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Research Article

**COMMUNICATIVE MODELS OF MANAGEMENT DECISION
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Institute of Service and Business (branch), Don State Technical University, Shakhty, Russia.**Article Received:** April 2019**Accepted:** May 2019**Published:** June 2019**Abstract:**

This article discusses the various modeling processes used to solve complex problems in management, to prevent significant difficulties and costs in conducting experiments in real life. The basis of the simulation is the need for relative simplification of the real life situation or event, however, this simplification should not violate the basic laws governing the functioning of the system under study. Improving the management decision-making process and, accordingly, improving the quality of decisions made is possible through the use of a scientific approach, models and decision-making methods.

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INTRODUCTION:

The effectiveness of managers, state and municipal employees depends on the quality of management decisions. This determines the importance of each specialist in mastering these profiles with theoretical knowledge and skills to develop management decisions.

The modern practice of preparing and executing decisions is replete with numerous inaccuracies at all levels of government. The reason for this situation is the diversity of life situations. The determining place in the composition of the causes of ineffective solutions is taken by ignorance or non-compliance with the technology of their development and organization of implementation.

The development of effective solutions is a fundamental prerequisite for ensuring the competitiveness of any enterprise on the market, the formation of rational organizational structures, the implementation of proper personnel policy and work, the regulation of social and psychological relations in the enterprise, the creation of a positive image, etc.

The problem of decision making is of a fundamental nature, which is determined by the role that decisions play in any sphere of human activity. Synthesizing various components, managerial decisions act as a method of constant influence of the controlling subsystem on the managed one (subject to the control object), which ultimately leads to the achievement of the goals set. This is a permanent link between the two subsystems, without which the company as a system cannot function. This circumstance emphasizes the decisive place of the management decision in the management process.

The management decision is the result of a specific managerial activity of the manager. Decision making is the basis of management.

The purpose of such a decision is to provide movement to the tasks assigned to it. Therefore, the most effective management decision will be the choice that will actually be implemented and will make the greatest contribution to achieving the ultimate goal. The decision can be viewed as a product of managerial labor, and its adoption as a process leading to the emergence of this product.

Solutions used in management are diverse. Different management links create multiple solutions. There are many different reasons and grounds for them, they extend to a wide variety of objects and regulate various social relations and interrelations that arise in all areas of the economy and social life.

Production management provides for the purposeful influence of the governing system on the production activities of enterprises and their divisions in order to ensure optimal functioning and development, creating normal working conditions for employees, meeting their material and spiritual needs.

From a functional point of view, a managerial decision is both the process of selecting acceptable activities from a given set, and the process of developing activities that have not been previously specified. In addition, the decision-making process includes the collection and processing of necessary information, coordination and approval of measures, legal registration of the decision act, etc.

In the sociological literature there are various points of view on what decisions a person takes in an organization to be considered management. The point of view seems to be justified, according to which only decisions that affect relationships in an organization should be attributed to management decisions.

Management decisions, therefore, are always associated with changes in the organization; they are usually initiated by an official or an appropriate body that is fully responsible for the consequences of the decisions being controlled or implemented. The boundaries of competence, within which he makes a decision, are clearly defined in the requirements of the formal structure. However, the number of persons involved in the preparation of the decision is significantly higher than the number of persons invested with power.

Management training in modern organizations is often separated from the function of their adoption and provides for the work of a whole team of specialists. In the "classical" management theory, it is usually the function of headquarters services.

The process of implementing the decision is associated with the implementation of a special plan, which is a set of measures aimed at achieving the goals and deadlines for their implementation. The development of such a plan is the prerogative of the relevant services in the administration. However, today those who will implement it, that is, direct performers, are involved in its development.

On the adoption of management decisions have a merger of internal and external factors.

Internal factors most dependent on the enterprise itself: goals and development strategy, state of the order portfolio, production and management structure, financial and labor resources, volume and quality of work, etc. They form an enterprise as a system, the interconnection and interaction of elements of which ensures the achievement of its goals. Therefore, a change in one or several factors simultaneously necessitates the adoption of managerial measures aimed at preserving the properties of the system as a holistic entity. For example, if there has been a change in the strategic direction in the development of an organization, it is necessary to determine how this will affect the activities of such subsystems as production, scientific and technical progress, personnel, etc. In other words, the management system should develop an organizational change plan aimed at achieving the goals of the new development strategy.

