

## ИСПОЛЬЗОВАНИЕ МАТЕМАТИЧЕСКИХ МОДЕЛЕЙ ДЛЯ ОПИСАНИЯ ПРОЦЕССОВ В ТУРИСТИЧЕСКОЙ КОМПАНИИ

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*В данной статье обсуждаются вопросы математического моделирования, которое может использоваться при описании работы современных туристических организаций. Указаны основные ключевые параметры, которые следует учитывать при моделировании.*

*Ключевые слова: туристическая компания, математическое моделирование, параметр.*

Tourist activity today covers a large number of airlines, hotels and tourist corporations. Tourism in Russia is a promising direction in the development of economic activities. In this regard, the management issues to ensure the effective functioning of tourist companies in current market conditions are among the current.

For making effective administrative decisions, taking into account the need to process large volumes of information, necessary office analytical processing of the results of economic activity.

To comprehensively address the challenges of sustainable tourism development it is necessary to develop and use mathematical models and methods. In Russia, such studies and the practical use of models and methods for making management decisions in the tourism industry are practically not presented and have no systemic character.

Of particular relevance for analytical processing of economic activity is the use of modern information technologies and mathematical modeling with the help of which it is possible to identify the trends of the enterprise development and justification of administrative decisions taking into account the market situation. In particular, the article describes the essence of information systems in management and describes various types of information systems that provide managers with effective decision making.

For modeling the development of sustainable tourism must analyze the current state of the regional tourism market: to determine the provision of the market with tourist resources,

to assess the strength and the direction of the state policy in the sphere of tourism, as well as the dynamics development of the industry, to identify the factors hindering the development of tourism.

Formulation of the problem is to create a system of management of the tourist company, providing analytical processing of economic information and decision-making on the basis of mathematical modeling.

For a substantiation of administrative decisions should have full information on the economic activities of the company, while taking into account the results of studies, we believe that the Central role in addressing such issues is analysis of the relationships that reflect the relationship between the structural elements of the tourist company as a complex economic system.

To describe the basic elements of the economic system and the relations between these elements to organize proper management process, an important role belongs to the concept of feedback.

It should be noted that the special role of feedback in the complex process of management of economic systems, because on their basis are three key management process: the management, control and management decisions.

In that we have studied the economic system of the tourist company, feedback is shown through the interaction of the input and output values.

In accordance with the General management theory, the process of management of a tourist company can be represented as the interaction of two systems – the managing and controlled.

The management system operates on the basis of information on the state of the object - tourist company, inputs X (various types of re-

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sources) and output Y (economic and financial indicators).

The system is controlled by the filing of managerial decisions based on the feedback - the current state of the economic system of the tourist company and the external environment.

The purpose of the management system consists in the formation of such impacts on managed economic system that would induce tourist company to take the state corresponding management objectives taking into account the state of the environment.

The management process to ensure the effective functioning of the economic system of the tourist company largely depends upon the direction of influence of external and internal factors.

The ways of increase of efficiency of functioning of the economic system of the tourist company may be represented by two groups: the first contains the methods of increasing efficiency through the use of external factors and compliance with external market conditions, and the second - the methods of increasing efficiency through the effective use of internal resources.

The ways of increase of efficiency of functioning of economic system can set the overall direction of the development of the tourist company as a whole.

The General orientation of development can be investigated on the basis of mathematical models and on the basis of the obtained simulation results form the basis for making management decisions. Information essence of management processes allows in General to consider management technology and to identify the main stages of its implementation.

On the basis of the first two stages of information gathering and decision making - are the next stages of the management process aimed at implementation of decisions.

When implementing the decisions of the object changes its state in the right direction.

These changes are managed by the system of collection and processing of information. On the basis of information about the new object's state is formed a new decision in accordance with the selected criterion.

Thus, there is a feedback mechanism in the management system. Special attention during computer modeling and identifying patterns the functioning of the economic system of the tourist company, as well as analytical research is paid to the methodology of the development of mathematical models.

Mathematical model should be adequate, because only in case the adequacy of the mathematical model can be used for modeling and management decisions.

Provides for the construction of several types of functional dependencies, in particular: linear and several types of nonlinear dependencies.

Parameters of mathematical models for each functional dependencies are calculated by the method of least squares. The choice of the most adequate mathematical model is obtained from a variety of functional dependency.

On the basis of the received data is a comprehensive comparative evaluation of mathematical models.

The basis for testing the quality and adequacy of the models supposed proof of randomness residual components.

The main component, i.e. the functional dependence is found correctly only when the random component satisfies the following conditions, proving that it really is random.

These conditions are several: the condition of randomness; condition normality; the condition of equality to zero mathematical expectation and the condition of independence.

Therefore, a comprehensive assessment of the adequacy of the selected functional dependence, accuracy of mathematical model and randomness residual components includes several test phases.

At the first stage of check of conformity of distribution of residual components of the normal distribution law.

The second stage involves the testing of the equality of the expectation values of the residual components to zero with the help of student's criterion.

On the third step is to validate the randomness of the fluctuations of the level of residual components.

The test is carried out according to the criterion of the peaks.

Check the randomness of the fluctuations of the level of residual components is to evaluate the hypothesis of independence of the values from the values of test of independence of values of some residual components is carried out using criteria darbin-Watson.

Thus, the use of mathematical models in tourism organizations will improve their efficiency.

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## USING MATHEMATICAL MODELS TO DESCRIBE PROCESSES IN A TRAVEL COMPANY

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*This paper discusses the mathematical modeling, which can be used to describe the work of modern tourism organizations. The main key parameters that should be taken into account when modeling are specified.*

*Key words: travel company, mathematical modeling, parameter.*