Aalto University

ELEC-E7861

Lecture 4: User Research

2021
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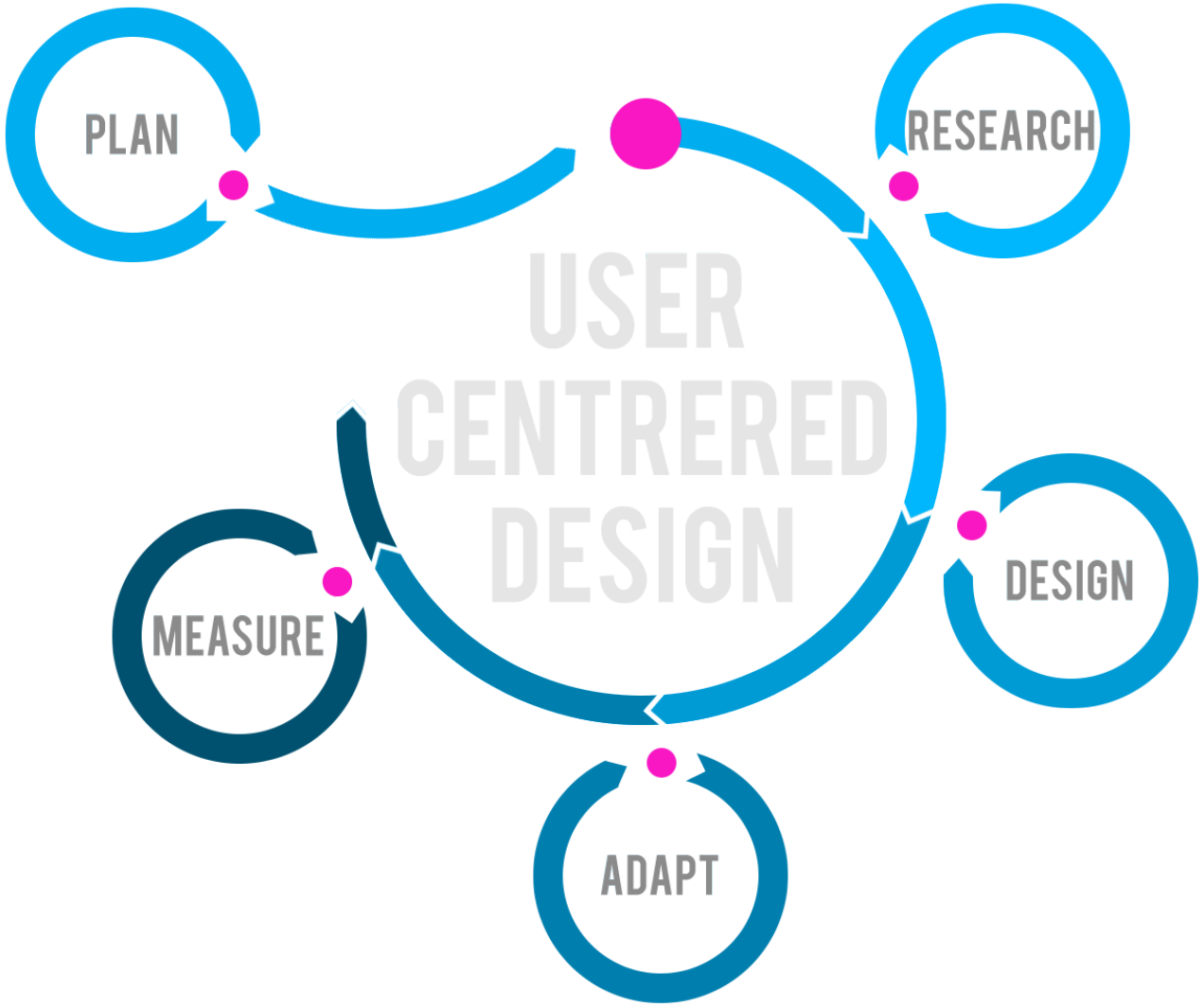
Schedule

Jan 14: Introduction
Jan 21: Computational modeling
Jan 28: Analytical methods
Feb 4: User research
Feb 11: Literature review
Feb 18: Research strategy
Feb 25: No meeting
Mar 4: Research planning
Mar 11: Study design
Mar 18: Data analysis
Mar 25: No meeting
Apr 1: Scientific writing
April 8: No meeting
Apr 15: Scientific presentation
Independent study period
May 14: Submission of paper (PDF)
May 15: Dress rehearsal
May 16: Final presentations