External factors are less influenced by the managers of the organization, as they form the environment in which the organization operates. In modern conditions, it is characterized by great complexity, dynamism and uncertainty, which makes it difficult to take into account environmental factors when making organizational decisions. And the factors themselves have a different impact on the work of the organization. For example, suppliers, consumers, competitors, legislative bodies, creditors, other organizations and institutions of society that are directly related to the area of activity in which this organization is engaged, have a direct impact on its work, the nature of the problems that arise and their resolution.

Stages of the decision-making process.

The need for a solution is manifested either as a problem or as an opportunity. The problem arises when the results obtained by the organization do not meet the goals set for it, which means that some aspects of its activities require improvement. Opportunity means that managers see the potential for improving the performance of organizations, allowing them to exceed current goals.

The stage of the decision-making process, at which managers analyze the main causal relationships of a particular situation, is called a diagnosis, or simply an assessment.

If the solution is programmable, the search for feasible solutions is straightforward. Usually, they are already laid down in the rules and procedures of the organization. Non-programmable solutions, however, require new behaviors. For decisions made under conditions of a high degree of uncertainty, it is possible to work out only one or two acceptable options. It is obvious that the proposed solutions are aimed at reducing the gap between the current and the desired provisions of the organization.

The best option is the one that allows you to achieve the result that is most relevant to the goals and values of the organization when using the least amount of resources. The manager, generally speaking, seeks to choose an option with minimal risks and uncertainty. Since any non-programmable solution involves a certain amount of risk, managers have to set certain success criteria. Under conditions when uncertainty is high, they can rely on their own intuition and experience, because it is not possible to assess the chances for success of this or that enterprise otherwise. However, the correct choice is also possible with an orientation exclusively towards goals and values. The desire to take on additional risk "in exchange" for potential benefits is called risk appetite. The decision of the manager in each case depends on the costs and potential benefits of the choice.

The process of implementing a decision is a lot like the process of implementing a strategy, its success is determined by whether management will be able to transform the guiding ideas into practical actions. Sometimes on the way of implementation there is a lack of organizational resources or a lack of internal energy among managers. Implementation may require lengthy discussions with staff affected by the decision.

Of great importance in the process of implementing decisions is feedback, and, above all, because decision-making is a consistent and never-ending process. The decision does not end with a vote on the board of directors or the meeting of managers. Through feedback to decision makers, information is received that can initiate a new cycle. Perhaps the solution will be unsuccessful, and then you need to conduct a new analysis of the problem, assess options and select a new plan of action. This is how many major problems are solved: various options are being consistently introduced, each of which helps to improve the situation. Feedback is an element of control through which management receives signals about the need to make new decisions.

Classification of management decisions is necessary to determine the general and specific-specific approaches to their development, implementation and

evaluation, which allows to improve their quality, efficiency and continuity. Management decisions can be classified in a wide variety of ways. The most common are the following classification principles:

- by functional content;
- the nature of the tasks (scope);
- by management hierarchy;
- the nature of the organization of development;
- the nature of the goals;
- by cause;
- on initial development methods;
- on organizational design.

Management decisions can be classified by functional content, i.e. in relation to common management functions, for example:

- planned decisions;
- organizational;
- controlling;
- predictive.

Typically, such decisions affect in one way or another all the functions of management, but in each of them it is possible to distinguish the main core associated with some basic function.

