CHALLENGES IN EVALUATING THE QUALITY OF DIGITAL LIBRARIES

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One major area of library and information science research is the evaluation of digital library. The term „digital library" (DL) covers different applications and has been used interchangeably for digitized collections, e-journal platforms, network databases, library websites. As Chowdhury (2010) pointed out, „a modern digital library is a space – a centre of intellectual activities – with content, available in different forms and formats in a distributed network environment, as well as tools and facilities for user-centric access, use, interactions, collaborations and sharing". In line with the growing number of operational DLs, there is also growing interest among researchers to investigate the quality of DLs (Agosti, Ferro, Fox, Goncalves, 2007; Gonçalves, Moreira, Fox, 2007; Kyrillidou, Giersch, 2005; Xie, Joo, 2010; Zhang, 2010). The overall quality of DLs is insufficiently studied and reported (Zhang, 2010), and DL quality and evaluation is a very underrepresented research area in the digital library literature (Gonçalves, Moreira, Fox, 2007).

Researchers and DL practitioners proposed several DL evaluation models, frameworks, and tools, along with various evaluation criteria, indicators, and measures (Xie, Joo, 2010). DELOS Network of Excellence has conducted a series of research concerning the evaluation of DLs and developed the DELOS Reference Model (Agosti, Ferro, Fox, Goncalves, 2007). In this model, the notion of „quality" is one of the highest level concepts which groups parameters characterizing the DL behaviour within a given operational domain. Fuhr et al. (2007) proposed a scheme for digital library evaluation which contains four dimensions: data/collection, system/ technology, users, and usage. Tsakonas and Papatheodorou (2008) further examined the interactions of DL components. An interaction is composed of three components: the user, the content and the system. They identified three categories of criteria which define relationships among components: usability (user-system), usefulness (user-content), and system performance (content-system). Xie (2008) investigated DL evaluation criteria from the users' perspective and classified them in five categories, namely: interface usability, collection quality, service quality, system performance efficiency and user opinion solicitation. Studies offers detailed information about evaluation criteria, their importance in evaluating DL, and the relationship between the perceived importance of DL evaluation criteria and actual evaluation of DL. Jeng (2005) proposed and tested an evaluation model for assessment of the usability of academic digital libraries by examining their effectiveness, efficiency, satisfaction, and easiness in learning.

The DigiQUAL (protocol (Kyrillidou, Giersch, 2005) has identified 180 items linked to twelve themes related to DL service quality: design features; accessibility / navigability; interoperability; DL as community for users, developers and reviewers; collection building; role

of federations; copyright; resource use; evaluating collections; and sustainability. Gonçalves et al. (Gonçalves, Moreira, Fox, 2007) defined a formal quality model for digital libraries based on the 5S formal framework for digital libraries. Key concepts of a minimal DL (digital object, metadata specification, collection, catalogue, repository, and service) are considered along with corresponding quality dimensions and a set of indicators. Shen (2006) formalized the DL integration problem and proposed a model of DL success from the end-user perspective, based on the 5S framework and DeLone-McLean information system success (DeLone, McLean, 2003).

Recently, Zhang (2010) developed a "holistic digital library evaluation model" for various levels of digital library evaluation (content, technology, interface, service, user, and context), in which the most relevant DL evaluation criteria among five groups of stakeholders (administrators, developers, librarians, researchers, users) are identified and organized. The model contains 19 core criteria and 18 group-based criteria. The author has constructed the holistic model by using descriptive and inferential statistical techniques. The validity of the model was tested through stakeholders' interaction with a real digital library. More recently, Balog (2011) proposed and analyzed a multidimensional and hierarchical model (LibEval) can be used to assess the quality of digital libraries. The model is based on a Zhang model (Zhang, 2010) and DeLone & McLean IS success model (DeLone, McLean, 2003). It contains 5 dimensions and 19 criteria. The preliminary validity of the model was assessed by using of exploratory factor analysis (EFA) and confirmatory factor analysis (CFA).

As noted by Vullo (2010), evaluating digital libraries is a challenging activity, as digital libraries are complex, dynamic and synchronic entities which need flexible approaches. Several assessment methodologies have been built and the interdisciplinary research is growing, while a broadly accepted model is still lacking.

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