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QUALIFICATION WORK

on the topic: "**RESEARCH OF THE USE OF INFORMATION FLOWS IN PHARMACIES"**

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АНОТАЦІЯ

У дослідженні розглянуто концепцію створення єдиного інформаційного простору в організаціях, проаналізовано особливості формування інформаційного потоку в фармацевтичних організаціях, а також виявлено розриви в інформаційних потоках на рівні роздрібної ланки. Кваліфікаційна робота містить 44 сторінок, 17 рисунків і включає список літератури з 30 найменувань.

Ключові слова: інформаційні потоки, аптека, автоматизація, інструменти маркетингу, ефективність.

ANNOTATION

The study considered the concept of creating a single information space in organizations, analyzed the peculiarities of information flow formation in pharmaceutical organizations, and also identified gaps in information flows at the retail level. The qualification work contains 44 pages, 17 figures and includes a list of literature with 30 titles.

Keywords: information flows, pharmacy, automation, marketing tools, efficiency.

CONTENT

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INTRODUCTION

Relevance of the research topic. Modern trends in the development of production management systems force domestic pharmaceutical organizations to increasingly use decision-making automation systems in their activities. The penetration of foreign quality standards into the pharmaceutical industry, as well as the strengthening of international competition [8], have a significant impact on this process.

In itself, the problem of using automated production management systems is not new. Previously, there were developments that allowed the use of information technologies in the control systems of large systems. However, the relevance of this problem remains high to this day. This is due to the following circumstances. First, the level of computing technology is constantly increasing, which allows, at constant costs, to increase the efficiency of the computing process by increasing the productivity of information systems. Secondly, changes are taking place at all levels of the national economy. In particular, macroeconomic indicators are stabilized at the macro level: the rate of growth of the gross domestic product, the exchange rate of the national currency against the currencies of other countries, and stock indices. At the micro level, relations with partners stabilize, the market becomes more and more open, which makes it possible to conduct a competitive struggle using economic methods [6].

Thirdly, scientific integration allows companies to use not only the developments of domestic researchers, but also foreign systems and automation technologies. Domestic developers, using modern planning theories of various types of resources, create software products adapted to modern conditions [4].

All of the above shows that the relevance of this topic will exist constantly and transform in accordance with changes in information and management technologies. According to the chosen direction of research, the topicality of the theme is determined by the fact that currently the problem of researching the interdependence of the effectiveness of management of the activities of enterprises and the effectiveness of their information systems [2].

The problem of mutual dependence of activity management and the information system of a company is currently not sufficiently investigated in detail. The use of statistical methods to identify the mutual dependence of various groups of indicators is currently quite common. However, the problem of researching the relationship between the efficiency of companies has not been considered enough [8].

The effectiveness of the pharmaceutical organization's activities has been studied in detail in works of the most diverse orientation. From works on management theory to works on information technologies. As practice shows, solving the problem of calculating the efficiency of a complex system is complicated by the fact that each researcher has his own view of the target management function. This is due to the application of various optimization criteria [14].

In our opinion, for the purposes of evaluating the effectiveness of the use of the information system, it is most appropriate to use a group of indicators both for evaluating the effectiveness of the pharmaceutical organization and for evaluating the effectiveness of the information system. Thus, there is a task of developing a set of indicators for evaluating the effectiveness of the information system to increase the effectiveness of managing the activities of a pharmaceutical organization. All of the above determines the relevance of the chosen topic of the work [3].

The purpose of the qualification work is to research of the use of information flows in pharmacies.

To achieve the goal of the qualification work, it is necessary to solve the following **tasks**:

- to reveal the concept of building a single information space in organizations;
- to describe the essence and main types of economic information;
- to investigate the peculiarities of creating an information flow of a pharmaceutical organization;
- to monitor information flows as marketing tools to increase the efficiency of the pharmacy's work;

- to investigate the peculiarities of the automation of pharmacy;
- to analyze gaps in information flows at the retail level.

The object of the research is pharmaceutical organizations.

The subject of the study is to increase the efficiency of the pharmaceutical organization due to the optimization of information flows.

