

**METHOD OF ASSESSMENT OF THE STATE  
OF INFORMATIONAL AND ANALYTICAL ACTIVITY  
OF OPERATING UNITS OF THE STATE BORDER GUARD  
SERVICE OF UKRAINE**

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**INTRODUCTION**

The reliability of protection the state border is achieved by the high efficiency of the operational and service activity of organs and units of the State Border Guard Service of Ukraine (hereinafter – SBGSU), including search and operational units (hereinafter referred to as operational units)<sup>1</sup>. To accomplish this, the operational units of the SBGS of Ukraine carry out a set of measures aimed, primarily, at the discovery, collection (extraction), processing, storage, and exchanging of information<sup>2</sup>. These activities in the aggregate constitute information and analytical activity (hereinafter – IAA) according to R. Lyashuk and O. Farion<sup>3</sup> (Lyashuk & Farion, 2010a). Such activity, under the influence of changes in the operational situation at the state border and other factors may, to some extent, satisfy or not the heterogeneous needs of the operational units of the SBGS of Ukraine.

The results of the operational and service activity of operational units' activity of the State Border Guard Service of Ukraine indicate that the rapid nature of changes in the operational and criminogenic circumstance limits the amount of time available for the complete collection of the situation data, their comprehensive analysis and preparation of analytical products (for instance, distribution of forces and means, decision making)<sup>4</sup>.

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<sup>1</sup> Pro derzhavnij kordon Ukraini (1992) [About the State Border of Ukraine] : Zakon Ukraini vid 04.11.1991 r. № 1777-XII / *Vidomosti Verhovnoyi Radi Ukraini*. № 2. St. 5 (z nastupnimi zminami ta dopovnenniyami). (in Ukrainian)

<sup>2</sup> Pro operativno-rozshukovu diyalnist (1992) [About the operative-search activity] : zakon Ukraini vid 18.02.1992 r. № 2135-XII. Data onovlennya: 28.08.2019. URL: <http://zakonl.rada.gov.ua/laws/show/2135-12/page> (data zvernennya: 12.09.2019). (in Ukrainian)

<sup>3</sup> Lyashuk R. M., Farion O. B. (2019) Informacijno-analitichna diyalnist operativno-rozshukovih pidrozdiliv Derzhavnoyi prikordonnoyi sluzhbi Ukraini [Information and analytical activity of the operational and search units of the State Border Guard Service of Ukraine]. *Zb. nauk. pr. Hmelnickij : NA DPSU*, no. 30, pp. 62–75. (in Ukrainian)

<sup>4</sup> Rezultati operativno-sluzhbovoyo diyalnosti Derzhavnoyi prikordonnoyi sluzhbi Ukraini (2019) [Results of the operational and service activities of the State Border Guard Service of Ukraine]. Data onovlennya: 10.12.2019. URL: <https://dpsu.gov.ua/ua/photo-infografika-rezultati-operativno-sluzhbovoyo-diyalnosti-za-2019-rik/> (data zvernennya: 12.12.2019). (in Ukrainian)

Thus, how well the data received will be in line with the operational situation and processed in a qualitative manner, so timely and well-grounded the management decision will be made and the response measures effectively implemented (for example, prevention and/or cessation of illegal activities, detention of offenders).

So, the final result of activity of operational units of the border guarding depends, first of all, on efficiency of IAA, the condition of which needs to be determined for further adjustment, if necessary. Therefore, the need to address the issue of assessing the status of IAA operational units of the SBGS of Ukraine determines the relevance of the study.

### **1. Analysis of recent publications**

Some results of the study of IAA organs and units of the SBGS of Ukraine are revealed in the scientific works of B. M. Alekseyenko, A. S. Androshchuk, Ya. S. Galanyuk, Yu. B. Ivashkov, I. S. Katerynychuk, D. A. Kuprienko, G. A. Magas, Yu. V. Mazur, A. V. Makhniuk, A. B. Misyka, O. V. Mikhaïlenko, V. O. Nazarenko, V. O. Subotina, P. O. Tsigikala, O. M. Shinkaruk and other scientists. They have proposed a number of approaches to improve management of decision-making processes, substantiated individual views on the usage of forces and tools to obtain information, developed a number of models and techniques for upgrading border security, considered the improvement of information and analytical work in the operational and other units SBGS of Ukraine. In the course of studying the content of articles of domestic scientists who have considered the issues of IAA in the bodies and units of the SBGS and law enforcement agencies of Ukraine, a lack of methodology is defined for assessing the status of IAA, and the available scientific and methodological tools for assessing these activities in the operational units of the SBGS of Ukraine do not take into account a set of indicators that characterizes the assessment. Thus, the lack of scientific development on the topic defined determines the urgency of this scientific research.

