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Studying the Possibilities of Postgraduate Specialisation Programme Collecting Governmental Aimed Info-communication Systems and Services:

Presentation of Research Program

A kormányzati célú infokommunikációs rendszereket és szolgáltatásokat összefoglaló szakirányú továbbképzési program lehetőségének vizsgálata

Kutatási program bemutatása

Abstract

During the recent national and international level crises, danger situations and other emergency events, a strong cooperation is required among the defence organisations maintaining the response activity. Thus info-communication support of command and control activity is put into focus, which can be a key feature to success. To the purpose of helping this, high level preparation of info-communication experts with a focus on complex activities is inevitable. In this recent paper the author wishes to draw up the necessary knowledge material for the creation of a possible postgraduate specialisation programme, and to present the subject, aim and basics of a research in interest of it.

Keywords: research project, postgraduate specialisation programme, info-communication, defence sector, defence communication

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„Az Emberi Erőforrások Minisztériuma ÚNKP-17-4-III-NKE-76 kódszámú Új Nemzeti Kiválóság Programjának támogatásával készült” „Supported by the ÚNKP-17-4-III-NKE-76 New National Excellence Program of the Ministry of Human Capacities”

Absztrakt

Napjainkban bekövetkező nemzeti- és nemzetközi válsághelyzetek, veszély helyzetek és egyéb vészhelyzeti események során szoros együttműködésre van szükség a felszámolást végző védelmi szervezetek között. A vezetés és irányítási tevékenységek infokommunikációs támogatása ez által külön figyelmet követel meg, amely a siker záloga lehet. Ennek elősegítése érdekében fontos az infokommunikációs szakemberek magas szintű felkészítése a komplex tevékenységek szem előtt tartásával. Jelen közleményben a szerző egy lehetséges szakirányú továbbképzés kialakításához szükséges ismeretanyag behatárolását, valamint az ennek érdekében végrehajtott kutatás tárgyát, célját és alapjait kívánja bemutatni.

Kulcsszavak: kutatói project, szakirányú továbbképzés, infokommunikáció, védelmi kommunikáció, védelmi szektor

1. INTRODUCTION

In recent times the international events, just like those on national level back it just well, that upon each emergency, danger situations (disaster, migration issues, other sort of emergencies) cooperation of each defence organisation is inevitable in the interest of a successful approach to their task, which has to be supported by communication and information backing. One of the key features to this is the preparation and postgraduate specialisation programme of info-communication personnel. (Farkas & Hronyecz, 2018, pp. 1-2)

Within the frame of his HAS János Bolyai Scholarship for Research, won in 2015 (for three years) the author analysed the basic info-communication requirements, and info-communication system services of command and control for counter-disaster and – emergency activities.

Based on the results of the research until now, and according to the strategic directions and aims define in the Institutional Development Plan of National University of Public Service (NUPS IDP), the more efficient research of info-communication services and postgraduate specialisation programme in the recent topic is important. Thus, the execution of a new research in the above topic, based on the existing results but with other field in scope is inevitable. According to this will the above mentioned research direction be analysed within the *New National Excellence Program of the Ministry of Human Capacities* between 2017-2018.

2. GENERAL INTRODUCTION OF NNEP PROGRAM

Ministry of Human Resources in Hungary has announced an open scholarship within New National Excellence Program in 2017, to win „National Higher Education Excellence Scholarship – Higher Education Young Lecturer, Researcher Scholarship”, with the aim of sup-

porting the new generation of Hungarian researchers, their first steps on scientific and arts field, also their stay on this field later on, and the research work of experienced researchers and artists on international level as well. The scholarship aimed several circles of researchers from university students to young researchers.

The announced scholarships of the program in 2017 support the research excellence by helping young teachers and researchers, who maintain a successful research and creative work in institutions of higher education. The program wishes to help scientific research and innovation with a view on research and creative excellence on all fields of science and arts.

