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## **INFORMATION SYSTEMS IN THE ENTERPRISES OF HIGHLY TECHNOLOGICAL ECONOMIC SECTOR AND THEIR IMPACT ON THE SAFETY OF BUSINESS ENTITIES**

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### **ABSTRACT**

The article covers the research of key aspects of information systems creation in highly technological economic sector (HTES), the analysis of their tasks and causes that influence information systems safety, the measures to implement information systems at the enterprises of highly technological economic sector. It has been noted that there is a threat for economic safety at the enterprises of HTES. The most appropriate ways to fulfill the tasks of modern information supply have been determined.

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Economists, politicians and business representatives are detached to the positive image of the word-combination “advanced technologies”. Concerning its connotation as well as the criteria being involved in this category and the range of advanced technologies sources, the consensus has not been achieved yet in Ukraine and around the world<sup>1</sup>. Anyway, there are common ideas while interpreting certain activities like the production of airplanes, space ships, electronic and telecommunication machinery, computer and office equipment, pharmaceuticals, medical facilities, optical tools.

The majority of scientists regard these branches as top highly technological ones. The enforcement of economic integration gives birth to quite aggressive competition in sales market, which, in turn, has negative influence on domestic production of our country. These domestic goods that are incompatible in foreign market turn to become incompatible in internal market, being superseded by imported goods. In such conditions, certain spheres suffer from financial deficit, lack of information and staff encouragement which leads to their entire technological degradation or disappearance<sup>2</sup>.

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<sup>1</sup> O. B. Salikhova, *Metodolohichni pidkhody do otsinky vy-sokotekhnolohichnoho sektora ekonomiky Ukrainy*, [http://eip.org.ua/docs/EP\\_09\\_3\\_75\\_uk.pdf](http://eip.org.ua/docs/EP_09_3_75_uk.pdf) (13.06.2015).

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<sup>2</sup> A. S. Ablov, O. S. Dovhyi, L. P. Halperina *ta in, Instytut-siini zasady innovatsiinoi ekonomiky: mizhnarodnyi dosvid*

According to the Law of Ukraine on Information, documented or publically announced data about the social events and phenomena, state or environment, could be regarded as information. The social connotation of the term “information” is the closest to the issues “data”, “facts” that include accuracy, completeness, originality, ability to become old-fashioned etc. According to above-mentioned law, computer information is not the data itself but the way of its technical presentation – a set of characters, saved in computer memory or on the data medium (floppy disc, optical and magneto-optical discs, magnetic tape etc.)<sup>3</sup>. One should also realize that in certain circumstances some physical fields can serve as data medium.

Concerning the ways of obtaining, information can be divided into primary and secondary, documental and non-documental according to the form of fixation, manual and mechanized one due to the way of its transfer, background and processed – according to the means of processing<sup>4</sup>.

It is impossible to conduct management process without information, as well as to outline management objectives, to estimate the situation, to determine the problems, to forecast the course of events, to prepare management decisions and to control their implementation. The sphere of business security is very dynamic and complicated, it needs to be constantly improved and provides collaboration between business and police, police and private security services due to sufficient information supply<sup>5</sup>.

Informational work should be properly arranged. The arrangement of informational work involves its optimization – obtaining the most

accurate results due to minimum efforts and costs. Informational work is the component of the system which includes staff, data, equipment, complex of methods, the procedures of data accumulation and transformation<sup>6</sup>.

The key objective of information supply system for internal affairs services of Ukraine is a complex information support of internal affairs services in crackdown on crimes based on the set of organizational, legal, technical, policy and other measures.

The formation of general and branch information subsystems as the basis for information supply system is accompanied by the principles of functional purpose, legal support, data accuracy, efficiency of application and exploitation, development.

Information subsystems as the components of information supply system are aimed to accumulate, preserve and process the information of certain registration branches in order to implement it in various services. These subsystems are considered to be general departmental subsystems.

The level of certain information system is determined by the principles of territoriality, application peculiarities and the amount of processed information.

The components of information system are as follows: information (data), staff, technical equipment, methods and procedures of data processing, connections/links (source, channel and receiver); data medium (paper, electronic etc.).

There are numerous criteria to classify information systems. We will describe two of them: 1) judging by the peculiarities of data processing, information systems are subdivided into calculating, analytically-statistical and info-searching; 2) according to the resolved tasks, the information systems are recording/accounting (reference, statistical, controlling),

*ta vitchyznana praktyka: Monohrafiia*, V. Ye. Novytskoho (za ah red.), Kiev 2005, 200 p.

