Summary of PhD thesis

Introduction of the author

Captain András Tóth:

The possibilities of implementation of the network enabled capability in the communication system of the Hungarian Defence

Scientific supervisor:

Colonel Zoltán Rajnai PhD
Professor

Budapest, 2015

Definition of the scientific problem

After the Prague Summit in 2002 the NATO started to build its network centric warfare system and in 2014 the comunnication system at all level was changed to IP based networks. With this the basis of the network enabled capability was accompished and it results the possibility the members of the Alliance to execute their missions in a network centric environment. The western armies started to develop their own network centric systems and a new interoperable communication meshes built up among the NATO core, mobile and national communication and information systems.

The development of the communication and information system of the Hungarian Defence Forces started as well, but these networks still not able to provide a near real time information sharing capability for the commanders. To reach this it is needed to analyze all the capabilities, systems, devices and organizational procedures which can provide a network enabled capability based communication and information system to cooperate with the same network of NATO and NATO-members. Our currently used equipments are old, analog and we don't have spare parts to repair them any more, so they are not able to work in network enabled capability based warfare. I consider it is necessary to digitize the operational and tactical level systems in wired and non-wired environmet as well.

Research objectives

1. To analyze and examine the principles and systems of NATO Network Enabled Capability;
2. To determine the currently used communication and information system of the Hungarian Defence Forces;
3. To formulate the operational and tactical challenges and capabilities which determine the development trends of the digitization of the communication and information system of the Hungarian Defence Forces;
4. To analyze the establishment and development of the communication systems at all level;

5. To propose a possible way for the digitization process of the communication and information system planning;
6. To propose the using of the the new developed digitized communication and information system in multi-national environment.

Research methods

1. I've drove a literature examination and literary research on the area of literature being attached to the topic;
2. I've studied the different laws, decisions and measures related to the NATO Network Enabled Capability and the communication and information system of Hungarian Defence Forces;
3. I've prepared consultations with professionals who operated in multinational operations;
4. I've examined the organizational principles considering my experiences in international professional exercises and missions;
5. I've analysed and I've drew conclusions from the abilities and organizational procedures of the present communication and information system;
6. I've determined a possible organizational principle based on the strength of the organized knowledge, on the part of inferences, and on the capabilities and factors which affect the communication and information system;
7. I've studied the different laws, decisions and measures related to the HDF's crisis response operations;
8. I've prepared consultations with professionals who operated in crisis response operations.

The structure of dissertation

After the introduction the dissertation has four main chapters.

In the first chapter I analysed the basic principles of the network enabled capability, and I examined the general operational capabilities and requirements of it. I

examine the capacity of the network services provided by the integrated system services of the network enabled capability, their effects of the operations, and the foundations of the cloud computing as well as the basic elements of the network enabled capability.

In the second chapter I analyse the NATO core and tactical networks, and I examine the principles of the practices, procedures, applications and these influence to the digitization of the communication system. In this chapter I also analyze the core and tactical network of the Hungarian Defence Forces and the currently used devices and systems.

Based on the first two chapters, *in the third chapter* I defined a new digitized tactical network and I specify the necessary equipment and applications in the command posts at tactical level. I analyze the possible modernization of the currently used communication devices. I determine a complex system to grant a network enabled capability based environment for the coalition forces.

Based on the third chapter, *in the fourth chapter* I analyze the possible usage of the network enabled capability based environment in multinational and crises response operations for the Hungarian Defence Forces. I determine the connections with the coalition forces, the operational and national headquarters.

The final part implies the important recommendations, the considerations and the deductible conclusions, scientific results.

Scientific results

1. I stated that it is needed for the operational capability of the Hungarian Defence Forces a real time common operational picture sharing via the commandres command and control system.

2. I intoruced a proposal for the evolving of the tactical communication system of the Hungarian Defence Forces in order to meet the NATO Network Enabled Capability based warfare especially during coalition cooperations.

3. I jastified that the organizational principles of the tactical communication system of the Hungarian Defence Forces must adjust to the NATO based principles. The network enabled capability is a basic condition in coalition operations.

4. Compared the experiences of international roles I defined a communication and information system to support multinational and crisis response operations, which provides compatible and interoperable environment for the coalition forces.

