

MILITARY INFORMATION

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Abstract: *The role of information was amplified in the “Information Age” while theories of information have developed continuously. The complexity of this term generated the existence of several definitions and interpretations and a multitude of meanings that are presented in this article in a synthetic manner. Military information became a purpose, a goal, a target, and a means of support for the military actions and sometimes even their result. Moreover, military information is considered “raw material” for “intelligence” that plays the main role within the informational component of military actions aiming at the procurement, processing and transmission of information in order to ensure the effectiveness of energetic component.*

Informational power, which is the fundamental component of strategic power, depends on the quality and quantity of information in a given time segment and on the ability to efficiently manage and use it in order to make optimal decisions.

Keywords: *data, information, knowledge, intelligence, military information, informational power*

The specific features of “*information age*”, expressed strictly as informational dependence, consist in the dependence on electronic networks and the handling, processing and exchange of information at speeds comparable to that of light. They have produced revolutionary changes in all fields, including the military one.

In the opinion of military experts¹ this “*information age*” prompted an increase in the role of information² and theory related to it, and turning it

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into an important factor of economic and social, as well as military development.

Modern military action is presented as a dynamic two-piece of mutually interdependent components: the energy component and the information component. The action of the energy component has as objective destroying or neutralizing an adverse physical system. The information component aims at finding, processing and transmitting information in order to ensure the effectiveness of energy action.

When compared with the destructive component, the information component is characterized by much lower energy consumption. Therefore, it is considered that information is a real weapon, a fourth weapon³.

The concept of information

As a concept, *information* is one of the most commonly used terms, having different formulations and meanings depending on the person using it.

The studies⁴ made on definitions of information or kindred concepts show that there are not generally accepted views, each referring to certain aspects of objective reality, which can cause confusion, ambiguity and sometimes even losses in various fields.

The word “information” is used generally for defining many elements of the informational domain within which it helps communicating⁵

¹ Constantin ALEXANDRESCU, Gheorghe BOARU, Gelu ALEXANDRESCU, *Bazele teoretice ale sistemelor informaționale*, Editura Universității Naționale de Apărare „Carol I”, București, 2014, p.81.

² The emergence of information age, a postindustrial era, occurred in the early ‘70s when American Whitfield Diffie predicted that information would become the most valuable asset of mankind. [<http://www.descopera.ro/.../10056537-criptografia-si-codurile-secrete-care-au-marcata-istoria-..>], accessed on 23.11.2012.

³ Stan Petrescu, *Informațiile a patra armă*, Editura Militară, București, 1999, p.18

⁴ Constantin ALEXANDRESCU, Gelu ALEXANDRESCU, Gheorghe BOARU, *Sisteme informaționale-fundamente teoretice*, Editura Universității Naționale de Apărare „Carol I”, București, 2009, pp.101-188.

⁵ The main feature of the communication process is the *message*, evaluated as a sequence of elementary signs related to its length, the dimensions in space and time of its support, or of the transfer channel [<http://www.edugal.fsea.ugal.ro/pdf/SIGcap2.pdf>], accessed on 14.09.2008.

and acquiring knowledge. The well known knowledge pyramid⁶ comprises four levels: *data*, *information*, *knowledge* and *understanding* (*wisdom*), interconnected by signals.

The expression “*data*” has its origin in Latin⁷ and is the most common and useful element for information consisting of raw facts with little relevance, without causality (unprocessed), un-interpreted symbols, numbers, words, images that are not integrated in a context. There can be statements, unrelated objects or events, having no meaning in themselves, fact which is reflected in the quantity and quality of the lowest layer of the information pyramid. “*Data*” can be potential information that can take any shape, consisting of a set of symbols which, if interpreted based on certain judgment, could produce change in a particular context thus acquiring value in decision making. *Data* therefore represent the raw material of the information useful in the decision-making process.