In work, the following **research methods** were used: questionnaire, analysis, systematic, graphic.

Practical significance of the obtained results. The use of the results of this study will allow to increase the efficiency of the pharmaceutical organization due to the optimization of information flows.

Approbation of research results and publication. The qualification work was tested on All-Ukrainian scientific and practical conference with international participation "Modern pharmacy: present realities and development prospects". The abstracts of reports were published: Bondarieva I.V., Malyi V.V., Fatih H. Study on the utilization of information flows in pharmacies. Modern pharmacy: current realities and development prospects [Electronic resource]: theses addendum. Ukrainian scientific and practical conf. from international participation, April 9–12, 2024, Odesa / edited by k. x. Ph.D., Assoc. V. V. Menchuka, Ph.D. Ph.D., Assoc. Raskoly L. A., Pharm. Ph.D., Assoc. Kalko K. O., Ph.D. Ph.D., Assoc. A. V. Kovpak, candidate of biol. N. Tsysak A. O. – Odesa: Odesa. national University named after I. I. Mechnikova, 2024. – P. 564.

Structure and scope of qualification work. The qualification work consists of an introduction, a literature review, an experimental part, general conclusions, a list of used literary sources, and appendices. The qualification work is laid out on 44 pages, includes 17 figures, as well as 30 sources of literature.

PART I
THEORETICAL APPROACHES TO BUILDING A UNIFIED INFORMATION SPACE IN THE ORGANIZATION

1.1. The concept of building a unified information space in organization

The unified information space of the pharmaceutical organization includes the following systems: support system for formation and decision-making; system for evaluating the effectiveness of management activity; as well as principles of information transformation [2].

Based on the processing of a certain system of indicators in the pharmaceutical organization, a support system for formation and decision-making should function. The concept of its organization has undergone significant changes over the past few years [11]. It should be noted that increased competition necessitates an increase in the number of analyzed indicators for making strategic decisions within pharmaceutical organizations. Along with this, the factors of the management environment are also complicated [20]. In these conditions, it is necessary to strengthen the support of strategic decisions made by the top management of the corporation by information systems. In particular, rapid changes in the management environment require the formation and decision-making support system not only to activate the role, but also to improve the ability to adapt to external changes [10].

In order to meet the requirements with the aim of creating an adapted system, it was proposed to include artificial intelligence techniques in the work of information systems. Today's state of research on the adapted system can be characterized by the following main points [2]: the system lacks a general structure, theoretical foundations; it has a strong dependency on external software.

Unlike the conventional system model, there is currently no universally accepted architecture for an adaptive system. Moreover, architecture of the proposed models is either narrowly specialized or adapted with only one component. This was due to the fact that most research was devoted to one or two of the following points [5]:

1. Development of an adapted system that supports a specific application or a specific phase of the problem-solving process.

2. Design of an adaptive model, database or interface.

3. The process of adaptive system design.

4. Application of specific abilities of perception or logic in the system.

The main topic of research on the adapted system is the development of the problem of how to adapt the knowledge base accumulated from the problem to new problems. Existing studies are focused on using the potential of various study strategies and automation for accumulating and updating databases [11].

Another topic is responsive interface design. The main task here is to create an interface that facilitates adaptive simplification of communication between the user and the system. In this connection, there is a problem of finding the optimal structure of the database to achieve the required level of adaptation, as well as the internal mechanism of information processing in the database to ensure its adaptive behavior [9].

Many researchers believe that artificial intelligence techniques can complement the system to support the manager in a dynamic environment, but until now no effective scheme of their interaction has been proposed. In this regard, it is appropriate to consider the best experience in the development of systems of a similar level based on the conceptual model of the adaptive decision support system [5]. The most effective tools for solving the formulated problem when developing a conceptual model of an adaptive decision support system are: the concept of a feedback-driven learning process, the conceptual structure of a decision-making organization, and the concept of a reflective system [6].

