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1.1 Audit aspects of the IT-infrastructure of the modern company

In today's world, stable operation and security of IT services are extremely important conditions for successful business. That is why your company's IT infrastructure must be built in such a way that it meets modern technologies, requirements and standards.

Since technologies are developing extremely fast, in the process of growth and development of your company, there are needs to implement new technologies, improve existing IT services, and most importantly, optimize your costs and resources to increase profits. It is important for the head of the enterprise to clearly understand the directions of development and improvement of IT services, because the investments you make in your IT department today may be used irrationally and tomorrow they may not be enough to meet the needs and requirements of your company. That is why it is important to perform an IT audit periodically, especially for large complex infrastructures. Information technologies are constantly improving and becoming more complicated. Positive aspects of the use of information technologies in business are overshadowed by new risks. For example, e-commerce, which is popular today, is associated with the processing of confidential information of various types: financial transactions, personal data, information about trades [1].

This, in turn, requires additional control by top management, external and internal audit. That is why information technology audits are carried out in companies in order to quickly receive systematized and reliable information for assessing the state of IT, making decisions about IT management. Of course, audits are different. The audit can be classified according to various features, but here we will talk only about the IT audit - checking the functioning and protection of information systems.

First of all, it is necessary to form a general understanding of what IT audit is and why it is needed. The term "IT audit" refers to the process of obtaining systematic and

objective data on the current state of IT and assessing the degree of their compliance with "best practices"

IT survey - collection of information to be used for carrying out further work, for example, work related to the implementation of a new information system or optimization and modernization of an already existing one. In this case, this type of audit is used to correctly collect reliable information about the current state of IT. It is worth noting that in this case it is not about the analysis and evaluation of the collected information. Expert assessment of IT is an assessment of the adequacy of financing project solutions and/or investments in the purchase of equipment and IT services.

Why is an IT audit so necessary in today's world? First of all, the results can be useful for the management of the company. Based on the results of an IT audit, you can understand whether the built IT infrastructure is functioning correctly and what impact it has on business development. On the other hand, the IT department may be interested in the positive results of such an audit, as the further development of the department and its employees within the company may depend on it: the better the results, the more willing the company's management will invest in IT.

The concept of IT audit is relatively new. Therefore, it is not surprising that IT audit is often interpreted in completely different ways. Someone realizes the practical value of an independent assessment of the state of their information system, while someone identifies IT audit only with IT consulting or even a financial audit of the IT sector. Meanwhile, IT audit is the basis for optimizing information technology costs, reducing current and future costs, and practically the only tool for a reliable assessment of the current state of the IS, its efficiency and development prospects. On the other hand, IT audit allows you to compare the costs that the company makes on the information system and its real return to the business. Simply put, IT audit helps to determine the efficiency of the entire IT infrastructure [2].

An IT audit is different from an audit of financial statements. Although the purpose of a financial audit is to evaluate the extent to which the financial statements present fairly, in all material respects, the financial position of the enterprise, the results of operations and cash flows in accordance with standard accounting methods, the

purpose of an IT audit is to evaluate the system in general, design internal control and efficiency. This includes, but is not limited to, performance and security protocols, development processes, and IT management or oversight. Installing controls is necessary but not sufficient to ensure adequate security. Those responsible for safety must consider whether the controls are installed as intended, whether they are effective, whether any safety breach has occurred and, if so, what actions can be taken to prevent future breaches. These requests should be answered by independent and objective observers. These observers perform the task of auditing information systems. In an information systems (IS) environment, an audit is an examination of information systems, their input, output, and processing [3].

Expert assessment of IT is an assessment of the adequacy of financing project solutions and/or investments in the purchase of equipment and IT services. At the same time, the following types of assessments are possible:

- assessment of IT projects or project solutions;
- evaluation of the reasonableness of investments in IT;
- assessment of the value of the IT component of the company;
- assessment of current IT projects;
- assessment of the possibility of repurposing the IT infrastructure;
- evaluation of IT operation organization;
- assessment of user training.

IT audit allows you to assess the compliance of information systems with business requirements and various standards designed to increase IT efficiency, as well as to build a long-term strategy for the development of information technologies. As a result of an IT audit, an estimate of the cost of IT services can be obtained, on the basis of which a decision can be made in the future to outsource some functions or to concentrate all functions within the company, as well as to identify potential risks and "bottlenecks" in the IT infrastructure in order to develop appropriate procedures for their minimization.