As a primary element of an information process, *data* is perceived as a set of characters or symbols that can be stored or transmitted as electrical signals on a magnetic, optical, etc. medium and on which computer equipment may execute processing operations. For example, *data* in computers may mean numbers, words, measures, relationships, images and other outputs that, by processing, will result from the conversion of physical quantities into symbols, recognized by the system.

Regarding study concepts on “data-information-knowledge-understanding (wisdom)” renowned specialists (Thomas Davenport and Larry Prusack) state that data can be converted into information⁸ through the following types of processes:

- condensation - *data* are summarized in a concise form and details are eliminated;
- contextualization - the purpose or reason for collecting *data* is known and understood from the beginning;

⁶ B. Sparling, *Information Theory as a Foundation for Military Operations in the 21st Century* (monografie), May 2002, pp.13-33, [<http://www.dtic.mil/cgi-bin/GetTRDocAD>], accessed on 20.01.2014.

⁷ Data, information, knowledge [<http://www.scrigroup.com/calculatoare/baze-de-date/Date-informatii-cunoștințe44451.php>], accessed on 01.06.2013.

⁸ *Data, Information, Knowledge and Wisdom* [<http://www.trainmor-knowmore.eu/FBC5DDB3.ro.aspx>], accessed on 28.10.2013.

- calculation - mathematical and statistical *data* are processed and can be aggregated to provide useful information;
- categorization – this is a process for assigning data types or categories;
- correction – this is a process meant for the removal of errors to ensure *data* authenticity.

“Linking and integrating *data* processing carried out in certain situation produce concrete operational *information* that, through interpretation and relevance of knowledge, helps users in their decision-making processes and in achieving their objectives. The essence lies in the possibility of transforming their data into information, by organizing, structuring and processing them in a particular way”⁹.

According to western specialists¹⁰, the current language concepts of “*data*” and “*information*” are synonymous, representing the same thing in the physical sense and the same signals, the former expressing the objective aspect of things and the other the subjective aspect of things, resulting from the manufacturing process which determines their significance.

However, given the way *data* and *information* are addressed by science, there is a clear distinction between them, namely: *data* refer to measurements made at different stages while information result from technical or organizational actions (studies, research, evaluation, processing).

The word *information*¹¹ taken from Latin (*informatio*), via French (*information*) is multifaceted and can have several meanings, sometimes conflicting or totally different, depending on the areas and varied contexts in which it is used.

According to information dialectics, there is a so-called principle of conservation of information¹² which states that “information cannot arise

⁹ Constantin ALEXANDRESCU, Gheorghe BOARU, Gelu ALEXANDRESCU, *Bazele teoretice ale sistemelor informaționale*, Editura Universității Naționale de Apărare „Carol I”, București, 2014, p.89.

¹⁰ B. Sparling, *op.cit.*, p.36.

¹¹ Wikipedia, *Information* [<http://ro.wikipedia.org/wiki/Informa%C5%A3ie>], accessed on 04.06.2010.

¹² *Universul energiei* [<http://www.universulenergiei.europartes.eu/intrebari/universul/>], accessed on 04.06.2010.

from non-information, but information always results from other information.”

It is considered that information may be characterized by three aspects¹³: the *individual* dimension (*targeting personal aspirations*), the *organizational* dimension (*seeking the achievement of the organization's objectives*) and the *social* dimension (exercising the rights and responsibilities of personnel within the organization).

Human knowledge generally speaking is based on *information*. Satisfying all basic needs and those higher needs of human existence is impossible in the absence of a critical mass of diversified information.

The complexity of the term *information* generated by the nominal existence of several definitions in Romanian explains the multitude of interpretations and meanings, among which we could mention: ... “Communication, news, updates... entire amount information and documentation material, sources, roots... each of the new elements as compared to the prior knowledge contained in the meaning of a symbol or group of symbols ... “¹⁴.

Generally, information is a gnosiological concept¹⁵ which defines its superiority and is the result of its semantic analysis made by the recipient (people, computers), thus inexhaustible but dependent on its ability it process and use its potential, thus representing a product of human or artificial intelligence. It is objective, systemic and procedural, representing the value of order¹⁶, and if it relates to the future state or circumstances of a phenomenon, information has either a predictive value or a pragmatic value (instruction).

