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Planning and Communication of Actionable User Research

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Abstract

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User research is an important element of human centred design and can have lasting effects on the development of all kinds of products and services. Nevertheless, integrating user research into industry projects faces various challenges. Being applied at different stages in the process, the clear planning and communication of user research insights and results is necessary in order to ensure that it has an actionable impact on the final product. The goal of this thesis is to explore how digital design agencies integrate user research into their human centred design projects and how they communicate the results with their clients.

After conducting contextual interviews and document analysis for seven projects, the data is analysed for common patterns and characteristics of successful and unsuccessful projects. By exploring how research is planned and communicated, it becomes clear that the plan itself is used as a communication tool, always keeping the process and direct in mind. User research needs to generate a solid basis of data by being used in every step of the process. Creating a mutual understanding about the process and the domain is a necessary step before starting the design process to create viable ideas and actionable deliverables.

Giving a brought overview over a wide range of human centred design projects, this thesis includes a set of suggestions and recommendations how planning and communication affect the impact of user research. Actionable user research is a combined and continued afford that lives from the exchanges of information and knowledge.

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1. Introduction

Designing usable products or services is no longer just something nice to have but can determine the success of any product or service. To prevent avoidance, misuse and frustrated users, companies include users and their needs into the design and development processes. The benefits of usable systems include, but are not limited to, enhanced user efficiency and effectiveness, reduced costs for fixing errors and maintenance, decreased need for training and support, higher system acceptance by the user and an increased number of positive reactions and responses (Maguire, 2001).

Research has highlighted the positive effect that user involvement and participation, as well as design for diversity, can have on projects (Yetim, Draxler, Stevens, & Wulf, 2012). Therefore, it is not a surprise that the industry's interest and attempts to include users in the design are rising. The direct connection between a system's success and the user's participation explains why Human Centred Design and User Research are of great interest for companies (Markus & Mao, 2004).

1.1. Human Centred Design

Human centred design (*HCD*) is a framework concerned with designing solutions with the human perspective in mind at all stages of the development process. The International Organization for Standardization (*ISO*) defines HCD as:

“A creative approach to interactive systems development that aims to make systems usable and useful by focusing on the users, designing around their needs and requirements at all stages, and by applying human factors/ergonomics, usability knowledge, and techniques.”

(DIS, 2009)

The goal of human centred design is to create usable, accessible and sustainable systems, tailored to the user's needs. It therefore directly influences the effectiveness, efficiency, satisfaction and well-being of the user. Furthermore, HCD includes the consideration of possible issues and harms for the user's health and security (DIS, 2009).

The core of human centred design is that humans, who will use or who will be affected by a system, are involved in analysing and collecting information about the intended users and their tasks. The specification of users and existing limitations allows appointing necessary functions appropriately. Furthermore, it is necessary to integrate all responsible roles, stakeholders and involved parties in the design process. Multi-disciplinary design teams, alongside with the active, constant and iterative involvement of users, are key principles of human-centred design (Maguire, 2001). A solid understanding of people who are using a system enables designers to generate a variety of ideas, concepts and designs that can be prototyped, evaluated and iterated in cooperation with the user.

1.2. User Research

The key elements of human centred design say that an active user involvement in each stage of the process is essential to gain the necessary knowledge and understanding of users, their behaviour, motivations and needs (Maguire, 2001). Therefore, special user research techniques and methods are applied in each step of the process. As written by Kuniavsky *“user research provides a consistent, rapid, controlled, and thorough method of examining the user’s perspective”* (Kuniavsky, Moed, & Goodman, 2012, S. 36). User research covers a wide set of methods to gather data, analyse and represent information and to communicate consequences for design (Hanington & Martin, 2012). User research is a key element of all human centred design processes.

1.3. Issues with User Research in HCD Projects

“[...] user research conducted before and during design can make the difference between a product or service that is useful, usable, and successful and one that’s an unprofitable exercise in frustration for everyone involved.” (Kuniavsky, Moed, & Goodman, 2012, S. 3).

Due to this fact, a growing number of companies apply a human centred design approach in their development (Thomsen, 2013). Next to the rising interest for HCD in industry, academic publications provide insights into the growing amount of user research and human centred design methodologies.

But even though user research can influence a design process and can make the difference between useful and frustrating products, research and experience have shown that companies often struggle when applying user research effectively in practice (Kuniavsky, Moed, & Goodman, 2012). Theoretical knowledge about methods often clashes with the practicalities of real life scenarios. A variety of concerns and issues appear when applying user research in real industry projects. Designers often need to defend their processes and work. They need to ensure that the value of user research is known in an organisation and that the impact is clearly communicated.

Communication

Due to the high number of stakeholders, departments and teams, the analysis, presentation and communication of gathered data and insights are crucial. Roschuni et al. conclude that *“In HCD user research provides a critical foundation for every subsequent step of the design process. However, the influence of user research depends on its visibility and credibility to decision makers.”* (Roschuni, Goodman, & Agogino, 2013).

Human centred design is a multi-disciplinary team approach (Thomsen, 2013). It, therefore, is necessary to communicate information in an efficient and clear way at all stages of the process. The risk is not only that the user’s perspective gets lost but also that the importance, value and possible effect of the conducted research get debased. If not communicated correctly, research results and the knowledge about users may remain unused and the time and effort spent on user research are meritless. For user research to have an impact on a design project, data, insights and design implications need to be collected and presented in a way that they maintain their importance during the whole development process.

As *“The division of roles in commercial product, service, branding, and experience design poses major challenges to that visibility and credibility.”* (Roschuni, Goodman, & Agogino, 2013, S. 143), it is essential to apply techniques that facilitate the conversation with stakeholders, departments, team members, clients, external sources and the users themselves (Hanington & Martin, 2012). It is not only the selection of user research methods that is crucial to the success of a project but also the way in which the research data and insights are analysed and presented.

Online blogs and forums regularly explore how to communicate research insights and how to maintain a culture that keeps the value of user research visible. Posters, postcards, workshops, reports, informal conversations or formal presentations, online blogs or forums, podcasts and websites are only some examples of methods used to communicate research results in and outside of a company. The visualisation of insights is as important as the clear communication when speaking with colleagues (Roschuni, Goodman, & Agogino, 2013).

Human centred design mainly discusses the conversation and exchange with users but often misses the necessary communication within multi-disciplinary teams and companies (Roschuni, Goodman, & Agogino, 2013). Roschuni et al. suggest applying user research techniques in the beginning of research projects in order to better understand the client they are working with. The authors call this approach *Double Ethnography*, as it not only calls for understanding the user but also for knowing the stakeholders and their goals, ideas, needs and concerns in the project (Roschuni, Goodman, & Agogino, 2013).

Planning User Research

The ISO standard defines multidisciplinary teams and companywide involvement as key elements of HCD (DIS, 2009). Several publications discuss how to create a shared vision and understanding across different roles and teams. Especially within distributed teams and responsibilities, the importance of structured and clear communication becomes even more obvious (Holtzblatt, Wendell, & Wood, 2004). Therefore, suggestions on how to create actionable user research often include accurate planning, not only of the research itself but also of the transition and communication between team members and stakeholders (Holtzblatt, Wendell, & Wood, 2004). Kuniavsky, Goodman and Moed state that for user research to have an impact on the project development, the corporate culture needs to be centred around the user's needs as well (Kuniavsky, Moed, & Goodman, 2012).

1.4. Case Study: HCD in Industry Projects

To understand how planning and communication are handled in industry projects today, this thesis explores how user research methods are planned, used and communicated in design agencies with a focus on delivering human centred solutions for their clients. Agencies directly face the situation that they not only need to understand the users they are designing for but also the clients they are working with. Having dealt with these issues in several projects with different clients, agencies have developed planning and communication processes to ensure that their research is used in the best possible way. The purpose of these structures is to have lasting effects on the process, the project and the client. These direct effects that user research has on the project's success is defined as impact in this thesis.

Based on seven projects in two digital design agencies based in Sweden, this thesis explores not only how user research is applied on a wide range of projects, but also how results and insights are analysed, collected and communicated with the team and with the client throughout the process. By looking at different projects the focus is on understanding the planning of HCD projects and the communication models applied to support the impact of user research. The goal is to see how user research is integrated, how it affects the communication and what impact it can have on the final results.

Digital design agencies help their clients to better understand and engage with their users and to build better, more user-centred products and services for them. Offering a wide range of services, digital design agencies aim to contribute to their client's success by applying their knowledge about design as well as creative and technical services on the client's projects. To deliver human centred solutions, digital agencies have different ways of integrating user research into their products.

2. Purpose

In order to understand the different techniques of integrating user research into projects at digital design agencies, this thesis explores what role the planning and communication of user research play in these projects. The goal is to learn from the agencies' experience, as they are used to effectively plan and communicate the value of user research in a great variety of projects. This thesis aims to explore this knowledge to understand how user research can be actionable in human centred design projects.

2.1. Research Questions

This thesis aims to answer three main research questions, which are categorised based on the different phases of a human centred design process, beginning with the planning phase, followed by the collection, analysis and communication of insights before looking at the impact of user research.

RQ1: How is the integration of user research in HCD projects planned?

Planning is an important step of all human centred design process. Therefore, the first focus area of this thesis is how agencies plan their research in cooperation with the client. As the information about the project is coming from the client, the designers need to understand the project, the relevant stakeholders, their goals and needs as well as the relevant users to proceed planning the outline of the project.

The next step in the thesis is the understanding of how user research is used and communicated between different roles, team members and stakeholders. In multidisciplinary teams, the transition of information is very important to maintain the value and impact of user research.

RQ2: How are results of applied user research collected, analysed and communicated?

For user research to have an impact on a project, the collected data needs to be analysed, structured and communicated in a way that every stakeholder and team member understand the relevant insights, conclusions and how to act upon them. To enable teams to leverage the results of user research in all following steps the collected data and obtained information needs to be understood clearly by everybody. For a client, it is important that the designer communicates the reasons for a design in order to create a deeper understanding, a shared vision and ownership based on the user's needs (Holtzblatt, Wendell, & Wood, 2004).

The final stage of a project regards the implementation and release of a product. For design agencies, this stage is about finishing the project and handing the final information over to the client. The third research question aims to see the full picture, not only of how user research has been applied and communicated but also what impact it has on the final project.

RQ 3: What impact does user research have on a project?

To understand what impact means for the client and the agency, the applied methods explore how results are communicated and how impact is being measured. For connecting the different phases and research questions, the goal is to understand how user research data and insights are used in the final delivery and how they are made actionable by the designers to have an impact on the project.

2.2. Limitations

This thesis has a very broad scope, which is a limitation in itself as it does not allow us to go very deep in all the areas of human centred design projects. Focusing on the three given research questions, the scope is limited by defining focus areas rather than cutting out parts. Having the holistic view of projects is necessary to understand all the connections and implications of our observations. Only looking at the communication without understanding how a project started and how the research was planned could lead to missing points and misunderstandings as crucial decisions might be made in the beginning of a project. Furthermore, the wide scope is a reason for selecting the case study method, which allows us to explore projects in their full length, providing us with a deep understanding and data about each project.

But to limit the scope of this thesis to some extent, only projects that have been finished will be explored in the case study. This limits the possible observations but it allows us to see the impact that user research has on the end results of a project. Next, this thesis only aims to provide an overview of industry projects from an academic perspective. As it is a case study research this is a qualitative study, based on a select amount of cases. This is especially important when measuring the impact of user research. For this thesis, we will measure the impact based on the client's feedback for the agency and not on numerical goals or achievements.

Since this is a qualitative study, we will only be able to consider the designer's personal perspective when answering our questions. This project cannot exclude the bias in all parts of the research. We try to avoid this by triangulating our data, using various sources, but due to the time scope of this project, this is only possible to a limited extent. Furthermore, when looking at communication processes, different roles and structures in the design agency and the client's organisation might add further value to the insights. Nevertheless, to limit the scope of the thesis, analysing the different roles and process structures inside a company is not part of this thesis if they do not affect the projects directly. This means that involved roles on the client and agency side will be included, but no further processes involved department or stakeholders.

2.3. Thesis Structure

The introduction and purpose chapter describe the background of the thesis and aim to give a motivation for the selected topic as well as the existing limitations. Next, a theory chapter collects and analyses various existing resources about planning, communication and impact in a human centred design project. Following this analysis of related work and existing practices, the next chapter describes how methods and techniques are selected, prepared and executed before describing the results from the case study at two different digital design agencies. A primary and a secondary analysis of these results lead to a conclusion and discussion which elaborate the gathered insights and how the findings can be understood before giving examples and suggestions of future work.

3. Theory

The approach of this thesis is to answer the research questions by understanding the how user research is planned and how the results are communicated in human centred design projects. The upcoming chapter aims to provide a solid background, based on related work and literature, about important elements and points when analysing how planning and communication support actionable user research that has an impact on a project's success.

3.1. The Human Centred Design Process

To include the user's perspective at each stage of the development, human centred design processes are categorised into different phases, all applying an own set of methods and approaches to involve the user. The basic idea is that at the beginning of the process the goal is to analyse the problem within a given context. The next step is to apply methods to develop a set of ideas and solutions which can be prototyped and evaluated in cooperation with the user. The final step concerns the development and implementation before releasing a product or service.

Academic papers, books and studies, as well as companies and design agencies, use different definitions, strategies and combinations of phases in an HCD process. For this thesis, a set of processes and definitions found in literature and in the industry are analysed and compared in order to get a better understanding of how human centred design projects can be structured. First, six academic sources from different disciplines of design are selected. Next, three examples from industry are analysed as well. The selected agencies have different clients and focus areas, from digital solutions to social services and development work. Combining the academic and the theoretical view on processes and stages applied in HCD, this first part of the theory chapter aims to provide a comparison as well as a process suggestion for the methods section of this thesis. The knowledge from the different process models and descriptions is combined into one definition of a process that is taken as a basis and frame for this thesis.

Literature Analysis of Human Centred Design Processes

Benyon (2014)

One definition of phases in a human centred design process can be found in the book *Designing interactive systems: People, activities, contexts, technologies* (Benyon, 2014). Focusing on the design of interactive systems the author splits the HCD process in five stage: Understanding, Envisionment, Design, Evaluation and Implementation. These stages relate to each other as shown in Figure 1 and the process can start at any point. As everything needs to be evaluated at every stage in time in cooperation with the user, the evaluation phase is key to the author's understanding of human centred design (Benyon, 2014).

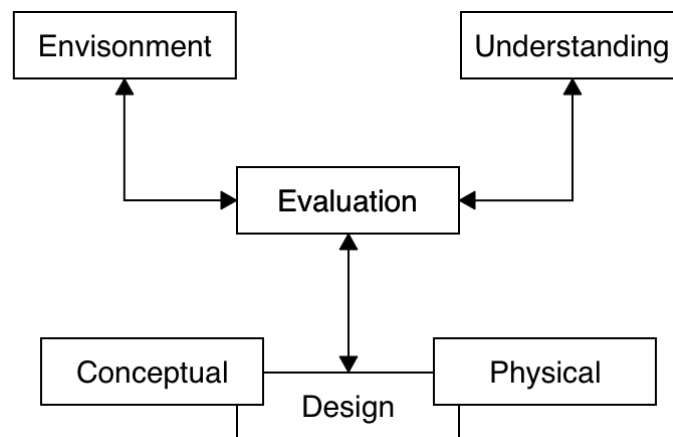


Figure 1 – Designing Interactive Systems (Benyon, 2014)

Understanding: The first phase is concerned with gathering the functional and non-functional requirements of a system, product or service. The goal is to answer the question what a system must do, what it should be like and what role it plays in the environment that it is placed in (Benyon, 2014).

Conceptual and Physical Design: This phase is about representing and communicating the results from the understanding phase with the help of personas, use cases and scenarios. It is split up into conceptual, defining what kind of information and functionality is needed, and physical design, caring about the operational, functional and interaction design (Benyon, 2014).

Envisionment: In this phase, ideas are visualised to provide a better understanding and to be evaluated. Therefore, the appropriate medium needs to be found, matching the designer's and the audience's needs (Benyon, 2014).

Evaluation: As shown in Figure 1, evaluation is at the centre and tightly coupled with envisionment of ideas. The methods of testing depend on the involved people (Benyon, 2014).

Implementation: The final stage is about implementing the specified ideas based on the existing requirements. There is a variety of formal (e.g. UML), semi-formal and informal methods of a specification that can be used in this stage (Benyon, 2014).

Duyne, Landay, Hong (2002)

In *The design of sites* Douglas et al. suggest how to use HCD when creating websites. The authors define the process as a seven-step progress (Duyne, Landay, & Hong, 2002).

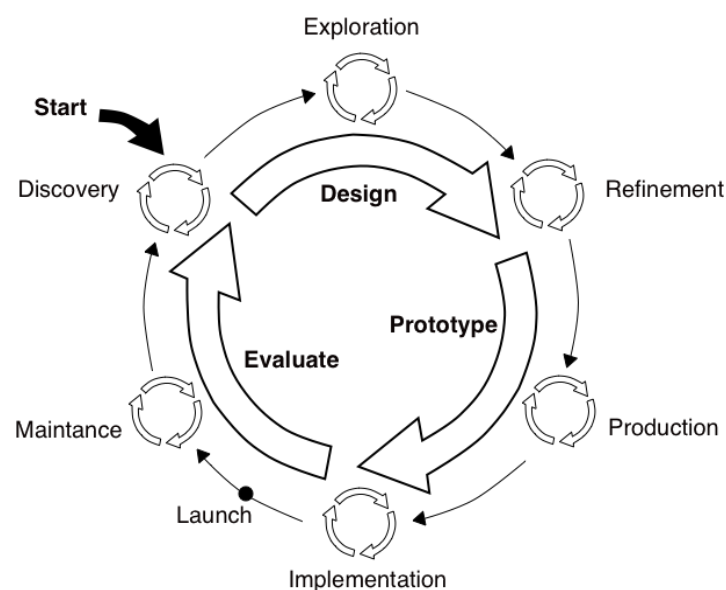


Figure 2 - Human centred design process for websites by (Duyne, Landay, & Hong, 2002)

Discovery: The goal in the first phase is to clarify the scope of the project, the business goal of clients and to define the target customer and to understand their needs. The three main deliverables are a customer analysis document, which gives both the design team and the client a deep understanding of the target customer, a business analysis document, which specifies the goal of the client, and finally a specification document, which describes requirements and design goal (Duyne, Landay, & Hong, 2002).

Exploration: Next, the design team generates initial design ideas and shows prototypes to the client, who will select one for the next step. The selected design is supported by evaluation results that meet the client's goal. Possible deliverables are site maps, storyboards and schematics (Duyne, Landay, & Hong, 2002).

Refinement: The selected ideas are now iteratively refined, polished and details are carried out. Deliverables contain more details (Duyne, Landay, & Hong, 2002).

Production: This phase develops an interactive prototype and design specifications. The deliverables are prototypes, design documents, technical specifications, design guidelines and so on. As the design is next handed over to the implementation team, the description needs to be very detailed to avoid ambiguity and misunderstanding (Duyne, Landay, & Hong, 2002).

Implementation: The goal of this phase is to create the functional websites, relevant maintenance documents, test plan document and updates (Duyne, Landay, & Hong, 2002).

Launch & Maintenance: First, a minor check is finished and the product is launched. Next, the maintenance phase ensures that the website is running and updating features (Duyne, Landay, & Hong, 2002).

Holtzblatt & Beyer (2014)

Contextual design is an approach used in a wide field of industries to create innovative, user-centred design. It leverages in-depth user research by integrating a broad amount of techniques to gather, analyse, iterate and present research insights (Holtzblatt & Beyer, 2014). In *Contextual Design: Evolved*, Holtzblatt and Beyer describe the three phases of contextual design: field research, ideation and design and evaluation.

Field Research: The goal of the first phase is to collect design data by immersing the designers in the situation and context of their users with the help of contextual interviews. Interpretation sessions and a great variety of models are used to analyse this data together in the team and to get a holistic understanding of the user's situation (Holtzblatt & Beyer, 2014).

Ideation: Based on the obtained knowledge, ideas and concepts are developed. The goal of this phase is to leverage the collected data and interpret it in a way that it supports the generation of the best designs for the users' situations. Data consolidation techniques such as affinity diagrams, contextual design models and personas are applied to better understand, handle and integrate the collected data into the ideation process. Workshops are used to directly connect design ideas to the collected data and to elaborate on ideas and concepts together (Holtzblatt & Beyer, 2014).

Design: In the final phase, concrete interfaces and interactions are designed, tested and iterated together with the user. Tools such as storyboards are used to match ideas with the generated user flows (Holtzblatt & Beyer, 2014).

ISO Standard 13407, described by Maguire (2001)

Maguire uses the ISO standard 13407 to describes the HCD process in the paper *Methods to support human-centred design* (Maguire, 2001). According to the author, the process consists out of five steps which are carried out in an iterative way, applying different methods at each stage. Figure 3 shows these key activities and how they are connected. The process suggested by Maguire describes a project that after the planning iterates in several, rapid and small circles to allow changes to be less cost intensive.

Planning: The first activity that needs to be done to initiate a successful human centred design process is the planning of all concerned elements and tasks. Especially when planning HCD as part of another development process these processes need to be integrated as smoothly as possible (Maguire, 2001).

Understanding: The second task is to understand and specify the context of use that a product or service is designed for. It covers the identification of user's goals and needs as well as further influential conditions. Collecting this information is necessary to generate requirements and to provide a baseline for later evaluation (Maguire, 2001).

Requirements Specification: Based on the understanding requirements are specified. Maguire describes this as a crucial activity to the success of a project (Maguire, 2001).

Design Phase: The next activity is to produce design solutions as part of a rapid, iterative process. These designs are important for validation and to uncover possible problems as early as possible (Maguire, 2001).

Evaluation: Designs need to be evaluated at every step of the process. Evaluation is a very important activity in HCD and is intended to be applied directly from the beginning of the project (Maguire, 2001).

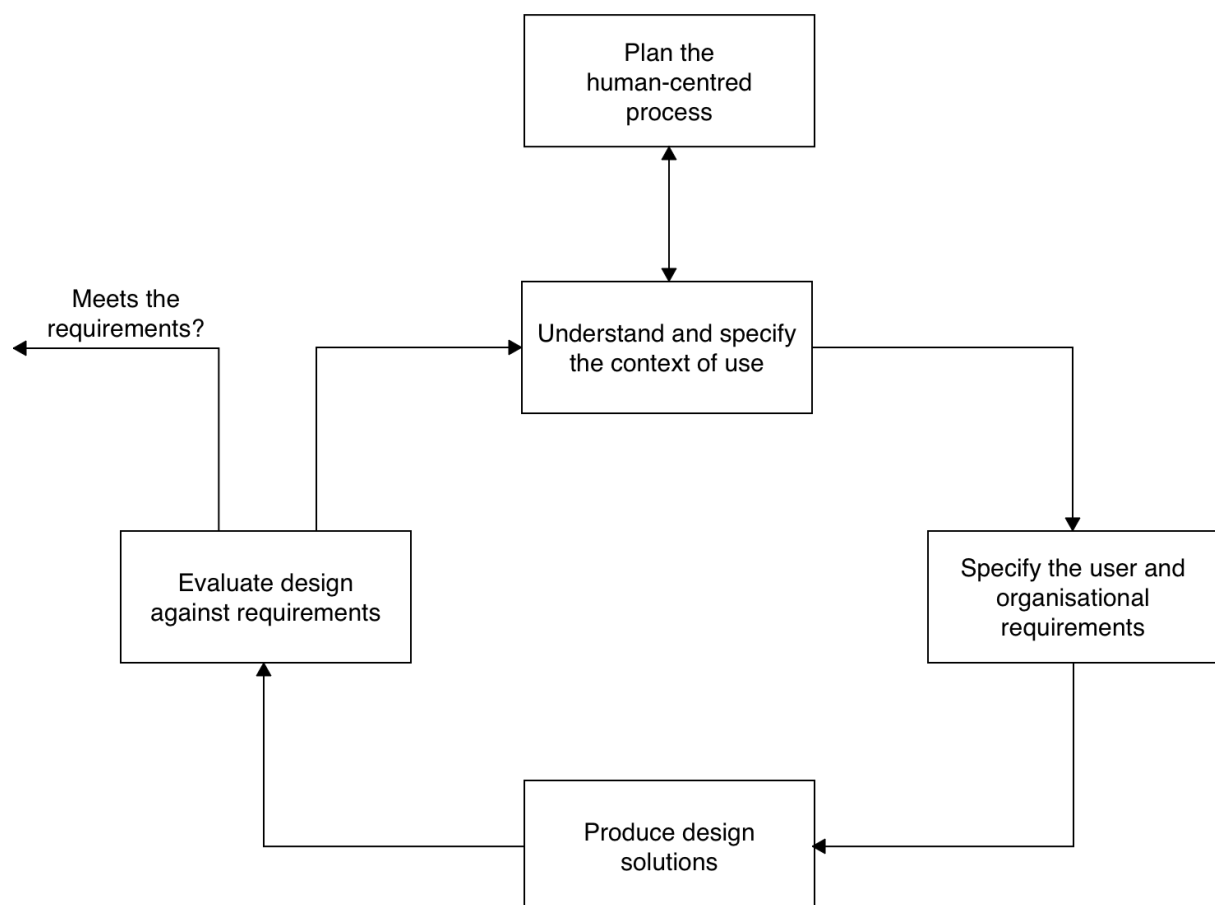


Figure 3 - Key activities based on ISO 13407 (Maguire, 2001)

In the book *Observing the user experience: a practitioner's guide to user research* Kuniavsky, Moed and Goodman describe iterative development as integrating the search for problems and the creation of solutions without losing the overview of the full picture and the connection between the individual elements. Using a three-stage model, the author emphasises the importance of continuous refinement in each step (Kuniavsky, Moed, & Goodman, 2012).

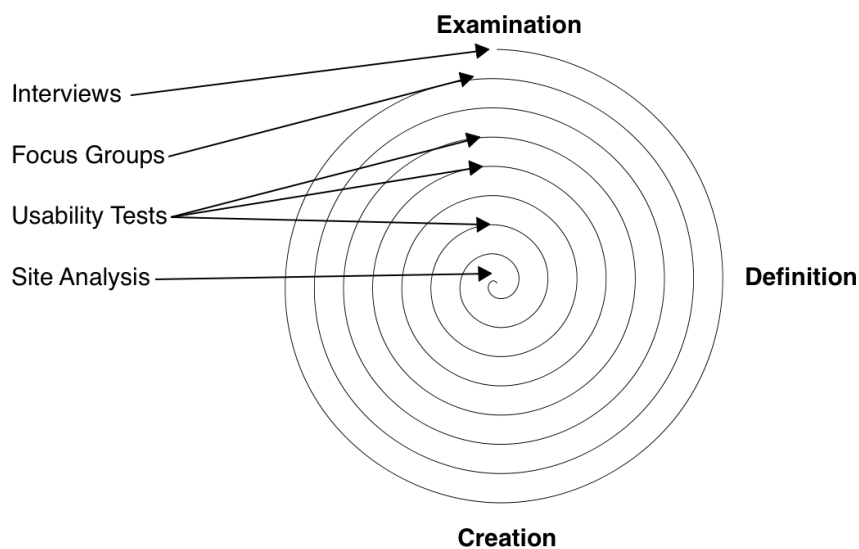


Figure 4 - User research in iterative development (Kuniavsky, Moed, & Goodman, 2012)

Examination: The goal is to identify problems and the people that are affected by them. Designers analyse the potential users' needs and conduct research to collect data and information to evaluate possible solutions (Kuniavsky, Moed, & Goodman, 2012).

Definition: Next, the data is used to specify solutions (Kuniavsky, Moed, & Goodman, 2012).

Creation: In the creation phase, solutions are planned and put into practice. According to the author, this is the time that requires the most time and that depends on the data collected in the examination phase (Kuniavsky, Moed, & Goodman, 2012).

Sharp, Rogers, Preece (2015)

The next model can be found in the book *Interaction design: beyond human-computer interaction*. Based on the HCD principles by *Gould and Lewis* from 1985 and the authors' extension of these ideas, they define four basic activities as stages of human centred design. Figure 5 illustrates the model that is connecting these activities, highlighting how these activities inform each other and how they are repeated iteratively, with evaluation at the centre (Sharp, Rogers, & Preece, 2015).

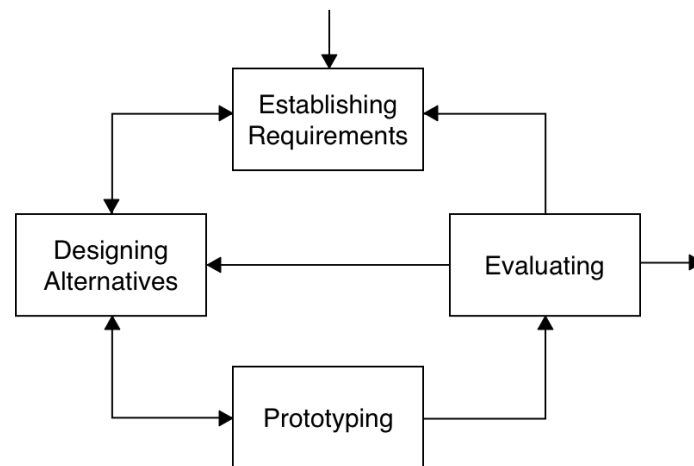


Figure 5 – Human centred design (Sharp, Rogers, & Preece, 2015)

Establishing Requirements: The goal of the first phase is to get to know the target user and to understand the necessary support, which needs to be provided by an interactive product, system or service. Different user research methods for data gathering and analysis are applied to examine the user's needs (Sharp, Rogers, & Preece, 2015).

Designing Alternatives: Next, ideas are generated to meet the collected requirements. This is done in two stages, conceptual and concrete design (Sharp, Rogers, & Preece, 2015).

Prototyping: Based on the designs, prototypes are created as they offer the best way to evaluate ideas and to allow the user to interact with the system to identify possible issues early in the process (Sharp, Rogers, & Preece, 2015).

Evaluating: Focusing on usability and acceptability, this stage is the centre of the design process and the gatekeeper before releasing a product (Sharp, Rogers, & Preece, 2015).

Human Centred Design Processes in Design Agencies

IDEO

IDEO is an international design agency using a design thinking methodology. Their book *The Field Guide to Human-Centred Design* (IDEO, 2015) describes how they apply different user research methodologies in an HCD process. IDEO highlights, that they do not see human centred design as a linear process but that it needs to be shaped and adapted for each project. The three phases defined by IDEO are *Inspiration*, *Ideation* and *Implementation* (IDEO, 2015).

Inspiration: In the first phase, the designers' goal is to learn from the people they are designing for by immersing themselves in their environment and context. This allows a deeper understanding of users and their needs (IDEO, 2015).

Ideation: Next, activities involve the analysis of the gathered data, exploring insights and generating several ideas and opportunities for design. This phase also includes prototyping, evaluation and improvements (IDEO, 2015).

Implementation: Finally, the last step is about creating impact by bringing the solution life and to market (IDEO, 2015).

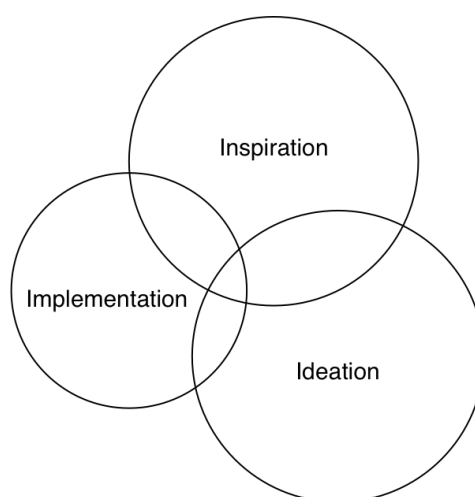


Figure 6 - The three phases of Human Centred Design used at IDEO (IDEO, 2015)

DesignAID

This Canadian Design Agency for International Development uses human centred design, focusing on participatory design and collaboration with their clients. Being a humanitarian agency working on social innovation, they apply HCD to solve problems and challenges for communities all over the world. Their process is split up into three phases: Preparation, Action and Review (DesignAID).

Preparation: The first phase is about partnering with the client and the community they are working with, followed by the field research and the identification of challenges and design opportunities (DesignAID).

Action: This step is split up into several phases. Beginning with co-creation of ideas with their partners and the real users, before synthesising these ideas to refine and prototype them and finally testing and measuring the results and the impact. Based on the evaluation, further refinements are made before the solution is released and implemented (DesignAID).

Review: The Final Review phase covers the assessment and conclusion of a project, providing tools for evaluation and monitoring to plan next steps (DesignAID).

Nurun

The design agency Nurun provides design and technologies consulting worldwide. Offering services as research, prototyping and release, they cover the full human centred design process. On their website, they describe their own process as split up into three main elements: Research, Model and Realise (Nurun).

Figure 7 shows how each of these steps contains several processes.

Research: The first stage concerns research about technology, ethnography and business to create hypothesis (Nurun).

Model: The modelling phase covers an iterative, human centred design process, starting by conceiving the researcher hypothesis followed by building and learning from testing (Nurun).

Realisation: The final stage is about realising the product, covering development, launching and final analysis and optimisation (Nurun).

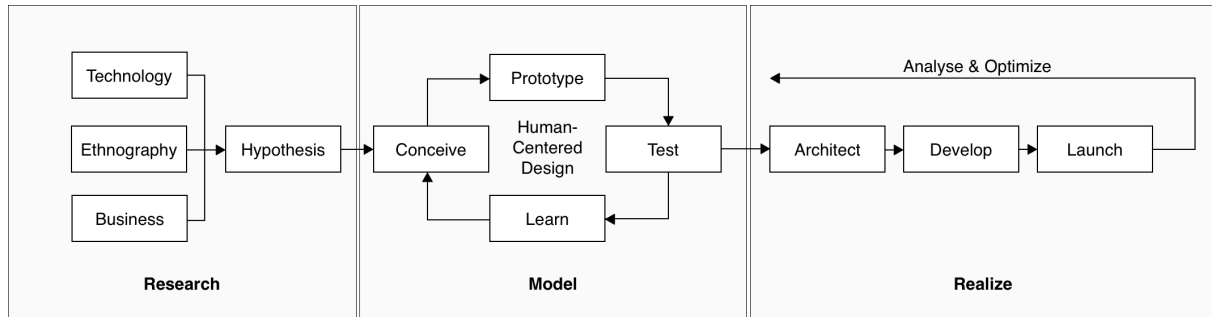


Figure 7 - Human-centred design process at the design agency Nurun (Nurun)

Definition of HCD for this Thesis

Based on the understanding gained from the analysis of the different processes, stages and methods when describing Human Centred Design, the methods applied in this thesis are oriented around the following combined definition of HCD. It leverages several stages from the different models described before and combines them in a way that it fits the definition of HCD in design agencies and the focus area of this thesis.

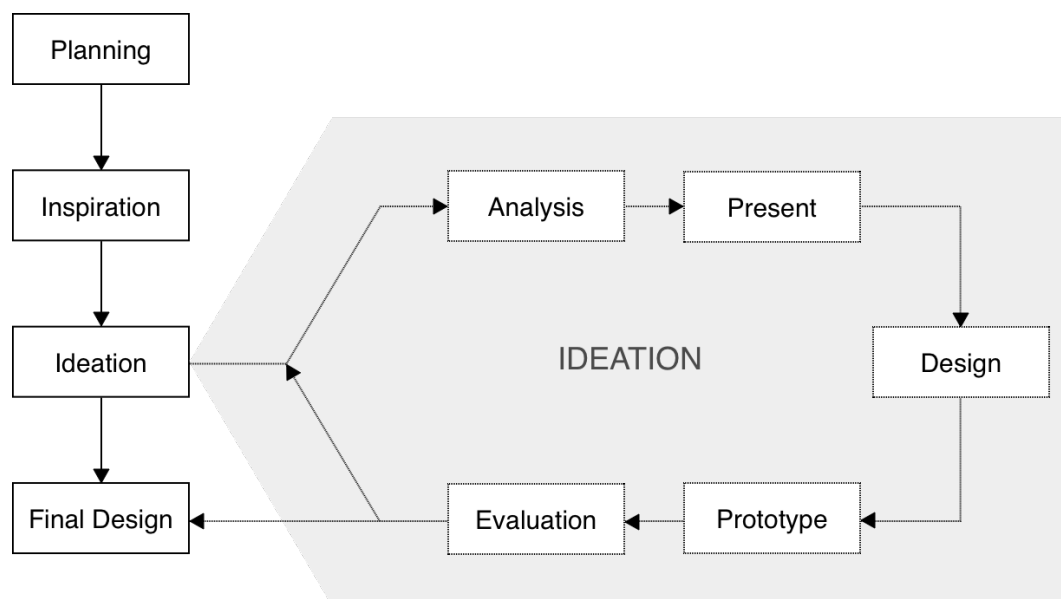


Figure 8 – Human Centred Design Process

Planning

Planning is an essential part of the ISO definition of HCD (Maguire, 2001) and plays an important role in several of the analysed academic publications (Duyne, Landay, & Hong, 2002), (Holtzblatt & Beyer, 2014), (Kuniavsky, Moed, & Goodman, 2012). Aligned with DesignAID's definition of HCD, understanding the project and the client as well as creating the base for a collaboration are necessary elements of this phase (DesignAID). Even though two of the analysed design agencies do not mention planning as an individual stage, this thesis wants to explore how planning influences the impact of user research and therefore explicitly starts with planning as the first phase in the HCD process. As we aim to explore the usage of user research in design agencies, this phase is understood as the communication with the client to create a plan that is matching the project's goals.

