

What Does Science Know about Experience? Alternatives Approaches to Evaluating User Experience

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1. INTRODUCTION

In human-computer interaction (HCI), once we have built a technology we evaluate it to figure out if we’ve done what we intended, if it does what we intended, and how we could make it better. Evaluation is an opportunity to find out what is good about a technology and shouldn’t be changed, and what is bad and needs fixing. HCI has developed various ways of understanding what it is like for a user to use a technology, and doing so helps us build better technologies. However, most of these evaluation techniques are designed for use at the level of the task, and so do not provide a way to engage with full experience of using the technology, and it is at this level that we actually use a technology. So, to produce better evaluations that really evaluate what it’s like to use a technology, we need to consider the experience and not just the task.

But understanding the experience of using a technology has another advantage. The technology is not a passive actor in the equation, any more than the end user passively uses a technology in the way that was intended by the designer. Rather, the technology when used can change the individual, and the individual can change the technology in use. [24] So to understand the technology we must understand the user and the network between and around the user and the technology, and by understanding the technology we can understand more about ourselves as individuals and groups and societies. The technology can serve as a probe which by interaction with the user can uncover new knowledge about people and their associated networks. [19]

There is a danger that an approach that attempts to reduce, quantify and reify user experience is one that is doomed either to fail, or to limp sadly on with an impoverished representation of user experience that does not adequately represent interaction with a system and thereby diminishes our ability as a field to build optimal technology. Instead of an approach that ‘brings science to bear on Usability Evaluation Methods’ (www.cost294.org), I propose following in the work of, among many others, Bell, Blythe & Sengers [4], Blythe [5], Brown & Bell [7], Cockton [8], Gaver et. al. [14], Höök et. al [18], Isbister et. al. [20], Sengers & Gaver [33], Sengers et. al [34], Sundström et. al. [37] and my previous work on the evaluation of experience-focused HCI [21,22] in building an approach to user

experience that draws from the humanities, arts and social sciences. These are disciplines that have a long tradition and a great deal of expertise in studying, representing, characterizing and understanding experience. This approach embraces and encourages multiple, simultaneous, partial, overlapping, ambiguous and sometimes contradictory representations of multiple stakeholders’ experiences. There is clearly much that can be learned from these approaches that can inform discourse around experience in HCI: in this paper, I propose five of the many possible lessons that we could draw from these disciplines to inform our work:

1. We need rich, detailed and **thick description** of users’ experiences to understand and appreciate the full complexity of the lived experience.
2. We need to understand the **situation** within which the technology is used.
3. We need to understand that there are many people or **stakeholders** involved in the use of a technology, not just the end users, and that to evaluate a technology we need to understand the experience of the technology from these multiple, local, partial perspectives.
4. We need to understand that those different people may have different **values** that influence the ways they experience a technology, and that these values maybe themselves local and situated rather than universal.
5. We need to recognize that there is going to be **ambiguity** in our characterization of the experiences that people have, and that we should not seek to eliminate that ambiguity to provide a canonical answer but rather embrace it as a resource that can be part of providing better and richer descriptions of experience.

This is not a canonical list; rather, it is a sampling that, as I will show in this work, has direct relevance to questions of evaluation of user experience in HCI. It also seems important to define what we’re not doing. The study of *usability* is an approach to understanding artifact use that has developed with an emphasis on characterizing, analyzing and improving well-defined tasks, and draws from HCI’s roots in experimental psychology and cognitive science, as well as a tradition of human factors research dating back to the second world war. [16] This emphasis on the task is at the core of usability: the International Standards Organization defines measuring usability in ISO

9241 as being “the measurement of the effectiveness, efficiency, and satisfaction of users trying to carry out tasks” [24] Usability has become so pervasive as an approach in HCI to building computing systems that evaluation has in many circles come to mean ‘usability evaluation.’ [10] To the field’s credit, many practitioners with a more holistic approach to the interface consider larger issues of user experience and the relationship of the technology to daily life as part of their practice of usability engineering, but it remains at the margins of HCI discourse and practice.

In this work I consciously invert this relationship, placing the experience at the focus of discussion and examination, while recognizing the importance although not focal nature of tasks themselves in technology use. I use the term *experience-focused HCI* in contrast to task-focused work to describe an approach to HCI that involves theorizing, designing, building and evaluating technological systems where the emphasis is on the experience of using those systems, rather than using those systems to accomplish a particular task.