¹³ I. I. Vădana, *Managementul informațional* [<http://www.academiclink.ro/Management/managementul-informațional-informația-sistemul-informațional-i-fluxurile-informaționale.html>], accessed on 04.06.2010.

¹⁴ *Dicționarul Explicativ al Limbii Române*, Editura „Univers Enciclopedic”, București, 1999, p.491.

¹⁵ Roceanu I., Buga I., *Informația - repere conceptuale și coordonate de securitate*, Editura AISM, București, 2003, pp.10-11.

¹⁶ Gh. Ilie, I. Stoian, V. Ciobanu, *Securitatea informațiilor*, Editura Militară, București, 1996, pp.98-99.

Semantics defines the significance of the information contained in the logical and philosophical¹⁷ representations of each statement from the message structure (separate statement or a statement connected with other statements that defines the “propositional content”), giving it value of representation. *Syntax* includes rules that constitute the information, defining its shape (structure) that makes it possible to process it formally, ensuring its order (anti-entropic) and assigning it to a certain processing value.

In a philosophical approach, in the real world, information is a fundamental attribute of matter, together with mass¹⁸, field and substance, resulting from the interaction of material systems and constituting real, objective property, through which the course of action is taken. Used as a scientific or technical term, information can also be linked to an informational process representing the sequence of activities through which information is sent out in a particular domain.

Information can even be the object of information management (information resources, information processes, information technology), finalized by the decision made, but also the result of this process (volume, variety of information obtained etc).

According to another model of approach, information is considered as “*decisional data*”, i.e. the data on which decisions are made and actions are triggered.

We believe that in order to make a decision it is necessary to ensure the rationality of the management process, the existence of an objective (mission) that is precisely determined and measurable, scientific rigor, and absolutely necessarily ensuring the optimum volume of information. Through the general theory of information¹⁹ that uses probabilistic research methods, two main approaches can be noticed, defined²⁰ as follows:

¹⁷ Gh. Clitan, *Teoria informației* [[http://www. facultate.regielive.ro](http://www.facultate.regielive.ro) › [Facultate](#) › [Cursuri](#) › [Stiintele Comunicării](#)], accesat la 08.07.2013.

¹⁸ Pavel Apostol, *Cibernetică, cunoaștere, acțiune*, Editura Politică, București, 1969.

¹⁹ Claude Elwood Shannon, American mathematician and electro-technical engineer, is considered the "father" of information theory. Important contributions to the founding of information theory were also made by N. Wiener - the creator of cybernetics; and Harry Nyquist who in 1924 developed his "*Certain Factors Affecting Telegraph Speed*" which approached the speed of information transmission; Ralph Hartley who in 1928 wrote his

- the *semantic theory of information*,²¹ comprising logical and philosophical representations of the meanings attributed to a message communicated, taken separately or collated with other statements (meanings), refer to the information brought by each statement in the message evaluated as a measure of information content or of semantic content. Information is a product that is intended for consumption²². Several scientific disciplines highlight the status information in its existence, imposing the concept of structural information.

- the *mathematical theory of information*²³ that includes mathematical expression of entropy and quantity of information contained in a message communicated, apart from its significance (meaning) it. It is a branch of applied mathematics that studies electronic engineering and statistical information that defines the extent of information transmitted by text message, evaluated as a mathematical depiction expressing the degree of uncertainty eliminated by creating an event within a system of possible events.

Applying information theory requires both a faithful approach to reality and a precise mathematical expression of notions regarding data and information, and correlated with these, also of signals carrying information. It envisages carrying out in the most efficient way the transfer of information in communicating messages.

"Transmission of Information", using the concept of information as a measurable quantity. [Http: //en.wikipedia. org / wiki / Information Theory], accessed on 20.12.2013.

