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EXPLORING THE ACTUAL PRACTICE OF USER EXPERIENCE AND SCENARIO-BASED METHODS

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1. Introduction: user experience in theory and practice

The interest in the phenomenon of user experience (UX) is growing rapidly in the past decades -in both scientific as well as industrial world. However, a fundamental question remains relevant: How can we create positive user experiences systematically? A number of different definitions, perspectives and approaches have emerged to address this question [Jordan 2000], [Forlizzi and Bartttarbee 2004], [McCarthy and Wright 2004], [Norman 2004], [Desmet and Hekkert 2007], [ISO 2008], [Hassenzahl 2010]. But despite the interest and efforts of the scientific community, we still struggle towards a unified, cross-discipline understanding, as well as handy tools, methods and criteria that would help design teams navigate through the complex design processes a UX [Roto et al. 2010].

Given the variety of theoretical works on UX and user experience design (UXD) methods from academia, it is the aim of this work to trace them in actual practices. This research goal is related to current debates on relevance of scientific work for design practice (e.g. the debate in the DESIGN 2014 on the topic of empirical versus basic research) and resulting attempts to bridge the gap between theoretical research and actual application [Kuutti 2010], [Law et al. 2014].

A first step towards this goal could be achieved by approaching practitioners and share their perspective before defining development needs, requirements and new methods. Therefore, we conducted a study exploring UXD practice in companies of different sizes, domains and cultures. We asked practitioners to share with us their understanding of UX, ways they implement UXD and their opinions. Based on their responses, we draw initial insights and requirements on a methodological support of UXD. The survey had no focus on a specific stage of the design process. Furthermore, we investigated the practice of scenario-based methods (SBM). This umbrella term describes in our work methods, techniques and tools that make use of scenarios, like the persona, storytelling and storyboarding techniques. The reason why we included this topic in our study is that, according to literature, SBM are very useful in the broader context of user-centeredness [Nardi 1992], [Fulton Suri and Marsh 2000], [Anggreeni 2010], [Carroll 2010] and UXD in particular [Quensbery and Brooks 2010], but meanwhile also popular in actual practice. In a previous survey, we have contacted 150 design practitioners to identify 40 of them, who were directly involved in UXD activities. 32 of the 40 UXD practitioners (80%) apply SBM in their practice.

Exploring the link of SBM to UXD would help us first of all confirm their usefulness, but also suggest ways to make their application more effective. In the next section, we describe the methodological approach of our study, present the research questions and information on participants, as well as the data analysis in the survey. In the following, we share the main findings concerning understanding, implementation and assessment of user experience, along with the main insights on practice of scenario-

based methods. Finally, we discuss the identified need for methodological support of user experience design and the appropriateness of scenario-based methods for this scope.

2. Research methodology

To specify the scope of our study, we first formulated research questions, which then broke down to concrete questions for practitioners. The questions root in literature and previous authors´ studies and are specific in nature, since they refer to explicit wording, definitions and issues. This nature of questions led to the decision for a structured questioning. We created a questionnaire with an introductory (including participants' demographics) and two main parts on user experience and scenario-based methods. To gain access to a large pool of participants, we decided to include our questions in an online survey. The target group were practitioners with experience in the practice of user experience design and/or scenario-based methods. The online-survey has the advantage of being better accessible to this target group. Being aware of the risks of misinterpreting questions or not being able to express a representative answer as participant of an online survey, we conducted some complementary interviews: parallel to the online survey to clarify if questions where perceived as intended and to gain deeper understanding of answers; after analysing the responses to explore in depth some issues worth further discussion. The study was conducted in the period March – May 2015.

2.1 Research questions

The overall issues explored in our study concern the topics of user experience (UX) and scenario-based methods (SBM) from three perspectives: understanding, implementation and assessment. By exploring those issues, we aim at addressing the following research questions: (1) Does is the understanding of practitioners on UX and SBM correspond to scientific literature? (2) What are current practices to implement UXD? (3) What does the actual application of scenario-based methods look like in industrial practice? (4) What do practitioners assess as opportunities and barriers of UXD? (5) Where do practitioners see benefits and challenges in the practice of SBM?