Goal of the program is to support the research and creative activity and professional development of young and talented lecturers, researchers and artists, showing exceptional successes, with the result of a high value publication, or other – relevant in the given field – scientific, engineering or artistic creation. (Emberi Erőforrások Minisztériuma, 2017)

During the time of the program, the researcher has to execute obligatory tasks, as follows: *„maintaining research activity in the scholar period, within the frame of the receiving higher institution, connected to the work of a research team, or on their own, further making the outcome of their scientific research, or development work accessible for the receiving institute in the period of scholarship.”* (Emberi Erőforrások Minisztériuma, 2017)

The task has to be fulfilled according to the following:

- in case of scientific application one publication in foreign language within the research plan;
- introduction of the outcome of research in the scholar period, within a NNEP event in the receiving institute;
- introduction of the same on a conference outside the institute (national/international).

3. INTRODUCING ÚNKP-17-4-III-NKE-76 RESEARCH PROGRAM

Subject of the ÚNKP-17-4-III-NKE-76 research program won by the author comprises from the new fields of research generated by earlier research, like the definition of knowledge material concerning the operation and organisation, also the services of information systems in the sectors of public service, defence control, and each governmental defence related sectors, and the defining of a new education within the research, with a scope on the unity of education and research.

Title of the program is: „Analysis on shaping a postgraduate specialisation programme, that summarises the different governmental aimed info-communication systems and services.”

Motivation of the research can be defined as follows. The postgraduate specialisation programmes defined in the NUPS IDP, which provide a certificate in accordance with the National Law on Higher Education (NLoHE), contribute largely to the ongoing postgraduate specialisation programme, or possible retraining of professionals, thus to the increase of

efficiency in governmental info-communication sector. In my view this is not entirely the case on the field of info-communication, hence this field has also to be strengthened in order to increase the level of knowledge competency. This also strengthens the contribution of NUPS to the innovation of public service. Existence of such knowledge increases the possibility that each segment of public info-communication sector cooperates easier, also supports and eases the possibly necessary flow of experts within the public sector.

Aim of the research program is beyond the definition of subsystems within governmental sector info-communication system, also the analysis of fitting professional postgraduate specialisation programme into the recent postgraduate specialisation programme system of NUPS. All this I wish to fulfil with a scope on development of quality teaching material, with a view on complex state research, within the research program, also with the definition of knowledge competency level.

The pace of research activity can be divided twofold as follows:

- *Step I. (months 1-5.):*
 - To localise and shortly analyse all the state info-communication networks and systems which can be part of the research subject.
 - To define, analyse and interpret the regulation and connecting other documents.
 - To define all the knowledge material, that helps broaden the knowledge of professionals.

- *Step II. (months 6-10.):*
 - To analyse the peculiarities and requirements of the national postgraduate specialisation programme system.
 - To define matching points, which enable the processed postgraduate specialisation programme to fit into the postgraduate specialisation programme system of NUPS.
 - To define the basic elements of the request regarding the start of postgraduate specialisation programme training, preparation of the process work (goal, form, timeframe, certification, verification, etc.)
 - Preparation for processing a education plan pattern, definition of basic courses and knowledge material.

Publishing of the expected outcome happens beyond the obligatory (as described above), also based on voluntary commitment, as described below:

- foreign language publication of the research outcome
- presentation of the results on national/international conference.

4. FIELDS OF RESEARCH AT NATIONAL UNIVERSITY OF PUBLIC SERVICE, STRATEGIC LINE DEFINING THE RESEARCH

NUPS has set the aim to become the scientific base of good state, good governance, and good public service that executes the approach of constant development. Performing basic activity is defined by uniform approach and forward-looking task execution for the common goals. Dedication towards quality teaching and research work is one of the most important aims of the institute. (Nemzeti Közzolgálati Egyetem, 2012)

In order to reach this, the main direction is the definition and standardising of main process in the fields of education, research and other auxiliary work, which also founds the reach of the goals set. One of the main lines within research and education tasks is the strengthening of international R+D activity and the realisation of research performed in network. Most important element of this is the definition and unifying of main process in the fields of training/education, research and functional operation, and the definition of requirements regarding the prescribed outcomes. NUPS has set these basic fields and the actual subfields in its quality development program, a stressed point of which, also strengthening internationalisation gives a good summary of basic guidelines:

