ABSTRACT
In this paper, we introduce our Self-Expression Template Method for design. We also briefly present three different UI design cases utilizing the template with authentic users and UI professionals from both research and industry. This method provided lots of valuable information to our design process of 3D UIs on touch screen tablet devices. We can recommend this type of low-fidelity method to other visual GUI designers also when involving users into the design process. This method is flexible, cost-effective and time-saving to be used in various different participatory or co-design cases among UI development process.

Categories and Subject Descriptors
H.5.m [Information interfaces and presentation]: (e.g., HCI): Miscellaneous.

General Terms
Experimentation, Design, Human Factors.

Keywords
HCI, UCD, participatory design, self-report methods, UI design, user experience.

1. INTRODUCTION
Involving users in design process provides a valuable information about the context of use, tasks and how users are likely to use the product or service [10]. Involving users in design is not a new topic. For instance, the idea of participatory design (PD) (known earlier as Cooperative design) emerged in Scandinavia in the late 1960s. The first international participatory design conference was held in Seattle in 1990 [11]. The traditional way to involve users in design is to interview, observe and conduct focus group studies in an early development phase. For instance, Beyer and Holtzblatt [5] have presented the Contextual Design method, which focuses on the early design phase and the aim is to provide input to the product design by interviewing and observing organizational members and users while they work.

Later on, there have been lots of different methods for User-Centered Design (UCD) process. In participatory design and UCD approaches, the aim is to understand the user's tasks and the context of use. User Experience (UX) research started to get a lot of attention around Millennium. The interests in academy and industry were so high that UX was even speculated to be just a buzzword. As a consequence, many user interface and usability activities or persons started to be called as UX activities or professionals, for instance, UX design, UX tools, UX specialists, etc. However, the UX research field has matured a lot, especially during the last decade. Blythe et al. [6] organized a workshop in 2006 for achieving a common understanding of theories and methods for Experience-Centered Design (ECD). ECD is focused on designing for the richness of human experience with various new technologies and media [17].

A wide range of UX methods for design and evaluation phases already exists [1][6]. For example, Buchenau and Fulton Suri [7] have presented the method called as Experience Prototyping, where the idea is that designers can achieve an understanding of the experience of users, and thus communicate and explore design ideas as a dialogical process [7]. Koskinen et al. [12] have written a book about how user experience can be taken into account in product design. In their Empathic Design approach, they have used Design Probes for gathering information from users [12][13]. The idea of the method is based on the Cultural Probes introduced by Gaver et al. [9]. In the Probe method, researchers or designers give a user self-reporting package, for instance, camera, documenting and hobby crafts material, depending on the research context. The aim of the method is that designers can utilize the gathered material in their design process and discuss with participants about their ideas. Kynsilehto and Olsson [13] used 30 participants' sketch maps of indoor spaces and smart services for understanding and designing smart environments. Sketch maps in outdoors context have been used in various field studies [13].

Prior research shows that different self-reporting methods are valuable tools for gathering users' experiences, ideas and wishes for product development [2][3][4][13][16]. However, new creative methods are needed for different development needs, especially for the design phase. In this paper, we introduce our creative self-expression method, which we have created and iteratively developed for different study settings. This paper briefly presents three different settings of how we have used the Self-Expression Template Method in designing for UX.
2. METHOD DEVELOPMENT

The motivation behind creating and using self-expression templates came from the need of getting users and professionals into the design process of 3D UIs on touch screen tablet devices. To get feedback in a way other than commenting on our designs, we decided to give the participants a possibility to draw their ideas on the paper. Instead of using just a blank paper, we created this simple template to collect user feedback and ideas for the design of the 3D UIs to be used in touch screen tablet devices (Figure 1).

Figure 1. A4 sized template with 10 inch tablet frame.

In our prior studies, we have also utilized different kinds of self-expression templates [3][4]. Based on these cases, we have learned that it is important for the participants to have some piece of context in the template, not just a blank paper. The amount of context depends on the case under investigating and what is the expected or wished outcome from the templates. For example, when we have used just a piece of blank paper, we have got mostly just written word lists or emoticons or nothing at all, even though we have given color pencils for the participants. Instead, if there is a simple box drowned on the paper, we get more drawings than with a piece of blank paper. However, if we want to have mostly drawings, then we need to give to the participant something to start with, for example, a simple line drawing of an interior with figures [4].

