

# Modern models of accounting and analytical support for management decision-making

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**Abstract.** Modern models of analytical support for management decision-making are considered in the article. The authors of the article present the main approaches to data analysis used in modern models of analytical support, as well as the principles and methods of making management decisions. Moreover, the main models of management decision-making, such as the hierarchy analysis method, the SWOT analysis method, the expert assessment method, and other methods are considered in the article. The features of their application and examples of practical use are described. At the end of the article, conclusions about the prospect of accounting and analytical support in the management of modern companies are made.

## 1 Introduction

In modern business, management often has to deal with situations of uncertainty and rapidly changing conditions [1]. For effective management of an organization, it is necessary to have a system of analytical support for making management decisions that would help managers to receive and process information, predict and analyze various scenarios for the development of events quickly [2].

### 1.1 Problem statement

The purpose of this work is consideration of modern models of analytical support for management decision-making and show their effectiveness in terms of management.

Objectives set during the study are the following:

1. study and analysis of use of existing models of accounting and analytical support for management decision-making;

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2. identification of the effectiveness of their use in various organizations;
3. making adjustments and improvements to the current models of accounting and analytical support for management decision-making based on constant monitoring of results and feedback from employees and management;
4. development of areas of accounting and analytical support in the management activities of organizations.

The subject in the modern model of accounting and analytical support for management decision-making is data and information that are related to the activities of the organization.

The subjects in modern models of accounting and analytical support for making management decisions are companies, enterprises and organizations that use these models to analyze their activities and make management decisions based on the information received.

## **1.2 Research questions**

The relevance of this study is due to the need for management organizations to develop guidelines for the organization of management accounting, taking into account the totality of financial, economic and production processes in various industries.

Modern models of accounting and analytical support for management decision-making are a toolkit that allows managers to receive and analyze information, make informed decisions and manage the organization effectively [3, 18, 19]. Accounting and analytical software includes systems for collecting, storing, processing and analyzing data, as well as methods and tools that help managers make management decisions based on data analysis.

## **2 Materials and methods**

The fundamental step in the process of making a complex decision is the selection procedure [4]. For this procedure, the most commonly used is the criteria language for describing the choice, which is mathematically most fully developed, which makes it possible to widely use computer technology for solving problems.

At all stages of the process of making management decisions, various methods are used, which can be divided into formal, heuristic and methods of expert assessments [5].

The key stage in the process of development of a decision is the stage of goal setting, which is associated with objective difficulties in practice, therefore, different methods of developing goals are used for different tasks. An important factor for making an effective decision is the formation of a complete set of its possible alternatives [6, 7]. To achieve this goal, it is advisable to use various methods and modern information technologies that allow you to speed up the process and gain modern knowledge in various fields.

## **3 Results**

Decision making is a process that takes place over time and goes through several stages. It involves choosing one course of action or one alternative from a given set. If there are no alternatives, then there is no choice and no decision [8, 9, 20].