²⁰Constantin ALEXANDRESCU, Gheorghe BOARU, Gelu ALEXANDRESCU, *Bazele teoretice ale sistemelor informaționale*, Editura Universității Naționale de Apărare „Carol I”, București, 2014, p.82.

²¹ Carnap R., Bar-Hillel Y., *An Outline of a Theory of Semantic Information*, Technical Report No. 247, M.I.T., Research Laboratory in Electronics, 1952.

²² Vlăduțescu Ștefan, *Informația de la teorie către știință*, Editura didactică și pedagogică, București, 2002, p.60.

²³ *Information theory* itself is not only applied science that uses probabilistic research methods, but it should also be studied as a chapter of the probability theory. We can mention there three authors who had a great contribution in this field: C. E. Shannon, N. Wiener and Harry Nyquist.

Military information

We believe that, given the increasing complexity of modern warfare, approaching information as a power factor becomes evermore nuanced and more important.

Actually, interest in this field of analysis existed even 2500 years ago when the great Chinese strategist Sun Tzu expressed a great truth as follows: “What allows a smart government and military leadership to surpass others and have extraordinary achievements is knowledge”²⁴. This statement, which we consider topical in the context of the contemporary era, emphasizes the need to provide timely information needed for increasing the efficiency of human actions, whatever their nature. In the theory of military art, *information* is not only a necessity, but also becomes a major element like a formidable weapon for the entity that owns, protects, and manages it efficiently. Information can determine winning a dispute, be it military or of different sort even before the outbreak of hostilities.

Thus, information may:

- determine the reconsideration of operational concepts, as well as the integration and harmonization of the new means of fighting with previous experience;
- become important and decisive for the fate of a war or conflict, by influencing the functioning of information systems used in decision making (command and control);
- taking action, allowing anticipation and timely support for operational decision making.

Informational power, fundamental component of strategic power, is dependent on the quality and quantity of information held within a given time segment, the ability to efficiently manage and use them in order to make optimal decisions.

All fields of activity are influenced by information and therefore they are considered a factor of power and efficiency.

The lessons learned resulting from the military conflicts that took place in modern times as well as in other historical periods showed that information may increase the strength, morale and skills of leaders as it

²⁴ Sun Tzu, *The Art of War*, Barnes & Noble Inc. New York, 2003, p. 58.

helps them to win the operations they conduct, can lead to shortening wars and the most important effect is that it can save soldiers' lives.

According to some military experts from academia²⁵, "in the military, decision represents the purpose and final goal of the information process, as it describes through information the actions to be triggered in military operations in order to achieve a certain objective. So, information is the datum or the range of data which, through analysis and calculation, determines the level of optimization reached in the decision making process and ensures that activities are undertaken in exactly the way they were planned".

The concept of "information", according to sources in the military literature of our country²⁶ is defined as "a piece of news regarding the phenomena, facts, trends previously unknown to a certain person, data or instructions in any form and in any environment, as well as people's understanding of data, in the sense of acknowledging the conventions used in their representation, primary data and processed information".

From a military perspective, according to a well known classical author²⁷, in the approaches on warfare, information is the result of expressing individual observations obtained by sensors or other data elements found in the battle space in a given context. Thus, the term *information* designates "all the knowledge we have about the enemy and his country that is the basis of our own ideas and actions. Much of the information received in war is contradictory, even more is false, and by far most of it is largely subject to uncertainty".

In a US military doctrine²⁸, information is generally defined as "raw data of any description used for the production of intelligence."

In the same military publication²⁹ we find the concept of "intelligence" currently used in most western countries and armies in

²⁵ Constantin ALEXANDRESCU, Gheorghe BOARU, Gelu ALEXANDRESCU, *Bazele teoretice ale sistemelor informaționale*, Editura Universității Naționale de Apărare „Carol I”, București, 2014, p.93.

²⁶ *Doctrina pentru sprijinul cu informații al operațiilor întrunite*, SMG, București, 2003, p.57.

²⁷ Carl von Clausewitz, *Despre război*, Editura Militară, 1982, p.102.