The design of the template used in these cases is quite simple, just picture of a 10 inch tablet without the screen placed in the center of the A4 sized paper in the Photoshop. After this, we just printed them on heavy weight paper (200grams) with a color printer.

3. Case1: The Template and Color Pencils

The first study was conducted with 40 potential authentic users of the 3D UIs on touch screen tablets. We utilized the template in our user evaluation of our 3D UI design concepts, which we showed first as an introduction to the 3D UIs. User evaluation was conducted in pairs.

3.1 Participants: Authentic Future Users

We recruited 40 participants through an online test user environment and email invitations, which were distributed by friends and colleagues. The criteria for selecting participants were that each participant should have at least two months' experience of touch screen devices (mobile phones or tablets) and be approximately 20 to 50 years of age. Participants completed a short background questionnaire, which had questions about their gender, age, prior experiences with touch screen devices: tablets and mobile phones.

We also asked about participants' prior experiences with social media services, 3D games and virtual worlds. 93% of the participants had previous touch screen experience with smart phones and 85% of them had tried or used tablet devices. 8% of participants were active tablet users and used it on a daily basis. The participants' age varied from 23 to 52 years, the average being 35 years. 63% of the participants were male.

3.2 Task Set-up

After filling the background questionnaire, we started the actual evaluation phase, where we introduced ten different 3D UI concepts to the participants [15]. Participants we asked to comment on concepts and perform small selection and preference tasks. Then, in the end of the evaluation, we gave the Self-Expression Template (Figure 1) and color pencils for the participants (Figure 2). We asked them to draw or write their own version of 3D UI on touch screen tablet.

After this, participants started to think or directly draw. If they had any questions, we naturally answered to those. We recorded the sessions on video and observed participants. After they finished their drawings, we asked them to explain what they have drawn and we wrote down their explanations and asked additional questions.

3.3 Results

We obtained 37 drawings and three written explanations. Participants who did not draw said that they have no skills to draw or do not know how to draw their ideas. The content of the drawings varied; 27 of drawings based on our 3D UI designs [15] and thirteen of them were novel from our designs. Participants orientated the template mostly horizontally, only eight used it vertically.
One of the 3D UI concepts we showed to the participants related to the room type metaphor [15]. This metaphor inspired seven participants to draw either a square or round shaped room space.

Figure 3 and 4 show examples of users' drawings. The drawing in Figure 3 is very plain and things are in order. Instead, the 3D UI drawn in Figure 4 is very homelike, where plants depicted hobbies and sofas were places for friends (their avatars). The room space in Figure 4 has doors for entering to other virtual environments.

Half of participants draw an abstract 3D UI, for instance, a space with 3D menu objects like carousels, cubes and balls. Figure 5 is an example of the user's drawing of a 3D UI in space context with carousel menus for applications and contacts.

45 percent of the participants emphasized the meaning of social communication in their drawings, for instance, they placed social contacts on a certain area of the UI and they draw different categorizations for groups of friends. Figure 6 depicts one example of the users' drawings where contacts (friends) have a strong role. In the drawing, avatars depict the participant's friends and they are planning a trip together. They are in the virtual space, where they can easily drag and drop elements from different services, they want for the trip, for instance, hotels, museums, cafeterias nearby their hotel, etc.

The presented drawings are just examples of 37 drawings and three writings that we obtained by utilizing this Self-Expression Template method. In this paper, we do not present all results in detail. Instead, we just wanted to show and share this method information with human-computer interaction (HCI) audience in order to encourage other designers and researchers to use this or similar type creative methods as a part of their design and evaluation processes.

With using this Self-Expression Template method as a part of concept evaluation process, we were able to obtain more evaluation information for our concepts that we showed to the participants, but also we were able to catch lots of users' ideas and wishes for future design iterations. For instance, it was valuable to notice which metaphors people like in 3D UIs and which issues they perceive as meaningful for them (e.g. contacts, games or applications, calendars and schedule management).
4. Case 2: The Template with Other Materials
The second case when we utilized the template was during the 3DCHI workshop in the CHI conference with professionals working with the 3D UIs on either research or industry point of view. We utilized the template in the design session of the workshop (http://www.cie.fi/chi-workshop.html).