3 Pro informatsiiu: Zakon Ukrainy vid 02 zhovtnia 1992 r. # 48, art. 651, stanom na 06 kvitnia 2000 r. # 27, art. 213.

4 V. V. Babaskin, S. A. Zhahunova, *Problemi pytannia informatsiinoho zabezpechennia diialnosti OVS*, „Naukovyi visnyk”, YuA MVS, 2005, # 3, p. 32–38

5 O. M. Bandurka, *Upravlinnia v orhanakh vnutrishnikh sprav Ukrainy*, Pidruchnyk – Kharkiv 1998, 780 p.

6 A. F. Melnyk, O. Yu. Obolenskyi, A. Yu. Vasina, L. Yu. Hor-dienko, *Derzhavne upravlinnia: Navch. posib.*, A. F. Melnyk (za red.), Kiev 2003, 343 p.

analytical (diagnostic, forecasting, consultative), decision-making (planning, managing).

The optimum arrangement of information files and databases can be provided by creating the set of interconnected information systems within certain body and entire system. The activity aimed at developing particular information systems regarding their functions and the field of application can be called informational supply of planning, control, prevention etc.

The content of informational supply may describe the entire process of management, its particular functions or stages of management cycle, the activity of certain branches or staff categories<sup>7</sup>.

The necessity to design information systems occurs while creating new or transforming previous functions of management body or when the systems mentioned above are transferred to more advanced technical basis.

The tasks of paramount importance for information system reflect: 1) its constant replenishment with necessary information; 2) timely provision of the customers with accurate data; 3) collection, processing of information concerning the work and the results of control in management objects in order to present this information in the governing bodies; 4) analytical processing of the data necessary for decision-making in management.

One can divide the functions of information systems into preparatory and basic/key ones.

Preparatory functions include the recording of primary data, its collecting and saving.

Key functions cover data search and processing, reproduction of results and their transfer to receivers.

Dealing with information consists of the following interrelated activities: document preparation (drafting); their copying; forwarding/primary processing, data saving and search, its

arithmetical and logical processing, visual presentation, distant transfer. Each of these steps more or less involves the application of particular equipment – for drafting, copying etc.

In management implementation there are situations when employee is physically unable to work out all necessary information. Under such conditions it is sufficient to use computer and calculating equipment. Modern IT sphere grows tremendously, particularly for the last 100 years the speed of movement increased 102 times, the speed of connection – 107 times, the speed of data processing – 106 times. These figures prove the necessity of information system implementation while making and managing decisions.

The information in management possesses the range of peculiarities that require usage of technical devices, namely: 1) clearly defined deadlines of data processing; 2) long-term data preserving and the calculation of its obtaining; 3) taking into account the customer needs, the background information is multi-processed during production<sup>8</sup>.

To preserve the information in public institutions and in business, databases and data banks are created – functionally arranged data files providing users with all information necessary for decision-making<sup>9</sup>. Management activity will depend on the reliability of information sources, the means of its analysis and saving. Management information is processed with the help of interactive methods including the work of two groups of experts, one of which introduces data files, another implements them in production. In order to set up database in the enterprise, one should sort out the statistical figures and the results of company activity. The database should be constantly renewed with

7 O. I. Lezhenina, *Analiz ta napriamy rozvytku informatsiino-ho zabezpechennia mizhnarodnoi pravookhoronnoi diialnosti OVS Ukrainy: orhanizatsiino-pravovyi aspekt*, „Pravo i bezpeka”, # 4, Kiev 2002, p. 106–108.

8 V. P. Lysiuchenko, P. V. Olkhovyk, *Teoriia upravlinnia orhanamy vnutrishnikh sprav: Navch. Posibnyk*, Kiev 2004, A. V. Palyvoda, 128 p.

9 V. Y. Knorryn, *Teoriia, praktyka y yskusstvo upravleniia: [uchebnyk dlia vuzov po spetsyalnosti “Menedzhment”]*, Yzdatelstvo NORMA (Yzdatelskaia hruppa NORMA–YN-FRA • M), 2-e yzd., yzm. y dop., Moscow 2001, 528 p.

regard to all production transformations, customer requirements, terms and accuracy of information, the complex of management informational supply, data security system.

One of the aspects that is relevant while creating the system of company's economic safety, demonstrates the ability to prevent leak of confidential information. The task of paramount importance is to define the categories and sources of confidential information, the ways of its leak<sup>10</sup>. The rules of data safety are determined by the authorized bodies, the Law on the State Secret and by the owners of the information, legally viewed as confidential<sup>11</sup>.