Inspiration

The second phase covers the actual conduction of user research and therefore the collection of research data. This phase is grounded in the industry definition of *Inspiration* and *Preparation phases* by IDEO and DesignAID and in the academic theory, where it is defined as *Understanding phase* by (Benyon, 2014) and (Maguire, 2001), as *research phase* by (Holtzblatt & Beyer, 2014) and as *Examination phase* by (Kuniavsky, Moed, & Goodman, 2012). The action required in this phase is the research about the user's tasks, context, wishes and needs. The goal is to gather data that can be analysed in the next stage to transfer them into implications for design solutions.

Ideation

As this thesis aims to explore the analysis and communication of research data and resulting insights, the third HCD process phase covers the full ideation process. As shown in Figure 8, this stage is split into several smaller steps: Analysis, presenting, design, prototype and evaluation. First, the data gathered is analysed to understand and create requirements (Benyon, 2014) (Sharp, Rogers, & Preece, 2015) (Holtzblatt & Beyer, 2014). Second, the insights are visualised, packaged and presented in the team and for the client. The goal of the presentation step is to generate actionable decisions which can be made based on the gathered data.

Third, based on the analysed and visualised data, ideas, opportunities for designs and possible solutions are created. This step covers conceptual and physical design activities (Benyon, 2014) (Duyne, Landay, & Hong, 2002). Fourth, the design ideas are put into practice by prototyping them. Finally, the generated prototypes are evaluated based on the analysed requirements. If the design meets the requirements, it can be put forward to the final delivery stage. This stage can be found in all academic and industry definitions of HCD

Final Delivery

The final action is about the final delivery. In design agencies, the result depends on the project and the client's need. An output can be a fully delivered system, a report containing research results and specifications, a design or anything else. As it can be seen for (IDEO, 2015), (DesignAID) and (Nurun), the final delivery always plays a role in their definition of HCD.

3.2. Planning Human Centred Design Projects

As stated in the definition of a human centred design process in Figure 8, the first important action in a project is the planning. A research plan is necessary to ensure that goals are understood and that methods are selected in the way that they support reaching these goals (Kuniavsky, Moed, & Goodman, 2012). As user research often needs to be integrated within various software development processes, planning is necessary to ensure that it is represented in every stage and that its results are used efficiently (Maguire, 2001). Furthermore, a plan aims to cover the framing conditions of a project, determining the time, duration and budget. A process and matching research methods are selected based on these conditions. A good plan is described as the first necessary step to ensure that results from user research have an impact on a project (Kuniavsky, Moed, & Goodman, 2012).

“Design is not an easy routine kind of problem solving” (Carroll, 2000, S. 21) This quote by Carroll highlights even more how crucial it is to consider and anticipate all steps in a design process for each project. Not knowing a project's goals and schedule might result in a situation where user research results are delivered to the wrong person or at a point in time when they are not needed.

Not considering all stages of a development process and not ensuring an integration of HCD in every stage might create gaps in the knowledge about the user and thereby can make research obsolete (Maguire, 2001). The goal of the research plan is to ensure that user research has an actionable impact on the project. On one side, planning can be used to argue for doing user research and on the other side, it creates a common understanding about what to research and explore at what point in the project (Kuniavsky, Moed, & Goodman, 2012).

What can be accomplished by writing a research plan according to Kuniavsky, is showing the motivation for the research, the goals that the project is aiming for, the time frame and what needs to be done at what point in time, and finally the budget for the project and the concerned research (Kuniavsky, Moed, & Goodman, 2012). The following text covers the three main areas of HCD project planning: Setting the Project Goal, Integrating Research and Action and Project Boundaries. Based on these stages a select of user research methods can be made.

Influencing Factors

A key element in planning HCD projects is to answer the necessary questions about the scope and goal as well as to cover topics as resources, framing conditions and everything that can influence the project. This also includes the understanding of the organisational requirements and structures that the project takes place in. When working for a client, an agency needs to know the different goals existing for different stakeholders as well as the existing preconceptions, opinions and knowledge about user research and human centred design. There are several internal issues that can make the clear communication of user research results complicated. The acceptance of user research is directly connected to the mind-set of the company. A good example are the stages of a usability related mind-set: ignorance, uncertainty, awakening and finally enlightenment (Bevan & Curson, 1999). These points might also play a role when working with a client on a human centred design project. If a client thinks they don't have any problems with usability or user experience design, or that they don't trust the user regarding any input for design decisions, this needs to be reflected and considered in the planning phase. Therefore, Maguire says that it is a necessary step to discuss the meaning and importance of human centred design for a project amongst all stakeholders directly in the beginning (Maguire, 2001).

This example shows the necessity of not only understanding the project but to also understand the client. Next to identifying all involved parties are, it is necessary to know how the stakeholders are going to be integrated into the project, how to communicate with them and what their ideas, motivation and knowledge are when entering the project (Holtzblatt, Wendell, & Wood, 2004). A design agency does not only need to connect with the needs of the end user but also with the needs of their client (Roschuni, Goodman, & Agogino, 2013). This fact is especially important in the planning phase, as this often is the first contact between the agency and the client. Next to planning the project facing the user's need, the agency also needs to plan how to structure the project towards the client. Roschuni et al. describe how researchers "*often approach communication with their clients and stakeholders as though it were also a HCD project*" (Roschuni, Goodman, & Agogino, 2013, S. 151). Therefore, next to exploring how literature describes the planning of a human centred design project in general, this thesis explores how agencies involve clients and stakeholders in their planning and how and what they are learning about them.

Defining Project Goals

The first step of a research plan is to identify the goals of a design project to understand what needs to be researched, when and by whom. Finding the goal first means understand the underlying problem that needs to be solved in the project in order to not start solving the wrong problem (Carroll, 2000). To create research results that have an impact on the project, designers need to figure out what they need to ask and in what order (Kuniavsky, Moed, & Goodman, 2012). This includes the definition of expectations and priorities from different stakeholders. When knowing all stakeholders, it is necessary to understand their goals and the metrics of success for them. Different role and departments might have different ideas and motivations for the project. A designer needs to know the different priorities, motivations and ideas to define the research goals in the best possible way (Holtzblatt, Wendell, & Wood, 2004). It therefore is necessary to involve different stakeholders and to gather their feedback in the planning. Kuniavsky describes the process of setting the project goal with the following steps. First, collecting existing issues and presenting them as goals before prioritising and finally, rewriting them as questions to be answered (Kuniavsky, Moed, & Goodman, 2012).

Good and clear communication and an understanding of each other's intentions plays an important role in this stage, as words, phrases and definitions used for goals and expectations might have different meanings for different people (Carroll, 2000). The issue of creating a shared vision and understanding will be further elaborated in the upcoming communications part beginning on page 29.

Working on a design or research project for an external client makes it necessary that the design agency understands the client's expectations and goals as well as other responsibilities on the client's side. Not being directly involved in further internal organisational processes and projects might place agencies in a position where their planning is mainly based on assumptions about how to achieve a goal. These assumptions need to be tested as quickly as possible in the process. When missing critical information in the beginning, a plan needs to base on "*well-established facts from past industry experience*" (Ries, 2011, S. 81). In agencies, designers work on a lot of projects, but not necessarily for the same client, and therefore they build their plan based on their previous professional experience and assumptions about the client.

Integrating Research and Action

Kuniavsky describes the second step in planning as the definition of how research results are going to be used, by whom and when, what the outputs and deliverables are going to be. Designers need to know how their research is going to be used in action. They need an understanding of the target audience of the research results to adapt how the results need to be packaged and presented. The goal is to "*deliver research findings when stakeholders need them the most.*" (Kuniavsky, Moed, & Goodman, 2012)

Motivations and processes need to be analysed for different roles in the project to explore how research can be structured and integrated in the best possible way in which it has an impact on the project. In some cases, design agencies might just step into a company for one project and have no understanding of the client's business goals, existing hierarchies and other related important projects. Therefore, involved stakeholders and connected processes need to be identified and understood in what way they relate to the project (Kuniavsky, Moed, & Goodman, 2012). Knowing all stakeholders and their individual goals allows to plan for how to involve them in the design process and how and when to communicate with them (Holtzblatt, Wendell, & Wood, 2004).

Next to understanding the client's development processes, it is also necessary to understand their perception of human centred design and their motivation for doing user research. The designer needs to know the audience that they create and present the user research results, and then adapt them to the existing level of knowledge. Therefore, it is also important in the planning to get a feeling for how clients perceive human centred design, what their background knowledge is and what expectations they have for the research (Maguire, 2001). Maguire suggests methods such as usability planning and scoping and usability cost-benefit analysis to achieve a better common understanding and shared interest in user research. Both approaches can help to ensure that stakeholders know that they gain something from applying HCD principles (Maguire, 2001). Knowing the client's knowledge also helps to adapt the communication of user research results so that it fits the client's expectations and background (Holtzblatt, Wendell, & Wood, 2004).

Knowing the Project Boundaries

After knowing the project goals and motivations for all stakeholders and the way that research insights need to be delivered, the next step is to set the framing conditions for the projects. This is mainly defined by the budget and the time frame, the involved roles and teams as well as the possibility to contact real end users (Kuniavsky, Moed, & Goodman, 2012). This can either be provided by the client as fixed conditions or suggested by the agency as a proposal for how much work, time and budget is necessary to solve a problem.

Planning User Research Methods

For the different phases of a human centred design process there is a huge amount of methods that support the necessary tasks and goals for this part of the process. In the research plan the designers decide on which method or mix of methods they expect to apply in each of the phases. This decision is based on the given requirements, the project framing conditions as goals and expected deliveries as well as resources such as time and budget but also the available designers, their previous experiences, skills and knowledge (Bevan & Curson, 1999).

Based on the given conditions, designers can choose from a wide range of descriptive, relational or experimental research methods. Descriptive research is used for describing a situation, relational research for understanding the connections between elements and experimental research to explore reasons for situations (Lazar, Feng, & Hochheiser, 2010).

Examples of common methods are interviews, surveys, observations, usability tests, focus groups and much more (Lazar, Feng, & Hochheiser, 2010). Several papers, books and websites show the tremendous amount of existing techniques to collect data about user behaviour, needs and problems. Methods can be traditionally applied in a different field of research, adapted for design or innovative and purely developed for a design context (Hanington & Martin, 2012). Data collection can be done either as qualitative or quantitative research, defining the format in which data is collected and communicated. Numerical data mainly is used for research with a fixed study strategy and a strict plan and preparations. Non-numerical data, typically text, is used in studies with a flexible strategy where the strategy is developed while collecting data (Robson, 2002). Robson describes that studies cannot be fixed or flexible at the same time but can have stages in the process that are flexible and others that are fixed. Next to qualitative data, it is also possible to collect quantitative data in flexible design but only rarely the other way around (Robson, 2002). The reason for choosing a strategy depends on the study's focus and goal. This purpose can either be to do an exploration in an early stage, to generate a concept or to test an existing system (Hanington & Martin, 2012). In an evaluation, the outcome is more important and a fixed study might be more adequate. For explorations and generative studies the process is more important than the output and a flexible study might fit better (Robson, 2002).

Research methods can further be described by the role that the researcher or designer plays in it. For example, fixed studies can be separated into experimental and nonexperimental, being differentiated by the fact if designers influence the researched situation or not (Robson, 2002). Hanington and Martin separate methods more detailed by the position that researchers take towards the study participants. Involving participants in the design process defines a participatory study, whereas observational, self-reporting, expert review and design processes afford less cooperation between the two roles (Hanington & Martin, 2012).

It is important to acknowledge that for each phase of an HCD process designers can select from a great variety of methods. Methods exist even for the planning phase itself.

Table 1 provides a short overview of existing user research methods for the different HCD phases based on the collection provided by Hanington and Martin. It does not aim to be a complete collection of methods but aims to give a perspective about different methods that designers can choose from for various phases. In the book *Universal Methods for Design*, the authors describe 100 methods and how they fit into a defined set of phases (Hanington & Martin, 2012). For this table, the authors' phases are matched with our definition of HCD.

Method	Planning	Inspiration	Ideation	Final Design
Affinity Diagram			x	
Brainstorming	x	x	x	
Card Sorting		x	x	
Case Studies		x		
Cognitive Walkthrough		x	x	
Competitive Testing	x			x
Contextual Design	x	x	x	
Critical Incident	x	x		x
Customer Experience Audit	x	x	x	x
Design Workshop		x	x	
Diary Study		x		
Eye tracking	x		x	x
Focus Groups	x	x		x
Heuristic Evaluation			x	
Interviews		x	x	
Literature Review	x	x		
Observations		x		
Participatory Design		x	x	x
Personas			x	
Prototyping			x	x
Questionnaires		x	x	
Research Through Design	x	x	x	x

Scenarios		x	x	
Shadowing		x		
Site Search Analysis	x			x
Stakeholder Maps	x			
Storyboards			x	
Surveys		x		
Triangulation		x	x	
Usability Testing			x	
User Journey Maps			x	
Wizard of Oz			x	x

Table 1 – Methods for Human Centred Design (Hanington & Martin, 2012)

Overall, in the planning phase, the designer's goal is to find a good mix of methods to answer the given questions in the best possible way.

3.3. Communicating User Research Results

“Communication design, the intentional creation of artefacts that communicate the data, is a necessary design step and an important skill for all UX professionals” (Holtzblatt & Beyer, 2014)

In human centred design projects, doing user research is not just about collecting relevant and useful data but also about communicating research results and creating a shared understanding plays an important role. With an effective way of communicating, the collected findings can reveal its values and ensure the impact on the project. It is necessary for designers to select suitable methods to interpret, represent, and communicate data and results in an effective way (Benyon, 2014).

Since not all people in a design project participate the data collecting process, a large amount of data needs to be shared within the team and the stakeholders (Holtzblatt, Wendell, & Wood, 2004).

Some stakeholders might have no experience in the human centred design or might have never been involved in a user data collection, so it is hard for them to “*embody the memories*” of the real users and their issues (Holtzblatt, Wendell, & Wood, 2004). Interpreting data in a cross-functional team affords integrating people who are working with the system. The goal for them is to have a better understanding of the information and allow them to bring their own perspective to the project (Holtzblatt, Wendell, & Wood, 2004). Sharing the experience and interpreting the data together develops a mutual understanding and creates empathy for users and their problems. A good communication can keep the value of the research results high. This helps stakeholders to focus on key issues and to make decisions based on the research data (Holtzblatt, Wendell, & Wood, 2004).

Data interpretation requires capturing key issues and consolidating the data into different representations. These representations need to condense the collected data, remove redundant details and highlight important issues (Benyon, 2014). A good representation can communicate the research results in an effective and efficient way. To achieve this, the representation needs to be highly accurate, easy to understand and needs to use an approach that is matching the project’s purpose (Benyon, 2014). When creating data representations designers need to have the ability to select relevant data, to adapt the content for the audience and to understand the purpose. Communicating the data can also be used to explain the status and the reasons to make sense and vision the future (Minneman, 1991).

“Communication design is a bridge from data to design action” (Holtzblatt & Beyer, 2014)

A good communication can also be used to create insights and visions. It gives the team a chance to look back, arouses the memories and uncovers patterns (Holtzblatt, Wendell, & Wood, 2004). Holtzblatt et al. describe the process as “*walking*” the data, which allows the team and the stakeholders to get more familiar with the data, to put themselves into their users’ shoes and to generate design ideas for the users (Holtzblatt, Wendell, & Wood, 2004). A good communication can secure the value of research results that can be used to develop a solution.

Influencing Factors

Human communication processes are interpreted by using communication models. The first communication models are proposed by Shannon and Weaver in 1949, as a fundamental theory of all communication models (Weaver, 1949). They bring up the sender as a primary role and add that the communication channel might include “*noise*” as a distraction, which can lead to problems in the communication process. In human centred design projects, there are many factors influencing the way of communication of results. The “*noise source*” in a design process can be the type of the project, the data resource (Benyon, 2014), organisational cultures or boundaries within the teams (Roschuni, Goodman, & Agogino, 2013). All of them can influence the communication process. The following part explains these different influential factors in the communication process.

Roschuni and his fellows find out that some researchers in the company often consider themselves as boundary-spanning communicators. With different cultures across organisations, team, and disciplines, the effective communication becomes difficult but necessary (Roschuni, Goodman, & Agogino, 2013). When working with clients, researchers should understand their clients’ organisation, strategies and styles of working. In addition, sometimes, mediated organisations between a client and an agency can cause translation problems. Original research insights might be lost in the handover process or by having miscommunication (Roschuni, Goodman, & Agogino, 2013).

In addition, Roschuni et al. extend Maier’s communication model (Maier, Eckert, & Clarkson, 2005) shown in Figure 9. This model contains communication problems and influential factors in both mechanistic and systemic perspectives. In the mechanistic aspects, Roschuni et al. use the same content and structure as suggested by Maier et al.’s model. It includes facilitating information exchange using different tools to decrease the “*noise sources*” by increasing the channel capacity (Roschuni, Goodman, & Agogino, 2013). This thesis focuses more on the systematic aspects (the yellow highlighted part in Figure 9) instead of mechanistic aspects, where Maier et al. suggest solving the problems by increasing the awareness and involving users in the learning process. Roschuni et al. add another systemic level of communication, which points to cognitive biases and resistance as problems in the communication. To solve this, the authors argue it is necessary to create actionable deliverables, socialise the research and help clients to develop ownership.

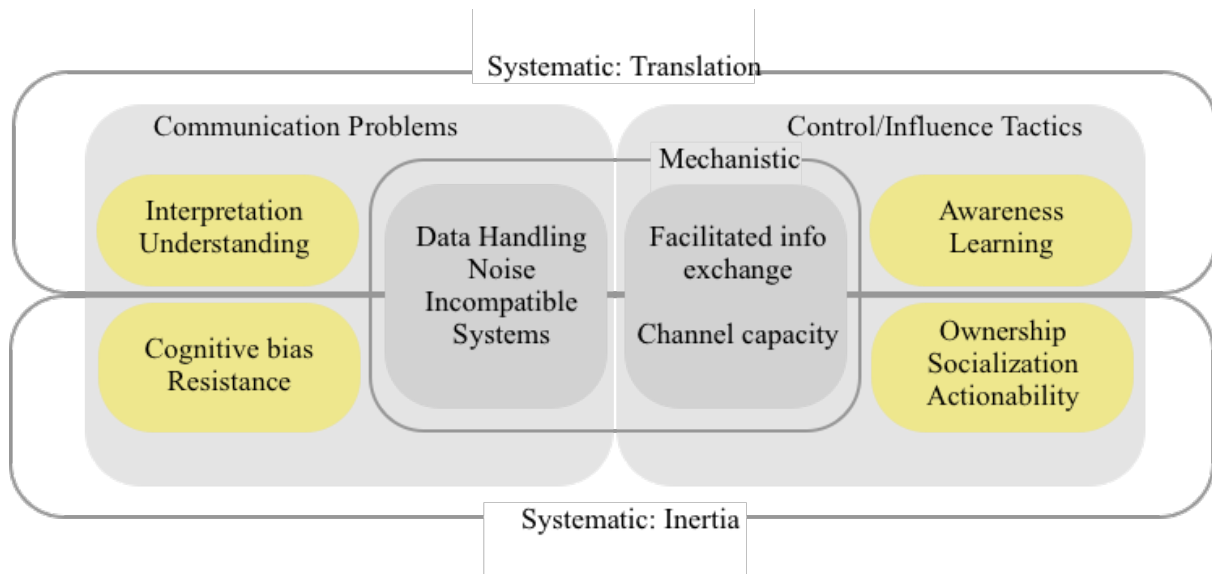


Figure 9 - Extended communication models by Roschuni et al. (Roschuni, Goodman, & Agogino, 2013)

Eckert and Stacey list different dimensions of communication situations leading to different types of breakdowns and influences in the way of designers are dealing with the design process (see Table 2) (Eckert & Stacey, 2001). They also create several communication scenarios, indicating when and where communicate happens during a collaborative process. These scenarios include as “*handover*”, “*joint designing*” and “*interface negotiating*”, where the communication could be misunderstood due to a lacking and not adaptable information flow.

Influence factors	Explanation
Form of Communication	
Place	Where does the communication happen (far or close)?
Time	When does the communication happen (in real time or not)?
Size	How many people are involved in the communication?
Identity	How much knowledge exists about the participant?
Form of Task	
Objective of task	What is the goal of the communication task (example: collecting data, share the data, and generation of ideas)?
Division of decision-making	What is the task about in the decision-making process?
Hierarchy of decisions	Who makes decisions?
Duration	How long will it last?

Information type	What kind of information are discussed (facts, opinions or ideas)?
Time pressure	How much time is left (urgent or not)?
Subject Expertise	
Equality of expertise	What is the level of expertise of each participant?
Balance of Expertise	Do participants share the same expertise or complement each other?
Mental representations	How do participants understand the topic in their mind?
Familiarity	Do the participant know each other or not?
Context	Do the participants have the same contextual knowledge or not?
Tool Expertise	
Competence with groupware	Do the participant use the tool frequently or not?
Organisation	
Hierarchy	What is the hierarchy status among the participants?
Interest	Do the participants work in the same company or not?
Security	How to use the collected information (share or not)?
Representation of information	
Medium	Examples: speech, gestures, hand drew sketches, hardcopy printouts of text files or models, web pages, shared files, physical objects such as prototypes and more.
Form of information	Examples: text, data plots, tables, diagrams, code, photographs and more.
Notation	What are alternative notations for the same information?

Table 2 - Influential dimensions in communication (Eckert and Stacey, 2001)

Effective and consistent Communication

As Chiu pointed out, communication is central to the human centred design process and has a great effect on every phase (Chiu, 2002).

Therefore, it is important to have an effective and consistent communication when sharing accurate information for achieving a common understanding to make right decisions and for ensuring the impact of user research. This section explains the different elements that can create an effective and consistent communication.

Maier et al. provide a list of recommendations, collected from various literature sources, how to achieve an effective communication in a collaborative design process. First, it is important to ensure the validity of information. Doing this requires collecting data correctly and thoroughly and to absorb multiple data sources (Maier, et al., 2001). Besides, it is necessary to keep the terminologies consistent and easy to understand in every deliverable for all audiences during the full communication process (Maier, et al., 2001). Sharing information early in the project phase with different stakeholders can also help to validate information (Maier, et al., 2001). When sharing the information using certain tools or platforms, it needs to be adapted to the audience's needs (Maier, et al., 2001).

Second, Maier et al. recommend providing reliable feedback and promoting collaboration as essential part of teamwork (Maier, et al., 2001). To let each team member achieve a common goal, role expectations and responsibilities need to be clear from the early phase. Questions such as what to accomplish, what is his/her role in the team, when to and how to handover, need to be clear in order to create a smooth communication process. Concrete goals and measurements can be set so that everyone in the team understands the direction and achieve a common understanding. When giving feedback, terms with ambiguity in meaning should be changed or added with a more detailed explanation (Maier, et al., 2001).

Moreover, in a broad perspective, a whole organisation can make efforts to create an effective and consistent communication. A company can create an atmosphere where everyone is encouraged to talk freely and safely (Maier, et al., 2001). An environment, that respects all people's efforts and ideas, drives collaboration and increases the team's creativity. It is important to build mutual trust amongst all kinds of teams. This atmosphere can be created by having a close communication with positive emotions (Maier, et al., 2001).

Methods and Tools to support Communication in Design

To facilitate an effective communication and to ensure that research has an impact on the design process, it is necessary to structure and present the data in an understandable way. In the data collection phase, the possible artefacts that are produced as outcomes of the specific data collection method include but are not limited to images, video recordings, written journals and diaries, drawings, memos, internal documentation, the researchers' and participants' memories and historical records (Strauss & Corbin, 1990).

The quality of the material has an important influence on the quality and extent of the analysis of the collected data (Strauss & Corbin, 1990). A researcher needs to be careful when collecting data to not influence it with his or her own perspective and behaviour. Personal assumptions and biases lower the reliability of findings and therefore affect the decision-making process. Strauss and Corbin even suggest keeping a research journal or diary for every activity in the research process. This can help researchers to become more self-aware of own assumptions and reasons for making a decision (Strauss & Corbin, 1990).

One focus area of this thesis is to understand how data is used and communicated so that user research has an impact on human centred design projects. This section covers theoretical frameworks for analysing, packaging and presenting collected data, and introduces different approaches and methods to support these three stages.

Data Analysis

After collecting the data, the next step is to do an analysis of the obtained information. Strauss and Corbin describe the analysis of user research data as not being about going through the documents and denoting concepts but as a series of mental activities that happen when categorising and labelling data (Strauss & Corbin, 1990). They further describe analysis as both "*an art and a science*". On one side, creative methods and techniques are applied to solve analytical problems and to organise data. On the other side, an analysis is used to support and backup concepts, ideas and interpretations, drawn from the collected data and it allows a validation with the help of further data (Strauss & Corbin, 1990).

Most of the data analysis starts with an initial interaction with the data, finding patterns or calculating correlation values (Sharp, Rogers, & Preece, 2015). After the initial analysis, more detailed work supporting structure frames or theories is needed (Sharp, Rogers, & Preece, 2015). Theoretical frameworks for qualitative analysis can be used to approach and structure the data analysis process. Some examples of these frameworks are grounded theory, distributed cognition, activity theory and contextual design (as shown in Table 3). This list does not aim to be a complete collection of theoretical frameworks but to give an overview of possible concepts that can guide and therefore influence the analysis of user research data.

Framework	Description
Activity Theory	Activity theory is used to explain human behaviour by focusing the analyse on the concept of a specific activity (Sharp, Rogers, & Preece, 2015).
Contextual Design Analysis	Contextual design analysis includes interpretation sessions and the creation of different models. These models can for example capture and represent the user's work (Holtzblatt & Beyer, 2014).
Distributed Cognition	Distributed cognition is a framework which focuses on an event-driven description and information through the cognitive system (Sharp, Rogers, & Preece, 2015).
Grounded Theory	Grounded theory is an approach to developing qualitative data into theory by doing a systematic analysis and interpretation (Sharp, Rogers, & Preece, 2015).

Table 3 – Theoretical framework for qualitative analysis

Data analysis is a circular, iterative process, taking places in every phase of human centred design processes. When analysing data, a researcher is required to keep asking questions and to make comparisons, enabling the process to keep moving between the abstract and the concrete analysis (Strauss & Corbin, 1990). The goal of a constant comparison is to match data patterns with the related conceptual categories before integrating them into a core concept on a more abstract level (Strauss & Corbin, 1990). The collection and the analysis of data are directly connected with the development of a concept in a project. It is important to ensure that the data matches and supports the found solutions. When designers are changing or updating their concepts, it needs to be done either by exploring new properties or by building a new relationship between concepts (Strauss & Corbin, 1990).

A common mistake is that the researcher makes a claim that cannot be supported by the data (Sharp, Rogers, & Preece, 2015). A claim needs to provide a general description using a hypothesis. It helps researchers and designers to understand and remember the relationship between the data (Carroll, 2000). When doing data analysis, researchers apply different methods and strategies, using various levels of detail. Table 4 illustrates a variety of different methods for analysing the collected data. Again, this does not aim to be a complete representation and detailed description of methods rather than an overview of tools that a designer has when analysing user research data

Method	Description
Conceptual ordering	Conceptual ordering describes the approach of categorizing data based on its properties and dimensions. Data with similar features is clustered into one category and researchers use words to give these categories a meaning (Strauss & Corbin, 1990).
Critical incident analysis	The focus of a critical incident analysis is on identifying the key incidents and to analyse them in detail (Sharp, Rogers, & Preece, 2015).
Discourse analysis	Discourse analysis focuses on the dialog and the meaning of words (Sharp, Rogers, & Preece, 2015).
Interpretation Session	The goal is to share the experience of the research with the team and to interpret the data, capturing the key issues by using modelling. This session needs to be held as soon as possible after the data collection (Holtzblatt, Wendell, & Wood, 2004).
Scanning for causes and effects	Scan situations for reasons and consequences. This method is used to evaluate and summarize a relationship (Carroll, 2000).
Systematic questioning	Systematic questioning is a method for understanding the background knowledge by questioning events, actions, goals and experiences (Carroll, 2000).
Task analysis	Task analysis is used to analyse the cognitive process and physical actions on an abstract level (Sharp, Rogers, & Preece, 2015).
Transformation	This method uses an existing set of situations and changes them in order to create a bigger set of scenarios (Carroll, 2000).

Table 4 – Methods for analysing the collected data

When analysing data, different tools and techniques can be used to represent the data and the findings. The following table aims to give a brief overview of existing methods that a designer can choose from when describing data during and after that analysis process.

Methods	Description
Contextual design models	Different models can be used to represent the user's work and activities. Some examples of these models are: Affinity diagram, day-in-the Life model, Sequence model, Physical model, Artefact model (Holtzblatt & Beyer, 2014) (Holtzblatt, Wendell, & Wood, 2004).
Diagrams	Diagrams are another good way of organizing data when doing an analysis. They show structured data and the relationship between different elements (Strauss & Corbin, 1990).
Memo	A memo is a document supporting the researchers in memorizing the recorded data. There are several types of memos, including <i>Data Exploration, Comparisons, Questions</i> , as well as <i>Actions and Results</i> (Strauss & Corbin, 1990).
Rigorous Notation	A rigorous notation provides clear guidance by offering specific elements to describe data. The unified modelling language (UML) is one of the examples, which is often used to specify internal software design (Sharp, Rogers, & Preece, 2015).

Table 5 – Tools and techniques to support the analysis of collected data

Data Packaging, Abstraction and Conceptualizing

After analysing the collected data, the next important step is to structure and package the gathered insights in a way that it can be communicated most effectively. Instead of presenting the full raw analysis of the research, designers decide how to group and pack the analysed information so that it can be easily understood by their audience. This can be done by building concepts and theories based on the analysed data (Strauss & Corbin, 1990). In a human centred design project, scenarios, use cases and personas are common ways of packaging analysed results.

Concepts

Concepts are a tool to build a context for the analysed data. They can either be used on a very low level of abstraction, for example by simply adding a name to a defined group of information or data. Otherwise, concepts can also have a higher level of abstraction, building more abstract categories, describing the general mood, theme or topic of an analysis (Strauss & Corbin, 1990). The grounded theory research methodology mentioned in Table 3, uses concepts with different levels of abstraction to build a theory for research. Lower-level concepts again build categories which again are used to define a core category (Strauss & Corbin, 1990).

Theory

A theory is built from a set of well-developed concepts that are generated based on their own properties and relationship to explain certain phenomena (Strauss & Corbin, 1990).

It stands beyond other concepts with a high level of abstraction. Using a theory to explain research findings can provide a foundation for revealing phenomena and can provide a basis for the next steps (Strauss & Corbin, 1990). When constructing a theory, the most important is to show the relationship between the concepts by identifying the main issues and explaining the potential interaction and its outcomes. To do this, the gathered information needs to be analysed from different perspectives (Strauss & Corbin, 1990).

Personas

A persona is a “*detailed caricatures used to represent user needs*”. It highlights user issues by creating a detailed profile of motivation and pain points (Cooper, 1990). The goal of personas is to create a representation of the user that can be communicated to the different team members. It is made in a simple and easy way to allow everybody to instantly understand the person’s motives and issues and to react according to them. Cooper explains that personas are a tool for communication within a group of designers, developers, managers, customers and other stakeholders (Cooper, 1990).

Scenarios

In design projects, scenarios are an “*informal narrative description*” (Carroll, 2000) and are used to explain human activities and tasks in a way of storytelling, which connects context, needs and requirements (Sharp, Rogers, & Preece, 2015). Scenarios highlight the goal of using a system, the interaction between people and a system and the interpretation people have about a system (Carroll, 2000).

Scenarios can be used both for understanding a current situation and for describing a future vision. It includes concrete and specific objectives which provide implications in the design phase.

Use cases

Use case focus on the user's interaction with a system instead of the user's task (Sharp, Rogers, & Preece, 2015). Focusing on the user, called *actor*, use cases explain the actor's interaction with the system. Scenarios can be included in the context of use cases, to illustrate different ways how a user can go through one use case (Sharp, Rogers, & Preece, 2015). A use case can be illustrated by using different diagrams, showing the relationship and interaction between users and the system.

Presentation of User Research Results

Having conceptualised research results, the next step is to deliver and present them in an effective way.

“Structuring the presentation of results – in effect, designing their delivery – in one of the most important steps to making research useful” (Kuniavsky, Moed, & Goodman, 2012)

This section introduces several approaches that the designer can use to deliver results.

Reports

A report is a form of presenting the research results where the main goal is to help the stakeholders to make decisions about a product (Kuniavsky, Moed, & Goodman, 2012). A Report should contain the motivation of doing the research and needs to emphasise the findings (Kuniavsky, Moed, & Goodman, 2012). Before creating a report, it is necessary to know the audience that will get the report - what do they know and what are they expecting. Besides, it is also important to show the process and the limitations. When preparing a report, the designer needs to discuss the format with the stakeholders and pick up one format that is suitable for them (Kuniavsky, Moed, & Goodman, 2012). It is better to explain the report's structure to make the report easier to understand. Moreover, testing a report with the audience in a “*beta*” version before delivering it, is a good strategy for making the report more actionable (Kuniavsky, Moed, & Goodman, 2012).

Presentations

Presentations are different from written reports. As it is necessary to spend most of the time to discuss specific issues with specific groups, a presentation should be customised for a specific group of people, since different stakeholders might have different roles and specialities (Kuniavsky, Moed, & Goodman, 2012). Presentations can often cover more than a report as some experiences are difficult to explain in a pure text description but can be demonstrated more easily in a visual presentation. Besides, in a presentation, it is easier to receive direct feedback and to discuss a certain topic. Some points proposed by Kuniavsky regarding the presentation are: *“prepare the audience, use professional terminology, emphasize user’s perspective, use real examples and leave one-third of time for questions.”* (Kuniavsky, Moed, & Goodman, 2012).

Workshops

Workshops are often used for creative reasons and in complex decision making (Kuniavsky, Moed, & Goodman, 2012). There are different kinds of the workshop with different purposes. Two examples are research-driven workshops and design workshops. Research workshops are used to interpret the data and to share information. Design workshops are used to generate ideas and solutions together in a team. In a workshop, active participation for all people is necessary. Therefore, it is important to set clear expectations and to facilitate activities that keep the participants energetic. Using a workshop can give stakeholder’s a personal experience that helps them to understand the research. It can also be leveraged to directly solve problems (Kuniavsky, Moed, & Goodman, 2012). In a workshop, user research data and insight can be used to catalyse and control the work that is done in the group (Sharp, Rogers, & Preece, 2015). Different methods and artefacts can be leveraged to integrate the analysed data from the user research.

Other Strategies

Next to reports, presentations and workshops, there are other methods to present and communicate user research results across multiple teams using a great variety of channels. Multimedia resources such as videos, audio recordings and websites are only some examples how information can be made accessible to a wider audience. Tangible, physical objects such as posters, flyers and other physical artefacts are further tools to communicate insights and implications for design. To keep research findings alive after a presentation and to make sure that it has value in the decision-making process.

Kuniavsky suggests three strategies to support the research results. First, *augmenting the deliverables* by containing all the raw data into the project. This allows to go back for evidence and to support future decisions. Second, *encouraging research ownership*. It is critical to help the clients to create a feeling of ownership for the suggested ideas and the gathered research findings. The last one is to *follow up*, to ask and to check the process occasionally to see how they are using the information and to give guidance if needed (Kuniavsky, Moed, & Goodman, 2012).

3.4. Impact of User Research

In human centred design projects, the intention of user research is not purely to gather data and analyse findings. The final goal of user research is producing *action* instead of being satisfied with the gathered data (Kuniavsky, Moed, & Goodman, 2012). Therefore, it is important to ensure the impact that all research efforts can create and all the value it can reveal. Strauss and Corbin state in their book that knowledge and action both affect each other, useful knowledge provides a basis for following actions (Strauss & Corbin, 1990). User research as a form of knowledge can have a big impact on developing new ideas and actions. These actions can also be used as an indicator for measuring the success of user research. According to Kuniavsky et al., user research can have *systematic* consequences (Kuniavsky, Moed, & Goodman, 2012). User research can not only impact the focus product but also influence future projects and stakeholders, even the organisational development. The following part of this sections discusses the results of successful user research in four different categories: the impact on the development process, on future projects, on stakeholders and on the organisation.

