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Improvement information systems of the Hungarian Defence Force, role of the data modelling in the development's process

Proposition booklet

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Borders of the chosen project

The main topic of my researches **is**: **to analyse** the most important characteristics, components, structure of the modernity, unified, suitable for the information revolution Hungarian Defence Force information system, **to define** the conditions, process, procedure and order it's construction.

I concentrated the main attention on the questions of the long-time strategic planning, which is necessary for the development of the information system. In opposite of the one-sited technical, technological, infrastructure orientated point of view I demonstrate the priority of the integrated in the real control processes application's information support, and I present the realization's possibility and conditions of this priority.

I my dissertation summarizing the results of my researches I present one variant the information strategy of the Hungarian Defence Force, in detail analyse integrating role of the information system's data model, which support the functional processes, describe the relationship of the data model with other elements of the information support.

The describing of the main topic doesn't overstep the strategic marks of the developing and application of information systems, doesn't determine concrete projects and their realisation, at the same time the dissertation describe the conditions, possibility and methodology the realization of the strategy in within the scope of projects.

Timeliness of the theme

The Hungarian Defence Force got to doorstep of the information society with out of date, non effective information system. "The present information system of the armed forces is in arrears with the modern requirements and strong demand the renovation." [1] This is an objective requirement, which works independent of our recognizing, at the same time idling, or the wrongly selected direction causes serious problems, results our lagging behind.

The whole information system of the Hungarian Defence Force is to be reconstructed.

The pressure of the reconstruction from the foundation can be changed into virtue if we make conscious, centrally controlled development in the future, because we can leave out some technological steps. Nowadays the rapidity and complexity of the technological progress means a serious challenge in planning and using information technology.

At the same the favorable chances can be utilized only in case setting ourselves the target of complex information development and for the realization of this target we settle an suitable development strategy.

In result of the defence revision, and defence force refashioning will be built a professional, well organized, powerful structured, possessing high capability armed forces. For the modernized defence forces we have to bring up to date the information system.

The development of the military information system is it is absolutely necessary both for the national interest and for the performance of the allied obligations. . The **information** is getting more and more significant **resource** of organizations, among them military organizations. The NATO doesn't determine any specifications for the allied armies for the unification of their information systems. At the same time the Alliance determine the main requirements of interoperability, and the performance of these requirements indicates the main goals of the national development process.

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[1] Maj. Gen. István Mráz: The modernizing of the higher command's information system. PhD dissertation (Bp. 2001. p.38.)

Nowadays the information technology has come to a crisis at Hungarian Defense Forces. The lack of centralization in some cases has opened the way before the occupational carelessness. At many places the knowledge of an informatics specialist is demanded but only at a few places the informatics as a science is demanded, which could answer to the questions of integration and unification of independent systems. At the same time in the process of reorganization is opening an advantageous perspective for the military information technology. The recognition and analysis of the former shortcomings, the recognition of necessity of development conception, the increasing expectation of chiefs are characteristic nowadays.

In the next years in spite of the fact that the financial founds would limited, in case of having strong development strategy, powerful project management the Hungarian Defence Force has good chance in the field of improvement in his information system.

The Hungarian Defence Force doesn't have yet a complex, integrated information system's development strategy.

The first task is to accomplish the strategy, the second one is to adjust it permanently to the new requirements and conditions.

Work-hypothesis

In my researches I started out from the following hypotheses:

- We are essentially behind with informatics systems used in NATO countries, especially at Armed Forces in the USA, the whole information system has to be reconstructed;
- The Alliance doesn't determinate the detail requirements of the allied countries information system, doesn't deliver such systems for the allied armies, we have to think about the national development tasks;
- For the establishing of the HDF's new information system is necessary to absolve a conscious, complex, national developing process;
- The development and improvement of informatics systems are generally middle and long-term investments, therefore in compliance with that require an appropriate planning of periods. Since the information by itself inside the organization is the primary resource of command and control, the definition of requirements connected with the creation and application of informatics systems, the right and task of the leadership is to work out informatics development strategy and the management of its realization.;
- The elaboration and acceptance of the informatics strategy is timely and indispensable. In case absence of the information strategy we will meet the following problems:
    - these systems are not full-scope on the given sphere;
    - with a few exceptions these systems are made for the supreme leadership of HDF;
    - there is no connection between the systems or the connection is very loose;
    - the same data are stored in several systems and these data are not taken from each other but asked of the subordinated organizations. That's why the overload of the data providers is quite enormous;
    - the used code systems are not unified what in many cases make the transportation between the databases impossible;
    - the development activity of different informatics organizations are not properly synchronized, that's why there are several parallel developments.