The purpose of the article is to develop a methodology for assessing the status of IAA of operational units of the SBGS of Ukraine.

### **2. Outline of the Main Research Material**

Considering that the solution of the issues of timely obtaining the situation data and their effective analysis by the forces and means of the

operational units of the SBGS of Ukraine is entrusted to the IAA<sup>5</sup>, the object of modeling is the specified activity.

The subject of modeling is the processes of collecting (extracting) information on the operational and criminogenic situation at the state border, analysis of received and available data, organization of IAA in the operational unit of the SBGS of Ukraine.

The process of obtaining, collecting (extracting) by the opportunities and means of the operational unit information about the situation on the state border, in particular illegal activities, includes:

collecting and retrieving information about illicit events and phenomena that may indicate, through information characteristics, the committed crime or its preparing according to A. Voytovuch and O. Farion<sup>6</sup> (Voytovuch & Farion, 2010a); according to P. Tsygikal and O. Farion<sup>7</sup> (Tsygikal & Farion, 2017a);

monitoring of Internet resources available in operational and interactive units of databases O. Farion<sup>8</sup> (Farion, 2018);

determining the degree of importance of the data received for prompt response to them O. Farion<sup>9</sup> (Farion, 2013a);

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<sup>5</sup> Pro zatverdzhennya Polozhennya pro operativno-rozshukovij viddil organu ohoroni derzhavnogo kordonu (2015) [On approval of the Regulation on the Operational and Investigative Division of the State Border Protection Body] : nakaz Ministerstva vnutrishnih sprav Ukrayini vid 02.02.2015 № 118 URL: <https://zakon.rada.gov.ua/laws/show/z0187-15> (data zvernennya: 12.09.2019). (in Ukrainian)

<sup>6</sup> Vojtovich A. I., Farion O. B. (2010) Poryadok viznachennya prioritetu protipravnih situacij, sho vinikayut na richkovij dilyanci derzhavnogo kordonu [The procedure for determining the priority of unlawful situations occurring at the river section of the state border]. *Zb. nauk. pr. : trudi akademiyi. Kiev : NAOU*, no. 6(99), pp. 98–102. (in Ukrainian)

<sup>7</sup> Cigikal P. O., Farion O. B. (2017) Model rozpiznavannya zlochiviv operativno-rozshukovim viddilom Derzhavnoyi prikordonnoyi sluzhbi Ukrayini dlya svoyechasnogo yih poperedzhennya, viyavlennya i pripinennya [Model of crime detection by the Operational Investigation Department of the State Border Guard Service of Ukraine for their timely prevention, detection and termination]. *Zb. nauk. pr. Hmelnickij : NA DPSU*, no. 1(71), pp. 238–255. (in Ukrainian)

<sup>8</sup> Farion O. B. (2018) Okremi prijomi i sposobi monitoringu prihovanih resursiv Internetu, nakopichennya informaciyi ta doslidzhennya oznak protipravnoyi diyalnosti iz zastosuvannam kriminalnogo analizu [Separate techniques and methods for monitoring hidden Internet resources, accumulating information and investigating signs of criminal activity using criminal analysis]. *Zb. nauk. pr. ser. Hmelnickij : NA DPSU*, no. 29, pp. 119–130. (in Ukrainian)

<sup>9</sup> Farion O. B. (2013) Instrumentarij viznachennya tipu zagroz prikordonnij bezpeci v procesi provedennya strategichnogo kriminalnogo analizu operativno-rozshukovim pidrozdilom regionalnogo upravlinnya Derzhavnoyi prikordonnoyi sluzhbi Ukrayini [Toolkit for determining the type of border security threats in the process of strategic criminal analysis operational-search unit of the regional department of the State Border Service of Ukraine]. *Zb. nauk. pr. ser. Hmelnickij : NA DPSU*, no. 2(60), pp. 212–218. (in Ukrainian)

establishing a specific type of crime according to P. Tsygikal and O. Farion<sup>10</sup> (Tsygikal & Farion, 2017b), in accordance with the provisions of the Criminal Code of Ukraine;

selection, if necessary, of information concerning further actions of criminals and / or persons (e.g., aide, carrier, financier), who assist them in committing a crime (e.g., paying the costs associated with committing a crime, accompanying illegal migrants to the state border), ways of committing a crime, changing the route of traffic, etc.

