

FEATURES OF ANALYSIS AND MODELING OF MANAGEMENT PROCESSES IN LAW ENFORCEMENT

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Abstract. In this work, the author attempted to reveal the importance of management issues in various spheres of activity and the peculiarities of management in the law enforcement sphere. A look at the origin and development of a scientific approach to the management process is given. The complexity, multi-component, and dynamism of the social management system, which is determined by the characteristics and nature of its components, is emphasized. The above determines the use of a system approach that is optimally suited for the analysis and research of complex objects and relationships, taking into account a large number of dynamic variables. The author noted that in the field of law enforcement, a number of factors and conditions must be constantly analyzed to forecast changes, develop the external environment, and ensure the effective operation of relevant bodies. This emphasizes the importance and necessity of using analysis both in the activities of law enforcement agencies and in the management processes of this area. Its indisputable importance for strategic management and ensuring long-term effective activity of law enforcement agencies is emphasized. The peculiarities of the application of SWOT analysis, which allows to investigate the impact of external and internal factors on the object, taking into account its weaknesses and strengths, are revealed. Modeling is considered an important component of system analysis and a general scientific management method. Attention is paid to the specifics of the use of this method when the model acts as a scientific tool and a means of scientific knowledge. The author paid attention to the types of models, their purpose, and features of application in management processes.

Keywords: law enforcement activity, management, strategic management, system approach, system analysis, analysis, modeling.

INTRODUCTION

In an era marked by rapid social transformation and escalating global interaction, the landscape of law enforcement management is undergoing a profound evolution. This article, titled „Features of Analysis and Modeling of Management Processes in Law Enforcement,” aims to delve into the intricacies of these changes and their implications. The contemporary world, characterized by an accelerated pace of social processes and expanding interactions at multiple levels – from local communities to international platforms – faces unprecedented challenges. These include the rise of terrorism, military tensions, and conflicts in regions like Iraq, Georgia, Syria, Ukraine, and Israel, compounded by the global repercussions of the Covid-19 pandemic. Such a scenario underscores the escalating importance and complexity of management in regulating public life (Zhou, 2023).

Management, particularly within the social sphere, is increasingly recognized as an indispensable tool for fostering harmony and order in the pursuit of shared objectives. In the context of law enforcement, this becomes even more critical. Law enforcement agencies, the linchpins of societal security and order, must adapt to these dynamic changes. The purpose of this article is to explore the pivotal role of analysis and modeling in the management processes of law enforcement activities. By examining the unique features and applications of these tools, the article aims to shed light on how they can enhance the efficacy and responsiveness of law enforcement in an ever-changing global environment (an Nguyen & Luong, 2023)

Through a detailed exploration of these management processes, this article seeks to contribute to a deeper understanding of the strategic and operational dimensions of law enforcement management. In doing so, it aspires to provide valuable insights for policymakers, law enforcement officials, and scholars, facilitating the development of more effective, adaptable, and forward-looking law enforcement strategies in the face of the 21st century's complex challenges.

MATERIALS AND METHODS

Management issues are of interest to specialists in various fields of activity: management, economics, physics, mathematics, informatics, cybernetics, biology, sociology, jurisprudence, psychology, etc. Such a wide field of scientific interest in management and its aspects emphasizes its demand and a kind of universality. The empirical basis of the research was made up of the works of many scientists, and specialists of various spheres and industries, who studied the issues of management, social management, management systems, system analysis and modeling, etc. Among them: V.M. Plishkin(1999), whose scientific work „Theory of Management of Internal Affairs Bodies” should be recommended for study by every head of law enforcement agencies; I.S. Hrashchenko (2021), who researched methods of mathematical programming, econometric and simulation modeling, management decision-making in conditions of risk and uncertainty; Zahorskyi, V., Lipentsev, A., & Andreyeva, S. (2018), who considered the issue of the formation of civil society and determining the place of power in state administration; D. V. Lande and V. M. Furashev studied informational and socio-legal modeling; B.A. Zaplotynskyi(2018) considered information technologies in legal activity; I. S. Kravchenko studied the basics of management in the National Police (2020); V. Lefterov (2021) developed the topic of psychological preparation of the heads of law enforcement agencies for management in crisis conditions; Dolzhenkov O.O. studied the issue of regulation of social relations that arise in the sphere of state administration in the process of executive and administrative activities by bodies of executive power and bodies of local self-government.