- In the information strategy is involved the risk of the overweight technological questions and being pushed into the background the questions of the applications. The information system's development strategy has to be complex and proportional, which means the proportional effort in both the infrastructure and the application's system.

Research-aims

The **final goal** of my researches: **to specify** the significance of the strategic planning, the essence of the strategic plan, the conditions and process of realizing of the strategic plan. To outline a variant of development strategy, which provide proportional, stable evolution of the HDF's information system, make possible stepping over some steps and provide immediate closing up to the allied systems.

Section goals:

- To verify the necessity the information development strategy's elaboration ;
- To verify, that the development and improvement of informatics systems are generally middle and long-term investments, therefore in compliance with that require an appropriate planning of periods. Since the information by itself inside the organization is the primary resource of command and control, the definition of requirements connected with the creation and application of informatics systems, **the right and task of the leadership is to work out informatics development strategy and the management of its realization**.
- To explore and analyze the evolution's process of the HDF information system, and estimate the position of information technology in Hungarian Defense Forces;
- To define the main components, elements of the information development strategy;
- To describe the structure of the data base, which is the most important bonding material of the information system;
- To analyse the applications, based on the integrated data base system;
- To define the most important starting tasks in the realization of development strategy;
- To analyse the requirements and conditions of operating the developed and installed information system.

Research methods

In my researching process

- I made an effort to explore, get to know, analyse the relevant bibliography and documents, draw the conclusion for my field of research, to utilize the methods had found in the specialized bibliography;
- I made the most of the benefits of my membership in the Scientific Advisory Forum at the NC3A, I discovered knowledge and experience from information system development goals and successes of NATO and allied defence forces;
- I analysed the symptoms and the principles experienced in my information system developing activity;
- I worked up the materials of different conferences, demonstrations, presentations;
- I experimented at some medium sized organisations to analyse the possibility of realization the suggested development ideas.

Structure of the dissertation

The dissertation is divided on five paragraphs.

In the **first paragraph** I look over the challenges, environmental factors, internal requirements, that need the improvement the HDF's information system. For the evaluation of possibilities of the application of information technology I explain a short historical review, and summarize the main requirements of the developing.

The position of the present use of information technology can be characterized according to the following:

Relatively a lot of independent informatics systems have been elaborated which well have infiltrated into the command work in the given sphere and have become indispensable.

At the same time:

- these systems are not full-scope on the given sphere;
- with a few exceptions these systems are made for the supreme leadership of HDF;
- there is no connection between the systems or the connection is very loose;
- the same data are stored in several systems and these data are not taken from each other but asked of the subordinated organizations. That's why the overload of the data providers is quite enormous;
- the used code systems are not unified what in many cases make the interoperability between the databases impossible;
- the development activity of different informatics organizations are not properly synchronized, that's why there are several parallel developments.

We are essentially behind with informatics systems used in NATO countries, especially at Armed Forces in the USA. The reason is first of all – but not exclusively – the lack of resources that can be used for technological development. This lack of resources can be changed into virtue if we make conscious, centrally controlled development in the future, because we can leave out some technological steps.

Analyzing the situation it could be concluded that the most important task is the drawing up and enforcement of the central will. The conflict and the differences between various systems should be revealed. In the beginning the big investment has to be avoided (because of lack of required resources) but should be started with review of requirements of command system and control of processes providing information. There are some milestones. Even the information technology of HDF cannot avoid the build up of large database center. These centers should be connected to a hierarchy system. Around these centers such professional informatics organizations should be assured that efficiently help the command and the users.

At the same time in the process of reorganization is opening an advantageous perspective for the military information technology. The recognition and analysis of the former shortcomings, the recognition of necessity of development conception, the increasing expectation of chiefs are characteristic nowadays. The problem is, that the defense reduced his in-house development capacity, and the sector doesn't have any professional quality information system development staff.

Summarizing and evaluating the present situation of development and use of information technology is not a technological, technical question. It is the problem of supporting this process, and the responsibility of the military leadership for the information system development.

In the **second paragraph** I describe my conception for the developing of military information system, the elements of information development strategy and the content of some elements.

