The Fuzzy Front End of Experience Design: Eliciting and Communicating Experience Goals

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ABSTRACT
When starting an experience design process, designers should first determine the experience to aim for. In the fuzzy front end of the experience design process, there are often several alternative sources for gaining insight and inspiration in defining this experience. In this paper, we describe our findings from two surveys about experience goal setting and approaches to communicate about these goals with stakeholders. The results from researchers working on 9 different experience design cases suggest that "empathic understanding of the users' world" is the most used source of insight and inspiration in defining experience goals. As an end result, we propose the model for Experience Goal Elicitation Process to clarify the fuzzy front end of experience design and instructions to support designers in defining and evaluating experience goals.

Author Keywords
Experience goal, UX goal, experience design, fuzzy front end, survey study, Experience Goal Elicitation Process

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
In experience design, the emotional and experiential elements are the main starting point of design activities. The intended user experience (UX) is taken as the primary objective of the design process (Hekkert et al., 2003). ISO 9241-210 (2010) defines UX as "a person's perceptions and responses that result from the use or

anticipated use of a product, system or service". Hassenzahl (2003) divides UX into pragmatic (e.g., usability and utility) and hedonic (e.g., stimulation and identification) aspects of product use. Similarly, Mahlke (2007) presents a model of UX components with instrumental (e.g., ease of use) and non-instrumental system qualities (e.g., visual attractiveness). In addition, he also links the perceptions of these qualities to emotional reactions which are presented as the third UX component, during user's interaction with the system (Mahlke, 2007)

Because experiences with interactive products and services are subjective, dynamic and context-dependent (Hassenzahl & Tractinsky, 2006), it is suggested that designers can only aim to facilitate specific experiences among the users, i.e., design *for* an experience (Wright et al., 2003; Sanders & Dandavate, 1999). According to Desmet and Schifferstein (2011), two important challenges in experience design are: 1) to determine what experience to aim for and 2) to design something that is expected to evoke that experience. In this paper, we focus on the first challenge.

The "fuzzy front end" refers to actions at the beginning of the development process, when the targeted product or service is not yet decided and making changes to the target result is still inexpensive (Khurana & Rosenthal, 1998). The first step in designing for an experience is to define the *experience goals* that concretize what the users are intended to experience before, during or after interacting with the product or service. Clearly defined experience goals, to which the project team commits to already during the fuzzy front end phase, can help the team by "keeping user experience in focus through the multidisciplinary product development and marketing process" (Kaasinen et al., 2015).

In this paper, we present results from web survey studies with nine (9) respondents working on nine different experience design cases in the field of human-computer interaction (HCI). The surveys were conducted in connection with an academic conference workshop in NordiCHI2014. The workshop focused on the first phases of experience design in real life design cases where the design was driven by the intended experiences, described as "experience goals". The research questions directing our research were:

- Where can insight and inspiration be gained from to define experience goals?
- What are the characteristics of a good experience goal?
- How should experience goals be communicated to stakeholders?

As a result of our findings and prior research, we propose a model illustrating the elicitation process of experience goals and different approaches for communicating them among stakeholders. The model aims to clarify the fuzzy front end of experience design for HCI academics and practitioners. We also summarise our learnings in a more practical set of instructions to support designers when defining and evaluating experience goals. Our findings contribute to the body of knowledge of experience design research in the field of HCI.

EXPERIENCE/UX GOALS
The first academic workshop to collect cases of UX goal (in this paper, we use term "experience goal") utilisation was held in a NordiCHI2012 conference (Väätäjä et al., 2012; Väätäjä et al., 2015). The domains of the case studies varied from workplace to consumer applications and education. The workshop participants defined a good experience goal as something that 1) helps aiming the design as a guiding light, 2) is measurable, 3) describes positive emotions, and 4) is a way to communicate the desired experience with other people. Furthermore, experience goals were considered useful in keeping the focus on important issues and providing inspiration.

In their recent study, Kaasinen et al. (2015) identified five approaches to gain insight and inspiration for experience goal-setting in industrial environments. The approaches were derived from four industrial design case studies with companies and were supplemented with literature study.

Table 1 presents definitions for the five identified approaches (Kaasinen et al., 2015).

