

ICT Support in a military decision making process in land forces – chosen aspects

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Abstract. Different military forces have one common area as far as their activity is concerned, i.e. the realization (provision) of certain tasks (services) for the benefit of the fighting elements in order to help them complete the assignments set for them. There is a gap in normative documents connected with a consistent terminology of the undertakings realized by the signal and IT corps. There is only an entry on the classification of the command measures and the characteristics of a military communication system. ICT support provided to the commanding body should be considered as a project where the effects of the activities (products) performed by the supporting subject as seen as services. Due to this approach it will be easier to determine needs, reckon up and supervise the provided services.

Keywords: information communication technology (ICT), ICT support, military decision making process (MDMP)

1 Introduction

Information in the present world is a vital indicator of the existence in the information society. Being at the disposal of up-to-date, reliable information, as well as being able to process it quickly is a key to success and a guarantee of efficiency. Information is the basic element of the decision making process which is very often realized in the condition of big uncertainty and time limitations. Supporting the process is guaranteed by proper tools for information production, sending, processing as well as storing, which may exert a significant influence on the pace and aptness of the taken decisions. Due to that it is extremely important to carry out research on the efficiency of the sent information and its possibly fast processing.

In order to improve the activities connected with information, the automation of the elements of Military Decision Making Process (MDMP) is a necessity. It is realized by the application of proper supporting tools integrated within an automated command and control system (Fig. 1.).

Presently, the solutions are not effective enough and fail to assure satisfactory support for taking decisions. Mostly, the process is realized without any tools but exclusively with a human element of the commanding body.

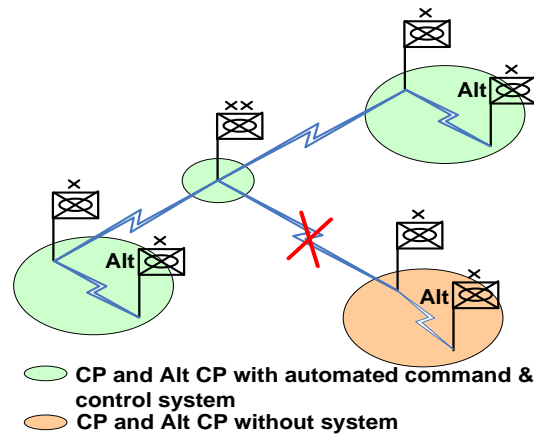


Fig. 1. The essence of an automated command and control system [5].

However, a question emerges: „Is the provision of proper tools a sufficient condition to improve the process?”

According to the authors it is necessary to carry out research in the scope of ICT support with a comprehensive approach, not only in the technical sphere but also the legislative, procedural, organizational and mental.

2 Identification of ICT support

Connecting the issues of IT and communication has become an assumption to create a new concept integrating the two, i.e. Information Communication Technology, which has not been unambiguously defined yet, in spite of the fact that a discussion concerning the issue commenced at the end of the 70s. Presently, ICT networks (common solution for information and telecommunication elements) are more and more often organized in a civil environment. The aspects of ICT networks are being noticed also in the military communication information systems [2]. Defining the ICT network of a tactical level as well as determining the scope of tasks realized by signal subunit in the process of supporting the other units is a vital issue which should be taken into consideration.

2.1 Structure of Military Communication Information System

The analysis of the above problem area should start with defining the scope of tasks entailed by military communication information system. In accordance with the definition [3]: *military communication information system is an organizational-technical set of communication and IT means corresponding with the needs of command and control as well as of steering striking means, and the character of conducted activities and tasks performed by the army.*

The authors decided to base further analysis on the above definition; having regard to the specific character of military communication information system they took into account a comprehensive application of different means of communication in all relations: decision making process and steering the means of striking, cooperation, notification, warning and alarming as well as logistic back-up.

The subject literature distinguishes the following basic elements of military communication information system based on the criterion of functionality (Fig. 2.):

- subsystem of management;
- subsystem of information exchange;
- subsystem of support.