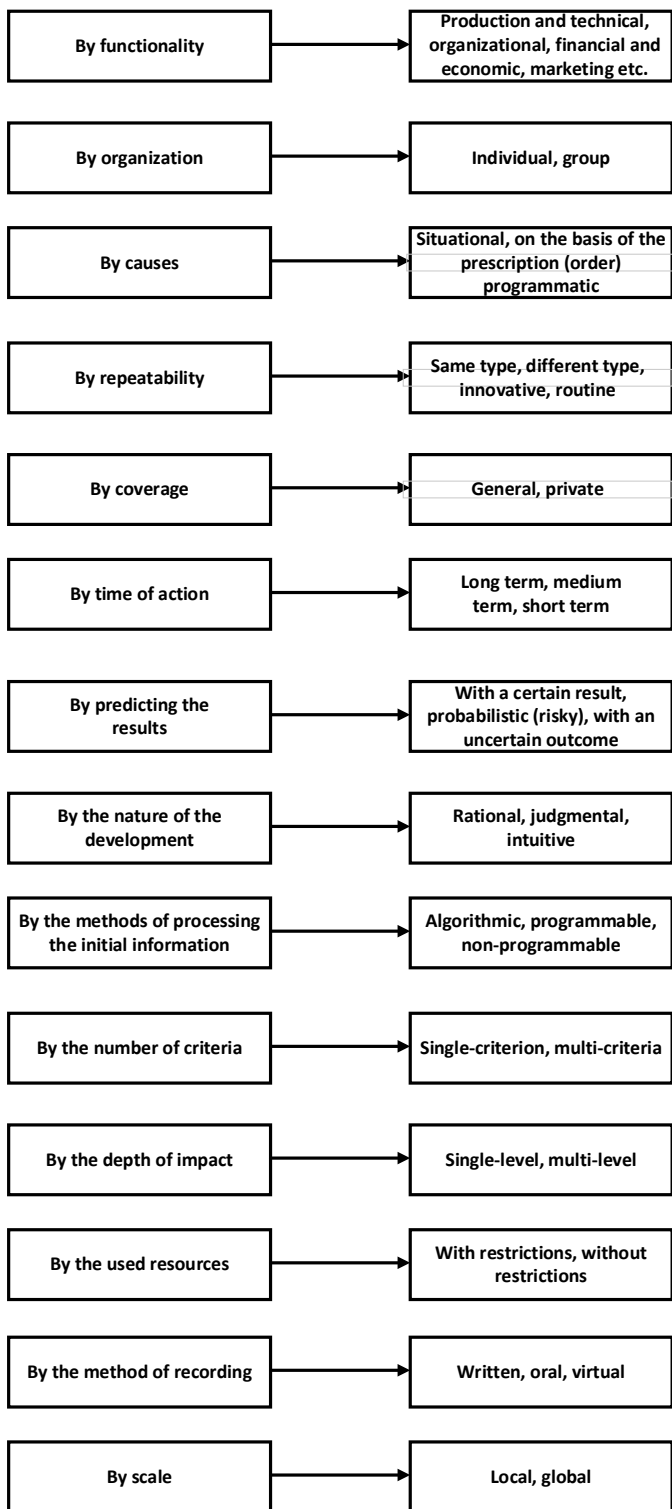
A management decision is the result of management work, and the adoption of this decision is a process that leads to the appearance of this result.

The decision-making process in an organization is characterized by the following features:

- it is carried out consciously and aimed at achieving the goal by a person;
- it is based on facts and value orientations;

- there is interaction between members of the organization;
- it involves the choice of alternatives, taking into account the social and political situation of the organizational environment;
- it is an integral part of the overall management process;
- it is necessary for the daily work of the manager [10,11].

The duration of management decisions is also an important factor. Decisions can be general or particular in terms of the scale of the solved problems and can have an impact on both the internal and external environment [12].



**Fig. 1.** Classification of decisions.

According to the principle of development and adoption, management decisions can be individual or collective. The functional orientation of decisions can correspond to planning, organization, coordination, regulation, control, etc. The form of expression of decisions can be written or oral. The reasons for the emergence of decisions can be prescriptive, situational, seasonal or initiative [13]. The nature of the action of decisions can be recommendatory, normative or directive. Decisions can be made under conditions of certainty, risk or uncertainty.

The creative level of decisions can be routine or creative. The frequency of recurrence of decisions can be different - they can be periodically recurring, non-periodic or unique.

Management decisions can also perform various management functions such as planning, organization, motivation and control. Finally, the approach to decision making can be intuitive, judgmental, or rational. The same decision can simultaneously refer to different types of decisions, depending on the specific situation [14, 21, 22].

## 4 Findings

One way or another, modern models of analytical support for management decision-making have become an integral part of many enterprises and organizations. These models include numerous intelligent tools for collecting, analyzing and using data. They help managers to use their resources more efficiently and reduce risks when making decisions [15]. Among them there are:

### 1. Hierarchy analysis method (HAM).

The hierarchy analysis method is a mathematical method that allows the manager to make a choice between several alternative decisions to a problem. The HAM is based on an assessment of the subjective significance of each criterion and alternative for solving the problem. The essence of the method is to build a hierarchy of criteria, alternatives and sub-criteria, and then compare them with each other using paired comparison matrices. The method is based on the theory of utility, which allows you to evaluate how important each criterion is for achieving the goal and which alternatives better meet these criteria.

The advantages of the hierarchy analysis method are the ability to:

- evaluate of complex decision making;
- take into account a variety of criteria;
- take into account the interdependence of various alternatives.

In addition, the HAM allows to build useful models in many areas, such as business, ecology, infrastructure, technology, and many others. Hierarchy analysis is an increasingly popular management tool in areas such as strategic planning, investment decision making, best technology selection, risk assessment, and many others. Modern technologies and methods of analysis used in the HAM make it possible to make informed management decisions based on the analysis of large amounts of data and identify weaknesses in management processes.