„Aim of the University during the maintaining of international competitiveness, the internationalisation of education and research work, and the development of scientific success and international embedding, is the strengthening of research system within network. Goal is that the researcher connects to the education, teaching material developing, and education-organiser activity of the University, and on the base of mutuality, also provides connection to the teachers and researchers of the university into their international network.” (Nemzeti Közzolgálati Egyetem, 2016, p. 18)

The plans of NUPS regarding the development of the institute provide a fundament to the education and research activity, which is inevitable in order to contribute to the common goals of European integration through the development of Hungarian public service, also to the cause of international peace, security and solidarity. (Nemzeti Közzolgálati Egyetem, 2015, p. 2)

NUPS IDP prescribes, that the University requires and means the unified and mutually aware prosecution of three activities, everything else is connected to these, or are supporting them. The three activities are as follows:

- research, which means basic and utilised research activity as well;
- creation of knowledge, which means the development and foundation of knowledge material;
- education.

In the focus of scientific goals and activity at NUPS, are standing research activities based on the innovative, general, multidisciplinary, comparative and utilised approach to the state and public service. NUPS IDP prescribes nine strategic fields of target, to which the matching goals have to be defined. These are as follows (Nemzeti Közzolgálati Egyetem, 2015, p. 19):

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- Efficient cooperation
- Institute of higher education in the field of state science
- Public service Development 2020
- Excellent education and postgraduate specialisation programme training
- Successful research
- International value
- State of the art infrastructure and services
- Reasonable institutional work and „good governance”
- The culture of value and excellence

Present research has been defined according to these nine fields as follows. Efficient cooperation is inevitable between each state and defence organisation, just like between institutes of research and education. The research topic meets the requirements of research stemming from the existence as an institute of higher education on state science, which is a fundament to the development of public service. Since the aim of the research is to analyse the realisation of a professional postgraduate specialisation programme, it has to be processed with focus on *excellent education and postgraduate specialisation programme*, which can be executed through *successful research*. It is inevitable to utilise the international connections and earlier outcomes, also to publish the new successes on international level, in order to secure *international value*. NUPS as the platform of the research provides *state of the art infrastructure and services*, which is supporting both the research and the recent research outcome (postgraduate specialisation programme). All these require a focus on *reasonable institutional work and „good governance”* and on *value and excellence* from the researcher and the outcome of his work.

Furthermore, NUPS IDP prescribes, that the strategic outcomes of state science research have to be introduced into the programs of public service postgraduate specialisation programme and leadership education. Importance of the discussed research is further supported by the fact, that this field of research is included in Point 5. of NUPS IDP. The document defines 23 fields of research, from which those below are connected to the research discussed (Nemzeti Köszolgálati Egyetem, 2015, pp. 24-28):

- „An indicator-system has to be developed at Faculty of Military Science and Officer Training founding the regular and general evaluation and measuring of defence sector capabilities
- *Digital state and cyber-defence as a strategic aim of the University: strengthening of engineer and informatics education and research capabilities. The fields of priority have to provide excellent performance, have to show uniqueness and through that they have to make good relationship with the representatives of engineer higher education*
- *The engineer field of military science goes on to strengthen the engineer orientation of the University and also serves to support the defence capabilities.”*

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The basics of the research are also greatly affected by the research, development and innovation strategy of the University (NUPS Research, Development and Innovation Strategy 2016-2020; NUPS RDIS), which provides a frame for the fields of research and education keeping the IDP in mind. NUPS is member of European University Association² and International Association of Universities³ both with the aim of creating European value in the field of education and research. R+D+I on the University goes on in several fields of science, which secure the strategic goals in a coordinated way. NUPS RDIS defines research priorities in symphony with the NUPS IDP. Lines of research are identified in two fields, as *accentuated fields of research in social science*, and *accentuated fields of research in engineering science*. These are described in detail as follows (Nemzeti Közszolgálati Egyetem, 2016, pp. 16-18):