IT audit is a comprehensive survey of the company's IT sector, during which information is collected and analyzed about the current state of the information system,

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its "problem areas" and possible risks. IT audit is used as the first step to "put things in order" in the information system and eliminate possible technical risks. An IT Infrastructure Audit is a set of works to examine and analyze the main components of the company's IT infrastructure for compliance with modern technologies and the needs of your business to determine opportunities for further optimization and modernization [4].

The purpose of an IT audit is to improve the IT control system. For this, both external and internal auditors must:

- carry out IT risk assessment;
- contribute to the prevention and mitigation of IP failures;
- participate in IT risk management;
- help prepare regulatory documents;
- help link business risks and automated tools control;
- carry out periodic inspections;
- to assist IT managers in the correct organization of management IT management;
- take a "side view".

In general, six types of services with audit of information technologies:

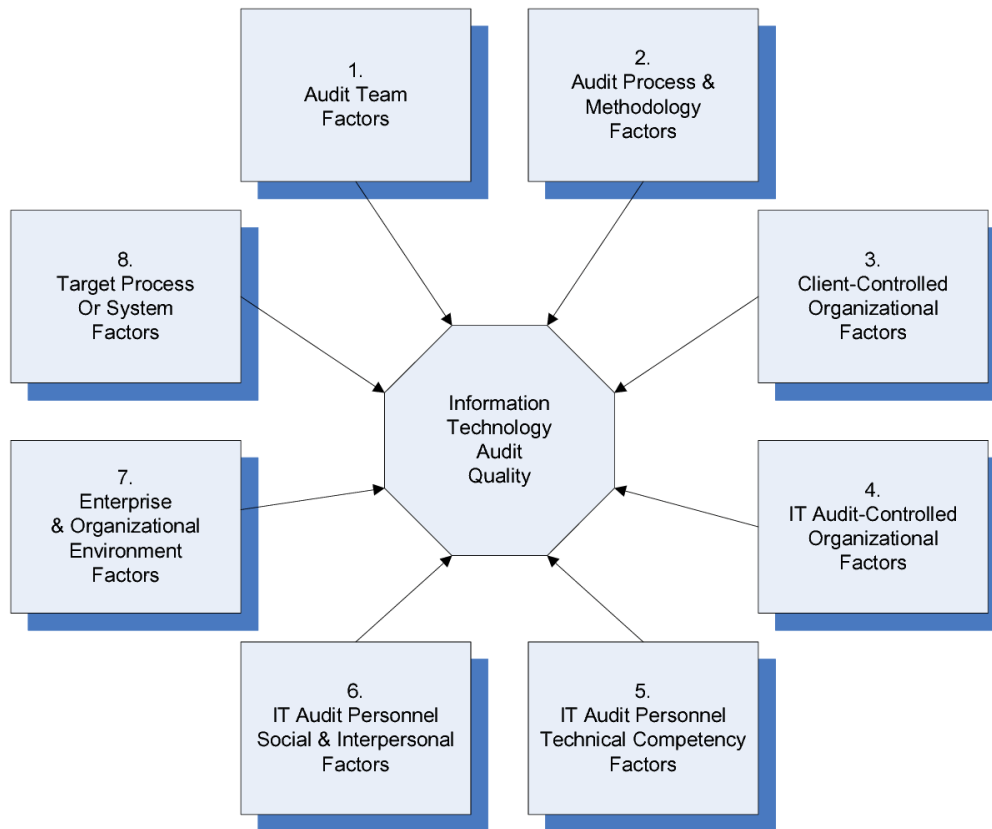
- Survey of IT.
- Expert assessment of IT.
- IT technical audit.
- Audit of the IT business process.
- IT criterion audit and comprehensive IT audit.

From the point of view of the IT department, an independent external assessment of the state of IT services is an opportunity to optimize computing resources, increase the level of reliability and security, and obtain up-to-date technical documentation and instructions. For Business, an IT audit is a tool that helps in developing a strategy and making a decision on the directions for improving the IT infrastructure to optimize the costs of IT services in the company (Picture 1).