A model is a representation of an object of a system or idea in some form different from the integrity itself. It is a simplified depiction of a specific life (managerial) situation. In other words, real events, circumstances, etc. are displayed in models in a certain way. There are a number of reasons for using the model instead of direct impact attempts with the real world:

- the complexity of the real world - the real world of the organization is extremely complex and the actual number of changes relating to a specific problem far exceeds the capabilities of any person, and it can be comprehended by simplifying the real world using modeling;
- experimentation - there are many management situations in which it is desirable to test and experimentally test alternative solutions to a problem. Certain experiments in the real world can and must be performed;
- orientation of management to the future - it is impossible to observe a phenomenon that does not yet exist and may never take place, as well as conduct direct experiments. However, many leaders seek to consider only real and tangible, and this, ultimately, must be expressed in their turn to something visible. Modeling is the only systematic way to see the options for the future and determine the potential consequences of alternative solutions, which allows them to be objectively compared.

Building a model is a process. The main stages of this process are problem statement, construction, validation testing, application and updating of the model.

The first and most important stage of building a model that is able to provide the right solution to a management problem is the problem statement. Proper use of math or computer will do no good if the problem itself is not accurately diagnosed. The correct formulation of the problem is even more important than its solution.

After the correct formulation of the problem, the next stage of the process envisages the construction of a model. The developer must determine the main goal of the model, what output standards or information is intended to be obtained using the model to help management solve the problem before it. It is also necessary to determine what information is required

to build a model that satisfies these goals and provides the necessary information at the output.

After building the model, it should be checked for authenticity. One aspect of verification is to determine the degree to which the model fits with the real world. The control science specialist must establish whether all the essential components of the real situation are embedded in the model. Testing of many control models has shown that they are not perfect because they do not cover all relevant variables. Naturally, the better the model reflects the real world, the higher its potential as a means of helping the manager make a good decision, assuming that the model is not too complicated to use. The second aspect of testing a model is to establish the extent to which the information obtained with its help really helps management cope with the problem.

After checking for accuracy, the model is ready for use. No model of management science can be considered successfully built until it is adopted, understood, and applied in practice. This seems obvious, but it often turns out to be one of the most disturbing moments of the construction.

Even if the application of the model was successful, it will almost certainly require an update. Management may find that the output form is not clear or additional data is desired. If the goals of the organization are changed in such a way that it affects decision making, the model must be modified accordingly. Similarly, a change in the external environment — for example, the emergence of new consumers, suppliers, or technologies — can devalue the assumption of the initial information on which the model was based upon construction.

The number of various specific models is almost as large as the number of problems for which they were developed. The most common types of management science models are game theory, queuing theory models or optimal service models, inventory management models, linear programming models, simulation modeling, and economic analysis.

1. Game Theory. Method of modeling the impact of the decision on competitors. The game theory was originally developed by the military so that the strategy could take into account the possible actions of the enemy. In business, game models are used to predict the reaction of competitors to price changes, new sales support companies, offers of additional services, modification and development of new products. If, for example, using game theory, management determines that competitors do not do the same with price increases, it will probably have to abandon this step in order not to fall into a disadvantageous position in the competition.

Game theory is not used as often as other models. Unfortunately, real-world situations are often very complex and change so quickly that it is impossible to predict exactly how competitors will react to changes in firm tactics. Nevertheless, game theory is useful when it is necessary to determine the most important factors that need to be taken into account in a decision-making situation in a competitive environment. This information is important because it allows management to take into account additional variables or factors that can influence the situation, and thereby increases the effectiveness of the decision.

2. Model queuing theory. The queuing theory model or the optimal service model is used to determine the

optimal number of service channels based on the need for them. Situations in which queuing theory models can be useful include calling people to the airline for reserving space and getting information, waiting in line for machine data processing, equipment repair masters, truck queue for unloading to a warehouse, waiting for customers of a free cashier. If, for example, trucks have to wait too long for unloading, they will not be able to complete as many trips in a day as they should. Thus, the fundamental problem lies in balancing the cost of additional service channels (more people for unloading trucks, more cashiers, more clerks engaged in pre-selling tickets for airplanes) and losses from service below the optimal level (trucks cannot make an extra stop because for delays under unloading, consumers go to another bank or turn to another airline because of slow service).

Queue models provide management with a tool to determine the optimal number of service channels that must be in order to balance costs in cases of an excessively small and an excessively large number of them.