The process of analyzing received and available data includes:

primary analysis of data about events and other situations on the state border received (obtained) by the operational unit from available sources of information, or personally;

determining the priority of illegal situations;

systematization and converting the obtained data in a convenient form for use and also for conducting analytical research;

analytical study of available and operational data by forces and means of informational and analytical units, such as, for example, units of information-analytical support of operational-search activity, units of criminal analysis;

development of analytical products;

presenting (proving) the results of analysis to the customer or the management of the operational unit, other interested parties and cooperating structures.

At the same time, each of these processes must correspond to the level of organization that would allow to receive the necessary result in time to ensure the activity of the operational unit. The timeliness requirement is important for all IAA processes. Thus, the timeliness of a crime detection is determined by the degree (level) of correspondence of time moments since its committing to the receiving the information about it by the operational unit. The moment of committing a crime in the area of responsibility of the operational unit of the SBGS of Ukraine, unknown in advance, depends on the intent of the actions of criminals in committing a crime and their ability to achieve the goal. The moment of detection (recognition) of a crime is also unknown in advance, so it is a random variable and depends on the availability of sources of information at the site of the unlawful situation and

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<sup>10</sup> Cigikal P. O., Farion O. B. (2017) Model rozpoznavannya zlochiniv operativno-rozshukovim viddilom Derzhavnoyi prikordonnoyi sluzhbi Ukrayini dlya svoechnasnoho yih poperedzhennya, viyavlennya i pripinennya [Model of crime detection by the Operational Investigation Department of the State Border Guard Service of Ukraine for their timely prevention, detection and termination]. *Zb. nauk. pr. ser. Hmelnickij : NA DPSU*, no. 1(71), pp. 238–255. (in Ukrainian)

their ability to organize and transfer information to the authorized person or to the operational unit; from the ability to reliably recognize (identify) the type of crime on the basis of available evidence from sources of information.

Timeliness of analysis of received and available data is determined by the degree of accordance of moments from the receipt of information for analytical research to the development of analytical products and the presentation (demonstrating) of the results of analysis to the customer or the management of the operational unit, other interested persons and interacting structures. The moment of the receiving the information required for analytical research depends on the content of the data obtained, its accuracy, completeness and relevance, which in the aggregate must satisfy the needs for qualitative analytical research. The moment to develop analytical products and to present (demonstrate) the results of analysis to the customer depends on the achievement of the goal of analytical research.

The timeliness of the organization of the IAA operational units of the SBGS of Ukraine is determined by the degree of correspondence of moments from the formation of the purpose of the IAA to the setting of tasks for the forces and means of the operational unit to achieve it. That is, the tasks of obtaining information, analyzing it and presenting (demonstrating) the results of analysis to the customer (for example, to the head of the operational unit, other interested persons, interacting structures).

The purpose of the modeling is V. Gorodnov<sup>11</sup> (Gorodnov, 2004a):

1) evaluation of the IAA state of the operational unit of the STGS of Ukraine;

2) decision making on formation of rational composition of forces and means of obtaining information (networks sources of information, including agent), effective mechanism of information analysis and production of analytical products to timely provide the needs of operational and service activities of the operational unit.

So, based on the study of the content of the subject area of the study, it is defined that the assessment of the IAA state of a separate operational unit of the SBGS of Ukraine is determined by a set of marks:

the status of implementation of measures aimed at obtaining (collecting, extracting) the situation data at the state border of Ukraine and in border areas;

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<sup>11</sup> Gorodnov V. P. (2004) Metodika ocenki effektivnosti variantov obespecheniya funkcionirovaniya sistemy raznorodnyh mnogoparametricheskikh obektov razlichnoj vazhnosti [Methodology for assessing the effectiveness of operational options systems of heterogeneous multi-parameter objects of various importance]. *Naukove vidannya Sistemi obrobki informaciyi. Harkiv : NANGU*, no. 2, pp. 159–163 (in Russian)

the status of implementation of analytical research aimed at the production (development) of the analytical product necessary to implementation the tasks assigned by the laws of Ukraine to the operational unit;

the status of the IAA organization in the operational unit of the SBGS of Ukraine.

