Analysis of Possibilities in Postgraduate Specialisation Programmes Summarising Government Aimed Info-communication Systems and Services

Fundaments of the Training, Abilities, and Requirements[1]

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An accessible info-communication system is a key element of cooperation between each level of governmental leadership and defence organisation (police, disaster management, army, etc.) during crises, emergency cases and other events of this type. Beyond technology and technical fundaments, the availability of human factor is also a primary criterion in order to execute the activity with success.

To help this, the author analyses the conditions of creating a possible postgraduate specialisation programme, together with the most important elements, knowledge material and criterion requirements of such in the recent publication.

Keywords: *info-communication, ICT, defence sector, defence communication, postgraduate specialisation programme*

Introduction

In his earlier publications [1] [2] [3] [4] the author has analysed all the activities, during which the cooperation of each defence and governmental organisation is a key element in creating and constantly maintaining national security. Beyond disaster situations, the cooperation between governmental and public service organisations is also necessary in everyday life to ensure the broad spectrum of public service and other types of services and support of the citizens, which is a basic principle of the continually sustainable state.

The Hungarian Government, recognising the importance of the own Information and Communication Technology (ICT) sector, and its positive effect on financial and social development, has adjudicated the document *National Info-communication Strategy 2014–2020* with Government Decree 1069/2014 (II.19.) and has set its goal as: "The purpose of this strategy is to give a comprehensive overview of the current situation of the Hungarian information society and the ICT market, to define the ideal target situation and to identify

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professional trends and development targets in info-communications for the same period as the 2014–2020 planning cycle." [5: 4]

Of course, this developing tendency has to be true for the activity of all governmental and public service organisations including their info-communication network and service, as well. A National Info-communication Strategy sets the most important goal, in that the possibility of utilising information networks has to be broadened for the population, more people have to use the possibilities within info-communication networks and services, for which the conditions have to be secured by the governmental network. (See Figure 1.)
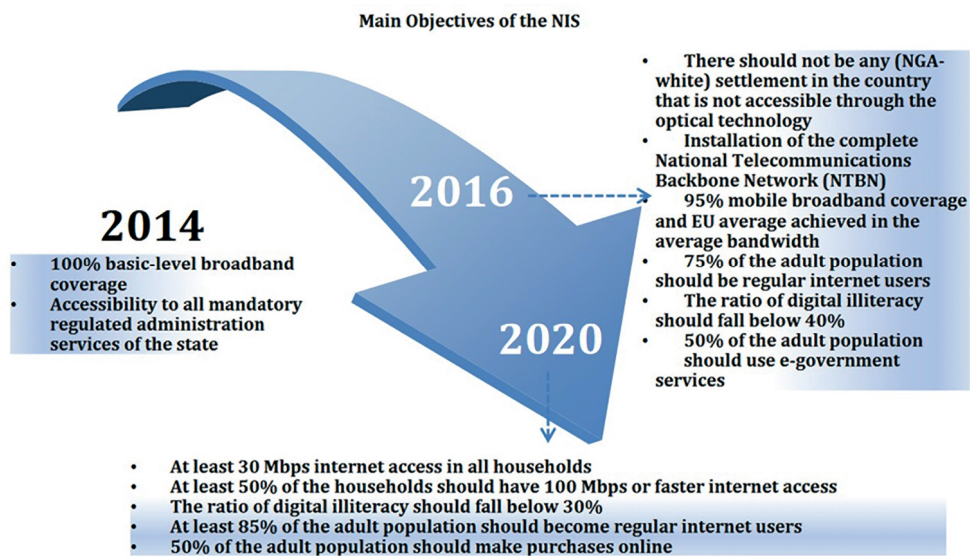

Figure 1. *The main objectives of the National Info-communications Strategy.* [5: 8]