4.1 Participants: 3D UI Professionals
The aim was that all of the workshop participants would take part in the design session. We divided participants in groups of 3-4 people. We got eight groups with a total of 22 participants. Different creative low-fidelity methods were somewhat familiar to almost all participants. A few mentioned using these kinds of materials in scenario-based design or brainstorming.

4.2 Task Set-up
In this case, the 3D UI topic was familiar to all participants and the design session was held in the middle of the workshop day, so we did not need any additional introduction to the research topic; we just introduced the topic of the design session, the Self-Expression Template and additional materials to them. Additional materials were: paper and paper strips, 3D sketch paper and 3D glasses, film, icon stickers, tapes, paper glue, yarn, fish line, post-it notes, color pencils, sharpeners and scissors (Figure 7). Participants were also encouraged to use their own body and other material that they can find from the conference site.

4.3 Results
In this design session, we obtained lots of different ways to utilize the given material. Participants were able to illustrate different aspects of 3D UIs, for instance, 3D interaction and stereoscopic effect. This study really indicated how this kind of Self-Expression Template method can be used in various ways together with other material depending on the research target. Figure 8 and 9 are good examples of how participants utilized the template with other materials. The template was not regarded as a tablet device anymore. Instead, it was seen like a window to any kind of device or service.

Table 1. Participants (professionals) feedback about using the template and other material for designing 3D UIs. G=Groups

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
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<tbody>
<tr>
<td>G1</td>
<td>&quot;Interaction with different/new people. Easy to prototype. Feel for actual space, as opposite to using just paper &amp; pencil”</td>
</tr>
<tr>
<td>G2</td>
<td>&quot;Really good to have some material for low-fidelity prototypes”</td>
</tr>
<tr>
<td>G3</td>
<td>&quot;Interactive, facilitates discussion”</td>
</tr>
<tr>
<td>G4</td>
<td>&quot;Good. Paper is so flexible, easy to cut, easy to start over. Can stuck on 3D”</td>
</tr>
<tr>
<td>G5</td>
<td>&quot;Very creative due to inspiring materials”</td>
</tr>
<tr>
<td>G6</td>
<td>Good for brainstorming</td>
</tr>
<tr>
<td>G7</td>
<td>-</td>
</tr>
<tr>
<td>G8</td>
<td>Interactive, fun</td>
</tr>
</tbody>
</table>

In the end of the design session, we asked participants to give feedback about using the template method with other materials. The Table 1 presents participants’ Pros and Cons for the method. All participants found the method being as creative and fun.
However, it was interesting to note that some participants thought that it is difficult to design a 3D UI with this kind of method. One reason for this could be the fact that 3D UIs are typically designed with technical software tools. We also asked, based on this experience, if participants would use again the similar type low-fidelity method in their design or research activities. All groups answered that they would like to use this kind of creative method in the future as well. They gave different reasons why they would like to use it or in which situation they think this type of method suits well:

- in scenario-based design
- for brainstorming
- for ice breaking in multidisciplinary settings
- for certain context and circumstances

5. Case3: The Paper and Laminated Templates with Various Materials and Legos

In Case3, we utilized the template method during the workshop in the FRUCT conference, where participants had a possibility to try different rapid low-fidelity prototyping techniques for design (http://www.fruct.org/node/325588). In this session, we had participants from research fields and industry. In this study, we utilized the Self-Expression Template method in various ways. For instance, we cut the white area of the paper and laminated the tablet frame, which made it look like a touch screen or as see through a magic lens. We also made different sized frames for depicting the various tablet and phone sizes.

5.1 Participants: Academy and Industry

In this design session, we had a total of thirteen participants. Six of them were male and seven female. Participants were divided into three groups of 4-5 people in each. The age of participants varied from 26 to 58 years, the average being 34. Different low-fidelity methods (paper prototyping, sketches) very somewhat familiar to approximately half all of the participants.

5.2 Task Set-up

In this case, we introduced the tasks and material to the participants. The task was to design a 3D (mobile) application with the given materials. The participants had a possibility to select one issue where to focus on in their design from the following topics: Healthcare & wellness, Education, Family communication, Office work & communication, Media sharing, Sustainability, or Traffic. Groups selected topics: Sustainability, Traffic and Education.