- „*Accentuated fields of research in social science*
 - *Efficiency in the practice of ruling*
 - *State and governing in national and international economical, judiciary and social context*
 - *New challenges on the field of state and governance*
 - *Research on professional traditions*
- *Accentuated fields of research in engineering science*
 - *digital state;*
 - *cyber-security;*
 - *environmental security;*
 - *defence against disasters;*
 - *research on defence meant engineering;*
 - *logistics and traffic;*
 - *water economy.”*

Research colleagues of NUPS define each subfields of research, which are described in detail in the annexes of the NUPS RDIS document. Resent NNEP research topic involves several matching pints to those described above, thus verifying its importance. New environmental challenges, state and good governance, also the scientific analysis of each professional activity as research priority is present in all the defined fields of research. According to this, Military Science Collective defined the following five strategic directions (Nemzeti Közszolgálati Egyetem, 2016, p. 34):

- strategic command,
- armed forces of the future,
- challenges of hybrid warfare,

²„Our vision of European universities of the future is that of a system of academic institutions with highly diversified profiles, providing a wide spectrum of graduate qualifications and facilitating the mobility of staff and students.”(European University Association, 2018)

³„IAU works to enhance higher education community's role and actions in advancing societies worldwide. As a global membership organization, IAU represents and serves the full spectrum of higher education institutions and their associations.” (International Association of Universities, 2018)

- human issues of armed forces,
- modern technology in the armed forces,
- regional geopolitical crises.

Beyond strategic directions, also research priorities are important to define future research (Nemzeti Közzolgálati Egyetem, 2016, pp. 35-38):

- Theory of warfare,
- Strategy development and defence planning,
- Future vision of HDF 2025,
- Home defence and good governance,
- Home defence,
- Human resource work,
- International crisis management and piece keeping,
- Military history, traditions, civil-military relations.

The realisation of the above on the short and middle term serves the defence interests and tasks of Hungary, also the meeting of new challenges the military science is facing on the fields of defence policy and development of the armed forces. Detailed definition of these fields of research can be found in the article in *Military Science Review*. (Boda J. et.al, 2016)

Next to Military Science Collective also the Collective of Engineering Science is maintaining engineering connected research, also about info-communication technology within. Within engineering field of science, the matching lines of research can be described as follows (Bleszity [et al.], 2016):

- digital state,
- cyber-security,
- environmental security,
- disaster management,
- research on defence meant engineering,
- logistics and traffic.

Based on the above it can be said, that the connection of state science and engineer science is present within the research activity of NUPS, in coexistence and complementing each-other. The recent research topic thus fits well to the research fields of NUPS, by the creation of efficient education and knowledge competency it comprises several subfields of research, which supports the further strengthening of the University in national and international comparison. Thus in my view the researched topic fits well into the research portfolio of NUPS, and its outcomes can be utilised further on the fields of state science and engineer science as well.

5. THE INFO-COMMUNICATION SYSTEMS GIVING THE SUBJECT OF THE RESEARCH

The utilisation of state of the art info-communication devices and systems is inevitable in order to process and transmit information, further to realise up-to-date governmental control and command of organisational activity. To meet the constantly changing and broadening array of challenges, the use of modern tools and systems is necessary, in order to maintain efficient service to control⁴, command⁵ and the successful execution of activities.

The info-communication network in Hungary doesn't show a uniform picture, since some elements are under central management, others but belong under the supervision of the given organisation. This can of course be different in each sub-system and functions (e.g. information security) and requires collective supervision.

With the development of information technology, the possibilities a given info-communication system can provide to the user, are changing constantly, just like those, which secure the reliable operation of the system. Based on this, also the reliability and disposability of the consuming organisations can increase thus meeting the expectations.

