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DATABASE STRUCTURE OF THE DISTANCE LEARNING INFORMATION SYSTEM

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Abstract: *Distance learning is an educational system based on new information technologies, telecommunication technologies and technical means. This thesis examines the database structure of the distance learning information system. The study examines six main modules of the system - the structure of the higher education institution, educational participants, educational documents and materials, mastery and assessment, assignments and tests, educational monitoring and system service schedules. This database structure can be the basis for designing modern distance learning platforms.*

Key words: *distance learning, information system, database, LMS, educational monitoring, assessment system, multilingual system, permission management, syllabus, test system.*

INTRODUCTION

In the era of digital transformation, distance-learning systems have become an integral part of higher education institutions. The COVID-19 pandemic has dramatically increased the demand for online education and has shown the need for a robust technical infrastructure for its effective organization. The basis of distance learning information systems is a correctly and optimally designed database structure. The database structure allows you to store and manage all the functional aspects of the system - students, teachers, subjects, assessment, monitoring, etc., in an interconnected manner.

The purpose of this study is to analyze the database structure of the distance learning information system, identify its main modules and their relationships.

MAIN PART

According to the results of the study of the database structure of the distance learning information system, the system consists of seven main modules: the structure of the university - universities, departments, faculties tables store information about the university, department and faculty; the personal data of students and teachers and educational areas are managed through the tables of educational participants - students, teachers, specialties; the group of educational documents - curricula, syllabus, subjects tables store the list of curricula, syllabus and subjects.

The academic performance and assessment module of the system consists of control types (control_types), exam schedules (exam_schedules), rating systems (rating_systems, ratings). The individual_exam_groups, individual_exam_schedules tables are separately allocated for personal schedule exams, which allows supporting the individual learning trajectory of each student.

The Tests and Assignments module contains the test_questions, test_answers, complete_tests, question_attempts tables. In particular, the complete_tests table is designed to store temporary state during the test solving process, which ensures the system's resilience to interruptions. The learning monitoring module tracks student resource reading statistics through the read_lesson_resources table, and commentary_lessons allows you to write comments on lesson materials.

One of the important features of the system is its multilingual architecture. As can be seen from the naming of the tables, there is a _translations table corresponding to almost all the main tables: university_translations, department_translations, faculty_translations, subject_translations, etc. This structure allows the system to be used in several languages.

The permissions, permission_groups, and permission_group_permissions tables are used for security and access control. This corresponds to the RBAC (Role-Based Access Control) architecture. Monitoring of system requests is carried out through the telescope_entries and telescope_monitoring tables, which provide monitoring of system activity and error detection. There are conversations, notifications, and notification_users tables for user communication.

To further improve the system, it is recommended to integrate adaptive learning algorithms based on artificial intelligence, strengthen the analytics module, and increase the capabilities of Learning Analytics.

CONCLUSION

The results of the analysis showed that the database structure of the distance learning information system has a comprehensive architecture that meets the requirements of a modern LMS. Firstly, the system is designed in accordance with international standards with multilingual support. Secondly, the role-based permissions system ensures data security. Thirdly, the full digitization of the learning process — from the curriculum to the test results — is integrated into a single database.

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