

Chapter 27

Revolutionary and Evolutionary Technology Design Processes in Location-Based Interactions

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ABSTRACT

Development and deployment of location-based systems is a key consideration in the design of new mobile technologies. Critical to the design process is to understand and manage the expectations of stakeholders (including funders, research partners and end users) for these systems. In particular, the way in which expectations impact upon technology development choices between small-scale, 'high tech' innovations or larger scalable solutions. This paper describes the differences in a revolutionary design process (for 'high tech' prototypes or catwalk technologies) versus an evolutionary design process (for scalable or prêt-à-porter systems), as exemplified in two location-based mobile interaction case studies. One case study exemplifies a revolutionary design process and resultant system, and the other an evolutionary design process and system. The use of these case studies is a clear natural progression from the paper that first described the concept of 'catwalk technologies' (Adams et al, 2013), which itself drew upon research that used mobile devices for outdoor 'in the wild' locations. This paper presents a set list of fifteen heuristic guidelines based upon an analysis of these case studies. These heuristics present characteristics and key differences between the two types of design process. This paper provides a key reference point for researchers, developers and the academic community as a whole, when defining a project rationale for designing and developing technical systems. In addition, we refer to the role of the researcher/research team in terms of guiding and managing stakeholder and research team expectations and how this relates to the planning and deployment of catwalk or prêt-à-porter technologies. Lastly, we state how this research has vital implications for planning and enacting interventions and sequences of interactions with stakeholders and, crucially, in the planning of future research projects.

DOI: 10.4018/978-1-4666-9845-1.ch027

INTRODUCTION

Location-based services and apps are becoming ever more ubiquitous, in parallel to the growth of mobile consumer devices. Many of these location-based technologies tend to be associated with commercial uses. Location-based systems include marketing and/or advertising, such as showing what shops, cafes, gyms or other facilities are nearby and what offers or discounts may be provided to their clientele. Other location-based services can be used to provide information for visitors about local facilities, such as hotel recommendation sites or tourist information. In contrast, this paper examines the way in which mobile technologies are designed, developed and deployed to support meaningful interactions in outdoor locations. In particular, we focus upon the way in which such technologies are planned and designed and the extent to which they are expected to be scalable solutions as opposed to bespoke, custom systems that do not scale well to mass deployment. In this paper, we expand upon the HCI concept of ‘catwalk technology’ (Adams et al., 2013), a metaphor borrowed from the fashion industry “whereby innovation leads the development process whilst also providing hooks for some iterative, scalable and sustained technology design processes”. Adams et al. (2013) analyse ‘in the wild’ research projects from the perspective of both the technology and the role of the researcher. In particular this research highlights the role of the researcher as a boundary creature, similar to a boundary object. As boundary creatures, HCI researchers need to cross between communities and domains and manage different norms in practices and domain languages. Through crossing these boundaries the researcher can be thought of as both horrific, by contradicting the norms within that domain, and insightful, by transporting new ideas into the domain. Within this research the ‘wild’ may mean either the physical terrain (e.g. fieldtrip learning) or an unfamiliar environment in which the researcher finds themselves in (e.g. hospital, school etc.). In all these contexts there is an increased importance for the researcher as a boundary creature to establish a joint understanding of the location-based design approach.

Our work here relates to the design processes involved in producing catwalk and prêt-à-porter (ready-to-wear) location-based technologies. To understand these design processes in more detail we have used an evolutionary and revolutionary design perspective, whereby a revolutionary design process tend to be, but is not exclusively, linked to a catwalk technology design. In contrast, an evolutionary design process tend to be, but is not exclusively, linked to a prêt-à-porter system. According to Adams et al. (2005), revolutionary design processes are rarer than evolutionary ones and tend to encompass conceptually new designs, new possibilities and may enforce fundamentally different ways of working. In contrast, an evolutionary design process involves small, incremental changes and fairly stable design concepts, with working practices evolving gradually over time in parallel with new products. Evolutionary design processes do not usually result in radical new ways of doing things compared to revolutionary design processes, where this may be a natural consequence of the work.

The main aim of this work is the creation of *development guidelines* or *heuristics* for academics and their collaborators, to inform the design, development and deployment of technologies and systems created by the research community. The production of these guidelines has resulted from the analysis of two case studies, viewed through the lens of revolutionary and evolutionary design processes to produce *catwalk* versus *prêt-à-porter technologies*. Using a grounded design approach, the features of these two types of technical solution can be identified from the case studies and presented as a reference for the community, providing a mechanism by which researchers can mediate interactions and guide expectations with stakeholders to inform the development and direction of future research projects.

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