Adaptive interface research is currently focused on mechanisms that allow the system to modify the software interface to best match changes in the user's competence, experience, and preferences. In this regard, when developing the system, it is necessary to include two main mechanisms [14]: a registration mechanism that accumulates records of appeals; a control mechanism that performs appropriate actions. Usage record can be registered in the form of usage patterns or

custom model. The control mechanism can be applied using an algorithmic approach or an expert system. The level of knowledge of the system to achieve the goals of interface design includes: knowledge of the system itself, knowledge of the main problem and use of user knowledge [17].

Different learning strategies can be used to take advantage of the ability to adapt knowledge to changes in the environment. Among them, an inductive strategy was proposed in several studies. Learning automation is an alternative for an adaptive knowledge base. It is also suggested to use an expert support system in the form of a community of experts. Although none of the researchers call it an adaptive decision support system, various scientists study the methods proposed to adapt to changes in the environment [3].

This model differs from others in that it takes into account changes in both the problem area and the user. However, this model cannot clearly work with the fact that the performance of the presentation format is influenced by the characteristics of a specific task [3]. Since the accuracy of the presentation form depends on the content of the problem statement, the adaptive decision support system must have the ability to perceive changes in the user and in the problem, as well as in their influence on each other. In order for the system to be able to modify knowledge about itself, a mechanism of self-analysis is needed at the meta-level to conduct observations and conclusions about the system's operation [7].

Based on the above rational idea, a new model of an adaptive decision support system can be proposed, which consists of two operational levels: the goal level and the base level. The base level includes two feedback-driven learning processes: one to enable adaptability to problem solving, the other to simplify interface elements. The problem processing block includes a database, a base of accumulated knowledge on the main problem, a model building base, training methods, an assimilator, and problem processing. The database contains the actual and normative data of the study, and the initial results of decision-making. The base of accumulated knowledge on the main problem carries instrumental models, for example, using systems theory or statistics. The base of model construction includes administrative

rules, procedures and models related to the core of the problem in which the decision-making system operates [6].

Teaching methods include controlled or unsupervised learning strategies, such as learning by writing into a device, by inductive method (introduction), by deduction, by analogy. In this system, the assimilator works as a knowledge base management system. Also, he can constantly integrate new knowledge generated by the used learning method into already existing knowledge. Processing of the problem is similar to the standard generator of conclusions in expert systems. When receiving input data from the user, it can use decision rules to solve the problem [11]. The interface block can include a user profile base, a base of interface elements, a knowledge base based on the type of representation, an assimilator, formalization mechanisms, and a dialog management system. The user profile database includes the following types of knowledge [1]: refer to the user's knowledge of the problem; about the professionalism and experience of the operator using the system; about user preferences. A user profile is a user model that dynamically represents the user's knowledge, experience, and primary goals. The system includes tools for creating special presentation effects, design of the obtained results, and interface building blocks, such as graphics, diagrams, tables, and text, and also has a body of knowledge on the relationships between interface elements, user characteristics, and problems the user is working on [7].

Formalization mechanisms produce a specific type of knowledge representation depending on the result of solving the problem and the user model. The dialog management system accepts input, issues output data, and collects user characteristics. When there is no knowledge of the preferences of an individual user working on a specific problem, the dialog management system can forward the inspection request to the meta level [21].

The meta level consists of self-knowledge systems and an introspection processor. The self-knowledge system includes knowledge about different forms of knowledge, knowledge about the relationships between the six types of knowledge, and knowledge about the strengths and weaknesses of processing capabilities. When

the system generates a query depending on the nature of the problem, the system in the course of introspection can turn to a specific learning method to generate knowledge. When new knowledge is significantly different from existing knowledge, the system initiates data processing [30]. Thus, a conceptual model of an adaptive decision support system can be used in the development of management decisions. The conceptual model is adaptive in the sense that it can adapt not only its ability to handle the problem, but also its interface to changes in the problem domain and the user. Also, the model has the property of detail in terms of the fact that it covers the features of other architectures [22].