The development and improvement of informatics systems are generally middle and long-term investments, therefore in compliance with that require an appropriate planning of periods. Since the information by itself inside the organization is the primary resource of command and control, the definition of requirements connected with the creation and application of informatics systems, the right and task of the leadership is to work out informatics development strategy and the management of its realization. The necessarily growing investment in informatics systems requires the command on higher level to take part personally in the formation of the development strategy and in its implementation, and should be committed towards it. Important guidelines are that the strategy should comprehend the use of information in their widest sense including the traditional paper-based document systems, reports, records and manual administration of data as well as systems based on up-to-date information technology. Naturally the information technology is more and more effective tool for supporting information systems therefore it is one of the most important components in the planning of informatics strategy. Nowadays the rapidity and complexity of the technological progress means a serious challenge in planning and using information technology. Nevertheless the informatics systems using the information technology must be subordinated to the necessary information demanded by the organization of HDF, its structure and command hierarchy. The elaboration and acceptance of the informatics strategy is timely and indispensable.

The informatics strategy includes:

- declaration of commitment of higher command towards the important role of information systems in any organization;
- declaration of policy to be followed;
- technical and guiding conceptions that declare the methods and fundamental rules with their help the development and operating of informatics systems will be made.

The development strategy cannot be drawn up with one goal. It should be interpreted as an alloy of many developing tendencies that all together serve the realization of the global aim, it means the increase of efficiency of command and control. The other important point of view that the informatics strategy does not contain developing projects. The strategy has to provide guidance that what kind of developing projects should be started and which projects fit into the strategic goals.

The possible elements of the development strategy are shown on the Figure 1.

The Elements of Informatics Strategy

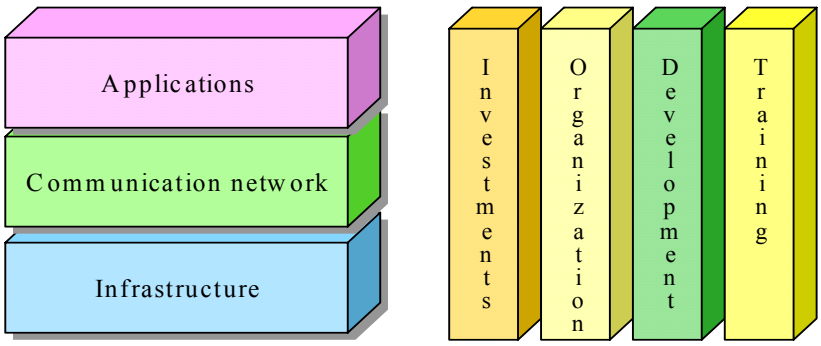

Figure 1.

Users can get informatics support by **applications**. The more full-scale, more authentic, more complex the applications are, the more the informatics system becomes indispensable and integral element of the command system. The applications come into existence through informatics developments. In initial stage of information technology the special problems were managed by suitable solutions. Nowadays the world turns towards general applications. The leaders follow certain standards in the countries possessing highly developed information technology. There are not enough special developments and sources to cover all areas of life. It is necessary to make a compromise with standards that demand adaptability from the command. The quality of the strategy of informatics development depends on the determination of proportion of special and general developments. Naturally it is necessary to remark that there is no clearly special nor clearly general development in a given, concrete application, because they are considerably related.

The creation of the infrastructure includes the creation of the information technology systems and organizations.

The computer backbone system of Hungarian Defense Forces constitutes the basis of the technical system. (Please, do not confuse with backbone network involved in the developing plans of the signal corps.) The backbone system means computer centers for each command and control level (data processing or informatics centers). Professional staff should operate them basically. The user workstations installed at the workplaces form the important part of informatics infrastructure. These are connected to the given computing center like a naval string.

According to the informatics regulation of Hungarian Defence Forces every military organization should posses informatics system. For its operation the suitable informatics infrastructure is needed. On the certain command level the informatics infrastructure contains the informatics centres and workstations installed at the user workplaces.

In the informatics centers the staff supports the general informatics tasks:

- gathering information;
- recording information;
- information storage (keeping the rules of secure data preservation);
- data archive;
- the connection of user workstations and the access according to the authorization; registering and coordinating the messages;
- automation of handling classified documents;
- the creation and organization of the possibility of connection with external organizations and other commanding levels;
- supporting users in efficient use of informatics system.

The increase of efficiency of informatics system (considering the enlargement of applications) can be achieved by enlarging the number and services of user workstations as well as assuring that the information technology is not only a simple aid of command process but a more and more complete assistant of that.