Similarly to the above, info-communication systems of the defence organisations have to secure appropriate level of access to data and information for the whole personnel of the involved organisations, within the whole spectrum of the given operation or task. Thus info-communication systems have to provide such level of support, that is able to secure the constant flow of information, serves the users, and provides the possibility of cooperation between each organisation enabled by its interoperability. Of course these are only the basic features of the networks, which have to be complemented by others, from which one is security. The security of networks and information is one of the most vital criterion requirement nowadays, which has to be realised through local and central protection. The other requirement is that of highly trained operating personnel with broad knowledge on the system, who are able to organise the system and maintain it throughout the timeframe of use. To secure the latter, a basic element is the postgraduate specialisation programme of experts with appropriate professional basic knowledge in the field of maintaining info-communication systems in public service and the defence sector.

A platform for such education and training has to be the National University of Public Service (NUPS), since this institute is concentrating the different education, training and

postgraduate specialisation programmes of professionals for the public, governmental and defence sector.

The present publication is summarising the outcome of the second phase within the *New National Excellence Program of the Ministry of Human Capacities (UNKP)* research activity. This has been defined as follows:

- to analyse the peculiarities and requirements of the national postgraduate specialisation system;
- to define those matching points, that can make the created postgraduate specialisation training fit into the postgraduate specialisation programme system of NUPS;
- to describe the basic elements of the request for starting the postgraduate specialisation training, preparing the process of the request (goal, form, timeframe, certification, evaluation, etc.);
- preparing the process of an educational plan pattern, definition of basic courses and knowledge material.

Postgraduate Specialisation Training within the Hungarian System of Higher Education

The law on Hungarian higher education (Act CCIV of 2011 on the National Higher Education) defines what level an institute of higher education has to reach in their educational activity. The basic activity of education in such institutes involves higher professional education, basic education, master's level education, Ph.D. level education, and postgraduate specialisation, thus the whole spectrum of education levels. Figure 2 shows the system of the Hungarian education.
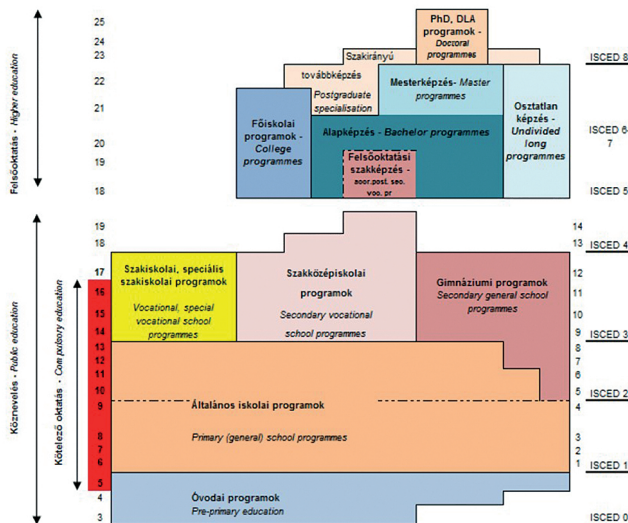

Figure 2. *The Hungarian Education system.* [6]

Following the certification on BSc or MSc level, professional specialised certification can be reached. A basic requirement to apply for the training is the existence of a BSc or MSc level certificate. This basic requirement can be complemented with further requirements defined by the institute, like a given time of professional experience, the existence of other certifications, etc.; these have to be defined by the institute in a way so it will not be dependent on which institutions of higher education the applicant has got the certification. If succeeding with the application, the student takes part in a minimum two, maximum four-semester education, depending on the actual training. The education ends in all cases with a final exam and the certification is prepared, which enables the student to fill in different workplaces and tasks. [7]

According to the regulation of Government Decree 87/2015 (IV. 9.) [8] a professional specialised training can be:

- training giving professional specialisation connected to one or more fields of education;
- training giving professional specialisation connected directly to a specialisation;
- training giving individual professional specialisation defined in the requirements for BSc and MSc education.