Varenko V. M., Bratus I. V., Doroshenko V. S., Smolnikov Yu. B., Yurchenko V. O. (2013) revealed the topic of system analysis of information processes; L.M. Shipilova highlighted the peculiarities of management activities in strategic planning in the field of national security; Emelianov V. M., Yevtushenko O. N., Andriyash V. I. (2015) revealed the problems of public administration: in definitions, explanations, schemes, tables.

Despite the constant scientific interest in various aspects of management in many areas,

the peculiarities of modeling and analysis of management processes in law enforcement activities require additional attention from scientists.

A number of general scientific and special methods of scientific knowledge became the methodological basis of the study of this problem: historical-legal method, systemic-structural method, methods of analysis, synthesis, and generalization.

RESULTS

Considering the above, it can be concluded that the modeling and analysis of management processes that take place in the field of law enforcement in modern conditions are important tools for improving the efficiency and effectiveness of the activities of relevant bodies, developing strategies, and solving tasks. They are used to better understand the processes that take place in society, and the intra-organizational state of the law enforcement system and, as a result, influence the state of law and order. In order to ensure a proper, effective level of management in the law enforcement sphere, it is necessary to carry out appropriate training of management-level personnel, teach analytical work and improve their qualifications, implement the latest methods and technical solutions, develop scientific potential, attract specialists from various related fields, use the information obtained for effective use of available assets and the right choice of priorities in specific situations.

The listed steps, the use of a systemic approach in management activities will contribute to the further evolution of the management system in the law enforcement sphere, the development of its flexibility, and adaptation under fast and dynamic social processes.

Human nature has always pushed people to find more effective ways and methods of achieving any goal, and this is what contributed to the development and improvement of management. Let us recall the founders of the school of scientific management, the emergence of which accompanied economic growth and technical progress. Its representatives used a scientific approach to the development of methods and ways to improve efficiency by introducing new management techniques and practices.

Frederick Winslow Taylor, the author of the works „Production Management” and „Scientific Management”, became the founder of the scientific organization of work in management. He suggested the use of a scientific approach to the performance of each element of work and the selection and training of personnel; cooperation with workers and the distribution of responsibility for work results between managers and workers.

Frank and Lillian Gilbreth focused on standardizing work operations to save time and effort.

Researcher Henry Lawrence Gant developed work schedules and sequences he refined action algorithms and certain procedural models that ensured the efficiency and effectiveness of the technological process. In addition, he studied the issue of employee stimulation and its impact on the effectiveness of their activities.

This issue was also studied by Henry Ford, who believed that workers who work better and more efficiently should be rewarded more, in the future, thanks to their high earnings, public welfare, and high corporate profits will increase.

This emphasizes that the development of management, and the use of a scientific approach in management activities, have become natural in the history of human development.

Social activity always has goals and is aimed at achieving a certain goal. This feature is inherent in social management as opposed to management in other systems (technical or biological).

„Management goals are achieved as a result of the implementation of its general functions, such as analysis, forecasting, planning, organization, regulation, and control. They act as varieties of managerial activity, which are objectively necessary in any social systems” (Plishkin, 1999).

In general, schematically, the management system is depicted as channels of direct and feedback communication between the subject and the object of management within a certain environment. In social management, both the subject and the object of management are represented by people (individuals or associations, communities, and society in general), who in each case have their own goals and interests and enter into various social relations.

Therefore, for social management, the scheme cannot be so unambiguous, because the object of management not only responds and reacts, it also changes and influences the subject of management, prompting him to change, improve managerial influence, and choose other approaches and methods. The development of one encourages the development of the other. The system of social management is practically not stable, it is in a constant process of change due to the characteristics and nature of its components.

That is why, to ensure its functioning and smooth progress, it is necessary to use a number of tools, including systems of information support, regulation, and control, effective and flexible organizational structures, analysis and forecasting, modeling and planning, etc.

