Suri, J. F. (2000). Experience Prototyping. Proceedings of DIS. New York: ACM, 424–433.
- Czarniawska, B. (2007). Shadowing: And Other Techniques for Doing Fieldwork in Modern Societies. Copenhagen: Liber. Copenhagen Business School Press.
- Interaction Design Foundation. (n.d.). What is User Shadowing? Retrieved November 06, 2020, from <https://www.interaction-design.org/literature/topics/shadowing>
- Millen, D. R. Rapid Ethnography: Time Deepening Strategies for HCI Field Research. Retrieved November 06, 2020, from <http://peres.rihmlab.org/Classes/PSYC6419seminar/Millen2000rapidethnography.pdf>
- Putz, M. (2018). How the LEAD User Method has developed further. Retrieved November 06, 2020, from <https://www.lead-innovation.com/english-blog/lead-user-method-has-developed-further>
- Think Design. (2020). Focus Groups in User Research. Retrieved November 06, 2020, from <https://think.design/user-design-research/focus-groups/>
- Zapfl, D. (2018). What is a LEAD User? Retrieved November 06, 2020, from <https://www.lead-innovation.com/english-blog/what-is-a-lead-user>