²⁸ *Joint Doctrine Encyclopedia*, USA Army, 1997, p.328.

²⁹ *Ibidem*, p.339.

NATO. As there was no proper term in Romanian, the concept was taken over in our military as well.

By the term “intelligence”, another Romanian military author³⁰ defines the product needed for decision-making at the state level or the military (strategic, operational, tactical) level, at peacetime and in war, resulting from the collection, transmission, processing, analysis and interpretation of the available information about the informational environment, foreign countries (armies) and opponents, hostile or potentially hostile forces, areas of operations (forces, terrain, weather conditions, population etc.) as well as the information held about them, obtained through observation, investigation and knowledge.

Also, this term is also used to describe the activity undertaken resulting in the production of intelligence and the organizations engaged in this activity³¹.

As a product of “intelligence”, information is an unrated material about objects, events, situations and actions etc. which is used for the production of “intelligence” through the process of merging with other information.

Making a comparative analysis upon the views of Romanian and Canadian Armed Forces, regarding the production of knowledge and understanding within NATO³², and analyzing the pyramid of knowledge lead us to the conclusion that information is processed data of any type that can be used in producing intelligence. The relationship data - information - intelligence intervenes in the process of acquiring information and their transformation into intelligence (knowledge, understanding and foresight). Turning information into intelligence in NATO doctrine is identical to that within the national military intelligence doctrine. From the point of view of “intelligence” as product, information is the material which, through the process of merging with other information, is used to produce “intelligence”. Therefore *intelligence* products represent a superior component of modern information confrontation.

³⁰ C. Onișor și alții, *Securitate și Intelligence*, Revista de Științe Militare nr.3/2012, p.64.

³¹ FM 3-0, *Operations*, Glossary, p.8.

³² AJP-2, *Doctrina Aliată pentru informații, contrainformații și securitate*, 2003, p. 1-2-1.

Both at peacetime and in war, the activity of military intelligence is an important component of the national security system. Thus, the efforts made within the intelligence domain are aimed at both ensuring own security, and in obtaining relevant information needed for preparing military actions (operations).

At the strategic level, intelligence includes political, diplomatic, economic, military, technical, tactical or sociological factors, whose changes are analyzed in connection with the known factors on the geographical, demographic and operational area of interest, industrial capacities³³ etc. Also, strategic intelligence is used for policy making at national and international level, while reflecting the consensus of the international community and the opposition to potential opponents.

At the operational level, intelligence provides the necessary support to commanders of large combat task groups, being attached to the command posts of the respective formations, while at tactical level this is a continuation of activities at operational level, meant to ensure information support of the joint operations of tactical echelons, both before and during the actions in the battle space.

As a process³⁴, “*intelligence*” is both a means by which certain types of information - needed and certain - are collected, analyzed, processed and disseminated, and coherent set of methods and procedures, legal and illegal, visible or covered, used for reaching a certain informational goal.

The main intelligence means used for gathering new information consist of: human resources, research through electronic and communication means, nuclear research, directed energy, electrical radiation, image searching, open sources etc.

At this stage of development of human society, information has become increasingly more abundant and necessary. It has become both a raw material of society and its engine for development.

³³ Wikipedia, *Military intelligence* [http://www.en.wikipedia.org/wiki/Military_intelligence], accessed on 21.02.2013.

³⁴ Mark M. Lowenthal, *Intelligence-from secrets to policy*, CQ Press, 2009, p.9.

Owning information is a resource of hegemony. Thus, it is estimated³⁵ that the US controls over 80% of the flow of information circulating worldwide.

We believe that, from a military perspective, the holding of information can become a great resource given by the informational leverage which, in conjunction with other factors, can provide decision leverage. If, besides these two forms of leverage, conditions are met for ensuring fire superiority (modern endowment and superior combat training), it is easy to ensure the success of the respective battle or operation.



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³⁵ Desmaretz Gerard, *Totul despre spionaj*, Editura Polirom, Iași, 2002, p.8.

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