Safety and security of information systems should be based on an integrated approach to building system that combines a set of measures necessary to protect information at all security levels.

Information security system must be designed to prevent loss of information, its distortion, unauthorized access and its illegal use during design, implementation and application of information subsystems.

Informational subsystems management determines the security and protection of information supply. Information safety is provided on the technological stages of accumulation, storage, processing and transfer of information. Certain departments are responsible for information security on particular technological stages of all levels of information supply. At the enterprises of high-tech economic sectors this function is performed by special subsections of the security service – analytical departments, competitive intelligence, marketing departments and others.

We have developed the measures to implement information supply of innovative activities in the marketing management of high-tech enterprises, which are depicted in fig. 1. It allows

manufacturing companies to establish innovative information strategy aimed at obtaining competitive advantage in the industrial market.

It is suggested to study scientific, technical innovations and proposals supply concerning its optimization based on advanced technologies. It will help to discover the trends of development and implementation of modern logistic, scientific and innovative means at the HTES enterprises.

To perform the functions in information security, special subsections of the security service are established and specially instructed staff is appointed.

The system of information safety and security should be devised at the stage of development of technical specifications to design information subsystems. A significant role in information security at companies has been played by police forces, as most HTES companies are important state strategic objects. All projects that are being developed, must necessarily include the section "Data Security", which, for example, in the internal affairs bodies is developed according to the "Temporary guidelines for the development of information security chapter in the specifications to create an automated system"<sup>12</sup>.

The global rapid development of information technologies has led to their use in crime crackdown. The main tendencies of information systems development in law enforcement are: improvement of the forms and methods of information system management; centralization and integration of computer data banks; implementation of new information technologies for keeping criminological and crime-detection records; widespread application of efficient computer networks; the use of particular information security means; establishing effective information exchange in criminological international level<sup>13</sup>.

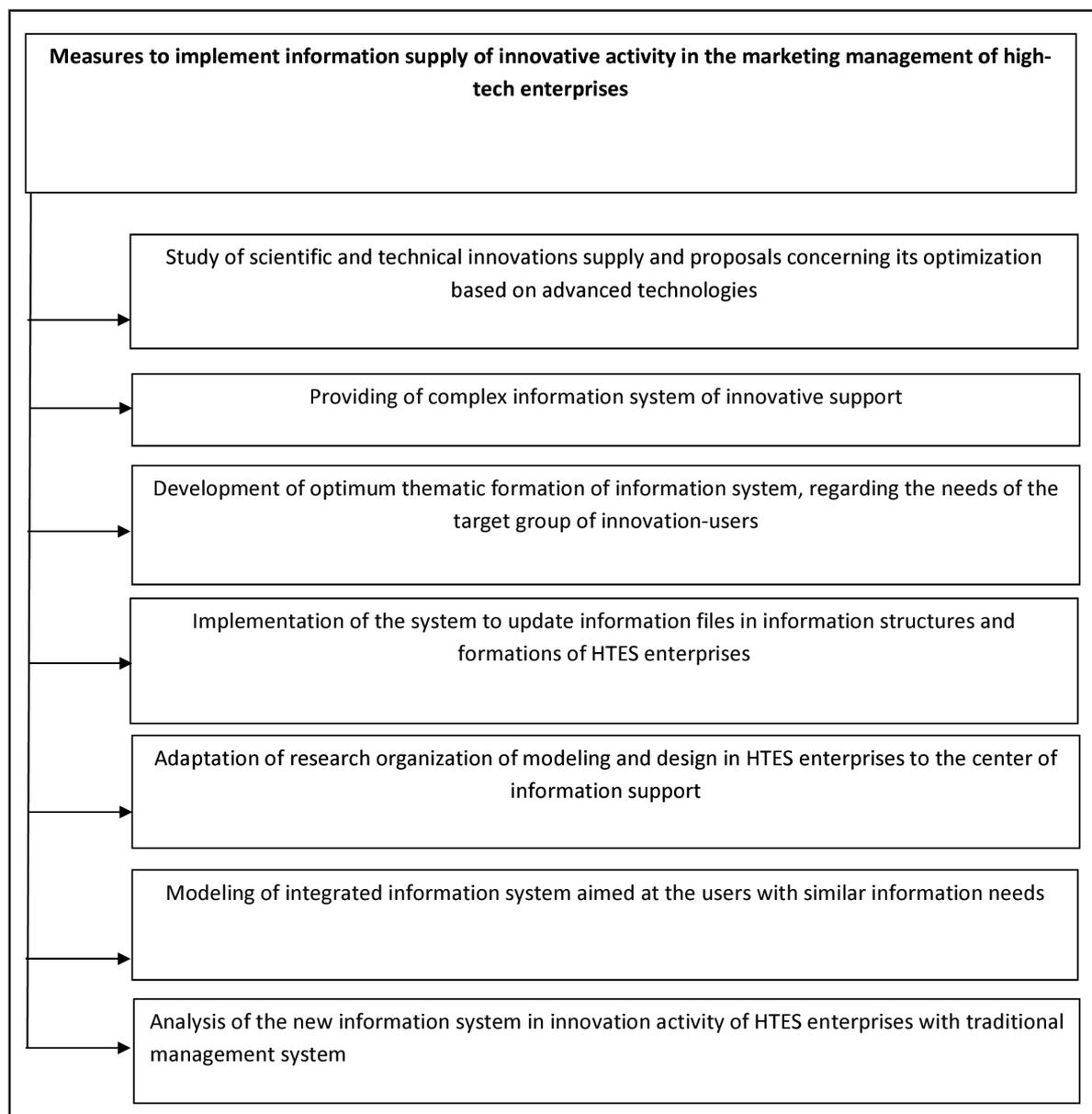
10 Zakon Ukrainy vid 02 zhovtnia 1992 r. # 48, art. 651, stanom na 06 kvitnia 2000 r. # 27, art. 213, N. H. Navrotska, *Pravova statystyka: Navchalnyi posibnyk*, Znannia, Kiev 2007, 280 p.