In other words, an audit is a comprehensive, intelligent approach to the organization, modernization, and optimization of the IT infrastructure, which allows

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you to save money, time, and nerves of the company and its managers. After all, there is no need to make unnecessary movements and expenses for the implementation or use of systems that entail other services - the miser, as you know, pays twice. Also, an audit is a great opportunity to get a reliable partner for further fruitful cooperation [5].



Pic 1. The Information Technology Audit Quality Framework

The purpose of the examination and analysis of the company's IT services is to obtain objective information about the current state of the IT infrastructure, to receive recommendations on improving the productivity of IT services and correcting critical points in the IT infrastructure, as well as to form a program for further optimization of IT services in accordance with business requirements and modern technologies.

When should an IT-audit be conducted?

There are many cases where an IT audit can help your business or enterprise. An audit is required if:

- the company's IT infrastructure is outdated (software and equipment have not been updated for several years), the last audit was conducted more than three years ago, or was not conducted at all;

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- your organization is rapidly growing and developing, hires new employees, opens a new branch, or vice versa, the staff is reduced and it is necessary to reduce IT costs;
- new services and systems appear in the company, new technologies are introduced;
- you are not satisfied with the performance of existing information systems (there are frequent errors, malfunctions), you receive constant complaints from users;
- you use the technical support services of an outsourcing company, or you are not satisfied with the work of your IT department.

In all these cases, it is necessary to understand the current state of the infrastructure in order to assess the compliance of IT services with business requirements and to identify directions for further development of the company's IT infrastructure [6].

As a rule, the examination of the main IT services is carried out in 3 stages.

The first stage is preparatory: this is an organizational meeting, or a call, getting to know the project team, defining the limits of the audit, the conditions and terms of work, signing a contract for services and NDA, obtaining the available technical documentation and temporary remote access to services and equipment.

Next, the collection of information about the operation of individual systems and services and the IT infrastructure as a whole continues, at this stage sometimes the assistance and participation of the customer is required. After that, our engineers analyze the received data: identify vulnerabilities (critical points) in the system, identify areas and opportunities for their optimization [7].

And the final stage is the preparation of documentation, namely a report on the results of the audit, which includes a description of the current state of the inspected IT services and systems (it may be additionally accompanied by a system passport), recommendations of qualified engineers to correct deficiencies and bottlenecks in the infrastructure, options for further modernization and optimization. In addition, a detailed project program with approximate terms and budgets can be developed.

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Initial survey of the existing IT infrastructure, inventory and detailed description of the current state of the client's software and hardware. IT audit allows you to preliminarily assess the state of affairs in the customer's IT sphere, identify "problem areas" and possible risks. At this stage, we see problems and prioritize their solution.

Further, our employees conduct a more detailed IT audit - they analyze the identified problems in detail and search for the most rational ways to eliminate them. You can be sure that the proposed solution will be optimal, as our IT company has competent auditors in various IT areas. In addition, a list of used IT solutions is compiled in relation to current business processes, their rationality is assessed, bottlenecks are identified and possible optimization methods are identified [8].

Also, IT audit provides a description of the logic of interaction between various components of the information system in the process of performing business tasks and assessing the relevance of the IS structure for their solution (Picture 2).

