Chapter 8
The Approach and Research of Localization for Student Response System

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ABSTRACT

This paper introduces a multilingual Student Response System (SRS) that is designed to handle anonymously on-the-fly questions for local and distance lectures between teachers and students and is deemed necessary to be utilized in Europe after being tested in classroom for over two years. SRS consists of two friendly and interactive interfaces: a control interface (SRS-CI) on the teacher side and a response interface (SRS-RI) on the student side. The technologies in Flex builder and JavaServer Pages (JSP) are applied to develop multilingual support for SRS-CI and SRS-RI, respectively, based on the method of resource bundles. The localization design and implementation of SRS are carried out in this research as a case study to illustrate and investigate the Flex and JSP-based localization issues for response system. This paper performs linguistic testing against the functionalities provided in SRS, discusses the generated test results and highlights the problems in localization and cross-culture design. Finally, multilingual SRS could make an additional contribution to pedagogical communities to engage trainers and learners whose native languages are other European languages.

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INTRODUCTION

Current Student Response System (SRS) (Lu, Pein, Hansen, Nielsen, & Stav, 2010) is initially derived from the EduMecca project to handle anonymously on-the-fly questions for local and distance lectures between teachers and students. The previous system provides a single language based voting services to allow students to submit anonymous responses. Two friendly and interactive interfaces, a control interface (SRS-CI) (Pein, Scanlon, Lu, Thorseth, Stav, & Moldovan, 2010) on the teacher side and a response interface (SRS-RI) on the student side, are designed in SRS. A teacher needs to enter a “username” and “password” in order to log into the control system, whilst a student only needs to enter a session code generated by the voting service from the teacher side to join into an open session and make voting. The SRS-CI (Pein, Scanlon, Lu, Thorseth, Stav, & Moldovan, 2010) is developed using Flex Builder 3 as a desktop application to run in Adobe Air runtime. This application can be easily used with multiple operating systems and communicate with web service. The application is made transparent and can be automatically updated (Pein, Scanlon, Lu, Thorseth, Stav, & Moldovan, 2010). On the other hand, the simple, intuitive and responsive web-based SRS-RI is implemented using JavaServer Pages (JSP) technology, which has Java embedded in HTML and enables the web page to show dynamic content.

After being developed and tested in classroom for over two years, SRS has been deemed necessary to be utilized in European countries (European Commission, 2011). To integrate multilingual operations into SRS design, it is imperative to carry out internationalization and localization of the system.

Internationalization (Internationalization LISA, 1990) is the process of designing software to support different languages and culture without having to change the program. On the other hand, according to LISA (the Localization Industry Standards Association) (Localization LISA, 1990), localization is the process of modifying an internationalized program so that it behaves correctly in a given language, culture and other requirements of a specific target environment or market (a “locale”) (Johnston, 1996). This process often entails the use of special computer-based tools and is presently an industrial activity in which hardware and software manufacturers, and vendors (i.e., localization service providers) play the key role. The localization issue is becoming more and more important. Simons and Thomson (1995) have discussed problem of multilingual and Guo (2003) has viewed the impacts of localization upon curriculum. For web applications, internationalization is a significant element as well, which typically requires a modification of source code (Lerner, 1999). If internationalization is not integrated into the software development process, adding it later can be much more expensive. As a result, internationalization requirements should be studied at the requirements analysis and definition phase, or at the latest phase of system and software design.

A number of methods and techniques, including obtaining the localized data from property files, databases and using resource bundles, have been utilized to develop localized systems (Parr, 2006). A popular method that has been mentioned in Brandon (2001), Mrabet and Bentahar (2002), Müldner, Wang, and Benoit (2004), and Noble and Anderson (2008) is the use of resource bundles in the software. Much research has been conducted in application of internationalization and localization. Gillam (1999) has talked about
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