

# Chapter IV

## Warranting High Perceived Quality of Experience (PQoE) in Pervasive Interactive Multimedia Systems

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### **ABSTRACT**

*This chapter presents an overview of diverse ethnographic praxis intended to know users and understand how the usage scenarios can influence the quality of their experiences when interacting with pervasive communication systems. Data gathering and evaluation techniques from users' perspective, future interfaces, and applications for pervasive interactive multimedia systems (an evolved state of mobile and pervasive iTV) are discussed. This chapter also focuses on well-established ethnomethodologies that study users and their context in field living labs, cultural probes, focus groups, and on-the-field enactments, integrated within the participatory design process to create future scenarios and applications for pervasive interactive multimedia systems.*

### **INTRODUCTION**

Data gathering and evaluation activities that aim to understand the users' point of view and their experiences when using a technology are a central

element of user-centered design approaches such as Participatory Design and play a key role in the assurance of optimal user experiences (Douglas et al., 1993).

Identifying appropriate requirements to make interactive systems accessible is not enough to ensure the relevance and personal satisfaction of the designed system for users. “Designers need more soft data about users such as their problems, preferences, lifestyles and aspirations” (Newel, 2006, p. 112). Traditional data gathering and evaluation methodologies such as focus groups, interviews, observation, usability labs, and expert based evaluation (e.g., heuristic evaluation) together with new experimental techniques such as in-situ evaluation (e.g., living labs, observation, and mobile probes) can help to understand the user experience in the people’s real contexts (for example, in their homes, at work, and on the move). At the same time, these techniques can be useful to identify design requirements and to assess the usage quality of the proposed applications and interfaces in terms of usability, accessibility, and last but not least, acceptance. Data gathering and evaluation activities need to assess specific experience of the users in their specific physical, system, and social context (e.g., community aspects in daily life, social cohesion, and social identity), in diverse situations and circumstances (e.g., leisure, government, and health care). At the same time it is crucial to verify the overall user acceptance of the applications proposed (e.g., using models such as the uses and gratifications).

However, the main concerns in obtaining design requirements and evaluating these systems are: first how to observe people’s usage of these systems without making them feel controlled, as this might influence their natural usage of the system; and second, to avoid the subjective position of the ethnographers due to their cultural background, views, position, and understanding as well as their direct interaction with the environment and with the observed subjects and therefore their distortion of the data (Anderson, 1994).

This chapter discusses the application of different data gathering and evaluation approaches such as expert based evaluations, lab-based user experience tests, in-situ evaluations such as living

labs (e.g., in home Wizard of Oz deployments), and video observation on the move to identify requirements and to deliver first feedback on the interface designs of prototypes and user-centeredness of the applications. It also explores how these methods can gain in reliability when combined with other experimental data gathering methods such as mediated data collection, mobile probes (do it), data logs (use it), video observation (wear it), and simulations such as prototype tests, scenarios, heuristics, and enactments such as role-playing and storyboarding. The aim of this analysis is to understand which research tools can be more appropriate to ensure a high quality of experience (QoE) for users interacting with pervasive interactive multimedia systems (Alben, 1996). Finally, the chapter illustrates the methodology that has been used in this research project aiming to unfold future scenarios of pervasive interactive multimedia systems, focusing on commuters.

## **THE QUALITY OF EXPERIENCE IN PERVASIVE INTERACTIVE MULTIMEDIA SYSTEM**

The assumption of pervasive interactive multimedia systems is that users can, in any situation, select the most suitable interface to produce (or have access to) multimedia content and to share it with others. For example, taking a video with a mobile phone, editing it in a PC, and from there broadcasting or narrowcasting it on iTV or allowing users to download it in an ambient display at home or in a MP3-player gives the idea of pervasive computing. In fact, the quick diffusion of powerful handhelds with multimedia features together with the increasing interoperability between devices that enables interconnection dialogue between different interfaces are stimulating the genesis of domestic pervasive multimedia systems. This concept considers not only handhelds as possible interfaces to create and share but also receive and interact with multimedia content but it also

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