The model opens several areas of research: mechanisms of materialization and object relevance; relationships between problem domain knowledge, presentation type, and user model; mechanism of introspection [18]. Additionally, since this model contains different forms of knowledge, another area of research could be, for example, the coordination of different representations of accumulated knowledge. For timely and effective management of businesses within a manufacturing company, its management must have access to economic information [7].

1.2. The essence and main types of economic information

Under economic information, it is customary to understand the entire set of information in the field of economics, which are used to perform the functions of managing production and its individual links [7].

Sometimes in the literature there is a definition of economic information as various data that are subject to reception, storage, processing and transmission in the process of implementing management functions. However, equating the concepts of "economic information" and "data" is wrong. These are not synonyms, so they should be distinguished [4]. Data is the result of observation, registration of any fact, the state of the process and is expressed by a set of signs or symbols arranged in some way to reflect observed events or states. From these ordered sets of symbols of the primary alphabet, the main economic indicators are formed. The grouping of indicators according to certain characteristics forms a document or message [11].

Informational content is the meaning derived from data, which is a means of conveying facts. The meaning of this data is completely different in different messages and different sets of characters of the primary alphabet. Data taken out of the context of messages lose their information content. The same data, but in different messages, have different information content (amount of information) [8].

When trying to determine the amount of information in specific economic data (documents, indicators), it turns out to have a strange property — it can appear and disappear in them [11]. Data become information only in connection with the possibility of using them in solving any problem. And, on the contrary, any economic indicator, if it is separated from those tasks, the solution of which it provides, ceases to be information and becomes only data [3].

The most important feature of economic information is its unity, interrelation and mutual conditioning. It is a consequence of the fact that every organization from a cybernetic point of view is considered as a single object of management with a certain set of interdependent economic information characteristic of it, which has its own peculiarities of education and processing [4].

Economic information in its main mass is discrete, has a linear form, uses a relatively limited alphabet, which includes letters, numbers, blanks and several special symbols [25]. A characteristic feature of economic information, both initial, subject to processing, and resulting, obtained after arithmetic and logical processing, is the need for long-term storage. This is caused by the duration of its use, the discrepancy in terms of processing after the information appears, or the discrepancy in the terms of its transmission and processing, etc. [3].

The specificity of economic information lies in the fact that it is characterized by a large mass and volume, and therefore requires repeated grouping, arithmetic and logical processing in different directions, consolidation or transfer to the higher management level [4]. The complex structure and large volume of economic information make it necessary to classify it according to various characteristics. The classification of economic information is based on the goals set in the process of its research. Such goals can be the determination of the functional purpose of economic

information in the management process, methods of its transformation, usefulness, stability, etc. For each of the specified areas, specific characteristics of the classification of economic information are used (Fig. 1.1 and Fig. 1.2) [14].

The most important feature of economic information is its functional purpose. Depending on the functions performed by economic information in the management of production activities, it is divided into planning, accounting, analytical, reference-normative and directive. Each of the listed types of information has its own specific features and terms of processing [11].