Impact on the Development Process

First, good research accelerates product development processes and makes the user feel happy and satisfied. In a human centred design cycle, user research should not become an extensive and time-consuming process since it is not the main driver (Kuniavsky, Moed, & Goodman, 2012) but a foundation for the next steps in development (Holtzblatt & Beyer, 2014). Useful user research findings can give instructions and provide guidelines for the product design and development to make sure it follows the right direction without losing the focus on defined problems and user needs.

A deep understanding gathered from user research supports the design processes in putting the focus on the user at all time in the design (Holtzblatt & Beyer, 2014). Besides, good research can simplify the maintenance process by reducing the amount of revisions after launching, which helps the company to reduce unnecessary expenses (Kuniavsky, Moed, & Goodman, 2012). Moreover, useful research findings can last for a long period and still keep its value (Sharon, 2012). Effective research findings allow a more efficient and easier way of future changes and updates. A final product, which is based on valuable user research, can provide a better user experience, that in the long run can remain to satisfy existing users and create the opportunity to gain new users.

Impact on Future Projects

Next to the impact that good user research can have on a product, it can also inspire new projects and the discovery of new opportunities (Sharon, 2012). During the research, findings can not only be applied to specific projects, but can also help finding “*new market, needs, desires and capabilities*” (Kuniavsky, Moed, & Goodman, 2012). As human behaviour does not change frequently, research results can keep their value for several years (Sharon, 2012). When a project’s domain and user group are fixed, future projects can directly leverage the results from previous projects, which saves time and money. The useful user research findings can provide more basic knowledge and help the designers to create more insights for future development.

Impact on the Stakeholders

Furthermore, good user research can have an impact on the design team and various other stakeholders. A project with successful to user research can change the project team’s view on the products and can help the to have a better understanding of their users (Sharon, 2012). Taking the user's perspective into consideration helps the team to step out of their own role and focus on the user needs. When a design team goes back to the research findings several times and keeps working with the research results, this highlights the impact on the team even more (Sharon, 2012). But good user research can also change other stakeholders’ point of view and can help to gain their trust. When stakeholders make important decisions and act according to research findings, it is a good implication that the user research has an impact on their decision-making process (Sharon, 2012).

User research can also be involved in the selling process of projects, products or services. Therefore, another great impact of effective user research happens when a sales person includes it in a pitch and stakeholders believe in its value (Sharon, 2012).

Impact on the Organisation

Last but not at least, from a broad perspective, successful user research can create an impact on the business strategies, the organisation's development and a company's mind-set. Kuniavsky explains that user research is an important step in building "*a user-centred corporate culture*" (Kuniavsky, Moed, & Goodman, 2012).

To create this culture, it is important to let the company develop an awareness of high-quality research and help them to make the right decision based on the findings (Kuniavsky, Moed, & Goodman, 2012). Good and persuasive user research results help a company to overcome ignorance and uncertainty regarding user experience and usability and enable an awaked and enlightened mind set (Bevan & Curson, 1999). When a company finally puts user research as the core value of the company and when the whole organisation engages in an HCD process, it indicates that the impact of user research has extended to the organizational level (Kuniavsky, Moed, & Goodman, 2012). User research can also influence the allocation of financial and human resources. A successful user research can make a company put more financial efforts and investment in doing research because stakeholders believe in the benefits that it can have for future development (Sharon, 2012). Next to that, Sharon lists two aspects that an influential user research can have related to human resources. First, in a project team, developers corporate closely with user researchers and follow the research results. Second, when recruiting new employees, the user research skills become common requirements (Sharon, 2012).

Actionable User Research

As discussed, successful user research can have great influence, from a specific product to a whole organisation. Therefore, it is important to know how to make an impactful, good user research and what are the influential factors. Kuniavsky indicates that even if user research is best-planned and has the most intelligent findings, it could still become wasted if there is no action connected to it (Kuniavsky, Moed, & Goodman, 2012).

Hence, to ensure the value of user research, it is not enough to provide insightful results but to make it reliable and actionable for stakeholders.

According to Kuniavsky, some problems occur when delivering user research, for example, the disagreement between researchers and stakeholders, the misunderstanding between stakeholders and the fear of taking actions (Kuniavsky, Moed, & Goodman, 2012). To avoid these problems, user researchers need to realise the importance of their voice and promote actions by influencing stakeholders. First, researchers need to understand not only the user's need but also what different stakeholders want. As mentioned before, Roschuni et al. propose a method called *Double Ethnography* to learn about all stakeholders in order to promote actionable communication (Roschuni, Goodman, & Agogino, 2013).

Second, it is also important to get the stakeholders and the development team involved in the research process (Kuniavsky, Moed, & Goodman, 2012). As Kuniavsky mentions, one of the most effective ways to promote the value of user research is by making people engage and discover it by themselves (Kuniavsky, Moed, & Goodman, 2012). Letting stakeholders find out the existing problems by themselves has a more powerful impact on the decision-making than just showing them the gathered results. Not only the researchers, the whole development team should therefore be directly included in the research process. By being part of the process, they can get a better understanding of the reasons behind and get inspiration of how to integrate the needs in the future development. Involving the team and the stakeholders is also an important strategy in keeping the research efforts actionable and meaningful.

Besides, researchers need to be aware of how different stakeholders handle different findings (Sharon, 2012). Research needs to be delivered in a visible way that can be referred to easily (Kuniavsky, Moed, & Goodman, 2012). To create actionable deliverables, a simple written report is not enough. It is better for researchers to develop different ways of illustrating their results (Kuniavsky, Moed, & Goodman, 2012). Some methods such as personas and customer journey maps are introduced in the last sections. Besides, deliverables should not only be well-presented visually and conceptually but also need to be easy to understand and to share with other people (Kuniavsky, Moed, & Goodman, 2012). Therefore, researchers need to put themselves in the audience's shoes and make sure the deliverables are clear and understandable. Moreover, the presented information and process needs to be clearly structured and accessible to every audience (Kuniavsky, Moed, & Goodman, 2012).

A well-performing presenter is not enough. Researchers need to understand the audience's "*agenda and questions*", in order to make them remember the key points and create a willingness to take action (Kuniavsky, Moed, & Goodman, 2012). This is also a critical step in ensuring the research findings are essential and indispensable rather than optional supplements (Kuniavsky, Moed, & Goodman, 2012).

To create actionable user research, it is also necessary to build long-term values for the research results. To accumulate the value of research results researchers can make use of previous research knowledge and continuously add new findings to it (Kuniavsky, Moed, & Goodman, 2012). Adding a new value to research findings shows the credibility, authenticity and consistency of the data, which has a great impact on creating actionable user research (Kuniavsky, Moed, & Goodman, 2012).

The next point to ensure impact and that research advocates actions, user researcher needs to earn the stakeholder's trust (Sharon, 2012) and it also needs to have a fixed place in the decision-making process (Kuniavsky, Moed, & Goodman, 2012). When making decisions, researchers need to refer to the findings and present them corresponding to the existing problems (Kuniavsky, Moed, & Goodman, 2012). For example, a possible moment when researchers can play a role are "*during planning meeting, when prioritizing features, writing specification or comparing proposed solution to problems*" (Kuniavsky, Moed, & Goodman, 2012). When stakeholders pay attention to the findings and ask the researchers' opinion when making decisions, it shows the researchers have built trust within the stakeholders (Sharon, 2012). Caplin evaluates 15,000 client-agency relationships, indicating that clients see a higher value in a solution that is developed in a high collaboration with an agency (Caplin, 2016). In addition, Maier et al. conduct a study to see the correlation between different factors influencing communication. The study shows a high correlation between a mutual trust and collaboration, so it is important to involve the clients into the design process to create a trustful relationship (Maier, et al., 2008). To conclude, to ensure impact, it is important to build an open and trust partnership with transparent and collaborative working process.

All in all, to create actionable user research, researchers need to understand their stakeholders' needs, make the deliveries visible, convincing and create long-term values, that can earn the stakeholders' trust and have a strong voice at the decision-making table.

Measuring Impact

After seeing a positive feedback from user research, it is still necessary for companies to measure its impact (Kuniavsky, Moed, & Goodman, 2012). The reasons for doing measurement are that it can not only help the researchers to determine the effectiveness of applied methods but also to give organisations an overview of changes to set future goals (Kuniavsky, Moed, & Goodman, 2012).

Kuniavsky et al. suggest several ways of measuring the impact. First, using customer feedback and usage data as a source to evaluate the actionable value and performance (Kuniavsky, Moed, & Goodman, 2012). Next, using metrics and calculating the return on investment (ROI) are useful and convincing indicators for the impact of user research.

Using related metrics which directly influence the revenue are the most convincing tools for continuously applying a human centred design process (Kuniavsky, Moed, & Goodman, 2012). Moreover, the amount of decreasing customer services and support calls can also be evaluated because of implementing a human entered process can reduce expense in maintenance and support. Next to evaluating saved costs, “A/B testing” can be another useful tool for comparing different user experiences. Researchers can compare the key performance indicators (KPI) for two versions and see if there are any improvements (Kuniavsky, Moed, & Goodman, 2012).

4. Methods

To answer the given research questions this thesis conducts a qualitative research study by analysing seven projects in two design agencies. In this chapter discusses the motivation and general execution of the selected methods for data collection and data analysis.

4.1. Motivation for Qualitative Research

Research can be separated by the type of data that is collected and analysed in a study. This data can either be a fixed, rigorous format as numerical values or more flexible as text. Qualitative research enables flexible design where the researcher immerses him- / herself in the context of design, taking over a main role in the collection and interpretation of research data. This collection and interpretation of data happen in close connection to the study's context and involved people (Strauss & Corbin, 1990). Due to their flexible nature, qualitative research is especially suitable for exploratory work in a natural and realistic environment where the topic is brought and not easy to separate from the context (Gerring, 2006), (Robson, 2002).

In this study, the main goal is to understand how user research is used in a design agency, what the influencing factors related to user research are and what impact user research can have in a project. It requires a brought understanding of different projects and an in-depth analysis of the collected data. Qualitative research offers a holistic and thorough approach and helps to build hypotheses which can be validated through quantitative studies later (Strauss & Corbin, 1990). Therefore, using qualitative research allows us to answer the given research questions by gathering more comprehensive insights from different perspectives. As we need to explore the designer's project experience and how insights were generated and communicated, a qualitative study fulfils our requirements and matches the existing limitations and project frame.

Validity of Qualitative Research

“Fixed design experimentalists criticize the absence of their ‘standard’ means of assuring reliability and validity, such as checking inter-observant agreement, the use of quantitative measurements, explicit controls for threats to validity, and direct replication.”

(Robson, 2002, S. 168)

Compared to rigorous, non-flexible quantitative studies, qualitative research does not only generate a different kind of data but it also needs to consider how to ensure the validity of data and a reproducibility of the results. According to Robson, a good and valid qualitative research can be achieved by having a rigorous and accurate data collection, triangulation by using multiple sources, an interpretation of the data on several levels, a connection between obtained theories and the collected data and finally a reduced bias from the researchers (Robson, 2002).

In order to ensure the validity of our results, this study is conducted by two researchers which allow minimising the personal bias. The study is based on detailed methods, using a rigorous approach for the data collection and data analysis. Furthermore, triangulation is employed as the data is collected from multiple sources with solid evidence. Data is analysed in several stages, starting from a primary project analysis to a more general interpretation. Finally, the collected data, as well as the drawn conclusions, are evaluated and verified in cooperation with the design agencies. Details about the methods, the triangulation and the validation are given later in this chapter.

4.2. Case Study Research

“Case study is an empirical inquiry that investigate a contemporary phenomenon (the case) in depth and within its real-world context, especially when the boundaries between phenomenon and context may not clearly evident.” (Yin, 2013)

As stated above, the goal of a case study is to obtain an in-depth knowledge about one or a small set of related phenomena. Typically, case studies are used when a research project is interested in a greater variety of insights rather than in individual, defined findings (Yin, 2013). The case(s) are studied in-depth in their own context by collecting data from multiple sources with the help of a brought set of data collection techniques such as interviews, observations and document analysis (Robson, 2002). The focus of case study research is on the collection and interpretation of qualitative data (Lazar, Feng, & Hochheiser, 2010). Even multiple case studies are not emphasising statistical comparison but analytical generalisation with the first case providing a theory influencing all following cases (Robson, 2002).

Motivation

To understand how user research is applied in a real-life context, this thesis uses the case study method as the main approach to explore how design agencies apply use research to deliver human centred solutions. Following the statement by Lazar et al. that “*A case study is an in-depth study of a specific instance within a specific real-life context.*” (Lazar, Feng, & Hochheiser, 2010, S. 144) The specific instance that we are interested in is user research and the specific real-life context is HCD projects at design agencies. Our goal with doing a case study is to get a deeper understanding of the research process at design agencies, a better picture of existing issues and to explore the impact of user research applied in industry projects. User research can be affected by various factors. Some factors as clients, target user groups and a given time frame do not only influence the way of planning but also how insights and results are delivered. Therefore, using the case study methodology is an effective way of taking the contextual conditions into account when doing user research.

Multiple case studies are selected for this thesis to generate an analytical generalisation (Robson, 2002) and to increase the credibility of results (Yin, 2013). Considering that various HCD projects all have different features, it is not possible to draw a conclusion based on a single or only a few projects. Investigating different cases helps to reduce the bias and at the same time provides multiple sources of evidence for the data analysis. Furthermore, comparing different project helps to identify common patterns and to generate more accurate and reliable insights.

Preparation

For this thesis, seven case studies are conducted in cooperation with two digital design agencies. Both agencies are consulting companies delivering services and solutions to their clients. The details for each case study are based on the previous project and the related data collection and interpretation (Robson, 2002).

The selection of agencies and cases followed specific requirements from our as well as the agencies' sides. One main limitation for the selection of cases is, that we only consider projects which have been finished already.

Other considerations are the type and size of the project as well as previous collaboration with the same client. After presenting the thesis topic and the requirements for a case, the design agencies decided in which cases to present to us. After selecting the first cases, the major tasks for collecting the data are defined. For each case study, an interview with the designers is planned in the agency in the office. As the project details are confidential, all project related information is anonymous in this thesis.

Before the actual data collection, the designers are informed about our thesis project and what we are interested in. They prepare various project documents and deliverables which are needed as resources and supporting evidence. We also gathered background information of the agencies and the designers. All designers receive and sign consent forms at the beginning of each session. An example of the consent form can be found in the appendix (A01 – Consent Form).

The next step after selecting the agencies and the first cases is defining the *project focus* (Holtzblatt & Beyer, 2014). Based on our three research questions, questions and directions for each topic are defined for the data collection. Beginning with exploring how projects are planned and structured and how the communication between client and designers influences this stage, the goal is to learn what different user research methods agencies apply in their projects and why. Based on the agency's documentation and experience we aim to explore their reasoning and preparation when starting a project. Therefore, for the first research question, how the integration of user research is planned in HCD projects, the questions selected are centred around how planning is happening in cooperation with the client and the agency, what the motivation for integrating user research is and what project related factors play a role when selecting research methods.

As the next step is to explore, what methods the agencies use to describe their results and how they communicate them in their company and with the client, for this second research question the goals of the method are to explore, how data is collected, understood and how insights are generated from this data. Furthermore, the understanding of how insights are packed and communicated plays a major role. By exploring the project and client related factors which influence the construction and communication of insights, we analyse how and when data is used and transmitted in a project. The goal is to understand how design agencies generate insights and ensure a consistent and complete communication between different roles.

Finally, in the third part, we aim to research the impact that user research methods and the way of communicating them, has on each project. The questions to answer centre around how results are communicated and handed over to the client and how impact is measured.

It is also of interest for us to explore when and how user research data and insights are going to be used in the final delivery and how clients perceive the impact of applied user research. These focus questions need to be addressed in each case study to answer the given research questions. A list of the prepared questions aligned with the process of a project can be found in the appendix (A02 – Project Focus). Having prepared detailed questions as general guidelines in the case studies further enhance the reliability and supports the common understanding within the team (Robson, 2002).

Participants

For the cases studies, most interviews are conducted with the responsible UX designer. Some cases involve further roles, for example, project managers and UI designers. The basic background information of the company and the designers are described here and the questions used to analyse the designers' background can be found in the appendix (A03 – Screening Interview).

Agency A

Agency A is a small design agency based in Stockholm founded in 2012. The main business area is about building branding strategy, product and service design for their clients. The company size is around 10-20 people.

Designer	Job title	Description
A1	UX Designer	Engineering and media background in bachelor study, master in Human-computer Interaction. No previous UX related working experience before joining Agency A. Currently, working at Agency A for 10 months.
A2	UX Designer	Education background in communication design. Has been working in a design consulting agency as UX designer for two and a half years before joining Agency A. Currently working at Agency A more than half year.

A3	UX Designer	Studied in Interaction Design and Human-computer Interaction. Working in an IT consultant company as UX consultant for one year and a half. Now working in Agency A for one year and a half. Currently also running the own company as CEO.
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Table 6 – Participants Agency A

Agency B

Agency B is a global design agency founded in 2001, and it is a part of a big global business consultancy company. The agency works in the area including service design, marketing design, user insights, system design and Experience design. The company we corporate with is in Stockholm which has 45 employees from 20 countries.

Designer	Job title	Description
B1	Senior Service Designer	Has a business and financial education background. Has been working for a consulting company as a consultant for 4 years before joining Agency B. Currently working at Agency B for 2 years.
B2	Service Designer	With a graphic design and interactive art education background, has been working as user experience and visual designer in several design agencies for 3 years. Currently working at Agency B more than two years.

Table 7 – Participants Agency B

Data Collection

The data collection for each case study consist out of a contextual interview and a document analysis. This data is supported by observations and further interviews.

Contextual Interviews

In order to get detailed data to understand how user research is conducted and used in the different projects, one to two semi-structured, contextual interviews are conducted for each case study. Each interview session lasts around two hours because it is the right amount of time for both interviewer, interviewees and the data quality (Holtzblatt, Wendell, & Wood, 2004).

Conducting semi-structured interviews allows us to keep a better consistency of the same topics covered in each interview but that we can also adapt the questions and information according to the different cases (Strauss & Corbin, 1990).

As above, questions about the process as well as the designer's background are prepared before the interview. According to introductory information, the designers prepare slides and/or documents to present a project in a form of presentation. The sessions are conducted in the agencies' meeting room. Based on the principles of contextual inquiry, the goal of the data gathering is to engage the designers in presenting their work as they do it for clients, combining the interview with contextual observations. Talking about finished projects, the designers can use the project's documentation and other artefacts as reminders (Holtzblatt & Beyer, 2014). This even includes looking at old emails and communication messages for a project. As the sessions are conducted in the agencies' meeting room, the context is similar and physically close to where the original work and presentation happens. The designers bring their own computers, going through the old project folder structures together with us. They can even go back to their desk if they need to look for other documents. This not only provides a good source for the document analysis but also helps the designer remember the project details in this retrospective approach (Holtzblatt & Beyer, 2014). During the session, we add questions when something in the presentation is missing or when questions appear. Sitting together at the designer's computer, talking through a project together has the goal of collaborating in understanding the project structure, having the project focus with guiding questions as a supporting tool (Holtzblatt & Beyer, 2014). Using the format of a semi-structured interview also allows us to directly ask for feedback on our own immediate interpretation of situations.

In the interview, the data is recorded by taking notes in two versions and recording an audio tape. Pictures and screenshots from the interviews are also taken in order to provide evidence of the collected data. Some of the documents (the amount differs from case to case) are sent to us after the interview. If data is missing or if any questions emerge later, they are sent to the designers after the interview via email.

Document Analysis

After the interviews, the project related documents and deliverables are also analysed as a source to support the case studies results. The documents are including presentation documents, wireframes, videos, illustrations and pictures. The purpose to look at these documents is to support the findings from the contextual interviews, answer open questions or raising new once. Doing a document analysis provides a helpful and solid evidence of the collected data which increases the credibility and validity (Robson, 2002).

The project related documents are either shown in the interviews or directly sent to us. Some pictures and screenshots of the documents are also taken during the interviews. Due to the confidentiality of the documents, all the collected data are anonymous, and only the structure and basic content will be investigated and discussed in this thesis. Furthermore, the number of documents and the level of details varied for each case.

Observations

Besides the interviews and the document analysis, we also do observations to get some more contextual knowledge about the agency's working environment and the collaboration between different roles. Doing observation is a good way of complementing the interviews and gives us the possibility to validate the descriptions from the interviewees (Strauss and Corbin, 1990). For the observations, we were sitting or working in the office and paying attention to how the office space is arranged, what different artefacts are used while working and how the communication happens between different roles. Notes are taken and used when analysing the interview results as a supplement and support.

4.3. Data analysis

Doing seven case studies with seven completed design projects generates a lot of data. In order to be able to better handle the gathered data, the data analysis is split up into two parts. The goal of the first part is to clean and reduce the data before getting an overview and defining conceptual categories. In the secondary analysis, we are looking for relationships between different cases and the various categories (Robson, 2002).

Primary Data Analysis

To synthesis and structure our results, we first conduct a primary data analysis directly after each data collection session. Build on the idea of interpretation sessions (Holtzblatt & Beyer, 2014), these meetings happen shortly after each interview, ensuring that everybody has the same understanding of the data while still having the details in mind. As a first step, we go through the notes and audio taped before extracting the most related and useful information for the study, placing them as visible notes on whiteboards and post-its.

Next, project related facts are categorised, determining the basic background for each project. After this, the modelling starts. Besides, we also list our primary findings based on our observations and interpretation of each case study. Finally, the research questions and the questions from the project focus are answered for each specific case.

Conceptual ordering

Conceptual ordering is an approach to categorising data based on its own properties (Strauss and Corbin, 1990). The aim of our thesis is to organise the data and cluster it into different categories. During the primary data analysis, data is clustered based on the different project facts. After summarising and displaying the data with fact tables, a coding scheme is defined for modelling and displaying the data (Robson, 2002).

Data Interpretation and Modelling

To better visualise the project process, the models are created based on the collected data. The project process is illustrated in models which contain a high level of detailed information. Due to the complex nature of a project, no specific type of model is applied. The selected visualisation combines a sequence model with a relationship, collaboration and artefact model, focusing on the details defined in the project focus and the research questions (Holtzblatt & Beyer, 2014). This model is developed in detail for the first, most intense case study, before being applied to the rest of the cases. The goal with the models is to give defined codes to specific parts of the projects to enable us to find patterns and relationships as well as differences and themes (Robson, 2002). Figure 10 is an example of how the first model looks like.

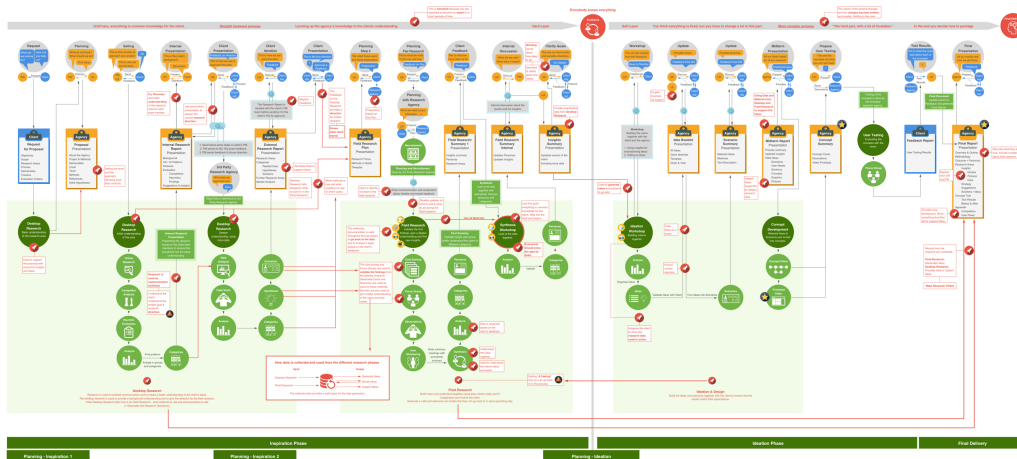


Figure 10 - Model Example

As it can be seen in Figure 10, the models represent the overall project procedure including the communication process, delivered/received documents and applied methods. Interpretations and comments are directly added to these models, including primary findings, marking where and what generates impact. When creating the model, we use the documents and deliverables as the first source of inspiration for the coding scheme before adding the communication process and methods in between.

In the models, different colours and shapes are used for indicating the different data categories. Orange represents the agency and the blue represent the client. The grey areas mostly in the top of the models are used to describe the communication process, where all handover and information exchange happens. In the middle of the models are documents and deliverables, the text inside indicates its basic content and structure. In the bottom, the green areas and bubbles show the different methods agency used in the project. Moreover, the red text and pins are showing where and how the research has an impact. Different arrows represent information flows, where the data goes and is used. You can see the legend and categories in Figure 11.

The models give a detailed view of the whole process which helps us to synthesise the data and achieve a common understanding. The models also play a main role in supporting the data analysis procedure from concrete to abstract. It is important to note that the models do not represent a timeline but just the logical structure of the process. Iterations and steps backwards are included as well.

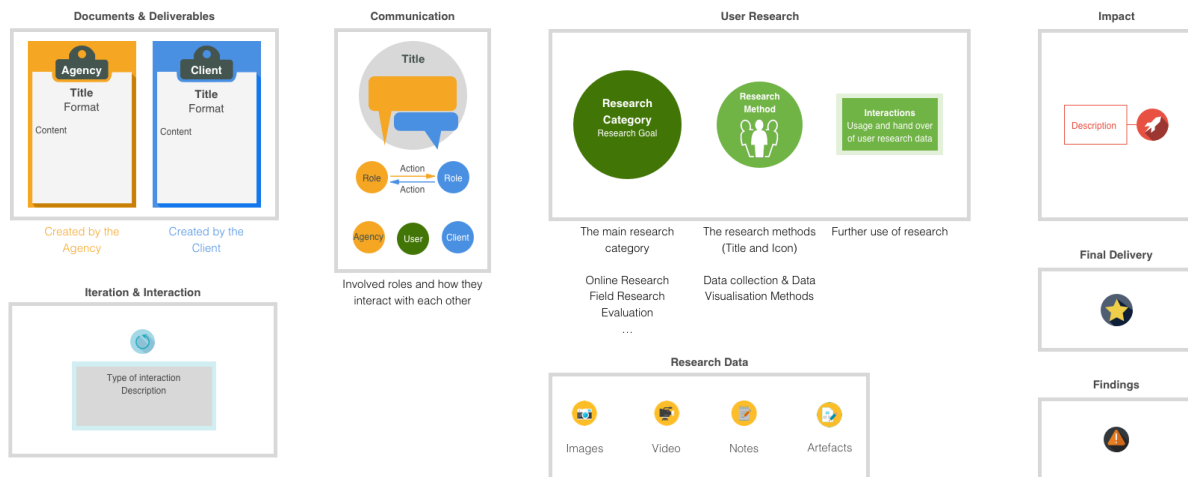


Figure 11 – Model Legend

Secondary Data Analysis

Based on the primary analysis for all case studies a more generalised analysis is carried out. The goal for the secondary data analysis is to construct theories and generate concepts. To draw abstract conclusions, we first categorise the data based on the given research questions. To answer each research question generally, the different case studies are compared with each other, which requires us to look at the data back and forth to find common patterns and differences. Multiple tables, matrixes and networks are used to give a better perspective of showing the data for pattern finding reasons (Robson, 2002). Looking at different patterns and questioning the reasoning behind helps to understand the trends and to build a logical relationship of evidence (Robson, 2002). Through the analysis, the data is conceptualised and built as constructs of theories.

4.4. Data validation

After the primary data analysis is completed for all case studies, we conduct a first data validation sessions with the designers and present them the models as well as the first findings.

“Validating refers to check out interpretations with participants and against data during the actual research process and altering or discarding interpretations that appear to be contradicted by incoming data.” (Strauss and Corbin, 1990)

The goal of the data validation is to confirm the models contain the right and accurate information and reduce the possibility of personal bias. Furthermore, we use the data validation to support the triangulation, improving the reliability by providing multiple data sources.

In the validation sessions, each case study is presented in about 10 to 20 minutes by showing the facts table and model for each case. The models are printed on big posters, which allows to show and discover the detailed information in full size while standing in front of the information together in the agency's office. In the presentation, we first explain how to read the models and then talk them through the details case by case. During the validation sessions, designers and other related roles provide immediate feedback and point out questions, problems, if anything missing or need to be changed.

5. Results

In seven cases studies at two design agencies seven different human centred design projects are investigated. As described in the previous methods chapter, this part contains the gathered data as well as the primary interpretation and analysis for individual each case. It aims to explain the methods applied for each case as well as the background, description and generated model for each project. The primary analysis also includes direct, first insights and answers the given research questions with the project focus in mind for each case. Following this chapter, the secondary analysis describes the results when not looking at each case individually but comparing them with each other, leading to more generalised concepts and the conclusion.

5.1. Case Study for Project P1

For the first case study, the project is selected in collaboration with Agency A after presenting the thesis approach as well as the focus for the case studies. The goal of the first case study is to explore the project in great detail as it aims to provide a first practical support and proof of the theoretical background, purpose and approach of this thesis, leading to changes in the following cases (Robson, 2002). Project A1 is selected, as it allows us to explore a project that has applied the full human centred design process with a great variety of methods in a high level of detail. Another reason for choosing this project for the first case study is that it has been finished several months ago, giving us and the designers the opportunity to reflect on the impact and the feedback over a longer time.

The project P1 is a big innovation project presented by designer A1 in the office of Agency A. Two contextual interviews are conducted with the designer, each interview lasting for around two hours. As preparation for the first session, background documents are analysed to get an initial basic understanding of the project. The designer prepares a set of slides for each session, using the original material and artefacts as sources. In the interviews, designer A1 presents the process and the work as well project documentation and deliverables. The deliverables and the designer's slides are used for an in-depth document analysis prior to the interpretation session for each interview. The pictures, notes and audio from the interview are used in the analysis. Synthesis and interpretation session happen after each interview.

Background

Type	Product innovation project	
Outcome	Research and concept design	
Duration	4 months	
Agency: Roles and Responsibilities	2 UX designers 1 project manager 1 UI designer	Exploration, user research Generation of ideas Concept design and development
Client: Roles and Responsibilities	1 VP (Product Innovation Team) 2 project managers Company's Headquarters	Feedback on process and ideas Decision making Participate in user research User testing
3rd Party: Roles and Responsibilities	Research agency	Provide data and participants Facilitate user research Supporting role
Client characteristics	Very hierarchical and structured Previous experience in HCD & user research Have the same innovation project in different countries each year Confidentiality is an important issue (makes it complicated to share data)	
Client-Agency Relationship	Equal partners Working together	
Process	Phase 1 - Planning	Request for proposal (client) Proposal (agency)
	Phase 2 - Inspiration	Desktop Research (Iterative) Field Research (Iterative)
	Phase 3 - Ideation	Desktop Research (Iterative) Field Research (Iterative) Workshops (Iterative) Concept design & Prototype (Iterative) Testing
	Phase 4 - Final Design	Final report

Table 8 –Background P1

Description

P1's goal is to conduct user research in a given domain and to create a set of different, innovative concepts. As Figure 12 shows, the project starts with a proposal request from the client. To get an initial understanding of the client's domain, the agency carries out desktop research. In the project proposal presentation, the agency presents a plan and first insights supported by the research. After the client agrees to the project proposal, the design team starts with desktop research to look at the current product and existing competitors. After analysing the findings, different patterns and categories are created and presented to the agency. In the project, research is used to facilitate communication within the agency and with the clients to get a better understanding of the goal and the research direction. The design team uses data provided by a third-party research agency to get a deeper understanding by doing in-depth data analysis supported by initial field visits. The first version of hypotheses, which are structured using scenarios, are presented to the clients. Due to the client's hierarchical structure, the research report is constantly iterated with the client's project manager before sending to the client's head quarter, where the final decision is made. This also results in all documents being stand-alone presentations. The results of the desktop research provide a basis direction for the field research, results in a plan for the field research with a more detailed research focus and methods.

In the field research phase, the agency closely collaborates with the client and the third-party research agency. The direct communication and cooperation with the client allow flexible and instant feedback. The goal of the field research is to validate the first findings and to gain a deeper understanding for finding new insights. Methods like card sorting, focus group, observations and user shadowing are used to gather data. Designers and clients have daily synthesis meeting to look at the data together and achieve a common understanding. Next, designers create personas and present them. After that, client and agency conduct a synthesis workshop by looking at all data together, discussing the personas and the research categories. Next, an insights summary presentation is delivered to the client before the ideation phase starts. To generate ideas, the designers facilitate a co-creation workshop with the client. The research results are used and during the workshop, lots of ideas are generated. Based on this, all ideas and designed sketches are validated by the client. According to the feedback, the agency turns the ideas into scenarios and present them with sketches and text description.

While updating the scenarios based on feedback, the agency prepares a mid-term report which includes a process summary, updated insights and initial ideas. Data and material from the desktop and field research are used to support the ideas. In the midterm presentation, agency and clients discuss priorities and select ideas. The designers turn them into concepts and develop concept flows as well as a video prototype. To validate the concepts, user tests are conducted by the third-party research agency in a form of focus groups, using the agency's designs and prototypes. A feedback report contains the test results. At the same time, the agency starts preparing the final delivery. The final presentation/document contains the project's processes, the methods, the final insights and concepts with the feedback. Data from the desktop and field research are used to support the concepts and to provide evidence. In the end, the clients are satisfied with the process and the results.

Model

Based on the contextual interview, a detailed model is created at the end of the second interpretation sessions. A bigger and more detailed version of the image can be seen in the appendix (A04 – Model P1).

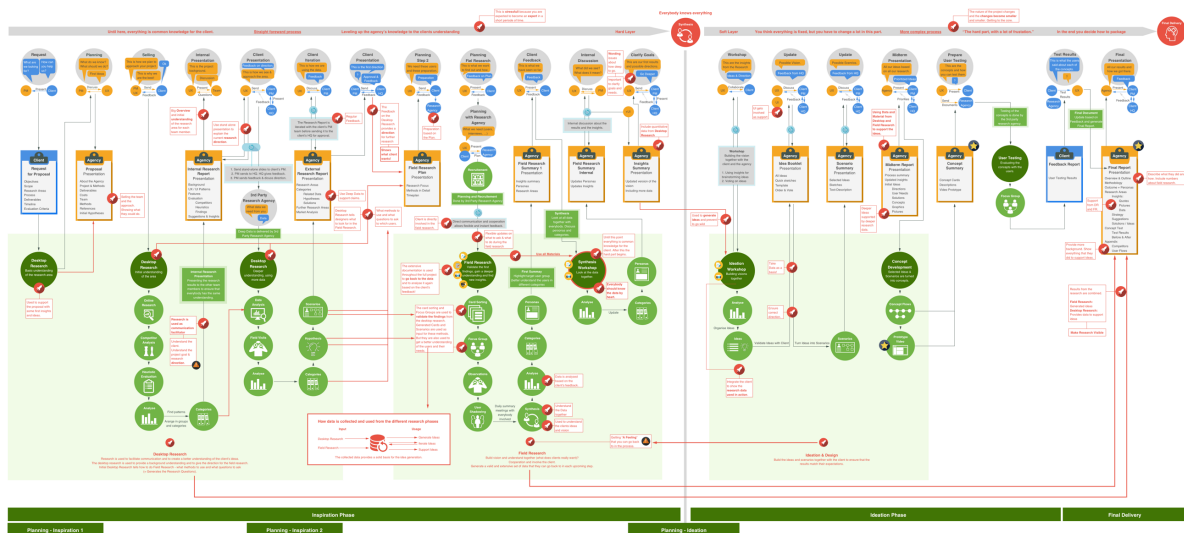


Figure 12 – Model P1

As explained in the 4. Methods chapter, the model contains the communication between client and agency, the delivered and created documents as well as the applied methods. It also contains the first insights and interpretations of the impact that user research has.

As it can be seen in Figure 12, the process is split into two sides. First, focusing on the inspiration phase before going into the ideation phase, which has been described as much harder for the designer.

Initial Insights

As part of the interpretation session, first observations and insights are collected and associated with the related research question of this thesis (see page 6). Table 9 lists these insights.

No.	Insight	RQ1	RQ2	RQ3
1.1	Research is used as a communication facilitator between the agency and the client.		✓	✓
1.2	Miscommunication about goals, directions and responsibilities leads to misunderstanding and influences the user research by increasing the effort.	✓	✓	✓
1.3	Constant feedback from the client helps to go into the correct direction (as defined by the client).	✓	✓	✓
1.4	Client involvement face to face is helpful.		✓	
1.5	The level of knowledge (about user research) on client side effects the planning and communication.	✓	✓	
1.6	Planning happens at different stages and with different intentions.	✓		
1.7	In the beginning, selling is key and influences the planning and communication.	✓		
1.8	Research documentation is important as designers use it to answer more questions than they had in the beginning. It also works as a facilitator for communication.		✓	✓
1.9	Communication becomes difficult when roles and processes are unclear.		✓	
1.10	Research data is used to support claims (insights, observations, solutions, users...) and designs.		✓	✓

1.11	User research has an impact on different stages in the project and should not only be measured in the end (step-by-step influence).			✓
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Table 9 – Insights P1

Answers to the Research Questions

RQ1: How is the integration of user research in HCD projects planned?