Today

User research

Assignment 4



http://www.serrewet.com/wp-content/uploads/2013/07/UCD-Process.png

Oxford style debate

Two teams: one *against*, the other *for*

Opening statement (<u>for</u>) > counter-arguments (<u>against</u>) > debate > questions from the audience

<u>Mini version</u>

1. Preparation (5 min)
2. Opening + debate
3. Questions from audience (5)

"User research is necessary for computational modeling in HCI"

Notes: Arguments for and against

Important distinctions

User research

- Empirical methods for understanding users

Representations of user data

- e.g., user profiles, cases, scenarios etc

Design

- The act of generating design ideas informed by data

Evaluation

- Empirical and analytical methods of evaluation of produced design ideas (sketches, prototypes etc)
- E.g., usability testing, A/B testing, design heuristics, walkthroughs

Next up:

Two examples of commonly used methods for utilizing the results of user research

Personas: Practice and Theory

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Abstract
ì Personasî is an interaction design technique with considerable potential for software product development. In three years of use, our colleagues and we have extended Alan Cooperís technique to make Personas a powerful complement to other usability methods. After describing and illustrating our approach, we outline the psychological theory that explains why Personas are more engaging than design based primarily on scenarios. As Cooper and others have observed, Personas can engage team members very effectively. They also provide a conduit for conveying a broad range of qualitative and quantitative data, and focus attention on aspects of design and use that other methods do not.

Keywords
Personas, User Archetypes, User Profiles, User Research, Design Method, Scenarios, User-Centered Design.

Industry/category
Computer software, hardware, and technology

Project statement
We have used Personas on projects that range from small to large. This paper will discuss two such projects, one small and one large. The smaller project involved the first version of a new Web browser, MSN Explorer. The larger, our most recent Personas effort,

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Microsoft's user persona template

	Persona 1	Persona 2	Persona 3	
Weight:	50	35	15	Weighted Sum
Feature 1	0	1	2	65
Feature 2	2	1	1	150
Feature 3	-1	1	0	-15
Feature 4	1	1	1	100
Etc.	-	-	-	-

Figure 4: A feature by Persona-weighted priority matrix.

Overview – Alan Waters (Business Owner)

Get to know Alan, his business, and family.

A Day in the Life

Follow Alan through a typical day.

Work Activities

Look at Alan's job description and role at work.

Household and Leisure Activities

Get information about what Alan does when he's not at work.

Goals, Fears, and Aspirations

Understand the concerns Alan has about his life, career, and business.

Computer Skills, Knowledge, and Abilities

Learn about Alan's computer experience.

Market Size and Influence

Understand the impact people like Alan have on our business.

Demographic Attributes

Read key demographic information about Alan and his family.

Technology Attributes

Get a sense of what Alan does with technology.

Technology Attitudes

Review Alan's perspective on technology, past and future.

Communicating

Learn how Alan keeps in touch with people.

International Considerations

Find out what Alan is like outside the U.S.

Quotes

Hear what Alan has to say.

References

See source materials for this document.

Issues with personas

1. The characters were not believable; either they were obviously designed by committee (not based on data) or the relationship to data was not clear.
2. The characters were not communicated well. Often the main communication method was a resume-like document blown up to poster size and posted around the hallways.
3. There was no real understanding about how to use the characters. In particular, there was typically nothing that spoke to all disciplines or all stages of the development cycle.
4. The projects were often grass-roots efforts with little or no high-level support (such as people resources for creating and promoting Personas, budget for posters or other materials to make the Personas visible, or encouragement from team leaders: “thou shalt use these characters”).

Getting Around the Task-Artifact Cycle: How to Make Claims and Design by Scenario

JOHN M. CARROLL and MARY BETH ROSSON
IBM Watson Research Center

We are developing an "action science" approach to human-computer interaction (HCI), seeking to better integrate activities directed at understanding with those directed at design. The approach leverages development practices of current HCI with methods and concepts to support a shift toward using broad and explicit design rationale to reify where we are in a design process, why we are there, and to guide reasoning about where we might go from there. We represent a designed artifact as the set of user scenarios supported by that artifact and more finely by causal schemas detailing the underlying psychological rationale. These schemas, called *claims*, unpack wherefores and whys of the scenarios. In this paper, we stand back from several empirical projects to clarify our commitments and practices.