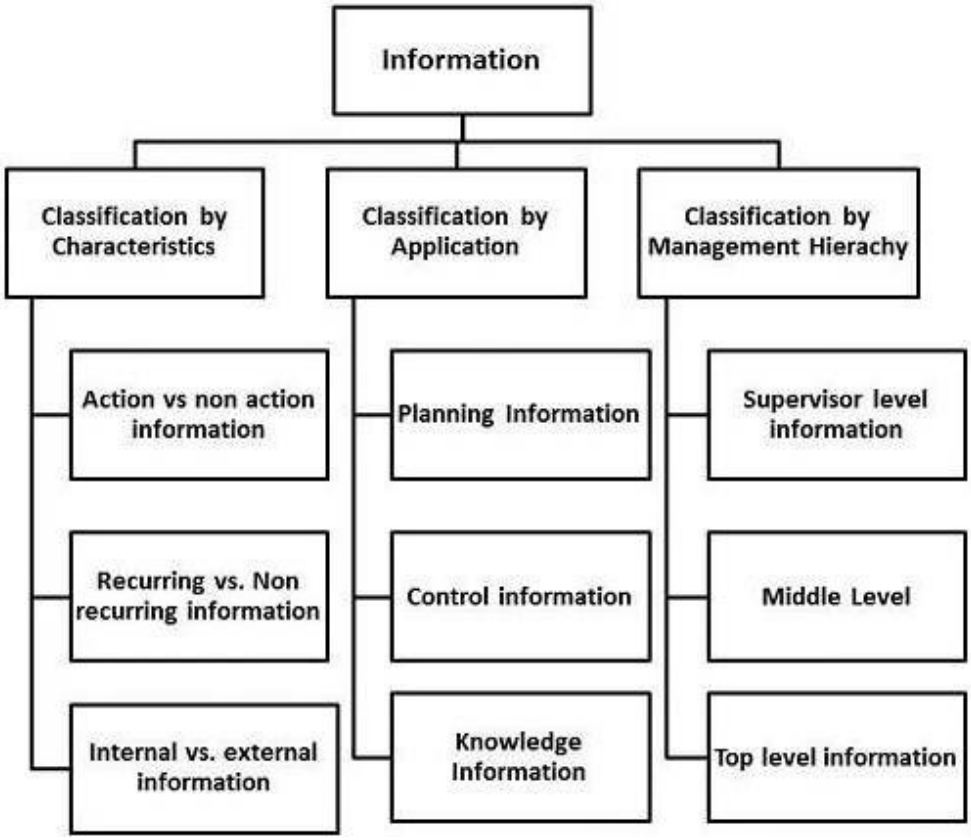

Fig. 1.1. Classification of information

Planned information reflects phenomena, events and processes that should take place in the future. It arises in connection with the implementation of long-term planning, with the development of current plans and the implementation of operational calendar planning. It is characterized by a small amount of initial data, which are set partly in a prescriptive way, a significant number of interdependent information, the acquisition and processing of which are associated with the

execution of a large number of logical operations. Planning information is closely related to normative and partly to directive information. These types of information serve as the basis for calculating planned indicators [6].

