

Review of the foreign scientific consultant, Candidate of Technical Sciences, associate professor, Tatyana Andreevna Goncharenko on the dissertation of Faizullin Adil Ramazanovich "Creation of an information and communication management system of a higher educational institution", submitted for the degree of Doctor of Philosophy (PhD) under the educational program 8D06201 (6D071900) "Radio engineering, electronics and telecommunications"

The dissertation on the topic "Creation of an information and communication management system for higher education institutions" is an in-depth analysis of the problem under study and a significant contribution to the field of management of educational institutions. The author of the study examines in detail the implementation of multidisciplinary research in the fields of radio electronics and information systems for the management of higher education institutions, which makes this scientific research relevant.

Based on the analysis of existing approaches and best practices in this field, the author proposes the concept and development of an information and communication system specially adapted to the needs of higher education management. The paper describes in detail the technical solutions, implementation methods and practical recommendations that can be useful for the administrative structures of the educational organization.

The following scientific and practical tasks have been solved in the dissertation research:

- 1) a conceptual model of an integrated information and educational environment of a higher educational institution has been developed;
- 2) complexes of models have been developed that define the architecture and requirements for certain types of software and hardware components of the integrated information and educational environment of the university, focused on supporting a mixed system for organizing the educational process and functioning in corporate computer networks using Smart technologies, namely:
 - a conceptual model of the integrated information and educational environment of universities has been created;
 - object-oriented models of the main components of the software package have been created;
 - improved algorithms for dynamic routing of information flows in a corporate computer network adapted to the conditions of the university;
- 3) methods of managing the educational environment through the introduction of intelligent devices and systems using smart technologies have been developed;
- 4) a structural model of a software logic controller for data collection and management has been developed;

5) the technological component of the Smart University concept of educational environment management has been developed.

6) the conceptual and logical structure of the distributed databases of the educational institution with extensive use of metadata has been developed;

7) a model has been developed to assess the effectiveness of the implementation and realization of the developed Smart technologies in universities;

8) a software logic controller for data collection and management has been developed and implemented;

9) the corporate computer network of the university has been implemented, providing high-quality data exchange between educational and management departments of the university based on the formulated principles of corporate computer network development and using dynamic routing technology of information flows;

10) a component structural model of the subsystem for organizing WEB access to information resources in the integrated information and educational environment of the university using a hardware and software complex and microservice technologies has been introduced.

Special attention is paid to the analysis of the effectiveness of the proposed system in practice.

The universal programmable logic controller developed by the author allows it to be used in various fields of activity, which indicates its multitasking. The author presents the data and results of testing the system, which allows us to draw conclusions about its effectiveness and potential for improving the quality of management of higher education institutions.

The dissertation demonstrates a high level of scientific approach, a deep understanding of the problem and professional knowledge of research methods. The author's research approach is comprehensive and well-founded, which makes his work a significant contribution to the creation of the Smart University system.

The thesis work of A. Faizullin is structured and logically consistent, which simplifies the understanding and perception of the presented information. The academic style of presentation and the use of modern literature sources indicate the high professionalism of the author and his deep involvement in the studied issues. The work not only illustrates the relevance and significance of the topic under study, but also offers specific practical solutions to improve management in modern educational institutions.

The obtained scientific results, as well as the developed universal programmable logic controller, are implemented and used in the "Digital University" at Astana IT University.

The main results of the dissertation work of A. Faizullin: 6 articles published in international peer-reviewed scientific journals indexed in the Scopus database (Q1, Q2, Q3), 4 articles - in journals included in the list of publications recommended by the Committee for Quality Assurance in Science and Higher

Education of the Ministry of Science and Higher Education of the Republic of Kazakhstan, as well as 5 articles materials of the IEEE International Conference, indexed in the Scopus database.

The dissertation work of Faizullin Adil Ramazanovich "Creation of an information and communication management system of a higher educational institution" meets all the requirements of the Rules for awarding degrees approved by the order of the Minister of Education and Science of the Republic of Kazakhstan, and its author Faizullin Adil Ramazanovich deserves to be awarded the degree of Doctor of Philosophy (PhD) under the educational program 8D06201 (6D071900) "Radio engineering, electronics and Telecommunications".

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