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THE HIERARCHICAL INFORMATION MODEL WITHIN INFORMATIONAL SOCIETY

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Abstract: *The specific opportunities offered by information and communications technology for the military field aim at ensuring the necessary conditions for substantial improvement of planning and engagement manner of modern war. It is about available informational systems that integrate sensors, cameras and other equipment for obtaining information and which are continuously perfected. These equipments show step by step the rising level of connectivity with the informational networks for ensuring an appropriate visibility of the battlefield, including placement of each fighter or means of fighting. In this article the analysis effort will be focused on detailing the information hierarchical model within the informational society with an emphasis on the main effects of the impact of informational era on the social environment.*

Keywords: *informational revolution, informational society, informational model, integrated system*

1. INFORMATIONAL SOCIETY – THE SOCIETY BASED ON INFORMATION AND KNOWLEDGE

Since ancient times, people felt the need to be informed, to know the surrounding world and to know what is happening around them in order to act accordingly, especially to keep themselves away from danger. Information, especially military information and its usage at the appropriate time was, is and will be a basic weapon of any state. Ignoring own allies or the inability to know them well and on time, and especially the inability to know your opponents might have serious consequences. More than 2500 years ago, the famous Chinese theorist Sun Tzu considered that „He who knows his opponent in good conditions, as he knows himself has the victory assured. But one who does not know his opponent will surely lose and can not ever be considered a winner.” [15].

The effects of the ongoing informational revolution in the social and military fields are in

permanent attention of military thinkers, and those who share common points of view and approve the informational revolution involvement consider that the current revolution in computers, telecommunications and informational technology will profoundly change society, democracy and our daily lives [9]. From a military perspective, informational revolution technologies will provide the means to increase the military efficiency by reducing losses and diminishing budgets. The union of military and social perspectives regarding military structure is essential, as well as the option and direction in which it develops.

Informational society is the organizational structure in which production and use of information is the most essential resource, information being recognized as core technology, informational and communication technologies being the base, while informational environment associated with the social and ecological environment shapes human existence. In this context, the

dimensions of the contemporary society based on information and knowledge are the following:

- *social* - with applicability in health, human protection and democracy fields;
- *educational* - for the development of conceptual and ongoing competence of activity in a computerized system, proper/intelligent management of processes and activities (distance education and learning, digital libraries, e-Teaching programs and e-learning);
- *environmental* - with an impact on resource use and environmental protection;
- *cultural* - with an impact on heritage preservation and development, cultural industry evolution (museums, galleries and art exhibitions on the Internet, digitization of information: books, national, regional and international heritage records);
- *economical* - for development of new economical paradigms in the digital and knowledge plans (we take into account programs such as: e-Commerce, e-Banking, e-Learning, e-money, e-Trading, Internet operations and businesses, etc.).

The main effects of informational era impact on the social environment and especially on the military field are considered to be the following: time and distance become less important in the spectrum of constraints; events can be influenced by a number of transnational and international factors; boundaries of any kind between international actors will become increasingly insignificant step by step; regionalization and globalization tendencies will have an ascending course; inequality between rich and poor will only deepen; threats can result from multiple diffuse sources, while asymmetric warfare is a real danger, although not a new concept aimed at national security and national interests; significant mutations in the strategy and tactics will happen in an attempt of constantly adapting to the requirements of the battlefield; real revolution in military spectrum is achieved by combining information and communication technologies in the present case with other technologies with applicability in the military environment.

The need for data and information obtained, processed and transmitted in "real time" concerning the enemy and the battlefield has

increased the role of information and the importance of informative products. Informational superiority can be defined as *"the ability to collect, process and disseminate information continuously, while exploiting or reducing (destroying) informational support capacity of opponent forces"*[11]. The processes of data gathering, processing and disseminating must ensure the relevance, timeliness and accuracy of information important for deployed forces, according to specific echelon requirements of which they are part of, the ultimate goal being to make available to the combatants a continuous operational picture of the battlefield. Also military intelligence must have the ability to make predictions and projections on the evolution of the security situation in a specific geographic area of interest, in order to provide the most favorable foreign policy decisions, at a given time.