In this project, the planning happens in each phase, from selling the project, to desktop research, field research and the concept generation. It has a very broad plan in the beginning and narrows it down with more detailed methods in each phase. The plan also changes according to the client's feedback and decisions. Results from previous phases provide a good basis for planning following steps. For example, the agency uses the results from the desktop research when planning the methods for the field research. Due to user research is requested by the clients, and the client has a high involvement and good HCD knowledge, also the third-party agency participation, the client plays an active role in the planning by giving constant feedback

RQ2: How are results of applied user research collected, analysed and communicated?

In this project, the research data is collected by doing desktop research, with the support of a third-party research agency and by doing field research. To understand the data, the designers categorizes and lists the collected data, making graphs and build scenarios to interpret it. Techniques like workshops and brainstorming are used to generate the insights. The user research results are used in every step to support the next phase. It also plays an important role in communicating between the client and the agency to achieve common understanding. To ensure the consistent and complete communication, the agency is always iterating the documents with the client and receives feedback and questions. Besides, agency and client have a very close collaboration during the process, for example, the daily synthesis workshop is seen as an effective way of creating a common understanding.

RQ 3: What impact does user research have on a project?

The project results are a set of innovative ideas and concepts which have been tested and prototyped. The communication of these results happens in the form of video prototypes, a final presentation and a concept summary. For this project, the impact is measured based on the client's feedback and by the fact that the client send a request for a proposal for a second project. In the end, the client is happy with the results but only after comparing them to the results of other agencies and other departments. Some parts of the concepts are implemented in the product right now, what is perceived as a great impact by the designer. Finally, the project has an impact on the designer's mind-set regarding how to approach communication and planning issues in this size of project and for clients with those characteristics.

The impact of the user research can be summed up by saying that it has had an impact on the communication and the final results. The research is very visible through the full process and the clients are involved in the research what creates trust and a better communication. In each presentation visuals and numbers from the data are used to support all kinds of statements. Furthermore, research is also used to facilitate the workshops and the designer's iterations in the ideation phase. Splitting it up, the desktop research enhances the communication and provide a direction for the field research. In the end the desktop research results are also used to support the ideas. The field research is used to get a better feeling for the domain to generate ideas.

5.2. Case Study for Project P2

The second project is introduced by Designer B1 in Agency B's office. The designer prepares the presentation based on an introduction to the thesis topic and presents the work in a two hour long contextual interview session. During the interview, designer B1 talks through the project's process and shows related documents and deliverables. Pictures are taken of the deliverables, two versions of notes and recorded the audio are used for further analysis. A synthesis and interpretation session happen directly after the interview.

Background

Type	Innovation project - improvement and combination of existing process	
Outcome	Design of a minimum variable service	
Duration	13 weeks	
Agency: Roles and Responsibilities	1 Service Design Lead 10 Designers (Service, interaction and graphic) 3 Developers	Facilitate communication and innovation Education about the process Concept design
Client: Roles and Responsibilities	1 Sponsor Users from 4 countries Several managers IT support team	Share documents and insights Participate in the process
Client characteristics	Banking sector Very structured client Four different countries with four different processes No previous knowledge of HCD	
Client-Agency Relationship	Collaborative effort Goal to build a relationship Trust is important as the client is not familiar with the process	
Process	Phase 1 - Planning	Process Kick-off meeting
	Phase 2 - Inspiration	Desktop Research Workshops
	Phase 3 - Ideation	State of art user flow Vision user flow Prototype
	Phase 4 - Final Design	Final presentation Video and interactive prototype

Table 10 – Background P2

Description

The second project has two parts. The first part aims to discover the domain and to develop a concept. The second part focuses on the design of the developed solution. Our analysis and the contextual interview focus on the first part, taking the second part as input for the impact of the first project by evaluating how the research is used in the second project.

Part 1

The project starts with a salesperson explaining the agency's process to the client. Based on this pitch, the agency receives a request for a proposal from the client. After a kick-off meeting with client, the agency delivers a proposal document including the project plan and deliverables. After the client agrees on the proposal, the designers start to do desktop research in order to get an initial understanding of the domain and the users. For this initial research, the agency receives interview transcripts and surveys to build personas, as they do not get access to the real end users. Next, the agency conducts a first workshop together with the clients. In this workshop, they discover the current user flows together. The personas, user flows and problems are analysed for a first state of art user journey draft which is generated by the designers after the workshop. Next, the design team validates the journey map with the client and users in interviews and further workshops in the four countries. When this is achieved, the design team makes the client sign the state of art journey which they created together in order to create the feeling of the ownership and responsibility.

A second workshop is used to create a vision together with the clients and to get people aligned and involved. The design team uses the previous user research results, such as personas and the signed user journeys to achieve a common understanding and to generate ideas. In the workshop, the design team, clients and users prioritize the different concepts together and build a story around these ideas. The design team synthesizes the generated ideas and analyses all the concepts internally and creates a vision user journey for the future development. In a third workshop the design team brings the vision user journey, user stories and user flows as big posters and builds paper prototype together with the clients. According to designer B1, big posters are used as a powerful communication tool to make the research results visible and tangible. During the prototype presentation, the design team validates the concepts and receives feedback from clients. After the workshop, the design team analyses the paper prototypes and creates wireframes. A video prototype is used to tell the story behind the concept.

In the final presentation of the first part, the different state of the art journey maps as well as the future vision are presented to show what they have been doing and how the concepts have been developed in cooperation. The goal of the agency was to make the collaboration process a fun experience for the client to make them remember, feel responsible and to educate them about the process. This is included in the final presentation by showing videos and images from the individual workshops - using the client's and user's voice to advocate for the concepts and the process.

Part 2

Based on the success from the first project, the client continues collaborating with the agency and starts the second part of the project. The artefacts, data and insights from the research done in the first project are used to plan and conduct the second part. In the beginning, the agency delivers the project plan which includes several sprints and user testing. In an iterative process with the clients the agency aims to meet the expectations and to ensure a consistent communication. The design team organizes user testing to validate the concepts with users. By involving the client in every process, the designer team creates user ambassadors who communicate the impact and importance of user research into different departments at the client's company. In the end, a final presentation is delivered to show the process and the results. In the end, the clients are satisfied with the process and the results.

Model

As Figure 13 shows, in line with the description for P2 the model is split up into the two project parts. The second project is shown with a grey background as it is not the focus of this analysis. The model also highlights how the two parts are connected and how user research is re-used in the second part. A bigger and more detailed version of the image can be seen in the appendix (A05 - Model P2).

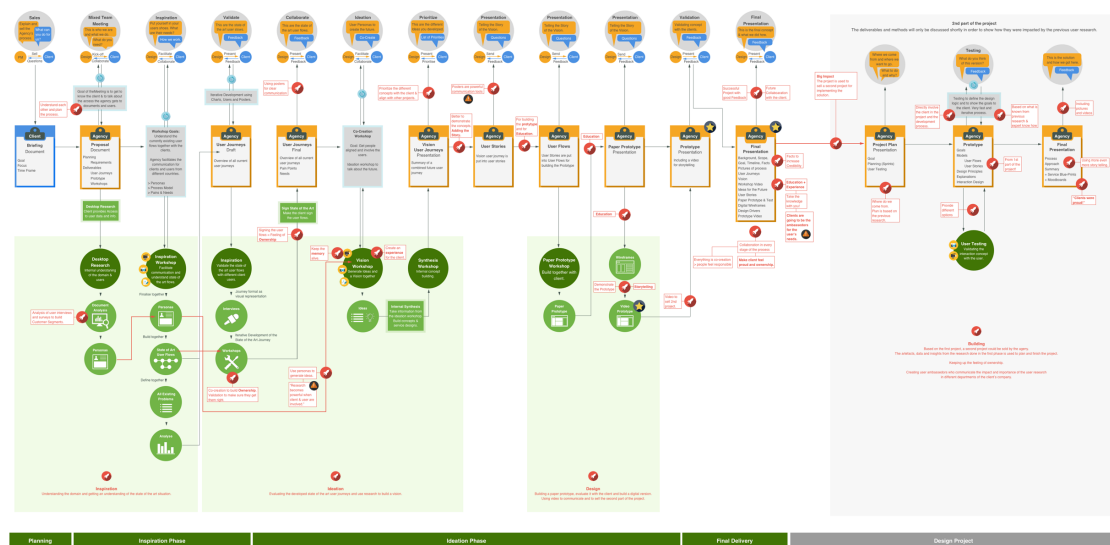


Figure 13 – Model P2

Initial Insights

No.	Insight	RQ1	RQ2	RQ3
2.1	Focusing on the process instead of the deliverables allows more innovation, collaboration, flexible projects.	✓		✓
2.2	Poster is powerful, communication tool.		✓	
2.3	Research becomes powerful when clients and users are involved.	✓		✓
2.4	Clients not always know their problems. Challenge ideas and reflecting help to find the problem and goal.		✓	
2.5	Collaboration makes clients feel around and takes ownership of what they are doing. Signing results can be used to make research have a bigger impact.			✓
2.6	Educating clients by creating experiences for them that they will remember! Videos are a good tool to catch and follow up on this experience.		✓	✓
2.7	Showing Numbers increases credibility and trust.		✓	✓
2.8	Educated clients have an impact by representing the user's needs even after the project is over.			✓

2.9	Storytelling is a way to connect results with emotions.		✓	
2.10	Personas, user stories, user flows are helpful in education.		✓	
2.11	Projects and communication have an impact on future projects.		✓	✓
2.12	Workshops to facilitate the communication for clients.		✓	
2.13	Good user research helps clients to have the better relationship with their customers.			✓

Table 11 – Insights P2

Answers to the Research Questions

RQ1: How is the integration of user research in HCD projects planned?

The planning for P2 is done by the agency alone. This is mainly because the agency sells the process to the client and the process defines the general plan. The planning happens in the beginning of part 1 and part 2. The project is very process focused, what makes no further planning necessary. This also results in the focus on creating a fun and memorable experience for the client and helps learn the process. The Influential factors for planning in this project are the client's domain and confidential aspects. The client decides on the access that the agency has regarding documents and users, what influences the planning. Because of the security and access limitations, the agency starts by doing a document analysis and desktop research. Workshops and interviews are directly planned in collaboration with the client but the agency also adds time slots to do the actual design work.

RQ2: How are results of applied user research collected, analysed and communicated?

The insights from the document analysis are transformed into personas. As results out of the workshops, user flows and journeys are created as state of the art and future visions. Interviews are used to validate the gathered and created data together with the client. Ownership and trust in the data are very important as the focus is on a co-creation processes. The client is involved in most stages of the design process. Storytelling and visualisations play an important role in communication. Throughout the process, the collected data is directly used in the next step after being analysed and interpreted by the designers. Furthermore, data is directly validated with the client. At the end of the first part, the first handover happens when a new team takes over. Otherwise, no handover happens in the first part, as everybody is directly involved.

Constant involvement, the validation and big visual posters are used to ensure a good and consistent communication.

RQ 3: What impact does user research have on a project?

A successful part of the first project is that the agency could sell the second project. A video prototype and visual aesthetic presentations are used to convince the client of every step as well as the importance of the project. The impact is measured by looking at the involvement and activity of the client, the achieved feeling of ownership as well as the influences on the client's mind-set. As the client is directly part of the user research and they see user research results used in action, so they perceive it is innovative and helpful. This is also matching the feedback the designer received from the client after the project.

5.3. Case Study for Project P3

Project 3 is another innovation project introduced by Designer B2 in Agency B's office. One contextual interview is conducted, where designer B2 talks us through the project process and presents original documents and deliverables. The session takes around two hours. The main deliveries are later evaluated in a primary data analysis. The pictures, notes and the recording from the session are also used for further analysis. The synthesis and interpretation session happens directly after the interview. For this project we receive the original data what allows a more through document analysis for this project. In the presentation, original co-created workshop artefacts, emails and other elements of the communication are shown as well, but the in-depth document analysis focuses on the documents that have been delivered directly to the client and that have been used in the workshops.

Background

Type	Innovation project (non-profit, pro-bono project)	
Outcome	A concept for digital platform	
Duration	4 months (not full-time. The main work is done in 2 months)	
Agency: Roles and Responsibilities	3 Service designers 1 Project manager (inactive role)	Facilitate design process Develop concepts Gather user's needs

Client: Roles and Responsibilities	3 Project owners	Connect with users (recruitment) Participate in workshops Decision-making Facilitate third workshop/party
Client characteristics	Unstructured client Not full-time working on this project This is their first pro-bono project with a design agency No clear expectations, scopes and deliverables	
Client-Agency Relationship	Collaborative (designer, client, user) Pro-bono influenced the communication (less-demanding, less critical)	
Process	Phase 1 - Planning	Briefing Project Plan
	Phase 2 - Inspiration	Discovery workshop
	Phase 3 - Ideation	Vision workshop Validation workshop
	Phase 4 - Final Design	Final presentation

Table 12 – Background P3

Description

The project starts with a meeting between the project manager and client discussing the project goal and scopes. Based on a briefing document from the client, the agency delivers a project plan specifying the process with a time plan and deadlines. No details and methods are planned yet. According to the designer, the deliverables are not clear in the beginning, and therefore she thinks it is necessary to do some research or conduct a workshop together with the client to better identify their needs directly in the beginning.

The project includes three workshops. The first one is a discovery workshop, where the goal is to understand the user's needs, problems and behaviours. In the workshop, methods and exercises are adapted to the end users and their circumstances. The agency is a facilitator and active listener, focusing on the client and user participation. After the workshop, the designers directly debrief and synthesise their observations to achieve a common understanding within the team.

With the co-created artefacts from the first workshop, the agency starts to analyse and categorise. Visualised deliverables of user characteristics and journey map are created based on these findings. The goal of the second workshop is to validate this user journey and to generate concepts with users and client together. The agency team brings visualised journey maps in a form of big visible posters that are used to enhance the communication and are used as a basis for generating ideas. The designers facilitate the workshop and help the participants stay open-minded, helping them to think outside of the box. A lot of ideas are generated in this workshop, the designers bring them back, analyse, refine and visualise those ideas into concepts. Next, the concepts are presented and discussed with the clients only. New concepts are created in the meeting together with the client.

The third workshop is a validation workshop which is used to validate the concepts with larger user groups (different than the group in the workshop). During the workshop, engaging and easy tasks are performed by the users to create a relaxed atmosphere and a memorable experience for both clients and users. In the final presentation, the refined concepts are delivered. Because the project is only the first part of the agency's usual process, the UX design strategies are introduced to clients to help the client to continue with the design process without the help of the agency. According to the designer, the project could have been better with a clearer and more structured plan, but the project has a great impact internally due to the eye-catching artefacts that raise interest in other designers. She also thinks the education part in the final deliveries did not play an important role for the client and was not successful.

Model

The three main workshops can be seen in Figure 14 in the areas with the light green background and the three blue boxes between the documents. The model also shows that after each workshop with the client and the user there was an analysis and visualisation done by the designers alone. The big impact at the end of the projects highlights the influence that the project had on the agency's mind-set regarding pro-bono and social work. Hearing about the designer's passion and engagement for this case really shows the impact that the project had on the designers themselves.

A more detailed version of the model can be found in the appendix (A06 - Model P3).

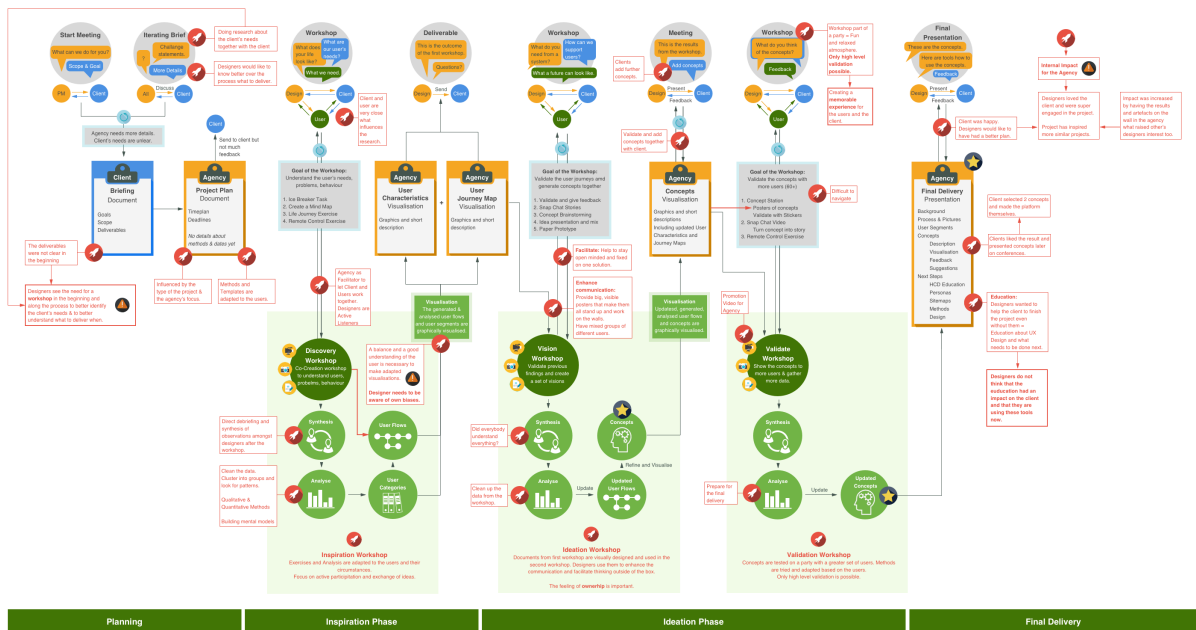


Figure 14 – Model P3

Initial Insights

No.	Insight	RQ1	RQ2	RQ3
3.1	Format, time and motivation for deliverables need to be clear from the beginning. Re-evaluated during the process is necessary. A fixed structure with deadlines supports this by increasing the agency's accountability.	✓		✓
3.2	Follow-up processes and feedback when the project is finished is very valuable for the designers to improve.			✓
3.3	Follow-up processes can help to measure the impact.			✓
3.4	The process and the methods can be improved by feedback		✓	
3.5	The type of the project influences the planning and the communication.	✓	✓	
3.6	User research, in the beginning, has an impact on every upcoming step and the communication		✓	
3.7	When adapting presentations to the audience, a good understanding and proper balance are important. The designers' bias plays a huge role.		✓	

3.8	A close user-client relationship can make the communication easier but can also have negative effects on research (e.g. missing deeper findings because things might be obvious).		✓	✓
3.9	Agency internal impact: Designers' engagement and inspiration for similar projects.			✓
3.10	Language barriers make direct synthesis necessary.		✓	
3.11	Enhancing creativity by facilitating and encouraging different working modes as standing up, in front of walls, using big posters, mixed groups to enhance collaboration.		✓	
3.12	Agencies open the clients about problems and solutions.	✓		
3.13	Co-created artefacts are good for documentation because the designer can be an active listener.		✓	
3.14	Co-created artefacts are good for analysis as they are a good data source (made by users = true). It is easy to organize and understand. The data speaks to the designer.		✓	
3.15	Co-created artefacts facilitate communication. They communicate insights and results, increase internal interest and impact by being visible & eye-catching.		✓	
3.16	Impact and ownership are about the project ("love your project") and the process ("love HCD").			✓
3.17	Education by <i>doing</i> is better than by <i>explaining</i> only.		✓	✓

Table 13 – Insights P3

Answers to the Research Questions

RQ1: How is the integration of user research in HCD projects planned?

For the planning, the client defines the scope and goal of the project. The agency uses the process as applied in most other cases. The methods are not defined in the beginning and not discussed with the client. But the agency challenges the client's thinking to get a better understanding of the real problem that needs to be solved. As the project is not full-time for the designers, it does not have a clear time plan and therefore is perceived as unstructured by the designer.

In the interview, we have been told that it is necessary to have a better plan and a more detailed understanding of the client's needs to be able to deliver results when they are needed. This miscommunication about the deliverables has been one negative point influencing the success of the full project.

As there is not much time for the project, the agency tries to involve the client as much as possible. The goal is to make the handover of the final results less complicated and to advocate their way of working. P3 is a pro-bono project, what influences the planning from both sides, the client's and the agency's. The client does not know what to expect and what to ask for, the agency does not have much time as they would need in other projects. The planning is also influenced by the close connection between the client and the user, what makes the planning easier, and the language barriers in the agency's team where not everybody speaks Swedish fluently.

RQ2: How are results of applied user research collected, analysed and communicated?

The data collection is purely done in cooperation with the client and the user by doing workshops and using creative artefacts. Synthesis meetings are used to cluster and categories the data to generate results out of these workshops. As the client and the users are very close, it is easy for them to talk and interact with each other. Nevertheless, this also creates bias which needs to be considered. After each workshop the data is analysed by the designers and used as input in the next step to validate the interpretations and proceed with the next steps. In the end, the findings are handed over to the client in form of concepts and suggest next steps. Using the materials and images from the workshops makes the results more personal and closer for the client.

RQ 3: What impact does user research have on a project?

The result of the project are the generated concepts as well as the suggestion of next steps. The concepts are presented by using images and videos from the workshops in a final presentation. The next steps are explained with the help of illustrations, examples and best practices. Another result is the internal awareness and increased interest in social projects. This impact was directly visible in the designer's explanations and expressions while going through the documents. Also, other designers in the agency are impressed by the project, seeing the artefacts from the workshops. On the client's side the user research had impact on the mind-set as well - unfortunately, not as much as the designers planned to.

5.4. Case Study for Project P4

The project 4 is a redesign project explained by Designer A1 in the Agency A's office. We conduct one interview with the designer, which is lasting for two hours. During the interview, the designer A1 presents the work and the process and shows us the main documents and deliverables. One of the documents for planning is sent to us for in-depth analysis. Pictures, two versions of notes and the recorded audio are used for further analysis. The synthesis and interpretation session for the primary data analysis happens directly after the interview.

Background

Type	Re-Design (improvement of existing product) - Accessibility project	
Outcome	Specifications for improvements	
Duration	2 months (including proposal)	
Agency: Roles and Responsibilities	1 Project Manager 1 UX Lead 1 UX Assistant 1 Copywriter 2 User Test Facilitators 1 Front-end developer	Suggest project Evaluate the systems for existing problems Do user research on these problems (including the recruitment for users) Deliver suggestion for improvement
Client: Roles and Responsibilities	1 product specialist	Decision Feedback
3rd Part: Roles and Responsibilities	Development Agency: 2 Developers	Technical supervision Providing feedback (feasibility) Technical implementation
Client characteristics	Previous collaboration Regular (non-project related) meetings with client and agency Flexible and a bit unclear structure Ongoing collaboration in other fields (such as social media)	
Client-Agency Relationship	Little collaboration in this project Flexibility allowed them to suggest projects (more freedom) Only direct collaboration with third party developers	

Process	Phase 1 - Planning	Initial Research Proposal Project Plan
	Phase 2 - Inspiration	Desktop Research Audit - Expert Evaluation
	Phase 3 - Ideation	Identification of Problems (Prioritize) User Testing Design Specifications
	Phase 4 - Final Design	Specification Document Feedback and Improvements

Table 14 – Background P4

Description

The project is initiated by the agency, after the project manager has been confronted with the accessibility issue and discussed possible issues for user with the UX designer. Following this, the designer starts with an initial desktop research to evaluate existing problems and to have a basic knowledge in the area. With the results from the first research, the agency gives a proposal presentation to the client, including the background and the existing problems. The research results are used as evidence and to help the agency to sell this project. After the client approves the project, the designer categorizes the findings and creates a proposal plan. In the plan, user flows and sitemaps are used as communication tool that gives clear instructions of what and where to improve. Based on this plan, the designer starts with the auditing process by digging into deeper into the existing problems. A previous project is used to plan and define the outline for the auditing document. In the next step, to validate the findings and user needs in this specific area, the agency conducts user tests. The user test not only proves the found problems but also gives a lot of inputs that the designer did not consider before. Building on all the findings from auditing and user test, the designer analyses the data and creates personas combined with current problems, which are presented to both client and developers. In the presentation, pictures and quotes are used to provide evidence for the findings. The presentation is adapted to the audience according to their different focus areas. Both include the domain background and the results from audit and user tests. In the presentation for the developer, the designer focuses on feasibility issues and test the structure of the final deliveries.

Based on the feedback from clients and developers, the designer integrates the finding, research insights and design principles into a specification document. According to the designer, she thinks the project changes the perception and awareness of the topic for both agency and client.

Model

The model shown in Figure 15 illustrates the process of the project. A bigger and more detailed version of the image can be seen in the appendix (A06 - Model P3). The model highlights that research is used to support the proposal. The main steps are desktop research, expert evaluation and user testing. One important impact can be seen in the end, where the format of the final deliverables is tested with the developers to create actionable results.

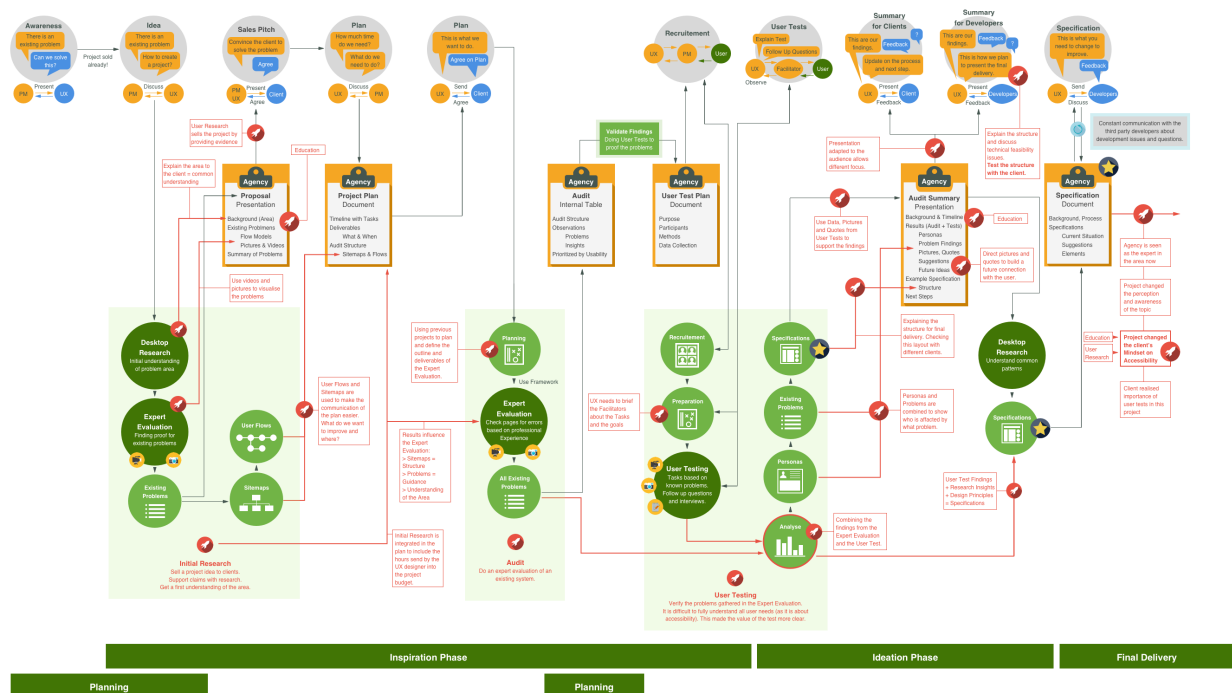


Figure 15 – Model P4

Initial Insights

No.	Insight	RQ1	RQ2	RQ3
4.1	Selling, type of project, goal influence the planning.	✓		
4.2	User Research can be used to provide evidence and sell a project.			✓
4.3	HCD projects can include elements of education.			✓
4.4	Previous, long-term relationship allows a more flexible planning, communication and decision-making thanks to clear responsibilities.	✓	✓	
4.5	The designer's experience and knowledge play a role in planning when to do which method.	✓		
4.6	Information is repeated throughout the project and builds on each other (to avoid communication issues and ensure complete communication)		✓	
4.7	Previous projects are frameworks & provide structure	✓		
4.8	Research about how to present and package helps to create actionable user research.		✓	
4.9	Changed mind-set is a big impact (on agency & client side)			✓
4.10	Having a user “far away” from the client (physically, mentally, location age, knowledge, ...) makes the need for user research more obvious.	✓	✓	✓
4.11	Deciding on a project yourself creates ownership.	✓		
4.12	The first step is to get an understanding and build a basic knowledge of the project’s domain. This knowledge (about the clients and domain) shapes the design process.	✓	✓	

Table 15 – Insights P4

Answers to the Research Questions

RQ1: How is the integration of user research in HCD projects planned?

The project is planned and proposed by the agency. The initial plan is used to sell the project, and then detailed plan is added in the later phase.

The motivation to do user research is the accessibility topic, which requires to involve the real users to fully understand the problems and needs. The planning is influenced by the unknown domain, by the third-party developers and by the close and long relationship between clients and agency.

RQ2: How are results of applied user research collected, analysed and communicated?

The designer use lists, sitemaps and user flows to describe and categorize the collected data. To create insights, the designer uses the context to understand the problems and conducts user test to validate the previous research results. In the following process, the data is used to plan the next steps. For example, pictures and quotes are used to support the claims. In the end, the research results are handed over to the third-party developers using specification documents. To ensure a consistent communication, constant feedback is given directly at every point in the process. Also, to let the developer understand the structure, the designer creates a test document before presenting the final delivery.

RQ 3: What impact does user research have on a project?

The result of this project is delivering and presenting a specification document with detailed suggestions how to improve an existing system. Another result is that both, client and agency, have a changed mind-set about the domain and user research. After the project, the clients see the agency as an expert within the domain and ask questions for other projects as well. User research helps the agency to understand the area and the problems. The user test helps the designer to find more problems and to get insights in the user's behaviour. The user research also ensures a good and consistent communication between clients and agency.

5.5. Case Study for Project P5

The project P5 is a redesign project presented by Designer A3 in a skype call. The interview takes two hours and during the interview designer A3 shows us the process and how they generated the results. Some documents and deliverables are also presented to get a deeper understanding. We also talk to the UI designer who was involved in the final deliverables of this project to see how the work is handed over. Some screenshots of deliverables, two versions of notes and recorded audio are used for further analysis. The synthesis and interpretation session happens directly after each interview.

Background

Type	Audit & re-design, improve existing product	
Outcome	New design specifications	
Duration	12 months (not full-time)	
Agency: Roles and Responsibilities	2 UX designers 1 UI designer 1 Product manager (PM changes)	Evaluation (audit and test) Re-design Deliveries User contacts
Client: Roles and Responsibilities	Technical experts Content experts	Expert for the domain Discussion Answer all questions, give feedback Participate in the workshop
Client characteristics	No previous knowledge about domain A lot of technology and security related issues Huge use basis, large span (age, abilities...)	
Client-Agency Relationship	Good relationship Collaborative	
Process	Phase 1 - Planning	Briefing Desktop research
	Phase 2 - Inspiration	Desktop research User study Workshop
	Phase 3 - Ideation	User flow Prototype User test Sprints for developing wireframes UI sprints
	Phase 4 - Final Design	Final presentation with interactive prototype

Table 16 – Background P5

Description

The project is separated into two parts. The goal of first part is to audit and redesign the existing mobile application. The second part focuses on a redesign for the website. Both parts include UI designers and developers.

Part 1

The first project starts with a small pre-project after the client requests a proposal for a given scope and goal. For the pre-project, the designer conducts a web analysis to get a first understanding about the domain and existing problems. Doing the pre-project shows the agency's skills and a possible direction, which helps to sell the project. After the client agrees on the project, the designer analyses the existing problems in depth and packages them into sitemaps and templates. Next, the designer presents the results with possible solutions. By building up arguments for each problem, it helps to reduce the negative effects and it directly shows that all problems can be solved. After the presentation, the designer conducts stakeholder interviews to understand the different stakeholder's needs and gather more information about the users. With all results the designer delivers a user study presentation as a basis for the ideation workshop. In the workshop, the designer and the client work together building the different concepts. Next to analysing all the ideas from workshop, the designer packages them to new user flow and presents them to the clients. Different alternatives are created to give the client more options and avoid feasibility issues. All the ideas are supported by UX aspects with advantages and disadvantages. During the presentation, the designer and client discuss the alternatives together and decide to work on one flow. The next step for the project is to visualize the ideas and to build prototypes. To get more understanding of the end-user, the designer conducts a user test, which is not part of the plan from beginning.

Building on the results from the user test, the designer creates personas and lets the client sees the value of user tests by showing the results. Because of the positive results from the user test, the client changes the mind-set about their users and continues with the user tests for the future projects.

Part 2

The second part is divides into different sprints. The first UX sprint starts with card sorting, where the designer uses the results from the previous part to analyse and find the best sitemaps and users stories. The designer also considers different competitors and evaluates UI templates.

With the client's feedback the designer creates interactive wireframes and updates them in several iterations. When the UX work is done, the designer hands the following work over to UI designer and supports the UI if there are any questions. During the sprints, the UX designer, UI designer and clients have a very close communication about the state of development and for the feedback and questions.

Model

Figure 16 shows the model describing project 5. The grey boxes separate the process into two parts. The green areas in each grey box show how each project is planned individually and how they are connected. The circles with the numbers one to three are used to indicate the three different sprints in the second part of the project. A detailed version of the model can be found in the appendix (A08 - Model P5).

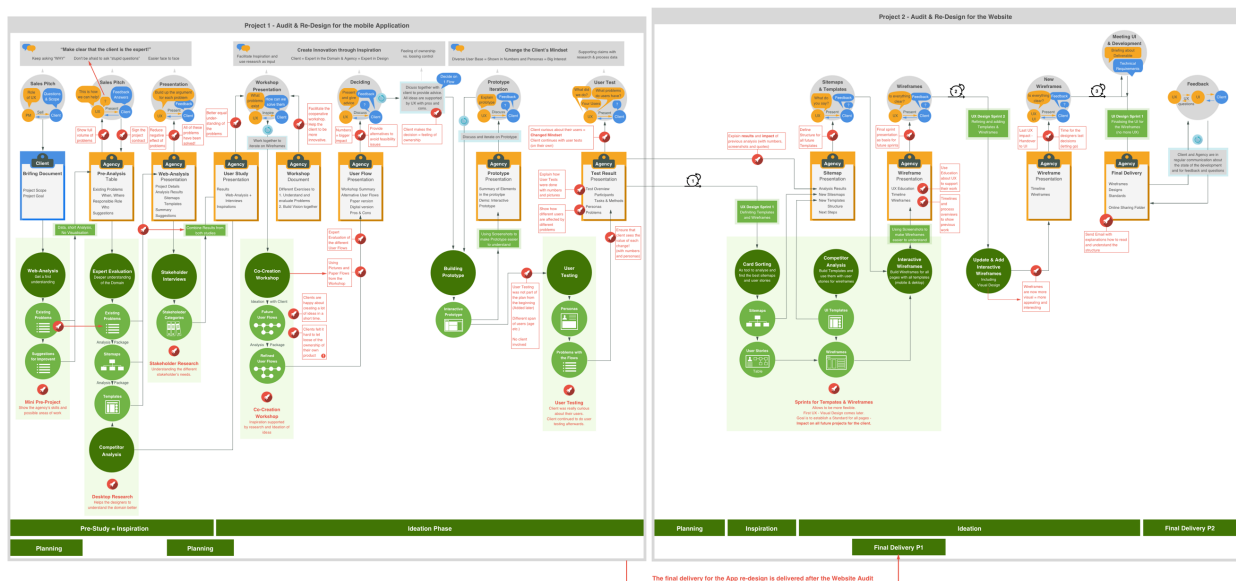


Figure 16 – Model P5

Initial Insights

No.	Insight	RQ1	RQ2	RQ3
5.1	Small pre-projects provide a better understanding of the client and are a good selling tool.	✓		
5.2	There are no stupid questions in the beginning of a project. Always continue asking “why.”	✓		
5.3	Problems should be presented step by step to avoid a shock for the client.		✓	
5.4	Co-creation workshops depend on if it is about an existing product (= client might be afraid to change) and if the client is old fashioned (= needs help to innovate)		✓	
5.5	Providing several alternative solutions reduces the risk of feasibility issues and allows the client to make the final decision (and to feel ownership).		✓	✓
5.6	No previous knowledge about the users makes it easier to convince clients about the value of HCD.			✓
5.7	The impact can be a more long term when delivering templates which help to establish standards.			✓
5.8	Education is done in visible and invisible ways.			✓

Table 17 – Insights P5

Answers to the Research Questions

RQ1: How is the integration of user research in HCD projects planned?

The planning for this project starts when clients give the request. The agency uses a pre-project to show their skills and existing problems, which helps to sell the project. The client involvement is directly included in the initial plan. Doing a good plan helps to understand the client’s need and their domain. In the beginning of the plan, the designer decides to start with the pre-analysis, desktop research, interviews and then conduct workshop with clients to generate ideas, the user test is not planned in this phase but add it later during the product development.