In addition, to increase the objectivity of assessing the IAA status of the operational unit of the SBGS of Ukraine, it is necessary to take into account the coefficients of influence such factors as:

1. Group of factors of operational and criminogenic situation on the state border of Ukraine that influence the process of obtaining and results of information analysis in the process of IAA operational units according to A. Voytovuch and O. Farion<sup>12</sup> (Voytovuch & Farion, 2010b); P. Tsygikal<sup>13</sup> (Tsygikal, 2017a): development of migration processes from risk countries, caused by conflicts of ethnic and confessional orientation and financial consequences of the crisis; development of activities of cross-border criminal groups specializing in smuggling of illegal migrants, trafficking in human beings and smuggling, development of activity transborder criminal groups which are specialized in transferring the illegal migrants, human trafficking and contraband; development of a support base among the residents of the border, further branching and improvement of tactics of criminal activity; existing threats of terrorist acts on the state border of Ukraine, their nature and prognosis for further development; the presence of foreign diasporas, the degree of involvement of their representatives in the establishment of channels of illegal migration and the legalization of illegal migrants; attempts to involve population of the border regions of Ukraine and neighboring states in the illegal activities, etc.

2. A group of factors that affect the logistics process IAA: the availability of technical means of obtaining information; the provision of operative means for special expenses; availability of technical means for analytical work; availability of special software; availability of communication facilities; availability of transport (its working conditions); availability of databases, etc.

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<sup>12</sup> Voytovich A. I., Farion O. B. (2010) Poryadok viznachennya prioritetu protipravnih situacij, sho vinikayut na richkovij dilyanci derzhavnogo kordonu [The procedure for determining the priority of unlawful situations occurring at the river section of the state border]. *Zb. nauk. pr. : trudi akademiji. Kiev : NAOU*, no. 6 (99), pp. 98–102. (in Ukrainian)

<sup>13</sup> Cigikal P. O. (2017) Metodika formuvannya sistemi informacijnogo zabezpechennya operativno-rozshukovoyi diyalnosti Derzhavnoyi prikordonnoyi sluzhbi Ukrayini v umovah teritorialnoyi oboroni [Methods of Formation of Information Support System for Operational and Investigative Activity of the State Border Guard Service of Ukraine in Territorial Defense]. *Shokvartalniy naukovij zhurnal Chest i zakon. Harkiv : NANGU*, no. 4 (63). 104 p. (in Ukrainian)

3. A group of factors that influence the organization process IAA: staffing and security of the unit; professional training of staff; staff experience; term operational and service activity in the unit, etc.

4. Other factors.

The analysis IAA processes, the impact of these factors and results operational performance operating units form a group of indicators to characterize the properties and assessment of IAA in operational units to SBGS of Ukraine according to O. Farion<sup>14</sup> (Farion, 2013b); P. Tsygikal<sup>15</sup> (Tsygikal, 2017).

Table 1

**Aggregate indicators to assess the state of information  
and analytical activity of the operational unit  
of the State Border Guard Service of Ukraine**

S/n	Name complex indicator	Constituent elements	Note
I. Indicators of assessment of the state of implementation of measures aimed at obtaining (collecting, extracting) data from the situation at the state border of Ukraine			
1	The degree of realization of reliable information, Retrieved second of the constituent elements of network sources	operatives of the operational unit	
		sources that provide sensitive information	
		cooperating law enforcement agencies	
		citizens, governmental and non-governmental institutions and organizations	
		in analytical research and peer review	
		information and analytical databases	
		other sources of information	
2	The degree of correspondence of the information received to the operational interest of the	to check alarm information	for use in search operations
		within the framework of the operative-search case	

