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WAYS TO EVALUATE THE INFORMATION SECURITY OF SMALL ENTERPRISES

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Abstract

The article discusses the problems of the formation of information security of the enterprise, related to the level of individual entrepreneurship.The author proposes to build a model of building a security system for protecting information, which will demonstrate the impact of objective external and internal factors on the state of information security of an enterprise.

It is shown that the information security system is created to obtain certain information services (services) for the sustainable operation of the enterprise. Otherwise, the absence of a security policy is detrimental to all subjects of information relations.

Therefore, the enterprise security system and the availability of its Security Policies are becoming crucial elements in ensuring the required level of implementation of business processes in the enterprise.The results of the studies conducted by the authors of the article will allow identifying and analyzing the main executable measures at the enterprise for analyzing information security.

Key words: *Security Information, confidentiality, integrity, availability, access to the information, information protection, unauthorized access, informational resources, information security policy.*

The modern stage of development of our state is characterized by the increasing role of information infrastructure, which is a combination of different types of information and to carry out its collection, formation, distribution and use, as well as regulatory systems arising from this relationship.

The rapid growth of informatization and computerization of the main areas of human activity, including the management of state structures and law enforcement agencies, weapons, power plants and transport infrastructures, industrial enterprises, on the one hand, allows for high achievements in science and research, technology and engineering, management and organization of life in general.

On the other hand, the presence of global computer networks, their lack of protection from equipment failures caused by a variety of reasons, from illegal actions of people committed intentionally or inadvertently, can cause the most unpredictable harmful consequences for humanity as a whole.

Crimes in the information sphere cause great material and moral harm to the development of the country. According to foreign law enforcement statistics, for example in Germany, up to 4 billion euros are stolen using computers annually, in the USA up to several billion dollars [4].

In computer security studies in the United States, it was noted that the number of complaints about computer crimes is increasing dramatically, 30% of respondents among them reported that their information systems were hacked by external attackers [5]. 57% of respondents were exposed to attacks via the Internet and 55% of them noted violations by their own employees.

This is where the urgency of the problem of information security of enterprises in the country arises. Itisasfollows [1-3]:

1. In the special nature of the public danger of criminal encroachments on information security (IS) of public structures.

2. The presence of trends to an increase in the number of crimes in the information sphere in the territory of the Republic of Kazakhstan.

3. Imperfections of a number of normative documents and theoretical provisions related to the information security of the country.

4. The need to implement objectively determined integration of technical and legal provisions related to information security.

In the case when the IB object is a commercial enterprise (such as an Individual Entrepreneur), the content of the “information security” will be to protect the interests of the owner of the enterprise, satisfied with the information and related to the protection of information from unauthorized access of the information that is presented to the owner rather important.

Accordingly, interests as a security object can be represented by information capable of satisfying the interest of the owner and his actions aimed at mastering information or hiding information. These components of the IS object are protected from external and internal threats.

In the case when the owner of the enterprise does not see the need to protect his actions, for example, due to the fact that this does not pay off, the content of the information security of the enterprise can be reduced to the protection of specific information, the disclosure of which can cause significant damage to commercial activities.Such information is usually referred to as a trade secret.

The purpose of this article is to study the specifics of the organization of information security services by the example of a real-life enterprise, and the development of a project of measures to improve the efficiency of information protection.

From this goal, the article discusses recommendations for solving the following tasks:

1. Review of regulations governing the software market for information security.
2. The disclosure of the concept of information protection (IP) and information security.
3. The state of analysis of the security of the main software products in the field of enterprise management for the protection of information.
4. The generalization of the organizational and economic characteristics of the enterprise, selected as the object of practical research on the formation of its information security policy.
5. The choice of software activities of the enterprise for the organization of information protection (IP) and information security (IS).
6. Search and identify ways to improve the organization of information security measures in the enterprise.

The clarification of the content of the formed recommendations can ensure the relevance of the following work and research:

1) development of the IS policy of the enterprise in the conditions of informational struggle;
2) mandatory deep study of the solution of a number of important problems aimed at improving the state of information security for data processing of the enterprise while ensuring resistance to counteraction of technical and technological intelligence conducted in the territory of Kazakhstan;
3) work on the development and introduction to the use a package of documents on the security of information in the enterprise.

