



INFORMATION ACQUISITION SYSTEMS AND PROCESSES: PRINCIPLES AND APPLICATIONS

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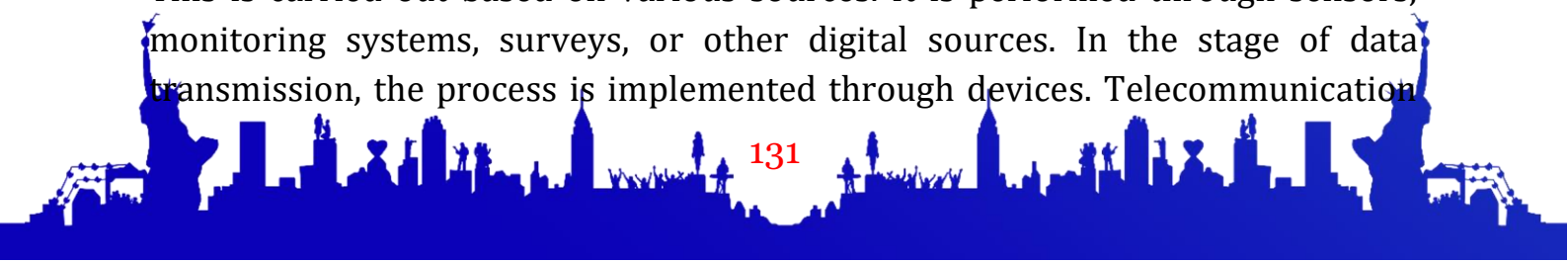
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Abstract. Information acquisition systems are one of the main directions of modern technologies and consist of complex processes that ensure the collection, processing, and analysis of data. This article explores the concept of information, methods of data collection, the role of sensor and measurement technologies, as well as issues of managing information flow. In the modern era, these systems play a crucial role in scientific research, industrial processes, healthcare, education, and management mechanisms. Integrated information systems support real-time decision-making and create essential infrastructure for innovative development.

Keywords: information, information systems, data collection, information processes, management processes.

Introduction. In the modern world, information is regarded as a strategic resource. The success of societies, states, and companies directly depends on the management of accurate and prompt information flow [3]. Information acquisition systems are technical and software-based complexes designed for the proper collection and processing of data. These systems are based on various principles. The main goal of information acquisition systems is to provide accurate, reliable, and timely data about existing processes. These principles include accuracy, promptness, reliability, and efficiency. The principle of accuracy reflects the correspondence of the obtained data to real processes. The principle of promptness refers mainly to the timely acquisition of data. The principle of reliability, as its name suggests, ensures the secure and correct storage of information. The principle of efficiency explores optimal ways of using information resources [4]. Information acquisition systems and processes are designed to collect, process, and present information from various sources for use. The main principles of these systems are the accuracy, reliability, regularity of the data, and their compliance with the needs of users. Their applications include journalism, scientific research, business analytics, and public administration.

The acquisition of information goes through several stages. The processes of data acquisition consist of a sequence of steps. The first stage is data collection. This is carried out based on various sources. It is performed through sensors, monitoring systems, surveys, or other digital sources. In the stage of data transmission, the process is implemented through devices. Telecommunication





networks, the Internet, and other communication tools play an important role at this stage. The next stage is data processing, where information is analyzed using computer systems and algorithms. Data storage is ensured through databases and cloud technologies as methods of long-term preservation. The use of information is applied in management decision-making, reporting, and analytical systems [2].

There are a number of application areas for information acquisition. These include industry, healthcare, education, and management. It is used in the management of medical diagnostic data, in the organization of online education, in the automation of production processes, and more.

Information processes include the collection, transmission, storage, processing, and delivery of information to the user. The collection of information is carried out in order to obtain data about the state of the studied object. In ordinary cases, information collection is performed by humans, while in automated cases it is carried out by technical means and systems. The transmission of information refers to the transfer of collected data to processing devices for further analysis. Normally, information processing is conducted by humans, whereas in automated systems it is performed by computers. The transmission of information can be carried out by different means depending on the distance. For short-distance transmission, cables are used, while for long-distance transmission, communication channels (telephone, telegraph, satellite communication, etc.) are applied. In modern computers, a special device called a modem (modulator-demodulator) is used for the reception and transmission of information over long distances via telephone channels.

The storage of information refers to keeping data on carriers both before and after processing. As information carriers, paper was used, and in older computers, punched tapes, punched cards, and magnetic tapes were applied. In modern computers, magnetic and optical disks as well as cards are used. Searching for and processing information is usually performed by humans in traditional ways, while in automated systems it is carried out by computers. Information processing, in other words, means solving the task at hand. For this purpose, pre-prepared algorithms and programs are used. The results obtained from processing information are delivered to users in the required format. In automated processing (by computer), information is usually provided to users through computer output devices (monitor, printer, plotter, etc.) in the form of text, tables, graphics, and so on [5].