Earlier research and also the result of the recent author verify, that governmental info-communication systems have to maintain high level disposability, accentuated security and high level ability to cooperate in order to fulfil their basic tasks, also to make each defence organisations able to cooperate, and serve each other during the given defence activity. (Farkas & Hronyecz, 2017), (Farkas, 2016)(Farkas & Hronyecz, 2016)

According to this, and based on the first goal of the research program (definition of info-communication subsystems within governmental sector) the process of following systems and subsystems is necessary during the shaping of knowledge material:

- info-communication systems supporting services;
- each subsystem with special operation and task;
- services provided by the systems;
- technology and devices building up the systems.

Government level command and control is realised with the use of governmental info-communication systems, which is basically defined by 346/2010. (XII.28) Gov. order on governmental aimed networks, and by 88/2016. (VII. 13.) Gov. order changing the above. According to these, governmental aimed networks are as in Appendix No.1.:

- National Broadcasting Main line (earlier called Electronic Governmental Main line);
- Standard Digital Radio Broadcast System;

⁴*Control* is an activity resulting in an intervention to the operation of a system, in order to maintain outer dominance of the controller through an inner process on all fields of operation of the organisation. Control is always hierarchic, making the conditions of control mean the state of superiority for one party.

⁵*Command* is an activity, during which the leader maintains dominance within the organisation, being part of it at the same time, in order to achieve the goals prescribed by the controller, but doesn't change the aim of the activity for the organisation. (control within the organisation)(Honvédelmi Minisztérium, 2010, p. 52)

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- Closed Law Enforcement Network;
- Common Network;
- K-600/KTIR News and Information System.

Furthermore, the regulation also defines the network called as closed network earlier, which means the network comprising of special systems and restricted services. These government aimed networks created and maintained by those authorised to execute separated transmitting activity, are called government aimed separate broadcasting network. Such a network is also maintained by Hungarian Defence Forces with the name Government Aimed Separate Broadcasting Network of HDF (HDF GASBN) (Farkas, 2016)

Governmental aimed networks are operating separated from common networks in all cases, which is defined by the (2) section of 1§ in the according regulation as follows:

„This recent law is applied to all electronic broadcasting networks providing public service defined by law, which are separated from the public broadcasting network physically or logically (further government aimed network), ...” (2003. évi C. törvény az elektronikus hírközlésről, 2003, p. 1§ (2))

Governmental networks are based on the National Broadcasting Main line (NBML), which supports the reach to the services as physical media. According to the above, electronic broadcasting services provided by NBML are maintained by state owned organisations and companies, thus enabling independence from the „market providers”. This of course has many positive outcomes, like cost efficiency or the utilisation of reliable state organisations. Naturally the network services are also increased greatly, like endpoints and band broadness as well. To meet this, also the experts of the state owned organisations have to possess enriched knowledge on info-communication systems and their services. The necessity of new type postgraduate specialisation programme system is thus further supported.

The other subsystem, *TETRA*, is providing radiobroadcast support for emergency tasks as a standardised system. Its main aim is to provide highly disposable, secure radio-communication to the emergency and law enforcement organisations. Since *TETRA* is utilised broadly, several organisation has authorisation to use it, the place within the system is also of high importance. Of course, this provides sound and data service as a mobile communication network. Further importance of this system is, that it works based on EU standardisation, thus enabling great possibilities during international cooperation as well.

Integration of law enforcement organisations into the national network is realised through NBML, which is enabled by the network of MVM Net PLC, and the services of NISZ PLC with the control of Ministry for Inner Affairs. High accessibility secured is inevitable to the internal organisations, because the main network between the different bases of these organisations founds the possibility of information sharing. According to this, the easily realised connecting and solid connection is inevitable, also to provide a physical base for transmitting of any type of information (voice-, data-, video service); and also the sharing of services among the cooperating organisations. (Farkas & Prisznyák, 2017, p. 593)

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K600/KTIR system is an info-communication system securing special operational conditions for the Home Defence Council and the Government, and also the information support of decision preparing and making within Hungary's defence control organisations. The three level system (central: e.g. Ministries; regional: e.g. County Defence Councils; settlement: Local Defence Councils) is a country-size network, which enables full spectrum leadership in emergency cases. It is easy to see also from this, that it is a multiply combined system comprising of several organisations, the knowledge of which can help the work of governmental experts during the planning and organising of possible cooperation.