Governments collect, process and use information. A writer concerned with the issue of war called the art of government as being *"the central importance of knowledge, both in general and in particular"*. [8] In the formulation given by Deutsch, the systems that realize the knowledge represent the *"nervous system of the government"*. [3] He presents a series of associations with international relations, national defense, national security, classified character and specialized institutions labeled as *"intelligence"* [7]. However, within the governmental activity the term "intelligence" has a meaning more concentrated than the one of information and information services. The American professor, Sherman Kent member, a member of intelligence services in the period of the World War II and a CIA specialist addressed the term "intelligence" since 1949, defining it as "a kind of knowledge achieved by a particular type of informative organization". Although this definition is often used, the main element of intelligence is represented by the organizational one. In the framework of government, the term "intelligence" is based on a particular set of structures bearing the name of "intelligence services" (information services) or "intelligence communities".



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Other organizations have their own informational systems and the term "intelligence" is sometimes used to describe all these governmental or nongovernmental systems and the information which they produce. Terms like "business intelligence" or "competitive intelligence" are already consecrated as specific elements of the private sector, other commercial information services have similar names. In large organizations, the term "intelligence" is used to designate "information - questions, intuitions and deductions, assumptions, evidence - with impact on the organization's policy"[17]. According to some analysts, "social intelligence" is the system / process by which a company, organization or individual accumulates, processes, assesses, stores, disseminates and uses information in the practical action.

Informative activity consists of what these organizations do as cognitive elements which are produced as a result of their work. The Romanian translation of the term intelligence, according to the most common dictionaries, has several meanings: cleverness, wisdom, information, espionage. Any of these terms do not fully express the term of intelligence when it is used to express the activity and the services of informational services, reason why, in general, the term was assimilated as such in the Romanian literature. Organised informational activities have constituted an industry in the twentieth century, and are currently in full development, most governments having it permanently institutionalized. It constitutes an important part of the modern state and also a factor contributing to the success or failure of a government activity. It consumes significant resources, if not enormous. U.S. spending in this sector at the end of the Cold War, amounted to about one tenth of spendings on national defence and the British effort in this

area currently costs more than the effort in diplomacy. Although the tragic events of September 11, 2001 represent a failure of U.S. intelligence, the U.S. and UK efficient use of resources allocated to this sector as a whole is unquestionable. Also, informative activity had direct economic effects such as the influence manifested in the early computer industry and in the development of satellites and miniaturized electronics. In addition, this type of activity gave concreteness to a certain kind of power at state level: power given by information activities, due to the ownership of information.

2. THE ROLE OF INFORMATION IN THE EVOLUTION OF MILITARY CONFLICTS - INFORMATION HIERARCHICAL MODEL

Modern military conflicts use informational technology as a means of achieving economy of time, forces and means, in which information is a vital element in obtaining success. Analyzing latest armed conflicts, it can be concluded that the main factors influencing the fight are: armament and equipment; human, strategy and doctrine; information and communications.

The role of military intelligence has grown considerably once the Romanian Army started to attend international missions under various mandates. Thus, early warning, identification and evaluation of risk factors, intelligence protection of military actions and forces are basic missions for military intelligence structures deployed in theaters of operations. Moreover, past military conflicts have highlighted the importance of information in preventing surprise, fair assessment of situations, decision making, planning and conducting successful joint actions against terrorism.

If we represent, in another way, the *role of information* in the management of military structures, we must emphasize at least the following aspects of *information*: it causes the *decision-action reaction* at management level;

is related to the human, technical and material resources, objects, time, space and relationships; represents a novelty or a piece of news about forces, events, actions, ideas, opinions, experiences and so on, all related to past, present and future; reflects *the interests and will of the manager; establish direct contact* between the manager and the people / structures which act directly to achieve objectives.

