Chapter 2
User–Centered Study on Quality of Mobile Video Services

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ABSTRACT

Mobile video, as an emerging market and a promising research field, has attracted much attention from both industry and researchers. Considering the quality of user-experience as the crux of mobile video services, this chapter aims to provide a guide to user-centered studies of mobile video quality. This will benefit future research in better understanding user needs and experiences, designing effective research, and providing solid solutions to improve the quality of mobile video. This chapter is organized in three main parts: (1) a review of recent user studies from the perspectives of research focuses, user study methods, and data analysis methods; (2) an example of conducting a user study of mobile video research, together with the discussion on a series of relative issues, such as participants, materials and devices, study procedure, and analysis results; and (3) a conclusion with an open discussion about challenges and opportunities in mobile video related research, and associated potential future improvements.

INTRODUCTION

Thanks to the rapid advance of multimedia and mobile technologies, an increasing number of people are watching videos through the Internet using mobile devices, such as smart phones, tablets, and laptops. The increasing trend of consuming videos (and TV) on mobile devices, that is, mobile video, has been seen in many parts of the world. According to a survey by QuickPlay Media in 2012 (Burger, 2012), 35% of American respondents have tried mobile video services primarily viewed by means of smartphones and tablets. In Australia, video content consumption
on extended screens of computers (e.g., tablets and smartphones) is also showing a 11% increase of mobile video streaming over the end of 2011 for teens, according to the first quarter report of 2012 by the Nielsen Co. (2012). The global growth of mobile video consumption brings pressure to the network data traffic. Allot’s surveys in 2011 (Lawson, 2011) showed that video streaming dominated mobile traffic, accounting for 39% of all mobile data traffic worldwide and increasing 93% of use over the year. To reduce the network load and smooth video streaming, a high compression ratio of the videos is needed. This, however, may result in a low video quality, especially when compressing the video to a low bitrate for wireless network transmission. Research has found that the consumers’ Willingness To Pay (WTP) is closely associated with the delivered quality of the mobile video stream (Ries, Nemethova, & Rupp, 2008). It has also been recognized that video content and video quality viewed on a small screen importantly affect user’s willingness to watch mobile video (Orgad, 2006; Song & Tjondronegoro, 2010). In fact, although mobile video is demanding, the actual uptake of mobile video is still low. There is evidence that the monthly time spent on viewing videos on a mobile phone per American user only increased from about 3:37 minutes in 2010 to 4:20 minutes in 2011 (The Nielsen Company, 2011a). To sum up, the previous investigations indicate a promising future of mobile video, as well as a huge pressure for the mobile video vendors in content and quality delivery.

To achieve the success of mobile video service, user experience (i.e., the way of users feel about or perceive the mobile video) has to be considered. The challenge of improving user satisfaction mainly comes from two aspects. On the one hand, due to the complexity of user experience (UX) and the recent emergence of the mobile video, the understanding of UX of mobile video is insufficient, which leads to an incapability of designing for good UX when providing video content to mobile users. On the other hand, the resource constraints, such as the limited display capability of mobile devices, the limited bandwidth of mobile networks, and the big size of video, bring forth difficulties to deliver satisfactory quality to mobile video users.

To understand and improve user experience of mobile video, including user perception, acceptance, satisfaction and needs, a great deal of user-centered research has been made. The focus of the research varies: some studies investigated users’ attitudes toward and their experiences with using the mobile video; some aimed to find which technical factors influence user perceived video quality or overall acceptability; and others attempted to understand how users evaluate the quality of the service. In order to help future research on mobile video (including mobile TV and other mobile video formats) or relevance area such as mobile multimedia, and mobile HCI and applications, this chapter will firstly review the current user studies on quality of user experience of mobile videos in three themes: research scopes or focus, user study methods, and data analysis. Each will be discussed with examples. This will help researchers better understand the research area of mobile video and determine a clear research direction. The chapter then provides an example of conducting user study of mobile video research, along with the discussion on a series of relative issues, such as participants, materials and devices, study procedure, and results. This will be helpful for researchers to conduct user study properly and achieve good performance. Finally, this chapter explores challenges and opportunities in mobile video related research, and discusses potential improvement in future research.

**FOCUS OF USER STUDIES IN MOBILE VIDEO QUALITY**

Concentrating on the quality of the mobile video service, this section summarizes three main research focus of user studies: (1) understanding of
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