2.2 Participants of the survey

Participants of our survey were employees of German and Dutch companies of different sizes and domains acquired from the institute's contacts. We intended to cover a broad spectrum from companies with big company culture to companies with small company culture and companies with formal and informal structures. We included companies specializing in the design of consumer products, working tools, as well as services. We considered only complete responses from participants with experience in UXD and in both UXD and SBD and finally included the responses of 22 practitioners. We analyzed the gathered data as whole but also country-specific. In some questions, we asked the participants to rate the relevance of predefined statements. Responses signified as "relevant" received a weighted score (9, 6, 3, 2, 1 points), while responses signified as "irrelevant" received -1 point.

2.3 Limitations

The paper describes a survey, which explores the opinions of 22 practitioners on experience design, its methods and challenges and compares it with current academic work. The main aim of this study is, on the one hand, to motivate researchers to ground their future work in real practice and on the other hand, encourage practitioners to reflect their experiences by recognizing patterns or new opinions in the results of the survey. However, the current work has the limitation of including a sample that is too small to generalize. The sample is not sufficient to influence design theory, can yet motivate fruitful discussions and future studies. Findings are rather implications and not yet generalizable results, reflecting opinions of a limited number of persons with various backgrounds, so they should be concerned under this limitation. Nevertheless, the opinions presented could be valuable for sensitizing readers (i) with academic background: on the importance of practitioners' needs and motivate research to focus on relevant issues; (ii) with practical involvement in UX: on reflection of their own understanding and practices compared to that of other practitioners and theory. For instance, recognize common challenges, yet unexplored chances of user experience design, or new training areas for their company. That would

be particularly interesting for companies who want to build expertise in user experience design. Many of the participants of the survey have a strong (mechanical) engineering background and would be interested in conclusions that might be trivial for practitioners with a different background. Despite the small sample size, some general conclusions could be drawn, because of the broad spectrum of participants. E.g. because all 22 different in background participants mentioned the communication of soft aspects of interactions as a challenge in user experience design, we have an indicator that future research could contribute in that direction. Such conclusions should encourage activities that bridge the gap between research and practice and highlight the usefulness of practitioners' input.
Another point to clarify is the motivation for including questions on scenario-based methods. Scenario-based methods were chosen because they are commonly proposed in literature for analysis, conceptualization and co-creation steps of user experience design. However, in the mechanical engineering context, in which our study took place, we saw in many cases no acknowledgment of their advantages compared to traditional, quantitative engineering methods. Pointing out benefits of scenario-based methods in the context of user-experience design would motivate readers to use them. Pointing out challenges related to their application would inspire future research, e.g. empirical studies.

3. Results: initial insights in experience design practice

In the following, we present the results of the survey and implications. Detailed results (tables with counts of responses) can be found in the appendix. Interesting insights from analysing and reflecting on the responses as whole are further discussed in the subsequent section.

3.1 Understanding of user experience

In our literature study, we identified a wide variety of frameworks explaining the phenomenon of UX. A lack of a common view on UX was also evident in practice. Interestingly enough, this even applied in cases where we investigated the understanding of more practitioners from one company. Whereas most participants connected the concept of UX with common keywords and many participants agreed on the characteristics of UX, we could identify a poor distinction of the goals of UX opposed to usability.

3.1.1 Keywords related to and characteristics of user experience

We selected keywords from scientific works mentioned in the introduction (which have a high citation index) to see which concepts practitioners connect to the concept of UX. Momentary usage and anticipation were the most frequently selected keywords. This comes to agreement with literature on temporal aspects of UX [Karapanos et al. 2010], [Roto et al. 2010]. Remembrance was also mentioned, but not as frequent. Functionality, interactivity and active product usage were also highly associated to UX. This could imply that product characteristics shaping interactions are what practitioners mainly look at when designing UX. The question on characteristics of UX revealed a general agreement among practitioners and with literature [Roto et al. 2010] that UX is subjective, context-related, worthwhile, dynamic and temporal.

3.1.2 Goals and targets of user experience design

We distinguished high-level goals of UX from concrete targets of UXD projects. Asking about high-level goals (Table 1), we intended to understand what motivates practitioners to apply UX approaches. Responses reflected an unclear distinction of UXD from usability goals. The items "designing most effective, efficient and satisfactory product use" and "avoiding frustrations" (which we considered goals related to usability) were highly rated, whereas "fulfilling psychological needs and motives through product use" (which we considered a primer UX goal) was selected by 60% of the participants. Another interesting insight is that innovation and introduction of new functionalities are also highly rated. The question on targets was rather related to practitioners' expectations from UXD projects. Our experience in previous studies had shown that UXD projects could have various targets. This was confirmed, since at least three participants selected all named targets (derived from [Bengler et al. 2014]). As depicted in Table 2, in most cases, UXD projects relate to existing products and their analysis, evaluation or improvement. New developments seem to refer mostly to GUI´s ("display and operating concepts").