When creating and using an information system (IS) for any organization, the following should be taken into account:





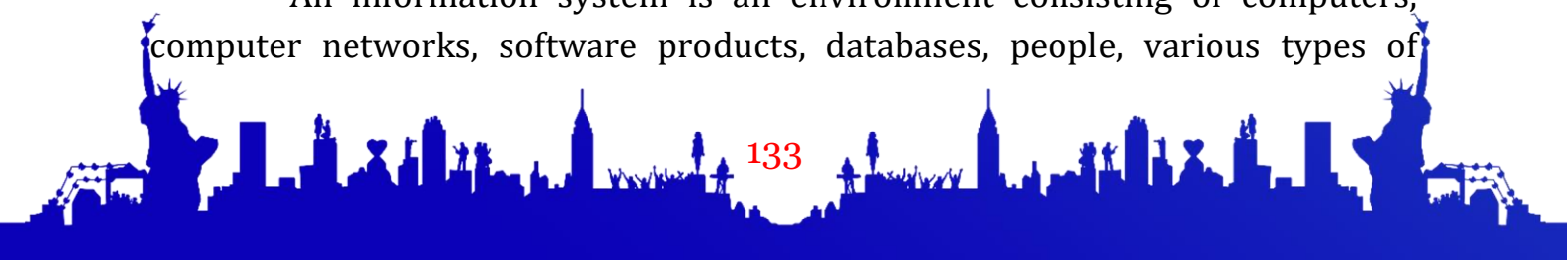
1. The structure of the IS and its functional purpose must correspond to the goals set by the organization. For example, in a commercial firm – efficient business; in an enterprise – the solution of social and economic issues.
2. The information system must be controlled and understood by humans and must be used in accordance with appropriate social and ethical principles.
3. The IS must produce accurate, reliable, up-to-date, and systematized information.

To take these factors into consideration, before building an IS it is necessary to study and understand the organization's structure, functions, policies, management objectives, decision-making processes, and the capabilities of computer technologies. An IS put into operation becomes an integral part of the organization. The creation of an IS begins with an analysis of the organization's management structure. The coordination of the work of all departments of the organization is carried out through management bodies at different levels.

Management refers to the achievement of objectives through the implementation of functions such as organization, planning, accounting, analysis, control, and motivation. In recent years, the concept of decision-making, as well as related concepts such as decision-making systems, methods, and tools, have been widely used in the field of management.

To implement the storage, retrieval, and processing of information, appropriate software must be available, which forms the software provision of the information system. For the representation of information and queries in a form understandable to the computer, as well as for establishing communication between users and the system, certain linguistic tools (languages) are required. The information system belongs to the class of "human-machine (computer)" type systems. In such systems, human participation in the operation of the system is considered essential. On one hand, the human acts as a user of the system, and on the other hand, bears responsibility for the operation of the system (ensuring its operability, meeting user requests, maintaining the relevance of stored information, etc.). The difference between a computer and an information system is also related to the human factor. A computer equipped with special software constitutes the technical basis and instruments of the information system. It is impossible to imagine an information system interacting with computers and telecommunication facilities without human involvement.

An information system is an environment consisting of computers, computer networks, software products, databases, people, various types of



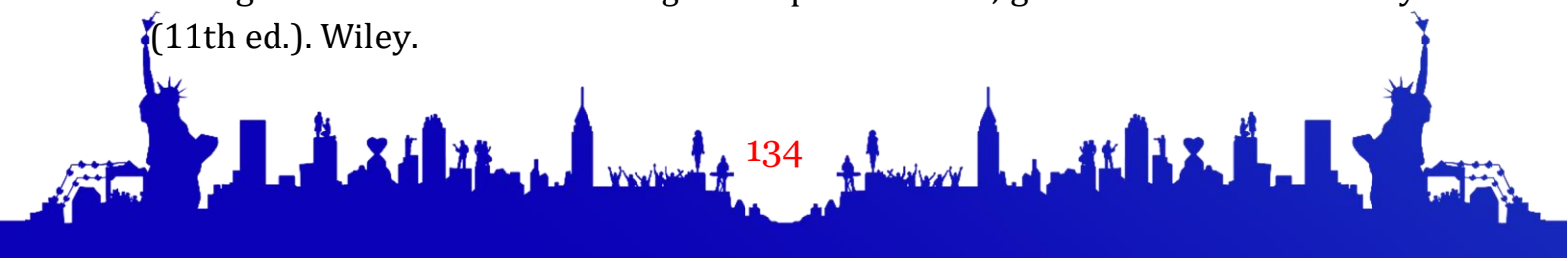


communication tools, and so on. An information system is an “human-computer” type information processing system, where the main purpose is the storage of information, its retrieval according to queries, and the delivery of the selected information to the user in the required form. The realization of the functions of an information system is impossible without knowledge of the information technology directed towards it. At the same time, information technology can also be implemented independently of the information system. Thus, information technology is a broader concept that reflects a modern understanding of the processes of information transformation in the information society. The successful construction and operation of an information system depend on the skillful and joint use of information and management technologies. Concepts used in material production such as standards, regulations, technological processes, technological operations, etc., can also be applied in information technology. In any technology, it is first necessary to determine the goal before defining these concepts. Afterwards, one should attempt to structure all the tasks required to achieve the set goal and select the necessary program algorithms.

Conclusion. Information acquisition systems and processes are the foundation of the modern information society. These systems do not consist only of technical means but also represent essential components that determine the efficiency of social and economic processes. With the application of innovative technologies, it is expected that in the future the processes of information acquisition will become faster and more reliable. The task of the information provision subsystem is to ensure the timely and adequate supply of information to the system. This subsystem is created based on the classification and coding of information by accepted methods, the unification of documentation, schemes corresponding to the information flows circulating within the enterprise, and the methodology of database construction.

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