The staff, equipment and hereby capacity of informatics centres of the informatics backbone system is increasing, moving upwards in the command hierarchy. The General Staff of Hungarian Defence Forces has to have such an informatics centre that provides the General Staff with the database referring to resources of the Hungarian Defence Forces in each period. Additionally it receives data from subordinates; prepares and sends them to the users of information; holds together and supplies the rest of informatics organizations with data of consistent order of battle and table of organization. The Informatics Service Centre of Hungarian Defence Forces is the one of the most important elements of the backbone system that has to be established at first. This is on the top of the system from the point of view of information technology. This centre can provide the function with consistent informatics

systems of the Hungarian Defence Forces, connection of different subsystems, system integration, unification of different databases, professionally support fulfilment of informatics tasks ongoing in every command level of HDF.

It is practical to establish informatics centre providing informatics support in functional fields represented by blocks of General Staff. These functional centres can provide more detailed information for experts of given area. On the other hand these centres must have tight data connection with the Informatics Service Centre of HDF, since linking with the consistent database describing resources of HDF they have to solve their tasks.

It is necessary to provide connection between the elements forming infrastructure of informatics systems. It would be realizable exclusively with tools of information technology in such a way that informatics centre of each command level is self-supporting. It means that its database contains data necessary for each command level, and the change of data between levels is realized by sending on data carriers. However this technology can be only temporary, because nowadays it is out-of-date and excludes one of the most important achievements of application area of information technology namely the direct and fast data access.

That's why in tight connection with formation of infrastructure of information technology, the **communication system** has to be formed at the same time. Its planning and founding is the task of signal service of HDF, for that reason present concept does not contain it. On the other hand consistent establishment of informatics and communication infrastructure is unavoidable requirement. Informatics and communication centres in each command level have to be installed near each other and cooperate tightly with each other. It increasingly becomes more inseparable with growth of electronics for users. At the same time their functions and purposes are always fairly distinguishable.

Infrastructure of the backbone system and workstations of users to certain command levels are static systems. They are mass-produced and available in commerce. It is temporarily applicable for the whole system in case of lack of financial sources. In certain troop command levels portable and military tools have to be taken into consideration in the long-term.

An important **task** of **the informatics** strategy is **to point out the tendencies of development**.

In the **third paragraph** I describe the main system integration component of the information systems: the data model.

The existing systems were worked out and installed in different terms, in different development environments, and under different technical conditions. Besides applications of some codes and detailed data are different in a less degree.

Integration and unification of their services could substantially enlarge effectiveness of current and newly developable systems.

The basic condition of development, integration, and modernization of informatics system of HDF is the modelling and the creation of the model. During the modelling system of information technology of Hungarian Defence Forces, such a planning model has to be established, that reflects informatics process taking place at different command levels in the peace and wartime. That's why it is adaptable to synchronize the informatics systems building on the different command levels and different functional areas.

Two most important elements of informatics model are the **data model and the functional model**.

The **consistent database** describing resources of Hungarian Defence Forces can be established on basis of data model. The build-up of functional subsystems has to be determined and applied by **consistent** database. As the database describes resources, the

subsystems desired to develop can be assigned on basis of approach to resources, they can be fundamentally grouped in scopes of tasks of J1-J6.

Regarding performance of the traditional developments it is necessary to start from the fact that the foregoing developments are not adequately synchronized, in this manner beside the requirement to save quality, some of their reconstruction are necessary for integrated proceeding. **It is necessary to start the work with the description of resources or as its synonym with the formation of consistent database.** The integration of database is realizable only with central will and direction, planning coming from above to down; the application of up-to-date methodology and development tools. The most important tasks of database planning are the determination of objects that must be recorded, attributions describing them and working-out the identifying and grouping code system. Database planning is a continuous activity; its important part is the standardization that ensures the synchronization of results of system building, necessarily still remaining different.

Physical formation of databases is a long process that is realizable by means of gradual, systematic consolidation of functional subsystems. It would be practical to form a reporting system initially, before the build-up of functional systems for the sake of providing early operation of command system or in line with them for formation and feeding the database with data not covered by them. Thereafter it is necessary to gradually develop functional subsystems replacing reporting system.

In the **fourth paragraph** I systematize the conditions, tasks, methods, organizations, which are required for the developing information systems. I define the main tasks of investment, developing, organizational changing, building and training.

In the **fifth paragraph** I summarize the results of my researches, and put forward a proposal for the realisation of the strategic planning in the Hungarian Military, and having the strategic plan, on the starting the developing projects:

Summarizing of my experiences, analysis, system of my view

Entering the new millennium it will making reality, that the information revolution result the information community.