3.2 Implementation of user experience

The second block of questions concerned the implementation, i.e. current practices of UXD. The responses showed that, in most cases, UXD practice is company-specific and rather informal, based on various approaches. It was possible to identify which are the "key players" in UXD, but the question on responsibility showed great divergence. Finally, when asked about their requirements on a UXD method, most participants agreed that they look for possibilities of user participation, usability in the method application and usefulness of results.

3.2.1 User experience process

How does the application of UXD approaches take place? Most participants referred to company-internal processes, while only two companies mentioned external consultancy/support. In 14 of 22, the proceeding is not standardized and in only three cases in accordance to a literature-based approach. Current approaches to shape UX appear to be mostly product/technology-related, with "increasing functionality" or introducing "interactive behaviour", "technical innovations", and "unique product characteristics" being frequently named. Need fulfilment and storytelling approaches are also relevant.

3.2.2 Stakeholders in user experience design

Literature on UXD consistently suggests working multi-disciplinarily (e.g. [Roto et al. 2010]). Bengler et al. present five essential roles for UX teams. Our survey confirms that typical actors of UXD do have various backgrounds: developer/engineer, designer, project controller, evaluation expert, manager, market - and communication expert. An interesting addition to Bengler et al. is that end-users are considered active actors participating in experience design. Furthermore, the responses on this question showed that the project controller is a major stakeholder in UXD, while high-level management is also involved in UXD. However, when asked about the responsible person for the coordination of UX projects, the participants rarely agreed. "A company-internal expert", "individuals from various departments within the company" and "cross-departmental, company-internal division" were mentioned equally often. In two cases, "the whole company" was mentioned. "Project manager" was mentioned once. Another participant answered "different organizational units within the company, due to the company size". With only one exception, all answers refer to a company internal entity.

3.3 Requirements on support

When developing a methodological support, it is essential to know what prospective users of the support find important. We had collected a set of requirements in our previous studies. In the survey, we asked participants to rank those requirements according to relevance for their practice, as well as add further important requirements. The resulting requirements (in descending relevance) are:

- good understandability of method
- possibility of user participation
- adequate communication of the results
- concrete results
- applicability of methods is multidisciplinary teams
- great flexibility in the use of methods
- comprehensible documentation of results
- minor learning curve
- re-use of results
- complete documentation of results
- low costs
- minor need for special equipment /facilities
- other: proper fit in the development process

"Good understandability" was rated as the most relevant requirement. It is visible that top-requirements relate to user participation, usability of method, usefulness of results, as well as applicability from multiple actors. Three of the participants added the requirement of fittingness to existing practices (or similar). Since this requirement was not predefined and visible to all participants, it did not receive a

high relevance score. Nevertheless, we consider this an important requirement since it was added and elaborate on it in the discussion session.

3.4 Assessment of user experience

The third issue explored in our study was the assessment of UXD by practitioners. Being aware of the fact that the application of user-centred methods requires organizational effort and costs, we wanted to identify the opportunities that are decisive for practitioners and contribute in applying UXD approaches nonetheless. Top-opportunities relate to the increased understanding of users and its positive impact on the quality and success of the product. Furthermore, we asked practitioners' opinion on challenges of current UX practices. The latter seem to vary from challenges rooting in the nature of UXD to challenges connected to the structure or even culture of companies. Finally, we found a high willingness to expand and improve UXD activities in future.

Opportunities and challenges of user experience, willingness for future activities

When asked "what are opportunities for a company through the targeted application of user experience design approaches?" a great majority of the participants highlighted the deeper understanding of users and use context. The continuous consideration and greater involvement of users were also mentioned opportunities. Another highly ranked cluster of opportunities relate to the positive impact of UXD on the actual and perceived product value ("increased product value", "higher acceptance of products"). An obvious advantage, which was rated relatively high, is the inclusion of emotional aspects in design. Finally, practitioners considered as opportunities some positive "side-effects" of UXD on procedural level: creativity, focusing, as well as interdepartmental and interdisciplinary collaboration can benefit from application of UXD approaches.