Categories and Subject Descriptors: D.2.1 [**Software Engineering**]: Requirements/Specifications—*methodologies*; tools; D.2.2 [**Software Engineering**]: Tools and Techniques: H.1.0 [**Models and Principles**]: General; H.1.2 [**Models and Principles**]: User/Machine Systems—*human factors*

General Terms: Design, Documentation, Human Factors

Additional Key Words and Phrases: Design rationale, planning, user interfaces

1. INTRODUCTION

Here is a perplexing contrast. In the world of science, everything is made as self-consciously explicit as it possibly can be. In the world of practice, many things of critical importance are never made explicit. Indeed, some have raised this to a principle of ineffability, claiming that the most important things *cannot* be made explicit [34]. Design work on human–computer interaction (HCI) is a case in point: lots of scrupulously detailed normal science, lots of implicitly detailed design work. We wish to develop a proactive understanding of the gap between science and practice in HCI. Our approach is to try to build science *in* the extant practice, to reify the practical ontology of design so that it can be used more deliberately, interrogated, improved, and applied.

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Task-artifact cycle in HCI

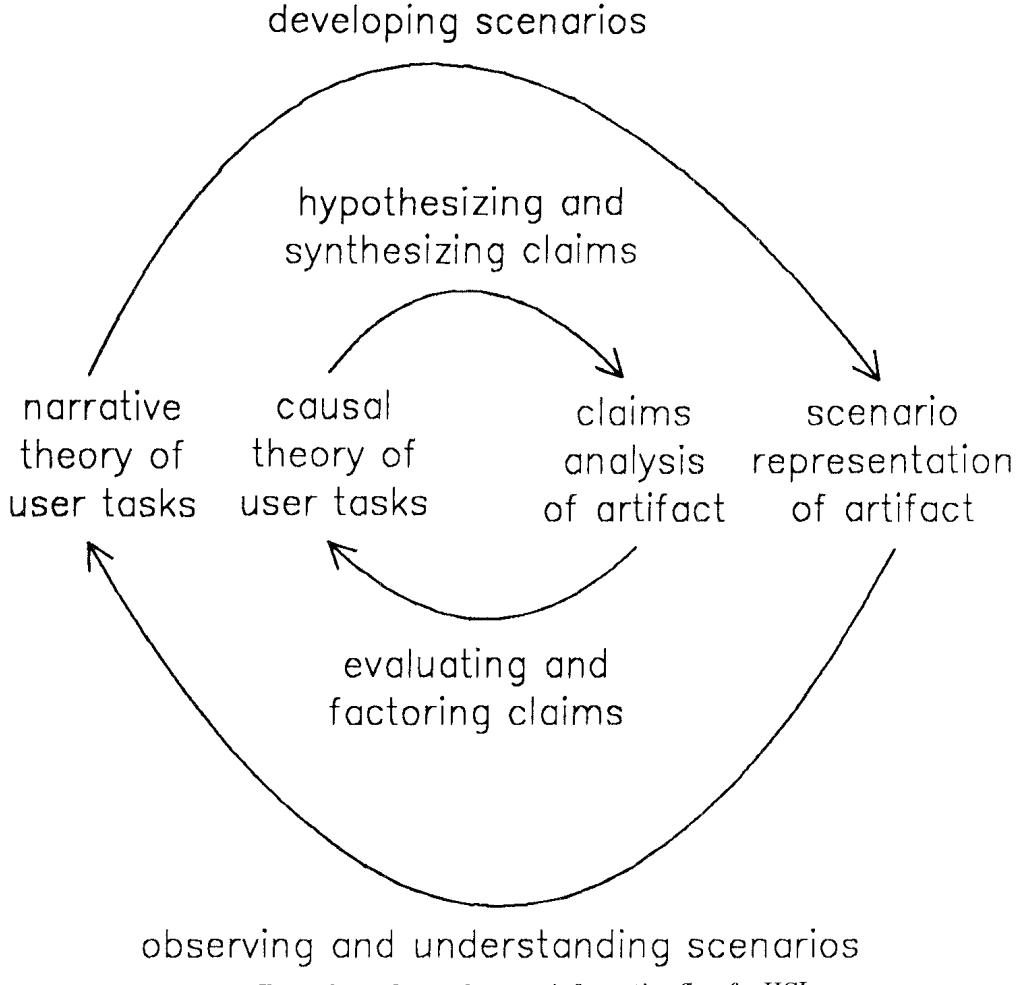


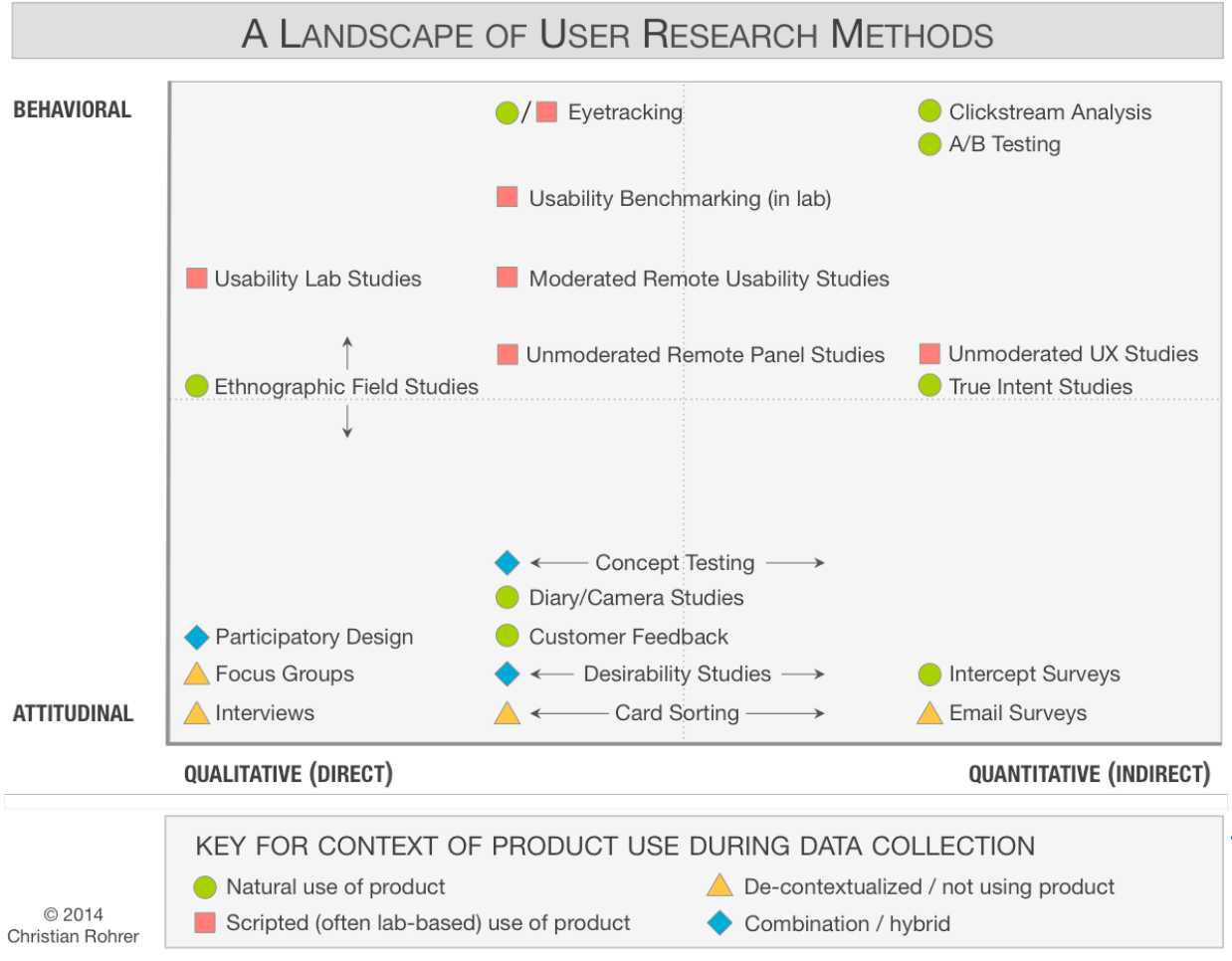
Fig. 13. The task-artifact cycle as an information flow for HCI.

User Research: Exercise

Exercise

Taxonomy by N&N Group

User research method landscape



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Methods per development phase

	Product Development Phase		
	Strategize	**Execute**	**Assess**
Goal:	Inspire, explore and choose new directions and opportunities	Inform and optimize designs in order to reduce risk and improve usability	Measure product performance against itself or its competition
Approach:	Qualitative and Quantitative	Mainly Qualitative (formative)	Mainly Quantitative (summative)
Typical methods:	Field studies, diary studies, surveys, data mining, or analytics	Card sorting, field studies, participatory design, paper prototype, and usability studies, desirability studies, customer emails	Usability benchmarking, online assessments, surveys, A/B testing

Methods UX practitioners report using

Roto et al. 2009 INTERACT

Lab studies with individuals	11
Lab studies with groups	1
Field studies (short, e.g. observation)	13
Field studies (longitudinal)	8
Surveys (e,g. online)	2
Expert evaluations	2
Mixed methods	6