Brand	UX Goals Derived from Company and Brand Image
Theory	Deriving UX Goals from Scientific Understanding of Human Beings
Empathy	Inspiration from Designer's Empathic Understanding of Users' World
Technology	UX Goals Identified Based on Possibilities and Challenges of a New Technology
Vision	Inspiration from Investigating the Deep Reasons for Product Existence and Envisioning Renewal

Table 1. Five approaches to gain insight and inspiration for UX-goal setting. (Kaasinen et al., 2015)

Karvonen et al. (2012) suggest that the made design solutions should be traceable back to the originally defined experience goals during later design phases. In this way, it is possible to measure and evaluate the fulfilment of the experience goals in different phases of the design work, such as when evaluating the designed product with users (Karvonen et al., 2014). In their experience design case of a remote operator station (ROS) for container gantry crane operation in port yards, a combination of methods was used to evaluate the fulfilment of the original experience goals. User interviews, testing sessions with a simulation version of the ROS, and UX questionnaires (for measuring UX and usability of the system) provided evidence to evaluate if the original claims for target experience goals had been achieved. They concluded that a modified version of the Usability Case method (see Liinasuo & Norros, 2007) could be a suitable approach for evaluating the fulfilment of experience goals in the future.

STUDY DESIGN
The goal of the study was to understand how experience goals are created and communicated among stakeholders. The study consisted of four phases: 1) a survey for experience design cases, 2) the analysis of the results and creation of model prototypes and instructions, 3) a follow-up survey, and 4) the iteration of the most promising model and the instructions.

Participants
The respondents were researchers working on experience design related cases, and had submitted their case papers to a workshop about experience design in the field of HCI. Prior to the workshop, we received 11 responses from 16 possible authors and co-authors (i.e., a 69%

response rate). Three identical responses were received from the same experience design case, so two of them were removed from the data set. Therefore, in total, nine responses were used in further analysis. All nine respondents came from academic institutions, either universities or research organizations, situated in Sweden, Finland, Germany or United Kingdom.

Ten responses were received to the follow-up survey. Despite two reminders, only five of the original nine respondents answered the follow-up survey. Table 2 summarises how these five described their expertise in the HCI and experience design fields to be at the time of the first survey. Three of them were researchers responsible for defining, designing and/or evaluating the solution, one was a researcher conducting a user study and one acted as project manager and design lead. All five had more than four years of experience from experience design related activities and had worked in several experience design projects (see Table 2). Four out of five respondents had more working experience from academia than from industry. In addition to the five original respondents, three HCI researchers from the Tampere University of Technology and two of the workshop organisers gave feedback about the proposed models and the instructions.

Based on the follow-up survey responses, case C4 (see Table 4 for the case descriptions) was an academic research project, while cases C3, C5, C6 and C8 were collaborative projects between academic and industrial partners.

Web Surveys

Table 3 presents the questions used in the first web survey. The participants were first asked to choose a specific case of experience design and answer the questions 2 to 5 (see Table 3) based on their experiences during the case. In the second question about the sources of insight and inspiration for the used experience goals, we utilized the five approaches presented by Kaasinen et al. (2015), but also left an open-ended option for alternative sources. The last question was related to the definition of experience goals in general. Here, we used a projective technique called sentence completion (e.g., Soley & Smith, 2008).

The follow-up web survey was conducted to iterate the

Based on the case described in your paper, or thinking about some other case, please answer the following questions.

1. Describe the topic of the case briefly

2. Where did you get insight and inspiration to define what experience to aim for? (Choose all that apply)

  a) Company or brand image (Brand)

  b) Scientific understanding of human beings (Theory)

  c) Empathic understanding of the users' world (Empathy)

  d) Possibilities and challenges of a new technology (Technology)

  e) Reasons for product existence and envisioning renewal (Vision)

  f) Something else, what?

3. Who participated in defining the targeted experiences (experience goals)?

4. What were the targeted experiences (experience goals) in your case?

5. How (in what form) did you communicate the targeted experiences?

6. Based on you own experience, please complete the following sentence: In my opinion a good experience goal is…

Table 3. Experience design case survey questions.

