Kerti András
kerti.andras@zmne.hu

Pándi Balázs

Rajnai Zoltán
rajnai.zoltan@zmne.hu

STRUCTURE OF THE COMMAND AND INFORMATION SYSTEM

Absztrakt/Abstract

Jelen közleményben a szerzők a hazai katonai híradó és informatikai szakterületen tapasztalható szabályozatlanság és ezzel együttjáró definíciós problémák kérdéskörével foglalkoznak, amelynek során néhány részterületen megoldást próbálnak kínálni

In this publication the authors study the issues regarding the lack of regulation at the area of national military communications and information systems and the definitional problems connected to this, and try to offer a solution for particular sub-areas

Kulcsszavak/Keywords: híradó és informatikai rendszer, NATO, Összhaderőnemi Doktrína, vezetési és információs rendszer ~ communications and information system, NATO, Joint-forces doctrine, command and information system

Before the 1990s and in present time an unfinished change of paradigms in general military thinking has become noticeable, which has three main factors:
- Change of military culture;
- Change of terminology;
- The change of basic role.

Change of military culture

The end of the Warsaw Pact (WP) and our NATO membership as a result of a long political process was not merely "switching" to another organisation. While members of the WP

practiced the military art of the movement-centric military culture, NATO strategists are the followers of the material-centric military culture.

Change of terminology

The changes have not only brought about the change of the language of the organisation, but also the change of the terminology. This might not as apparent because many of the terms have similar meanings. However experts growing up on the two different schools have different meanings for the same term.

The change of basic role

Before the change in the political system we lived in a "bi-polar" world, where military strategy has been mainly determined by the conflict of the two sides, in which frontal tactical and operational tasks typical to WWI and WWII were envisioned. According to our current ideas however: "The Hungarian Republic is not threatened by an attack using conventional warfare within the foreseeable future, and the occurrence of event is also less likely on the longer term." [1]. In our opinion in the current situation Hungarian military terminology is a mixture of terminologies from before and after the change of the political system, there is no clear picture, or common concept developed. Another factor impairing clarity is the development in technology, the convergence between communications and information systems. The emergence of terminology regarding Command and Information Systems has been examined in a scientific nature by Károly Fekete in chapter 1.1 of his PhD study [2]. In the current situation however there is no clear standardized terminology that the experts of this field interpret formally or informally the same way. There has been many occasions where the reason for disagreement between experts was only that they had different interpretations for the same term. This viewpoint is also confirmed by a statement from Károly Kassai regarding information security: "...terminological confusion can also be found in the military lexicon, the reasons for which are the merging of old and new terms and the intention of translating or localising English terms." [3].

Furthermore particular terms change over time, thus the NATO practice of yearly revision of important terms, and yearly new edition of collection of terms and abbreviations gains more interest.[1] In order to make any kind of examination regarding the Command and Information System, we first need to define the concept of the Command and Information System. As a first approach we can interpret it as the assembly of data-processing, data-transfer, and data-storage technical equipment. In a deeper analysis of the situation it can be found that the described system is only the subsystem providing technical implementation of facilities for the Command and Information System. In our opinion the *Command and Information System* has two more important components, the *system of concepts and notions* regarding the operation of the Command and Information System, and the *operating personnel*. Staffs operating the Command and Information System are not to be confused with personnel operating the technical subsystem of the Command and Information System, they are the users of the technical subsystem, the information technology experts of the particular military units. The structure of Command and Information Systems in NATO terminology is: "*Command and Control Systems / C2S An assembly of equipment, methods and procedures and, if necessary, personnel, that enables commanders and their staffs to exercise command and control.*" [4].

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[1] e.g.: AAP 6, AAP 15, AAP 42

Although it's true that the above definition only applies to Command and Control Systems, and that Command and Information Systems have more components, still this statement is a good demonstration of the relationship between the particular components. In our opinion the most important component of the Command and Information System is the commander. In order that the commander can from an opinion the commander needs a lot of information and many kind of information. This information is produced the specific specialists of the commanders' unit, by collecting and processing information through their own sources. The commander based on his / her concepts regarding commanding and command systems determines who, when, in what form and with what content should report and transfer messages, reports and data.

Concepts and notions regarding the
Command and Information System

Staff of the Command and Information
System, the users of the technical
subsystem

Technical subsystem of the
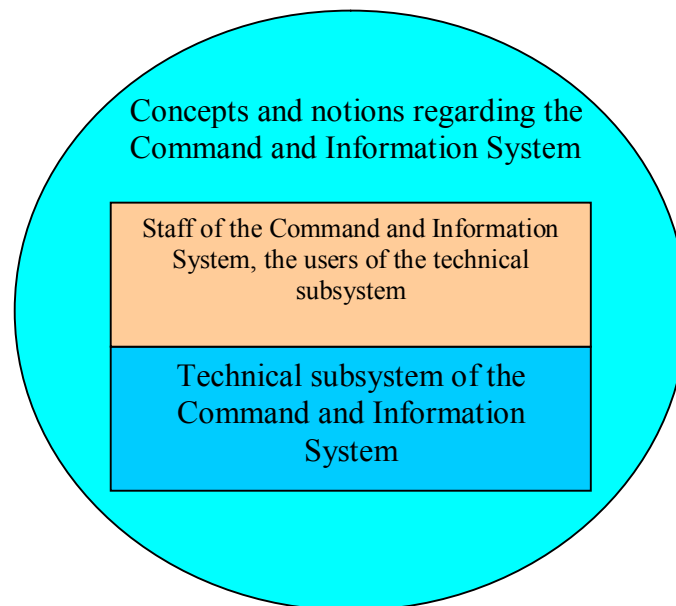Command and Information
System