<sup>14</sup> Farion O. B. (2013) Instrumentarij viznachennya tipu zagroz prikordonnij bezpeci v procesi provedennya strategichnogo kriminalnogo analizu operativno-rozshukovim pidrozdilom regionalnogo upravlinnya Derzhavnoyi prikordonnoyi sluzhbi Ukrayini [Toolkit for determining the type of border security threats in the process of strategic criminal analysis operational-search unit of the regional department of the State Border Service of Ukraine]. *Zb. nauk. pr. Hmelnickij : NA DPSU*, no. 2(60), pp. 212–218. (in Ukrainian)

<sup>15</sup> Tsygikal P. O. (2017) Obgruntuvannya sistemi chastkovih pokaznikiv formuvannya sistemi informacijnogo zabezpechennya operativno-rozshukovoyi diyalnosti Derzhavnoyi prikordonnoyi sluzhbi Ukrayini v umovah teritorialnoyi oboroni [Substantiation of the system of partial indicators of the formation of the system of information support of the operational and search activity of the State Border Guard Service of Ukraine in the conditions of territorial defense]. *Zb. nauk. pr. K. : CNDI ZSU*, no. 3(81), pp. 222–230. (in Ukrainian)

S/n	Name complex indicator	Constituent elements	Note
	operational unit	as part of the pre-trial investigation	
		as part of operational interaction	
		for expedited criminal analysis	for analytical research
		for thematic criminal analysis	
		for strategic criminal analysis	
		for use in GART-10	
		for use in iBase databases	
		for use in other databases	
		other indicators	
3	The degree of ability of a network of information sources to report a particular object of immediate attention	the number of sources of information that have the potential to retrieve information about an object in an operational focus	
		the number of sources of information, as well as involved and to obtain information object of immediate attention	
		sources of information, have given notice of an object prompt attention	
4	The degree of ability of a network of information sources to provide prompt coverage of a particular area of the terrain	the number of sources of information located in a particular area	
		the amount of reliable information obtained from sources of information in a particular area	
		(Normative) amount of information required to provide prompt coverage of a particular area of land	
5	The degree of conformity of information properties to the needs of the operational unit for the effective fulfillment of the tasks set by the legislation of Ukraine	topicality	degree of correspondence of information of the current moment of time
		adequacy	compliance level created using image data actually the first object, process, phenomenon.
		certainty	property to



S/n	Name complex indicator	Constituent elements	Note
			display really existing objects with the required precision.
		timeliness	receiving information within the time when it is fit for decision
		completeness	characterizes the quality of information and determines the adequacy of data to make decisions or to generate new data based on available data
		value	a property of information that determines the degree of achievement of a goal by the information obtained
		accessibility	the extent to which one or other information can be obtained
		objectivity subjectivity	Objectively the assumed that information in a second method of obtaining are less subjective element
		adequacy	a property that determines the degree of satisfaction, suitability

S/n	Name complex indicator	Constituent elements	Note
		novelty	a property that determines the degree of correspondence of the information obtained to the available data
		uniqueness	lack of other interpretations of information
		utility	relevance of information to a specific purpose
		relevance	correspondence of the result of the information received to its needs
		accuracy	a property that determines the degree of approximation of the data of certain information to objectively existing information
		optimality	the property at which the highest compliance with this task, conditions, etc. is ensured
		other indicators	
6	The degree of effectiveness of the information received	the ratio of the number of detected signs of illegal activity to the number of established offenses	
		the ratio of the number of crime reports received to the number of crimes eliminated	
		other indicators	
...	Other indicators	other indicators	

S/n	Name complex indicator	Constituent elements	Note
<i>II. Performance assessment of the implementation of measures analytical research aimed at developing (development) analytical products , required to perform tasks operating unit</i>			
1	The degree of effectiveness of the implementation of analytical products in the operational and operational activities of the operational unit	the number of analytical products that make the best management decision number of analytical products that contributed to the rational distribution of forces and resources of the operational unit to accomplish tasks the number of analytical products that produce a high result of the use of forces and means of the operational unit number of analytical products that were used as evidence of the involved east and individuals to commit crimes number of analytical products, in which could prevent the commission of the offense the number of analytical products that have been used to stop the crime other indicators	
2	The degree of effectiveness of the implementation of analytical products within the framework of operational interaction	the number of analytical products that have formed an effective common crime-fighting strategy the number of analytical products used to expose and eliminate an organized crime group the number of analytical products by which the cross-border crime channel was discovered and liquidated other indicators	
3	The degree of quality of processing of analytical research products	the total volume of the analytical product volume of specific material volume of reliable data volume of accurate data the volume of valid conclusions and suggestions timeliness of analytical research topicality other indicators	
4	The degree of quality of monitoring research that he	number of quality analytical products, developed on the	

