Chapter 10


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ABSTRACT

This chapter focuses on the usability evaluation of Digital Libraries (DL). The research literature in this area is reviewed. The strengths and weaknesses of the traditional evaluation techniques are discussed. A Cognitive Task Analysis (CTA) approach is proposed based on its applicability for the iterative and formative usability evaluation of digital libraries. The theoretical framework and features of CTA are explained. The advantages of the proposed approach for the usability evaluation of digital libraries are elucidated and the procedure of carrying out this type of evaluation is detailed. Future directions for DL usability evaluation, especially for the purpose of iterative design process, are recommended.

INTRODUCTION

Digital Libraries (DL) have been a topic of great interest of both research and practice for many years. They “serve communities of people and are created and maintained by and for people” (Marchionini, Plaisant, & Komlodi, 2003, p. 119). Compared to the ongoing effort in digital library research and practice, evaluation of digital libraries did not keep pace, especially in the first period of digital library development (Saracevic, 2000; Chowdhury, Landoni, & Gibb, 2006).

Digital libraries are extensions and augmentations of physical libraries (Marchionini & Fox, 1999). They are developed to serve the informational needs of users. Therefore, it is important to

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evaluate both existing digital libraries and those still in developmental stages (Van House, Butler, Ogle, & Schiff, 1996). Evaluation is a research activity, aiming at assessing the extent to which a digital library meets its objectives and offering suggestions for improvements (Chowdhury & Chowdhury, 2003). It is a judgment of worth and “has both theoretical and practical impact in information science” (Marchionini, 2000, p. 312). Among all the evaluations of digital libraries, a great amount of effort focuses on the usability. “Usability is a multidimensional construct that can be examined from various perspectives” (Jeng, 2005a, p. 96). Different approaches have been adopted for the purpose of evaluating DL’s usability (Jeng, 2005a, p. 99). Many of them are traditional summative evaluation approaches, aiming at how a developed digital library meets a set of pre-defined goals. Yet these approaches often have limitations. This book chapter discusses the theoretical framework of Cognitive Task Analysis (CTA), its features, the proposed procedures of carrying out this kind of evaluation, and the advantages of this approach for the evaluation of digital library usability.

BACKGROUND

The evaluation of digital libraries is a challenging task because of the complicated technology, rich content and variety of users who are involved (Borgman, Leazer, Gilliland-Swetland, & Gazan, 2000; Saracevic & Covi, 2000). While various sets of criteria have been developed for the evaluation of digital libraries, the most recognized ones are derived from evaluation criteria for traditional libraries, Information Retrieval (IR) system performance, and human-computer interaction (Chowdhury & Chowdhury, 2003; Marchionini, 2000; Saracevic, 2000; Saracevic & Covi, 2000). In the past years, DL evaluation research has been conducted on different aspects and can be summarized mainly into such categories as 1) general DL evaluation framework and evaluation criteria, 2) specific DL evaluation framework and evaluation criteria, 3) usability studies, and 4) evaluation studies on other aspects (Xie, 2008, p. 1348).

Among the categories of DL evaluation research, there has been continued interest in usability since the beginning of this century (Jeng, 2005a, p. 100). Usability is a multidimensional construct, and people usually hold the belief that “there is no uniform definition of usability” (Joo, & Lee, 2011, p. 524). It may mean different things to different people and many previous studies in different areas have mentioned various attributes of usability (e.g. Shackel, 1991; Nielson, 1993; International Standards Organization, 1997; Schneiderman, 1998; Kengeri, Seals, Harley, Reddy, & Fox, 1999; Brink, Gergle, & Wood, 2002; Guenther, 2003). Among these various usability attributes, effectiveness, efficiency, subjective satisfaction, and learnability are most commonly applied in different studies (Joo & Lee, 2011, p. 525). Effectiveness refers to the completeness at which users achieve specified goals; efficiency can be understood as the resources used in completing a task; and subjective satisfaction is positive attitudes toward using the system (International Standards Organization, 1997). Learnability, according to Nielson (1993), is easiness with which casual users learn a system. In the field of digital libraries, different categories of usability criteria were developed for the evaluation purpose (e.g. Saracevic, 2004; Ward & Hiller, 2005; Xie, 2008). One set of usability criteria of digital libraries was proposed by Jeng (2005b), including effectiveness, efficiency, satisfaction, and learnability.

People have been employing various approaches in evaluating usability, many of which are traditional techniques. Questionnaire is one of the techniques often used for usability assessment. One such assessment was carried out by the National Taiwan University Library. In this study, one thousand, seven hundred and eighty-four users were surveyed via questionnaires and some usability problems were identified as a result (Lan, 2001).
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