The object of research discussed in the article is the IS of computer facilities and digital technologies in connection with the increased attention of the country's leadership on the digitization of the economy and industry of the Republic of Kazakhstan, as well as on the further development of the telecommunications industry of enterprises, especially state structures.

The subject of the stated research results is the development of scientific and practical recommendations on the organization of IS for small businesses.

Therefore, the problems of developing general recommendations for an enterprise to provide IP and IS in data processing systems and the development of a standard set of documents to prevent unauthorized access to company business information, in the opinion of the authors of the article, require increased attention in our time.

The problems discussed initiate the search for solutions in the following directions [5]:

- research of existing channels of information leakage and search for ways to close them at such a lower level as a typical enterprise is an individual entrepreneur;
- development of methodologies for creating an IS Policy for an enterprise, especially a small business;
- the formation of a package of governing documents of the enterprise to ensure the security of information.

The issue of information protection has been raised since people learned to read and write. There has always been information that not everyone should know.People who possess such information have resorted to different ways to protect it [6].

Of the well-known examples, these are such methods as secret writing (writing in sympathetic ink), encryption (“gibberish”, Caesar's cipher, more advanced replacement ciphers, substitutions).

At present, the universal boom of computerization, the well-being and even life of many people depend on ensuring the information security of a variety of digital information processing systems, as well as control and management of various objects.Such objects (they are called critical)

include telecommunications systems, banking systems, nuclear power plants, control systems for air and ground transportation, as well as processing and storage systems for secret and confidential information [1-2].

For the normal and safe operation of these systems, it is necessary to maintain their safety and integrity.

Currently, to penetrate into other people's secrets are used such opportunities as [3]:

- eavesdropping conversations in the premises of the enterprise or car using pre-installed "radio bells" or recording devices;
- control of smartphones and communication devices, radio telephones and radio stations;
- remote reading of information from various technical means, primarily from monitors and computer devices and other electronic equipment;
- laser irradiation of window glasses in a room where “important conversations” or, for example, directional radio emission, which can cause the “details to respond and speak” in a television, radio or other broadcast equipment.

Now 3 aspects of information leakage vulnerability were specifically identified [5]:

1. Exposure to physical destruction or distortion.
2. The possibility of unauthorized (malicious) modification.
3. The danger of unauthorized receipt of information by persons for whom it is not intended.

There are also 3 directions in the problem of information protection [6]:

1. Improving the organizational and technical measures of information processing technology in the computer.
2. Blocking unauthorized access to the processed information.
3. Blocking unauthorized access to information through technical means.

The main factors hindering the solution to the problem of protecting information are [1]:

- massapplication;
- the ever-increasing complexity of the functioning of computing;
- a variety of computer programs, architectural solutions and their easy adaptability to solve specific problems of users.

The use of hard disks creates conditions for malicious actions (substitution, theft, introduction of a “computer virus” into the system, unauthorized copying of information, illegal use of a network, etc.).

The most important measure to IP on hard drives is the organization and control of disk usage.Any computer at work creates an electromagnetic field that allows unauthorized to receive and receive information. In a personal computer, this is especially dangerous, since the information processed in them is more structured.

For protection purposes, a variety of measures are used, from shielding buildings and premises to suppressing radiation with special noise generators.

One of the main means of protecting information in a computer is cryptographic means.They have the task of IP in the transmission over communication lines, storage on media, as well as the obstacle to entering false information (imitation resistance).

The practical implementation of cryptographic security tools can be software, i.e. Encryption is implemented by a special program, and technical, with the help of special technical tools that implement the encryption algorithm.

The main difficulties in the implementation of protection systems are that they must satisfy 2 groups of conflicting requirements [3]:

1 group. Elimination of the intentional release of information to unauthorized persons and the delimitation of access to devices and information resources of all users.

2 group. The security system should not cause noticeable inconvenience to users in their work with ODS resources.