S/n	Name complex indicator	Constituent elements	Note
	ealizuye appear on the basis of information, obtained from the «traditional» and «nontraditional» sources	basis of collecting information from «traditional» and «nontraditional» sources to meet the needs of the operational unit	
		the effectiveness of the application of analytical methods of researching the information obtained from «traditional» and «non-traditional» sources for the information support of operational and operational activities of the operational unit	
		indicator of continuity of monitoring research of «traditional» and «non-traditional» sources to ensure regular information support of operational and operational activities of the operational unit	
		other indicators	
...	Other indicators	other indicators	
<i>III. Indicators of assessment of the status of the IAA organization in the operational unit of the STS of Ukraine</i>			
1	Leader's ability to prioritize IAA tasks to achieve effective operational and operational outcomes of the operational unit	the ability of the manager to determine the needs of the operational unit in IAA	
		the ability of the head defined atm performers analytical research priorities according to the objectives IAA	
		the ability of the manager to set tasks with IAA in their importance	
		other indicators	
2	Degree of ability of analysts of operational unit to develop qualitative analytical products	time spent developing an analytical product	
		number of cases of receiving / not receiving necessary information for analytical research	
		stupas and Hb goal develop analytical products	
		the ability of data banks to provide the necessary information	
		the ability of software to carry out information research	
		the ability of the technical	is determined

S/n	Name complex indicator	Constituent elements	Note
		means to receive and process information	by its functionality and usability
3	The degree of flexibility of the IAA operational unit	dependence on the time required for processing the information received, on time, needed to rebuild IAA for processing	
4	The degree of efficiency of IAA	the dependence of the time required to process the information received from the available time to submit the necessary information to make a decision	
5	The degree of concealment IAA	the total amount of information that is extracted at a given time	
		the amount of information known to offenders at this point in time	
6	The degree of resistance of the IAA	the ratio of the time of absence of receiving data of the situation for a certain period to the total time	
		the ability to counteract the conditions and factors that influence the effectiveness of IAA	
7	The degree of readiness IAA	readiness of the network of sources of information	
		readiness of forces and means of operational unit for information processing	
		the readiness of the management of the operational unit to organize the IAA	
		other indicators	
...	Other indicators	other indicators	

The set of indicators shown in Table 1 is a qualitative and quantitative characteristic of the IAA properties of the operational unit of the State Customs Service of Ukraine, which in combination allows to estimate the general state of the said activity. Therefore, the procedure for assessing the status of IAA is to determine the quality of execution of the processes of receipt (collection, extraction), processing of data of the situation, their organization in accordance with the needs of the operational unit of the STS of Ukraine. The quality of the IAA state is a set of properties that determine the ability to meet the necessary needs in accordance with the purpose.

Quality Score is an indicator related to only one of the IAA properties, and a comprehensive Quality Score is relative to several of its properties<sup>16</sup>.

Therefore, for the overall assessment of the IAA status of the operational units of the STS of Ukraine, it is necessary to define an integral indicator that characterizes the ability of its constituent processes to fulfill the tasks and the ability to meet the needs at a high level.

To develop a methodology for assessing the status of IAA, it is necessary to define a system of rules that allow to obtain a complex assessment of the quality of implementation of the processes of the specified activity, adjusting them through management decisions and meeting the needs of operational and operational activities of the operational unit.

The methodology should include V. Gorodnov<sup>17</sup> (Gorodnov, 2004b):  
a description of the assessment situation in the light of the objective;  
IAA processes to which the methodology is applied;  
needs taking into account the requirements for the development of the methodology;  
list of indicators with definition of scales of their measurement;  
algorithm of actions for estimation of values of indicators;  
a list of decisions made in accordance with the comprehensive assessment.