2. LEARNING FROM THE SOCIAL

At the core of an experience-focused approach to HCI evaluation is the notion of characterizing the experience. In HCI, we have excellent theoretical work discussing experience-focused foundations for HCI, such as McCarthy & Wright’s *Technology as Experience* [28] and Dourish’s *Where the Action Is*. [9] These works emphasize the ways in which both a theoretical and practical understanding of experience can influence the design of technological systems. What, then of the *evaluation* of such systems? Unlike in task-focused HCI, we do not have well defined tasks that can be studied under laboratory conditions: instead, the act of observing, reflecting on, recording and analyzing our own and others’ experiences is fundamental to the evaluation of experience-focused HCI. As mentioned, I detail five areas in which we, as a discipline, can learn from other fields who have spent a great deal of time understanding how to characterize experience.

2.1 Thick Description

Anthropology and its related disciplines are familiar with the notion of experience. For example, Turner & Bruner’s 1986 book *The Anthropology of Experience* provides a wide variety of descriptions of and discussion of the difficulties of characterizing experience [39]. A key part of the anthropological approach to describing experience is the notion of *thick description*. The anthropologist Clifford Geertz, in one of his most well-known chapters, paraphrases the work of Gilbert Ryle in putting forward the necessity for thick description in the practice of ethnography. He writes:

“Consider, he says, two boys rapidly contracting the eyelids of their right eyes. In one, this is an involuntary

twitch; in the other, a conspiratorial signal to a friend. The two movements are, as movements, identical; from an I-am-a-camera, “phenomenalistic” observation of them alone, one could not tell which was twitch and which was wink, or indeed whether both or either was twitch or wink. Yet the difference, however unphotographable, between a twitch and a wink is vast; as anyone unfortunate enough to have had the first taken for the second knows...

The original winker might, for example, actually have been fake-winking, say, to mislead outsiders into imagining there was a conspiracy afoot when there in fact was not, in which case our descriptions of what the parodist is parodying and the rehearser rehearsing of course shift accordingly. But the point is that between what Ryle calls the “thin description” of what the rehearser (parodist, winker, twitcher .) is doing (“rapidly contracting his right eyelids”) and the “thick description” of what he is doing (“practicing a burlesque of a friend faking a wink to deceive an innocent into thinking a conspiracy is in motion”) lies the object of ethnography: a stratified hierarchy of meaningful structures in terms of which twitches, winks, fake-winks, parodies, rehearsals of parodies are produced, perceived, and interpreted, and without which they would not (not even the zero-form twitches, which, as a cultural category, are as much nonwinks as winks are nontwitches) in fact exist, no matter what anyone did or didn’t do with his eyelids.” [15]

The problem of applying task-based evaluation techniques as detailed above to experience-focused HCI is precisely this problem of winking-description. As a discipline, we have developed excellent tools for the description of winking, but these tools become inadequate when faced with the need to understand winking in context, winking with a purpose or goal. Thick description of the situation within which technology use – or, indeed, winking – occurs is by itself insufficient to serve for evaluation, but thick description is a necessary tool for providing us with an understanding of the experience of using a technology. Related to, but distinct from, the notion of thick description is situated action, which is the next of our five aspects.

2.2 Situated Actions

A related notion to thick description is that of **situated actions**, made popular by ethnographer Lucy Suchman [36]. The essence of situated action is that an experience is changed by the context in which it occurs: in Suchman’s words, “this term underscores the view that every course of action depends in essential ways upon its material and social circumstances”. [35] Thus, a phone call from a lover can be a pleasant diversion from routine daily work, an inconvenient interruption in the middle of a task or a catastrophic embarrassment in the middle of lunch with one’s husband or wife. Suchman references Boden’s article “The structure of intentions”:

“If one intends to buy bread, for instance, the knowledge of which bakers are open and which are shut on that day of the week will enter into the generation of one’s plan of action in a definite way; one’s knowledge of local topography (and perhaps of map-reading) will guide one’s locomotion to the selected shop; one’s knowledge of linguistic grammar and of the reciprocal roles of shopkeeper and customer will be needed to generate that part of the action-plan concerned with speaking to the baker, and one’s financial competence will guide and monitor the exchange of coins over the shop counter.” (Boden cited in [35] p.44)

An emphasis on situated action provides a way to understand how and why the users experience, react and respond in the ways that they do. Rather than treating their experience as created as part of a series of pre-planned steps, situated action provides a way to understand and refer to the lived experience of a particular individual’s unique lived experience of a particular experience.

The third aspect of our five parts of an evaluation starts to look at what happens when we have multiple individuals involved in the evaluation of an experience, as is often the case.

