

Paradigms of Interaction & Design

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ABSTRACT

In this paper we introduce two approaches to interaction with technical systems and draw parallels between them and dominate approaches to design within the HCI community. Each of these approaches includes a particular perspective on how to frame both the design problem and its evaluation. We argue that the core problem to experience design's acceptance, as a discipline, is not refining the theories and methods of experience design itself. Rather, the central issue is how to reconcile whether humans interactions with systems are shaped by there being *rational actors* or whether *situated action* is enacted in the context of *cultural performativity*.

Author Keywords

Interaction Design, User Experience, Evaluation, Bounded Rationality, Situated Action, Cultural Peformativity

INTRODUCTION

There are two key approaches to how we interact with technologies in world that are used in HCI. These are drawn from psychological and anthropological traditions. Anthropologists would frame interactions in terms of the relationship between humans and technology; how we explore technology in light of cultural constructions of its value to us. Psychologists, on the other hand, frame interactions in terms of learning and problem solving. Each of these framings of interaction brings an important theoretical framework for understanding HCI. Anthropologists would discuss interaction as *situated action* enacted under the constraints of *cultural peformativity*. Psychologists on the other hand would discuss interaction in terms of humans as rational actors engaging in *bounded rationality*. There are clear parallels between these two approaches and dominant approaches to design, each with a particular perspective on how to frame both the design

problem and evaluation.

Let us look at each of these. The first is that of situated action in the context of cultural performativity. Situated action argues that behavior is opportunistic, and while we may have high-level goals, behavior is opportunistic and dependent on the context [1]. The cultural performativity approach to human behavior argues actions are caught up in complex cultural construction of what constitutes socially appropriate normative behavior. The second is that of humans as *rational actors* engaged in *bounded rationality* for *exploratory learning*; we solve problems to allow us to attain goals and analyze the information available for potential costs and benefits to determine how best to meet these goals [2]. We will argue that there is a parallel between these two approaches to interaction and how design is problematized in HCI.

TWO PARADIGMS OF DESIGN

Broadly, there are two paradigms of design that are prominent in HCI, that of interaction design and that of experience design, each of which reflects a different orientation to problem solving and learning. Broadly speaking, these two approaches align themselves with engineering design and creative design respectively [2].

Interaction Design

The interaction design tradition, with its strong origins in cognitive psychology and engineering, focuses on understanding users' goals and modeling users' tasks [4,5]. It is typified by the Norman action cycle [6], which models the users' interaction with the system, breaking down



Figure 1. Norman Action Cycle [6].

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complex tasks into clear-cut goals to be executed and evaluated. Based on modeling users' tasks, the interaction design approach mirrors this by modeling users tasks. Well defined tasks and goals are well suited for waterfall-style system design and validation-style usability testing. This approach is historically older within the CHI community and thus pays homage to CHI's strong cognitive psychology origins. Exhaustive modeling of user tasks differs from the approach of the studio-based design culture of visual and communication designers from outside the CHI community. Consequently, visual and communication designers found integrating their practices within the community difficult [7].

Experience Design

An alternative approach within HCI is experience design which is rooted in a situated action tradition. In part, this reflects the field's turning away from simple problems to wicked ones [6], partially in response to the moving from fixed location single user-computer interactions to the potential complexities of multi-user ubiquitous mobile technologies. Users may have high-level goals—enjoying themselves while watching TV, worshipping their ancestors [9], or shopping for fashionable and pleasurable additions to their wardrobe—but they do not have tasks that can be accurately modeled as they are context dependent. Further, the nature of these activities makes it increasingly difficult to abstract out the socio-cultural context in which they are enacted. These contexts are culturally constructed and are themselves being renegotiated in response to changing social pressures and the introduction of new technologies. Consequently, the combination of situated action and the emergent phenomena of cultural construction makes accurate modeling of the sort used in interaction design deeply problematic.

In part this reflects how technology itself has changed, but it also reflects the internal politics of the HCI community. Whereas the interaction design community has strong cognitivist origins, it is here, we argue, that individuals with communication and visual design backgrounds have attempted to align themselves within the HCI community. It is these types of wicked problems that visual and communication design approaches are ideally suited to, and as modeling breaks down with wicked problems so visual and communication designers have gained prominence in this area. Studio design culture is particularly suited to addressing wicked problems, because it focuses on design judgments and critiques [10], which is an alternative to the validation style usability testing core to the interaction design approach [11]. Metrics for formal testing to determine whether a design affords relaxation, spirituality, or fashion have been slow to emerge, but design judgment provides a framework for critical reflection.

THE PROBLEM FOR DESIGN

The experience design approach is struggling for legitimacy in the HCI community, but the problem for the design

community as a whole is reconciling the ongoing tension between these two treatments of learning and problem solving. They vary in a number of respects. They vary with regards to domains—experience design projects move beyond the desktop to ubiquitous and social communication mechanisms. They vary with regards evaluation tradition—experience design attempts to establish use of design judgments alongside formal evaluation. Finally, they vary with regards to the type of problems that are tackled. Experience design often moves beyond individual interactions, which might be quantified in terms of efficiency, task time, and error-rate. Instead, experience design tackles wicked problems, and a project's success is determined based on its ability to encourage senses of immersion, spirituality, emotional-fulfillment, peacefulness, a sense of family or community. The tension then for experience design is to define these new domains, evaluation paradigms, and measures of success as legitimate, yet fundamentally there is an issue of framing. The problem for design is how do we reconcile these two approaches of interaction and are often treated as theoretically mutually exclusive given they shape our design paradigms.

The question that must be resolved for experience design to succeed is:

Do we frame interacting with novel technologies as the behavior of a rational actor which can be modeled, or is behavior situated and enacted within a complex web of cultural performativity?



Figure 2. Uriu and colleagues digital shrine [9].

Alternatively, we may ask how can we create an overarching philosophy of design that embraces both of these approaches, as we argue these approaches should not be treated as mutually exclusive. Some design tasks, for instance safety critical systems, are well-suited to modeling and the joint legacies of interaction and engineering designs. Others, for instance the digital shrine developed by Uriu and colleagues [9], present the HCI community with tasks for which modeling is wholly inappropriate. Other

tasks still, for instance, using mobile technologies while driving, are uniquely suited to a combination of these perspectives being applied. The HCI community needs to reconcile how these approaches relate to one another, by recognizing and understanding the differences and limitations of each approach. While certainly, the methods and theory of experience design require formalization, it is this tension in framing interaction which is core to the legitimacy of an experience design approach. Experience design is ultimately caught up in a larger tension between issues of bounded rationality and situated action, between issues of rational actors and cultural performativity.

Differences between experience design theory and practice may well be caught up in trying to account and reconcile these treatments. Some designers may pull from one or both traditions when addressing design projects in industry. The formalization of experience design, which will lead to consistency between theory and practice, can not occur until the larger issue of framing how we interact with the challenges presented by new technologies is resolved.

CONCLUSION

The fundamental tension within HCI with regards to experience design, is not one of design theory, nor of methods, nor of cultures of evaluation, but is instead an issue of how we frame interaction. Are we framing it in terms of bounded rationality or situated action? Another option is that it might be possible to create a theoretical framework that combines these two disparate approaches. Experience design may have its roots in situated action and cultural performativity, but just as there is a place in HCI for complementary evaluation methods, there might also be a place for alternate paradigms of interaction. Central to establishing a clear tradition of experience design in HCI is to understand, reconcile, and develop a culture that understands how these paradigms of interaction relate to one another.

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