11 N. H. Navrotska, *Pravova statystyka...*, p. 128.

12 S. V. Pietkov, *Efektivnyi menedzhment v orhanakh vnutrishnikh sprav*, Tavria, Simferopol 2004, 564 p.

13 O. H. Frolova, *Pro suchasne informatsiino-metodychne zabezpechennia upravlinnia v OVS, Derzhava i pravo*, Kiev 2001, Vyp. 13, p. 171–176.

Fig. 1. Measures to implement information supply at high-tech enterprises



The most sufficient ways to solve modern problems of information support must be achieved by: 1) implementation of a common policy in information security; 2) creation of multipurpose subsystems for collaboration between the police and HTES companies; 3) improvement of information units structure and staffing; 4) integration and systematization of information management support on all levels; 5) development of information network; 6) creating conditions for the effective work of data recording to prove its accuracy, reliability, relevance and safety; 7) upgrading of information units with powerful modern computer equip-

ment; 8) establishing the range of computer vacancies among the information subsystems users; 9) further computerization of data records/info-supply; 10) introduction of modern information technologies.

Proper security introduction at HTES enterprises, and therefore the result of effective running of enterprise economic security can be represented as a criterion, which illustrates the absence or presence of significant losses. The main factors that characterize the content of economic security at HTES enterprises are: preventing the leak of commercial secret information; preserving facilities and intellectual

property of the company; prevention, localization and suppression of the crimes committed by staff, clients, visitors; prevention and liquidation of the effects of disasters and emergencies; support of the employees exposed to violence; timely detection and prevention of unauthorized access to the objects of secured companies<sup>14</sup>. We totally agree with the author<sup>15</sup> that the determination of quantitative and qualitative changes of these figures/records can be performed by estimating management effectiveness.

## CONCLUSION

The availability of information is the strong guarantee of effective functioning of the HTES enterprises. Concerning the vectors of our country, one of which is the building of democratic state, it is impossible to underestimate the true ability of security services in the HTES enterprises to perform their duties which are regulated by current Ukrainian laws.

The conclusions based on the analysis of information systems of the HTES enterprises are following:

- firstly, the information available at the enterprises of HTES allows to draw the perspectives of changing the production output in the enterprises, to conclude about key areas of main branches (departments) work, rational division and application of responsibilities and measures in security service of the enterprises and their branches, the ways to correct forms and methods of their work,
- secondly, it has been determined that information supply at the HTES enterprises includes the organic functional unity concerning

the content, amount and quality of information, necessary for management, the measures to be taken in order to collect, systematize, accumulate and process this information applying various methods and equipment,

- thirdly, informational supply system at the HTES enterprises plays an important role in the effectiveness of security service, human resources department, analytical department, inner audit and control department. Information supply system provides informational support of production and financial activity of the HTES enterprises, gives statistical, analytical and reference information,
- fourthly, we come to conclusion that the application of IT in the HTES enterprises is not perfect, still in process of development, though the recent positive changes and the outlined perspectives will assist to overcome the obstacles in information supply of the HTES enterprises and increase the effectiveness of the business entities safety in highly technological economic sector.