72% of the participants of our survey had been involved in UXD projects that did not meet their expectations. What were barriers holding back from greater success? As depicted in Table 6 (right), challenges of UXD could have various origins according to practitioners. Many top-challenges relate to the lack of experience and appropriate methodological guidance, but also to corporate culture / mind-set, as we argue further in the discussion session.

Finally, we asked whether the participants are willing to extend the UXD activities of their business division and if so, whether they would apply new methods. A great majority of participants (78%) sees positively the increase of UXD activities. Only two of the practitioners asked would not be willing to try out new methods.

3.5 Understanding of scenario-based methods

In the second part of our survey, we explored scenario-based methods, beginning with practitioners' understanding. The findings showed an overall agreement among participants and with literature:

- Scenarios are seen as descriptions of real or (proto-) typical interactions and situations "as-is" or "to-be" (similar to [Bødker 2000]). Possible scenario contents are depicted in Table 7 (similar to [Bødker 2000], [Anggreeni 2010]). An interesting insight at this point is that scenarios do not typically depict emotional context.
- Scenarios are specific and narrative. Some participants indicated that scenarios are personal.
- Agreeing with the definition we introduced in the beginning of the paper, participants would assign following methods/techniques to the umbrella-term "scenario-based methods": use case technique, scenario technique, storyboarding, storytelling and persona.

3.6 Implementation of scenario-based methods

The participants of this part of the survey stated that 1/3 of all projects they are involved in make use of SBM. This confirms our finding that the great majority of UXD practitioners "(80%) apply SBM in their practice", which was introduced in the beginning of the paper. Both the project types of new product development/original design and configuration/adaptive design were considered relevant for application of SBM, with new product development being most popular. It was confirmed by the participants that SBM are helpful in co-creation projects. Furthermore, all development phases were considered relevant

for application of SBM. In descending order, the participants chose: prototyping, idea generation (conceptualization), problem definition, need derivation, developing solutions, testing, and implementation. This comes to agreement with the opinion of Nardi on the life cycle of scenarios: they are more valuable in the beginning of design and less valuable -though still useful in later stages. The responses to both questions are in line with literature suggesting application of SBM for various project types –including new developments and participatory design- and throughout the design process [Fulton Suri and Marsh 2000], [Anggreeni 2010]. In almost all cases, a company-internal expert moderates the application of SBM. The application itself bases in most cases on a company-internal and informal proceeding. This confirms the stating that the use of SBM is mostly ad-hoc [Anggreeni 2010].

3.7 Assessment of scenario-based methods

What makes SBM useful? Much theoretical work focuses on the benefits of scenario-based methods [Nardi 1992], [Carroll 2000], [Fulton Suri and Marsh 2000]. Our questioning resulted again in a confirmation that the theoretical view on SBM is in line with practitioners' perception. Top-advantages relate to better results (more concrete, comprehensible, and complete), better understanding of the method, greater flexibility and lower costs of SBM (Figure 1). Overall agreement applies to opportunities for a company through targeted application of SBM, too. Interesting, though, is the ranking depicted in Table 8 (left). Top-opportunities do not only relate to increased understanding and empathy as results of applying SBM, but relate also to positive effects on the design process (e.g. "better interdepartmental communication"). Despite the positive assessment of SBM, or exactly because of it, all participants replied positively when asked whether they would apply new approaches for a more effective usage of scenario-based methods. The willingness to apply new approaches could be due to existing challenges that practitioners experience in their current practice (Table 8, right). Some participants pointed out that they feel uncertain and miss a methodological support, where inputs and outputs of SBM, responsibilities and form of results are better defined. More linked to the company structure and culture seem to be the fact that there might be resistance or even lack of acceptance of results of SBM from employees. Another challenge is to have an "overview of how established techniques of the company can be linked with SBM". However, we should point out that the issue of high product complexity received a low score while the issues of high organizational complexity and insufficient cost-benefit ratio were explicitly rated as irrelevant. This could imply that despite increasing complexity and limited resources, SBM seem to be applicable.

4. Discussion of results and implications for practice

Reflecting on the results, we have identified some issues worth further discussion. One of them is the recognition of the fact that most companies deal with UXD in a company-specific and/or informal way. Another major issue was that of ill-defined responsibilities in UXD. Analysing current challenges of UXD, we tried to identify those linked to the company culture. Finally, we discuss the need for methodological support in UXD and the appropriateness of SBM in this context.