The Hungarian Defence Force has to prepare for keeping pace with challenges of information community, has to be prepared to apply the possibility of the new technology.

The Hungarian Defence Force reached the doorstep of the information community with an out of date information technology. We are essentially behind with informatics systems used in NATO countries, especially at Armed Forces in the USA. Nowadays the rapidity and complexity of the technological progress means a serious challenge in planning and using information technology. We have to consider, that the development of information systems is one of the most important task in the Hungarian military.

We are essentially behind with informatics systems used in NATO countries, especially at Armed Forces in the USA. The reason is first of all – but not exclusively – the lack of resources that can be used for technological development. This lack of resources can be changed into virtue if we make conscious, centrally controlled development in the future, because we can leave out some technological steps. We can leave out some technological upgrade steps, because we join in the evolution spiral on a higher level. The other reason is the question of information systems security. In the past the problem of security didn't have been in the front row in the developing of information systems. The countries have built their system in the near past now have big problems with solving the demands of information security and safety. If we develop our systems on the newest information security technology, we can economy a lot of budget founds.

It would be practical, if the information system development obtained a highest priority in the developing process of capabilities of the whole military system. During the DPQ planning the Hungarian Defence Force took a big number of information and communication technology development task upon oneself. Among the DPQ tasks are many, which need the information technology support. We experience many problems with fulfilment of NATO engagements.

Significant part the fulfilment of NATO engagements needs investments from import sources. If the information technology investments receive a higher priority, the development process could be accelerate, and in the same time involving the national information system integrator companies we could be replace the import with national sources.

Winning military order for their products the Hungarian national information technology companies, getting financial founds, could increase their military development capability. Turning stronger this companies could be engage retired from the military good specialized officers and generals, in this way strengthen their professional tools, and on this found could be successful compete on NATO tenders. In summarizing we can determine, that in this way we could rapidly work off our backlog, and could realise advantage in national economy.

After the decision of giving the information system development an appropriate high priority, we have to work out the information development strategy.

For the preparation of development projects and realization of these developments, Hungarian Defence Forces (HDF) have to posses a strategy for information technology. The informatics strategic planning is such an intermediate-term planning of informatics systems and their operating infrastructure that fully helps the management in realization of efforts of organizations and their goals. The **information** is getting more and more significant **resource** of organizations, among them military organizations.

The main aim of the military use of information technology is that the leadership of HDF could control as efficiently as possible the carrying out the tasks coming from their basic function. For this informatics systems have to be created which facilitate gathering, storing, processing and handing on information. The informatics systems improve the information supply and make it faster and more accurate, ensure the possibility of more and more complex analysis. The task of information technology is versatile utilization of environmental conditions (command requirements, organization, hardware, software and communication possibilities) for the sake of improvement of efficiency and continuity of leadership. The development and improvement of informatics systems are generally middle and long-term investments, therefore in compliance with that require an appropriate planning of periods. Since the information by itself inside the organization is the primary resource of command and control, the definition of requirements connected with the creation and application of informatics systems, **the right and task of the leadership is to work out informatics development strategy and the management of its realization**. The necessarily growing investment in informatics systems requires the command on higher level to take part personally in the formation of the development strategy and in its implementation, and should be committed towards it. Important guidelines are that **the strategy should comprehend the use of information in their widest sense** including the traditional paper-based document systems, reports, records and manual administration of data as well as systems based on up-to-date information technology. Naturally the information technology is more and more effective tool for supporting information systems therefore it is one of the most important components in the planning of informatics strategy. Nowadays the rapidity and complexity of the technological progress means a serious challenge in planning and using information technology. Nevertheless the informatics systems using the information technology must be

subordinated to the necessary information demanded by the organization of HDF, its structure and command hierarchy.

For the creation of informatics strategy it is necessary:

- to know the tasks of the organization
- to define the role of informatics systems in carrying out these tasks

The process of definition of the strategy:

- analysis of the present situation of information processing in Hungarian Defence Forces
- survey of claim connected with the information supply; analysis of the possibilities of satisfaction of all demands
- working out and approval of the development strategy
- insert in the yearly financial planning system
- determine projects for the sake of realization, control of implementation, installation and operation of the systems.

The informatics strategy includes:

- declaration of commitment of higher command towards the important role of information systems in any organization;
- declaration of policy to be followed;
- technical and guiding conceptions that declare the methods and fundamental rules with their help the development and operating of informatics systems will be made.