Table 1: Categorization of the collected methods by the type of participants in the UX evaluation

Methods HCI researchers use

Kjeldskov and Graham 2003, 2012 MobileHCI

Method	**Case studies**	Intensive empirical investigations of contemporary phenomena within small size entities such as groups, organizations, individuals, systems or tools in real-life context with the researcher distinct from the phenomena being studied
	Field studies	Characterized by taking place in "the real world" covering a range of qualitative and quantitative approaches from ethnographic studies of phenomena in their social and cultural context to field experiments in which a number of independent variables are manipulated
	Action research	A method through which researchers not only add to the body of scientific knowledge but also apply that knowledge to the object of interest through intervention and participation in the activity being studied
	Lab experiments	Characterized by taking place in a controlled environment created for the purpose of research or in dedicated laboratories allowing a detailed focus on specific phenomena of interest with a large degree of experimental control
	Survey research	Informs research gathers large amounts of data through various techniques such as questionnaires and interviews from a known sample of selected respondents assumed to be independent of their environment
	Applied research	Builds on trial and error on the basis of reasoning through intuition, experience, deduction and induction. Typically the desired outcome of an applied research process is known while means of accomplishing it is not. This makes applied research very goal oriented.
	Basic research	Characterized by trial and error based development of new theories and the study of well-known problems to which neither solutions nor methods are known, relying on the competences of the researcher
	Normative writings	Cover the body of "non-research" writings about phenomena of interests such as concept development writings organizing ideas for stimulating future research, presentation of truth describing ideas that seem intuitively correct, and descriptions of applications.
Purpose	**Understanding**	The purpose of research focusing on finding the meaning of studied phenomena through, for example, frameworks or theories developed from collected data.
	Engineering	The purpose of research focused towards developing new systems or parts of systems, for example an interaction technique for a mobile device, or a mobile application or device.
	Re-engineering	The purpose of research focusing on improving existing systems by redeveloping them such as, for example, adapting a web browser to a small display.
	Evaluating	The purpose of research assessing or validating products, theories or methods, for example, the usability or user experience of a specific application, or a theory of interaction.
	Describing	The purpose of research focusing on defining desirable properties of products, for example, a mobile guide system, or mobile HCI method.

Table 1. Overview of research methods and purposes

Continued

Method/ purpose	Case studies	Field studies	Action research	Lab experiment	Survey research	Applied research	Basic research	Normative writings
Understand	10, 54, 107, 136	8, 14, 28, 38, 46, 56, 61,63, 76, 79, 83, 87, 88, 92, 102, 110, 126, 129, 134	3	15, 42, 52, 77, 101	20, 26, 39, 43, 57, 61, 69, 70, 89, 90, 95, 100, 114, 117, 119, 122			131
Engineer	6	5, 40, 123		31, 62, 81, 94	39, 137, 141	1, 2, 7, 11, 13, 16, 17, 19, 21, 24, 27, 28, 36, 45, 46, 47, 58, 59, 65, 66, 74, 80, 82, 85, 96, 98, 104, 108, 111, 113, 114, 115, 116, 118, 120, 125, 128, 138, 140, 143, 144	29, 51, 109, 127, 130	
Re-engineer				35		37, 44	97	
Evaluate	84	9, 22, 39, 40, 43, 45, 58, 60, 75, 81, 86, 93, 96, 98, 104, 111, 112, 115, 123, 124, 128, 132, 138, 139, 141		4, 5, 6, 7, 11, 12, 13, 16, 17, 21, 22, 24, 25, 29, 30, 31, 32, 34, 35, 36, 37, 43, 44, 47, 48, 50, 51, 53, 55, 58, 62. 64, 65, 66, 71, 73, 74, 78, 80, 82, 89, 91, 99, 103, 104, 105, 106, 108, 109, 112, 116, 118, 119, 121, 125, 127, 130, 133, 137, 140, 142, 143, 144	1, 17, 18, 55, 75, 120, 135			
Describe	33, 93				23, 49, 50, 67, 68			41, 72

Table 3. Classification of mobile HCI research in 2009. Numbers refer to the list of reviewed papers.

A

Exercise: Co-Design journey planner

A jungle!