The influencing factors for planning are the project types (redesign project), the large span of user groups and that the client does not have any previous knowledge in user research and their users.

RQ2: How are results of applied user research collected, analysed and communicated?

To analyse and package the results, the designer uses some techniques such as card-sorting, personas and user stories. To create more insights, the designer conducts workshop and brainstorming, and then presents the results using user flow, sitemaps and templates. The reasons to use these methods are that the agency wants to find out the problems and at the same time provide education to the client.

Gathered data is used as a foundation and support the following steps. Other sources of data are used to validate the findings. The main handover in this project happens between UX and UI first and UI and client second. Regular meeting with the clients to ensure a common understanding and constant feedback from the client support the communication. The UI designer is involved from the early phase of this project. This makes the handover easier.

RQ 3: What impact does user research have on a project?

The result of the project is an auditing document and a redesign for a new product that is directly implement. The client trusts the user research and wants to know more about their users. They also want to do the user test by themselves in future projects. Because of client's high involvement during the process, the client feels the ownership for this product. User research helps to identify problems and to understand the different group of users and their needs. It also builds a solid step for the design process and has a direct impact on the communication.

5.6. Case Study for Project P6

The project 6 is a small innovation project presented by Designer A1 in the Agency A's office. We conduct a two hours long interviews with the designer and she presents the project and the process. She also shows us some documents and deliverables. Pictures, two versions of notes and recorded audio are also used for further analysis. The synthesis and interpretation session is conducted directly after the interview session.

Background

Type	Innovation project – New feature development, Branding	
Outcome	Finalised and designed new feature	
Duration	1 month	
Agency: Roles and Responsibilities	1 Product manager 1 UX designers 1 UI designer 1 Copywriter	Propose the project Research the context Concepts
Client: Roles and Responsibilities	Marketing person Stakeholders	Expert for the domain Discussion Make decisions
Client characteristics	Project is seen as light UX work, heavily relying on design Close collaboration between UX and UI Branding as the main purpose	
Client-Agency Relationship	Good relationship Collaborative	
Process	Phase 1 – Planning	Research before proposal Proposal
	Phase 2 – Inspiration	Desktop research
	Phase 3 – Ideation	Ideation meeting Concepts
	Phase 4 – Final Design	Final deliveries

Table 18 – Background P6

Description

The project is initiated by the agency. To better understand the issues and to provide a convincing proposal, the agency conducts desktop research. After analysing the findings, the designer proposes a research document, introducing the background and opportunities. The proposal is presented to different departments at the client and feedback is given from different perspectives. Pictures and details found in the initial research are used in the presentation of supporting evidence. After the client approves the proposal, the UX designer starts with more detailed desktop research to define the context and to get a good understanding of the domain.

A UI designer is also involved in the beginning. Based on the research, the UX designer creates different scenarios and groups them with the findings from a competitor analysis. The UX and UI results are combined to create different concepts, which are delivered in an ideation presentation, showing the final results and the process. The client focuses more on the visual deliveries and gives positive feedback on the concepts. After the presentation, the UX work ends and the project is handed over to UI. UI and UX communicate directly about contextual questions and concepts in order to keep the research effort implemented.

Model

Figure 17 shows the model for project 6. The project is quite small, therefore the number of methods used is relatedly small. The model highlights how UX and UI are working together to create a successful project. A detailed version can be seen in the appendix (A09 - Model P6).

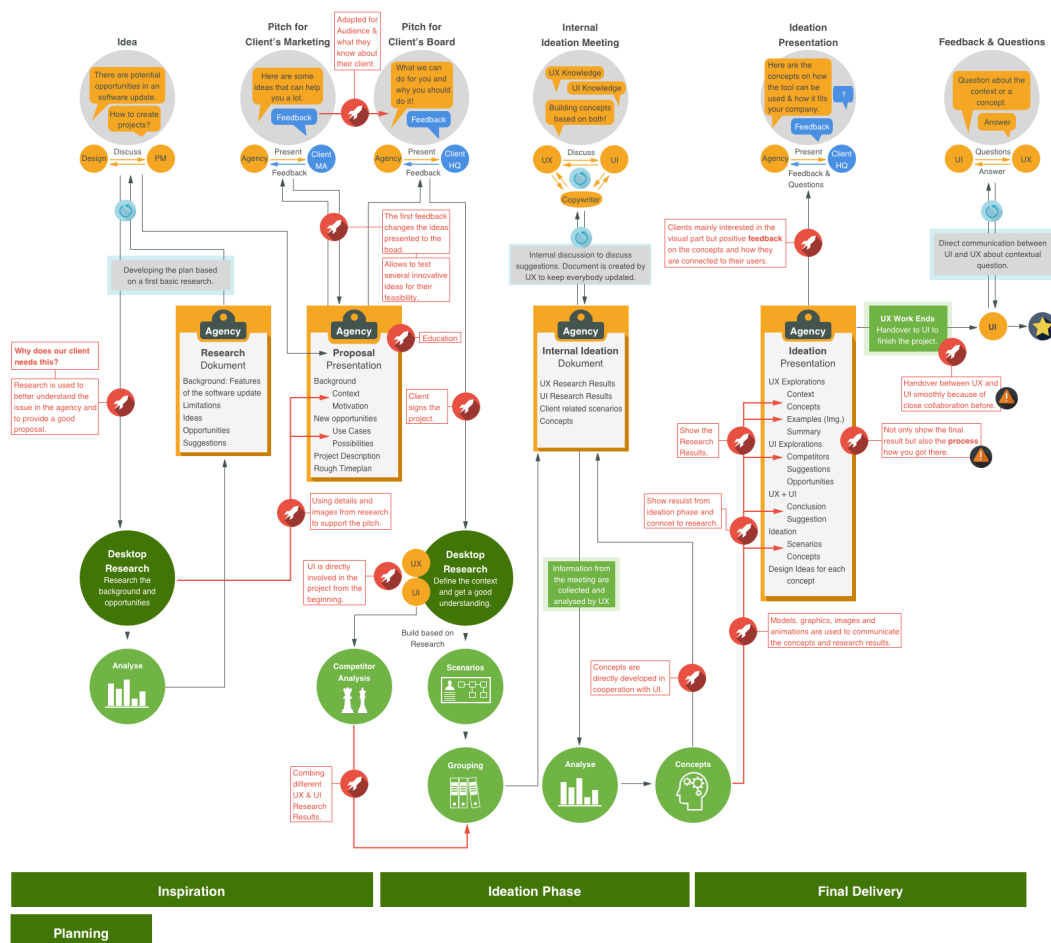


Figure 17 – Model P6

Initial Insights

No.	Insight	RQ1	RQ2	RQ3
6.1	Next to all deliveries, it is important to show the process to proof the agency's qualification & knowledge, to provide evidence, to justify decisions, to put ideas into context and to add the UX perspective		✓	✓
6.2	A good client-agency relationship means that you have different contact persons that you know how and for what to contact them		✓	
6.3	It helps to put features into client's domain context as it improves projects impact, makes communication easier and requires a basis domain understanding by agency	✓	✓	✓
6.4	Thinking in the context of a client in a UX process might limit the innovation because it would be difficult to explain and proof the value of innovative ideas.			✓
6.5	The workload is perceived as the biggest value of a project.			✓
6.6	The amount of user research and UX workload depends on the type of project, the previous experience and knowledge of the client, the designer's background and the company / agency culture.	✓		✓

Table 19 – Insights P6

Answers to the Research Questions

RQ1: How is the integration of user research in HCD projects planned?

The project is suggested by the agency, so the planning for this project is done by the agency without clients. The initial research is used to convince the client and supports the UI work after the concept is done. Handovers are planned in the beginning. Very basic research methods are planned, and the focus is on the features instead of the users. Since the good relationship between client and agency, the designer has more freedom to select the research methods and decide the communication process.

RQ2: How are results of applied user research collected, analysed and communicated?

The designer groups the gathered information and analyse it from different perspectives. The data is used in to support the suggested concepts and helps UI to understand the domain and the users. The main handover is from the UX designer to the UI designer, but as the UI designer is directly involved from the beginning, they make sure that the results are consistent. The influencing factors are the good relationship between client and agency and the different roles.

RQ 3: What impact does user research have on a project?

The result of the project is delivered in form of concepts and the final implemented product. The concepts are presented using pictures and animations. The impact of this project is measured by the customer's feedback. The clients don't only see the final product but also gain a deeper understanding of their users and the reasons to design those features.

5.7. Case Study for Project P7

The final project is a redesign project presented by Designer A2 in the Agency A's office. The interview is delivered in form of a presentation from the designer. We conduct two interviews sessions, each lasting 2 hours. The supervisor for this project is also participating and complements the presentation in the interview. The designer presents the project and the process and shows us the documents and deliverables. Pictures of the deliverables, the set of prepared slides, two versions of notes and recorded audio are also used for further analysis. The synthesis and interpretations sessions take place after each interview.

Background

Type	Auditing (Part 1) and Re-Design (Part 2), Education	
Outcome	Specifications for the re-design	
Duration	Part 1 = 1 month / Part 2 = 4 months	
Agency: Roles and Responsibilities	1 Product manager 1 UX designers 1 UI designer 1 Developer	Audit the existing product Define problems and strengths UX research and design Facilitate workshop Provide education sessions and give exercises UI design and frontend development

Client: Roles and Responsibilities	Two people in Decision Group (Steering), Five people in Project Group (Online Team)	Set scope for the project Provide feedback and deliverables Participate UX and UI workshop Collect data and information Complete the UX and UI exercise
Client characteristics	Successful fashion brand Clients don't have previous knowledge about UX or digital design Education was part of the proposal, but no details on "what" to teach	
Client-Agency Relationship	Collaborative Daily communication (Slack channel) Regular meetings and workshops	
Process Part 1	Phase 1 – Planning	Proposal Auditing
	Phase 2 – Inspiration	Desktop Research Field Research Audit
	Phase 3 – Ideation	Suggestions for Improvement
	Phase 4 – Final Design	Audit Document
Process Part 2	Phase 1 – Planning	Proposal Re-Design
	Phase 2 – Inspiration	Audit Outcome Desktop Research Field Research
	Phase 3 – Ideation	User Analysis Specification of Functionalities Design
	Phase 4 – Final Design	Wireframes & Interaction Specification

Table 20 – Background P7

Description

The project has two parts. The first part focuses on auditing the existing platform and finding problems. The second part aims to redesign the platform and give education about UX.

Part 1

The first part starts with the client sending a request for evaluating and auditing the current online platform. The client wants the agency to look at specific parts of different channels and provide an outsider's view. Based on the requests, the agency creates an audit proposal with a plan. Next, the designer conducts desktop research to gain an initial understanding of the client's domain and their users. In this phase, the designer analyses the internal statistical data investigates different competitors and conducts field visits. At the same time, the designer completes the expert evaluation of different digital channels. All the findings from the desktop research and the auditing are communicated with a presentation, which includes the client's brand advantages, education about UX work, existing problems, the best practices as well as the visions for possible next steps. According to the project manager, it is important to show the strengths of the client, making them feel excited to start the next project.

Part 2

After the presentation, the agency prepares the proposal for the second part. The client agrees on the proposal and requests education to gain a better HCD knowledge themselves. After the proposal gets approved, the designer makes use of the user research results from the first part of the project and creates personas. In the meanwhile, the designer also prepares for the first workshop aiming to teach the basics about HCD. In the workshop, the designer introduces user experience and gives instruction about how to do personas and scenarios. Exercises for data collection are given to the client's project team. After the first workshop, the designer starts to analyse the data she gets and uses the data to update her previous user cases. Based on the use cases, functionalities and wireframes are created.

In the second workshop, the designer teaches how to apply personas and use cases and introduces wireframes. Exercises related to the knowledge from the second workshop are given to the client's project team. Next, the designer starts to prototype by defining the interaction points for the wireframes. Digital wireframes are created and shown in a presentation. Based on the feedback from clients, the designer creates the interaction specification documents with an overview of all pages and instructions. After that, the specification document is handed over to the UI designer and developers. Constant communication between UX and UI makes sure that they are on the same page.

Model

Figure 18 shows the model created for project P7. Two grey frames indicate the two different project parts and how they are connected. The model shows that in the second part the focus is on the education and the main part of the user research is done in the first part of the project. A detailed version is shown in the appendix (A10 - Model P7).

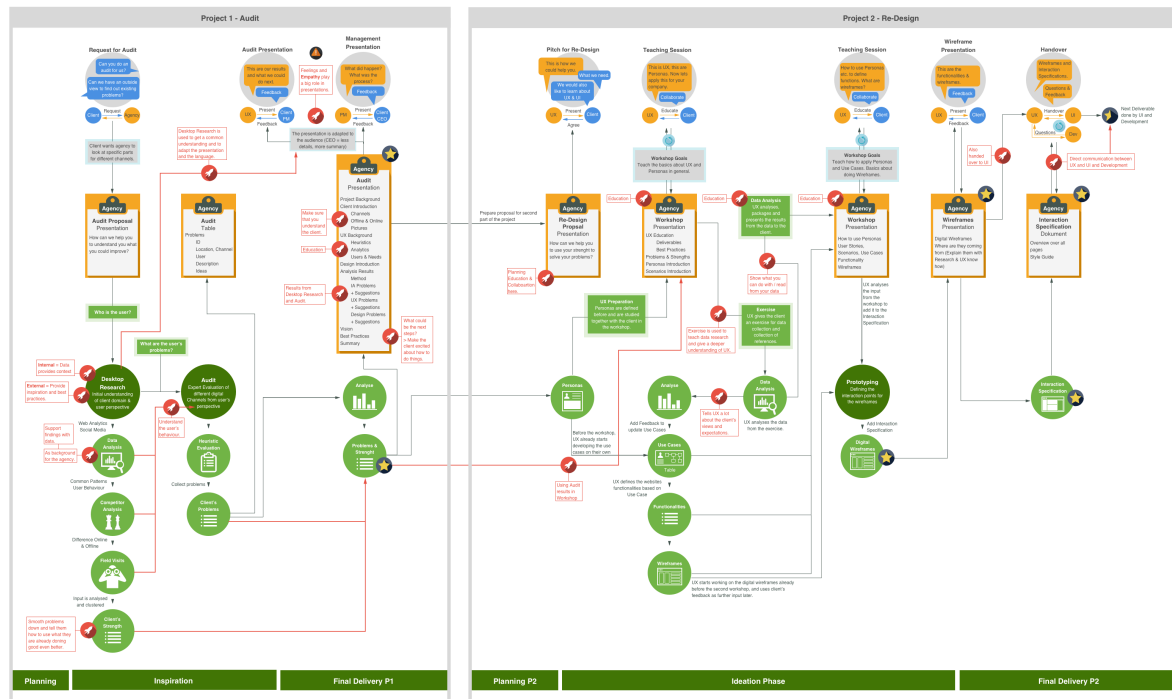


Figure 18 – Model P7

Initial Insights

No.	Insight	RQ1	RQ2	RQ3
7.1	When doing an audit, it is important to not only list problems but also strengths to keep a positive attitude from the client. It makes problems easier to solve (more actionable) and creates a better relationship.		✓	✓
7.2	Taking several channels of data sources as input makes results more meaningful and actionable (ex: data analysis)		✓	

7.3	Audit & Evaluation before re-design enhances the planning and impact because the client knows the problems.	✓	✓	✓
7.4	The goal of the audit is to make the clients think about their problems and strength. How to use the good things? How to solve the problems? It can also sell the second project.		✓	✓
7.5	Common knowledge: UX needs to have basic knowledge and adapts the language in the presentations based on good presentation and listening skills, empathy for client's reactions, the use of common knowledge to build up the relationship with the clients and to validate your understanding of a client (synthesis)		✓	
7.6	Presenting all ideas shows the innovative and creative thinking – you can't show too much as ideas show your skills and that you are a step ahead. The goal is to make the client excited about possible changes.		✓	✓
7.7	Education can also be used for validation / completing the data (proving guidance how to do something).		✓	✓
7.8	Exercise for the client can help to teach and better understand the client's goal, vision, preferences, ideas.		✓	
7.9	Education of UX requires understanding and adapting to the client's processes – knowing your students and how they work and adapt to the previous knowledge. Know how they will use this knowledge.		✓	✓
7.10	For experienced UX designers, it is difficult to explain the individual steps of the process, as a lot of happens automatically.		✓	
7.11	Sometimes it is good to not to be close to the client, to reduce/avoid bias, not doing “over” research and communication too much before the evaluation.		✓	

Table 21 – Insights P7

Answers to the Research Questions

RQ1: How is the integration of user research in HCD projects planned?

The user research is planned in the beginning. Since this project has two parts, the first planning doesn't involve the second one. The first and second part are planned directly after getting the client's requests. The first project is also used for selling the next projects. In the second project, education and redesign is planned at the same time, but the outcome of the education is not matching client's expectation. The problem is that the designer doesn't bring up a plan which integrates the education in the actual design process. The influential factors for planning in this project are the knowledge request from the clients and the communication process between clients and agency.

RQ2: How are results of applied user research collected, analysed and communicated?

Techniques like brainstorming and workshops are used to create insights and generate ideas. The collected and analysed data is used to provide evidence and give support for designer's work. It doesn't have direct impact on the workshop because the workshops only focus on the education. A lot of communication happens in the regular meeting and constant feedback, but most of work is done by the designer itself, therefore the client knows the process but does not understand it. Different locations and expertise background make the communication become more difficult during the process. The clear requests about the education from the client also influence the communication process.

RQ 3: What impact does user research have on a project?

The result of this project is that the designer deliver the auditing documents, interaction specification, wireframes and knowledge about UX and UI. The client is satisfied with the delivered design but doesn't understand the HCD process and how to apply it by themselves. Doing user research in this project helps the agency to sell the second project and to understand the users and their problems. Besides, user research can also provide a basis for the design and give education to the client.

6. Analysis

For the secondary analysis, the validated data and information from the primary analysis of each individual case study is further analysed for patterns and relationships across all cases. Different methods, tables and charts are used to interpret the data and to find generalised concepts and conclusions. The secondary analysis is based on the three research questions, aiming to explore general connections and similarities across the different case projects. Based on the general background information, the project description and models, the first insights and the answers to the research questions for each individual case, this data is now analysed by taking one step backwards, aiming to better see the full study and not the individual case.

6.1. General Case Comparisons

Before starting with the exploring patterns in the planning phase, the various characteristics of all cases are placed next to each other to allow a first informed look at all cases at once. These tables are used as an overview and input when exploring the individual research questions. Therefore, the tables themselves are only listed here and not analysed directly. They are used in the analysis to color-coded and group the cases based on specific characteristics in order to better find patterns and connections.

First, the main characteristics such as type, duration size and number of project parts are compared in Table 22. The information if a project is structured or unstructured is based on the client characteristics as well as the designers own impression of the planned process. If a project size is defined based on the given project frame as well as the designer's statements.

	P1	P2	P3	P4	P5	P6	P7
Type of Project							
Innovation	✓	✓	✓			✓	
Re-Design				✓	✓		✓
Structured	✓	✓		✓	✓	✓	✓
Unstructured			✓				

Duration							
Long (3+ months)	✓	✓			✓		✓
Short (under 3 months)			✓	✓		✓	
Size							
Big	✓	✓			✓		✓
Small			✓	✓		✓	
Number of Project Parts							
1	✓		✓	✓		✓	
2		✓			✓		✓
The Project is initiated by ...							
Agency				✓		✓	
Client	✓	✓	✓		✓		✓

Table 22 – Comparing Project Characteristics

Next, the previous and project specific collaboration between the client and the agency is compared to each other. The previous collaboration is only concerning previous projects with UX or HCD work included. Projects by other parts of the agency or individual people are not taken into consideration. The level of collaboration in the project is defined based on an analysis of the individual model for each case and the designer's own statements. How this collaboration looks like is more deeply analysed later. Next, the table lists the roles involved on the agency's side to examine the amount of collaboration and communication needed insight the team. Finally, it is determined if the final delivery is handed over to the client directly or not.

	P1	P2	P3	P4	P5	P6	P7
Previous Collaboration between Client and Agency							
Yes				✓		✓	
No	✓	✓	✓		✓		✓
Level of Collaboration in the Project							
High	✓	✓	✓				
Medium					✓		✓
Low				✓		✓	

Involved Roles in the Agency							
UX	✓	✓	✓	✓	✓	✓	✓
UI	✓	✓			✓	✓	✓
Project Management	✓	✓	✓	✓	✓	✓	✓
Developers		✓		✓			✓
Others (assistant, copy writer)				✓		✓	
Final Delivery goes to ...							
Client	✓	✓	✓			✓	✓
External Party				✓	✓		✓

Table 23 – Comparing Project Collaboration

Table 24 is listing the different client and user characteristics. The distance between the designer/client and the user describes the geographical, physical and mental distance but also differences in age, culture and location. These characteristics are used to explore the influence of biases and pre-existing knowledge.

	P1	P2	P3	P4	P5	P6	P7
Existing Knowledge about HCD							
Yes	✓			✓		✓	
No		✓	✓		✓		✓
Distance between the designers and the users							
Far distance	(✓)		✓	✓			
Close distance	(✓)				✓	✓	✓
Distance between the client and the users							
Far distance				✓			
Close distance	✓	✓	✓		✓	✓	✓

Table 24 – Comparing Client Characteristics

The final comparison looks at the success of a project. The difference between successful and unsuccessful, in this case, is done based on the designer's statements and judgment.

Finally, Table 25 compared if education about HCD was planned as part of the project and if the designers perceive it as successful.

	P1	P2	P3	P4	P5	P6	P7
Project Success							
Yes	✓	✓		✓	✓	✓	
No			✓				✓
Influenced the Client's Mind-Set							
Yes		✓		✓	✓		
No			✓				✓
N/A	✓					✓	
Education is a planned Part of the Project							
Yes		✓	✓				✓
No	✓			✓	✓	✓	
Successful Education							
Yes		✓		✓	✓	✓	
No			✓				✓
N/A	✓						

Table 25 – Comparing Project Results

Based on these tables and the primary data analysis, more general insights about the planning, communication and impact of user research are analysed.

6.2. Planning

First, the seven cases are analysed for how research is planned, how the different projects and client characteristics influence this and how agency and client collaborate in planning. The goal is to understand how planning affects the user research in an HCD project in general. After exploring factors, collaboration and motivations, a more general analysis of the planning phase collect all these findings once more to achieve one higher level of abstraction.

Influencing Factors

As the first step, all factors that influence the planning are compared and analysed across the different cases. These factors can be split up into client, project and agency related factors.

Client Related Factors

The client characteristics as size, structure and culture play an important role in all seven cases. In five out of seven cases, the amount of client involvement in the project also influences the planning phase. The client's existing knowledge about HCD can be very influencing (observed in three out of seven cases) or less influencing. In most of the last cases, the agency and the client have been working together on previous projects, so the client's level of knowledge is not a major factor because the client trusts the agency that they know what they are doing. The distance between the user and the client as it can be seen in Table 24 is another influencing factor in the planning, as it makes the argument for HCD stronger when the client is further away from the user. The final client related factor is the relationship between the client and the agency. A close design collaboration in previous projects resulted in a higher trust and autonomy for the agency.

Project Related Factors

Project related factors that played a role in the planning phase are:

- The type of project is important
- The project scope always influences the planning
- The end user characteristics play a role in all cases
- It always plays a role who initiates the project
- The different involved roles and parties influence the planning
- The project/client domain is
 - very influencing in four cases
 - less influencing in three cases
- Barriers (such as language, ...) played a role

Agency related factors

In the agency, the main influencing factor in all seven projects is the designer's previous knowledge and experience, the previous work experience with the client and the agency characteristics as size, budget and culture. The intention for planning differs between the cases as well. In all cases, the goal is to satisfy the client, but also to sell the next project and change the client's mind-set in the planning phase. The distance between the user and the designer also affects the planning.

Planning in Cooperation with the Client

Next, it is analysed how the planning happens in cooperation with the client across all cases and what influences this collaboration.

Type of Project

When the agency starts a project, they do most of the planning without involving the client at all. The client is only agreeing on the different steps. In this case, the agency owns the process and drives the project. They make all necessary decisions about the process the steps. This has been observed in all projects that are initiated by the agency. The plan does not change a lot because the agency can build a stable plan. The reason for this is, that the agency knows the goals and directions in this case, what allows them to make a more precise plan.

For evaluation and re-design projects, which are initiated by the client, the agencies might first do a pre-project, focusing on the evaluation and understanding of the existing problems. The goal and the direction of these projects are relatively clear which leads to fewer changes in the process but still requires adaptations and evaluation of the plan over time. In the two projects of this type, the client and the agency look at the plan together at several stages in the process. The client owns the problem and the goal, so they need to check more often with the agency if the project is going in the correct direction and following the goals. It requires a higher collaboration between the agency and the client in at all main stages in the process. In none of the cases, any big initial research about the goals is used but constant feedback and communication on the process are necessary.

Innovation projects initiated by clients are harder to understand for the agency. They need more client involvement and discussions to get a better feeling for the direction and the scope of the project. Cooperation between the agency and client is necessary because the client owns the goal and the direction. Clients and agency need to work together very closely and the plan needs to be flexible and open. Details are filled in later when the goal and direction are clearer for the agency.

Based on these observations, the amount of collaboration in the planning phase depends on the project type. The project type defines who owns and knows most about the project scope, goal and direction what directly influences the amount of work necessary to build a stable plan. It also indicates that in the different kinds of projects, the plan is used with different intentions.

Client's knowledge about HCD

When the client has a high knowledge about human centred design, the clients decide on the outline of the process, the agency only fills in the details but when the client has no previous knowledge about human centred design, the agency decides on the process and the clients participate in nearly every step of the process.

Necessary Steps in Planning User Research

The second area of interest, what steps are planned by the designers to create in cooperate user research in a project and how these are influenced the type of project and the client-agency relationship.

Type of Project

In innovation projects, designers start by planning to get a deeper understanding of the client's and the project's domain. Next, they plan how to get an understanding of the client's users before applying this knowledge to build concepts.

In most of these cases, the designers plan to evaluate the findings with the users. In three out of four cases, selling a project is supported by user research to show the agency's skills and to make the client sign the contract. In general, this shows that user research is planned for all steps of the process - from selling to the final delivery.

In Re-Design projects, the necessary steps are much more defined. Starting with an evaluation and continuing with a re-design part. In two out of three cases, the designers plan to evaluate the findings with the users.

Previous Collaboration

If the agency does not have any previous project experience with the client, the designer's feedback is that they wish to have more research about the client in the beginning of the project to better understand the necessary deliverables and the client's structure, which can improve the communication. We received this feedback in four out of five cases. When the agency has a lot of experience working with a client, the understanding of the client and the client's expectations do not need to be researched in the beginning.

Motivation for doing User Research

Third, it is analysed what the different motivations for doing user research are and how these motivations are influenced by the type of project.

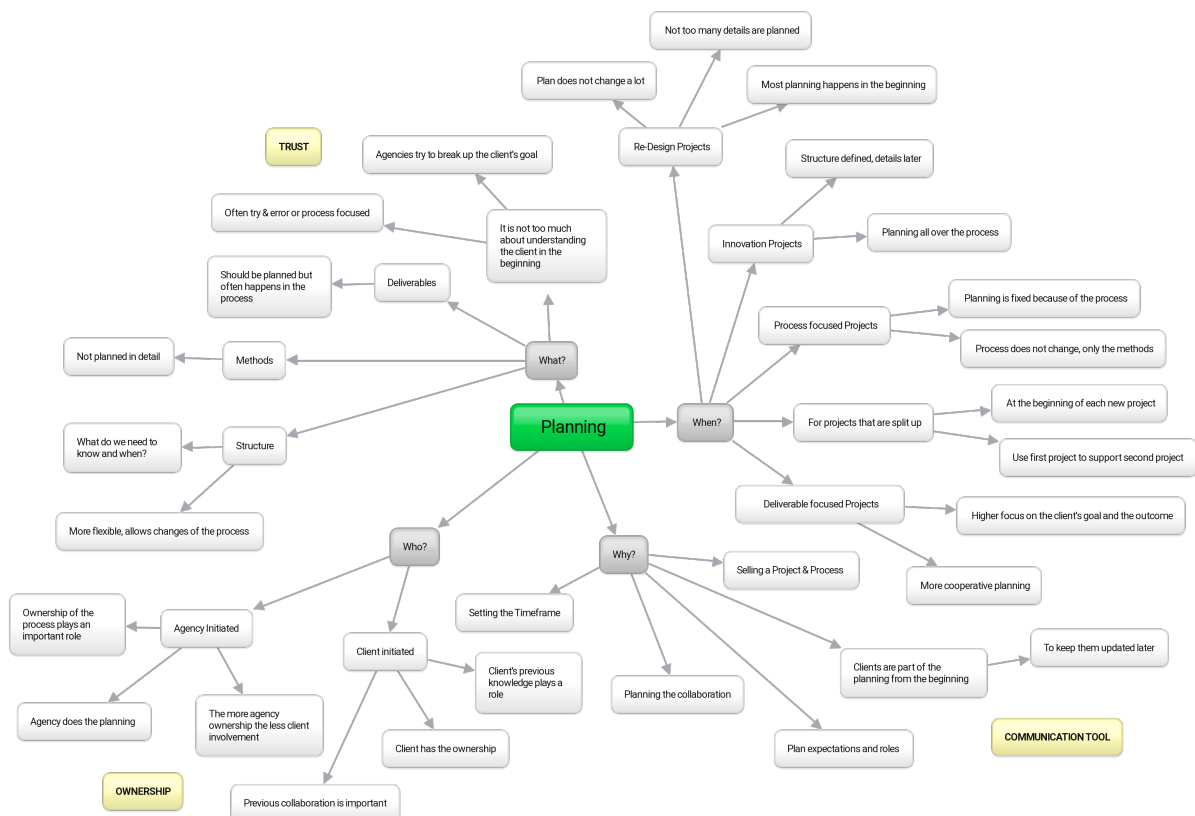
The first observation is, that for all types of projects, user research is used to sell the project. For innovation projects, the motivation for doing user research is to generate ideas and to show the agency's skills and experience to support their concepts and ideas. As ideas are otherwise coming "out of nowhere", the designers need to prove where the ideas are coming from and why they are valid. Research is applied to generate something that supports the ideas and concepts. For re-design projects, the motivation is to find, evaluate and solve problems. Next, research is applied in these projects to understand the users and their needs.

Planning User Research Methods

Finally, it is analysed how user research methods and techniques are planned. It shows, that six out of seven projects begin with research that is done by the agency alone. Applied methods are desktop research, competitor analysis, heuristic evaluations and more. Real users are only seldom involved in the data gathering phase. Two out of seven projects used interviews, observations or workshops to directly involve users in the data gathering. But five out of seven projects are planned to include methods for collaborating with the client in the ideation phase. The projects without collaboration are projects where the client has a well-established relationship with the agency. Five out of seven projects include methods for validation of their findings, by integrating user testing, workshops and interviews. These five projects all involve the real end user in the validation.

General Analysis

Taking one more step backwards and looking at the planning in general, the patterns shown in Figure 19 can be found.



created with www.bubbl

Figure 19 – Mind Map Planning

The mind map highlights that planning is used for different reasons and at different points in time. Focusing on the various roles that a plan can take in a human centred design process, it became clear that a plan needs to be seen as an artefact and not just as a planning phase in the process. Trust, ownership and communication are all affected by how, when and by whom the planning is conducted. A more detailed version of the mind map can be found in the appendix (A11 – Planning).

Having explored ownership as one of the main elements of the planning process, Table 26 analyses who owns the problem, the process and the project in the individual cases. Outlining cases are marked with red. “C” stands for client and “A” means agency.

Ownership	P1	P2	P3	P4	P5	P6	P7
Who owns the problem?	C	C & A	C & A	A	C	A	C
Who owns the process?	C	A	A	A	A	A	A
Who owns the project?	C	C	C	A	C	A	C

Table 26 – Analysing the Ownership

P2 and P3 are both projects with a fixed process, where the planning is not used to understand the client or domain. As for these cases the selling point was the process rather than the project outcome, the agency used a fixed process to help the client better understand their problem and to be more innovative. P1 owns the process due to the high knowledge that the client has about HCD. With the proposal, the client already has clear expectations what to expect from the agency and the process. In agency initiated projects, the agency owns the project and sets the project frame by themselves.

6.3. Actionable User Research

The second focus area of this thesis is the collection, analysis and presentation of user research data. This part shows the analysis of the applied user research methods, aiming to explore patterns and connections between the communication elements and the types of projects. The most important influencing factor for the inspiration, ideation and final design phases is the type of project.

For most innovation projects, the inspiration phase happens as cooperation with both client and users and for redesign projects, the inspiration phase starts with research and collecting data before applying user test and developing a persona in the ideation phase. The user tests are introduced as support for previously found or already fixed problems.

Data Collection

To get a better overview of the methods applied for data collection, Table 27 collects all used methods and shows the way that data has been collected for these methods.

Method	Outcome
Online Research	Excel sheets, documents, images, screenshots, videos
Expert Evaluation / Auditing	Excel sheets, documents, screenshots, videos
Heuristic Evaluation	Excel sheets, documents
Data Analysis	Excel sheet, graphs, documents, models, numbers
Document analysis	documents, models, notes
Interviews	Transcripts, notes, audio recording, video recording, pictures
Field Research	Notes, pictures, video recording
Observation	Notes, pictures, video recording
User Shadowing	Notes, pictures
Inspiration Workshops	Co-created Artefacts, notes, pictures, video recording
Card Sorting	Notes, audio recording, video recording, transcripts
Competitor Analysis	Document, images, screenshots, pictures, videos
Focus Groups	Audio recordings, video recordings, transcripts, notes, pictures

Table 27 – Data collection methods and outcome

The following table shows analyses which methods are used in which project. It also indicated if the agency has been working alone (A), with the client (AC) or with the client and the user (ACU) to gather this data.

Method	P1	P2	P3	P4	P5	P6	P7
Online Research	✓	✓		✓	✓	✓	✓
Expert Evaluation / Auditing				✓	✓		✓
Heuristic Evaluation	✓						✓
Data Analysis	✓						✓
Document analysis		✓					
Interviews	✓ (ACU)	✓ (AC) (ACU)			✓ (AC)		
Contextual Interview	✓ (ACU)	✓ (ACU)					
Field Research	✓ (A) (ACU)						✓ (A)
Observation	✓ (ACU)						
User Shadowing	✓ (ACU)						
Inspiration Workshops		✓ (ACU)	✓ (ACU)				
Card Sorting	✓ (ACU)				✓ (A)		
Competitor Analysis	✓				✓	✓	✓
Focus Groups	✓ (ACU)						

Table 28 – Analysis of Data Collection Methods

As it can be seen in Table 28, nearly all projects start with an online research to get an understanding of the domain. Re-design projects begin with the auditing of existing websites to find problems that can be solved with a new design. The table also highlights that no innovation project is using auditing in the inspiration phase.

One main influencing factor on the selected method for data collection and the level of collaboration is the project size. Bigger projects allow for more methods in the data gathering phase, what allows a better triangulation of the data, as several sources are used for input. This allows the designers to be surer about their solutions and to have more data to support their claims. In smaller projects, designers have less sources of incoming data. They ensure the validity of their data and the client's trust in their findings by having a high client and user involvement in the data collection and when building the vision (one out of three small projects) or they base it on trust generated with previous project collaborations (two out of three small projects).

When looking at the choice of methods for data collection and the level of collaboration, the following can be analysed.

- When the data collection in the inspiration phase is done by agency alone, the preferred method is online research.
- Another preferred method for data collection without any cooperation is auditing but this method is only used in re-design projects.
- If the data collection is done by agency alone, they try to consider different sources. The amount depends on the project size.
- Most projects with a high agency-client interaction have a high collaboration in the data collection phase.
- Using data collection methods together in collaboration with the client increases the chance for a successful project.
- In one out of five projects with a client-agency collaboration, the project was unsuccessful because the client and agency were not working together but separately most of the time.

Describing Data

The following methods and techniques are used to describe data after the collection is finished:

- Listing of insights and findings (in documents)
- Site-maps to analyse and describe the current structure of a page
- Personas for categorising and describing the different users and their needs
- State of the art scenarios to describe how users interact with a system/product/tool
- State of the art user flows to describe how users interact with a system/product/tool
- Analysing co-created artefacts (using original documents, cleaning, analysing the data)
- Best practices to highlight the client's and the competitors' strength
- Synthesis Workshops
- Other ways of categorising the collected data to find common patterns and concepts

Table 29 shows the methods to describe data for each project.

Method	P1	P2	P3	P4	P5	P6	P7
Lists		✓		✓	✓		✓
Site Maps				✓	✓		
Personas	✓	✓		✓			✓
Scenarios	✓				✓	✓	
User Journeys		✓	✓				
User Flows				✓			
Co-Created Artefacts		✓	✓				
Best Practices	✓				✓	✓	✓
Synthesis Workshop	✓		✓				
Categorising	✓		✓		✓	✓	

Table 29 – Methods to describe Data

The following table combines the methods to represent data (Table 29) with the matching methods to collect data (Table 28).