After group formation and topic selection, participants were asked to select the Technique Table where to start. We had three tables, which each were equipped with different materials:

- Table A: Legos & other toys (characters, vehicles, buildings, blocks, cars, etc.)
- Table B: Tablet Frame Paper Template (the same than in Case 1) & other materials: pencils, tapes, stickers, balls, straws, glue, etc.
- Table C: Mobile Device Screen Frame (Laminated Template in Tablet and Phone sizes) & 3D city, office and map images + traffic signs, pencils, stickers, glue, etc. (Figure 10)
Figures 11-13 illustrated that these rapid low-fidelity techniques with various materials enabled subjects to create different application ideas. According to feedback, all participants were interested in using these kinds of methods in the future as well. They gave the following examples:

- Enables fast communicating about design ideas
- To be able to more openly design new concepts
- Good brainstorming methods
- Can demonstrate ideas
- To make models
- Good when designing unusual interfaces
- Fast and free of technical restrictions
- Fosters creativity.

5.3 Results

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In the feedback questionnaire, we also had Likert Scale statements. Answer options for the statements were: 1=strongly disagree, 2=partially disagree, 3=cannot say, 4=partially agree, 5=strongly agree. Figure 14 and 15 present participants' answers to these statements. It is interesting to note that all three Technique Tables got quite similar ratings, for instance, all techniques were perceived suitable for early design phase (A: 4.4, B: 4.2, C: 4.5). Based on the results we cannot say which technique was the most preferred. However, an encouraging finding is that participants regarded these techniques to be useful for different types of purposes, for instance, for brainstorming, team building and communication (Figure 14). Figure 15 indicates that participants' overall experience of techniques was positive.

6. Discussion

As we utilized the Self-Expression Template method in three different kinds of participatory design cases, we can claim that it worked well and offered us valuable information for our next design iterations. When utilizing this template, we highlight the fact that it is important to familiarize the participants to the topic before the task at hand unless they are familiar with the research topic already. We can recommend this method to be used also with UI and mobile application design cases. Limitations or downsides of this method are the suitability and the decision of the right amount of context to be added on it. Also, the usage situation is crucial to the outcome of the Self-Expression Template. Thus, in the further studies, we will define guidelines how to create and use templates for different cases to be used with different kinds of participants (authentic users, different age groups, UI
Table 2. Plus and minus sides of the method.

<table>
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<th>+</th>
<th>-</th>
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<tbody>
<tr>
<td>Cost-effective and time-saving to produce and use</td>
<td>Can be labor to analyze participants’ designs</td>
</tr>
<tr>
<td>Gives a context to the user</td>
<td>May require familiarizing to the topic (e.g. 3D UI)</td>
</tr>
<tr>
<td>Easy to produce</td>
<td>Can guide or steer the design ideas</td>
</tr>
<tr>
<td>Easy to understand and use by participants</td>
<td>Can be difficult or unpleasant if one cannot draw</td>
</tr>
<tr>
<td>Expandable with additional materials</td>
<td>Additional materials can make design a bit more difficult, or lead or restrict ideas</td>
</tr>
<tr>
<td>Suitable for group work</td>
<td>Some can dominate the group’s design ideas</td>
</tr>
<tr>
<td>Suitable for individual work</td>
<td>Depends on the topic, which is more creative, individual or group work</td>
</tr>
<tr>
<td>Can be used in different design and evaluation settings (in wild, mobile, laboratory...)</td>
<td>Requires UX expertise from researchers or designers who are going to use the method</td>
</tr>
</tbody>
</table>

professionals, multidisciplinary workshops, etc.). Table 2 presents the plus and minus sides of the method based on our experiences of its use.

7. CONCLUSION

In this paper, we introduce our Self-Expression Template Method for HCI field, and especially for a designer with the UX approach. We briefly introduced three different UI design cases where we have utilized the template with both authentic users and UI professionals from field of research and industry. This method provided lots of valuable information to our design processes, especially relating to 3D UIs on touch screen tablet devices. Based on our experiences and feedback, we can recommend other visual GUI designers to involve users into the design process and use this method or similar type of creative low-fidelity methods. This template method is flexible and cost-effective to be used in various different participatory or co-design cases among UI development. In the future, we are going to make this and different sized templates freely available through our websites.

8. ACKNOWLEDGMENTS

We thank our funders: Intel, Nokia and Tekes. Warm thanks to all workshop co-organizers and participants as well.

9. REFERENCES