As for the management of law enforcement activities, it should be noted that it has a complex, branched structure because it touches many aspects and relations related to the provision of this activity. Therefore, as well as for the implementation of public administration, a systematic approach should be used in the management of law enforcement activities, which is optimally suited for the analysis and research of complex objects and relationships, taking into account a large number of dynamic variables.

System analysis is an important tool for ensuring the existence and development of any social system because it allows taking into account a complex of various factors, conditions, and internal and external factors, its purpose is to solve large-scale complex management tasks.

As V.M. Plishkin rightly pointed out „The analysis function has the right to an independent existence in the classification of general management functions because it occupies a very important place in the management process. This function is basic: it starts the management process, and with its help, the goal of management is determined, analytical research allows you to develop the optimal version of a management decision, and analysis is quite often used in the process of implementing a management decision and when summing up the results of the implementation of the decision” (Plishkin, 1999).

The analysis is of decisive importance for strategic management, aimed at ensuring the long-term management of the organization, determining specific activity goals, developing a strategy for their achievement, and taking into account all relevant external and internal conditions, variability, and complexity of the external environment and internal organization (Emelianov, 2015).

In the field of law enforcement, a number of factors and conditions must be constantly analyzed to forecast changes, develop the external environment, and ensure the effective operation of relevant bodies. The evaluation of the external environment has two areas of analysis: the analysis of the target environment (task environment) and the analysis of the macro-environment (macro-environment), which is also called PEST analysis (P - political and legal environment, E - economic environment), S - sociocultural environment, T - technological environment). Therefore, the analysis of the macro environment is an analysis of external factors of influence and covers political, economic, social, cultural, technological, ecological, security, demographic, territorial ideological, and other factors that can affect the relevant activity positively or negatively.

To determine the development prospects of the body, it is advisable to use the analysis of the management body's activities. This analysis has the following varieties: target, functional, organizational, and resource, each of which has its specifics. The purpose of the target analysis is to confirm the existence and correctness of the definition of the diagnosed, scientifically substantiated, and publicly supported goals of the body's functioning, which should be determined by the relevant activity programs. Functional analysis compares the actual activity of the body with the tasks and functions defined by the normative legal acts. Based on the results of these types of analyses, it is possible to conduct an organizational and structural analysis of activity in the future (Shypilova, 2023).

The most important categories of system analysis are defined as:

- analysis as a research activity with the help of imaginary decomposition of the system into components;
- system analysis – a set of methods, techniques, and algorithms for the application of a system approach in analytical activity;
- systematic research analysis – analytical activity is constructed as research, and the results are used in science;
- general system analysis – based on the general theory of systems, carried out from general system positions;
- system applied analysis – analytical activity is a specific kind of practical activity, and the results are used in practice;
- recommendatory analysis – a type of analysis focused on the development of recommendations regarding the behavior of actors in a certain situation;
- program-target analysis - represents the further development of the recommendation analysis in the aspect of developing a program to achieve a certain goal;
- retrospective analysis — analysis of the systems of the past and their impact on the past and history;
- situational analysis „Case study method” - a type of analytical activity based on a description of the situation and a detailed analysis of this description;
- structural analysis – analysis of the structure of the system as a set of connections between parts of the system, clarification of the value of an individual element for a whole structured in a certain way;
- structural-functional analysis – selection of elements of interaction and determination of their place and role in the functioning of the system;

- functional analysis – explanation of phenomena from the point of view of the functions they perform;
- cause-and-effect analysis - establishing the reasons that led to the occurrence of this situation and the consequences of their development;
- prognostic analysis – preparation of forecasts and ways of their implementation regarding the likely, potential, and desired future;
- analytical model – a model that allows analyzing the object reflected by it (Varenko, et al., 2013).

DISCUSSION

The specified categories of system analysis are also of particular importance for ensuring law enforcement activities. In the management activities of law enforcement agencies, in particular in the activities of the National Police of Ukraine, system analysis allows: to take into account the impact of various conditions on the state and development of social systems, to obtain information about their hierarchy; develop tasks for different levels of management, setting connected tasks for different links; prepare management decisions, taking into account various developments; calculate and allocate available assets, using them according to priorities in a specific period. System analysis is used to assess the operational situation in the area of service of the National Police of Ukraine.