Figure 1. Relationship between the components of the Command and Information System

The purpose of the technical subsystem of the Command and Information System is to transfer reports, data, messages to the recipients so that they can be processed.

The Command System is: "the assembly of control processes, control methods and control tools within an organisation" [5]. Thus the command function cannot be separated from the technical subsystem. Despite this the joint-forces doctrine of the Hungarian Army discusses topic of Communications and Information Systems (as the technical subsystem of the Command System) in the chapter of combat support. So the question arises, why Communications and Information Systems cannot be thought of as support systems. For this, first lets overview the concept of support: *"Support is basically an activity during, which the coordinating commander using the forces and equipment under his / her command helps the forces performing the operation in successfully accomplishing the military operation, without even temporarily submitting the supporting forces and equipment to their command."* [6]. In our opinion the two systems are inseparable. The commanding function cannot be conceived, if the commands, orders, and supporting information cannot be transferred from the sender to the recipient. The problem with judgement is caused by the fact that the technical equipment is not installed by the users, but by a separate subunit, which is however under the command of the commanding organisation. The basic tasks of the technical subsystem are shown on

Figure 2. The shown model can be applied to describe all systems from the smallest subsystem to the complete system, from the inner architecture of a computer to the NII.

One of the greatest challenges of the information society and thus the army of the information society is to implement information security at a level proportionate to the costs and potential damage. We don't find it practical that the joint-forces doctrine discusses *information security* in the information operations chapter separately from the chapter of *Command and Control* and the chapter of *Communications and Information Systems.* Information security cannot be implemented at only one place or only using one method, the information security has to be deliberately implemented at every point throughout the Command and Information System. This is even more important regarding the technical subsystem. In order to implement information security throughout the whole information processing procedure, various tasks have to be performed depending on locations (geographical or logical) and roles. Information security mechanisms reach their goal by being applied at every area of the information infrastructure cooperating with each other [7].
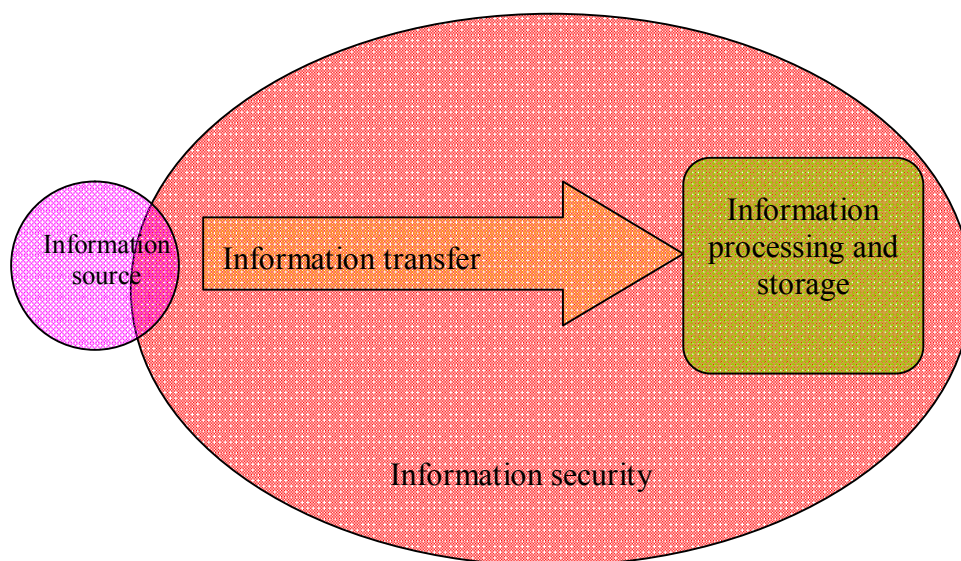

Figure 2. Roles of the technical subsystem of the Command and Control System

The part of the figure marked by us as information source is the least defined part of the system, which can vary from case to case from sensory data, recognisance reports to other information systems. The level of control we have over the information source is however important. It can be partially, or complete independent from us. Based on this as it can be seen in the figure, information security does not entirely cover the information source. We can only guarantee the security and validity of the information source at a level proportionate to the level of control we have over it.

István Ternyák made the following statement regarding the units performing information transfer and information- processing, storage: *"...informatics is concerned with the formation, handling, and usage of information. The 'raw materials' of the information system however not only have to be used – processing, storage, display, distribution, etc. -, but transferred as well. The system that transfers the reports, data etc. in various forms is the Communications System."* [8]. It could also follow from this statement that telephones and faxes are similar end devices such as computers, this viewpoint is however is not completely accepted within the Hungarian Army (HA). The networks connecting the mentioned devices form the Communications System, the computers and their connecting networks form the Information

System. In our opinion the above distinction is made because of the differences in the level of technological development in the systems of local military equipment.