Topic	n	Range	Mean (SD)
HCI related working experience from academia? (years/months)	4 (1 missing)	3 y 3 m – 14 y	12 y 9 m (3 y 11 m)
HCI related working experience from industry? (years/months)	4 (1 missing)	1 y – 6 y	3 y 5 m (2 y 2 m)
Working or research experience from Experience Design (e.g., experience goals, design for experience, experience evaluation) related activities? (years/months)	5	4 y 2 m – 15 y	7 y 8 m (4 y)
How would you evaluate your own expertise and knowledge from theories and research related to experience design field? (Very low 1 – 5 Very high)	5	3 – 5	4 (0.63)
How would you evaluate your own expertise and knowledge from conducting experience design work in practice? (Very low 1 – 5 Very high)	5	3 – 5	4 (0.63)
How many other experience design projects had you worked on before the one reported here? (i.e. projects following experience design process, with defined experience goals)	5	6 – 11 projects	9.4 projects (1.85)

Table 2. The follow-up survey results regarding the respondents' expertise at the moment of the first survey [n=5].

proposed models and instructions. This survey also included more detailed background questions regarding 1) the respondent's role in the experience design case, and 2) working experience in HCI field and experience design related activities at the time of the first survey. In addition, we asked the respondents to choose their favourite of the three Experience Goal Elicitation Process model prototypes, justify their choice and suggest improvements to the model. Finally, we asked how understandable our instructions for "defining and evaluating experience goals" were, did they agree or disagree with the instructions, and how they could be improved?

Process
A link to the first web survey was sent by e-mail to the participants of the workshop and to all the authors of each accepted position paper of the workshop. Two researchers analysed the results of each open question and categorised similar responses to their own groups. Based on the survey results and previous literature, the researchers outlined several prototype models for an Experience Goal Elicitation Process and a set of instructions for defining and evaluating experience goals. The models and the instructions were iterated by a group of HCI researchers at the Tampere University of Technology and separately by each author of this paper, resulting in three alternative versions of the model and an updated set of instructions.

Approximately 8 months after the first survey, a link to a follow-up survey was sent to all workshop participants and organizers. An abridged version of the survey was also sent to HCI researchers working at the Tampere University of Technology. Based on the feedback received from the workshop participants, the workshop organizers, and the fellow researchers at the university, two researchers further iterated the most promising version of the model and updated the instructions.

RESULTS
This section describes the main results and discusses the findings. At the end of this section, we present the model of an Experience Goal Elicitation Process and instructions to support designers in defining and evaluating experience goals.

Sources for Insight and Inspiration When Defining Experience Goals
Table 4 presents short descriptions of the cases and what *sources for insight and inspiration* (see Kaasinen et al., 2015) the participants reported in each case *when defining experience goals*.

In the reported case studies, "empathy" (7/9 responses) and "visioning" (5/9) were the most often used sources. "Brand" and "vision" were mentioned in all three industrial cases, which may indicate that these cases had clear business purposes, which were different from more research-driven cases. In seven out of nine cases, three or more different sources were used for insight and inspiration when defining experience goals. This suggests that the respondents prefer to combine multiple sources of information when defining experience goals.

The reported five "Other" sources for insight and inspiration were 1) the environment (case C4), 2) co-design cued by site visits (C5), 3) the values of an author to whom the museum is based on (C5), 4) previous published pilot work related to the user group (C7), and 5) rules and functionalities created by the paper generation (C9). Kaasinen et al. (2015) include co-design in the empathic approach, according to the original idea of co-design by Sanders and Dandavate (1999). However, they also question whether co-design should be an approach of its own.

Our results seem to confirm the findings from previous studies by Väätäjä et al. (2012; 2015) and Kaasinen et al. (2015) where "Empathy" (e.g., user studies) was the most often used source for inspiration when defining experience goals. However, it is not evident if our respondents interpreted the given options for the sources of insight and inspiration in a similar way, since the provided descriptions in the questionnaire were brief. For example, it may not have been evident to the respondent from C5 that co-design was included in the "Empathy". Therefore, more elaborate descriptions for the sources, possibly with some examples, would be required in any future studies to avoid misinterpretations.