On the basis of the analysis of IAA of operational units of the State traffic police of Ukraine, its purpose, tasks and a significant system of rules, a method of assessment of the state of IAA of the operational unit of the State traffic police of Ukraine in the following stages was developed according to G. Azgaldov and, E. Rajhman<sup>18</sup> (Azgaldov & Rajhman, 1973a); G. Azgaldov<sup>19</sup> (Azgaldov, 1982):

1. Description of the assessment situation. At this stage, a description of the IAA is met to meet the needs of the operating unit for the period (eg, month, year).

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<sup>16</sup> Busel V. T. (2009) Velikij tumachnij slovník suchasnoyi ukrayinskoyi movi [A great explanatory dictionary of modern Ukrainian (with additions, supplements and CDs)]. *Kiev : Iripin : VTF «Perun»*, 1736 p. (in Ukrainian)

<sup>17</sup> Gorodnov V. P. (2004) Metodika ochenki effektivnosti variantov obespecheniya funkcionirovaniya sistemy raznorodnyh mnogoparametricheskikh obektov razlichnoj vazhnosti [Methodology for assessing the effectiveness of operational options systems of heterogeneous multi-parameter objects of various importance]. *Naukove vidannya Sistemi obrobki informaciyi. Harkiv : NANGU*, no. 2, pp. 159–163 (in Russian)

<sup>18</sup> Azgaldov G. G., Rajhman E. P. (1973) O kvalimetrii [About qualimetry]. *M. : Izd-vo standartov*, 172 p. (in Russian)

<sup>19</sup> Azgaldov G. G. (1982) Teoriya i praktika ochenki kachestva tovarov. Osnovy kvalimetrii [Theory and practice of assessing the quality of goods. Fundamentals of qualimetry]. *M., Ekonomika*, 256 p. (in Russian)

2. Determination of conditions affecting IAA.

3. Substantiation of requirements for IAAs and their implementation processes.

4. Deciding on the assessment of the status of IAA. Here, decisions are made to meet the conditions for quantitative assessment of the quality of the activity. A set of such solutions determines the composition of indicators and how they are used.

5. Selection and justification of the list of properties and indicators IAA needed to assess its status. Due to the fact that the processes operating unit IAA is characterized by a large number of properties as and form a quality activity, vital question of choice is her cumulative spine properties as a more interesting one's person, which assesses the state of IAA. To evaluate the IAA status of the operational unit, only those properties that meet its needs are required. Properties are divided into simple ones, which are grouped and measured by a complex metric, and complex ones. Complex metrics are combined into more complex groups at the time the overall comprehensive metric is obtained. This metric structure is based on the IAA property tree according to G. Azgaldov and, E. Rajhman (Azgaldov & Rajhman, 1973b).

Some indicators are normative, for example, the amount of time it takes th for analytical research within the operational business. Indicators that characterize the qualitative properties of IAAs are calculated using peer review methods. However, the value of each indicator of the quantitative and qualitative characteristics of the properties of a particular process may vary over a different period of time. This is due to the influence of different conditions (factors affecting the status of IAA; threats to border security, etc.), so for more accurate calculation their impact factors should be taken into account.

6. Determination of quantitative value of indicators and the order of their calculation.

Quantitative and qualitative indicators have the inherent dimension and peculiarities of calculations.

7. Determination of the weight of the coefficients of indicators. At this stage, the coefficient of weight of each of the IAA indicators and the coefficients of the weight of the effect of conditions on the IAA are determined, the coefficient of the tasks solved by the operational unit with the help of the IAA.

8. Building a graph of the dependence of IAA indicators according to the calculated indicators and the weight of the influence of the coefficients plot a dependence.

9. Formation of an integral indicator of the IAA status of the operational unit. The procedure for forming an integral indicator of the IAA status

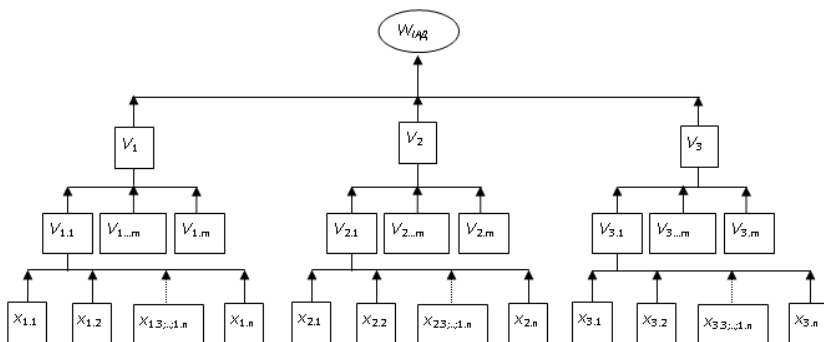
assessment of the operational units of the STS of Ukraine is presented in in Figure 1.