The activity of information faces two major problems[14], both comprehensive and never ending. The first problem concerns *the activity of prediction*. The objective is, of course, to predict what will happen next. This activity has steadily improved with the increase of intelligence activity instruments. If Wellington said: *"All the problems of war consists of guessing what is behind the hill"*, research technology that is currently available can see much farther than "over the hill". Another problem that intelligence activity is facing is the so called *Cassandra Complex*: what should be done so that political and military decision makers accept information that they do not agree. This aspect is not new and has been identified in the course of history. Alfred von Schlieffen, the Chief of the General Staff of the German Army before World War I, said that *"in general, commanders at the highest levels, make their own opinions about friends and enemies, taking into account their own desires. If the reports received match this image, they accept it with satisfaction. If the reports are in contradiction with the image previously formed they consider it to be false "*. Marshal Montgomery, the initiator and organizer of World War II "Market Garden" Operation, refused to take into account the evidence of German armored units presence at Arnhem and analysts who presented him the reports were changed from their positions. The result was failure in conquering that bridge and huge human losses.

According to Russell Ackoff, a specialist in theory systems, the ensemble of the human mind includes: data, information, knowledge, understanding and wisdom.[2] Data is *"a description of letters and / or numbers of a phenomenon, process, object, fact, event or actions within or outside military organization"*[10]. It is composed of a group of

structured symbols according to a predetermined syntax recorded on a support material which can be manually, mechanically or electronically processed. Data represents any conventional notion represented by a number, size, link etc.. It is produced through research activities, aims to solve a situation and is subjected to subsequent manufacturing processes at different time intervals. Data is *"a fact, notion or statement represented in a suitable conventional form of communication, interpretation or processing by human or automatic means"*[4].

Information is data processed for use and contains answers to the questions "who", "what", "where" and "when" that have acquired meaning through relational connections. Their meaning might be useful or not. The notion of information is defined as *"a communication, news, story that puts someone up to date with a situation; all materials used for informing and documentation sources (written text, spoken message, plastic images, indication of an instrument)"*[5].

The information is *"the basic object in communicating knowledge. Any information can be seen from two perspectives: that of the meaning (semantic content) and that of the structure"*[6]. *Knowledge* is the application of data and information and answers the question "how". It is an useful adequate collection of information.

Understanding is the process in which previous knowledge is summarized, concentrated and transformed into new knowledge and requires an answer to the question "why". The difference between knowledge and understanding is as that between learning and memory. Those who understand can perform useful actions because they can synthesize new knowledge and information from that already known. *Wisdom* is evaluated understanding and is thought to be an applied knowledge.

Ackoff states that the first four categories are related to the past and have in consideration happened or known facts. Only the fifth category, wisdom, refers to the future and contains vision and projecting.

John Arquilla and David Ronfeldt have created a classification of information based on the pure meaning of this categories. According



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to this model, information is any informing way involving the use of human mind to create other information. Therefore it can be concluded the following hierarchical order of these categories: data, followed by information and knowledge. It can be observed that the main achievement of this classification rule is determined strictly by

the inverse correlation between the amount and quality of information as part of the its processing. The amount of information decreases with the increasement of its quality, thereby leading to outline a pyramidal model (*Figure no. 1*).

