

Abstract

of PhD thesis in Information Systems (6D070300 -Information Systems)

Nurbekov Askar Baktyly

DEVELOPMENT OF INFORMATION SYSTEM FOR MODELING THE FUNCTIONING BRANCHES OF INDUSTRY OF THE REPUBLIC OF KAZAKHSTAN

Thematic justification. Currently, material sectors are the basis of industry of Kazakhstan, which makes the state's economy dependent on external factors such as demand and price situation for exported raw materials. Raw specialization foredooms the state's economy to unequal foreign trade exchange and increasing technological gap. In this respect, the development of the manufacturing sector is of particular importance for the economic development of the Republic of Kazakhstan in modern conditions and taken as a basis of the state Strategy of industrial-innovative development. Production of competitive and export-oriented production in the manufacturing industry is the main subject of the state's industrial and innovation policy. Due to the importance of manufacturing industry to the economy of Kazakhstan, there is a need for the application of mathematical methods and information technologies for modeling the industry. It has defined the purpose and scope of the research. There were developed models of production and information system functions to simulate the industry functioning of the Republic of Kazakhstan, allowing you to build an optimal model of the production function for each of the industries.

At the same time, nowadays there is an urgent need for science-based methods and technologies to develop information systems that would enable planning of parameters of the system and receive a guaranteed high-quality and reliable product.

It is necessary to reduce the dependence of the quality of development results of information systems on such subjective factors as the qualifications of performers and their experience. In this regard, the establishment of scientific methods and technologies for information systems design is an important scientific and technical challenge. There are many problems related to different stages of the software life cycle. At the same time the analysis and design stage, the purpose of which is the identification, classification and formalization of information about all aspects of the subject area, affecting the properties of the final result, has a decisive influence on the quality project results.

It follows herefrom the special importance of the tasks relating to this stage. Works in this area are conducted for several decades by many scientists. However, currently existing methods and technologies of software development does not formalize the modeling domain sufficiently. In modern methods criteria and procedures to ensure the functional completeness and logical consistency of the results of building information models are not sufficiently formalized. Herewith, the development of information systems has its own characteristics that must be reflected in special events to maintain the logical integrity of the results throughout the project.

The importance of the research and applicability of the results is that the thesis is aimed to construct mathematical models and develop appropriate information system to simulate the operation of industry of the Republic of Kazakhstan, develop technology and software systems that allow to analyse and plan all necessary work in the design of information systems, allowing to assess the extent of information systems, and forming the basis for planning and allocation of resources in the design of information systems.

Purpose of the study. The aim of the thesis is to build information systems and mathematical models to predict the functioning of the industry of the Republic of Kazakhstan and develop methods and technologies for the design of information systems.

Research methods. Methods, such as methods of graph theory, mathematical modeling, system analysis, regression analysis, production function were used to solve the problems.

Scientific novelty. The scientific novelty of the thesis is as follows:

- Methods and technologies for the design of information systems were developed. These methods and technologies were developed based on the network model of information systems design stages.

- A software package for the design of information systems was developed. The software package is designed for the analysis and planning of all necessary work in the design of information systems.

- The models of production function to simulate the functioning of industries of the Republic of Kazakhstan were developed.

- The information system for modeling the functioning of industry of the Republic of Kazakhstan, which allows to build an optimal model of the production function for each of the industries was developed.

Implementation of the results and practical value of the thesis work.

Results of the study and developed software and systems are adopted and successfully used in practice. The developed methods and technologies for the design of information systems has been applied in the dissertation work in order to develop an information system for modeling the functioning of industry of the Republic of Kazakhstan at the stage of analysis of the subject field.

Work approbation. The main provisions of the thesis and the results were presented at the international conference in the United States and four international conferences in Kazakhstan.

The main results of the thesis were published in 16 papers, 2 of them were published in the international journals included in the database Scopus, 6 papers were published in journals recommended by the Committee for Control of Education and Science of the MES of the Republic of Kazakhstan, 1 paper was published in the

materials of foreign conferences in the US, 6 papers were published in the materials of international conferences and 1 paper was published in scientific journal in Kazakhstan.