2.3 Multiple Stakeholders

A key part of understanding the evaluation of experience-focused HCI is the importance of recognizing the different stakeholders whose experience we must include in our evaluation. Any given design, be it a website or product or syllabus or paper has a number of stakeholders, each of whom have different (although perhaps intersecting) criteria. Stakeholders for a standard HCI system might consist of the people who buy the system, the people who use the system and the people who are affected by the system. In the early stages of system design, the emphasis was on the former group: the people who buy the system. For example, in the very influential 1970 paper on the Waterfall Method of software engineering, Royce discusses the importance of testing and discussion with the ‘customer’, but there is no notion of the end user. [38] With the development of user-centered design (UCD) in the eighties, the role of the end-user of the system became emphasized. [40] However, work in science & technology studies has emphasized that “people affected by the system” can be extremely large. Pinch & Bijker [31] and later Oudshorn & Pinch [30] have shown the varied roles that users play in constructing meaning and understandings of a given technology, and Wyatt has placed particular emphasis on the role of *non-users* in technology [41]. Further work by Kline & Pinch emphasizes the way in which technologies are appropriated and influenced by their users in ways that were not conceived of by their creators, and that such appropriation is a valid and inherent part of technology use. [23] This work suggests that including a wide variety of stakeholders, including non-users, can be a powerful tool in understanding aspects of the experience of

technology use that are not apparent from just studying end-users.

The multiple perspectives of multiple stakeholders are also important in an evaluation as they avoid an emphasis on the generation of a single, apparently canonical correct answer. Haraway has emphasized the potential of partial perspectives[17]. She advocates that an approach that really reflects a situation cannot and must not provide a top-down, God’s eye view but must instead provide multiple partial perspectives each of which provides a different variety of comprehension. Active consideration of multiple stakeholders is a way to actively provide for partial perspectives in a coherent and manageable manner.

Martin Ramage’s thesis, *The Learning Way: Evaluating Co-operative Systems*[32] contains an in-depth look at the role of multiple stakeholders in technology evaluation. He develops a five-step method for evaluating Computer Supported Cooperative Systems (CSCW) that he refers to as Systematic Evaluation for Stakeholder Learning (SESL):

1. “identify the type and purpose of the evaluation;
2. decide what is the system to be evaluated;
3. determine who are the stakeholders;
4. observe & analyse (the heart of the process), concurrently formulating a set of key questions;
5. encourage various forms of learning (such as reporting back to stakeholders).”

Ramage proposes his approach purely for cooperative technological systems – ones in which multiple people use technology to interact with each other – and his examples and research are focused on the workplace. I suggest that considering multiple stakeholders continues to be important for technology other than computer-supported cooperative systems and important for systems outside of the workplace, and that his five steps should be applied as a standard part of evaluation of any experience-focused technological system. In the next section, I will discuss how the *values* of different stakeholders matter, and why this matters in the evaluation of experience-focused HCI.

2.4 Values

The notion of *value* or *values* in design is one that has received considerable attention in the field of HCI. Discourse around *value* and *values* include Value Sensitive Design (VSD), made popular by Batya Friedman and her colleagues at the University of Washington [11,11] and Value Centered Design (VCD), popularized by Helen Nissenbaum at NYU. In response to the question “What is a value?”, Friedman et. al. write:

In a narrow sense, the word “value” refers simply to the economic worth of an object. For example, the value of a computer could be said to be two thousand dollars. However, in the work described here, we use a broader meaning of the term wherein a value refers to what a

person or group of people consider important in life. In this sense, people find many things of value, both lofty and mundane: their children, friendship, morning tea, education, art, a walk in the woods, nice manners, good science, a wise leader, clean air. [11]

They point out that values are often local and situated (“depend substantively on the interests and desires of human beings within a cultural milieu”); they also list a set of human values with ethical import that are frequently implicated in system design, including privacy, trust, universal usability, autonomy, informed consent, courtesy, calmness and environmental sustainability. It’s important to distinguish values from goals: while, once again, it is possible to argue over exact definitions, we will treat values as being long-term metrics that are consistent across multiple tasks and experiences, as compared to shorter-term goals that may comprise the intent for a particular task. Friedman et. al. also provide a set of ‘practical suggestions’ for engaging in Value Sensitive Design:

1. “Start With a Value, Technology, or Context of Use.
2. Identify Direct and Indirect Stakeholders
3. Identify Benefits and Harms for Each Stakeholder Group
4. Map Benefits and Harms onto Corresponding Values
5. Conduct a Conceptual Investigation of Key Values
6. Identify Potential Value Conflicts
7. Integrate Value Considerations Into One’s Organizational Structure”

They also encourage interviewing stakeholders to further understand their reactions and uncover a richer understanding of their values.