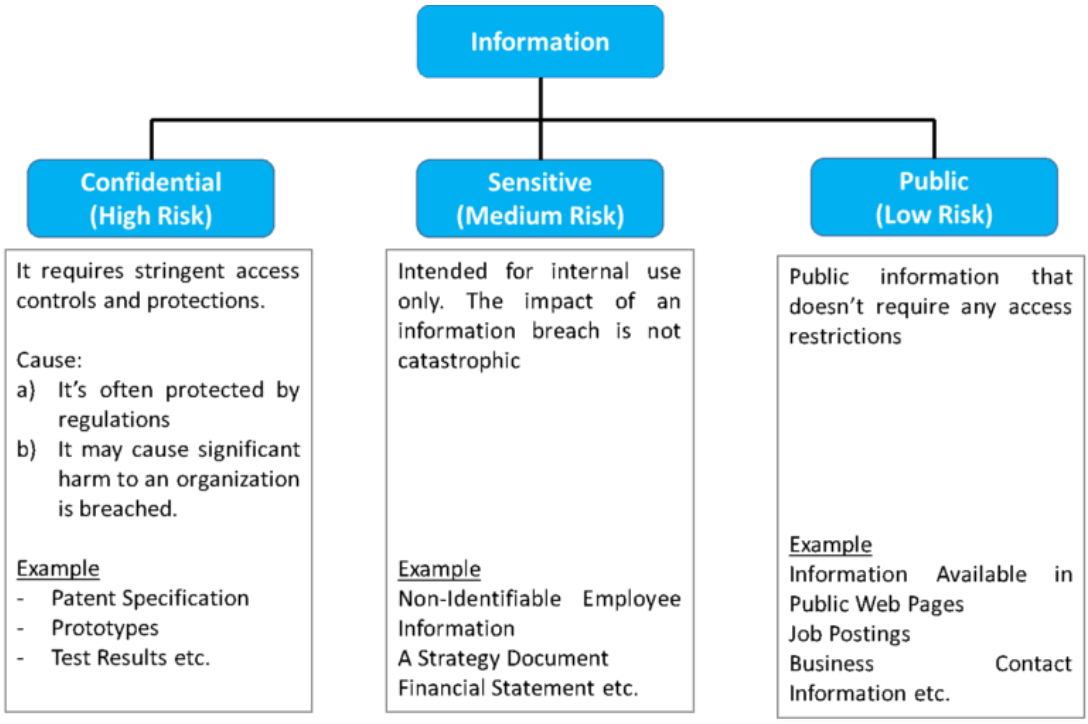

Fig. 1.2. Classification of information

Unlike planned, accounting information reflects production and economic operations that have already taken place. It occupies the largest specific weight in economic information. According to research, accounting information in diversified corporations covers about 80-85% of all documentation and about 90% of the number of indicators. In the structure of economic information in farms, accounting information accounts for 80-83% of all indicators. According to the terms of processing and methods of formation, accounting information is divided into accounting, statistical and operational [5]. Each of them has specific techniques and ways of displaying production processes and its own field of application [4]. In accounting, for example, it is fundamentally impossible to use a probabilistic approach to reporting. Due to the accurate display of production results, accounting data is widely used to analyze and control the progress of the plan and for the purposes of current planning. Accounting information is obtained after arithmetic

and logical processing of the raw data obtained by continuous registration of economic transactions on the appropriate media. It is the most massive (50-55% of all indicators) and diverse [20]. Statistical information provides a quantitative explanation of the phenomena of economic life in their relationship and totality. The specific weight of statistical information in the information system of individual business units is small — only 1% [9]. Accounting and statistical information reflects phenomena, events and processes of economic activity of a manufacturing company, which have already taken place and is sent to management bodies after displaying them on the appropriate media at the end of the reporting period [7].

To control individual business operations and processes directly during their implementation, operational information is used, which is a system of indicators that reflect the activity of the management object and are used for its operational management. In the economic literature, you can find other definitions of operational information, which are usually based on the period of time during which operational information is used [20]. Operational information has many common sources with accounting, but differs from it in stricter processing terms. It covers a wide variety of phenomena that occur in the object of management, and contains various indicators, mainly of a production and technical nature. In the information system of manufacturing companies, operational information occupies a large specific weight — 32-33%. According to the number of indicators recorded in the documents, it is inferior only to accounting information. But unlike the latter, operational information indicators can be obtained in addition to documents — from telephone or verbal messages, and its total volume significantly exceeds the volume of accounting information [8]. Accounting and planning information is almost never used to make management decisions. For this purpose, analytical information is used, based on the comparison of accounting with planning and reference-normative information [18]. Analytical information is used to assess the achieved level of production and economic activity and identify unused resources. It is the basis of control, which can be considered as a system of monitoring and checking the compliance of the process of functioning of the managed object with the

management decision. Depending on what types of accounting and planning information are compared and for what purposes they are used, operational analytical information is distinguished, based on the use of operational, planning and accounting information for the purpose of operational management, and strategic, the main content of which is the analysis of the implementation of current and prospective plans, — such information is used to make strategic decisions. The specific weight of analytical information is small — 4-5% [2]. Reference-normative information must be considered as a separate type of economic information and put on a par with accounting, planning and analytical information. First of all, because in the conditions of the use of computers, reference-normative information is fixed in the form of separate arrays on machine media, subject to long-term storage and repeatedly used in the process of automated data processing. This type of information is used not only for planning — it is also widely used for the purposes of analysis and control [14].

Reference-normative information has a small volume — 1-2%. It includes normative (material, labor and other standards), price (price lists, tariff rates, salaries, assessments), contractual and reference tables (passports, coefficients, technical characteristics, etc.) [4]. Directive information in market conditions is characterized by irregular, one-time receipt in the form of directives, orders. It has a small volume (0.5%), but it can significantly influence the adoption of certain decisions [4]. Classification of economic information can be based on other characteristics. Without the classification of economic information, it is impossible to analyze existing information flows, build new, more advanced information systems, and make optimal management decisions [2].

CONCLUSIONS TO PART I

1. The concept of building a single information space in organizations is revealed.
2. The essence and main types of economic information are characterized.