Summative and formative purposes often mixed

- Example: usability testing is a user research method for some but not all

Science and design mixed

- Many methods have their roots in scientific practice, yet their aims are not purely scientific
- When the purpose is to inspire design, rules change

Each discipline has its own methods

- Interaction Design has its own user research methods, but so do human factors specialists, managers, marketers etc

Many variants

- sometimes with different names

Development process mixed with method type

- E.g., “user research methods for agile development”

Rational choice of method

- Too many methods available for any given problem
  - Interviews, logs, …
- To choose, one should take into account at least these general dimensions:
  - Outcomes: What kind of knowledge needs to be produced
  - Data types: Type of data and access to it
  - Validity and reliability issues
  - Usefulness: How this data can inform your choice
  - Cost-efficiency and available resources

  - And many more…

Learning objectives for the next exercise

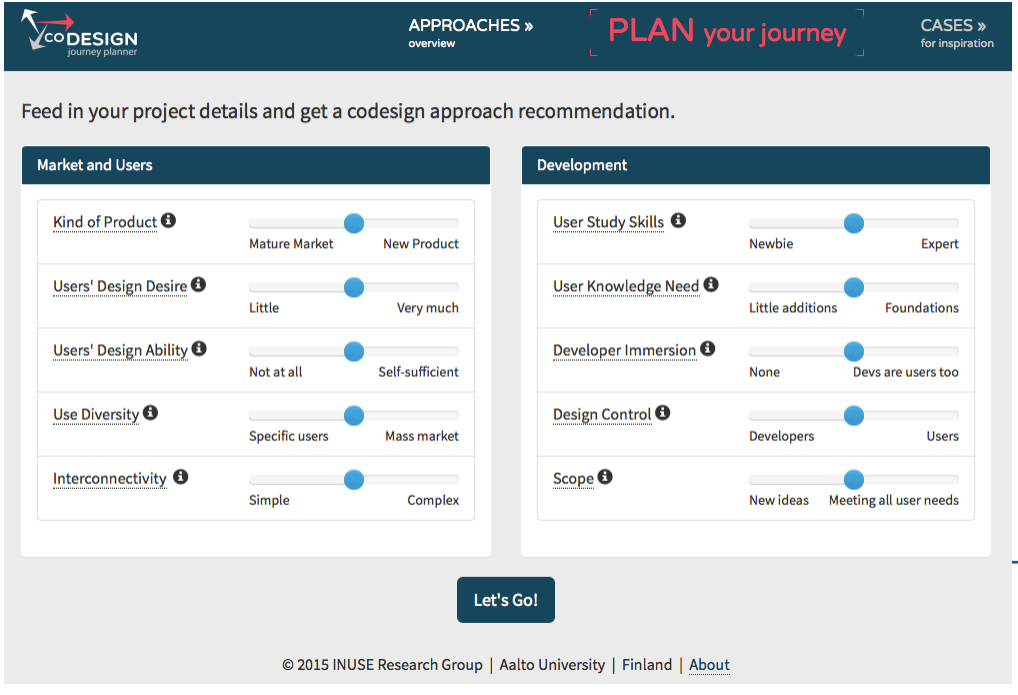
Critical thinking about user research method

