

Essential Customization for Moodle Adoption in School

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Abstract. Open Source Software(OSS) learning management system might be the alternative way since these days many verified OSS are used in educational domain. Customization is necessary to adopt OSS since every organization has own requirements. OSS customization is not easy since OSS does not support enough documents for developers. In this paper, we identified common customization requirement and suggest how to manage them with guideline and supporting tool.

Keywords: We would like to encourage you to list your keywords in this section.

1 Introduction

The expansion of e-learning distribution and the emergence of u-learning have increased the application of learning management systems (LMSs). The introduction of an open software LMS reduces the cost and reflects the latest verified concepts. One of the most representative LMSs used widely is the Modular Object-Oriented Dynamic Learning Environment (Moodle)[1,2,3]. Moodle contains a variety of learning resources and more functions can be added to it by using plug-ins or filters. Moodle is stably supported through frequent quick updates. But, the customization process is also inevitable[4,5], including the options provided for the available features, depending on the users' capability or the special demands of each school. Moodle does not provide clear development guidelines. Such disadvantages restrict the application of this open software. In this paper, we discuss the common requirements for the implementation of Moodle in the field of education and the implementation of the environment needed to support such requirements. Through this study, we have enabled the reuse of the networking environment by implementing the common requirements of each school.

2 Common Requirements of Moodle Networking with legacy

The interface and learning management functions of Moodle need to be customized in order to satisfy the requirements of learners and schools and of the curriculum operation methods of schools[5]. The first step for using Moodle is to register users. Next, the courses required for operating Moodle need to be registered. Such information already exists in the academic affairs system. Moodle can be streamlined by providing a common environment that supports the existing systems in all schools as a common requirement. Second common customization requirement is changing the user experiences based on each school's culture. Final one is to extend the capabilities of Moodle since every institution has different teaching and learning styles. Even though Moodle provides various learning and teaching blocks, new blocks should be required. While Moodle is an open source platform, it does not provide well-described references for developers. This poor software development supporting is the reason schools hesitate to use Moodle. In this study, we have identified common customization requirements of schools and systemized and proposed a solution and process for facilitating the implementation of Moodle in schools.

3 How to customize Moodle for information integration

Moodle has around 200 database tables that are correlated in a complicated manner. Moodle can be modified for organizations by saving the relevant data in these tables. Moodle provides an Entity Relationship (ER) diagram between the database tables; however, only a large number of major tables are correlated. A developer is required to analyze and understand the database schema in order to modify the elements that are not present in the ER diagram. In this study, we systemized the essential tables required for managing classes and users as well as the method and process required to modify them. To integrate the several information with school information system, we identified critical tables. These tables are config, user, user_preferences, groups, group_members, role, role_assignments, course, course_categories, capabilities, context, modules, block, log, log display, backup config, backup_course, backup_files, backup_log. Basic guideline for data integration is defined in table 1.

Table 1. Data Integration Guideline

Phase	Activity	Task
Analysis	Moodle Analysis	Identify database configuration

School Information System Analysis	Identify database configuration
Gap Analysis	Identify the gap of DB schema between Moodle and school information System
Transition Migration	Extract essential information between Moodle and school information system for integrating Schema mapping for integrating with Moodle Register essential information from school information system to Moodle

4 Data integration tool maintains data integrity

In this paper, we propose an approach for controlling the above-mentioned tables and fields by configuring the fields required for integrating with legacy information system. On the basis of the proposed approach, the developers can directly generate queries and network data. However, the risk of damaging the data consistency during transfer remains when the data are networked on the basis of a query. Furthermore, verification of the accuracy of the generated queries is required even though a developer generates queries after understanding the schema proposed in this paper and refers to the relevant limits. The environment computerizing the processes defined in Table 1 is required to secure the consistency of the networking related actions without the generation of queries.

5 Conclusion

The use of LMSs in schools has increased in accordance with the expansion of e-learning and u-learning. Commercial LMSs are expensive and are difficult to implement and modify. In contrast, open software LMSs can reduce investment costs, reflect the latest verified concepts, and be easily modified on account of their open source code. Open software LMSs require customization in order to meet the requirements of specific features for each school and the features needed for curriculum operations and learners. In this study, we identified the necessity of integrating between Moodle and school information systems as a common requirement for the implementation of an open software LMS, i.e., Moodle. The integrating support environment developed as a plug-in could maintain the data consistency; the problem of data inconsistency typically occurred when a database is directly modified and networked.

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