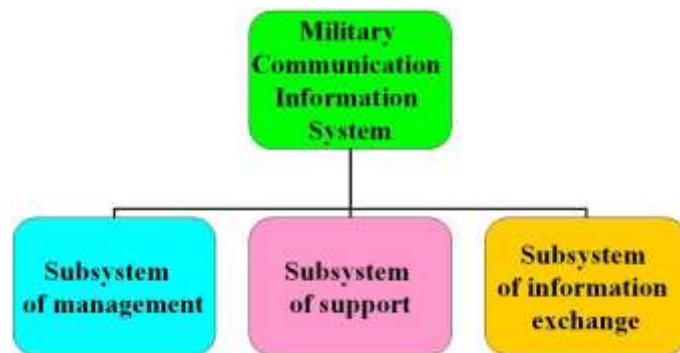


Fig. 2. Basic elements of military communication information system according to the criterion of functionality [4].

Subsystem of management consists of bodies responsible for the management of communication, deployed in management points on Command Post (CP) of tactical level which can communicate with all elements of the system and with the surrounding.

Subsystem of support (combat, logistic and communications reserve) constitutes an integral part of communication information system, without their reliable and constant operation, the system would not be able to realize the tasks assigned to it in a crisis situation or during a battle.

Subsystem of information exchange (considered mostly as the major subsystem of military communication information system) creates on a tactical level of land forces three separate, highly mobile communication networks; their division is based on the methods of information exchange as well as means used for their structure.

Nowadays, the normative documents include the following division [6]:

- communication network;
- military mail network;
- signalling network.

In the subject literature one can encounter modification of the above division, with computer networks taken into consideration. According to the authors, such modification can result from the recent increase of the significance of computer networks in military mobile networks.

The results of research indicate that the state illustrated above is presently applied in land forces where there are two separate networks providing different services for the benefit of the commanding body [1]. The authors suggest to replace two separate networks: communication and IT with one ICT network providing services from the scope of both networks and other possible ones with single managing element [4].

2.2 The essence of ICT support

The suggested concept *ICT support* should be considered in two basic aspects: *sensu stricto* and *sensu largo*¹. A demonstrative model of the areas of responsibility in both aspect is presented in Fig. 3.

ICT support sensu stricto shall be understood as a sequence of planning activities as well as organizational-technical ones aiming at the development of ICT infrastructure in the region of operations as well as assuring the functioning of command and control support applications for automation of certain activities in the military decision making process and steering the means of combat for the benefit of commanding body and the elements of the order of battle.

The essence of ICT support is to help the commanding body and the elements of the order of battle realize their tasks. The support entails services which first of all assure the exchange of information and possibility of steering the means of combat, which directly contributes to the achievement of the goal set for the supported elements.

According to the authors ICT support is a broader concept and is not limited exclusively to tasks connected with the organization of ICT networks and the provision of services.

Realization of ICT support in a narrower approach is possible due to many activities realized in a broader sense including inter alia: search for new organizational-technical solutions, creation of doctrines, preparation of procedures, education, national and international trainings, choice of personnel, frequency management as well as assignment of Internet Protocol, etc. The enumerated tasks cannot always be realized by the supporting elements in the narrower approach.

According to the authors, omission of the above elements will hinder or prevent the realization of tasks for the benefit of the supported elements (units, subunits), which consequently may result in the failure to achieve the set goals.

Due to the above, *ICT support sensu largo includes as set of activities and processes assuring tasks realization by the supporting elements sensu stricto.*

In other words, realization of support in a broader approach is necessary to provide support in the narrower approach. According to the authors, the element which realizes ICT support is not able to perform tasks for the benefit of commanding body and its order of battle without the support of external subjects.

¹ According to the authors ICT support is a complex process, realized at all levels of command and control, thus, in order to assure proper conduct of research process, support should be considered in narrower approach (*sensu stricto*) as well as broader approach (*sensu largo*).

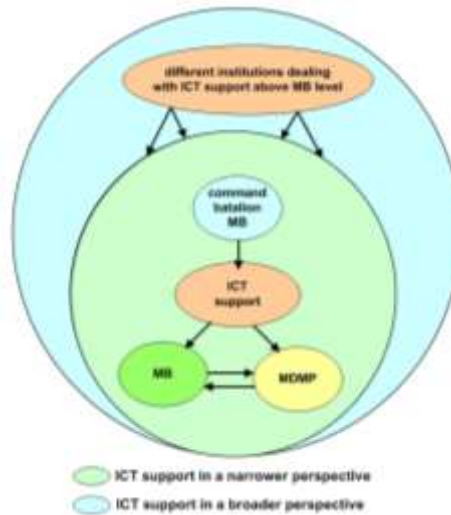


Fig. 3. ICT support in a narrower approach (sensu stricto) and broader approach (sensu largo) based on a mechanized brigade [5].

