Designing for experience: the design space as search problem

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ABSTRACT
Designing for experience is a complex task, due to the concept of experience itself, the necessary multidisciplinary input and the needed creativity. Moreover, most designers currently lack enough insight and expertise for this task. This paper advocates a structured approach of the design space, by describing it as a search problem: the designer needs a tool to express his particular design space and to find proven solutions that are suitable to his needs.

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Experience, design methods, design space

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H.5

INTRODUCTION
Designing for experience is a complex task. First, this is because successful design requires understanding of the phenomena aimed at, but this understanding is not always available in design teams. Second, as stated in the call, there is no unifying theory available that is married to a healthy and usable design method. Third, in experience design, multiple disciplines are involved. They all carry their own theories, methods and techniques, which can contradict each other at the conceptual level (e.g. the meaning of 'knowledge' in cognitive psychology vs. in distributed cognition theories vs. in ethnographic understanding). And fourth, many practitioners actually designing artifacts supposed (among other things) to trigger an experience for its users are not experts in user-centered design, let alone in experience-oriented design.

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This position paper reflects our pragmatic concept of experience, identifies related implications and challenges for an "everyday" design practice, and contains our view on a concrete solution for this design practice. We will conclude with a research agenda.

As research group at the Open Universiteit Netherlands, we have especially focused on supporting experience design for novice HCI designers (students or software engineers confronted with experience design issues).

CONCEPT OF EXPERIENCE
An experience is a result of, both, the artifact, the individual experiencing it, the context and the culture of the audience to which the individual feels engaged. Individuals develop themselves (being influenced, among other things, by related experiences in their culture, context and personal history), culture evolves (because of development of many individuals who are part of it) and context changes [1].

An experience with an artifact is not a static thing, but an ongoing story (a holistic process) that starts with anticipating, then connecting, interpreting and reflecting, and results in appropriating and recounting (i.e. [2]).

Consequently, it is not possible to design *an* experience, only to design *for* experience. The client comes with requirements for an intended experience, but due to context, expectations, individual and cultural differences, each user will have his or her own actual experience (the apparent experience).

Experience can be seen as a construct with four aspects: cognitive, instrumental, emotional and sensual [3]. Because this construct will always be instantiated in-time and in-situ for each user or stakeholder, these aspects cannot be directly influenced by the designer. The designer can only control tangible elements of an artifact: functionality, dialogue and presentation (and, by doing so, can influence the intangible aspects). Designing for experience means explicit (and human) decision-making on the design of these elements.

IMPLICATIONS AND CHALLENGES FOR 'EVERYDAY' DESIGN PRACTICE

Within experience-oriented design, the design space 'zooms out' from the former product-centered view to a view on the entire experience. This broader view needs more input from different disciplines, but multidisciplinary knowledge and techniques are often not readily available, nor affordable. Also, by involving more disciplines (each with their own theories and concepts), it becomes more difficult to make decisions on the design (i.e. because of inevitable contradictions).

Creativity is of great value in the design process. In our view, creativity means the ability to choose in a well understood design space. Next to this, because creativity is still being considered a 'human' thing, the designer or design team needs to be in control: decisions should not be made out of computation or democratic rules.

SOLUTIONS FOR DESIGN PRACTICE

Our target group (software engineers and novice HCI designers) lacks (parts of) the context (helicopter view) that allows the essential creativity, and lacks knowledge of or access to multidisciplinary knowledge (theories, techniques).

These 'shortages' can be overcome by providing collections of 'proven solutions' to different design issues, better known as design patterns.

Many design patterns (i.e. [4, 5]), prototyping patterns and evaluation patterns are available, but these patterns have the wrong labels and suffer from other usability issues to be applicable in our situation. They need a rewrite to make non-expert designers understand relevant theory and concepts [6].

Our solution is two-fold: it consists of restructuring, re-labeling and rewriting of various pattern collections (leading to a pattern language for this purpose) and presenting these in a 'pattern finding tool': a guidance tool that should help the designer (or design team) in his decision-making process.

A requirement of this pattern finding tool is that it should not be like a Pandora-box coming up with a single solution: the designer should be in control and should be able to have a continuous overview of his design (solution) space.

Another requirement is that the designer should be allowed to (and is required to) provide all relevant information about his situation: i.e., the client's intentions, the prospective types of users (personas with typical pre-knowledge, culture and actual needs) and the envisioned contexts of use related to the different personas.

Design space as search problem

As we stated earlier, the design space has changed from an artifact-centered to an experience-centered space. This means that other factors become relevant in describing the design space.

This design space can considered real estate for a search problem, where setting several factors helps to narrow down the number of possible solutions for a specific design problem in that given design space. In experience design, there is often uncertainty, e.g., about the type of users that will use the artifact, and about the context in which the artifact is used. In our intended pattern finding tool, certainty or uncertainty can be represented by sliders to explore the boundaries of the design space. Using such a representation of uncertainty on relevant factors in combination with a specific design problem, it is possible to represent an impression of the distance between the problem (defined by the sliders) and possible solutions to that problem (based on known use by experience designers and published as "forces"" in pattern collections [7]). When displayed in a 2-dimensional distance-matrix, novice HCI designers get a feel for what solutions are useful in their design space, and what solutions aren't.

A sketch of the suggested 'slider-tool' is explained in figures 1 to 4 with an example of which evaluation methods are of interest in different situations.