	P1	P2	P3	P4	P5	P6	P7
Online Research	Scenarios Best Practices Categories	Personas		Lists	List Best Practices	Scenarios Best Practices Categories	List Personas Best Practices
Auditing				List Site-maps User flows	List Site-maps Best Practices Categories		Lists Personas
Heuristic Evaluation	Best Practices Categories						Lists Personas
Data Analysis	Scenarios Categories						Lists Personas Best Practices
Document analysis		Lists Personas Scenarios User Journeys					
Interviews		User Journeys		Lists Personas	Categories		
Contextual Interview		User Journeys Co-created Artefacts					
Field Research	Persona Scenario Synthesis Categories						Lists Personas Best Practices
Observation	Persona Synthesis Categories			Lists Personas			
User Shadowing	Persona Synthesis Categories						
Inspiration Workshops		Lists Personas User Journeys Co-created artefacts	Personas User Journeys Co-created Artefacts Synthesis Categories				
Card Sorting	Persona Synthesis Categories				Lists Scenarios		

Competitor Analysis	Best Practices Categories				Best Practices Categories	Best Practices Categories	Lists Best Practices
Focus Groups	Persona Synthesis Categories						

Table 30 – Combining Data Collection and Data Presentation

This analysis shows that most of the projects use methods that allow storytelling for gathering their insights. The most commonly used tools to describe data are best practices and personas. Lists are a good technique to structure and analyse data for different methods. They are used for collecting problems (in redesign and innovation projects) and when the agency does not have an extensive collaboration with clients in the data collection and analysis phase. This might be because lists are an easy way to deal with a huge amount of data. Furthermore, lists are often used in projects with a second part. One reason for this might be that this way designers can show a huge amount of opportunities and possible ideas for a second project. Best practice is a good way to collect and use findings from online research and competitor analysis. Best practice is a technique that is used in innovation projects and re-design projects, to analyse what others are doing and how this can be translated to the own project. In two out of four projects, best practices are used for selling the second part of the project. Personas are created by a wider range of methods in different projects. All projects use several sources to build personas. The higher the client involvement is in the state of the art analysis the more storytelling methods are used to analyse and communicate the state of the art situation in cooperation.

The storytelling methods are used for the client, not for the agency. The agency wants to make the work easier to help the client understand and to be more convincing. The fewer clients are involved in the state of the art analysis, the less storytelling methods and more lists, sitemaps and other ways to efficiently write down findings for the next steps are used. In four projects, the way of categorising is adapted to the project. They don't use standard ways but adapt the categories to the project and the client.

Gathering Insights

The following methods are used to generate insights. Table 31 also states of the client (AC) or the client and the user (ACU) are involved in these methods.

Method	P1	P2	P3	P4	P5	P6	P7
Analysis	✓	✓	✓	✓	✓	✓	✓
Ideation Workshop	✓ (AC)	✓ (ACU)	✓ (ACU)		✓ (AC)		
Brainstorming	✓ (A)	✓ (A)	✓ (A) (AC)	✓ (A)	✓ (A)	✓ (A)	✓ (A)
Validation	✓ (AC) (CU)	✓ (ACU)	✓ (AU)	✓ (AU)	✓ (AU)		

Table 31 – Methods for Concept Development

When gathering insights only in the agency, the designers use the collected data and artefacts to generate ideas based on the described and categorised data. The designer uses several sources of data to form their ideas from several stages in the process. This shows that a good and solid data documentation is necessary so that designers can go back to their data with new ideas and insights at any point in the future. When different roles are part of the project in the agency, they are involved in the brainstorming to bring different ideas by having a different perspective.

Ideation Workshops

When gathering insights together with the client and the user, the designers are preparing by having good documented descriptions and categories of their collected data. Examples are print outs as posters of personas, user flows and journeys.

Before an ideation workshop

Gathering insights is never exclusively done in cooperation, but the agency needs to prepare the ideation workshop based on the input from the inspiration phase.

The designers need to do the first analysis, description and building categories with the data. They visualise this information in a way that it can be used in workshops.

After an ideation workshop

Even though the workshops are mainly used to generate ideas together, the designer's tasks afterwards are to categorise and cluster ideas in order to define how to proceed. This is either done by a UX designer or in a team with different roles.

Domain Context

Another point is that agencies need to put the data from the inspiration phase into the domain context to generate ideas for the specific client. They start with a more general analysis of a topic and later use the exact client domain context to generate ideas with their collected and categorised data.

Presenting Insights

The following methods and techniques are used to describe and visualise ideas and insights. The difference to the presentation methods before is, that these methods are used purely for representing a vision and not a state of the art situation. In the following part, they are analysed for the different types of projects.

Method	P1	P2	P3	P4	P5	P6	P7
Concept descriptions	✓		✓			✓	
User flows	✓	✓	✓				
User stories (Storytelling)		✓					
Scenarios	✓	✓				✓	
Video	✓	✓	✓				
User stories (Development)					✓		✓
Site-maps					✓		
Prototype		✓			✓		
Wireframes		✓			✓		✓

Specifications				✓			✓
Templates					✓		

Table 32 – Methods for Presenting Insights

Nearly all innovation projects use user flow to describe their visions and ideas. User flow is a way to communicate the story of a concept. That is why it is not used for re-design projects, where the goal is not to tell a story but to explain what need to be changed. The same applies for videos, which are good for communicating concepts and ideas, but not for handing over a final delivery to developers. Innovation projects tend to use more storytelling tools compared to re-design projects, which use more clear specifications. The final delivery of innovation projects mostly is a concept that needs to be explained, and in re-design projects, it must be much more precise as it is going to be implemented directly. Redesign projects use more specifications, wireframes and user stories which can directly be delivered to the developers to implement the new design. A user story is a clearer concept to describe the functionality of a design that is why it is mainly used in re-design projects.

Usage of User Research Data

User research data is used at various point in the project process. In the planning phase, it is used as a basis and for planning the next steps. It is also directly used for education purposes. In the inspiration phase the data is directly integrated in workshops to facilitate interaction and the gathering of more data. The user research data is also used to validate new findings and ideas. In the communication with the client, the user research data is used to back up ideas and to support new concepts. Showing where ideas are coming from and giving the rationale behind concepts by supporting presentations with data, it directly influences the communication with the client. Furthermore, user research data also facilitated the agency internal communication as internal documents and information need to be exchanged between different roles.

The following tools are used to integrate data into the communication and the process:

- Posters are a good tool to communicate when there is a high collaboration between the client and the agency.
- Presentations with a lot of visuals and storytelling are used in all projects.

- Presentations also contain a lot of numbers and background information to proof a claim or concept. It shows that ideas are valid and how they have been developed.
- UI visualisations play an important role but might lead to complications as UI might be discussed before all UX questions are solved.

Communication & Collaboration in Human Centred Design Projects

The next part of the analysis explores how collaboration influences the communication and the usage of user research results across the different projects. Table 33 shows how different projects leverage collaborative methods in the different phases of a human centred design process. For each phase, it is analysed if designers only work by themselves or in cooperation with the client and the user. Next, it is evaluated how handover happen between the different people and roles involved in the different phases.

		P1	P2	P3	P4	P5	P6	P7
Inspiration Phase	Agency	✓	✓		✓	✓	✓	✓
	Agency + Client	✓	✓			✓		
	Agency + User							
	Agency + Client + User	✓		✓				
Ideation Phase 1 <i>Generating Ideas</i>	Agency	✓	✓	✓	✓	✓	✓	✓
	Agency + Client	✓	✓	✓		✓		
	Agency + User							
	Agency + Client + User			✓				
Ideation Phase 2 <i>Validating Ideas</i>	Agency							
	Agency + Client	✓	✓				✓	✓
	Agency + User		✓	✓	✓	✓		
	Agency + Client + User	✓						

Table 33 - Analysis of Collaboration

Handovers of Data and Findings

Handovers to the client happen regularly in all types of projects and with all levels of collaboration. Sometimes it needs to be a stand-alone handover because the client needs to share the documents internally. In smaller agencies, there is no need for internal handovers because all roles are collaborating along the process. When third party roles have involved another kind of handover needs to be included. Handovers are used to suggest next steps and are also used as part of an educational process. When a new team or role takes over, handovers need to be organised. Handovers are also used to communicate plans, ideas and directions with the client – they are communication facilitators. Furthermore, handovers are used to ensure that clients keep the knowledge and generate long-term values from the research data. Different methods are used to hand over information. In all projects, presentations are a common tool for handovers. In highly collaborative projects information is handed over in workshops and seminars to facilitate the interaction directly. When information is handed over, the feeling of ownership is important to make sure that the research results have an actionable impact.

Including different Roles in the Communication

The different roles in a project create a consistent and complete communication by ensuring that all roles are constantly involved in all stages of the process, if possible from the early beginning. Internal documents are used and shared between different roles, and important information is repeated a lot. This is done for education and consistency reasons. A complete communication is also created by providing evidence from the users so that the client believes the data. Validation with users helps to ensure the validity of information and strengthens their importance. Planning synthesis and workshops as part of the process ensures that everybody has the same level of knowledge, internally and externally. A constant interaction and close collaboration further improve the communication. Asking questions is an important skill of a designer to ensure that the client understands everything and that no information is lost.

Artefacts and Deliverables

The structures for deliverables and documents need to be tested with different roles to ensure that results are delivered in the best possible way. Working on documents and artefacts together increases a complete and consistent communication. Visualised artefacts such as presentations and interactive workshops with active participation make a clear communication easier.

Posters are a good visual tool for internal communication as everybody constantly sees the current process and ideas and can participate in the project. Iterating documents internally and with the client allows to ensure a good structure, that everybody understands, that everybody can follow and talk about the same things.

General Analysis

Following the analysis of the individual research questions, the next step is the clustering and packaging of the information. To get a better understanding and comparison of the different steps, how they were connected and how they are influenced or even driven by user research, we look at each project with the following four questions, analysing how the agency gained the necessary domain understanding, how they gathered the data, what was done after that gathering and who was involved in the ideation. The individual answers for these questions are listed in Table 34.

	How does the agency understand the client and domain?	How does the agency gather data for the project?	What is done after the data collection?	Who and how is involved in the ideation?
P1	Planning Desktop Research	Desktop Research Field Research Collaboration	Synthesis Meeting	Collaborative Agency only (focus) Client Feedback Iterations & Testing
P2	Desktop research	Desktop Research Collaboration	Data evaluation	Collaborative (focus) Agency only
P3	Planning (+ Ideation)	Collaboration	Analysis only	Collaborative (focus) Agency only
P4	Desktop research (+ Planning)	Desktop Research Auditing	Data evaluation Presentation	Specification Test how to deliver
P5	Pre-Project Planning Desktop Research	Auditing Field Research	Analyse Presentation	Collaborative Agency only (focus) Client Feedback Iterations & Testing

P6	Planning Desktop research	Desktop Research	Combine the results and present	Design > Deliverables
P7	Desktop Research	Desktop Research Auditing	Present	Design > Deliverables

Table 34 – General Analysis 1

Focusing on the analysis of the interaction between the client and the agency in the individual steps, a model is created for each project, allowing a more detailed analysis of the amount of interaction and the roles that the agency and the client have in a different phase. Figure 20 is an example of how this analysis looks like. For the different phases, we analyse how client and agency are interacting with each other, determining the type of role and if it is a direct or indirect interaction. This analysis is used to compare successful and unsuccessful projects for similarities and differences.

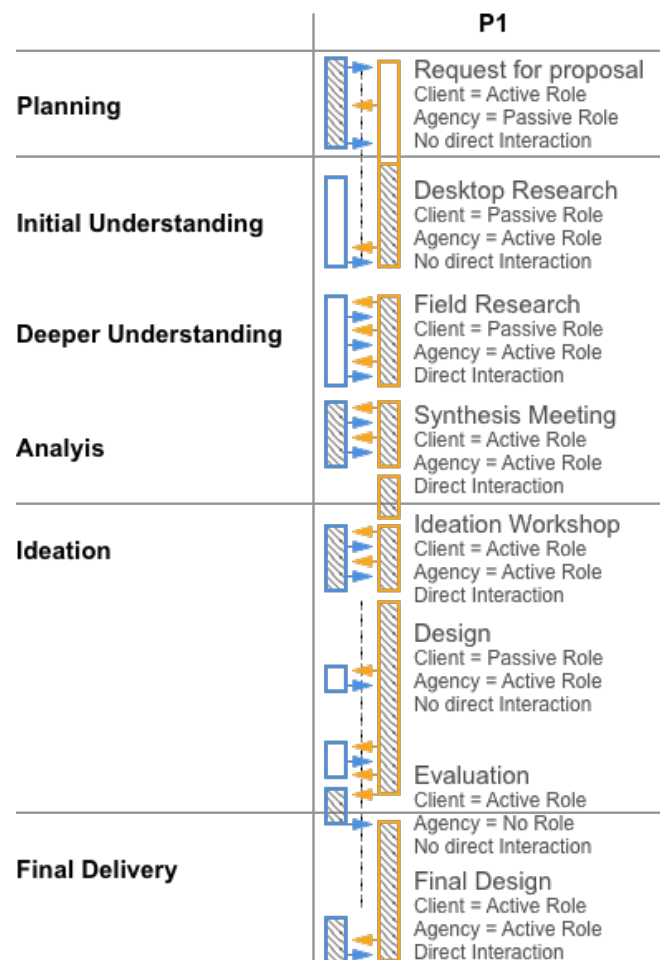


Figure 20 – Interaction Analysis P1

6.4. Impact of User Research

The third and final focus area of this thesis is the impact that user research can have on an HCD project. This part of the secondary analysis, therefore, explore what different project results are, how impact is measured and what the impact of user research can be.

Project Results

In the given projects, we observed different kinds of project results.

- Final delivery (either a concept or a re-design)
- Following projects with the client and selling new projects
- A changed mind-set for the client
- A changed mind-set for the agency and internal impact
- Emotions (feeling proud and feeling ownership)
- Education for the client about HCD principles, methods and tools
- Support and information for following projects. For example, data, concepts and plans that can be used again and methods that are adapted.
- A visible research process
- The visibility of the project and if the client spreads the word by presenting the results of events or conferences.

Measurement of Impact

According to our theory chapter, there are several ways of measuring impact (see page 47). For the analysed projects, the main measurement of impact was the client's feedback. A satisfied client who is proud of the results is a measurement that can be used for the successful impact. This is especially important for client initiated projects, as the client owns the product and the final delivery and therefore needs to be convinced that the result is the best possible solution. The impact is also measured by further requests for projects from the client and seen in comparison to similar projects from other design agencies who are working on similar projects.

For all types of projects, the amount of implemented suggestions and ideas is a sign of how successful the project was, how feasible the ideas were and how much the client believed in them. Another impact stated by the designer is the client's mind-set. When a client starts applying new methods and starts thinking about new ideas and approaches, the project had a lasting impact on them. Advocating the user's perspectives, designers see it as a success when their clients start taking this perspective into consideration by themselves. None of the projects relied on numerical KPIs and ROI, at least not on the agency's side.

Impact of User Research

Clients see the impact of user research the best when they directly involved in the research. By involving them, the designers can show them the process in action and show them where the ideas are coming from. Making the client love the process by feeling involved and engaged, increases the chance that the client believes in the results in the end and has a feeling of ownership. Visible research is also created by showing numbers and visuals from the research data to support every statement. This does not only increase the understanding but also the interest in the document. Furthermore, another impact of user research is that it can ensure a good communication where everybody talks about the same things. But also, the communication between the client and the agency impacts how research results are perceived by the client. Do they understand them and do they believe them so that they follow the agencies advice? User research gives the client they motivation, reason and context for ideas.

Research is also used to facilitate the collaborative work in workshops and other methods. Therefore, the research is always used in the following step and further in the process and directly creates the next steps. In the beginning, user research helps to sell a project and to understand a domain. Later it helps to create concepts. Another observed impact is that user research increases the awareness about certain issues and topics related to the users. It helps to educate the client not only about the process but also about the user's needs and topics such as accessibility.

Impact Criteria

Based on the definitions in the theory chapter as well the observations in the case studies, we develop a set of measurement points to evaluate the impact of user research in each project.

Therefore, the possible impact of user research is split up into the influences it directly has on the project (including 9 individual points), the impact on the agency itself and future projects (4 points) and the effect on the client's mind-set (7 points). The impact of each project is evaluated by analysing several points that one case can get in each category. The results are shown in a graph to allow an easy comparison between the different elements how they influence the project's overall impact.

Influence on the Project

1. Good basis for development and inspiration
2. Applied on final delivery
3. Used to sell the final delivery
4. Used to sell the project
5. Used in every step in the process and influences the process development
6. Used as tool for effective communication
7. Facilitates collaboration
8. Visible impact on the project's success
9. Successful project

Change in the Agency

1. Inspire future projects
2. Influence the project development process
3. The value of user research is higher
4. Influence on future projects

Impact on the Client's Mind-Set

1. Understanding the HCD process
2. More user integration in the future
3. Follow recommendations
4. Future projects with the agency
5. Satisfaction is high

6. Collaboration with different departments (facilitates exchange)
7. Concepts are integrated

Figure 21 visualises the amount of points that each project has in the different categories. The lines in the matching colour indicating the best possible score in each category. As shown in the graph, P1 and P4 are the projects with the biggest total impact but differently spread across the three categories. In P1, the user research had an immense impact on the project itself but less on the agency and the client. In P4 the impact on the client and the project are equally high, whereas the impact on the agency is smaller. It is also interesting to compare the projects that had the highest impact on the project (P1, P2, P5) and the projects that had the biggest impact on the client's mind-set (P2 and P4).

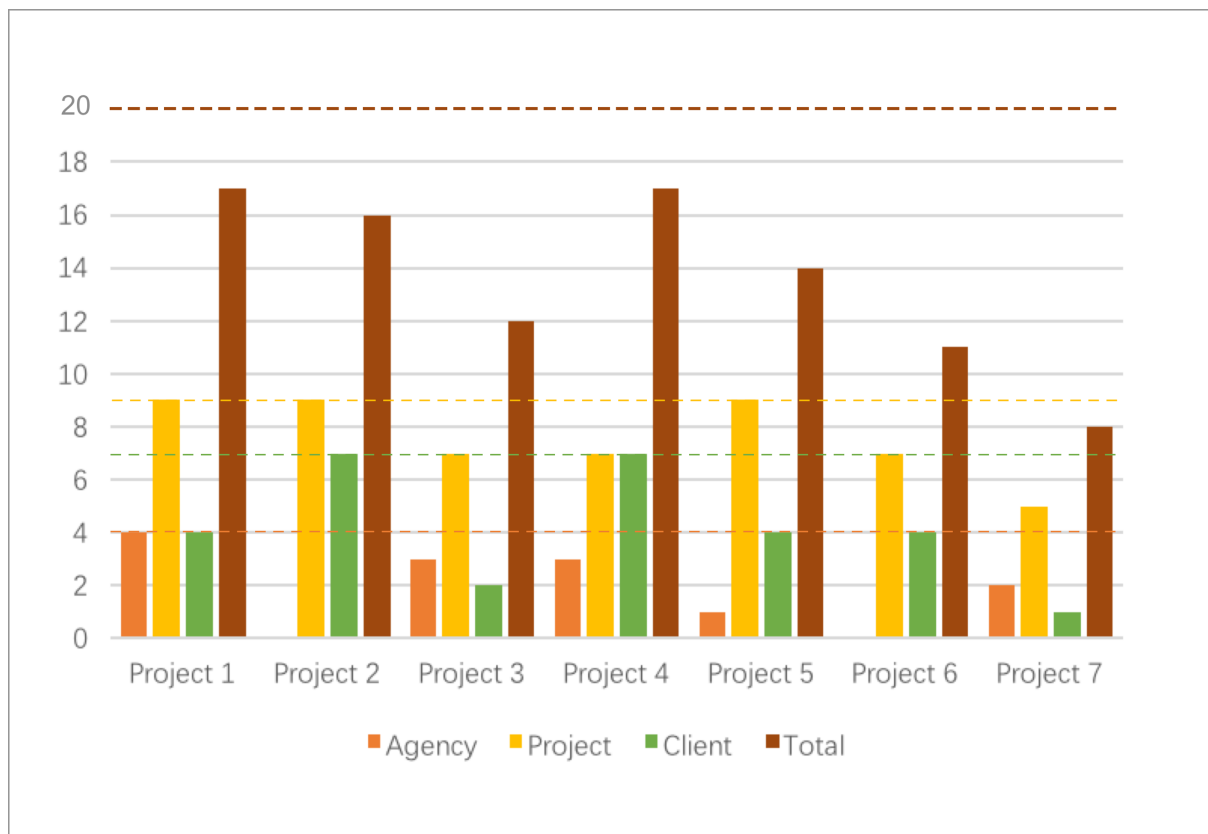


Figure 21 – Impact analysis

7. Conclusions

In seven case studies, we analyse how design agencies integrate and communicate user research in their projects to ensure that it is actionable and that it has an impact on the final delivery. Based on the collected and analysed data, this chapter contains our conclusions and learnings. Focusing on key elements in successful projects, this conclusion combines these findings to suggest how a best possible case can look like.

This thesis starts by describing the HCD process in four phases. After the planning, the inspiration phase is used for data collection, followed by the ideation of ideas before delivering the final design. The existence and order of these phases fit our observations, but it is important to relate them to all other processes that are part of a project. Figure 22 connects the HCD phases with the logical steps that manage the exchange of information in a project. The right side of the graphic outlines these steps of a project. The blue, green, orange and yellow bars show when the HCD phases play a role in the project over time. Finally, the areas with red text and boards show how user research can have the biggest possible impact on a project. This chapter describes how to best plan and communicate in each of the HCD phases in detail.

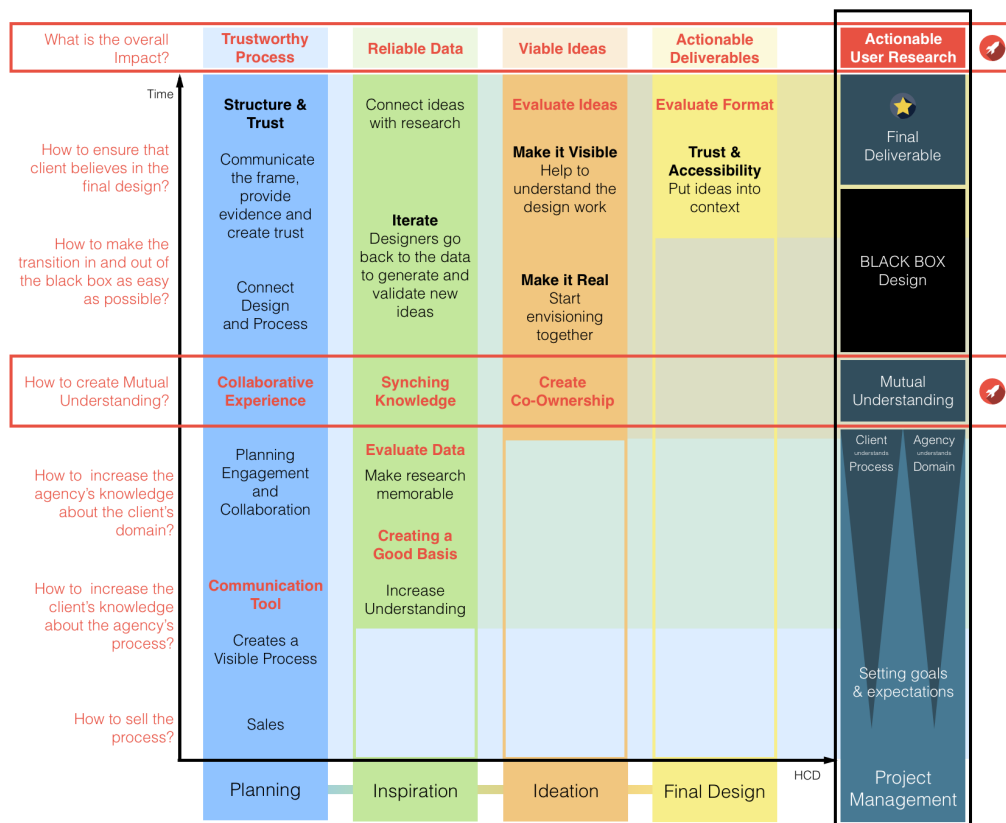
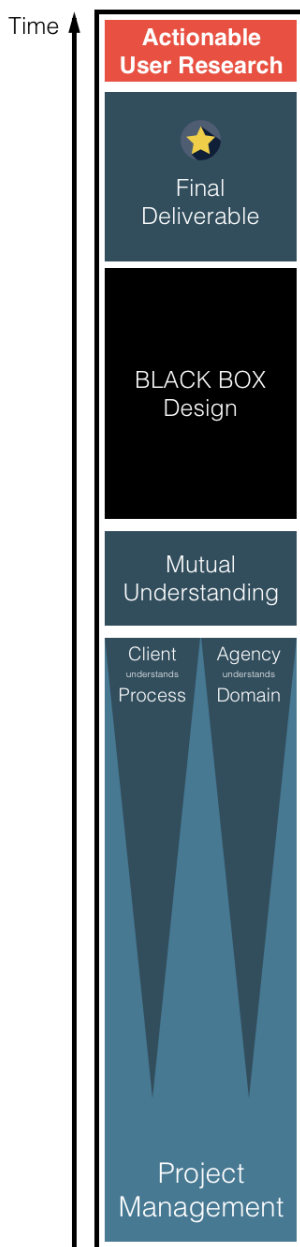


Figure 22 - HCD applied in Design Agencies

7.1. Human Centred Design Projects

Before describing the individual HCD phases and how to best use them to ensure actionable user research, this paragraph contains observations and our conclusions about the setup and management of human centred projects in general as also visualised in Figure 22.



As shown at the bottom of Figure 23, in the beginning of a project the goal for the agency and the client is to set the goals and expectations together. This starts two other processes. With all the following steps, the agency tries to gain a deep and solid understanding of the client's domain. At the same time, the client needs to understand the agency's way of working and the process of the project. This means, while the agency is working on understanding the domain by doing research, they also need to ensure that the client learns about how they are working. When client and agency have a better understanding of process and domain, this results in a situation of mutual understanding. Now every party knows where they are and where they want to go. The agency has a good understanding of the situation they need to design for as well as knowledge about the client.

This is the starting point of the design phase, where designers take the gathered knowledge and solve the problem that they have agreed on together with the client. The design process is owned by the agency and, from client's perspective, happens in a black box. This is the time when designers use different methods to generate, design and test ideas. The client will only have limited access and knowledge about this phase. The same is true for non-design roles in the agency.

Figure 23 – Project Structure

After the design, the final solution is delivered to the client. This is not one point in time but a process with possible several iterations and testing sessions.

To achieve the final goal to have actionable user research, designers and clients need to work together on different levels in the process.

All the individual stages need to be fluid and flexible, allowing interaction and exchange between the roles involved in them. How a good connection and bridge between the different stages can be achieved will be shown in the following paragraphs.

7.2. Trustworthy Process through Good Planning

Looking at each of the seven projects from the beginning, the value and importance of planning become very clear. The way that agencies and clients plan their project has an immense impact on the project's success as well as on the impact that user research has in the project.

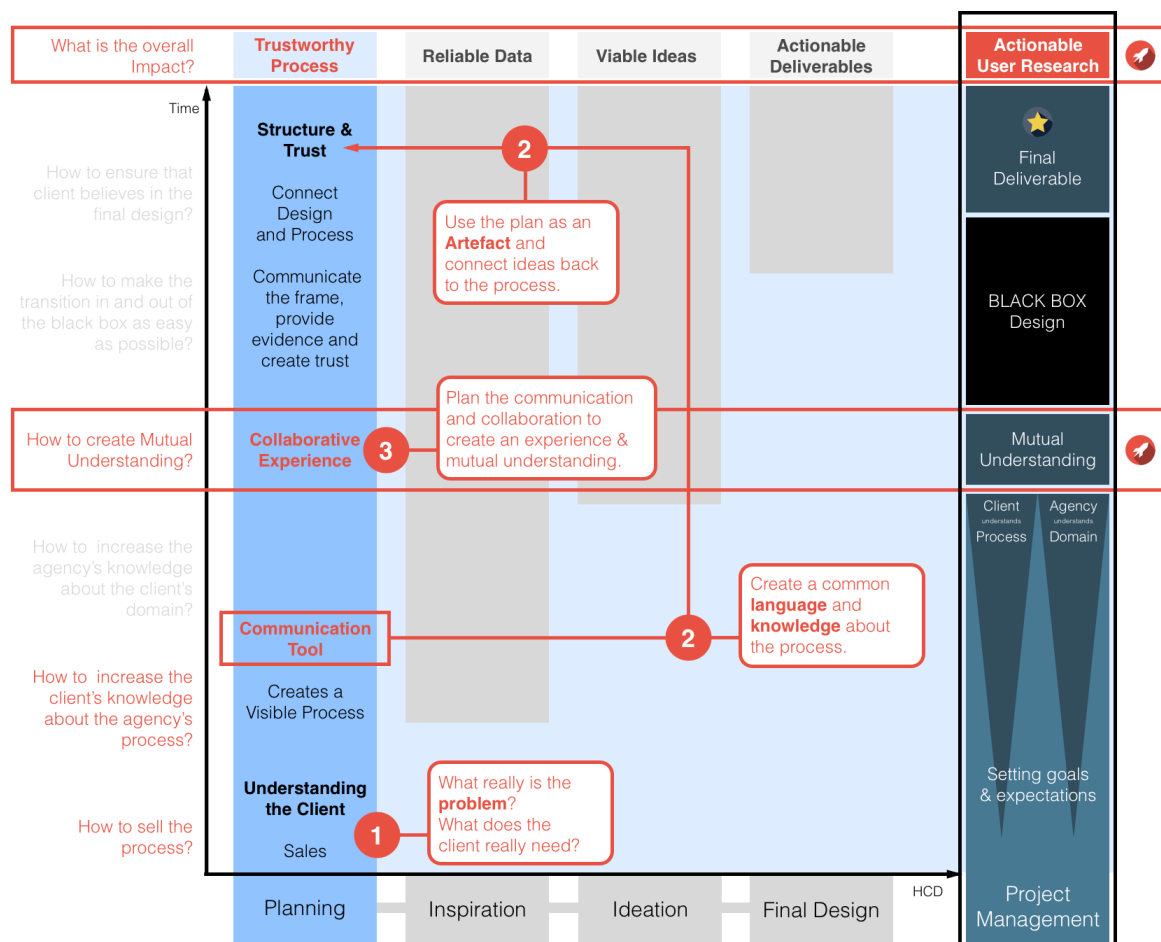


Figure 24 – Planning Conclusion

In contrast to literature, where planning is described as an initial step in the beginning to define goals, stakeholders and project boundaries (Maguire, 2001), in our observed projects, we have not only seen a wider range of reasons for doing planning, but also that it is not just something that needs to be referred to in the beginning, but at each stage of the project. It shows how the planning is stretching over all stages of the project. Having an impact on every following phase and the result, planning is not only a one-time event but a project long process. Furthermore, good planning goes deeper than setting goals and expectations (Sharp, Rogers, & Preece, 2015). As planning is used for selling a project, defining the structure of a project which later is used as a communication tool and to get a first understanding of the client and the domain, it needs to care for a wider range of needs.

1. Planning to understand the Client

Figure 24 also shows that planning is not only giving the client first insights into the agency's process but that it also gives the agency first insights into the client and the domain. While defining the structure and selling the project, the agency needs to get a quick first basic understanding. Therefore, the planning phase is also used to gather and directly use first insights. Sometimes, first research might already happen before a project officially starts, as the agency needs to support the proposal not only with a project structure but by showing that they already have a first understanding and idea of the domain. In this case, research already has a first impact by making the client sign the contract but also by directly starting to close the designer's knowledge gap about the client's domain. Initial research for establishing requirements is mentioned in the human centred design definition by Sharp et al. (Sharp, Rogers, & Preece, 2015). This conclusion takes this understanding one step further by connecting it with the findings described by Roschuni et al. (Roschuni, Goodman, & Agogino, 2013), extending the initial research about the user with research about the client.

It is important that a good plan does not simply takes in the client's suggested goal into a project plan, but to break the problem up into pieces and to look at it from different viewpoints. In many cases, clients might not know exactly what they are looking for. It is the agency's job to ensure that the goal is set correctly so that everybody gets on the right track directly from the start. Therefore, research and collaboration in the planning phase are necessary to explore and better understand the goal together with the client. This extends the given definition of defining a goal, as described in the theory chapter (see page 24) by Carroll and Kuniavsky.

It is not only important to plan the goal and to know the underlying problem but to also question the motives and underlying background in order to allow innovation and successful projects.

Finally, successful projects use planning not only as a research but also as a communication tool to increase the client's understanding of the process and the agency's understanding of the domain. As this could not be found in any of the researched literature, this is one of the main contributions of this work.

2. Planning as Communication Tool

Our main conclusion regarding the planning of user research is, that a plan is often used as a tool to support the communication between the client and the agency. It is used for ensuring an equal understanding and equal expectation throughout the full process – not just the beginning.

When a project starts, a plan is developed to define a common way of how the agency and the client are going to work together. The goal for the agency in this stage is, to ensure that the client understands their way of working from the beginning. By doing this, in the end of a project, ideas and concepts are not just coming out of a black box but are grounded in a mutually agreed process. Therefore, a plan is used as an artefact in the communication, enabling a common understanding and language about the project's process. By having a good plan, the agency has an artefact to go back to at every presentation and communication point. It can help to understand what the agency has been doing and what is going to happen next. Therefore, a plan needs to be structured in a way that it supports the client in following the process and understanding the final delivery. By providing a framework for communication and expectations from the beginning, planning supports the impact that user research has on the final design. Even for clients with a high knowledge about human centred design it is necessary that their understanding is adapted to the agency's way of working. In all cases, planning starts closing the client's knowledge gap about the process. Levelling up the client's understanding and making the agency's way of working visible, is a way of ensuring that everybody talks about the same things in the project at the same time.

A good plan helps the client to envision and know the project's process by not only providing a visible and tangible overview of the upcoming steps but also by introducing the client to the bigger context. It teaches the client the agency's way of working.

Next to showing all planned steps, it might be important to include steps that are not part of the project. This helps the client to get a complete picture of the agency's mind-set and helps them to better put the final results into context. For example, if a project covers only some parts of the human centred design process, the plan can also reveal missing logical next steps, which can not only lead to selling the second project but also empowers the client to have more actionable results in the end by better matching their expectations.

3. Planning the Communication and Collaboration

For human centred design project the planning of the collaboration throughout the project is important. Collaboration can create the feeling of ownership and can increase the trust in the process as well as the final outcomes. A good plan needs to include when clients are going to be involved, especially in the step between the inspiration and ideation phase, to create a common mutual understanding which allows the designers to generate ideas based on valid data, which are later accepted by the client.

Furthermore, it is helpful to plan the format, timing and usage of final deliveries in the beginning and to evaluate this throughout the process. Wrong deliverables at the wrong time can lead to problems and communication issues which could have been avoided from the beginning. A good planning phase should contain time for discussion together with the client when and how results are going to be used. Nevertheless, as projects are flexible and plan change, this needs to be revisited over the course of the project to ensure that the deliverables still have the biggest possible impact.

Some of these aspects are mentioned in literature, especially regarding the planning of user research in action (Kuniavsky, Moed, & Goodman, 2012). Nevertheless, this conclusion combines the classic second step in planning with findings from (Roschuni, Goodman, & Agogino, 2013) and (Holtzblatt & Beyer, 2014), both focusing on the planning of the collaboration and exchange. Our research has shown that even without focusing on collaborative or participatory design, a planned and active client involvement can have a positive influence on the project's success and the impact that user research has on it.

7.3. Communication and the Impact of Actionable User Research

The second part of our conclusion is about exploring how user research insights can be communicated effectively in human centred design projects. Looking back at the defined structure in Figure 8 on page 20, the goal after the data collection is to create a mutual understanding, where client and agency agree on the state of the art situation and start envisioning how a future can look like together. Generating ideas together allows the agency to get a better understanding of the client's way of thinking, what can help to know how to package and deliver the final design in a way that the client believes in the ideas.

Literature highlights the importance of good communication in human centred design projects (see chapter 3.3. Communicating User Research Results). After analysing different communication scenarios and comparing the usage of methods and techniques to support an effective use of research data, as suggested in literature, this conclusion combines the different findings, placing them into perspective and into the wider context of the communication between designers and clients in human centred design projects. As extension to the methods stated in chapter 3, the focus here is on methods, techniques and artefacts that support a collaborative process as this has been observed as an influential factor on the success of a project. Therefore, this conclusion highlights the main influential characteristics, motivations, scenarios and methods observed in our seven case studies, connecting them to the findings in the theory chapter in order to give suggestions on how user research can be actionable.