### 2. SWOT analysis.

SWOT analysis is a method that allows the manager to identify the strengths and weaknesses of the organization, as well as the opportunities and threats that it may face. SWOT analysis allows to assess the current state of the organization and determine the strategic directions for its development.

The modern SWOT analysis model includes accounting of changes in the economic, social and technological environment, changes in marketing approaches, the emergence of new competitors and consumers, new technologies, etc. SWOT analysis allows an organization to make informed and well-thought-out management decisions that can help it achieve its goals and stay in a competitive market [16]. It is also an excellent tool for

monitoring and evaluation of the performance of the organization in dynamics, as well as for timely response to changes in the external and internal environment.

### 3. Method of expert assessments.

The expert assessment review method is a method that allows the manager to obtain the opinion of experts on a particular problem or issue. The expert assessment method allows to combine the knowledge and experience of several experts and make an informed decision. The main goal of the expert assessment method is make an assess the possible consequences of solving certain issues based on their experience, knowledge and intuition by specially trained experts. The assessment is carried out on the basis of a quantitative scale and an overall assessment, which allows to establish how much this issue is a priority and necessary for decision.

As a rule, the expert assessment method calls on experts in the field of specific issues for evaluation, which provides a significant improvement in the quality of decisions. This method makes it possible to form a more objective assessment of the issue by using the experience and knowledge of specialists in this field, which has a positive effect on the effectiveness of the made decisions [17].

Thus, the method of expert assessments is a relevant and modern approach to solving problematic issues, which can be successfully used in various fields of activity, including business, science and technology. It improves the quality of decisions made and increases the efficiency of the organization as a whole.

### 4. Canvas business model.

Canvas business model is a method that allows a manager to develop a business model for an organization. The Canvas business model is a graphical representation of key business elements such as value proposition, sales channels, market segments and others. It was developed by Alexander Osterwalder and Jan Pignola in 2008 and has since become one of the most popular models in the world. One of the main advantages of the Canvas business model is that it provides a comprehensive understanding and describes all aspects of the business on one sheet of paper. Thanks to this, managers can see the business as a whole, assess its potential and risks, and allocate resources more efficiently.

Key components of Canvas business model:

- key partners who will help implement the business project;
- key activities that need to be completed in order to achieve business goals;
- key resources such as finance, personnel, materials and technology;
- the offer of a product / service that the company provides to consumers;
- sales channels through which the company's products and services will be sold;
- target audience, which are potential customers of the company;
- the cost of the offer, including the price of the product/service and marketing and sales costs;
- income that the company will receive from the sale of its products and services.

One of the main advantages of Canvas business modelis that it allows managers to evaluate the effectiveness of a business model based on key indicators such as revenue, profit and margin. In addition, it allows you to quickly respond to changes in the market and the external environment, change business goals and strategies.

In general, Canvas business modelis a modern model of accounting and analytical support for management decision-making, which helps managers to effectively develop and evaluate business models, make changes to them and improve business processes [15,17].

### 5. Method of ABC-analysis.

The ABC analysis method is a method that allows the manager to determine the most important and least important products, services or customers of the organization. The ABC analysis method allows the manager to focus on the most important elements of the business and optimize costs for less important elements.

This method is based on the Pareto principle (20/80), according to which 20% of the elements bring 80% of revenue or profit. Thus, ABC analysis aims to identify the most significant and critical elements for the organization.

ABC analysis consists of three categories:

- A - a category of elements with high significance (several of the most significant elements that bring a large share of revenue or profit);
- B - elements with average importance (elements that bring a moderate share of revenue or profit);
- C - elements with low significance (a large number of elements that bring little or no income).

Classifying elements into categories allows an organization to allocate key resources to manage category A, as well as determine which elements can be optimized or excluded from business processes.

With the help of ABC analysis, you can make various management decisions, such as:

- optimization of category A management, for example, development of a marketing strategy, cost reduction, quality improvement;
- reduction of funds spent on categories B and C;
- determining the speed and method of investing in different categories.

The use of the ABC analysis method is becoming increasingly relevant in the face of increasing competition and the need to optimize business processes.

6. Cluster analysis is a method that allows you to group data based on the similarities between them. Cluster analysis allows you to identify groups of objects that have similar characteristics and behavior. This allows you to understand the overall picture of the process, highlight key factors, predict results and make effective management decisions. The use of cluster analysis allows you to identify groups of consumers, determine the characteristics of consumer behavior, segment the market, determine the relationship between elements, etc. This method helps to improve the quality of management decisions and business results.