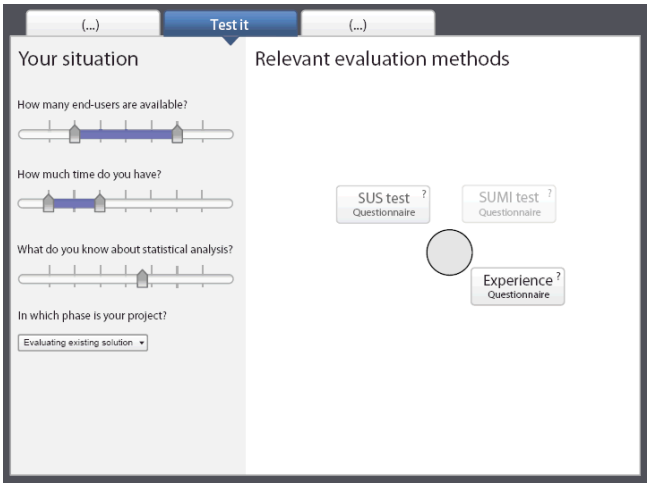

Figure 1. Example screenshot of finding tool for evaluation patterns. The designer characterizes the situation with settings in the left frame the suggested center of gravity of the forces is visually represented by the grey circle in the 'solution space'.

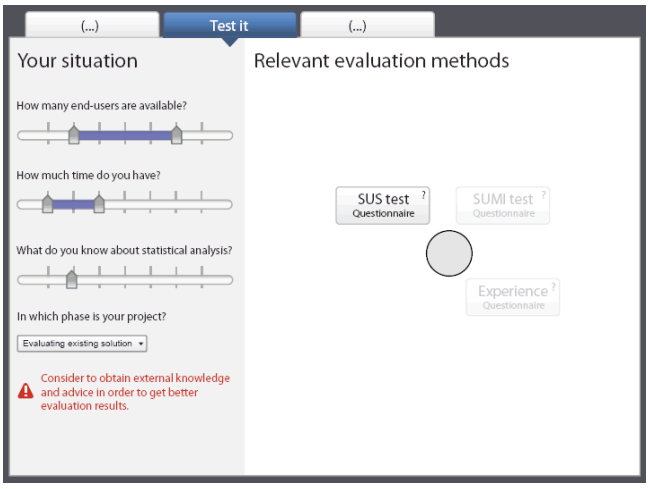

Figure 2. When the designer changes his situation (for instance indicates low statistical knowledge), the design space changes. Relevant solutions are close to the grey circle and not semitransparent. When the situation asks for external knowledge, this will be communicated to the designer. However, the designer is always in control: other solutions are still shown and information about these solutions can be obtained by clicking on them.

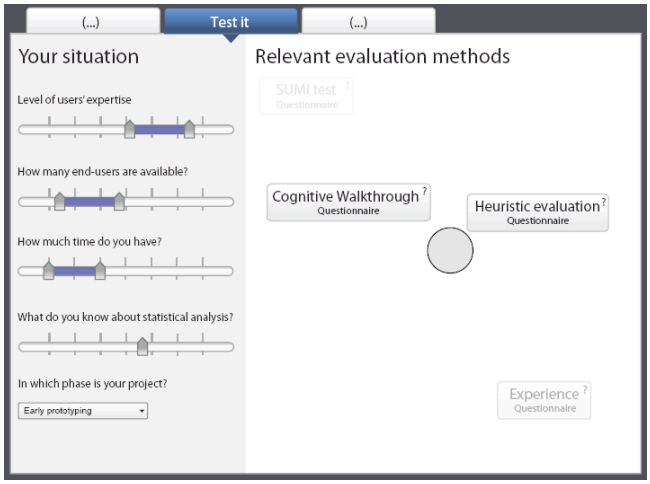

Figure 3. By changing the project phase, other evaluation methods become relevant and will be shown closer and brighter to the designers' situation.

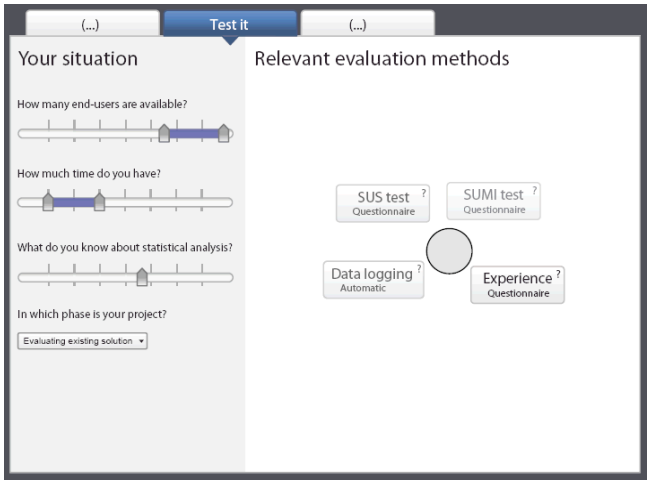

Figure 4. With more users available, evaluation methods like data logging will attain some focus.

Please note this example and idea of pattern finding tool is subject to further research and the example screens are just sketches. Currently, there is no working prototype and no evaluation with our target group of 'novice' designers (although this idea is based on our evaluation of related 'wizard'-approaches).

For the current authors this research is an academic effort: we want to develop and to preach: The result of our efforts will be made available as free online resource, embedded in explanation about experience and the overall design process (requirements engineering, early and later prototyping, evaluation, implementation).

RESEARCH AGENDA

Our research is ongoing. Future steps will include:

- Collect and elicit relevant experience design patterns (dealing with holistic aspects and multimodality) in addition to currently available usability design patterns;
- Collect and elicit an initial set of relevant prototyping patterns;
- Collect and elicit an initial set of relevant evaluation patterns;
- Develop the pattern finding tool that supports decision-making ("which relevant patterns are applicable?") as well as exploration ("which user- and context factors are relevant?")

For the workshop we aim at agreement on the conceptual framework; and we want to exchange ideas on approaches, methods, techniques, and tools.

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