In the activities of the National Police of Ukraine, analysis is a component of analytical work, and together they are a means for choosing the main areas of activity, identifying and assessing problems facing a specific system, setting goals, determining objectively necessary functions, justifying the structure and increasing efficiency activities for the performance of assigned tasks, evaluation of individual actions to achieve the goal (Plishkin, 1999).

The effectiveness of the analysis depends both on the competence of the analyst or the person making the management decision, his ability to work with information, identify relationships, draw conclusions and forecasts, and on the completeness of the information received from internal or external sources. Accordingly, internal is the information that is formed in the body or unit of the National Police of Ukraine, and external is received through various communication channels from other sources

The information that is concentrated and analyzed by the National Police of Ukraine is divided according to a number of indicators characterizing the state of crime and public order protection, the results of the practical activities of the bodies and units of the National Police of Ukraine, data on factors affecting the state of the operational situation, including socio-economic, demographic and other features of the service region; information on the structure, level, dynamics, and prevalence of offenses; information on the criminological characteristics of offenders, etc.

One of the options for conducting the analysis is the use of SWOT analysis, which was developed in the 70s of the last century.

SWOT analysis allows you to investigate the impact on the object, and the system of various external and internal factors, taking into account their weaknesses and strengths, for which a table is built and filled in, where, according to the abbreviation SWOT, the following are distinguished: S - strengths; W – weaknesses; O – opportunities; T – threats.

S-O means how to take advantage of the opportunity.

S-T - how to reduce threats?

W-O - What might be an obstacle to opportunity?

W-T - the most serious risks and threats.

S and W characterize the internal environment of the object to a greater extent, and O and T the external environment and its impact on the research object. Comparison of relationships „SO“, „ST“, „WO“, „WT“ provide an objective assessment and are used to form a strategy for the further development of the research object. Also, based on actual data, SWOT analysis helps to determine how it is possible to improve management technology.

Using the SWOT analysis algorithm, it is possible to analyze the factors influencing the macro environment (external environment) on management processes and the microenvironment (internal environment) in the following directions: legal, organizational, financial, personnel, etc. (Denysova, 2023).

The results of the analysis and assessment of the operational situation in the future can be implemented by: correcting the use of forces and means, directing efforts to strengthen the fight against specific types of offenses, interacting with the public to ensure law and order, strengthening control over the activities of individual units or employees, strengthening personnel potential, etc.

One of the important components of system analysis and at the same time a general scientific method of management is modeling. „Modeling in a broad sense is a special cognitive process, a method of theoretical and practical mediated cognition, when the subject, instead of the direct object of cognition, chooses or creates an auxiliary substitute object (model) similar to it, examines it, and the information obtained transfers to the real subject of study“ (Plishkin, 1999).

A model is an object of any nature, which according to its characteristics can replace the object of research. During the study of the model, new information about the research object is obtained. The modeling method is used in cases where it is impractical, inconvenient, or impossible to study a real object with all its properties. For example, when the study of a unique object will lead to its destruction or loss of its characteristics, or when a certain object can be studied only indirectly, then the crime can be studied through its information model, which is advocated by criminal statistics, trust in law enforcement agencies can be researched using the results of a social survey and indicators of citizens' appeals to the police, etc. Therefore, the model acts as a scientific tool, a means of scientific knowledge, and performs a number of functions, including descriptive, explanatory, and prognostic. The descriptive function ensures completeness, accuracy, and systematization of data; the explanatory function helps establish connections and dependencies; thanks to the predictive function, the presence of new characteristics or properties of the object is assumed.

Models have a large number of types, which is due to the variety of research objects. Models are physical, subject-mathematical, logical-analytical, symbolic, informational, descriptive, operational, cybernetic, simulation, etc.

Material (subject) models reproduce the researched original while preserving its physical nature, and ideal (mental) models function according to the laws of logic, they are most often represented by logico-mathematical models that function based on the representation

of their content, structure, and properties in a symbolic form.

Various models are created and used in the activities of law enforcement agencies and the National Police of Ukraine: algorithms for actions in specific situations (situational behavior model), models of traffic accidents, modeling of a person's appearance (identikit), crime model, special operations model, structural models are being developed, as well modeling is also used in expert activities.