Recommendations for Practical Usage

In my opinion, the results of the PhD thesis could be used in the organization of CIS elements in crisis response operations. These can be integrated into the educational system – both for BSc and MSc level and further professional training – of the National University of Public Service.

The described and determined organizational principles could offer a very good basement for further research of the related topics and for other special fields (info security, informatics, technical tools, abilities offered by networks) analyzes and PhD works.

Captain TOTH's publications

TÓTH András: A vezetés-irányítási rendszerek alkalmazásával szemben támasztott követelmények a csapatvezetésben, gyakorlati használata során felmerült észrevételek, tapasztalatok, Hadmérnök (IV. évf. 1. szám), ISSN 1788-1919, pp. 276-283. (2009)

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TÓTH András: The signal providing of the Hungarian NATO Response Forces, Kommunikáció 2010, ISBN 978-963-7060-71-2, pp. 69-72. (2010)

TÓTH András: A Magyar Honvédség Tartományi Újjáépítési Csoport kommunikációs rendszere, és annak alapvető problémái, Kommunikáció 2010, ISBN 978-963-7060-71-2, pp. 73-78. (2010)

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TÓTH András, FARKAS Tibor, PÁNDI Erik, JOBBÁGY Szabolcs: Organization of the communication and information system supporting command and control int he light of crisis response operations of the Hungarian Defence Forces, Hírvillám (I. évf. 1. szám), HU ISSN 2061-9499, pp. 107-115. (2010)

TÓTH András, TÖREKI Ákos: A kritikus infrastruktúrák és azok védelmi lehetőségei, Hírvillám (I. évf. 1. szám), HU ISSN 2061-9499, pp. 143-148. (2010)

TÓTH András: A zászlóalj informatikai rendszerei alkalmazásának szabályai, az informatikai tevékenységek védelmi feladatai, Hírvillám (I. évf. 1. szám), HU ISSN 2061-9499, pp. 163-167. (2010)

TÓTH András, KENDERNAY Zsolt, PÁNDI Erik: A készenléti szervek informatikai rendszereinek helyzete, várható fejlesztési irányai, Hírvillám (I. évf. 1. szám), HU ISSN 2061-9499, pp. 178-188. (2010)

TÓTH András: A felhőinformatika alapjai, Hírvillám (II. évf. 1. szám), HU ISSN 2061-9499, pp. 85-91. (2011)

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Andras TOTH: Architecture of network centric tactical command post, Distance learning, simulation and communication 'DLSC 2015', ISBN: 978-80-7231-993-0, (2015)

Curriculum vitae

Personal data

Name: Andras Toth

Rank: Captain

Date of birth: 10 January 1981

Nationality: Hungarian

Sex: Male

Place of work: National University of Public Service, Faculty of Military Sciences and Officer Training, CIS Department

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Education/Qualifications

2009 – 2012	Zrínyi Miklós National Defence University, Doctoral School of Military Sciences, PhD Study
2007 – 2009	Zrínyi Miklós National Defence University, M.A. in Defence C3 Systems Management
1999 – 2004	Zrínyi Miklós National Defence University, M.A. in Military Communication System Management

Employment to Date/Work Experience

2012 -	National University of Public Service, Faculty of Military Sciences and Officer Training, CIS Department, Assistant Lecturer
2010 – 2012	Zrínyi Miklós National Defence University, CIS Department, Assistant Lecturer
2007 – 2010	Hungarian Defence Forces 5th Infantry Brigade, 3rd Infantry Battalion, S6 (CIS Section), IT officer (Deputy CIS Chief)
2004 – 2007	Hungarian Defence Forces 5/3 Light Infantry Battalion, Signal Platoon, Platoon Leader

Deployments

03. 2013 – 10. 2013 Kabul International Airport North (KAIA North), Afghanistan, A6 (CIS Section), CIS System Manager (Deputy CIS Chief)

09. 2009 – 03. 2010 Provincial Reconstraction Team, Pol-e-Khomri, Afghanistan, S6 (CIS Section), IT officer (Deputy CIS Chief)

Budapest, 26 May 2015.

Captain Andras TOTH