So what of Value Sensitive *Evaluation*, instead of design? It’s clear that understanding the values of the stakeholders can be an integral part of understanding their metrics for evaluation. By the above definition, value sensitive evaluation is part of a value sensitive design process in which we ‘start with a... technology’. However, it’s important to consider the impact of the above discussion of thick and situated description to avoid the over-reification of values. Instead, it seems important to recognize values as ways of expressing meaning that are themselves local in time and space and society, and subject to change by (among many other factors) the very technology they influence.

For example, in 2002 the US Army released *America’s Army* (AA), which is an online first-person shooter designed as a propaganda and recruitment tool, modeled after the popular game *Counter-Strike*. It’s an excellent example of value-laden design. AA is one of the top five online games, has been the topic of significant controversy, and there is significant critical work on the game as a place for discussion of the civilian-military public sphere [27], as an embodiment of military pro-war values [26], and as a reappropriation of popular youth culture. [29] It embodies

explicit army values (“honor, duty and integrity”) as well as implicit army values (“it is appropriate to kill people if ordered to do so”)– and yet, as emphasized in our approach to stakeholder analysis, also embodies values for other actors, such as gamers merely looking for a satisfying first-person shooter. We are clearly not in a position to adopt value sensitive *design* of AA, but we can evaluate it post hoc and come to a deeper understanding of the technology and, I would suggest, a deeper understanding of the societies and cultures that have combined to produce AA.

2.5 Ambiguity

Of the five aspects of experience-focused evaluation, ambiguity is perhaps the most problematic to those accustomed to task-focused measures of evaluation. ‘Conventional wisdom’ suggests that we should seek to eliminate ambiguity in our evaluations to provide a maximally accurate and scientific approach. Gaver et. al. have shown how ambiguity can be a resource for design: as they point out, ambiguity can evoke personal relationships to technology, it can allow for multiple simultaneous points of view and allows designers to engage users with issues without constraining how they respond. [13,33]

However, Gaver et. al. called their paper ‘Ambiguity as inspiration for design’: they make their case for design, not evaluation. Making the same arguments apply to evaluation requires a change in the way that we talk about evaluation that has been hinted at thus far, but not stated explicitly. What this means is positing evaluation as a *creative* and not merely reactive act. It is not merely a passive response to a technology, but one that is active and thus can benefit from inspiration. By emphasizing ambiguity in the description and evaluation of the experience, we’re recognizing that the designers do not necessarily know what experiences will arise from the use of the technology. Gaver & Sengers’s recent DIS paper discusses this question further, and emphasize that it’s not sufficient for a designer to merely throw up her hands and abdicate responsibility, but rather that it’s important to consider appropriation in the course of designing for multiple interpretations [33]. Others have shown the importance of ambiguity in making use of communication technology [2], and in Boehner & Hancock’s recent discussion of ambiguity, they emphasized the importance of providing a space for stories, rather than designing stories themselves. [6] It’s ensuring space for multiple stories that is one of the objects of experience-focused evaluation, and preserving the ambiguity in the evaluation is as important as preserving it in the design.

3. CONCLUSIONS

In summary, therefore I propose that open-ended approaches to characterizing experience of the kinds that can be drawn from literary studies, from anthropology, from science and technology studies and from the arts have a great deal of potential for informing the design and evaluation of technological systems. I propose that the

evaluation should include multiple, partial perspectives of multiple stakeholders (including non-users of a system) and their values, aims and goals that together combine to build up a rich picture of the multiple roles the technology plays in use. Thick description of the situation around and within which a technology can be used to embrace ambiguity as an inherent part of the evaluation, which should be understood as being a innovative and not merely reactive act: not a passive response to technology but an active process of creation.

It is clear that there are several issues that remain, including but not limited to:

- How can we ensure that experience-focused evaluation is actually useful? What are criteria for 'useful', and how can we know when we've achieved it?
- How can we balance a belief in the importance of ambiguity and thick description with the need to make coherent and focused recommendations that are actionable for those building the technology in question?
- Does experience-focused HCI embody certain values itself, and can it used to embody other values? Are the aspects I have suggested as part of this evaluation valid across all kinds of evaluation of experience-focused HCI, or do they embody a particular set of values that are irrelevant in other contexts?
- How can we avoid a pendulum-swing danger, in which an emphasis on the experience discounts the usability issues that are an entirely necessary precursor to experience design?

It is my belief that despite these issues, it is feasible to design such an approach to the evaluation of experience-focused human-computer interaction, and that there is true value to the discipline and to our understanding of user experience in answering these questions in a complete and rich manner.

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