

# Chapter X

## QoE for Mobile TV Services

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### ABSTRACT

This chapter discusses the various issues that surround the development stage of mobile TV services. It highlights the importance of Quality of Experience (QoE), which is a shift in paradigm away from the widely studied Quality of Service (QoS). We discuss the factors affecting QoE and the types of assessment methods used to evaluate QoE. A QoE-layered model is presented with the aim of ensuring end-to-end user satisfaction. Using a case study, we develop a QoE management framework. We argue that gaining an understanding of users' perceptions and their service quality expectations may assist in the development of QoE models that are user centric.

### INTRODUCTION

The delivery of TV materials (i.e., mobile TV and video on demand) onto mobile devices is a fast-evolving technology. It is also a very active research area. Mobile TV services provide a different user experience, which is a big shift away from the traditional TV experience. Although mobile TV services have the advantage of content ubiquity, they have shortcomings such as small screen size, low transmission bandwidth, high error rates, and poor network type and coverage. These shortcomings lead to unimpressive viewer experiences. To improve user experience and acceptance of mobile TV services, these drawbacks need to be properly addressed.

The novelty of mobile technology has been the driving force behind the development and introduction of new services. Providers of mobile multimedia services have increasingly realized that the newness of this technology is not the only influential factor responsible for the success of a new service. Of immense importance are the user's opinions, expectations, and service preferences. This realization is mainly due to low uptake of some of the services and stiff competition in the telecommunication industries. The rapid increase in the number of mobile services, some of which were hurriedly offered to customers, has led to some commercial failures. A notable example was the WAP services, where users experienced difficulty in navigating to specific part of the service because of the design being adopted from traditional Web design. It was time-consuming even in accomplishing the simplest trivial tasks. This has taught the important lesson that the success of mobile TV services depends on their ability to meet user expectations and provide a satisfactory user experience.

This chapter discusses the various issues that can influence the user's experience when using mobile TV services. It demonstrates how to ensure end-to-end user satisfaction and also discusses the types of assessment methods used to evaluate the user's experience. A case study is presented by considering mobile user requirements, which assist in ensuring that the user's expectations of service quality are met. We advocate the management of Quality of Experience (QoE) in addition to the more widely studied Quality of Service (QoS).

QoS is a metric commonly used to represent the capability of a network to provide guarantees to selected network traffic. QoS considers parameters of a network that can be easily measured but do not tell how the service is perceived by users. Therefore, QoE represents a shift in paradigm from the traditional QoS. There are different definitions of QoE (David, Man & Renaud, 2006; Empririx, 2003; Nokia, 2004), but all have the same concept, which translates to user satisfaction. QoE is defined in David, et al. (2006) as the perception of the user about the quality of a particular service or network. QoE depends largely on the expectations of the users on the offered service. QoS metrics (e.g., packet loss, jitter) measured in the network may not linearly map to user satisfaction; hence, the need to understand QoE in order to use QoS efficiently. The next section explains what constitutes a good QoE in mobile TV services.

## **BEHIND THE SCENES OF QoE**

There are many factors that constitute producing a good QoE. Measuring and ensuring QoE for multimedia services in a mobile environment is very subjective in nature and includes a variety of factors such as terminal type, usability, content type, cost, delivery method, and quality of service. These factors are discussed next.

### **Terminal Type**

Various mobile devices such as mobile phones, personal digital assistants (PDAs), and laptops have the capability to play back multimedia content. The content formats for these devices are different due to their intrinsic small screen sizes. Thus, the QoE of a user watching a football game on a laptop might differ from another user watching that same football game on a mobile phone. In a mobile TV environment, the quickest and most cost-effective way to deliver these materials is to encode existing TV materials for the mobile terminals. This approach would hardly satisfy the user watching a football match

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