4.1 Company-internal and unstructured processes

The application of UXD approaches and SBM specifically seemed to be a "company-internal matter". Consequently, it is opaque to us, as external observers, what the characteristics of practices are. On top of that, it was stated in most cases that the processes are informal. Understanding, comparing and improving informal processes is a challenge. Recognizing this fact as scientific community, is a first step. More empirical work in cooperation with industry is valuable. In our study, to gain more insights on how the company-internal processes look like –if they do not follow a standardized process- we conducted interviews. Due to the discrepancy in our findings, we do not make any attempt to generalize them, but will further investigate this issue in future. However, we list some interesting insights.

1. Benchmarking as source for UXD approaches: Practitioners are well informed about "hypes" in design (e.g. through participation in seminars or internet search) and interested in the approaches that competitors apply. Elements of approaches or approaches adapted to own practices might be adopted.

2. Existing knowledge and practices: The background and previous experiences of employees seem crucial for the selection of methods and the actual practice of UXD. Furthermore, integrability to existing process is an important requirement confirmed in all interviews.
3. Isolated, systematic and generalized attempts: In our discussions with employees of different companies, we found three levels of implementation of UXD. The first level involves companies, where single divisions or employees have UXD activities, but the latter are not synchronized. The second level would describe a company, where a systematic and formal experience design process is applied. Our interviews did not include this case. The third level of implementation suggests that UXD is part of the employees´ mindset and their whole practice embraces its principles, without explicitly stating it. This scheme resembles the model of Sanders on embedding empathic design (cited in [Postma et al. 2012]).

4.2 Responsibilities in user experience design

The question of our survey with the greatest discrepancy in the responses was the one on responsibilities in UXD (Table 7). The responses vary from a specialized person ("company internal expert", "project manager", "external consultant") or group ("specialized division of the company", "individuals from various departments of the company") to a complete generalization ("entire company" was mentioned twice). We could assume that it is legitimate to see big differences, because the participating companies cover a broad spectrum of sizes and domains. However, "ill-defined responsibilities" was an explicitly named challenge of UXD. Interviews also confirmed that in companies regardless size and domain it responsibility for UX-projects was vague. Thus, we see great need for further research in this topic.

4.3 Issues linked to company culture and mind-set

When analysing the challenges of UXD (Table 6) and practices of SBM (Table 8), we could distinguish some issues that are rather rooted in the company culture. As scientific community it would be great to proof that UXD creates opportunities for companies and communicate them clearly. In cases of "limited resources for UX projects", "underestimation of the importance of UXD" and "lack of support of UX projects by management", it is evident that the strategy of the company does not support the attempts towards better UX. In the implementation of both UXD and SBM, it might be possible to face "resistance against new approaches/changes by employees" or "no acceptance of the results by employees". This could be the case in company cultures, where new equals more effort and everything that is not measurable is of no value. Similar challenges were identified in the studies of Postma et al. on empathic design. The nature of UX ("difficulty in communicating soft aspects of interaction" and "poor measurability and controllability of UX") can pose comparable matters. Finally, in cases of "high organizational complexity" and "high product complexity" it is possible that the introduction of any process change is more challenging. However, it is exactly in those cases, where, in our opinion, a systematic and formal approach is necessary. Finally, we argue that more issues could be addressed by methodological guidance and discuss them next.

4.4 Need for methodological support

Should UXD be a standardized process, a flexible process element, or a general mind-set? In our opinion, the nature of UX makes it hardly possible to create a standard. On the other hand, because the field of UX is still young, a generalized, not guided application would unlikely succeed. The golden mean could be a flexible methodological support. In our study, "lack of experience with user experience design approaches" was the most relevant challenge in UXD, while all participants explicitly stated "lack of methodological guidance" as a challenge (Table 8). In addition, further procedural challenges in the application of UXD were mentioned, namely: "difficulty in communicating soft aspects of interaction", "late integration of experience-related aspects into the product", "ill-defined roles and responsibilities in user experience design", "no anchoring of emotional targets in the development process". In our opinion, an appropriate methodological support could help in overcoming those barriers. Future research can focus on developing such a support, or on grounding existing scientific approaches in the needs and situation of practitioners. The requirements collected in our study could be a first step towards that.