NBML provides the connection of governmental organisations to the common governmental platform, thus reaching the info-communication services of it, and also the necessary sharing of information. In classified cases with some tasks, like disaster situations and emergencies, it gives the first step of control and info-communication support, which makes the sharing and processing of information necessary for coordination, from the alert to the ending of activities.

Another separated element of the government aimed systems is the *network of the Hungarian Defence Forces*, which is based on totally different principles of organisation, also it isn't using NBML as surface. It operates independent from that, but the integration to the governmental system is secured through a connection surface. Thus we are talking from an absolutely different shaped and serving system, which provide info-communication services to the HDF and her organisations. HDF GASBN comprises of two subsystems, which differ in the regional form of utilisation. The *stationery network*, which provides voice- and data connection to different organisations through different services, with the utilisation of different aimed systems. Typically there are two technological levels utilised in its network. These are the earlier ISDN technology and the joint package IP technology. Beyond that, also other connections, using different rented services can be found, like VSAT satellite system, EDR direction... In order to keep connection with each cooperating organisation, like ministries, international allied organisations, communication in 'outer direction' is also realised. The other subsystem is the *field network*, which is connected strongly to the permanent network, but involves more special military device, thus realising a special operational environment. Several elements of the system comprise also from analogous technology beyond ISDN and IP. According to this, the info-communication system requires a broader spectrum of knowledge from the operator personnel compared to a homogenous system.

The governmental networks above utilised the approach from the defence organisational side. Beyond that, also the sub-networks servicing other governmental and civilian organisations (ministries, offices, etc.) can provide important knowledge material during the training of experts. This element of the *governmental info-communication sector* can also be divided into additional fields, defining all the sub-fields, which provide service to the users. National Info-communication Strategy has measured and analysed the info-communication situation, and defined the most necessary guidelines of development. Situation analysis and the shaping of toolkit has been created following four pillars in the strat-

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egy, which shows just well the complex system, its users and the subfields of use. (Figure No.1.)

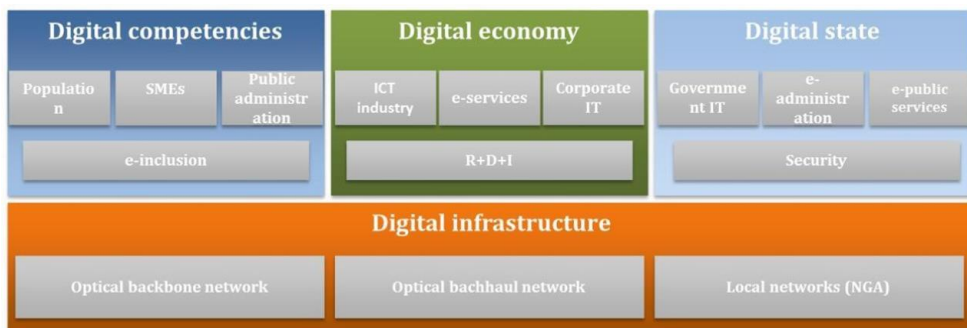


Figure no. 1: Pillars of the National Info-communications Strategy (Hungarian Government, 2014, p. 6)

The four pillars comprise of the following: (Hungarian Government, 2014, pp. 18-19)

- **“Digital infrastructure:** availability of the electronic communications infrastructure with a bandwidth required for the supply and use of digital services in all segments of the network (backbone, backhaul and local network);
- **Digital competences:** development of the digital competences of the population, micro, small and medium-sized enterprises and public administration employees, reduction of the primary (digital illiteracy) and secondary (low degree of utilisation) digital divide, enabling micro and small enterprises and public administration employees to recognise business opportunities resulting from the introduction of ICT systems and to make use of those opportunities, as well as making available the benefits of the digital ecosystem to those lagging behind durably (e-inclusion)
- **Digital economy:** development of the external and internal information systems of the ICT sector in a narrow sense of its definition and the enterprises using the electronic (commercial, banking, etc.) services of the sector, and incentives to ICT development and research-development and innovation activities for development based on ICT
- **Digital state:** supply of internal IT services supporting the operation of the government, electronic public administration services for the population and corporate target groups and other electronic services within the scope of interest of the state (e.g., health, education, library, cultural heritage related services or services aimed at the division of the state data and information assets), as well as ensuring the security of those services.”