The development strategy cannot be drawn up with one goal. It should be interpreted as an alloy of many developing tendencies that all together serve the realization of the global aim it means the increase of efficiency of command and control. The other important point of view, that the informatics strategy does not contain developing projects. The strategy has to provide guidance that what kind of developing projects should be started and which projects fit into the strategic goals.

The creation of the infrastructure includes the creation of the information technology systems and organizations.

The computer backbone system of Hungarian Defense Forces constitutes the basis of the technical system. (Please, do not confuse with backbone network involved in the developing plans of the signal corps.) The backbone system means computer centers for each command and control level (data processing or informatics centers). Professional staff should operate them basically. The user workstations installed at the workplaces form the important part of informatics infrastructure. These are connected to the given computing center like a naval string.

Users can get informatics support by **applications**. The more full-scale, more authentic, more complex the applications are, the more the informatics system becomes indispensable and integral element of the command system. The applications come into existence through informatics developments. In initial stage of information technology the special problems were managed by suitable solutions. Nowadays the world turns towards general applications. The leaders follow certain standards in the countries possessing highly developed information technology. There are not enough special developments and sources to cover all areas of life. It is necessary to make a compromise with standards that demand adaptability from the command. The quality of the strategy of informatics development depends on the determination of proportion of special and general developments. Naturally it is necessary to remark that there is no clearly special nor clearly general development in a given, concrete application, because they are considerably related.

The basic condition of development, integration, and modernization of informatics system of HDF is the modelling and the creation of the model. During the modelling system

of information technology of Hungarian Defence Forces, such a planning model has to be established, that reflects informatics process taking place at different command levels in the peace and wartime. That's why it is adaptable to synchronize the informatics systems building on the different command levels and different functional areas.

Two most important elements of informatics model are the **data model and the functional model**.

The **consistent database** describing resources of Hungarian Defence Forces can be established on basis of data model. The build-up of functional subsystems has to be determined and applied by **consistent** database. As the database describes resources, the subsystems desired to develop can be assigned on basis of approach to resources, they can be fundamentally grouped in scopes of tasks of J1-J6.

Regarding performance of the traditional developments it is necessary to start from the fact that the foregoing developments are not adequately synchronized, in this manner beside the requirement to save quality, some of their reconstruction are necessary for integrated proceeding. **It is necessary to start the work with the description of resources or as its synonym with the formation of consistent database.** The integration of database is realizable only with central will and direction, planning coming from above to down; the application of up-to-date methodology and development tools. The most important tasks of database planning are the determination of objects that must be recorded, attributions describing them and working-out the identifying and grouping code system. Database planning is a continuous activity; its important part is the standardization that ensures the synchronization of results of system building, necessarily still remaining different.

Physical formation of databases is a long process that is realizable by means of gradual, systematic consolidation of functional subsystems. It would be practical to form a reporting system initially, before the build-up of functional systems for the sake of providing early operation of command system or in line with them for formation and feeding the database with data not covered by them. Thereafter it is necessary to gradually develop functional subsystems replacing reporting system.

Services of systems based on traditional, basically character databases can be effectively grown wider with graphical databases and information services nowadays. Geographic information systems have primary importance in developments of informatics systems of HDF. Graphical systems are elemental accessories of traditional systems. With respect to technological features GIS are tightly attached to the traditional databases. Similarly to other systems in the development of GIS it is necessary to keep the order of development phases building on each other. In the development of GIS it is necessary to form standards that provide the interoperability of different systems. It is determinant to use the same digital map base in the development GIS. For this consistent base it is necessary to work out the database describing maps and database of applications attached to maps. The strategy of informatics development primarily deals with formation of user databases; formation and maintenance of describing databases attached directly to the maps are the tasks of topographer specialty. In the present situation the lack of databases describing maps substantially reduces applications, so at the beginning we will often meet such a problem, that within the frame of

The creation of the infrastructure includes the creation of the information technology systems and organizations.

The computer backbone system of Hungarian Defence Forces constitutes the basis of the technical system. The backbone system follows the organization structure of Hungarian Defence Forces.

According to the informatics regulation of Hungarian Defence Forces every military organization should posses informatics system. For its operation the suitable informatics infrastructure is needed. On the certain command level the informatics infrastructure contains the informatics centres and workstations installed at the user workplaces.