3 Areas of ICT support

In order to accept certain classification and to indicate the areas of ICT support analysis the authors made use of the concept of command and control system presented by M.D. Mandeles². According to this concept, in real world 'C2' organization resembles a system which includes interacting elements such as: personnel, organizational and technical ones. The concept has been the basis for deliberation on the influence of human factor (personnel) and organizational one on the command and control system presented in RTO Technical Report TR-081, *NATO Code of Best Practice for Command and Control Assessment*, RTO/NATO 2004. Under this report, command and control system can change alongside with the change of any elements which belong to the above mentioned three categories. Moreover, taking into consideration the fact that the personnel, organizational and technical factors are tightly interrelated, the optimization of one of them with the other terms equal for the remaining two elements rarely results in an efficient 'C2' system. In particular, the assessment of relations between the personnel and technical factor is a critical condition, which causes both social and technical challenge. Without the adjustment of the way of thinking, the patterns of human behaviour and organizational structures it might be impossible to use the potential of new technology. On the other hand, new ICT solutions may exceed people's ability to

² Mandeles, M.D., et al. (1996), *Managing "Command and Control" in the Persian Gulf War*, (ISBN 0-275-952614), Westport, CT: Greenwood Publishing Group.

process information (information flow) and consequently weaken the performance and efficiency of personnel as well as command and control system, regardless of the improvement of technical parameters.

On the basis of the above deliberation, the authors assume that **ICT support** should be considered in **three areas**: technical, organizational and personnel.

Holistic approach within the above areas can bring expected results in the form of certain solutions to improve ICT realization process for the benefit of commanding body in military decision making process (Fig. 4.).

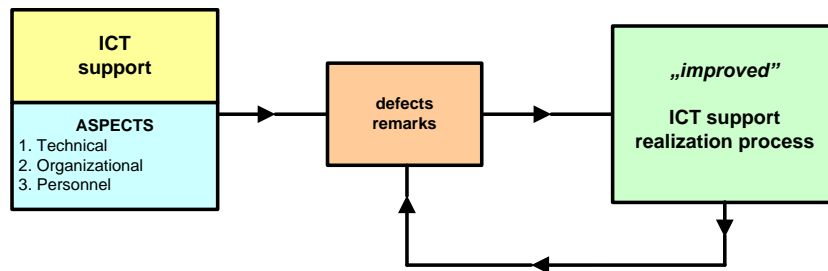


Fig. 4. Scheme of research procedure of ICT support process [5].

On the basis of the carried out research in the scope of indolent areas of ICT support as well as the needs of the commanding body and the supporting elements (e.g. command battalion) the authors suggest solutions in the below presented areas:

- technical:
 - network platform with the use of virtual ICT environment (solution based on the VMware software);
 - command support system based on an information portal of the command post (access to data base with the use of the so called *web-service*);
- organizational:
 - introduction of a help desk (an organizational unit providing technical support to the users) on the command post of the mechanized (the so called. *help desk*);
- personnel:
 - training for users in the scope of ICT tools (commanding body) as well as workshops for the technical support (command battalion).

4 Conclusion and suggestions

In a transition period between the present state and the network-centric state, one of the most important research problems is the assurance of proper environment for the functioning of the commanding body during military decision making process on a tactical level of land forces (Fig. 5.).

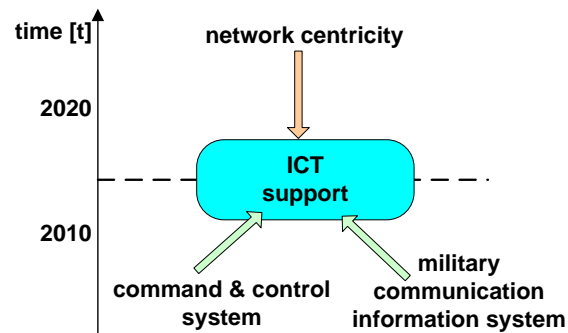


Fig. 5. Systemic elements having influence on ICT support [5].

One of the solutions can be the implementation of proper mechanisms of performance which should be adopted by the supporting elements at the given command and control level.

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