In managerial activities, simulation modeling is used, which provides comprehensive forecasting of the development of the system depending on changes in the factors of the external environment. For simulation models, due to their extreme complexity and the need to take into account various factors, servers or powerful computers are involved. „Imitation in this case means conducting various series of experiments on computers with models that are presented as a set of programs. A simulation model is a model that is specially designed for research in the simulation mode, that is, for comparing the characteristics obtained under different parameters” (Lande & Furashev, 2021). As a result, among the various received variants of the results, preference is given to the one that best corresponds to the set goal.

In order to ensure work with personnel, planning of job vacancies, calculation of staff turnover, and training of candidates for management positions, there is also a need to model the process of training and transfer of personnel; to increase the effectiveness of strategic or crisis management, behavior models are used, the purpose of which is the development of professional and personal characteristics (Lefterov & Mul, 2021).

Computer modeling is used to solve the problem of analysis or synthesis of a complex system based on its computer model. Its purpose, in particular, is to predict the object's behavior in non-standard situations, and computer modeling is also used to find optimal options for external influence on the object to obtain the highest indicators of its functioning.

Modeling is actively used in decision support systems, which are management information systems, to support managers in the decision-making process and are used to solve unstructured or poorly structured problems. The operation of decision-making support systems is ensured by the complex use of hardware, software, data, models, and the work of the decision-maker. These systems involve specialized databases, analytical models, and an interactive decision modeling process on a computer, and also take into account the user's position concerning a specific situation. The models used are simplified abstractions of the real main elements of the system and their relationships, which are important for decision-making. As a rule, these models have a matrix, mathematical or graphical display.

Modeling and its algorithmization is especially actively used in cases of high-efficiency needs: in project activities, in planning, operations research, creation of automatic control systems, simulation modeling, and creation of control systems.

Modeling of management processes can be done using functional and object-oriented approaches. In the first case, the management process is depicted as a function sequence that transforms process inputs into outputs using appropriate resources. An object-oriented approach to building a model takes into account the description of conditions and events under which certain functions are used and reflects the general scheme of interaction of objects without detailing operations (Shatilov, 2013).

The development of artificial intelligence systems for modeling human mental activity

became the next step in the development of modeling, and information technologies and allowed the creation of expert systems capable of accumulating information and modeling the examination process, which, in our opinion, is of great importance for the implementation of law enforcement functions and the provision of management processes.

„The main areas of application of expert systems are: diagnostics - determination of the condition of the object of expertise; interpretation - determination of the essence of the observed data; planning - defining a program of actions according to a certain criterion; forecasting – determining the consequences of the situation based on the current state of the object of examination; training is a comprehensive assessment of results based on many factors. The ideology of expert systems is embodied by the formula: system = knowledge + conclusion” (Zaplotynskyi, 2018).

CONCLUSION

Expanding on the conclusions drawn from the research, it is clear that the strategic use of modelling and analysis within law enforcement management is not only beneficial, but essential to navigating the complexities of modern society. These tools serve as critical tools for improving the operational effectiveness and efficiency of law enforcement agencies. By providing a deeper insight into societal dynamics and the internal workings of law enforcement systems, they play a pivotal role in shaping the landscape of law and order.

The need for comprehensive training for law enforcement management cannot be overemphasized. Such training should include not only the basics of analytical work, but also the continuous updating of skills to incorporate the latest methodologies and technical advances. This process requires a multi-dimensional approach, bringing together scientific research, technological innovation and expertise from different fields. The integration of different perspectives and interdisciplinary knowledge is crucial for promoting a more robust and responsive law enforcement management system.

In addition, the effective use of collected information is of paramount importance for the optimal deployment of resources and for making informed decisions in critical scenarios. This approach, based on a systematic and holistic understanding of law enforcement, will undoubtedly enhance the ability of agencies to respond to and manage evolving societal challenges. In the future, these initiatives will catalyse the evolution of the law enforcement management system. By emphasising flexibility and adaptability, they will enable law enforcement agencies to be more responsive and proactive in the face of rapid social change. This evolution will not only refine the operational capabilities of these agencies, but will also contribute significantly to the broader goal of maintaining social harmony and security. Ultimately, the further development and application of these analytical and modelling tools within law enforcement will be instrumental in creating a safer and more orderly society.

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