in training instead of quality, thus not an individual approach; imperfection extramular and distance learning; low qualification of teaching staff; corruption in higher education; low motivation of teaching staff; universities lack of interest in the implementation of innovation; outdated equipment stock; lack of cooperation with foreign universities; sharp annual decline in the number of students; low level of interest among foreign students; limited ability of scientists to participate in scientific activities due to their considerable cost and lack of funding for such travel; slow implementation of the issuance of double degrees in cooperation with foreign universities; poor involvement of foreign research and teaching staff into educational process in domestic universities; specialists training is irrelevant to the real needs of the labor market; non-recognition of national diplomas of higher education in the world.

Key words: *higher education institutions of Ukraine, economic security, threats, applicants of higher education, education funding.*

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Jerzy Kuck

MODERN IT SOLUTIONS IN DEFENSE AND SECURITY FOR CORRUPTION PREVENTION

In the paper the author drawing on his practical experience looks for new IT solutions for IT systems built and adapted in defense and security. These solutions are about building and implementing the integrated multilevel IT systems for logistics, finance and HR.

The base of Integrated Multilevel IT Systems for Logistics, Finance and HR is the reliable coding and identification system for all assets used and in stock. With the coding system it is possible to organize electronic shopping which help prevent corruption. The distance learning (e-learning) is another effective solution for logistics, finance and HR.

Presented solutions set general directions for informatization and involve implementation of the latest technologies (software, applications, hardware, and computer networks) and IT security. As the result the Integrated Multilevel IT Systems for Logistics, Finance and HR should be built.

Implementation of these solutions should foster rational assets management in organizations, institutions in defense and security. It will also prevent corruption, which will fundamentally improve the functioning of organizations and institutions responsible for defense and security.

Key words: *Informatization, Integrated Multilevel IT Systems, coding, electronic shopping, distance learning, defense, security.*

Formulation of the problem. Implementation of modern ICT solutions is the domain of information society. It is also tightly connected with technological advances including adapting new generation IT solutions in other areas of economy, public sector and social structures [1]. These technologies foster storing, processing, collecting and distributing information without any time or place limits. To face challenges of our times one should search for efficient methods and ways to provide accepted conditions in defense and security for the citizens to feel safe and develop. This feeling and guarantee of security should also enhance rational and effective use of capacity in defense and security and efficiently prevent corruption. The aim of the paper is to identify new methods (concepts), IT solutions in logistics, finance and Human Resources (HR) of defense and security services with the particular emphasis on those solutions which prevent corruption.

State of research. The completed analysis resulted in identification of needs and information exchange among experts of business sectors about possibilities to customize their solutions. This action contributes to development of logistics, finance and HR based on new IT solutions. It is the efficient and effective logistics, finance and HR in defense and security which influence directly the whole defense and security system of the state. Implementation of new IT solutions in time of peace, crisis or war helps rational management of capacity.

The completed analysis resulted also in synthetic findings about the development trends in new IT solutions. They are innovative, original, latest suggestions – landmarks of informatization of logistics, finance and HR. Their practical implementation commenced in Poland in 2005. These pioneering solutions were not always welcomed warmly. Only determination of a few enthusiasts led to creating theoretical foundations for implementation of new IT solutions. These solutions considerably influenced and still influence the whole defense and security system.

The research involved methods (analysis, synthesis, opinions and experts interviews) and resulted in publication of theoretical basis which set the directions of development in logistics, finance and HR with implementation of new IT solutions. Especially the identification of needs for the universal product coding system and integrated quantity-value-quality product registry in logistics and accountancy were considered crucial. These solutions are the basis for building the integrated multilevel IT systems. Over subsequent years the research was continued and included new, effective and safe technologies, connected with project-based budgeting, purchasing, e-shopping and e-learning (distance learning).

The aim of the study. This approach led to informatization of logistics, finance and HR and building the Integrated Multilevel IT System for logistics, finance and HR.

Statement of the main provisions. The author who over the years dealt with theoretical and practical aspects of implementation of new and safe IT solutions in logistics, finance and HR gained experience and made contacts with organizations and companies (in Poland and abroad), which made the analysis easier and help present synthetic findings which should be considered in modern logistics, finance and HR.

The assumption (working hypothesis) of the paper is that organizations, institutions responsible for defense and security with logistics, finance and HR departments do not function effectively. To improve their operating it is important to implement new IT solutions, especially identify already tested solutions, find new ways how to find and train highly educated personnel.

Defining main and partial targets of informatization of organizations, institutions and companies should lead to effective computer aided control and management processes and rational decision making about logistic support tightly connected with financial and HR support.