Figure 25 summarizes the HCD phases Inspiration (green), Ideation (orange) and Final Design (yellow) and how they can ensure a mutual understanding and actionable user research. This part of the conclusion includes the three main areas as highlighted by red numbers in. First, why it is necessary to create a good basic knowledge in the Inspiration phase. Second, how good communication after the data collection can create a mutual understanding. Third, how actionable user research can have an impact on the final delivery. And finally, the impact that user research can have on the success of a project.

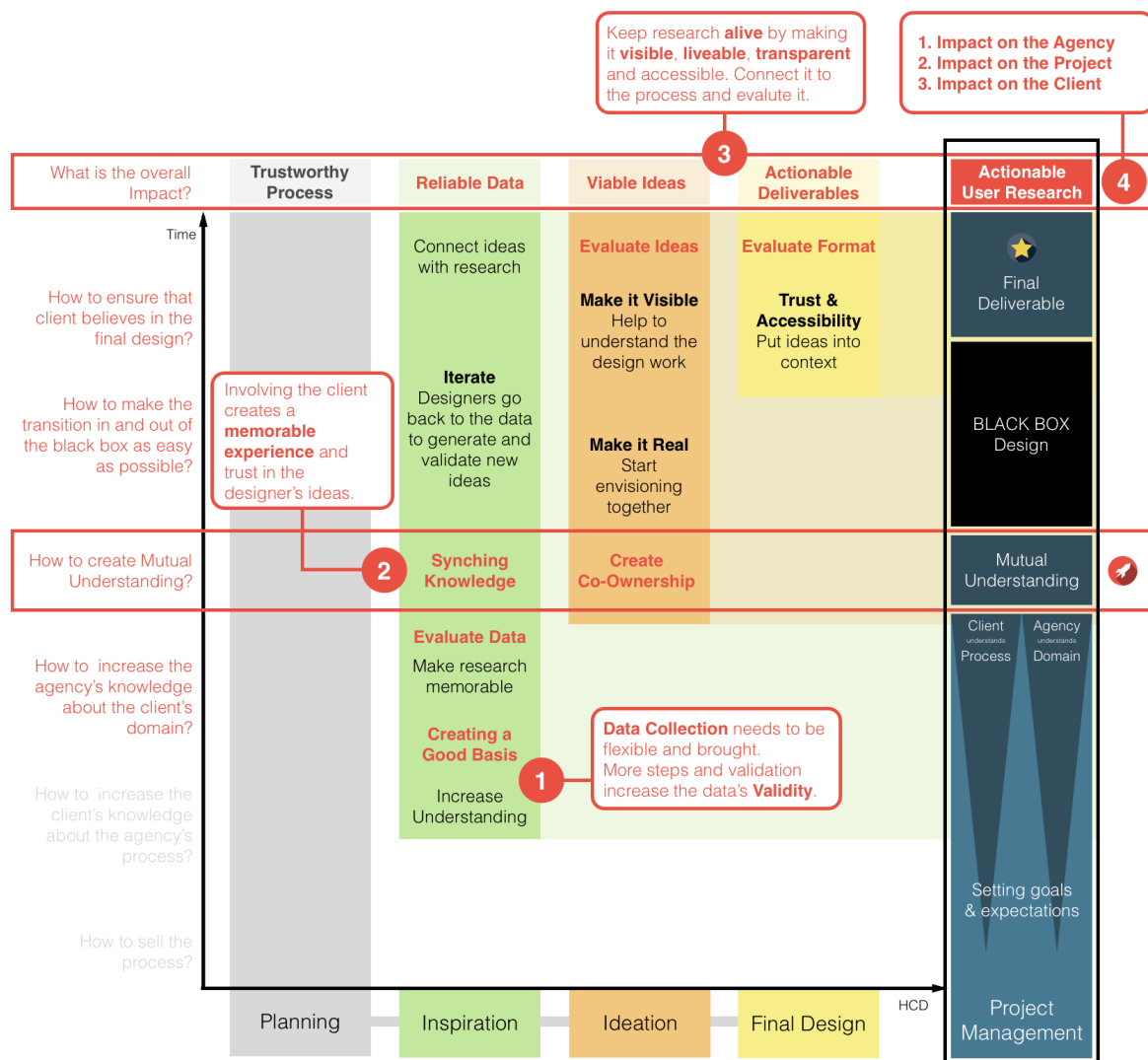


Figure 25 – Conclusion Actionable User Research

1. Reliable Data Collection to create a Good Basis

Our case studies have shown that one of the main goals of user research in design agencies is to create a good basis of data in order to generate knowledge and ideas in each project. A good basis is necessary to build on in at different stages in the process. As HCD projects are not linear but iterative, designers might need to go back to the data collection phase for several iterations. To better handle this flexibility from the beginning, designers aim to establish a good and solid basis of data in their main research phase, that allows them to leverage and go back to this data instead of going through a new collection phase all over again. Being able to go back at collected data and to support ideas and answers that have not appeared when planning the research provides several issues for the research.

Going back in time means that the data collection should not be too specific in the first place. A good basis is created by an inspiration phase that is open minded and looking for the big picture instead of direct answers to specific questions.

A good basis with reliable data can be created by doing the research in several steps across the process and by basing each step upon the previous' steps results. The observed projects have shown that the smaller and greater in variety several steps in the data collection are, the better is the basis and the more flexible designer can use and work with this information. The seven observed projects have shown that a mix of methods is important. Not only bigger projects can leverage a greater variety of methods, but also smaller projects can use a set of less expensive and shorter methods to gather data from various sources. As most observed methods focused on qualitative data, this triangulation by including various sources increases the validity of the data while at the same time offering more touchpoints with the client and the user, increasing the understanding and the valuing of user research. Furthermore, validating the collected data with the client and/or user does not only ensure the credibility of the data but increases also the client's trust and understanding in the data and the process and thereby increases the overall impact that user research can have.

Finally, having a good basis with reliable data means that everybody understands everything. In and at the end of the data collection phase it is necessary that everybody in the team – on the agency's and the client's side – understand all the information that has been gathered.

2. Synching Knowledge and creating co-Ownership for a Mutual Understanding

In order to use a good basis of data in the most efficient way, it is necessary that everybody understand the data and how it has been collected. Everybody needs to trust the source and understand what it means. A good communication and exchange is key in creating this mutual understanding for the client and the agency.

First, involving the client actively in the data collection process does not only improve the client's understanding of the process and the data but also the agency's understanding of the client. Looking at Figure 23, the goal of the first part of the project is to increase each other's knowledge. This is most efficiently done by cooperating with each other.

Having the client as active, equal partner allows for a better and more clear communication, leading up to a mutual understanding of the data and how to envision the future in the client's way of thinking. Having the best data and the best ideas do not help the agency if they cannot formulate in a language that the client speaks. Collaboration in the data collection gives the agency much better insights into how the client thinks and speaks than emails or phone calls.

Enabling this co-creation and co-understanding can be achieved with a great variety of methods.

Method	Conclusion
Synchronisation Meeting	Allows an active exchange of information between all involved parties. Has the clear goal to involve everybody and create the mutual understanding.
Data Evaluation with the Client	Evaluation the data for example in interviews. The client takes a passive role, giving feedback but not generating knowledge or a vision together.
Data Evaluation with the User	Evaluating the data for example in user tests does not involve the client but creates greater reliability and trust. User's voice needs to be shown to the client.
Collaborative Workshops	Very effective way of collecting data and/or generating visions together. Preparation and analysis are done by the designers but clients have active roles.
Presentations	Very passive client role and no direct collaboration. Needs to be adapted to the client's language, connecting it to the domain and the users. Can also be used to validate data and visions to involve the client more.

Table 35 – Methods to create mutual understanding

All evaluated methods shown in Table 35 can be supported using co-created artefact. In various projects, they have been effective tools for a clear and consistent communication. Visual and tangible artefacts raise interest and are more memorable. Therefore, they support creating a mutual understanding by having a memorable experience. Co-created artefacts also increase the client's feeling of ownership towards them. One good example of this use of co-created artefacts is that designers let the clients and users even sign the artefacts after the validation as a statement of ownership and validity. Multimedia artefacts such as videos are also helpful tools in collaboration as they create a story using an artefact that clients can revisit at any time.

In general, the stage of creating a mutual understanding is a very good example of how important good presentation skills and empathy are as it needs to be a memorable and maybe even fun experience for the client to be more inclined to believe in the results. When presenting, the designer should never forget the client's emotions and act according to them. Whatever method is chosen, the content needs to be personal and tangible what can be achieved by including stories, pictures, voices, co-created artefacts and so on.

This phase is also important in creating a consistent communication across different roles. Creating a mutual understanding for all involved roles ensures good handovers and fewer misunderstandings later in the process. It also ensures that the results and importance of user research is understood and not lost at any point in time.

To sum it up, using collaboration and co-creation in understanding the collected data and in envisioning a future together starts building the bridge for the final deliverable. After this phase, designers will start working on the design in the black box. Having a memorable experience of the gathered insights and some first, initial ideas, supports the concepts that are delivered by the designers later. Synchronisation meeting and co-creation workshops for envisioning future ideas together have been very successful in the observed projects. Gather data and building a concept together with the client plants this idea in the client's mind and therefore can much easier connect to the final design. Nevertheless, our research has also shown that creating a mutual understanding is only possible on big projects with a lot of resources. Even smaller projects can profit from including the client in this phase – the more active the better.

3. Actionable User Research generates viable Ideas

Simply doing user research does not ensure that it has an impact on the project. As design often happens in a black box that clients don't understand, the research needs to be included in a way that makes the transitions in and out of the black box as easy as possible for the client. Actionable user research can support the client's understanding of the final ideas.

Making research actionable means making it *real* for the client. Good actionable research allows the client to identify with the results and the concluding ideas by putting them into the client's context, showing the value for the client and the client's customers. Furthermore, it is important that research creates feelings.

This is often achieved by telling a story and making it visual. Insights and ideas need to be packaged in a way that they are feasible and in the best case directly gives suggestions how to achieve it. A good way of ensuring that research is actionable is to validate it with the user and/or the client.

Any insight and idea need to be connected to the process and the research where it comes from to show its validity and motivation. Supporting ideas with data from various sources is very efficient. This also proofs the importance of creating a good basis in the inspiration phase by using a wider set of methods (see page 131). Furthermore, showing the process increases the trust in ideas by showing how the designer got to these ideas (also see *Planning as Communication Tool* on page 128) and creating actionable deliverables is an important step of the planning and understanding phase, where designers need to ensure that they know the client's expectations and needs. All in all, making the research visible and trustworthy is achieved by having a well-planned process that is used as communication too and by having a good data basis where the designer can find numbers, facts, images and quotes to connect their ideas to their research. Especially for the final delivery, it is important that it is obvious how the research has been used to generate ideas and to provide evidence that the client believes in.

Furthermore, for user research to be actionable, it needs to be adapted to the clients' way of thinking and speaking. This can be achieved by having a good mutual understanding but also by testing the format and the way of presenting with the client. For example, if a role that receives the final delivery is not involved in the process and does not have the mutual understanding that the rest of the team has, a validation of the structure and format for the deliverables can ensure a consistent communication.

To sum this point up, user research needs to be visible, liveable and transparent in order to be actionable. A higher interaction between the client and the agency in general over the full process helps to keep the research alive and makes the designer's work in the black box more transparent and rational for the client. The designer's work will always be magic happening in the unknown, but successful projects ensure that this is not obvious, either by having constant evaluation and feedback or by direct collaboration and partnership.

4. Impact of User Research

The last conclusion shown in Figure 25 is the impact that user research can have on a project. As already stated in the analysis chapter, we observed three different types of impact. First, the influence that user research has on the agency. Second, how it affects the project itself. And third, how it influences the client's culture and mind-set. Looking at the evaluated projects, we can conclude that for user research to have an impact on all three of these areas, the designer needs to be open and not narrow the own mind-set too much by the given project frame. Not losing sight of the long-term values of user research and possibilities helps designers to stay innovative and thereby increase the impact.

Even though agencies do not necessarily work with the same client again, just thinking from project to project, without considering any longer implications, decreases the value and impact that user research can have on the agency, the project and finally even the client.

Influencing the Client's Mind Set

One of the observed impacts for design agencies is to influence the client's way of thinking about human centred design, the involvement of users and creative methods for creating innovative ideas. Sometimes this is a planned goal, sometimes it just happens on the side and sometimes it fails, what can influence the project in a negative way. When the client does not believe in user research and human centred design this results in a lower impact and acceptance of the generated ideas. When an agency is planning to influence the client's mind-set, the active collaboration in every single step of the process and a good planning are necessary.

The active involvement creates the feeling of ownership as the client actively sees and experiences how the process can be successful. According to our observed projects, learning about HCD is not about getting an explanation but about experiencing the steps together. In order to achieve this, designers need to be as naive as possible while being energetic and facilitate change-making. Especially for changing the client's mind-set, it is important that the experience is memorable. The most successful method we observed are workshops for data collection, data validation, ideation and testing. Next to these workshops presentations with personal and tangible impressions from the workshops support that clients remember and believe in the results as well as the process.

Being part of every step makes them believe in the process. Active involvement also results in education by doing rather than education by listening, what has been much more effective in the observed projects.

When involving the client, it is also important to involve as many roles and stakeholders as possible. On the one hand, this increases the sustainability of the changed mind-set, as more roles spread their knowledge and experience through the organisation. On the other hand, it also facilitated internal communication for the client, enabling different roles to better communicate with each other.

A good plan is necessary because it needs to be used as a communication and education tool. In a new process, the client needs to know what is going to happen and where they are coming from.

Influencing the client's mind-set does not only refer to a better understanding of human centred design but also to changes in the client's opinion about another topic. Nevertheless, a topic that is very new for a client can be used to also change the client's perspective on user research. Introducing a new topic to a client might make the value of user research more obvious for them. This also shows that it is necessary that designers do not a just thing about the project but take a brought perspective including education about new topics and how they are connected to the client as well.

7.4. Summary

Our thesis examines how planning and communication influence the impact of user research in human centred design projects. This conclusion shows how planning is a necessary step to create a trustworthy process. In contrast to the literature, planning needs to be considered at every step of an HCD project. It starts before a project even begins and continues even further by having the impact on future projects. The goal of the data collection in the inspiration phase is to build a good basis with reliable data. In the ideation phase, the agencies aim to create viable ideas that the client believes in. They ensure this by using actionable deliverables, connecting the ideas with the process and the collected data.

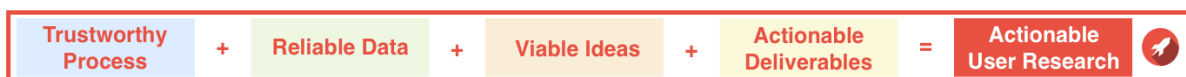


Figure 26 – The Impact of actionable User Research

All in all, actionable user research is important in all given stages. User research does not only happen in the inspiration phase but already in planning, when the agency needs to understand the client's expectations and goals, as well as in the inspiration and final delivery phases, when the format of the final deliveries needs to be adapted to the client's way of thinking. For user research to be actionable and to have an impact on the project, it needs to be considered in every step of the HCD project. A collaborative interaction between the involved roles helps to connect the steps and good communication skills are required to transfer the knowledge from one level to the next.

8. Discussion

8.1. Overview and Contribution

This thesis takes a broad and wide view on the topic of user research and how it can and needs to be used to be most impactful in human centred design projects. Covering the full project life cycle of seven projects at two different design agencies shows the complexity and the tremendous amount of influencing factors on these projects. In order to understand how user research can be actionable in projects, it first is necessary to understand the projects' structures and goals. Exploring the different phases of a human centred process in seven real-life projects provided deep and wide insights, covering a great number of topics. By not limiting ourselves to only one part of the process or only one of the influencing factors, this thesis provides a generalised overview of HCD projects and how they integrate user research. Taking the real-life perspective helps us to explore different kinds of facts and how they are connected to the impact that user research has on projects, teams and individuals.

By talking to agencies about their finished projects, we give designers a retrospective view on their projects. Explaining a completed project and having an independent analysis of what they were doing is not only interesting for the designers but can also help with their personal and professional development. As there is not often the time to fully reflect, with this project, the agencies got the opportunity to re-live a selected number of projects and getting external feedback. Next to the retrospective view, our work also aims to be a helpful tool for future projects. Collecting the learnings from seven different projects and by having a generalised conclusion, this work can support the designer in their future work. As agencies are eager to learn from their own but also from other agencies' experiences, this thesis offers insights into different ways of working with user research, examining, what is successful and what not.

Our goal with this document is, that not only designers in digital agencies can leverage our findings but also other designers and roles working with user research. As it combines all necessary elements on how to make actionable user research have an impact on a human centred design process, it provides ideas and suggestions that can not only be applied in design agencies but all real-life industry projects.

Having not limited ourselves, this thesis gives a good and holistic overview of all elements and factors playing a role in a project. It is not a guideline telling designers how to use research in projects but suggests approaches of what needs to be considered when and how. Industry projects are complicated and influenced by a lot of social and economic factors. Taking parts of these elements and exploring them in HCD projects, gives another perspective on actionable user research compared to previous work. Literature often looks at individual steps or describes single approaches to a process. By not having these limitations, this work takes projects as they are, not putting them into any framework, but just analysing the usage and impact of user research. Gathering insights from real projects also work as an inspiration for future projects. Exploring the planning, the communication and the impact of user research separately shows what is important for each of them but also how they are connected. Putting user research into real-life context, this document helps researchers, designer and students to get an idea of how user research can be used efficiently in projects. Aiming to help designers arguing for the value of user research, this thesis shows the impact that it can have not only on the project itself but also on the company culture.

8.2. Method Limitations

Having this very broad view on a big topic generated a lot of insights but at the same time also is the biggest limitation of our work. Compared to the size of the topic and the projects, this is only a small study for a short amount of time and a small number of projects. Even though the selected method provided sufficient insights and amount of data, only interviewing two agencies and only talking to four different designers is the main limitation. Aiming to cover this by using various data sources and by triangulating and validating our data, our work still might miss a lot of influencing factors as all agencies and all projects work differently. Exploring projects in the real-life context never is a clean and controlled environment. This again shows the great number of elements playing a role when looking at the impact of user research. The selected methods aim to include as many of these elements as possible, but still, has and needs limitations.

Another limitation is, that the client side is not covered very deeply. Only talking to the designers limits our understanding of the impact to their opinion and ideas. Talking to clients would have been a valuable and interesting factor but could not be considered due to time and access limitations. As this thesis solely takes the agency's side into consideration, it becomes even more obvious how different agencies are working in this field. Having seen these major differences is the reason for having a very generalised conclusion. Resulting in a lot of statements that might be obvious for experienced designers, this conclusion needs to be seen in a whole, connecting the points that are often just explored individually.

For some case studies, other roles such as interface designers and project managers are interviewed as well. This has been very helpful and directly shows how important different perspectives on the same project are to reduce the bias. Due to time limitations, this is not fully possible for each case. A document analysis is used to reduce the bias in the remaining cases. In general, talking to more involved roles would have given us even more insights. Another limitation is that we only take completed projects into consideration. By doing this we cannot make real life observations. Our interviews could be more contextual by following the designers to the presentations and their meetings, what might add very valuable insights too. Another point regarding the case selection is, that the agencies decide on the cases that they want to show to us. This is a limitation as they might only show us the good projects that they are proud of. Nevertheless, we also had failed and less successful projects.

As our questions, especially in the impact part, are not based on clear, numerical measurements but only on the designer's personal assumptions and opinions, we cannot make as strong statements about the impact of user research as we could have done by including more numerical KPIs or the return of investment. A missing quantitative perspective is a limitation. Furthermore, our research generated a lot of data. This makes it nearly impossible to analyse everything and from every perspective. Following our own guidelines, our research creates a good basis that we go back to for answering new questions that we do not have when planning and conducting the interviews. Nevertheless, this implies limitations as well. The final limitation is that this study does not validate the conclusion further than just presenting them to the participating agencies. The results are not tested with other designer or other agencies.

9. Future Work

Being very broad, this thesis contains several possibilities for future work. First, this project can be continued by adding a validation study with further designers and by leaving the world of design agencies, also comparing the results with the way that designers at other companies work. As stated in the discussion, adding a more quantitative study to evaluate the findings can be very beneficial in supporting the scientific impact of our findings. One main thing that we see as future steps for this project is to validate the results by looking at running projects. Doing deeper contextual studies in design agencies while they are working with the client and with the design can be a very good way to test the results in a live context. Finally, another next step might be to add a deeper mapping of the correlations between the different factors and the results. This can also be supported by doing further qualitative and quantitative evaluations of other designers' work. In general, it is very hard to do this study in a very controlled environment. An experimental project that applies all suggestion can be an idea to include all elements and to take detailed measurements in the project.

Looking at other research areas and topics, the first thing that comes to mind is the education aspect. In our work, we observe several ways of education clients about human centred design methods and thinking. Creating innovation and changing the company's way of thinking is a big area with various interesting research work in it, where our project can get more input and different perspectives from. Furthermore, exploring the impact of trust and ownership in projects is an area that our work starts to touch on, but cannot go very deep due to the existing limitations. In general, the full collaboration and participatory design is a field that we started to look at, but that we did not deep dive into either. Finally, the most interesting future work for us is to see this collaborative approach in combination with our suggestions and conclusion are working in organisations that are not agencies. Exploring the differences and similarities in other organisations structures can generate insights that are even more generally true and helpful for everybody who needs to argue for the impact of user research.

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Appendix

Appendix 01 – Consent Form

Consent Form

Research Project on actionable User Research

Information collected as part of this research will be used in a master thesis project concerning the planning and communication of actionable user research, undertaken by the Laura Wiegand and Xiwen Li, Human-Computer Interaction Master Students at Uppsala University. The information collected as part of this study will be made anonymous. No names, neither from designers, agencies or clients, or project related contents will be found in the final report. The audio recordings will be deleted once the project is over and will not be shared with anybody outside of the project. Images of documentation will not be published anywhere and only be used for data analysis in the related case study. This study only looks at the structure and processes and not the content of the project.

Statements of Understanding and Consent

I understand that my participation is voluntary and that I am free to withdraw at any time during the study without giving any reason.

I agree to be voice-recorded during the interviews for the case study.

I agree to provide access to project related documentation and data, either by direct access or presenting them in the interview. I agree that notes and pictures are taken about this documentation.

I understand that the data and recordings collected in this study will be treated as confidential. Any recording will be stored securely. The identity of the participants, projects and clients will remain anonymous in the study outcomes, and only the research team members will be granted access to these recordings for legitimate research purposes.

Based upon the above, I agree to take part in this study.

Name of Participant Date.....

Signature

Researchers

Name of Researcher Date.....

Signature

Name of Researcher Date.....

Signature

Appendix 02 – Project Focus

Phases and Questions

Phase	Elements & Description	Questions
0	<p>Preparation - before the project starts</p> <p><u>General Description:</u></p> <ul style="list-style-type: none"> Finding the project and understanding the basic requirements Research about the client Pitching the project to the client <p><u>Goal:</u> Understand the problem and prepare a good pitch so that you can start the project</p> <p><u>Possible applied Methods:</u></p> <ul style="list-style-type: none"> Competitive Research (?) Observations Interviews (?) Online Research <p><u>Impact:</u> Impress the client and get the project</p>	<ul style="list-style-type: none"> How did the project start? Where did you find the client's offer / problem? What kind of information did you receive about the project (even before you did a pitch or even before you have started the project) ? Did you do some preparation / research for pitching the project? <p>If yes</p> <p><u>Preparation and Research:</u></p> <ul style="list-style-type: none"> What is your goal for this phase? Why are you doing this pre-research? What did you do? <ul style="list-style-type: none"> What kind of research did you do? What methods did you apply? Did you explore what the client's competitors are doing? Why did you decide for this method? <p><i>For a specific method:</i></p> <ul style="list-style-type: none"> How did you prepare for this research method (eg. Interview) ? <ul style="list-style-type: none"> What did you take with you? What did you prepare? Where did you do the research? How long did you do this research? How did you document your research during the research? How did you collect and document your research findings when being finished? Did you discuss the research with other people in the team? Do you already start thinking about possible solutions?

	<p><u>Our methods for the thesis:</u></p> <p>> Interview</p> <p>> Observation (if possible see how they are preparing for an upcoming pitch)</p> <p>> Document analysis (check the slides and media they used for the pitch)</p>	<ul style="list-style-type: none"> Do you do that based on your research? How do you document possible solutions and ideas? <p><u>Holding the Pitch - Communicating the Research Findings:</u></p> <ul style="list-style-type: none"> How did you hold the pitch? <ul style="list-style-type: none"> Did you use slides or other media? Videos, pictures, ...? How did you present your findings in the pitch? <ul style="list-style-type: none"> Do you present the documentation from your research? Do you give the documentation to the client? What do the clients need to know in this first meeting? Who did you present to? Who was the audience? How do you structure your pitch: <ul style="list-style-type: none"> Present them a strategy that you would do Problems you observed in your research How you would approach the problem that they asked for help for <p><u>Feedback:</u></p> <ul style="list-style-type: none"> What kind of feedback did you receive from the client? Did they have any questions for you? How do you deal with the feedback you get? <p><u>Impact:</u></p> <ul style="list-style-type: none"> How do you make sure that your research is solving the client's problem? How do you make sure that the selected methods help answering the client's questions?
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1	<p>Research Planning - Decision Making</p> <p><u>General description:</u></p> <ul style="list-style-type: none"> • Making decision about the process and the research • What methods are used for the different goals? <p><u>Goal:</u> > Double Ethnography</p> <ol style="list-style-type: none"> 1. Understanding the requirements and priorities in the client's company 2. Prepare the research plan for the project <p><u>Steps for the Research Plan:</u></p> <ul style="list-style-type: none"> > Set expectations > Set schedules + responsibilities > Specify goals > Specify outputs 	<p><u>Understanding the client and the project</u></p> <ul style="list-style-type: none"> • How did you start this project? What were the first steps? <ul style="list-style-type: none"> ◦ Did you have a brief / introduction from the client? ◦ How did the client communicate the project? ◦ Did you start by making a plan about what to do and when? ◦ Is the client involved in this planning? • What was the stage of the project when you joined it? <ul style="list-style-type: none"> ◦ Did it start already before (was ongoing)? Was it a new project? ◦ Has there been any research done already before (by you or by others)? • Who is the final decision making authority? Which people to convince? <p><u>Expectations</u></p> <ul style="list-style-type: none"> • What are your client's expectations? • How do you know what your client's expectations are? • How do you communicate about expectations with your client? <ul style="list-style-type: none"> ◦ Do you discuss problems? Do they show you data / previous research or customer requirements? • Do you set expectations together with the client? If yes: How? <p><u>Goals:</u></p> <ul style="list-style-type: none"> • How do you know your objectives and what you aim for? • What are the specific project goals? <ul style="list-style-type: none"> ◦ Numeric goals, qualitative goals? • What did the client tell you are the goals for the project? • Did you discuss the goal with the client? <ul style="list-style-type: none"> ◦ Did you apply any method to better understand the goals? <ul style="list-style-type: none"> ■ Workshops, Focus Groups, Interviews ■ Who takes part in these workshops? Is someone missing? ◦ Did these methods influence the goals?
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		<ul style="list-style-type: none"> ◦ Did it help to better understand the goals (for you and the client)? • Do you prioritise the goals? Do you have an exercise for this? • Do you prepare research questions that you want to answer with your research? Do you specify your research questions? If yes, how? • How do you differentiate between client's and user's goals? <p><u>Responsibilities:</u></p> <ul style="list-style-type: none"> • What are the responsibilities in the project? <ul style="list-style-type: none"> ◦ What are the client's responsibilities? ◦ What are yours? What role do you have (collaborator, ...)? ◦ How do you distribute your roles in the team? ◦ Do you communicate this with the client? • Do you know who is a stakeholder (on your and the client's side) in the project? Who else is involved in this project? Who else do you need to talk to? • Do you know the stakeholders' / different roles' priority and expectations? • How much do you know about the product? Do you use it? <p><u>Schedule and Budget:</u></p> <ul style="list-style-type: none"> • What was the schedule for the project? • How much time did you have? • What was the budget for the project? • What was first, the budget or the research method? • Did you discuss how much research should be done? • Did you talk about research and what is necessary? • Did that influence the time and budget? • Have you prepared a schedule and possible time for research before? • Do you know the general product roadmap? Do you know about key milestones? How do they affect the planning and scheduling?
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		<ul style="list-style-type: none"> Do you know when your results will be used? Do you align your planning with the roadmap? <p><i>Planning of the research methods, techniques and sequences:</i></p> <ul style="list-style-type: none"> What methods did you chose for this project? Why? Which factors in the projects made you chose this method? What do you see as the benefit of this method in this project? What were where alternatives and why did you not select them? How did you plan to use this method? When, where, who, how much,... <ul style="list-style-type: none"> Do you plan the audience that you are going to recruit for tests? How do you plan to select the users? If the client represents the end user - how do you make sure that they know what they are talking about? How do you verify this? Do you have a schedule for when to use which method? Who is responsible for what? (preparing, doing, analysing, ...) in your team and with the client When is it enough research? <p><i>Outputs & Deliverables:</i></p> <ul style="list-style-type: none"> Do you discuss in the beginning what the client wants you to deliver in the end? <ul style="list-style-type: none"> Do you decide on a format? (report, presentation, workshop, actual product, personas, ...) Do you schedule deliverables together with the client? (Time) Do you know how is your research going to be used? Do you talk about documentation of the research?
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2	<p>Conducting User Research</p> <p>General definition:</p> <ul style="list-style-type: none"> Gathering user's needs Understanding user behaviour Analysis <p><u>Goal:</u> Getting an understanding</p> <p><u>Possible Methods:</u></p> <ul style="list-style-type: none"> Observation Interviews Field Visits Online-Research User Shadowing Workshops Focus Groups Usability Analysis (Audits) <p><u>Steps:</u></p> <ol style="list-style-type: none"> Prepare the Method Conduct the research Document results Analyse results (next phase) 	<p><u>Preparation</u></p> <ul style="list-style-type: none"> What do you prepare? Why? What is your goal for using this method? How do you make sure that the method is supporting the aim of the project? (Impact) How do you pick the audience? <ul style="list-style-type: none"> What do you do if you don't find the real end user? What do you expect from the user? How do they help? What do you do if you have recruited the wrong audience? What do you do before the research? How do you set everything up? Is your client involved in the preparation? <p><u>Conduction</u></p> <ul style="list-style-type: none"> How do you conduct this method? Is there any problems when using this method in this project? <ul style="list-style-type: none"> Why? How did you try to solve this? Is your client involved in the conduction of the user research? Do they participate as well? <ul style="list-style-type: none"> What is their reaction? How many people are you when doing research? What are the roles? <p><u>Document</u></p> <ul style="list-style-type: none"> How do you document while doing research? What tools do you use? How do you document after the research is finished?
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3	<p>Analysing and packaging the data</p> <p>General definition:</p> <ul style="list-style-type: none"> Collecting the insights from the user research Chose a method to package the information Gain insights from the user research Make results accessible for others <p><u>Goal:</u> Understanding your results and gain insights for your design. Make results deliverable and understandable for others.</p> <p>Create actionable intelligence - make research usable.</p> <p><u>Possible Methods:</u></p> <ul style="list-style-type: none"> Personas Scenarios Use Cases Storyboards Customer Journey Map Workshops Models (information architecture) Brainstorming 	<p><u>Chose a method to analyze the data:</u></p> <ul style="list-style-type: none"> How do you synthesize the information for yourself? What methods do you apply? <ul style="list-style-type: none"> Why? How did the user research method and the data influence this decision? How does the project goals influence this decision? How do you select the information that you want to analyse? Are the clients involved in this step? Are other team members involved? Do you make a brainstorming or anything after the research to talk about the results with someone from the team? <p><u>Apply the method:</u></p> <ul style="list-style-type: none"> How do you apply the method? Do you use any special tools? How do you use the data? Who is involved? How do you deal with unclear data or biased data? How do you make sure that your insights match the goals (that you actually have answered the research questions)? <p><u>Deliver and share the insights:</u></p> <ul style="list-style-type: none"> How do you deliver the information with your team? How do you communicate insights and the data? Is there is difference how you communicate the insights with the client and the team? When do you involve whom? How do you make sure that the deliverable is clear to understand for the team / client? How do you deal with questions?
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	<p><u>Steps:</u></p> <ol style="list-style-type: none"> Chose a method to analyse the data Apply the method Deliver and share your insights <i>Envision first ideas (Next Phase)</i> 	<ul style="list-style-type: none"> Do you gather feedback? How do you deal with feedback? How do you discuss / solve problems? Do you use and special methods or tools to share your information? <ul style="list-style-type: none"> Posters on the wall Presentations in the team Videos Any other?
4	<p>Design, Evaluation and Iterations</p> <p>General definition:</p> <ul style="list-style-type: none"> Using the data to envision a solution Design this solution Use research methods to evaluate the designs Iterate until user's needs are satisfied <p><u>Goal:</u> Create a design that solves the user's problem and fulfils all needs</p> <p><u>Possible Methods:</u></p> <ul style="list-style-type: none"> Prototyping Wirframes Sketches User testing 	<p><u>Design:</u></p> <ul style="list-style-type: none"> What methods and tools do you use to design solutions? How do you use your insights from the user research for this? Is the client involved in this step? If so: How? How is your team involved in this step? Whom and how? How do you make sure that the design is technically possible? How do you involve developers in the design process? Document your designs? How? How do you communicate your design with others in your team / the client? <ul style="list-style-type: none"> What methods / tools do you use? Any problems / difficulties with the communication of designs? <p><u>Evaluate:</u></p> <ul style="list-style-type: none"> How do you evaluate your designs? What methods do you use? Do you involve the client? What goals do you use to evaluate your designs? Who is evaluating your designs? How do you document the evaluation?

	<ul style="list-style-type: none"> • Usability tests • Focus Groups <p>Steps:</p> <ol style="list-style-type: none"> 1. Design based on data insights 2. Evaluate 3. Iterate 	<ul style="list-style-type: none"> • How do you communicate the results of your evaluation with the team / the client? • How do you make sure that the correct / necessary changes are done? <p><u>Iterate:</u></p> <ul style="list-style-type: none"> • How much did you iterate in the project? • What did you change? • What initiated the changes? • Do you iterate together with the client or only in your team? • What role does budget and time play in this phase of the project? <ul style="list-style-type: none"> • When are you done? When is the project done? • What is the minimum?
5	<p>Presentation & Communication</p> <p><u>General description:</u></p> <ul style="list-style-type: none"> > Communication with the team > Communication with the client <p><u>Goal:</u> Communicate the impact of user research throughout the project</p>	<p>During the project:</p> <ul style="list-style-type: none"> • How do you communicate with the client during the project? • Do you exchange results? • Do you have regular meetings or status updates? • Does the client asks about updates? <p>When the project is over (The final Specification):</p> <ul style="list-style-type: none"> • How do you present the final result to the client? • What kind of final presentation do you prepare? • What kind of tools and media do you use? Do you include pictures and videos? • How long is a presentation? • Who presents?

		<ul style="list-style-type: none"> • What do you present? <ul style="list-style-type: none"> ◦ How much level of detail? ◦ Do you focus on results or the process? ◦ Do you include your research results? ◦ Do you explain why you have been doing something? ◦ Do you explain the final design and how it evolved? • Who is in the audience? • Do you deliver a report? To whom? • Who is giving feedback in the presentation? • Are there discussions in the presentation? What kind of questions / topics? • Is the final presentation the real final thing or is there normally some changes to be made after the presentation? • What happened after the presentation?
6	<p>Impact</p> <ul style="list-style-type: none"> > When the project is over > Feedback from the client > Feedback from the user > Feedback from the team > Your own feedback <p><u>Impact</u></p>	<p>Feedback</p> <ul style="list-style-type: none"> • How do you receive the final feedback? • What influence does the client's final feedback has? <p>Impact</p> <ul style="list-style-type: none"> • How do you know that you project had a good result? • Do you compare it to the result from the planning phase? • How do you know that your research had an impact on the project? <ul style="list-style-type: none"> • Looking back at the project, would you chose other methods / another approach? • What is your personal experience?

Appendix 03 – Screening Interview

Background about your work in your current agency

- What is your title / your position?
- Can you describe your position and your role in the company?
 - Whom do you work with?
 - How many people are in your team?
 - What kind of projects to you work on?
- How long are you working in this team / this design agency?
 - How many projects have you been working on so far in this team?
 - What methods did you apply in other projects before?