4.5 Scenario-based methods for user experience design

In our previous studies, we identified that in theory SBM are useful for UXD and collected empirical data showing that UXD practitioners already use SBM. Furthermore, the current study contains results that contribute to confirming the hypothesis that SBM could be a suitable basis for a UXD methodology. Looking at requirements on a methodological support and benefits of SBM, we can identify many links (Figure 1). Practitioners wish a method with good understandability. SBM have the advantage of being better understandable than other methods. It should be possible to involve users and apply methods in multidisciplinary teams. SBM are often used in co-creation (as described in section 3.6 and [Buskermolen and Terken 2012]). Furthermore, SBM are suitable for practitioners with various backgrounds [Fulton Suri and Marsh 2000], [Aggreeni 2010]. The requirements related to results of method application match well to the benefits of results of SBM. Furthermore, the application of SBM is flexible and would not require a long learning phase. However, SBM are not always applied targeted for UXD. Scenarios do not necessarily/typically involve emotional aspects (Table 7). Our future work focuses on adapting SBM for a more focused application in UXD. Our survey showed that despite its benefits, the application of SBM could involve challenges for practitioners (Table 8). We therefore aim at reducing practitioners' uncertainty by defining inputs, outputs and format of results in a new scenario-based experience design methodology.

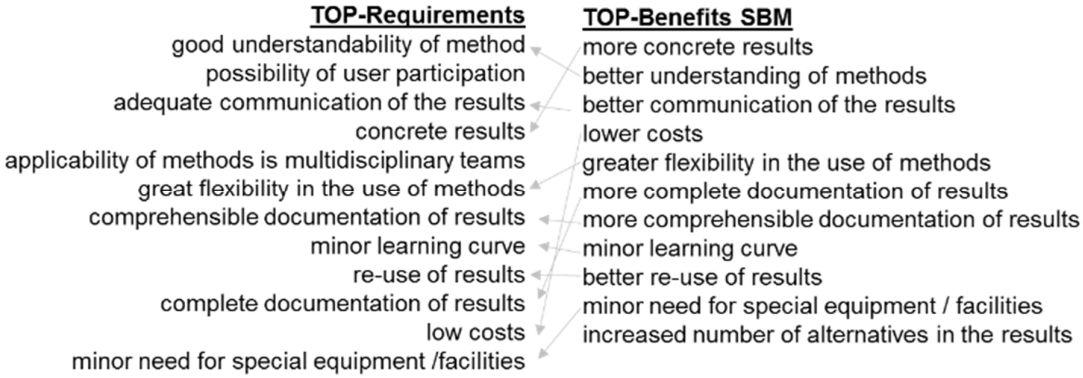

Figure 1. Requirements for methodological support opposed to benefits of SBM

5. Conclusions

Theoretical and empirical research should be complementary -this applies also in the case of user experience. In an attempt to understand better the actual practice of UXD, we conducted a survey with participants 22 experienced UX designers from German and Dutch companies. Although this number does not allow us to talk about statistical significance, we do believe that the results provide interesting insights on how practitioners with different backgrounds (educational, professional and corporate) understand, implement and assess UX. Similarly as in the scientific world, the practice that we explored seemed to lack a unified definition of UX. Although the opposition of UX to usability is meanwhile clear for scientists, it seemed vague for the practitioners we asked. In literature, many theoretical frameworks on UXD exist. However, the responses we received on the actual implementation of UXD reflected a tendency to informal and company-specific approaches. The German companies we investigated seemed to prefer more traditional, technological approaches for UXD, while the Dutch companies we investigated have adopted storytelling and need fulfilment approaches. We were unable to identify a clear picture about responsibilities in UXD in practice. This is definitely an issue we intend to look at in future works, because theory does not provide clear recommendations either. The actors of UXD in practice do have various backgrounds, while end users are seen as active participants in UXD. Practitioners see many opportunities in UX and seemed willing to try out new approaches. Methodological guidance seemed required. However, methods should meet practitioners' requirements and address current challenges. In our study, we collected a fundamental set of requirements and challenges that future works can build on. Some of the identified challenges could be related to the

company culture and mind-set towards UX. A possible recommendation is clearly communicating the opportunities for a company through UXD. We also identified as important requirement for a UX method to build on existing knowledge and practices of employees. In the second part of our study, we therefore explored the application of scenario-based methods (SBM), which are popular in practice and are at least in theory useful in the UX context. In the (unfortunately small) sample of responses analysed, we could recognize a good understanding of SBM and many perceived benefits. A benefit worth mentioning is the possibility of including end-users in design (even in early phases), when working with SBM. Our analysis implied that SBM are a suitable basis for an experience design methodology, as long as they are structured and focused on experience-related aspects. Our future work aims at confirming this and developing a new scenario-based experience design methodology. Finally, we would encourage further attempts to bridge the gap between science and design practice in the context of user experience.