The increase of efficiency of informatics system (considering the enlargement of applications) can be achieved by enlarging the number and services of user workstations as well as assuring that the information technology is not only a simple aid of command process but a more and more complete assistant of that.

The staff, equipment and hereby capacity of informatics centres of the informatics backbone system is increasing, moving upwards in the command hierarchy. The General Staff of Hungarian Defence Forces has to have such an informatics centre that provides the General Staff with the database referring to resources of the Hungarian Defence Forces in each period. Additionally it receives data from subordinates; prepares and sends them to the users of information; holds together and supplies the rest of informatics organizations with data of consistent order of battle and table of organization. The Informatics Service Centre of Hungarian Defence Forces is the one of the most important elements of the backbone system that has to be established at first. This is on the top of the system from the point of view of information technology. This centre can provide the function with consistent informatics systems of the Hungarian Defence Forces, connection of different subsystems, system integration, unification of different databases, professionally support fulfilment of informatics tasks ongoing in every command level of HDF.

It is necessary to provide connection between the elements forming infrastructure of informatics systems. It would be realizable exclusively with tools of information technology in such a way that informatics centre of each command level is self-supporting. It means that its database contains data necessary for each command level, and the change of data between levels is realized by sending on data carriers. However this technology can be only temporary, because nowadays it is out-of-date and excludes one of the most important achievements of application area of information technology namely the direct and fast data access.

That's why in tight connection with formation of infrastructure of information technology, the **communication system** has to be formed at the same time. It's planning and founding is the task of signal service of HDF, for that reason present concept does not contain it. On the other hand consistent establishment of informatics and communication infrastructure is unavoidable requirement. Informatics and communication centres in each command level have to be installed near each other and cooperate tightly with each other. It increasingly becomes more inseparable with growth of electronics for users. At the same time their functions and purposes are always fairly distinguishable. Figure 4 shows the infrastructure of consistent informatics system of Hungarian Defence Forces. It can be seen that individual organizations possess independent local networks (LAN). Their functional structure is shown in Figure 3. These local networks are connected via communication backbone network of HDF making connection between remote workstations and formation of network providing remote access (WAN) possible. According to the proposed architecture, servers of the individual local networks are connected that means services are always provided by organizations of information technology.

Infrastructure of the backbone system and workstations of users to certain command levels are static systems. They are mass-produced and available in commerce. It is temporarily applicable for the whole system in case of lack of financial sources. In certain troop command levels portable and military tools have to be taken into consideration in the long-term.

The informatics strategy doesn't determine particular developing tasks and developing requirements. The developments should be made in projects that have to be adjusted to the developing strategy. The higher commanders' tasks are the approval and supervision of the projects. The project management would be accomplished by temporary or permanent organizations with the control of higher commanders.

Before starting new projects we have to revise on-going or prepared developments, if they suit to our new strategy or not. If it is necessary and possible we can stop and reorganize them. After it the developments can be continued.

Establishing the informatics infrastructure, the organizations and their hierarchy have to be set up at the same time.

It is impossible to carry out the informatics strategy without intensive expansion of knowledge. The problem of training of the future specialists is solved, but we have to pay continuous attention to track improvements of information technology. The bigger problem is the retraining of experts. Not only the lack of financial resources, but professional problems constrain the exclusive application of outer training.

Essence of proposals

The leadership of HDF has to decide on beginning the intensive information system development.

After making the appropriate decision is necessary to create the right conditions for the warranty of realization.

The first question is to decide the resources employed for the development. There are two different ways in the development process of information system HDF: the first is the national development, and the second is the import and naturalize some systems. The third way, to receive unified systems from the Alliance practically doesn't exist. My suggestion is to decide on the national development. The naturalization an imported system is very complicated and in some situations is more expensive, then the original, national development. The price of the national manpower is less expensive, then the same resource in the allied countries. The national development is advantageous for the Hungarian economy. The national development is sensible to combine with using integrated systems, such SAP, Oracle, etc. The most important condition, that the system integration has to realized by national recourses.

It is very important to reorganize the organization's order of the information system's development. Since the information by itself inside the organization is the primary resource of command and control, the definition of requirements connected with the creation and application of informatics systems, the right and task of the leadership is to work out informatics development strategy and the management of its realization.

Significant problem is the order of realisation different developing projects. There are to ways: the in-house developing, or the outsourcing. In the Hungarian military doesn't exist any more the appropriate human resources for the in-house developing. At the same time the outsourcing variant of developing need a system integrator organisation, which can effective grant providing the military interest. The most effective way is, when the Ministry of Defence own the system integrator company.