Further, point 2.1.3 of Annex 6 within the degree defines the obligatory data of the professional specialisation training announced by the institute, and registered, which are inevitable to define the specialisation precisely.

The creation of a professional specialisation training is a complex and difficult procedure, defined by a great amount of regulation and other documents. The Educational Authority, as the supervising body defines the data necessary and proposal to start the training, also the required documentation, and the most important regulatory framework. These are as follows:

- Act CL of 2016 on General Public Administration Procedures;
- Act CCIV of 2011 on the National Higher Education;
- Government Decree 87/2015 (IV. 9.) on the implementation of certain regulations of Act CCIV of 2011 on HE;
- Government Decree 121/2013 (IV. 26.) on the Educational Authority;
- Ministerial Decree 10/2006 (IX. 25.) on the general requirements for providing post-graduate specialisation courses;
- Government Decree 423/2012 (XII. 29.) on the admission to higher education institutions;
- Government Decree 283/2012 (X. 4.) on the initial teacher education, specialisation and the register of degree courses in teaching;
- Government Decree 248/2012 (VIII. 31.) on measures required for the implementation of Act CCIV of 2011 on Higher Education;
- Government Decree 19/2012 (II. 22.) on the quality assurance and quality development in higher education.

In summary, we can say, that professional specialisation training can be started only by institutes of higher education, following which, additional professional specialisation is accessible beyond BSc and MSc graduation, with the collecting of new knowledge. During the procedure of creation, the educational and final requirements have to be prescribed

as part of the obligatory documentation, which defines the professional fundament of the education. Parts of the requirements for finalising education are: [9]

- *Designation of the professional specialisation training.*
  The designation has to show clearly the professional field and the required level of certification to get in every case. Beyond that, similar names have to be avoided which may refer to other levels of training.
- *The designation of specialisation as given in the final certificate.*
  The designation in the certificate also has to show clearly what type of specialisation the training gives, and it has to differ from other types or levels of professional training.
- *Categorisation of the specialisation training, regarding the field of education and level of certificate.*
  The specialisation training has to be connected to a field of education (e.g. information field of education), and also connected to the minimal starting requirement; further, it also has to be defined to which education category, what category system it belongs (e.g. ISCED 2011).
- *Requirements of admission.*
  A standard requirement is to gain admission with a BSc or MSc graduation, the connecting criteria has to be defined.
- *Timeframe of the training.*
  The timeframe of the training has to be minimum two, maximum four semesters, which has to be defined precisely. A more detailed schedule (like the amount of theory, etc.) is not required, that is included in the education plan.
- *The number of credits to be collected to succeed the training.*
  The credit points to be collected during the training define the weighting of the teaching material.
- *Goal of the training, professional competencies.*
  Description of the goals, abilities and knowledge, on which the training is based, and also of the professional competency, which can be acquired through it in general.
- *Professional attributes and fields of the training.*
  The most important circles of knowledge (not courses), which define the knowledge material essentially.

Based on these, it is easy to see, that the complex system of requirements secures the quality level of the professional specialisation training, according to which the available certification can also meet high expectations.

Fitting Governmental Info-communication Professional Specialisation Training into the Educational System of NUPS

The National University of Public Service (NUPS) came to life in 2012 with the aim of creating the fundaments of standard public service basic education. The university was created with the amalgamation of several already existing institutes, thus securing the basis for high level public service education.

The vision of NUPS is as follows: the National University of Public Service defines itself as the "University of cooperation"—an effective model of cooperation among social needs, national strategic governmental objectives, and higher educational autonomy. The vision of NUPS is to become:
- the best and most attractive university in Hungary;
- a solid research and education basis in the development of Hungarian public service and of public service career model;
- a committed supporter of Hungarian higher education programmes abroad;
- an active member of international research and educational networks, in alliance with leading universities of Europe and the world.