In the recent research, pillars one (digital infrastructure) and four (digital state) are of more significance, which secure e-public service from state- and public utilisation part as well.

According to this, the knowledge gained in this field provide a broad expertise to the operators during the process of training.

Based on these, during the specialised training it is necessary to introduce the systems of defence organisations (police, disaster management, possibly law enforcement and military) and also that of the governmental (civilian) sector as well.

„Through the above described it is also easy to see, that it is necessary to get to know the info-communication systems, networks and technology (digital competency and infrastructure) of other public, and defence organisations following organising and planning principles. In order to that, those infrastructure and system elements have to be defined, which serve as the base for this knowledge. These can be as follows:

- basics of defence operations and their support;
- info-communication infrastructure;
- planning and organising of info-communication systems;
- government aimed networks (based on 188/2016. (VII. 13.) Gov. Degree; a 346/2010. (XII. 28.) Gov. Degree);
- broadcast network of law enforcement organisations;
- separated governmental aimed broadcast networks (HDF GASBN)
- public service networks and systems;
- development and strategic directions;
- information security issues.”(Farkas & Hronyecz, 2018, p. 77)

Thus it can be seen, that great number of networks are present within the governmental info-communication system, which has to provide broad support towards the users to grant access to each service. In my perspective, possessing the knowledge on these elements, the operating personnel is able to provide the high level of accessibility to the users on sufficient level.

6. SPECIAL AIMED SYSTEMS WITHIN THE GOVERNMENTAL AIMED INFO-COMMUNICATION SYSTEM

Info-communication networks and systems always comprise of several subsystems. The *physical media, the network* is built up from centrally operated and also individually operated connections, just as described above, which contain of course different ways of transmission (copper wire, microwave, optics, etc.) according to distance, environment, etc. Next to networks, the other such main element tor subsystem is the *different services and aimed systems*, which support the task execution of the given organisation with the realisation of capabilities provided through special applications. Beyond these two, a third subsystem is to be differentiated, which can be called as *traffic maintaining network*. The purpose of this is to control data, and assure it to reach its destination through the network.

Beyond the network segment described in the last chapter, also the common analysis of traffic managing network, aimed systems and users' network can be done, since the different utilised technologies (traffic managing network) are greatly effecting the aimed

systems to be used. Of course these are mutually dependent, creating a single unity, also complemented by the transmitting network.

According to this, it has to be held in focus during the process of postgraduate specialisation programme material, that the state of each system and network can be different if compared to each-other. This system of relations can be differed as follows:

- *autonomous system;*
- *a subsystem with relative autonomy but being part of another system*
- *independent system providing services (possibly also using services for that)*
- *system connecting and cooperating to further systems (networks) in order to realise services*(Munk & Horvayné, 2011, p. 221)

The education material to be processed has to contain the introduction of services reachable within the network, the aim and purpose of those, the utilised technology and its place within the system. In order to make the expert attending the training know the governmental systems in the required broadness, they have to learn the place and role of each aimed systems and subsystems within the „big” governmental info-communication system.

To this purpose, they have to get known with the following aimed systems, services and info-communication capabilities (with a less than exhaustive listing).

The info-communication network of *HDF* differs from any other governmental network also in its built up, just as regarding its operation greatly. In my aspect, minimally the following elements and subsystems have to be processed:

- HDF long distance call network;
- HDF internet and intranet service;
- Services on rented line;
- satellite services (VSAT, satellite phone)
- HDF C2 system;
- Blue force Tracking System;
- HDF KGIR system (HDF Budget Management Information System);
- basic field network;
- VTC (Video TeleConference);
- Joint Tactical Radio System (JTRS)
- NIAR (office automation system);
- mailing and monitoring system;
- HDF Secure Command and Control System;
- information services of the border defence system.