In modern conditions, the use of cluster analysis is a relevant and effective tool in the organization. It helps to analyze the market, competitive environment and consumer behavior. Cluster analysis allows taking into account the specific conditions and characteristics of the enterprise, on the basis of which the most effective development strategies are formulated.

Thus, cluster analysis is a modern model of accounting and analytical support for management decision-making. It is widely used in business to analyze large amounts of data and helps to highlight key factors, predict results and make effective management decisions.

7. Machine learning is a technique that allows computers to extract knowledge from data and apply it to solve problems. Machine learning allows you to automatically identify conformities and identify patterns in data. One of the main advantages of machine learning is the ability to automatically process data without human intervention. It significantly speeds up the analysis of information and allows to maketimely and more accurate management decisions.

Machine learning can be used in various areas of management, such as marketing, business, healthcare, finance, etc. while analyzing data about customers, products, market, financial transactions and other processes.

An important aspect of the successful use of machine learning is the correct choice of models and algorithms, as well as the focus of the analysis on specific business tasks and goals. In addition, it is necessary to organize the process of collecting and storing data correctly in order to prevent errors and distortions in the analysis.

In general, the use of machine learning in accounting and analytical software for making management decisions can significantly increase the efficiency and effectiveness of a business, as well as provide more accurate and predictable result.

## 5 Discussion

In addition, an important element of management decision-making is the definition of criteria and goals to be achieved [14, 15]. The principles and methods of making management decisions include:

1. current state analysis is a method that allows the manager to assess the current state of the organization and identify problems and opportunities for improvement;
2. definition of criteria and goals is a method that allows the manager to determine what criteria and goals shall be achieved in order to solve problems and improve the business;
3. choice of strategy is a method that allows the manager to choose the best strategy to achieve the goals;
4. implementation of the decision is a method that allows the manager to implement the chosen strategy and achieve the goals;
5. evaluation of the results is a method that allows the manager to evaluate the results of the implementation of the decision and make the necessary adjustments.

Each of these methods and approaches can be applied depending on the specific task and situation in the organization. It is important to remember that the correct choice and use of methods and approaches is a key factor for making informed management decisions.

Management decisions must meet the following requirements:

1. Scientific validity. Decisions shall be based on objective patterns and laws in force in various fields of activity, including technical, economic, organizational, social and political;
2. Focus. Each decision shall have a clearly articulated goal, which shall be strictly consistent with the strategic goals of the organization;
3. Quantitative and qualitative certainty. Decisions shall affect the object of management and provide for the achievement of certain results, expressed in quantitative or, if this is not possible, in qualitative indicators;
4. Legitimacy. Decisions shall be subject to norms that establish the competence of management bodies and managers in accordance with the goals of the organization. Competence allows the manager and the management body to engage in those special activities that are part of their tasks;
5. The importance of optimality requires choosing the most efficient decision according to the organization's criteria, such as obtaining maximum results at minimum cost. However, the option chosen must also satisfy other requirements such as social, legal and technical;
6. The timeliness of the decisions made depends on the state of the control object and the possibility of mitigating the negative consequences of possible problems. It is also important to observe the deadlines for the development and control over the execution of decisions;
7. The complexity of organizational activity implies the necessary relationship and interaction between elements, such as equipment, technology, organization of production, material and other resources, and performance results;

In general, modern models of accounting and analytical support in making management decisions are a powerful tool for companies that seek to improve their efficiency and increase profits [17,23]. They can be used in many different areas of business, and companies that invest in developing their analytical capabilities usually gain an edge in the marketplace.



## 6 Conclusions

Each of these models has its own advantages and can be applied depending on the specific task and situation in the organization. However, it is important to remember that the effectiveness of accounting models depends on the correctness and accuracy of the data used in the analysis. Therefore, the correct choice and use of models of accounting and analytical support is a key factor for making informed management decisions.

Thus, the possibility of using modern models of accounting and analytical support for management decision-making in the management of organizations is of great importance for the successful operation of an organization and the achievement of its goals. The use of modern tools allows the management of the organization to obtain complete and timely information about all areas of activity analyze it and make informed management decisions.

Examples of the practical application of modern models of accounting and analytical support for management decision-making are the use of business analysis and control systems for production processes, inventory management systems, financial management and reporting systems, as well as personnel management systems. They allow the leaders of the organization to receive up-to-date information make informed decisions and optimize the work of the company as a whole.

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