## REFERENCES:

1. Salikhova O. B., *Metodolohichni pidkhody do otsinky vysokotekhnolohichnoho sektora ekonomiky Ukrainy*, [http://eip.org.ua/docs/EP\\_09\\_3\\_75\\_uk.pdf](http://eip.org.ua/docs/EP_09_3_75_uk.pdf) (13.06.2015).
  2. Ablov A. S., Dovhyi O. S., Halperina L. P. ta in., *Instytutsiini zasady innovatsiinoi ekonomiky: mizhnarodnyi dosvid ta vitchyznana praktyka: Monohrafiia*, V. Ye. Novytskoho (za ah. red.), Kiev 2005, Knyzhkove vydavnytstvo NAU, 200 p.
  3. Babaskin V. V., Zhalhunova S. A., *Problemi pytannia informatsiinoho zabezpechennia diialnosti OVS*, "Naukovyi visnyk", YuA MVS, 2005, # 3.
  4. Bandurka O. M., *Upravlinnia v orhanakh vnutrishnikh sprav Ukrainy*, Pidruchnyk – Kharkiv 1998, 780 p.
  5. Melnyk A. F., Obolenskyi O. Yu., Vasi-na A. Yu., Hordiienko L. Yu., *Derzhavne*
- 14 V. L. Ortynskyi, I. S. Kernytskyi, Z. B. Zhyvko ta in., *Ekonomichna bezpeka pidpriemstv: pidruchnyk*, Alerta, Kiev 2011, p. 113.
- 15 M. I. Kopytko, *Vykorystannia metodu naimenshykh kvadrativ dlia vyznachennia rivnia ekonomichnoi bezpeky promyslovykh pidpriemstv u vyrobnychii sferi, Materialy zvitnoi naukovo konferentsii "Ekonomichna bezpeka i pravo: problemy ta shliakhy vyrishennia" (25 liutoho 2011 r.)*, Lviv 2011, LvDUVS, p. 17–19.

- upravlinnia: Navch. posib.*, A. F. Melnyk (za red.), Kiev 2003, Znannia-Pres, 343 p.
6. Lezhenina O. I., *Analiz ta napriamy rozvytku informatsiinoho zabezpechennia mizhnarodnoi pravookhoronnoi diialnosti OVS Ukrainy: orhanizatsiino-pravovyi aspekt*, "Pravo i bezpeka", Kiev 2002, # 4.
  7. Lysiuchenko V. P., Olkhovyk P. V., *Teoriia upravlinnia orhanamy vnutrishnikh sprav: Navch. Posibnyk*, Kiev 2004, PALYVODA A. V., 128 p.
  8. Knorryn V. Y., *Teoriia, praktyka y yskusstvo upravleniia: [uchebnyk dlia vuzov po spetsyalnosti "Menedzhment"]*, Moscow 2001, Yzdatelstvo NORMA (Yzdatelskaia hruppa NORMA–YNFRA • M), 2-e yzd., yzm. y dop., 528 p.
  9. Navrotska N. H., *Pravova statystyka: Navchalnyi posibnyk*, Kiev 2007, Znannia, 280 p.
  10. Pietkov S. V., *Efektivnyi menedzhment v orhanakh vnutrishnikh sprav*, Simferopol 2004, Tavriia, 564 p.
  11. Frolova O. H., *Pro suchasne informatsiino-metodychne zabezpechennia upravlinnia v OVS*, "Derzhava i pravo", Kiev 2001, Vyp. 13.
  12. Ortynskyi V. L., Kernyskyi I. S., Zhyvko Z. B. ta in., *Ekonomichna bezpeka pidpriemstv: pidruchnyk*, Kiev 2011, Alerta, 704 p.
  13. Kopytko M. I., *Vykorystannia metodu naimenshykh kvadratov dlia vyznachennia rivnia ekonomichnoi bezpeky promyslovykh pidpriemstv u vyrobnychii sferi, Materialy zvitnoi naukovoï konferentsii "Ekonomichna bezpeka i pravo: problemy ta shliakhy vyrishennia" (25 liutoho 2011 r.)*, Lviv 2011, LvDUVS.

#### SOURCES OF LAW

14. Zakon Ukrainy vid 02 zhovtnia 1992 r. # 48, art. 651, stanom na 06 kvitnia 2000 r. # 27, art. 213.

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