Chapter 29
Application of Quality in Use Model to Evaluate the User Experience of Online Banking Software

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ABSTRACT

Open source software (OSS) has recently become very important due to the rapid expansion of the software industry. In order to determine whether the quality of the software can achieve the intended purposes, the components of OSS need to be assessed as they are in closed source (conventional) software. Several quality in-use models have been introduced to evaluate software quality in various fields. The banking sector is one of the most critical sectors, as it deals with highly sensitive data; it therefore requires an accurate and effective assessment of software quality. In this article, two pieces of banking software are compared: one open source and one closed source. A new quality in use model, inspired by ISO/IEC 25010, is used to ensure concise results in the comparison. The results obtained show the great potential of OSS, especially in the banking field.

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INTRODUCTION

The impact of open source resources on business has been noted in many sectors, especially with recent gains in various open source technologies from OSS to open source libraries (Hecht & Clark, 2018, Official Statistics of Finland, 2011). Banking is one of these sectors. Bearing in mind the sensitivity of the data managed by banks, banking software has to meet stringent criteria in terms of security and efficiency (Popp, 2015). In order to assess the suitability of software from this perspective, some quality standards must be defined.

Computer software is a term that includes all the parts of a computer system that handle data. Software can be a computer program, a library or any set of instructions that manage data. Open Source Software (OSS) is software that allows users to access and modify the source code, while closed source software provides users with functionality that can only be accessed through its unalterable user interface.

One advantage of OSS is its low cost. Since OSS source code is licensed to be freely accessible, only implementation, maintenance and training charges are necessary to start using an OSS product. However, if any support is needed, OSS users must rely on online communities, while closed source products generally offer after-sale support services. Another important advantage is the flexibility that OSS products provide. Indeed, as the source code of OSS is accessible, users can make any necessary changes in the product. On the other hand, closed source products require users to adapt to the environment provided, without any possibility of making changes.

In all fields, the software components need to be assessed to determine whether the software quality is sufficient for the intended purposes. Recently, a large number of quality models have been introduced to help organizations determine if a given software can perform the required tasks adequately and effectively. These quality models also ensure that the widest range of people can use the software, as they improve accessibility and acceptance, increase efficiency, reduce errors and training requirements, and improve productivity (Bevan, 2001).

The quality of a software product plays a significant role in the success of a business, as it reflects the level of customer satisfaction. Every quality model measures software quality based on a number of characteristics. The first quality model, introduced by Jim McCall (1977), assessed quality factors to evaluate user satisfaction and guide developer priorities. The second quality model was a hierarchical model introduced by Boehm, Brown, Kaspar, Lipow, McLeod, and Merritt (1978). It consisted of primitive characteristics, intermediate level characteristics and high-level characteristics. Finally, a more recent quality model proposed by Geoff (1995) addresses the relationship between quality attributes and sub-attributes.

In this paper, the authors apply Alnanih's new quality in use model (Alnanih, 2015), inspired by ISO/IEC 25010 (ISO/IEC 25010:2011), to assess two online banking software products: an open source product called Cyclos, (Social TRade Organisation, 1970), and a closed source product called E-pay Suite (Canopus Innovative Technologies, 1992). The qualitative approach has four phases: pre-experiment, data gathering, data analysis and evaluation. The aim of this study is to assess whether or not the open source product is capable of performance similar to that of the closed source product.

The rest of this paper is structured as follows: first, we present a comprehensive set of quality in use models for assessing OSS, followed by an explanation of the methodology used to assess the two banking software products—one open source and one closed source. We then provide a description of the experiments conducted and a discussion of the results. Finally, our conclusions are provided, along with some practical applications for the future.