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Appendix

Table 1. High-level goals of user experience selected by more than the half of participants

High level goals of user experience projects of your business area involve …	
Designing most effective, efficient and satisfactory product use	18
Creating innovations for the company	16
Fascinating customers	14
Avoiding negative experiences and frustrations	14
Developing new, add-on functionalities	13
Fulfilling psychological needs and motives through product usage	13
Including end-users in design	11
Achieve differentiation from competitors	11
…	
Other: create higher customer value through better usability	1

Table 2. Targets of user experience design

Which targets have been addressed by previous user experience design projects?	
Evaluating the experience with a function/product/technology	12
developing a comprehensive display- and operating concept	12
revising existing functions accordingly to customer feedback	10
analysing the experience with an existing function/product/technology	9
define potential experience of new or existing products	9
creating market-/country- specific variants of functions	8
assessing the potential of new technologies from other fields	7
adapt and adopt features / products of competitors	6
defining value of existing features that have been developed according to regulations	6
quantifying the success of a product	6
integrating existing display-and operating concepts in an new display-and operating concept	6
creating user manuals	4
comparing experience with various products	4
following a management request	4
creating a marketing concept	3

Table 3. User experience design approaches

Which of the following approaches to shape user experience are you familiar with in your current practice?	
increasing product functionality	17
interactive product behaviour	14
fulfilment of needs through product use	14
technological innovations	13
telling a story through a product	8

emotional design	7
introduction of unique product characteristics	7
introduction of surprise effects in the product behaviour	3

Table 4. Actors and responsibility of user experience design

Typical actors of a user experience project		Responsibility for user experience design projects	
developer/engineer	17	company-internal expert	5
designer	15	project organization with individuals from various departments within the company	5
project controller	14	specialized, cross-departmental division within company	5
user	12	other: entire company	2
evaluation expert	6	company external expert(s)/ consultant(s)	1
market - and communication expert	6	other: different units due to company size	1
manager	5	other: product manager	1
technology scout	4	company-internal expert	5

Table 5. Opportunities and challenges of user experience

Opportunities of user experience	Challenges of user experience
deeper understanding of users	lack of experience with UX approaches
increased product value	lack of support of UX projects by management
continuous consideration of users	difficulty in communicating soft aspects of interaction
better understanding of use context	ill-defined roles and responsibilities in UX
experience as "unique selling proposition"	resistance against new approaches
higher acceptance of products or new technologies	late integration of UX-related aspects into the product
inclusion of emotional aspects	high product complexity
higher user involvement	lack of methodological guidance
enhancing creativity	limited resources for UX projects
Better focus in selection of alternatives	insufficient cost-benefit ratio
better interdepartmental collaboration	high organizational complexity
better interdisciplinary collaboration	no anchoring of emotional targets in the process
	lack of support of UX projects by management

Table 6. Possible contents of a scenario

Scenarios involve information about...	
interaction between actor and product	10
motivation and goals of actors	9
events	8
properties of products	8
properties of actors (e.g. mental, physical)	7
physical context	7
time / sequence of the events	7
functionalities of products	7
emotional context	5

Table 7. Opportunities and challenges through application of scenario-based methods

Opportunities of scenario-based methods	Challenges of scenario-based methods
better understanding of context of usage	lack of experience with SBM by practitioners
better understanding of users	practitioners' uncertainty
increased empathy (different perspectives)	lack of methodological support
better interdepartmental communication	ill-defined inputs and outputs of the methods
improved communication	resistance against new approaches by employees
higher user involvement	no overview of how established techniques of the company can be linked with SBM
integration of ideas in physical and emotional context	poorly defined tasks and responsibilities/roles in the application
better understanding of the product	ill-defined levels of detail and media to display results
greater acceptance of products and market success	no acceptance of the results by employees
better representation of "soft" aspects	high product complexity
early/agile testing	existing methods / guidelines have no relevance to company-specific needs
better interdisciplinary collaboration	other: integration with technical requirements sometimes unclear
better understanding of context of usage	lack of experience with scenario-based methods by practitioners
better understanding of users	practitioners' uncertainty