The mission of NUPS, in the intersection of public service profession and academia, is to serve as an effective educational and academic base for state-building and public service development. Through its educational and further training programmes, NUPS supports the development of highly trained and efficient personnel in the field of public administration, law enforcement, defence and other areas of public service. NUPS defines its mission at national, regional, European and global levels. [10]

"Its foundation has created the structural, institutional and human conditions of standard public service basic education. The primary objective of the university is the high-level education of civilian public service, law enforcement, military, and national security personnel, at the same time the support of creating permeability between the standardised public service careers from the educational side." [11: 20]

The University has a significant role in education and training in the fields of public service and defence administration. The above defence activities are part of public service, thus the training of defence organisations (military, police, disaster management, etc.) is also a task of the University. "Defence administration is a task- and organisation system as part of public service, further, as a summary of activities maintained by public service organisations created and appointed to fulfil the defence tasks of the state, it involves the preparation for special legal conditions, and the state activities aiming the planning, organising and execution of defence, civil defence, disaster management, defence economy, and public supply tasks of such periods and situations. […] In order to execute defence administration tasks in a coordinated and efficient manner, the appropriate level and secure communication is inevitable. […] Primary strategic task of the future is the broadening of the started development. […] thus ensuring the standardised and effective flow of information, inevitable to fulfil defence administration tasks on an appropriate level." [11: 14–15]

All these support that NUPS, as a base for the education, preparation and training of public service and state experts, provides an excellent opportunity to realise the "postgraduate specialisation program summarising government aimed info-communication systems and services" researched and analysed by the author. The knowledge material, professional know-how and experience necessary is given at the University, which secures the organising of an excellent postgraduate specialisation programme.

In my perspective, the requirements defined in the Public Administration and Public Service Development Strategy can be achieved. The strategy prescribes that the Hungarian public service shall be organised and consistent, with a clear organisational structure,

and has to work with a personnel maintaining patriotic professional call, expertise and motivation.

The cooperation strategy of NUPS strengthens further all the efforts, which secure the high-level public service education by the process of national and international knowledge and research results. Basic success is guaranteed by the cooperation model of the University, being present in the institutional development plan as follows: [12: 4]

- national strategy, governmental goals;
- students;
- international bilateral mobility and research partnership;
- international scientific organisations;
- fellow universities;
- public service, law enforcement and military institutes.

All these support the basic strategy, according to which the task of NUPS is to build a state meeting the challenges of the 21st century, good and efficient government, and a dedicated public service with the means of science and education. Thus the task of the University is to provide complex and up-to-date knowledge, complemented with the results based on international cooperation.

In summary, the education maintained by NUPS results in experts professional both in public service and in defence administration, educated at all levels of higher education, with a special scope on the achieving further certifications, constant learning and training. The training meets the requirements of ANHE, gives an education pertaining to that regulation, securing the consistency of public service education, and fitting in the system of postgraduate specialisation programme. One of the most important parts of the regulatory framework is *Government Decree No. 273/2012 (IX.28.) on the Further Training of Public Servants,* which describes the possibility and directions of professional specialisation training for public service officers, and the necessary background to it. The results of the research at the University get built-in into all levels of education, thus into professional specialisation training as well, making them more efficient this way. Recently there are more than ten specialisation trainings in the education system of NUPS,[3] which realise the postgraduate specialisation programme of professionals with a scope on public service requirements.

Governmental info-communication specialisation training is thus easy to be fitted within the education system at NUPS, it can become a solid and leading training of the University. Based on the above, in my opinion, the knowledge material has to follow the strategic guidelines shown below:

- knowledge in focus;
- constructive methods in the teaching;
- operation oriented;
- unified;
- standardised;
- sustainable;
- secure.

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[3]   See: https://vtkk.uni-nke.hu/szakiranyu-tovabbkepzesek/szakiranyu-tovabbkepzesi-szakok

With the basic principles constantly in focus, the education has to be maintained by constantly keeping the knowledge material up-to-date, responding to changes, and keeping the basic scope. Through this, a high level education can be created, which can serve the constantly changing goals efficiently, and can meet the changing requirements effectively.