Exploration of a vast space of possible methods

CoDesign Journey Planner

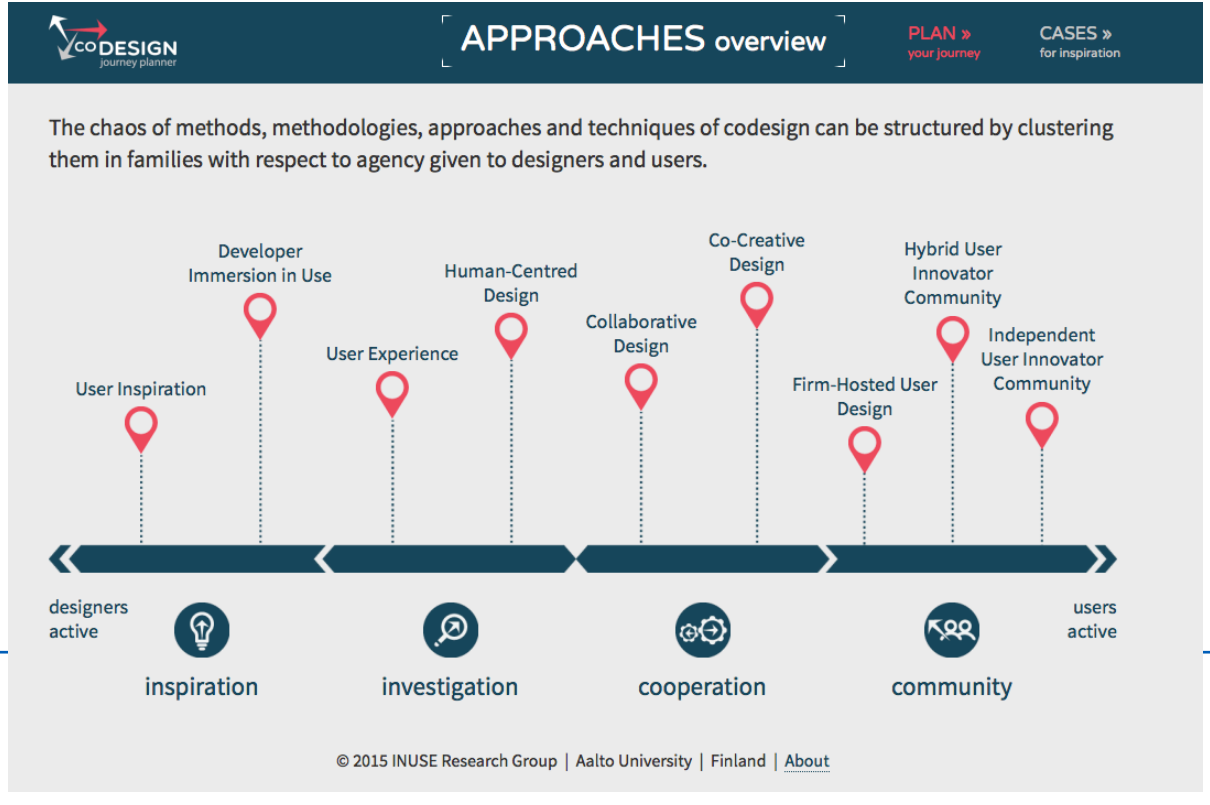
A Web app by Prof. Hyysalo's group at Aalto ARTS