In particular, the following should be provided [5]:

- complete freedom of access of each user and the independence of his work within the rights and powers granted to him;
- convenience of working with information for groups of interconnected users;
- the ability for users to allow customers to access their information.

In the sphere of small business and private users, the main interest is the provision of IS at the enterprise against possible threats to personal data.Also of interest is the possibility of raising the level of IS through the introduction of digital hardware and software, as well as the implementation of organizational measures.

The damage caused by the realization of threats to the information assets of business owners can reach huge sums. The implementation of Information Security Policies in an organization will significantly reduce the likelihood of situations arising from unauthorized access to information of owners.

The company's information security policy will allow the following tasks:

- analysis of the enterprise in terms of data protection and the choice of its secure organizational structure;
- analysis risk IS and assessment of identified risks;
- the choice of a set of tasks to ensure information security and protect commercial secrets;
- determining the location of the enterprise's designed Information Security Policy;
- choice of protective measures to ensure information security;
- adoption and compliance with the regulatory framework of the Security Policy;
- creation of an organizational basis for the functioning of the enterprise structure.

Thus, at present, Information Security is an integral aspect of the existence of commercial, public and private organizations. IP has serious reasons, because in case of information leakage, organizations may suffer not reparable damage, namely, financial losses, which ultimately can lead to destruction of the organization.

The rivalry unfolding around IS, the struggle to achieve and maintain information superiority, is beginning to occupy an increasingly significant place in the overall geopolitical competition of the developed countries of the world.At the new stage of the history of the world, when the possibilities of extensive growth due to the mechanical addition of new resources through the armed seizure of the territory of other countries and all the wealth in this territory were exhausted and ineffective, the question arose of more acceptable forms and ways of geopolitical competition in the information sphere.

Information security of the enterprise in the modern conditions digitalization of information processes is of fundamental importance for the prevention of illegal and criminal use of information constituting a confidential, commercial secret. The tasks of ensuring ISare implemented by an integrated information protection system, which is designed to solve many problems arising in the process of working with information, including financial.

It is recommended that the responsibilities of employees of the enterprise for handling information of various kinds should be clearly stated in the relevant instructions written for compliance with the requirements of the Information Policy (within the enterprise, these instructions should be "restricted access").

According to the goal set in the article, the formulation of recommendations on the application of protection methods for an enterprise's IR containing special value requires analyzing a multitude of IS threats, and also in fulfillment of the requirements of the Enterprise Information Policy, it is recommended to identify the most relevant security threats to protected resources of the enterprise.

As a result of this analysis of actual security threats in the structure of the enterprise, you should build an IS protection subsystem and choose ways to solve the IS Policy task.

According to the recommendations of research firms [6], 60-80% of all efforts to ensure the security of the enterprises activities should be directed to the development of the Information Policy and related documents.Because the Security Policy is the cheapest and at the same time the most effective means of ensuring information security (of course, if you follow it).In addition, if the Policy is formulated on the implementation of an enterprise development strategy, then it is also a guide for developing and improving information security systems.

It is also known [6] that the statistics accumulated to date in the field of computer crimes indicates that more than 60% of the total number of potential threats are internal IS threats associated with abuse of user powers.

Information is an asset of an enterprise, but its management is not always aware of the value of the information assets it possesses, but competitors may well pay a lot to study or even steal these assets.

IS rules play a key role in ensuring the protection of systems and telecommunications networks. A well-thought-out, implemented and implemented Enterprise IS Policy will help you to feel the difference between security guidelines and an organized security system that functions effectively.

Despite the fact that the IS Policy does not answer the question of how technological objectives should be achieved, yet, having properly determined what needs to be secured, the enterprise thereby ensures the proper management of the technological and economic processes of the enterprise.

The IS Policy sets out the requirements of what should be protected and what restrictions are imposed on the management of the enterprise. Despite the fact that they do not discuss the product range or production cycles, safety recommendations will help to better navigate the choice of product, and when choosing ways to develop the enterprise.Implementation of the requirements of the Information Policy will provide higher security for the entire enterprise.

