

# Towards Designing More Effective Systems by Understanding User Experiences

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Clare Hooper is a postdoctoral fellow at the Eindhoven University of Technology. She completed her EngD with the School of Electronics and Computer Science at the University of Southampton, supervised by David Millard. Her thesis, entitled *Towards Designing More Effective Systems by Understanding User Experiences*, was motivated by a desire to build better social technologies based on a sound understanding of user experiences in physical and digital contexts. To this end, Clare developed Teasing Apart, Piecing Together (TAPT), a Software Engineering design process for understanding user experiences and redesigning them for new contexts. TAPT underwent a three-phase mixed methods evaluation, which demonstrated that the method provides a strong analytical framework for understanding experiences and that it supports experience redesign. A full copy of the thesis can be found at <http://eprints.ecs.soton.ac.uk/22578/>

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## 1. INTRODUCTION

This work is about social technologies, user experiences and the problems of creative design. It is motivated by a desire to give people who are offline – whether for reasons of poverty, disability, infrastructure or cultural background – the access to social technologies that is currently provided via the web, letting them access the online content and communication facilities that so many of us take for granted.

There exist simple technologically-oriented approaches to this problem, such as identifying functional requirements and prototyping tools. This focus on technology, however, comes at a cost of neglecting the experiential aspects which motivate the work, and can result in systems that are functional but unappealing to (or even unusable by) their target audiences.

Traditional approaches to eliciting user opinion (such as interviews and focus groups) elicit surface-level explicit knowledge rather than latent experiential knowledge. Alternatives range from cultural probes [Gaver 1999] through role-play [Buchaneu 2000] to video-based techniques [Little 2009], but no method provides constructs for redesigning experiences in new contexts, and methods often omit constructs for understanding social or emotional facets. Dix's experience deconstruction and reconstruction [Dix 2003] aims to support experience redesign: however, it is presented as a description of its application rather than as a step-by-step process, and again does not address social and emotional elements.

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Software Engineering lacks methods for understanding and replicating user experience:

in response to this issue, the author developed Teasing Apart, Piecing Together (TAPT).

## 2. TEASING APART, PIECING TOGETHER

TAPT is a two-phase process. First, in Teasing Apart, an experience is analysed on various levels: superficial design elements and deeper emotional aspects are identified, and a *technology-neutral* description of the experience is written. The second phase, Piecing Together, involves using that analysis as a springboard for redesigning the experience in its new context. Figure 1 shows an example of TAPT in action.

TAPT was evaluated in three phases:

1. Lab-based comparative evaluation
2. Expert review of the outputs of the comparative evaluation
3. Case studies of TAPT's use grounded in practice

In the first evaluation, 43 software engineers worked in small groups to produce design artefacts using either TAPT, Scenarios and Personas (representative of industrial practice) or Unstructured Discussion (a neutral baseline). Outputs included questionnaire responses and design artefacts. The results suggested that TAPT provides a structure for thoroughly exploring all the facets of an experience, particularly emotional and social aspects that might otherwise be overlooked. Its primary weakness was not being user-focused, sometimes leading to less accessible designs (this might be mitigated by using it in conjunction with Scenarios and Personas). Participants found that describing experiences in technology-neutral terms helped them in the redesign process.

Teasing apart results				
Teasing apart				
Experience (1)	Surface elements (2)	Experienced effects (3 & 4)		Distilled experience (5)
		Literal (3.1)	Abstract (3.2)	
Wikipedia always uses to search and find pages about their topic, read info + pictures, follow links for more data, add and modify pages and review how and why change made	View + pictures follow links between pages, see change log, uncontrolled modifications unknown audience	See text See pictures Slowly change to find some info. Uncharted & amount of info. Hard to search information Easy to make changes Finding related information Remember to note key effects!	Sharing information Learning, expecting a topic I choose With suggestions to link more, uncertainty of accuracy and depth Ability to give others the benefit of my knowledge in some permanent way	
Piecing together results				
Piecing together				
Distilled experience	Learning about a topic I choose with suggestions to link more. Uncertainty of accuracy and depth. Ability to give others the benefit of my knowledge in some permanent way			
Context	Physical award museum, touch map, video screens, video camera + sound recording			
Description	Touch map to select user stories with location. Touch timeline to select when View / listen video / remember stories Rerecord over other people / add new Voice recognition to get links - "see Brantleygate"			

Fig 1. Teasing apart a wiki and piecing it together in a museum context

To gain more objective insights, six experts were asked to comment on design artefacts from the comparative evaluation. Experts perceived a disconnect between strong Teased Apart analyses and weak Pieced Together designs, suggesting that TAPT could be improved to better support the transition between these two phases.

To consider TAPT's use in a more realistic setting, four case studies of its use in the field were held. Two studies involved TAPT's use as a design tool within IBM: for designing a location-based social awareness system in the office, and for redesigning web-based social networking for voice websites. Two further studies concerned TAPT's use as an analytical tool in a research environment: researchers at the University of Southampton used TAPT to analyse and understand genres of game, and a researcher at the University of Bergen applied TAPT to analyse and understand location-based services. Participants used TAPT in various ways: applying it themselves, with focus groups and with anonymous subjects. The case studies provide encouraging evidence that TAPT is useful as a design, analysis and evaluative tool, which can be appropriated by a designer or analyst and used in a number of flexible ways.

### 3. CONCLUSIONS

TAPT is a systematic process of experience deconstruction, capable of improving the critical analysis of user experiences. In the context of software development, TAPT better scaffolds the initial design process and evaluation of user experiences compared to existing methods.

Contributions are the TAPT method, the three-part mixed methods analysis of TAPT, and reflections on approaches to evaluating Software Engineering design processes.

As technological social systems continue to rise in prominence, it is necessary to support the design of these systems in broader contexts, a task to which this kind of tool is highly suited. Meanwhile, the rise of disciplines such as Web Science demonstrate the need to understand the world around us in increasingly holistic ways: tools such as TAPT help us achieve that understanding, and support the design of the next generation of digital tools.

### REFERENCES

- BUCHENAU, M. AND SURI, J.F. 2000 Experience Prototyping. In *Proceedings of DIS*, Brooklyn, New York. ACM Press, 424 - 433.
- DIX, A. 2003. Deconstructing Experience - Pulling Crackers Apart. In *Funology: From Usability to Enjoyment*. M. BLYTHE, A. MONK, K. OVERBEEKE, P. WRIGHT, Eds, Kluwer, Dordrecht, the Netherlands, 165 - 178.
- GAVER, B., DUNNE, T. PASCENTI, E. 1999. Design: Cultural probes. *Interactions* 6, 21- 29.
- LITTLE, L., BRIGGS, P. AND COVENTRY, L.. Videotaped Activity Scenarios and the Elicitation of Social Rules for Public Interactions. In *Proceedings of British HCI Conference*, Leeds, UK.