General Description of Info-communication Professional Specialisation Training, most Important Data of Starting the Training

One basic element of governmental info-communication networks, regarding their utilisation is the level of sophistication of the used technology and devices, and also the preparedness of the operating personnel. In certain cases, (classified situations, disasters) a greater level of cooperation between the info-communication networks of each organisations takes place in order to fulfil their task with success. In such cases, successful ICT support greatly affects the ability of cooperation between the different systems, with the operating personnel being a key element to it. According to this, governmental cooperation is not to be desired without the support of connected information systems and info-communication devices. A basic requirement is the reliability of the info-communication system, which secures constant support and disposability, also securing operation.

To meet these challenges and expectations, a specialisation training is offering a solution with a possible title like *Professional Specialisation Training of Governmental Info-communication Experts.* The field of education is IT.

The aim of the training is to give high level, up-to-date theoretical and practical knowledge to all governmental info-communication professionals, who maintain a high level of professional knowledge already earned earlier.

A further aim of the training is to get the partakers to know the build-up and operation of governmental info-communication technologies, systems and networks, and the possibilities of realising cooperation between them, also the importance and possibilities of info-communication competency development.

Following the training, *possessing of their knowledge will make them able* to fulfil the organising and planning tasks evolving within the given info-communication field, to respond to problems, and to meet the new challenges and expectations of the age. Beyond that, they build up a knowledge, which makes them able to make well prepared decisions on the fields of planning, organising and operation through the development of their ICT competency.

Thus the expert graduating at the specialisation training will be able to:
- understand the necessity, place and role of governmental info-communication system within the national control system;
- realise and understand the importance of the governmental info-communication system and its operation, also to utilise it at a high level;
- operate info-communication systems;
- understand the info-communication support of the government sector, the peculiarities of each network and the possibilities of cooperation;

- further raise the info-communication support of the sector with high level professional expertise;
- take part or getting involved into development activities (ordering-development-test run-education-handing over-monitoring).

The target group of the training are professionals, who are working with planning and operating governmental (public administration, military, disaster management, law enforcement, police, national security etc.) info-communication systems. The knowledge material has to combine constructive organising and planning methods and approaches and the systems and sub-systems of the governmental info-communication sector, thus securing the possibility of access to the broad spectrum knowledge material. In any case, the training can be realised efficiently by involving experts maintaining special preparedness, years long experience in the given field and development of it as well.

The training can be organised in minimum three semesters with 300 hours which, beyond the general theory, also secures the presentation of knowledge regarding each professional field, in theoretical as well as practical regards.

The training can be successful if prescribing (non-professional) higher education level BSc or MSc certificate as an *incoming requirement.*

Regarding the method of the training, postal tuition supports the gaining of knowledge with theoretical and practical classes, also to the utilisation of knowledge in real life.

The knowledge material has to comprise sub-fields and knowledge circles easy to tell apart, from general defence and administration knowledge to the operation of special aim systems:

- *Activity, call and tasks of governmental, public service, defence administration organisations*
  The Hungarian governmental system and its sub-fields are in primary focus of the education, since the knowledge of these is inevitable to provide info-communication support to the command and control activities. The operator has to maintain appropriate knowledge in order to see through the most efficient systems and networks necessary to the work and control of the given organisation, also to see the possibilities of further development.
  Comprehensive knowledge of the roles and responsibilities of the defence sector (law enforcement agencies, disaster management, armed forces, etc.) and the public sector.
- *Knowledge on utilised info-communication technology*
  The second sub-field is that of the professional basic knowledge, introducing the summary of the most important technology, methods and knowledge in our days. The importance of this field is defined by the fact that most likely the partakers will be at different levels of professional knowledge, thus the creation of a uniform picture is of primary importance, presenting technologies and applications starting from basic principles. The knowledge material of the sub-field has to comprise quality management systems (systems, applications, methods and proposals), info-communication technologies, information infrastructure, basic cyberspace technologies, cyber-defence and information security knowledge and operating systems. Since the transmission technologies operate differently in governmental networks, spectrum management has

to be a primary part of the material. *(Comprehensive knowledge on info-communication network management.)*