3. Models of inventory management. The inventory management model is used to determine the time of placing orders for resources and their quantities, as well as the mass of finished products in warehouses. Any organization must maintain some level of inventory in order to avoid delays in production and marketing.

The purpose of this model is to minimize the negative effects of stockpiling, which is expressed in certain costs. These costs are of three main types: for placing orders, for storage, as well as losses associated with inadequate inventory levels. In this case, the sale of finished products or the provision of services becomes impossible, and there are losses from idle production lines, in particular, due to the need to pay workers, although they are not working at the moment.

Maintaining a high level of reserves eliminates losses due to their lack. Buying large quantities of materials needed to create stocks, in many cases minimizes the costs of placing orders, because the company can get the appropriate discounts and reduce the amount of "paperwork". However, these potential benefits are offset by additional costs such as expenses for storage, handling, interest, insurance costs, damage from theft, theft, etc.

4. Linear programming model. Used to determine the best way to allocate scarce resources in the presence of competing needs. Linear programming is usually used by staff specialists to resolve production difficulties.

Typical applications of linear programming in production management:

- integrated production planning (scheduling of production, minimizing total costs, taking into account the costs due to changes in interest rates, given constraints on labor resources and inventory levels);
- planning of the product range (determination of the optimal product range, in which each type has its own costs and resource requirements);
- product production routing (determining the optimal technological route for manufacturing a product that must be consistently passed through several machining centers, with each operation of the center characterized by its costs and productivity);

- process control (minimizing chip yield when cutting steel, leather waste or fabric in a roll or cloth);
- inventory control (determining the optimal combination of products in stock or storage);
- planning the distribution of products (drawing up an optimal shipping schedule, taking into account the distribution of products between manufacturing enterprises and warehouses, warehouses and retail stores);
- determination of the optimal location of the new plant (determination of the best location by estimating the cost of transportation between the alternative locations for the new plant and its supply and sales of finished products).

5. Simulation modeling. All the models described above imply the use of imitation in a broad sense, since all are substitutes for reality. Nevertheless, as a simulation method, imitation specifically refers to the process of creating a model and its experimental application to determine changes in a real situation. The main idea of imitation is to use a device to imitate a real system in order to explore and understand its properties, behavior and characteristics. The wind tunnel is an example of a physically tangible simulation model used to verify the characteristics of aircraft and automobiles under development. Production and finance specialists can develop models that simulate expected productivity gains and profits as a result of applying new technology or changing the composition of the workforce.

Simulation is used in situations that are too complex for mathematical methods such as linear programming. This may be due to an excessively large number of variables, the difficulty of mathematical analysis of certain dependencies between variables or a high level of uncertainty.

6. Economic analysis. Economic analysis incorporates almost all methods of estimating costs and economic benefits, as well as the relative profitability of the enterprise. A typical "economic" model is based on break-even analysis, a decision-making method with the definition of the point at which total income is equalized with total costs, i.e. the point at which an enterprise becomes profitable.

The volume of production, ensuring break-even, can be calculated for almost every type of product or service, if the corresponding costs can be determined. This may be the number of seats in the plane, which should be occupied by passengers, the number of

visitors in a restaurant, the sales volume of a new type of car.

CONCLUSION:

The choice of a particular model depends on the specific situation and the task. It is not rational to use any one model of managerial decision making for every problem that arises. Therefore, management should assess the situation as a whole and choose the most effective model for this problem.

The volatile economic and political environment forces enterprises to take different decisions more carefully and carefully, to draw up development plans, evaluating the existing reality. Many studies conducted in the United States and European countries show that even successful businessmen make informed and meaningful decisions only half the time.

Modeling allows you to anticipate the course of events and development trends inherent in the controlled system, determine the conditions of its existence and establish the mode of activity, taking into account the influence of various factors. At the same time, at first glance, it may seem that the greater the number of factors taken into account in the model, the better the model itself. In fact, a detailed model is not always advisable, since it unnecessarily complicates the model and presents difficulty for its analysis.

It is necessary to use models because of the complexity of organizations, the inability to conduct experiments in the real world, the need to look into the future. Based on the model, the manager spends much less time for making decisions.

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