Very important question is the operating the developed systems. For the operating can be effective the same company, which has played the significant role in the developing process.

After making the decision for beginning the information system developing it has to be founded the project management system, within his scope to elaborate the strategic plan of developing, and fix the priority of execution projects.

The first projects should be the following:

- data reporting system of Defence Forces;
- development of data model;
- development of logistic information system;
- internal message handler systems of General Staffs and Logistics Staff;
- information systems of specified areas;
- operational planning and management support system;
- complex information system of military organizations;
- developing Host Nation Support System.

I expect, that my researches will contribute to the planning of information system development strategy and his realisation within the scope of different projects.

Summary of my own scientific results:

1. I elaborated the military information system development strategy principles, defined the elements of the strategy plan, analysed the essence of the elements.
2. I elaborated the system integration function of the data model in the information system, created the draft of the relation data model.
3. I classified the information system applications, and elaborated the proposal of classification in Hungarian military.
4. I analysed and elaborated the basic requirements of the information back boon system.
5. I analysed the system of conditions the realizing of the information system developing strategy, and one variant of the outsourcing methodology.

Publications

Native published book, chapter

1. Introductory in the electronic data processing.
   College lecture notes
   Máté Zalka Military Technical College , 1975.

2. Method organizing of military information systems
   Reference book. System organisation chapter.
   Information Technology Institute 1988.

3. Information technology regulation
   Service book. System development chapter.
   HDF. 1993.

International, or national competition

1. Concept for information technology development in HDF.
   New Defence Review 1998. III. place
   Published: 7-th booklet, 1998. p.18.

Contributed article in Hungarian periodical

1. Support tasks in information systems of military leadership.
   New Defence Review 1996/7. p.131-137.
2. Organisational frames of realizing information strategy.
   MZNDU Publications 2002/2
3. Information technology challenges, development strategy
   MZNDU Publications 2003/2
4. Necessity and possibility of development HDF's information system
   MZNDU Publications 2003/3 (approved for publishing)

Presentations on conferences, lectures on Hungarian language.

1. Polemical lecture on the Information systems conference of HDF on 1993.
   Publication of Information Technology Department the General Staff.
   Budapest, 1993.

2. Information technology support of the command and control activity; „Reveal theoretical and organizational factors for the increase of effective the military leaders training." Conference.
   Publication of Scientific Organisation Department the General Staff.
   Budapest, 1994.

3. Information system development tasks of HDF.
   Information technologies conference of HDF.
   Publication of Information Technology Department the General Staff.
   Budapest, 1997.

4. GIS developments and results in HDF.
   „GIS systems in support of military command and control." conference
   Publication of Ministry Defence Technological Office.
   Budapest, 2001.

5. Necessity and timely of preparing information system development strategy for the different organisations.
   8-th. conference of enterprise information systems.
   Balatonfüred, 2001. November. . Collection of lectures. p. 17.-19.

Internal studies

1. Proposal force innovation project: "Developing of field tactical command, control, information and communication systems".
   ED MoD Information technology Office, 2003. January.

Curriculum vitae

Col. (ret.) Jenő GORZA

Personal details

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Qualification

1963-1967	*Secondary School* : **Nagy Lajos Gimnázium**, Szombathely (Hungary) summa cum laude
1967 - 1972	*University:* **D.Sz. Korotcsenko Economical University,** Kiev (Ukraine) M.Sc. in analyse and organisation of information technology summa cum laude
1983 – 1985	*Military education:* **Zrínyi Miklós Military Academia,** Budapest Military sciences summa cum laude
1999 -	PhD candidate at the **Zrínyi Miklós Military University**

Lenguage skills

English

German

Russian

Military carrier

1972-1977	Civilian employee at the Hungarian Defence Force General Staff
1977-1979	Captain at the Hungarian Defence Force (HDF) General Staff
1980-1985	Deputy Chief of Department at The Information Technology Institute Of HDF
1986-1988	Major, commander of the Information System Development Centre of the Information Technology Institute, Deputy commander of the Institute
1988 -2001	Lt. Col., commander of the Information Technology Institute Of HDF
1993	Promoted Col.

2001 - ret. col., Chief Information Officer at the MoD ED Co.

Area of expertise

Planning and developing of military information systems, planning and developing applications, data bases, information infrastructure and network, organisation and control military computing, control hardware and software inventory of HDF, developing information technology plans for the HDF, project-, and organisations management experience.