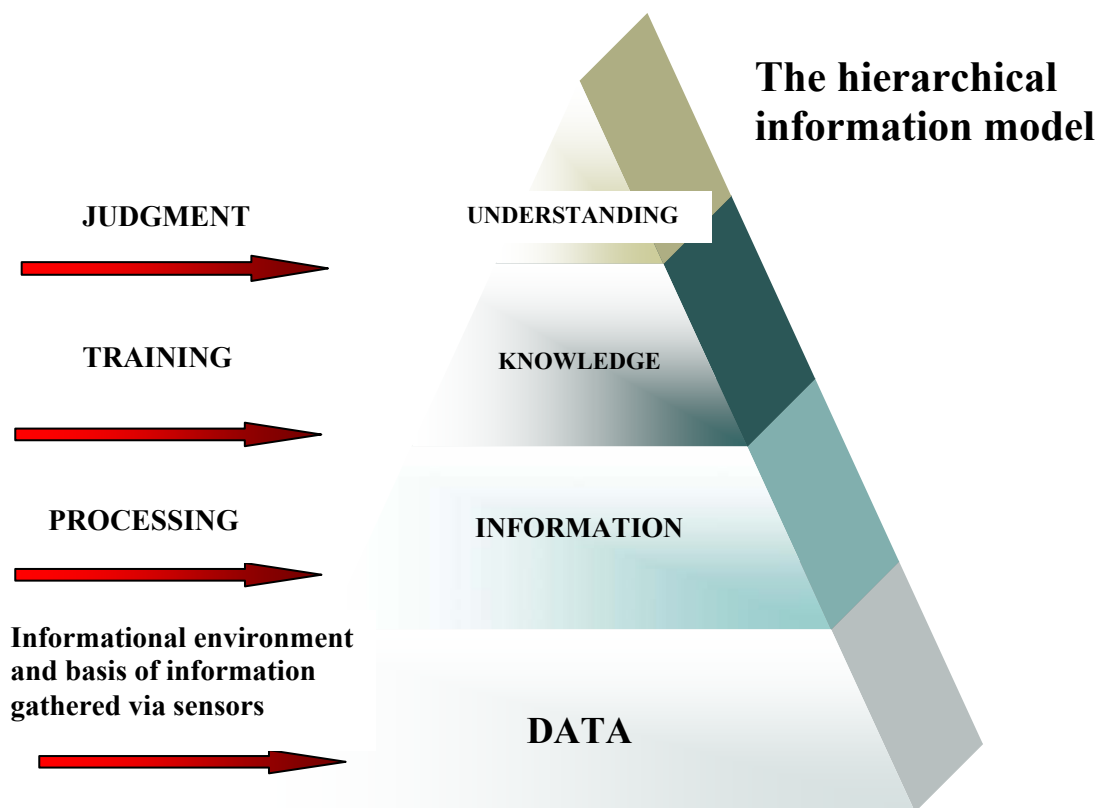


Figure no. 1 The hierarchical information model

Source: Arquilla John, Ronfeld David, *Preparing for Conflict in the Informational Age*

Information theory is the mathematical theory of general characteristics of information sources, transmission channel, storage and processing installations of information concerning their statistical properties. Some definitions of the term "information" highlight a number of its *features*, as follows: a real objective property that performs orientation of actions[1]; possible succession defined by

physical events aiming to influence activity of human sense organs and showing situations which are not easily notified; measurement of matter and energy unevenness repartition in space and time; abstract measurable quantity whose value should not depend in any way on the nature of the information; contributes to the organization of numerous regulation and self-regulation processes of the perceptible and

acceptable truths; is part of basic human needs; will be the key of the fourth wave [16].

3. CONCLUSIONS

Information, as a notion, is an integral element of all sciences, with the specification that some of it have performed quantitative determination and qualitative expression of these sciences. In a broad sense, information is an active and dynamic expression of substance and energy used for the disposal of uncertainty[13]. *Information*, as opposed to data, from the view of leadership, brings more knowledge and helps reaching a decision or to transpose its application. Information is a fundamental element of the informational systems, the raw material in the development of decision making.

The impact of technological evolution does not occur only in the battlefield, it affects *defense policy* too, these events occur in several *directions*, the most important being: information is essential to increase the wealth, power and influence, it is more important than traditional sources of wealth, considering that the new defense policy reconsider security objectives and activities of information defense and protection; permanent change of material and moral character norms of value must be based on a growing openness to information, the technological support facilitates people access to information, including the ordinary citizen; informational technology must continue to produce changes in the organization, structure and technological support of all parts of society including the military component, and information flows must facilitate the command and control in real time and in places in which distance, platforms and hierarchical levels are no longer taken into consideration.

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