Two different kind of models can be found in military publications regarding the convergence of the Communication and Information Systems of the HA. According to the first there the two systems will always remain separated to one point, the other one promises the complete integration of the two systems. One of the main advocates of the first model is Jenő Gorza who made the following statement: *"The convergence can only be conceived on the infrastructure level, and cannot be extended to the application level."* [9]. An example of the other model is the vision of Károly Fekete, which is demonstrated by Figure 3. The trends of recent periods have confirmed the second model [10], thus we use the figure to demonstrate the difference in the level of technological development of certain HA systems.

Currently we can speak of three systems with different levels of development. The first is the stationary technical subsystem, which can be thought of as the most advanced system, which is connected to the other governmental systems. The system at the least advanced level is the field communication system, which is virtually still on the technological level of the 80s. There is no modern field system that can serve as the subsystem for the Command and Information System.

The second level of technological development requires some explanation. From the second half of the 1990s our nation is involved in various missions, and these missions could not have been successfully achieved without a Command and Information System. However the technical subsystem of the Command and Information System of the missions cannot be thought of as part of either the stationary system or the field system. It's not part of the stationary because it's operated temporarily, far from the homeland. It's not part of the field system as it was assembled at the start of the missions and disassembled at the end of the missions and did not have to be moved during the missions like in a "classical" military operation. The Command and Information Systems of the missions consisted of modern field equipment introduced to the HA assembled with high quality commercial devices.
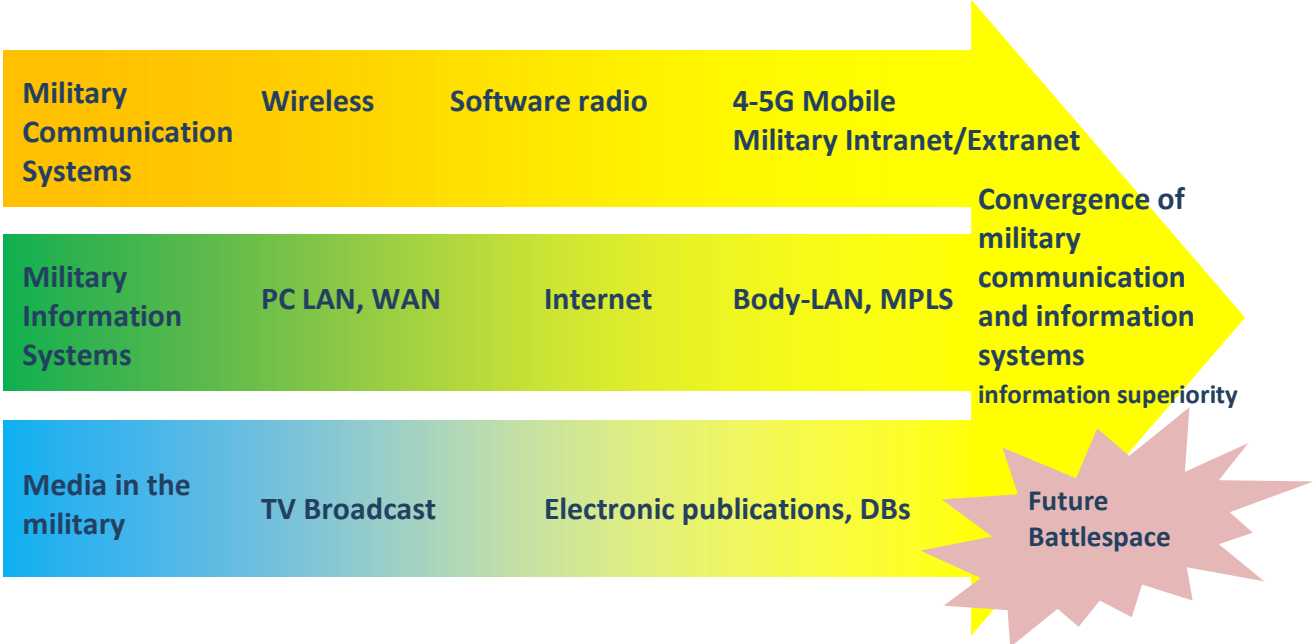

Figure 3. Development of military communication platforms. Source: Károly Fekete

The more advanced a system is the more difficult it is to separate the communication system from the information system.

Summary

In our opinion, according to the studied publications the concept of the Command and Information System as a Communication and Information System is best defined by the joint-forces doctrine: *"The Communication and Information System consist of the communications and information equipment (hardware), the system software operating the equipment, the client software providing user functions, maintenance and application procedures, the data stored and transmitted by the system, and the operating personnel."* [11]. It can be concluded from the above mentioned that the communication and information system is inseparable, however in practice the only information systems are represented by a separate department within the structure of the Ministry of defence (MD), the department of Information technology and information security [12].

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