

Chapter III

Getting the Big Picture on Small Screens: Quality of Experience in Mobile TV

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ABSTRACT

This chapter provides an overview of the key factors that influence the quality of experience (QoE) of mobile TV services. It compiles the current knowledge from empirical studies and recommendations on four key requirements for the uptake of mobile TV services: (1) handset usability and its acceptance by the user, (2) the technical performance and reliability of the service, (3) the usability of the mobile TV service (depending on the delivery of content), and (4) the satisfaction with the content. It illustrates a number of factors that contribute to these requirements ranging from the context of use to the size of the display and the displayed content. The chapter highlights the interdependencies between these factors during the delivery of content in mobile TV services to a heterogeneous set of low resolution devices.

INTRODUCTION

It is the second time around for mobile TV. In the 1980s, Seiko introduced a TV wristwatch that was capable of displaying standard TV channels on an liquid crystal display (LCD) wrist watch. It seemed like a great idea at the time. Many people wore watches, a growing number of people used LCD or digital watches, and it was possible to display anything on an LCD display. However, the watch was not a success. One of the biggest problems was high energy consumption—the watch wearer had to separately carry the battery, which was part of a box that housed the TV receiver and connected to the

watch through a cable. This setup gave the wearer approximately one hour of viewing time. The screen was monochrome and had low contrast. Furthermore, watching TV while wearing the watch resulted in an unnatural wrist posture. Last but not least, the TV wristwatch was expensive.

Twenty years later, mobile TV is back. Many people now carry inexpensive mobile phones with built-in LCD screens. This allows the display of moving images, which can be received in a more energy efficient way these days, and mobile TV is making its second appearance. Today, mobile TV services are available in a number of countries. While Asian consumers already have access to broadcast services, Western countries have finished trials and are aiming to move from unicast, that is, individual delivery services, to broadcast solutions. Portable play stations and video Ipods provide alternative platforms for playing prestored content.

So far, the deployment of these services has been driven by technical feasibility and matching business models. The wireless domain is one of limited bandwidth resources, and service providers have to decide on broadcasting more content at lower quality or vice versa in search of optimal configurations for people's QoE that are financially viable. The content is produced by companies with a specific primary target medium, that is, cinema, TV, or mobile in mind. This choice influences the selection of shot types, length, and the type of programme. Cameras can be chosen from a wide selection delivering different resolutions, aspect ratios, contrast ranges, and frame rates. After post-production the content is delivered to audiences through various channels. For example, TV broadcast companies adapt cinema content to the TV and mobile service operators adapt TV content for mobile TV distribution. Uptake of existing mobile TV services lags behind expectations, possibly because customers are not willing to pay high premiums for content (KPMG, 2006). To assist service providers in improving their service offerings, we need to understand how people might experience mobile TV services in their entirety. QoE (Aldrich, Marks, Lewis, & Seybold, 2000; Jain, 2004; McCarthy & Wright, 2004) is a broad concept that encompasses all aspects of a service that can be experienced by the user. In the case of mobile TV, QoE includes the usability of the service; the restrictions inherent in the delivery; the audio-visual quality of the content; the usage and payment model; and the social context as well as possible parallel use of standard TV. According to Mäki (2005) the following four requirements are the most important for adoption of mobile TV services:

1. Handset usability and acceptance
2. Technical performance and reliability
3. Usability of the mobile TV service
4. Satisfaction with the content

We will address each of these factors in turn in more detail in the following sections in order to provide a comprehensive view on the QoE of mobile TV services.

HANDSET INTEGRATION AND USABILITY

Currently, the mobile phone is the most likely platform for mobile TV, but personal digital assistants (PDAs), portable game consoles, and music players are attractive alternatives. In 2003 a total of 70% of the people in Europe owned or used mobile phones. The importance of mobile phones in people's lives means that most owners carry it with them wherever they go. Mobile TV consumption on mobile phones

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