After the informatization strategy is elaborated, the Integrated Multilevel IT System of logistic, finance and HR can be built. The suggested solution should be based on the main pillars of informatization: people, processes, information and data. Moreover, the main directions of strategic development should be defined based on implementation of new IT solutions and key factors determining successful building, implementation and application of IT systems.

The implementation success (projects) is possible if we adapt new, rational and safe way, i.e. project-based budgeting. This solution support effective public money management, costs of implementation of new IT systems. Project-based budgeting with: functions, tasks, subtasks and activities is an alternative to the traditional (units- chapters – paragraphs) way of planning and realization of the budget.

Implementation of the Integrated Multilevel IT System for logistics, finance and HR should be accompanied by business process management (BPM) method including ARIS suite by IDS Scheer, which in the author's opinion is the best software to organize and optimize structures of organizations and institutions.

Building IT systems for logistics, finance and HR need product identification and coding, which is fundamental for this system [2]. It support efficient management at the stages of : packing, repacking, storing and sending in the process of monitoring and tracking of products within the complete delivery chain. Single identification/coding methods can be applied in different areas and even in a complementary way. The analysis how the process of identification operates show the need to implement fully the

reliable and complete product identification system, which should foster informatization of logistics, finance and HR.

Another crucial enterprise determining efficiency of logistic, finance and HR is implementation of solutions for electronic shopping. The platform of Polish Security Printing Works serves these purposes. This platform supports safe e-shopping and this way prevents corruption.

The platforms for distance learning [3] also provide opportunity to deliver knowledge at any distance, even in the most remote locations the knowledge for defense and security can be available fast and safely.

The main aim of informatization of institutions, organizations and companies should be the effective IT support for management, decision making, HR management processes and logistics and finance support [4].

The task to be completed to achieve the main goal of informatization of organizations, institutions and companies should embrace the following areas:

- **System** (IT system): examination, design, implementation and functioning of IT systems in institution, organization and company and ensuring their interoperability with the systems outside,
- **Technological** – identification, evaluation and implementation of standards for hardware, software, design tools, protocols, data exchange and ICT security,
- **ICT infrastructure** – maintenance, exploitation and extension of local and distant ICT networks which constitute a transport base (infrastructure) for electronic data exchange,
- **ICT security** – the set of rules and technologies ensuring required security level of information processed in systems and networks,
- **IT systems organization** – developing of structures of IT systems control and management in organizations, institutions and companies.

The main aim of informatization in institutions, organizations should consist of the following partial aims:

- Making basic planning, budgeting and controlling processes more efficient,
- Automatization of control and management processes support at the single organizational levels on which the system operates,
- Synchronization of one-year and long-term planning and task fulfillment monitoring processes,
- Enhancing effectiveness of management of assets and reducing stock,
- Implementation of identification/coding systems for: resources, products, services and personnel,

- Identification and automatization of logistic, finance and HR processes,
- Implementation of the electronic circulation of documents and electronic signature,
- Ensuring the access to reliable information (data) through the central repository to support planning and decision-making processes,
- Choosing the hardware and software platforms which ensure development and technical, technological and application maintenance of the implemented IT systems,
- Building and implementation of the Integrated Multilevel IT System for logistics, finance and HR,
- Ensuring security and protection of data and information at the stage of creating, processing and storing as well as formulating procedures for access to processed information in ICT systems and networks at single organizational levels and departments,
- Ensuring technical – economic effectiveness of informatization process through implementation of project-based budgeting mechanisms,
- Implementation of platforms for electronic shopping to prevent corruption effectively,
- Implementation of the distance learning system.

The final effect should be the possibility to deliver products, services to the reciver in the right quantity and quality, time and place and competitive prices. Working decisions and acceptance of suggested solutions prove that the future integrated multilevel IT system should embrace logistics, finance and HR. To build computer aided logistics being a part of the built and implemented Integrated Multilevel IT System the following actions should be taken:

- Implement product identification/coding system as a base for building data bases and IT systems for all assets of organizations, institutions and companies,
- Build central data base for collecting data about management of logistic chain support in systems (subsystems) of supply, production, distribution connected with finance and HR,
- Ensure free electronic shopping,
- Build single modules of the Integrated Multilevel IT System,
- Ensure automatic data and information exchange about tangible and intangible assets of organisations and institutions through building and extension of computer networks,
- Apply the latest tested technologies for systems, networks and hardware,

- Ensure security of data and information and protection of ICT systems and networks at the building stage as well as exploitation and define procedures for access to processed information at the single organizational levels,
- Organize system of distance learning (e-learning trainings) with platforms and portals,
- Ensure the compatibility of logistic (finance and HR) IT systems with similar functions in other organizations, institutions in the country and abroad.