Compiles a large number of methods into a single recommendation system



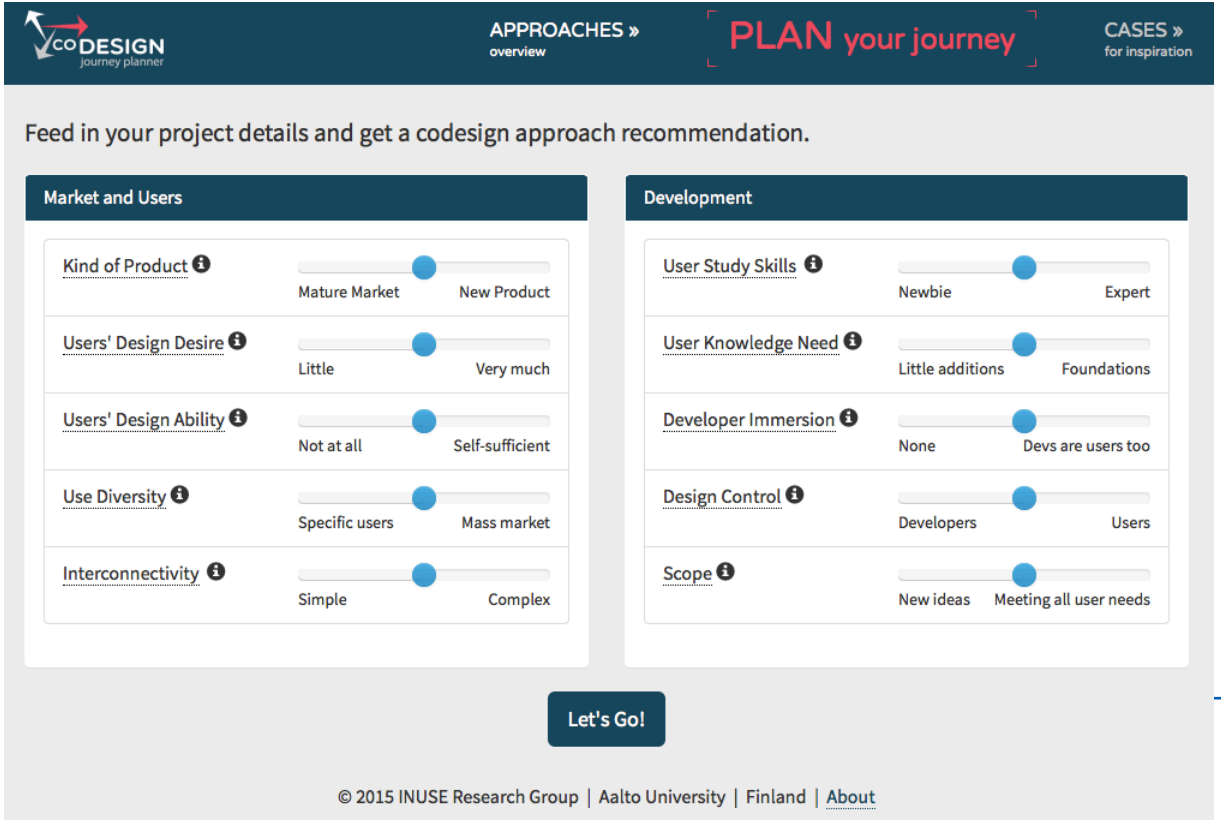
Walkthrough 1/3

Overview of approaches



Walkthrough 2/3

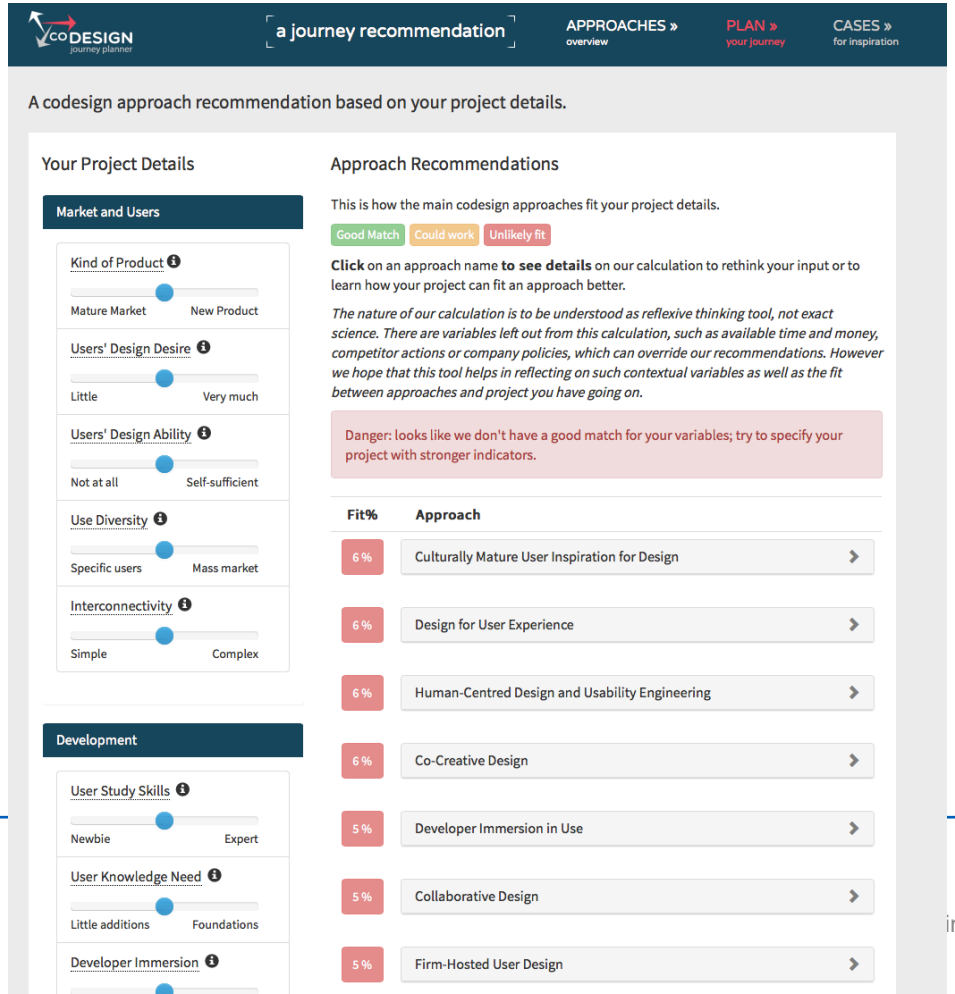
Problem definition



Walkthrough 3/3

Result list

Recommendations not to be taken literally, but as a source of inspiration to inform choice



Pair exercise

I'll assign you into pairs

Open codesign.inuse.fi

Pick one project in the pair

6 minutes > *Report to Chat*

Find

1. The **best** method for your case as suggested by the tool
2. A **surprising** method that you might not have thought about

Notes: Lessons learned

What are the most suitable user research methods for your case?

Aalto University

Assignment 4

Assignment 4

Peer review of present research plan.

- *Dr. Xiuli Chen (cognitive scientist) will review your plan and provide feedback.*
- *Instructions already in MyCourses.*