The other defence organisation, Police possesses also wire and radio frequency broadcast, connection technology, telecasting, and long distance data and information processing, frequency user, ciphering supervision and matching security technology tasks, also containing several special aimed systems, some of them being listed below (Robotzsaru integrált ügyviteli, ügyfeld. és elektronikus iratkezelő rendszer egységes és kötelező használatáról, jogosultsági rendjéről, az adatvédelem, valamint a rendszerfejl. előírásairól szóló 18/2011. (IX. 23.) ORFK ut. módosításáról, 2017):

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- Robotzsaru NEO („Robocop” office, case processing and electronic document processing system) and its subsystems;
- VÉDA (traffic monitoring system);
- electronic processing system;
- AFIS (automatic finger and palm print identifying system);
- ROVER (Police Training and Examining Uniform System);
- NOVA Integrated System (NIR-reporting portal);
- other scanning and detecting systems.

Because of its complex organisation and goals, the *National Directorate General for Disaster Management* possesses universal and special aim systems as well. It maintains broadcasting, operation control, information systems and also measuring, detecting and alarming systems covering the whole of the country, and manages the data processing connected to these as well. The place and integrity of these within the system has to be present as an important part of the knowledge material within the training as well. The following subsystems belong to the most important ones:

- disaster management information system;
- storm forecasting systems at greater lakes;
- public information system;
- MoLaRi (Monitoring and Public Alarming System);
- Marathon Terra (closed communication channel);
- help calling and alarm systems with disaster management aim;
- public and other alarm systems;
- ONER (National Nuclear Accident Relief System);
- OSJER (National Radiation Detecting, Signalling and Checking System);
- other disaster management information systems, emergency systems.

Beyond those of the three primary organisations, also the systems used by the National Command of Law Enforcement can be fitted within the knowledge material of the training, with the following elements:

- computer systems;
- broadcasting and security technology systems;
- FÓNIX (database of inmates providing non-classified data procession);
- FANY (Basic Inmates Data Recording System);
- Systems realising biometric identification;
- Marathon Terra (closed communication channel);
- other systems and technology of databases.

Other additional info-communication and information systems used by governmental and defence organisations can also be fitted into the knowledge database, in order to make the experts to see the utilised systems through in the required broadness, to increase efficiency. The constant development of governmental and public service info-communication systems and their spreading secures the service of public and organisation level require-

ments and needs, also wealth. This means that *governmental and local systems* have to be processed with a view on complexity.

Also each information security issues have to be addressed with a great emphasize, which regards the whole of the network and its subsystems as well. Thus, basics of electronic information security have has to be one of the most important part of learning material during the training, of course with a scope on the fact that this field is also present as an independent specialisation with NUPS as base.

7. SUMMARY

„*The command and control method of an organisation is affected by several inner and outer environmental factor. Important question is the feature of the supporting technical subsystem, in what quality and by which level of security it provides data and information to the workers of the organisations, in other words to the users. This feature naturally has its effect on the success as well.*”(Dorkó, 2015, p. 5) According to this and those in the earlier chapters, it can be seen, that a successful organisation can only operate efficiently, if a sufficient leadership sets clear goals, and the efficient info-communication support is granted to achieve them as well. During their work, the cooperativeness of governmental and defence organisations is mainly affected by the compatibility of their info-communication systems, and the similarity of their organising and planning procedures. In order to maintain these fields ore precise, more efficient, I understand the professional specialisation training of the info-communication personnel and the teaching of common knowledge material inevitable. In the recent paper I presented the most important Hungarian directions and goals of development by summarising the primary aims of the info-communication strategy, I listed the most important networks and subsystems, followed by the knowledge base of the planned education, which enables the process of knowledge material and a whole education plan for the postgraduate specialisation programme.

Of course all these have to be realised in a complex unity so the system and the professional personnel becomes to be able to provide a complex support, and through that the achieving of strategic goals as well.

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