Project management can be defined as the area of management which deals with application of knowledge, sills, method and tools to achieve formulated goals of the project, i.e. quality of the expected result, deadline and costs [7]. The Institute of Project Management defines project management as application of knowledge, sills, tools and techniques of the project to meet or even exceed needs and expectations of shareholders connected with a project [8].

The aim of project management is to predict threats and problems and planning, organization and control of activities in a way that in spite of any risks projects are successfully completed [9].

To ensure the most effective user support in time of IT system exploitation it is necessary to use or create a helpdesk – the part of organization (unit, section, team or assigned group of people) responsible for accepting claims from users and controlling solving problems. This solution ensures support of exploitation of software, hardware and other devices which is provided to users by the producer or expert company.

Processes supporting designing of services include: management of the service level, the catalog of services, access, information security, capacity, delivery, continuity of IT services.

Processes supporting exploitation of services in the production environment are: dealing with application, management of incident, access authorizations, events, problems.

Conclusions. In future organizations, institutions of defense and security will become intelligent, virtual, learning, based on common vision and system approach. They will acquire and apply new technologies easily. These will be surely challenges for logistics, finance and HR to face. This is a reason why competitiveness at the market enhances expectations and dreams of many decision makers to apply new IT technologies more extensively right now.

The analysis presented in the paper verified formulated in the introduction hypothesis that organizations, institutions of defense and security with logistics, finance and HR should still look for and apply appearing at

the market new IT solutions to operate more effectively and efficiently. This will result in need to employ highly qualified personnel and system of trainings.

Application of suggested solution should improve logistics, finance and HR operation in organizations, institutions and should lead to measurable financial and economic benefits. The biggest benefits will be generated if organizations, institutions and companies implement the integrated multilevel IT systems embracing together with logistics, finance and HR. Application of these solutions will support:

- Delivery of reliable information about the condition of the whole asserts of the organization, institution or company in a real time. The information will concern quantity, value and qualitative characteristics of allocated assets.
- Enhancing reliability, integrity and authenticity of source information for evaluation, planning and decision making processes,
- Monitoring the flow of assets between single elements in the right time, place, quantity and quality,
- Ensuring automatic information exchange and reporting in logistics, finance and HR,
- Providing tools for current control of budget expenses and unification of logistic planning processes,
- Effective register and monitoring of expenses on logistic and HR processes,
- Ensuring logistic support in any conditions including logistic contracts support abroad,
- Ensuring electronic shopping which prevent corruption,
- Provide distance learning without time and location limits
- Implement compatibility with solutions applied in the national economy and EU.

The conduced analysis embracing presented solutions supported with author's practical experience proves the necessity to take action to implement new solutions and complete basic enterprise of informatization of logistics, finance and HR in defense and security. As the final result implementing them at the same time in these areas in relatively short time can bring the biggest organizational and economic benefits. During research it appeared that building IT system is the enterprise going far beyond clearly technical domain and needs multifaceted approach. The IT system when being built becomes the integral part of organization, institution (it does not exist as an independent solution). The wild thematic scope of new technologies implementation the analysis are presented in the part which – in the

author's opinion – being innovative and universal should inspire decision makers first to further work and research in that area.

The acceptance and engagement of employees are really crucial for future implementation and achieving expected results. They are important factors if we expect the enterprise to be completed successfully. Providing information about new solutions to teachers, students and workers is also meaningful. This approach should contribute to better understanding of those who decide about implementation of new solutions in logistics.

To conclude the author invites to further analysis everyone who is concerned about application of new solutions and wishes the practical implementation in relatively short time contributed to better effectiveness and security of logistics, finance and HR on the single organizational levels and departments (services), organizations, institutions in defense and security.

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Кук Єжи. Сучасні інформаційні рішення у сфері оборони і безпеки, які сприяють запобіганню корупції

З власного авторського практичного досвіду здійснено пошук сучасних методів інформаційних вирішень для побудови та експлуатації інформаційних систем у сфері оборони та безпеки. Запропоновано методи, що обумовлюють будову та впровадження інтегрованих багаторівневих інформаційних систем для логістики, фінансів і кадрової сфери. Зокрема, рекомендовано використання таких методів, як бюджетне планування, система ідентифікації виробів, електронних закупівель і дистанційного навчання. Доведено, що використання зазначених методів уможливить раціональне використання існуючого потенціалу в організаціях та інституціях, котріо відповідальні за сферу оборони та безпеки.

Ключові слова: *інформатизація, інтегровані інформаційні системи, індексація, електронні торги, дистанційне навчання, оборона та безпека.*

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