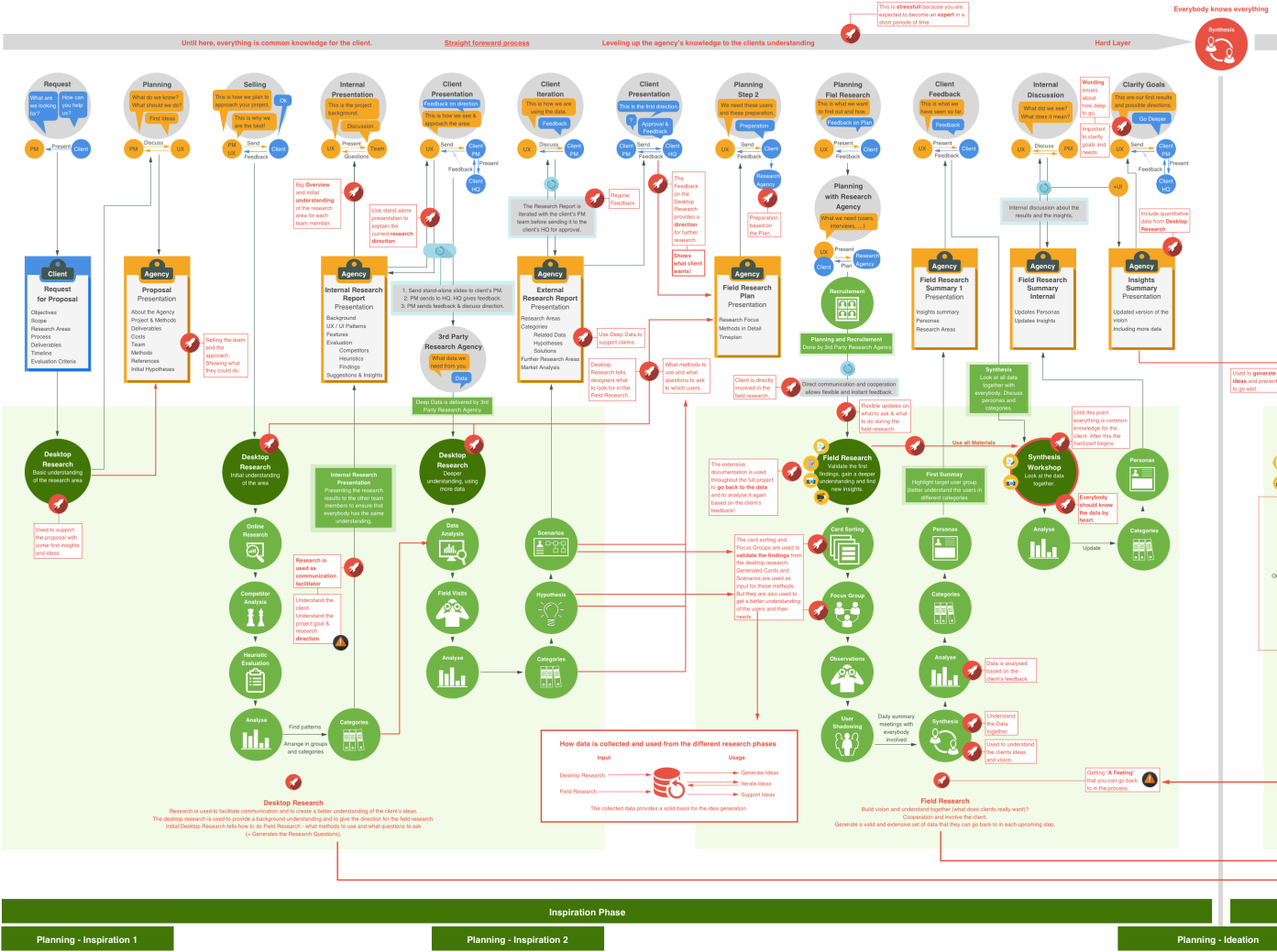
General Background

- What background do you have (study, internships, other experiences)?

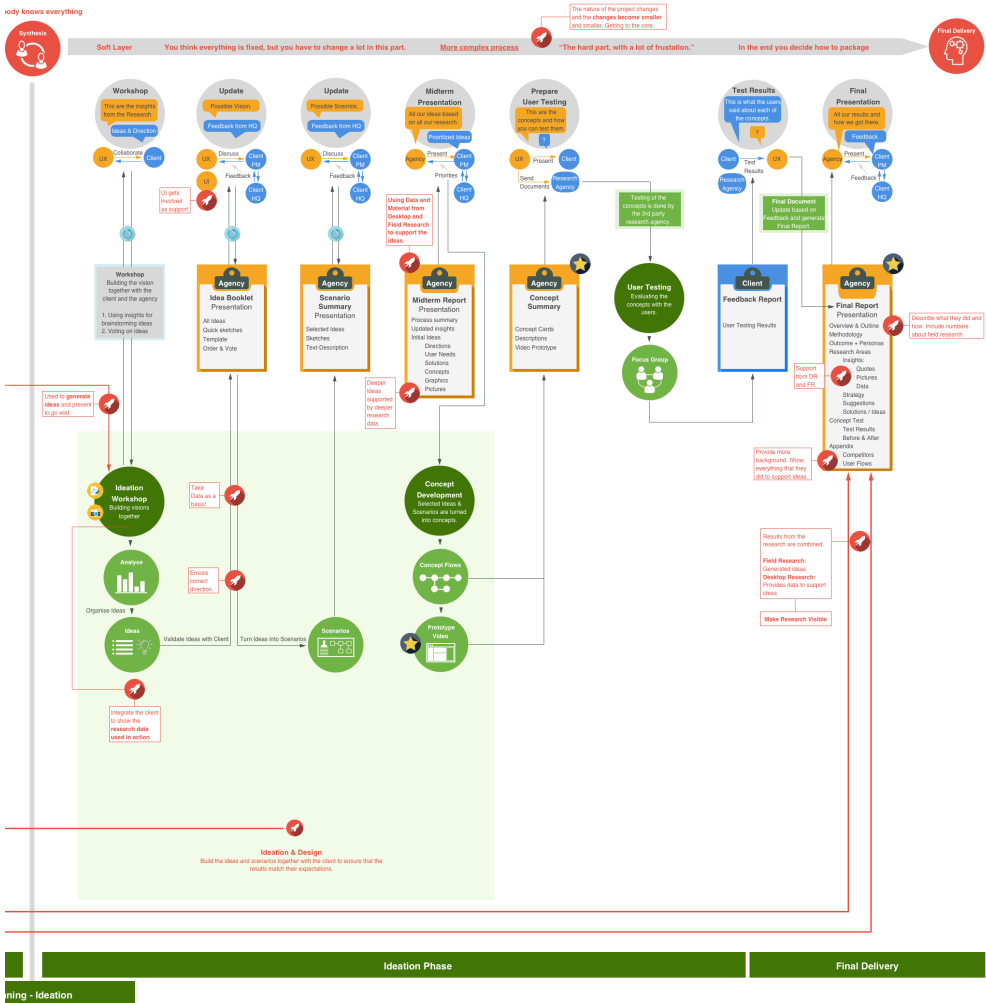
Background in other other agencies / positions

- How many years of experience in design agencies did you have before joining this team?
- How many years of experience do you have in other design teams?
- How many years of experience do you have in general?
- Can you describe your experience a bit?
 - What methods did you use?
 - What was your role?
 - What was different / similar to your current position

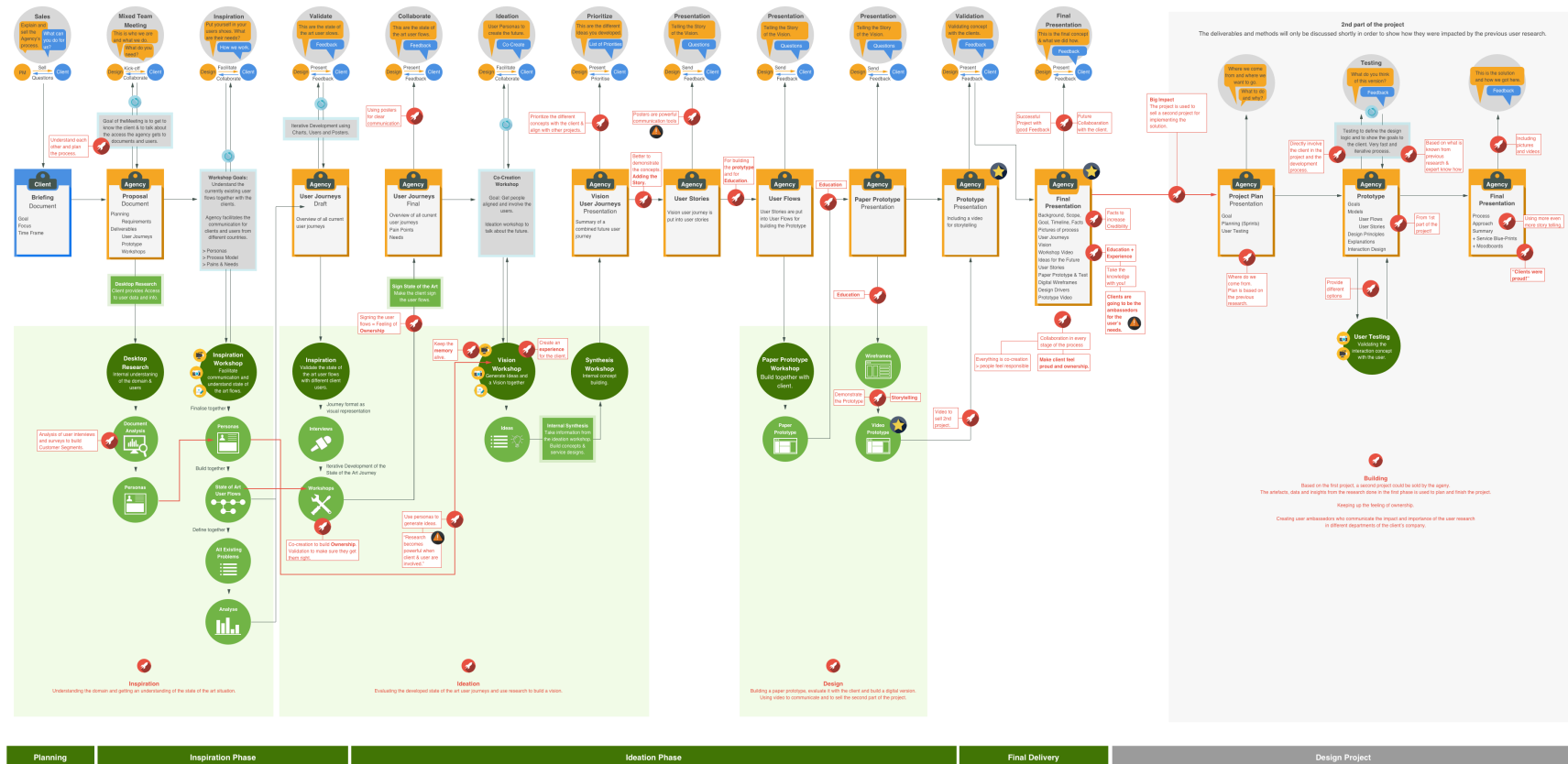
Appendix 04 – Model P1 (First part)



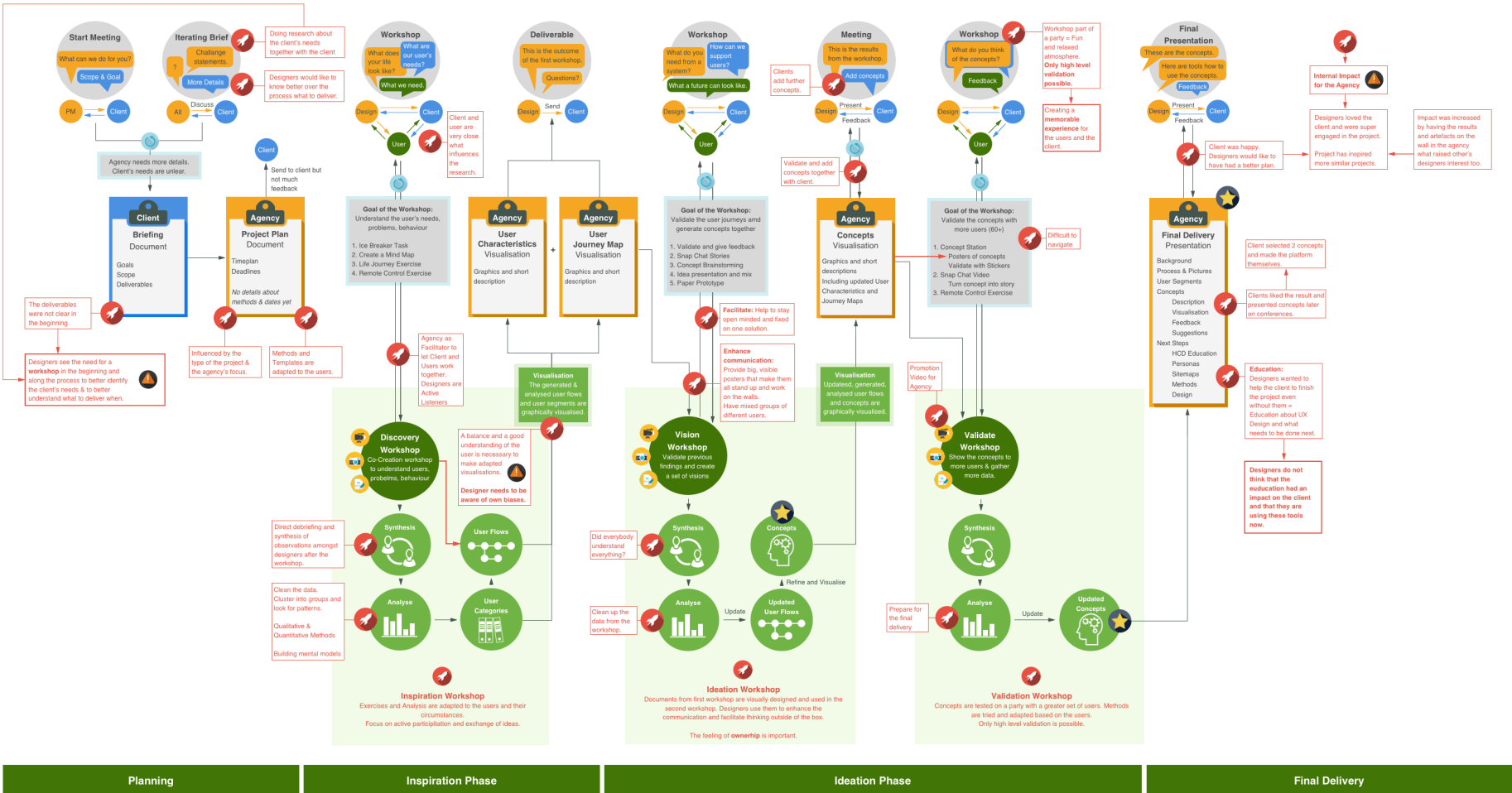
Continued Appendix 04 – Model P1 (Second part)



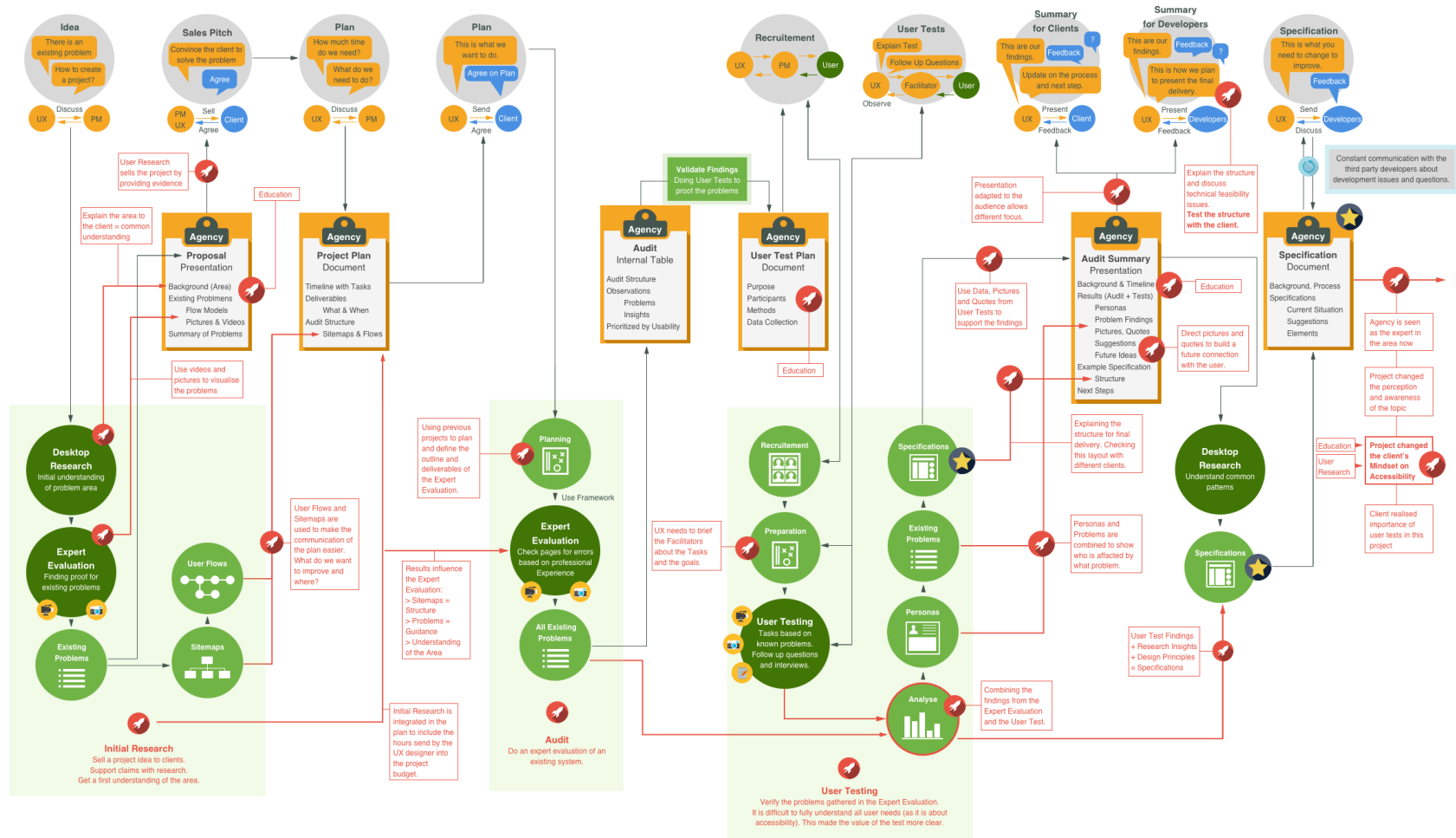
Appendix 05 - Model P2



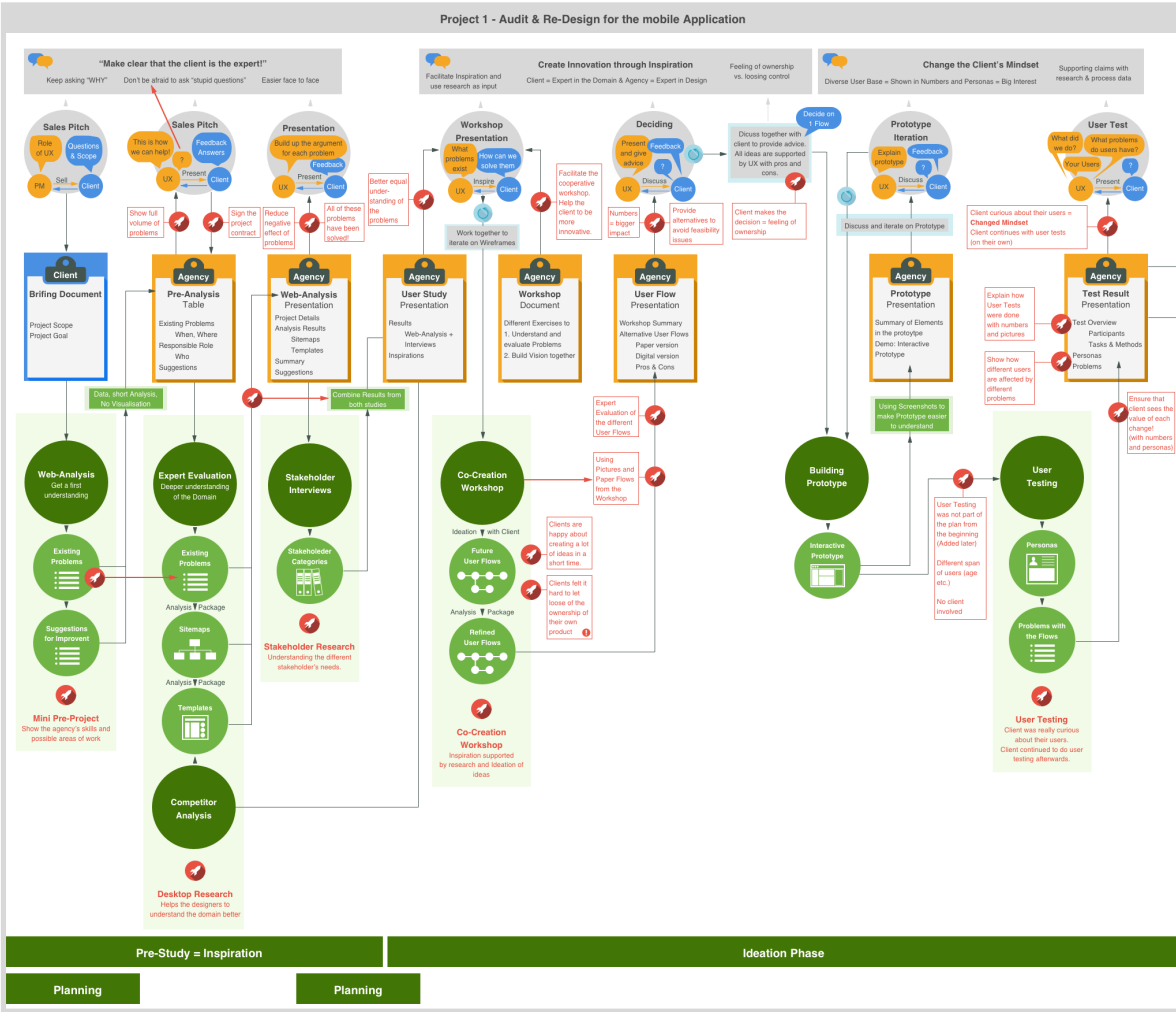
Appendix 06 - Model P3



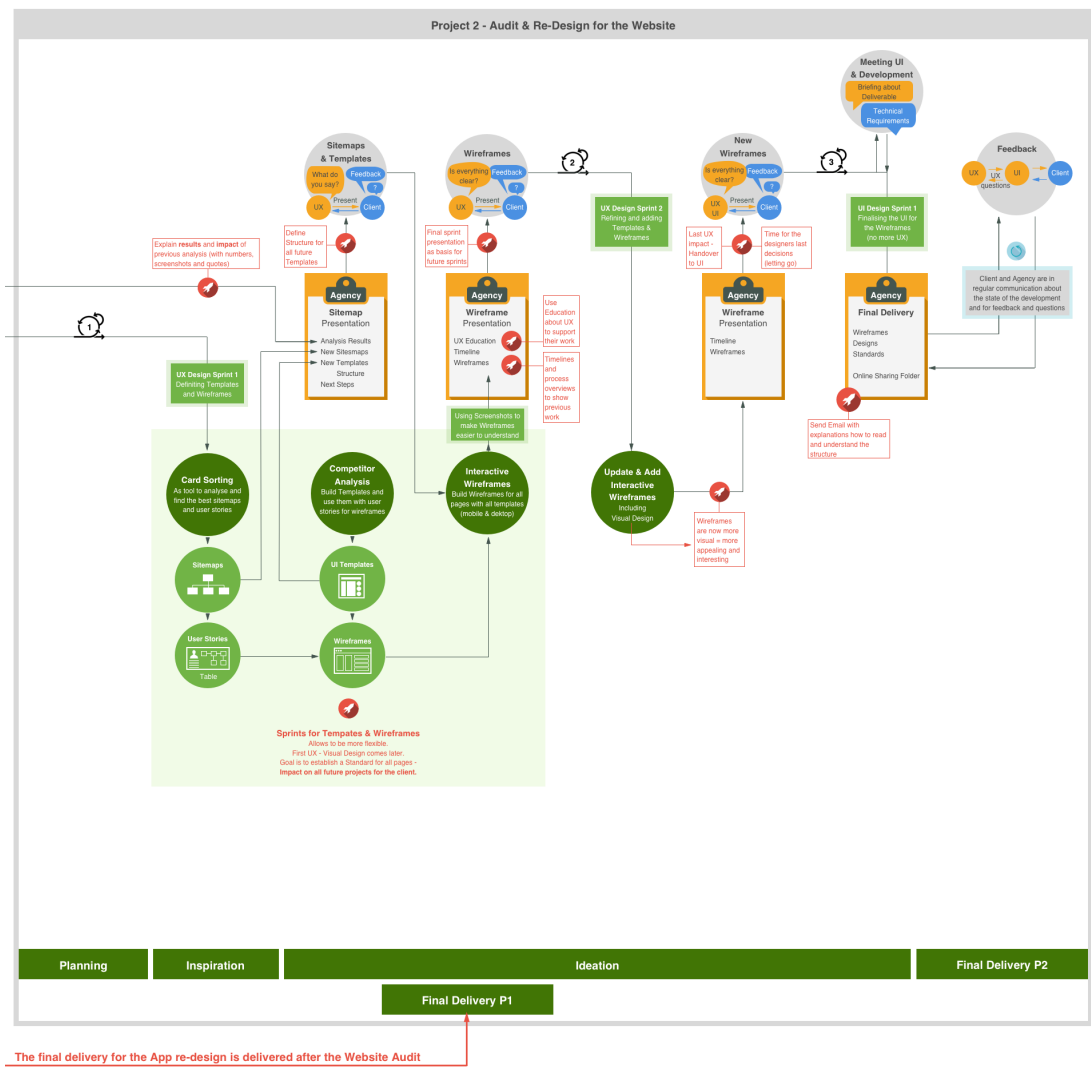
Appendix 07 - Model P4



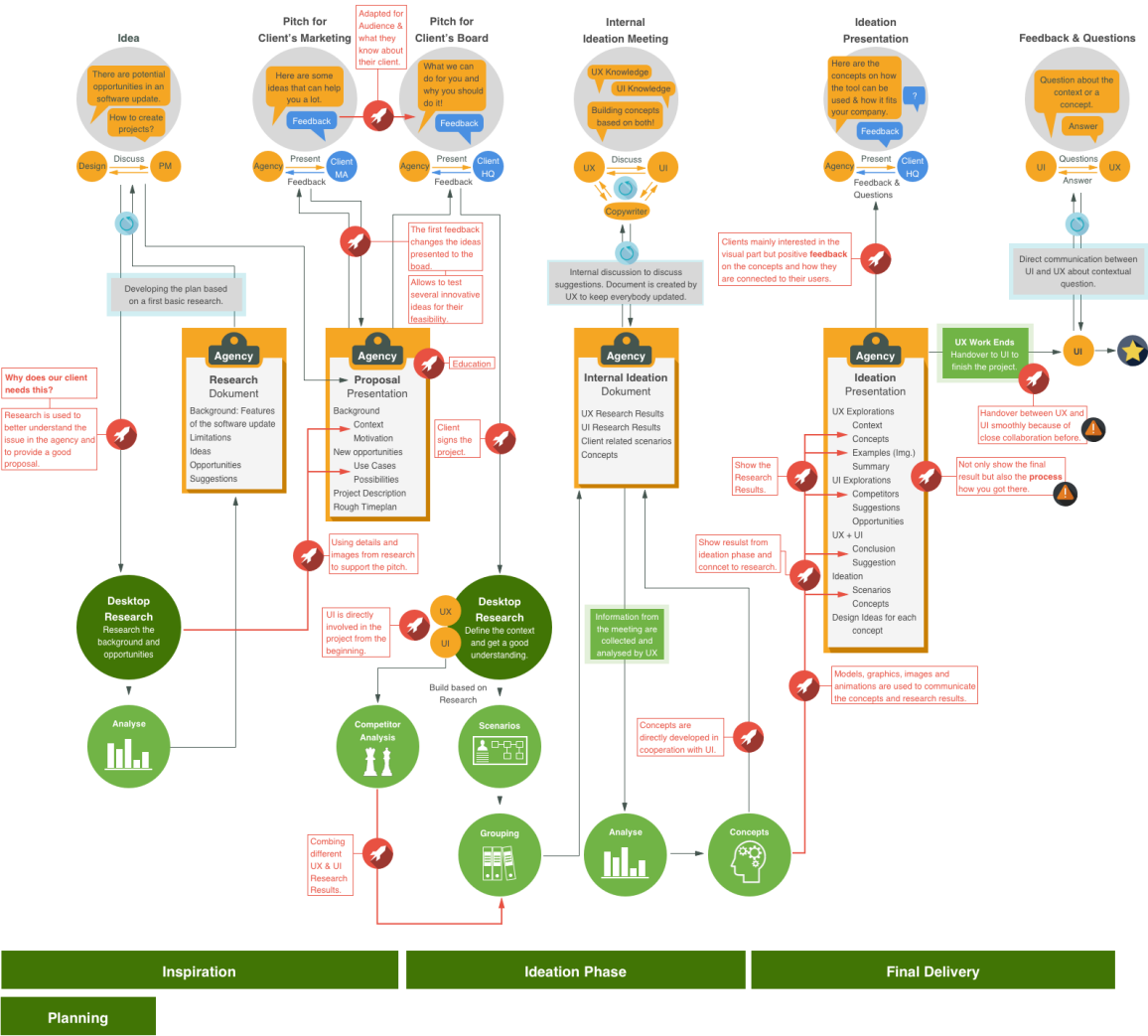
Appendix 08 - Model P5 (First part)



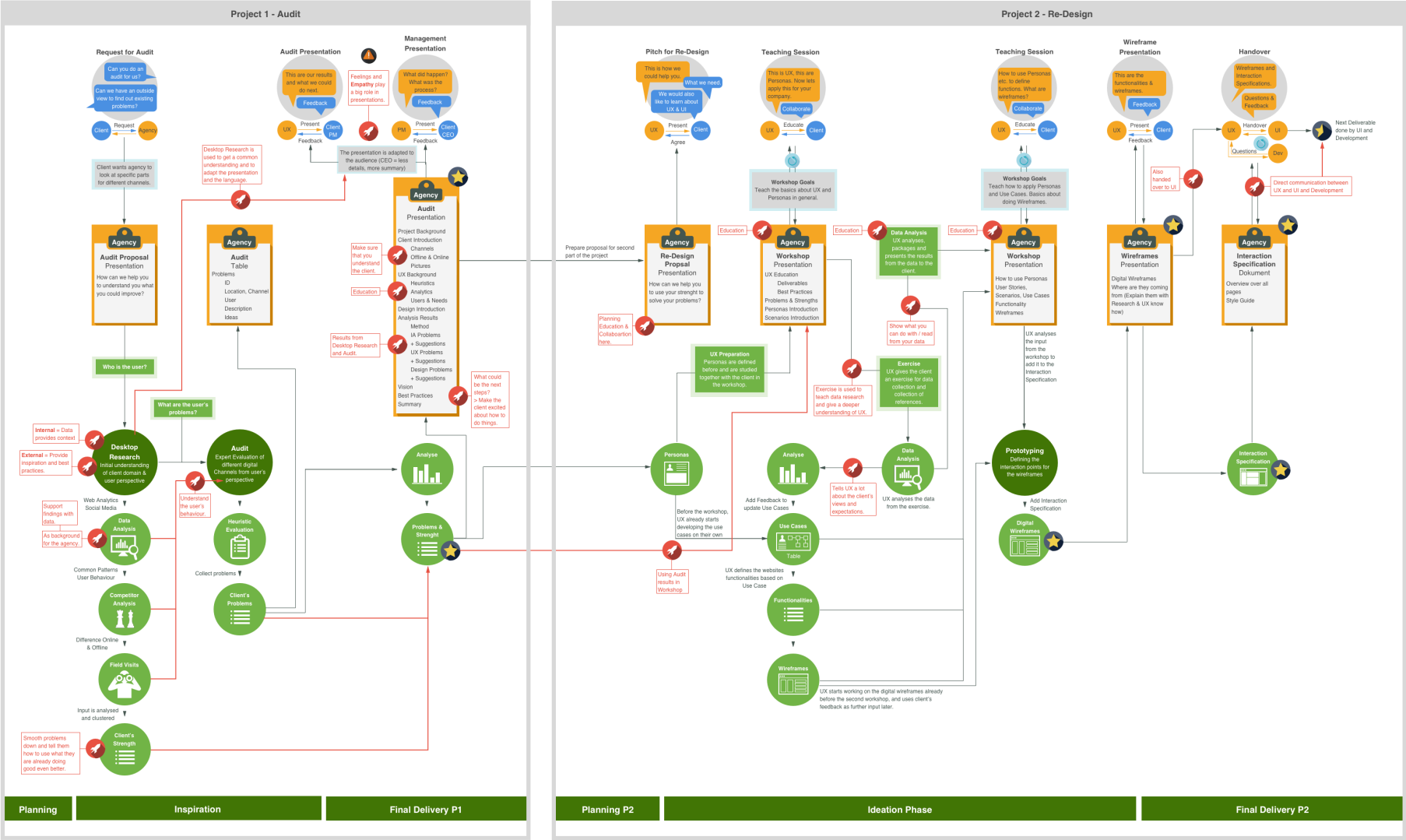
Continued Appendix 08 - Model P5 (Second part)



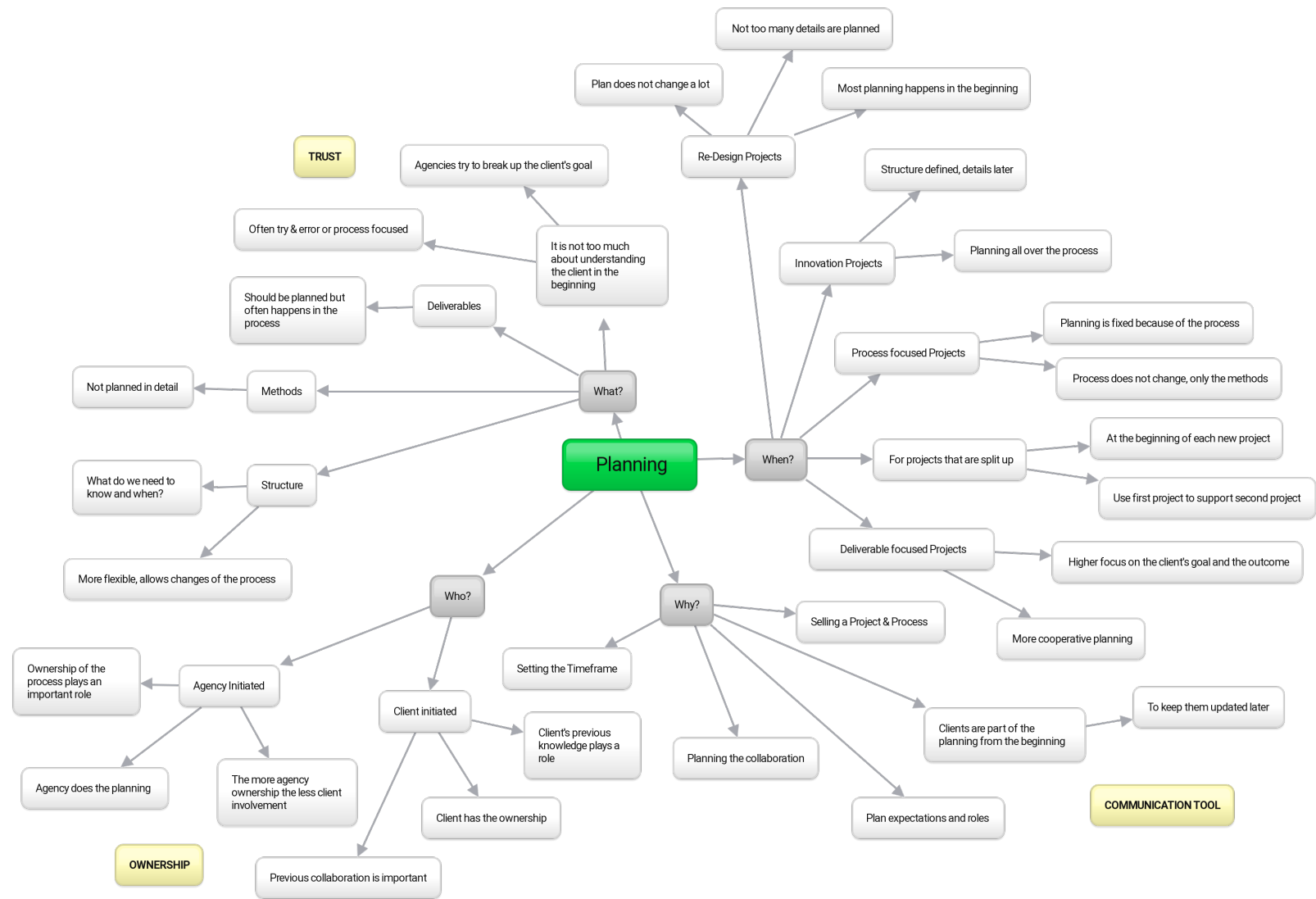
Appendix 09 - Model P6



Appendix 10 - Model P7



Appendix 11 – Planning



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