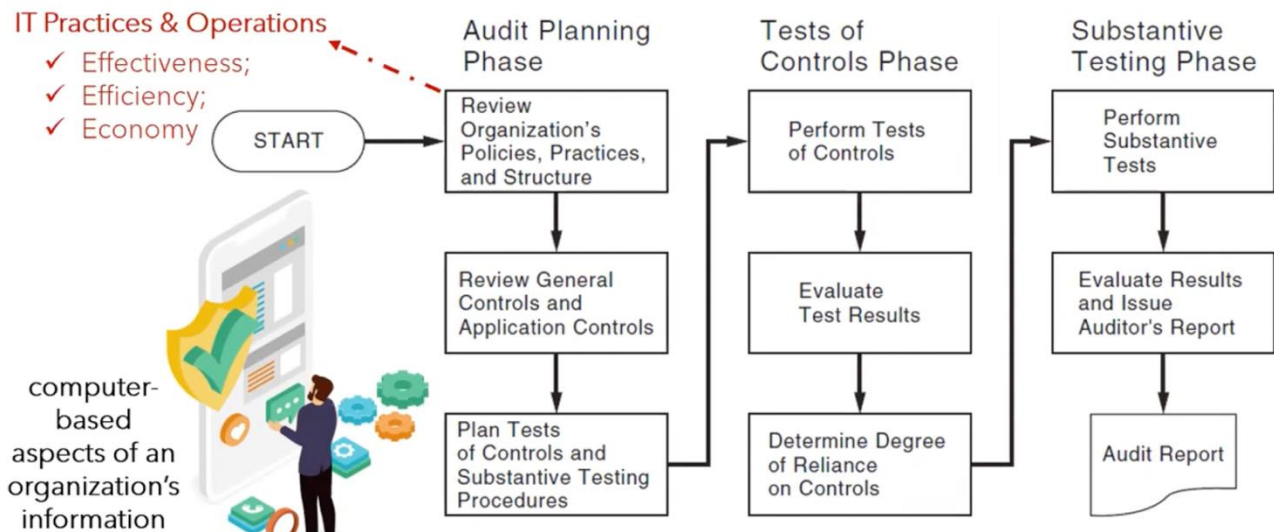
Then our specialists analyze the results of the audit, develop specific proposals and recommendations for optimizing all IS components (software and hardware).

Based on the results of the IT audit, we provide the manager with a detailed report on these issues. IT audit will improve the quality of the functioning of the information system, that is, get the most out of it, reduce possible risks, as well as restructure investments in IT, for example, reduce support costs and increase investment in the development of IP [9].

The audit can be comprehensive, or you can conduct an examination of individual services and systems:

- network infrastructure and wireless network - general information about the network, office network organization scheme, description of the hardware part, configured policies and rules on the equipment;
- server infrastructure and virtualization system – maturity, performance of equipment and virtual servers, operation of SZD, period of operation of equipment, availability of vendor support;

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Pic 2. Phases of an IT-audit

- AD directory service – analysis of group policies, domain controllers, structural organization of Active Directory;
- corporate mail system – setting of rules for sending mail, spam protection, filtering settings, DNS operation, etc.;
- telephony – analysis of hardware and software components, how routing of internal and external calls is configured, configuration of accounts.
- monitoring system – system settings, which metrics are recorded, whether there are employee alerts.
- backup and recovery system – ensuring fault tolerance, creating backup copies and recovery;
- SCS and equipment placement – how the structure of the cable systems is arranged, whether there is access control, video surveillance, how everything interacts, under what conditions the equipment is stored, arrangement in the server cabinet (cable management);
- workstations and peripherals – performance of user equipment, installed software, availability of latest system updates;
- SAM-audit – comprehensive software asset management (SAM) services from software audit to software security organization and optimization of used resources, and availability of licenses;

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- business processes – analysis of the company's main performance indicators, principles of work and interaction;

- IT security - assessment of the security of computer systems or networks by means of modeling an attacker's attack.

As a result of the audit, you will receive an independent expert assessment of the current state of your IT infrastructure, which may include the following:

- Detailed information about the current configurations, structure, logical scheme of operation of the main services;

- Data on software and hardware (maturity and security level of the installed equipment);

- Statistics on productivity and peak loads in the operation of the infrastructure;

- List of services and processes that can or should be transferred to the cloud environment;

- Assessment of opportunities and optimization directions of the existing IT infrastructure;

- A report describing the current state of the IT infrastructure and recommendations for improving the productivity of IT services and correcting critical points (capital and operational costs);

- Optimization program of the existing IT infrastructure with estimated budgets and deadlines (if necessary).

The benefits of an infrastructure audit for your IT systems

What are the long-term operational benefits of auditing your IT infrastructure:

- Improving data security. An IT audit will help point out potential problem areas in the infrastructure, so you can create appropriate strategies to improve the security of your data [10]:

- Reduction of IT costs. Allows you to make informed decisions by correctly planning IT costs.

- Alignment of IT and business goals. This is useful if you have plans for expansion, growth and development in the near future.

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- Objective assessment. Conducting an IT audit will allow you to truly assess your system. You will understand whether your previous investments and IT strategies were effective, what to pay attention to in the future.