Case description	Empathy	Vision	Theory	Technology	Brand	Other	Total
C1. Industry: UI design for a tool to manage customer information in product development	X	X			X		3
C2. Industry: Developing paper machine quality control system	X	X			X		3
C3. Industry: Concept design approach Innoleap for industrial work activity. Example of a ship command bridge design case.		X	X	X	X		4
C4. Entertainment: Considering quality of experience in a location-based augmented reality horror adventure	X		X			X	3
C5. Entertainment/Education: Use of mobile augmented reality and outdoor education principles to create something for families visiting a museum.	X	X	X	X		XX	6
C6. Education/Well-being: Designing technology to combat (cyber)bullying in classrooms	X			X			2
C7. Health care/Well-being: Enhancing patient agency in spinal cord injury (SCI) rehabilitation	X		X			X	3
C8. Marketing: Studying experiences from packaging design using Online Research Community method.	X						1
C9. Informatics: Enhancing archival UIs with UX techniques		X		X		X	3
Total	7	5	4	4	3	5	

Table 4. Case descriptions and the sources of insight and inspiration when defining experience goals [n=9].

Case	Researcher	Designer	Topic expert/ Specialist	Developer	Management/ Employee/Client	User/ Target user	Students	Total
C1. Industry		X		X			X	3
C2. Industry	X			X		X		3
C3. Industry		X			X	X		3
C4. Entertainment	X	X						2
C5. Entertainment/Education	X		X		X			3
C6. Education/Well-being			X			X		2
C7. Health care/Well-being	X	X	X		X			4
C8. Marketing	X							1
C9. Informatics				X				1
Total	5	4	3	3	3	3	1	

Table 5. Participants in the definition process of the experience goals in each case [n=9].

Who Participated in Defining the Experience Goals?

When considering "Who participated in defining the experience goals?" the results in Table 5 shows that researchers (5/9 cases) and designers (4/9, e.g., UX designers, graphic designers and game designers) participated most often in the definition process of the experience goals. Topic experts or specialists (3/9) included an expert panel of educators, outdoor educator specialists, and consultants. Management / employees / clients (3/9) category included museum management and employees (C5) and the spinal injury unit (SIU) director (C7).

We noticed that although "Empathy" was the most often mentioned source for inspiration (7/9, see Table 4), users participated in the definition of the experience goals only in three cases. This seems to suggest that although understanding users is necessary for designers to become familiar with the design context, the experience goals are

not always derived from the users. This may indicate that experience design seeks possibilities rather than aims at solving existing problems or evident needs. However, it is also possible that user participation during the experience goal definition was not feasible for some reason. Overall, when not involving users in the definition process of experience goals, there is a risk of basing the design on stereotypical views or assumptions. Still, designers with much previous experience from designing for a specific user group could arguably manage without actual user participation, but our data does not tell how experienced the respondents were with similar target user groups. However, some of the respondents did have a substantial experience from different experience design cases.

Chosen Experience Goals and Approaches to Communicate Them
Table 6 shows that the reported *targeted experiences* are rather unique in each case. However, industrial cases C2 and C3 shared a common experience goal: the sense/feel of control. Also, entertainment related cases C4 and C5, both utilizing augmented reality, had a similar goal: to provide an overall experience of curiosity.

Some of the reported goals seem to contain aspects related to good usability, such as "learnability" (C2) and "ease of use" (C7). Furthermore, in some cases, the usability quality was described from an experiential aspect, such as "feeling of efficiency" (C3). Some of the

goals do not seem to be related to experiential aspects, such as "support outdoors education" or "dialogue". However, the complete definitions of these goals may have included also the experiential aspects. Still, it seems that in some cases, the chosen goals were a blend of experiential and more pragmatic goals.

Table 6 also shows *how the targeted experiences were communicated* among stakeholders. Brain-storming sessions, workshops and meetings (3/9 responses) were the most common ways to verbally discuss the experiences to aim for. Written reports and documentation (2/9) and sketch-level scenarios (2/9) were also used. For example, in the case C5 "around forty design concepts were sketched down and presented to stakeholders". In the case C7, "a generalized timeline of a patient's journey through the SIU" was created based on user observations during an ethnographic study.

According to the survey results, experience goals are communicated between stakeholders in writing, verbally and by using artefacts, such as personas and sketches. An interesting theme for future research could be how well these different ways manage to communicate the intended experience, in what phases during the development process they are used and how.