- *Governmental info-communication systems*
  The third and most important part of the education material is the presentation of actual professional knowledge. Based on the basic, technology and network management fields, governmental info-communication systems, networks, their structure, and the newest technology solutions, network-, service-, and application development ideas have to be introduced. Beyond the exact knowledge, it is also important to show the developments, preferred network technologies to be expected, together with the social, administration, defence and EU developments and innovation goals. The aim is that the knowledge material supports the infrastructural conditions of the uniform central administration and defence services in the field of info-communication infrastructure and operation, and that it finds the realisations of high level security for governmental info-communication services.

In case of governmental level networks, the legislative background has to be presented, together with the network structure, aims and tasks, and the sub-fields of maintaining, as well. Network monitoring, network security and the question of interoperability also give a great part of the material to be educated. Following the common, uniform part, each subsystem, like police, military, disaster management, law enforcement and the networks attaching to public administration have to be presented, with their structure, operation, maintaining and capabilities, with a focus on the special systems within the networks. During the building of the material, the logic of presenting the networks of each organisation has to be similar supporting easier understanding. A possible approach to this can be to follow the "transport network", "traffic management network" and "user networks—special applications" division of presentation securing a uniform system-centric process.

In summary the training gives a complex knowledge on government level info-communication systems, on their operation, processing the knowledge material with a view on connecting laws and regulations, complemented by professional experience and the newest results in research. The importance of the training is increased further by the fact that the additional value in case of info-communication systems is much higher than at other fields.

Summary

A basic element of cooperation between governmental level organisations (public administration, defence) is the utilisation of integrated, communication capable info-communication systems, their constant and secure operation in order to support the leadership requirements and executants' expectations efficiently. Beyond technology conditions, the maintaining personnel are also a key feature.

Thus, specialisation training, vocational education and competency development of public service professionals is a primary task to secure, prescribed by different related regulations, as well. The inevitability of constant specialisation training is beyond doubt, so

securing these postgraduate specialisation programmes is to be regarded as a high priority mission.

The professional specialisation training is based on certification already achieved and prescribed, not giving a new graduation, and ending with the earning of a certificate verifying the professional specialisation. It supports the further education of those attending based on their own professional knowledge and experience.

The presented specialisation training is developed based on the research results generated by professional experiences gained in the past years, securing the fundaments of documents to be prepared obligatory for an actual realisation. The structure, aim and basic competencies of the training secure the in-depth process of education material, with the utilisation of publications presenting results of earlier research.

NUPS, giving home to the training is clearly able to secure the human, material and other necessary conditions that enable the realisation. According to all these, the postgraduate specialisation programme fits well into the vision and mission of the University as described earlier, and its strategy as it follows:

"The intention to build good governance and committed officials, thus enabling the state to respond to 21st century challenges with the means of science and education is at the heart of NUPS's strategy.

In order to fulfil its mission, NUPS strives to:
- provide public service oriented training for the youth, in combination with modern and comprehensive knowledge based on solid moral and values;
- participate in the further training of civil servants and public administration executives;
- be successful in public service development 2020;
- provide outstanding education and continuing education;
- conduct successful research;
- provide international quality with state-of-the-art infrastructure and services;
- maintain sound institutional functioning embedded in a culture of quality and excellence." [10]

Summing it up, the broadening of services provided by info-communication systems is inevitable responding to the changing expectations, the increasing number of users (institutes, organisations) and the brightened utilisation (the coordinated work of more organisations in disaster situations and crises is necessary), which can be realised through the modernisation of operation supporting info-communication applications and systems. This can only and exceptionally be maintained by the operating personnel with constant training and professional preparation.

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