10. Carrying out calculations of the IAA status of the operational unit based on the integrated integral index.

11. Checking the reliability of the developed methodology.

This stage is characterized by determining the compliance of the IAA operational unit to meet the needs of the operational unit in full, at a sufficiently high level, for a specified time and under the influence of various factors.

12. Determination of conformity of the calculated value of the state of IAA to its level and management decision making.



*Note:*

$W$  is an integral indicator of estimation of IAA status;

$V_1$  – the overall complex indicator of the properties of the process of collecting (extracting) information;

$V_2$  – the overall complex indicator of the properties of the information processing process;

$V_3$  – the overall complex indicator of the properties of the process of organization of IAA;

$V_{1..1}$  – a complex indicator with /  $n$  1 (see table. 1) the process of gathering (extracting) information;

$x$  is an indicator of the individual IAA property;

$m$  is the number of complex indicators of the properties of a single IAA process;

$n$  is the number of metrics in a complex metric.

**Fig. 1. Formation of an integral indicator of assessment of the state of information and analytical activity of operational units of the State Border Guard Service of Ukraine**



The scientific approach proposed by Harrington E. Harrington is used to determine the level to which the IAA status in operational units corresponds E. Harrington<sup>20</sup> (Harrington, 1965). The level determination is set in accordance with the value of the integral indicator of the IAA state at the interval from zero to one. If the value of the complex index is the same assessment of IAA units, the current state of IAA is the best and corresponds (meets) needs, that it has put forward. Table 2 presents the levels of compliance of the integral indicator of the IAA status levels.

Table 2

**Determination of the level of information and analytical activity of the operational units of the State Border Guard Service of Ukraine**

<b>Level</b>	<b>The numerical value of the integral indicator of the IAA state</b>
High	0.81 – 1.00
Sufficient	0.64 – 0.80
Low	0.43 – 0.63
Unsatisfactory	0.00 – 0.42

Based on the determined level of the IAA, the head of the operational unit makes decisions on adjusting, where necessary, the activities of the IAA in the subordinate unit.

Algorithm assessment methodology condition IAA operating unit is logically consistent structure precisely defined actions, combined with payments for performance, presented in Table 1, to achieve the goal of modeling. One example of such an algorithm would be the sequence of forming an integral index for estimating the IAA state, which is presented in Figure 1.

For convenience and to reduce the time of calculations, the evaluation of the IAA status of the operational unit is carried out using special software.

**SUMMARY**

The scientific article investigates the processes of collecting (retrieving) information on the operational and criminogenic situation on the State border of Ukraine; analysis of received and available data; organization of IAA in the operational-search units of the State border service of Ukraine. The groups of factors influencing the IAA of the operational-search units of the State border service of Ukraine are specified.

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<sup>20</sup> Harrington E. C. (1965) The Desirability Function. Industrial Quality Control. April, pp. 494–498. (in English)

On the basis of the analysis of IAA of the operational-search units of the State border service of Ukraine, the nature of the influence of various factors and scientific researches of the said activity, a group of indicators was formed, by which it became possible to carry out qualitative and quantitative assessment of the properties of the IAA of the division-division. The procedure of forming an integral indicator of estimation of the state of IAA is proposed.

Further research allowed to develop a methodology for assessing the state of IAA of the operative-search unit of the State border guard service of Ukraine in a series of stages, which are presented in a logical sequence.

It is suggested to use the Harrington function scale to determine the level to which the IAA in the operational-search unit corresponds.

The developed methodology is of practical importance, which consists in the ability of heads of operational and search units of the State border security of Ukraine to assess the state of IAA of the subordinate unit, identify the mistakes made in the process of organizing this activity, identify priority areas of work and formulate the necessary areas for work .

The prospect of further scientific research is the determination of more expedient methods of finding quantitative values of indicators of the IAA status assessment of the operational unit of the State border security of Ukraine.

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