Aspects of a Good Experience Goal
Based on the responses to the sentence completion task, *a*

Case	Chosen experience goals	Approaches to communicate experience goals
C1. Industry	-	Documents, Verbal presentations
C2. Industry	1) Learnability, 2) Awareness, 3) Feel of control, 4) Success	-
C3. Industry	1) Being one with the ship and the sea, 2) Feeling of community, 3) Feeling of efficiency, 4) Feeling of trust towards peers, 5) Sense of control	Scenarios, Sketching
C4. Entertainment	1) Overall experience of curiosity, tension and 'black-humour' horror, 2) Feeling of presence, 3) Speculative play, 4) Support trajectories as journeys through hybrid spaces	Audiovisual material, Free play
C5. Entertainment/ Education	1) Arouse curiosity, 2) Focus on natural and cultural landscape, 3) Communicate author's life and authorship, 4) Support outdoors education, 5) Sustainable experience over time	Bodystorming, Brainstorming, Moodboards, Personas, Scenarios, Sketching
C6. Education/ Well-being	1) No-blame strategy: not blaming bullies, 2) Positivity, 3) Kind authority, not strict or punishing, 4) Dialogue	Reports, Academic publications
C7. Health care/ Well-being	1) Patient-centredness, 2) Ease of Use, 3) Ownership, 4) Network Navigation, 5) Projection	Workshops, Verbally in meetings, Ad-hoc interaction, Patient journey timeline
C9. Informatics	1) Bring user experience of archives closer to modern day web	-

Table 6. Chosen experience goals and approaches to communicate them. No answers from C8 [n=8].

good experience goal is 1) expressed clearly (so that all stakeholders understand it in the same way) (4/9 responses) and 2) precise enough to guide the design (4/9). Furthermore, the goal 3) should be achievable (3/9) and 4) involve emotion or the feeling users have while interacting with the product/service (3/9). In individual responses, a good experience goal 5) is grounded in research, 6) comes directly from the end user, 7) is related to the context of use, 8) can be evaluated, and 9) is a principle that drives creativity.

In the follow-up survey, one of the respondents commented that an experience goal does not necessarily have to be realistically achievable, as it can still act as a target, even if it cannot be fully reached.

Our results are mostly in line with the earlier findings by Väätäjä et al. (2012, 2015). However, the requirements of clear and precise descriptions of the goals were more distinctively emphasized in our findings.

The Model for Experience Goal Elicitation Process and Instructions for Defining Experience Goals
When evaluating the proposed model prototypes in the follow-up survey, respondents highlighted that experience goal elicitation is an iterative process. One of the respondents justified the choice for his/her favourite model: "Because it shows an iterative process. Cloud is a symbol for possible approaches (indicating there might be

others)". Another respondent considered the boundaries between the "sources for insight and inspiration" and "approaches for processing information" to be blurry: "Participatory design can be one way of gaining such emphatic understanding, so the boundaries between the different boxes are not always clear to me."

Figure 1 illustrates the resulting model for Experience Goals Elicitation Process. On the left are potential sources for insight and inspiration, as described by Kaasinen et al. (2015). In the middle, information from the sources is iteratively processed by stakeholders using different approaches, such as brainstorming or co-design (examples come from the studied cases). The sources are overlapping with the approaches that "are also approaches to building sources for insight and inspiration", as one respondent commented. The iterative process produces a list of usually verbally described tentative experience goals, which are then prioritized. After making the selection of the target experience goals, they can be communicated to all stakeholders through different means, such as sketches, personas, and use scenarios (examples come from the studied cases). The means change depending on the stage of the project. The whole process is iterative, and during the communication with the stakeholders the experience goals can be further refined and more data can be gathered from the sources.
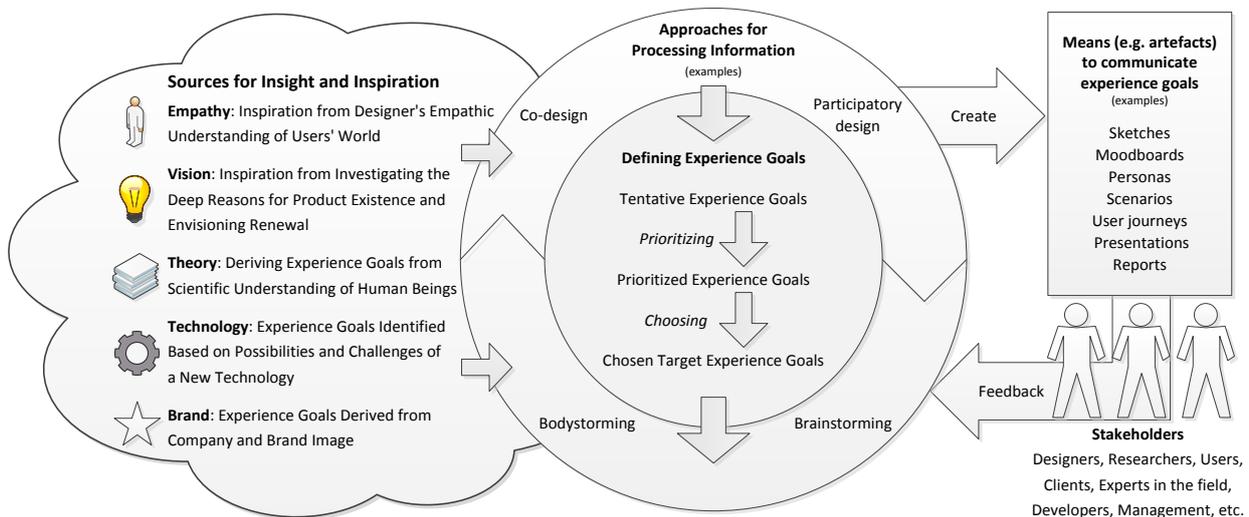
Figure 1. The model for Experience Goals Elicitation Process.