In conclusion, it should be emphasized that the development of the basic principles of ensuring the information security of an enterprise will allow solving the following tasks:

- consideration and choice of the essence of the created Information Policy;
- analysis of the main threats within the enterprise structure;
- formulation of recommendations for existing problems of providing information security;
- successful implementation of selected methods for ensuring information security;
- analysis of the methods of cost-effectiveness of compliance with measures in accordance with the Enterprise IS Policy
- making recommendations on the choice of information security tools;
- calculation of the payback of IS systems on a specific model of the created IS Policy.

In the future, the authors plan to implement the goal in 3 directions:

In the first direction to conduct a theoretical study on the creation of an effective enterprise information security policy. In the second, an analysis of the methods for assessing the economic efficiency of implementing the Information Policy is carried out; in the third, the development, research and implementation of a specific model of the information security system of an enterprise.

In the article, the information security of an enterprise was understood as the protection of its information and supporting infrastructure from accidental or intentional effects of a natural or artificial nature, fraught with damage to the owners or users of information and supporting infrastructure.

The recommendations are formulated that the IS of an enterprise can be provided if the following properties of the ISsystem are preserved [1-4]:

- availability (possibility to receive information service in a reasonable time);
- integrity (relevance and consistency of information, its protection from destruction and unauthorized changes);
- confidentiality (protection against unauthorized access).

IS systems are created to obtain certain information services (services) for the sustainable operation of the enterprise. If, for one reason or another, it becomes impossible for users to receive these services, this is detrimental to all subjects of informational relations.

Thus, at present, the IS systems of an enterprise and the existence of an IS Policy are becoming crucial elements in ensuring the required level of implementation of business processes of enterprises. In specific situations, information security action algorithms can vary significantly.

The results of the research carried out by the authors of the article will allow identifying and analyzing the main activities at the enterprise for analyzing the security of the corporate network:

- the study of the initial data on the information system of the enterprise;
- security risk assessment of its Information Resources;
- analysis and implementation of the IS policy of the enterprise and organizational and administrative documentation on ensuring the information security regime of the enterprise;
- assessment of the compliance of IR with the requirements of existing regulatory documents;
- analysis of the configuration files of routers and proxy servers that manage internetworking interactions, mail and DNS servers, as well as other critical elements of the network infrastructure;
- control of external network addresses of the corporate network of the enterprise from the Internet;
- scanning of IR in the enterprise network from the inside;

- analysis of the configuration of servers and workstations of the corporate network using specialized software.

The evaluation of the economic efficiency of the enterprise's information system will be a complex of various approaches and methods: both classical, general approaches to the assessment of economic efficiency and specific ones, taking into account the specifics of the implementation of the enterprise's information security policies.

The initial premise in developing models of the effectiveness of the IS system is to implement the assumption that, on the one hand, damage is inflicted if the IS and IP system is violated. On the other hand, the provision of information security of an enterprise is associated with the expenditure of funds for the implementation of measures to comply with the requirements of the IS Policy.

It is also known [6] that the ratio of the cost of protection and losses from its violation, taking into account the required level of security, as well as allowable losses, will allow to evaluate the economic effect of using the enterprise IS system.

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MAIN CONCEPTS OF IOT TECHNOLOGY

[1]Bolat Kurban, [1]Zhanat Umarova, [1]Besbaev Gani, [1]Zhalgasbek Iztayev, [2]Nur Izura Udzir

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Abstract

In this paper were considered the main concepts of Internet of Things technology (IOT). IOT technology is at the initial, mostly experimental, stage. With the beginning of its wide application there will be a lot of problems: reliability, legal consequences, real price of computer calculations, etc.Today the developers of the project actively develop the platform, expand its functionality, refine the code, fix vulnerabilities, and introduce new tools. In addition to the Internet of Things, IOT aims at the field of online payments and money transfers.The implementation of the IOT has been criticized because of non-standard ways of approaching cryptography and the lack of obvious to most users of the evidence that it has cost-effective advantages. There are also doubts about the triad redundancy for theoretical protection against quantum processors (there is not mass application, only prototypes are available) and the use of the Coordinator server (interacting with

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