Instructions for defining and evaluating experience goals	
Describe, prioritize & choose	1. Use/choose methods and means to describe experience goals so that all stakeholders can create a shared and similar understanding. 2. Consider possible user requirements connected with the experience goals. You can also describe emotions or feelings the user is aimed to experience. 3. Describe goals precisely enough to make them actionable for designers in the design process. Describe also the reasoning behind the goals (why) as designers need to select the proper means of conveying (how) the experience (what). 4. Prioritize the experience goals to aim for and choose goals that can realistically be achieved (or at least targeted).
Communicate & iterate	5. Plan what means (e.g. artefacts) to use to communicate the experience goals for stakeholders. 6. Iterate the goals as you learn more throughout the design process. Revise what deliverables to use if you find better ways of communicating.
Measure & evaluate	7. If experience is measured, operationalize the experience goals and select appropriate (qualitative) metrics for evaluation. 8. Plan how to trace the later design solutions back to experience goals so that it is possible to evaluate the fulfilment of the goals in different phases of the design work.

Table 7. Instructions to support designers when defining and evaluating experience goals.

Although experience goals defined at the very beginning of an experience design project should guide the whole design process, in practice it is possible that the original goals are iterated later on, as designers learn more about the users and the context where the product or service will be used.

Finally, in Table 7, we provide a set of instructions to support the definition and evaluation of experience goals, derived from our results and previous literature (Väätäjä et al., 2012; Karvonen et al., 2012; Karvonen et al., 2014). Although not an exhaustive list to cover all possible steps in the experience design process, our aim is that these instructions can act as a check-list to support the beginning of the experience goal definition process and that different aspects of good experience goals are discussed with stakeholders.

CONCLUSIONS

In this paper, we have focused on one of the first challenges in experience design process: determining what experience to aim for. Our aim was to understand how experience goals are defined and communicated with stakeholders in the fuzzy front end of experience design. We have reported our findings from two survey studies of 9 experience design cases. As a result, we proposed a model of Experience Goal Elicitation Process and instructions to support the definition and evaluation of experience goals.

There are several limitations of our current study that should be taken into account in studies to follow: 1) the small sample size of rather dissimilar experience design

cases, 2) lack of experience design projects ran by practitioners from industry, and 3) our data was based on participants' memories of the events, not necessarily what actually happened during the design process. From research perspective, it can be challenging to obtain a large sample of, especially industry-driven, design projects that actually follow the experience design process. Therefore, a more in-depth approach utilizing interviews and observations with practitioners could provide more valuable insights for experience design research and practice, even from a smaller number of cases.

We aim to iterate the model for Experience Goal Elicitation Process with practitioners from industry, since the participants of our current study were mainly from academia although several of them had work experience also from industry. Also, the model could be further iterated to better illustrate the experience design process in more specific domains, such as consumer electronics, educational games, or assistive technology, where different sets of stakeholders might be important.

Interesting research questions that have formed during this study include: 1) how experience goals can be prioritized and chosen, 2) how well different artefacts support the communication of experience goals for different stakeholders, and 3) how experience goals can be transformed to measurable design targets (e.g., Karvonen et al., 2014). With more research on these topics, we can hope to clear up the "fuzziness" of the fuzzy front end of experience design.

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