PART II
STUDY OF THE PECULIARITIES OF INCREASING THE EFFICIENCY OF THE PHARMACEUTICAL ORGANIZATION DUE TO THE OPTIMIZATION OF INFORMATION FLOWS

2.1. Creation of the information flow of the pharmaceutical organization

One of the features of the modern pharmaceutical market is a large amount of marketing information. This state of the pharmaceutical market was the result of the transition to a market economy and was accompanied by the processes of transformation of forms of ownership, the destruction of the state monopoly, both in the production chain and in the pricing system, as well as the trend towards integration into the world economy [11].

Different scientists were involved in the development of separate areas of information provision and the use of information marketing technologies in pharmacy. Availability and quality of pharmaceutical care for the population is an important element of the state's social policy. In this regard, in the area of providing informational support for innovative development processes of pharmacy, the role of information flow research in the field of drug circulation and medical devices is growing significantly [3].

This is possible only with the implementation of effective activities of all branches of the pharmaceutical market, which is connected with conducting marketing research of the firm's position in the competition and the competitiveness of its individual products, changing relations between market subjects and consumers, which require the development and maintenance of long-term, reliable relationships relations through informational communication flows based on increasing the level of social interaction between market subjects [7].

However, a large volume of work in this direction is limited to the presentation of narrow and formal-management tactical approaches to solving the problem of information provision.

In addition, research on the effectiveness of using informational marketing strategies to stimulate pharmacy sales as a competitive advantage has so far been insufficient. At the same time, over-the-counter medicines were considered, the group of vital and most important drugs, which is one of the main groups of pharmacy goods, did not fall into the field of view of the researchers [22].

The classification of information flows is presented in fig. 2.1.

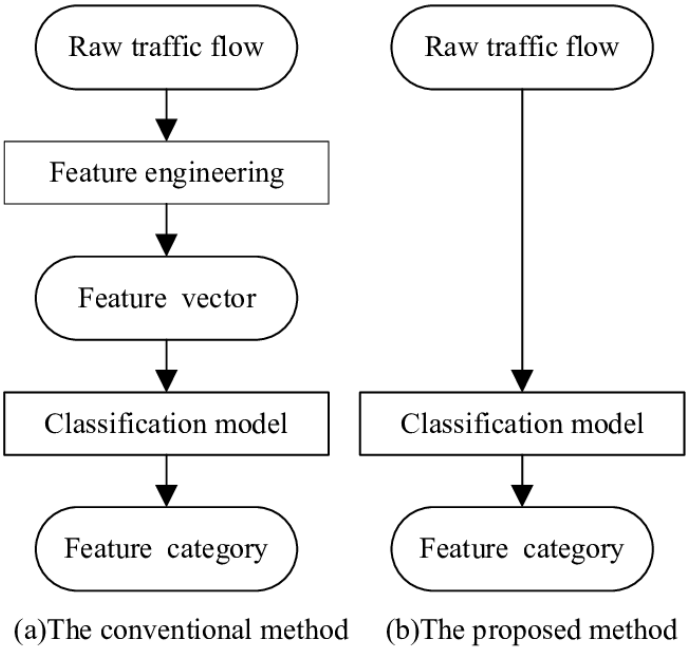

Fig. 2.1. Classification of information flows

The structure of the management process of a pharmaceutical organization reflects the orderliness of such components of management activities as the management function and stages of management [8].

In particular, considering the management process as a single interdependent process consisting of a set of numerous informational, logical, mental and organizational operations and procedures, four management cycles can be distinguished: 1. Information cycle — search, collection, transfer, processing, storage and use of management information. 2. The cycle of making and making decisions — making and making various decisions based on information. 3. Organizational cycle (or cycle of decision implementation) — performance of various organizational operations that affect the object in order to implement the

adopted decision. 4. Preparation of higher-level goals and objectives. This cycle is carried out in relation to the pharmaceutical organization by the branch body of the management system. Based on the results of the analysis, the management decision-making process includes the following stages: receiving information; its processing; analysis, preparation and decision-making. Management of objects in pharmaceutical organizations is performed, as a rule, with the help of documents. Documents are carriers of primary information, it is in documents that information is recorded for the first time. Fixation, display of information in the document ensures its preservation and accumulation, the possibility of transmission in time and space. In a typical structural element, two types of information flows are distinguished, with the help of which there is a connection between the governing body and the object of management (Fig. 2.2) [5]:

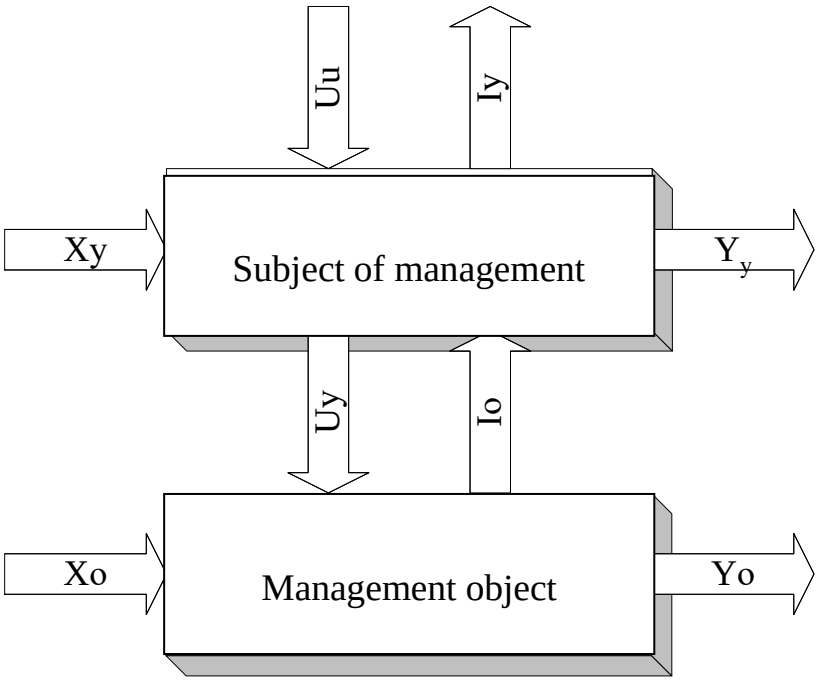

Fig. 2.2. Management system model

where:

U = <U1, U2, ..., Uk> — set of information about decision-making.

I = <I1, I2, ... , Im> — a set of information about the state of the control object;

Xy, Xo — input signals;

Yy, Yo — output signals;

Uu, Uy — controlling influence;

Iy, Io — feedback signals (information signals).

Input information of the governing body is divided into two types: governing and reporting. Management information includes management information (orders, resolutions, decisions, orders), which are a type of management decisions. The reporting information of the management body is information for higher authorities about the activity and state of the system as a whole. The management system of the pharmaceutical organization is considered as the interaction of two subsystems: the managing and the managed. The structure of a manufacturing company can contain more than fifty structural divisions, which include both those directly related to the business process and administrative and auxiliary divisions. The existing hierarchy of functions of the device by levels of information processing is presented as follows: decision-making is carried out at the highest level (management); at the second level (management), the selection of information necessary for solving management tasks is ensured; at the third level (subdivision), primary data are grouped and summarized to obtain aggregated indicators; the fourth (departmental) level ensures the collection of primary data, identification and registration of information about processes and subjects that characterize the main activity of the pharmaceutical organization [11].

As a rule, the movement of documents between points, its entry into and exit from the system, forms the document flow of a pharmaceutical organization or a separate structural unit. Thus, the information flow is considered as the movement of information between structural units related to the main activity of the pharmaceutical organization. A simplified diagram of the information exchange of the management circuit of a pharmaceutical organization, which takes into account the main recipients of circulating information, is shown in Fig. 2.3. Based on the formalization of the logic of information exchange, the information flow of the pharmaceutical organization is built. The information flow of a pharmaceutical organization can be represented in the form of a diagram (Fig. 2.4). In fig. 2.4 presents the three main components of the information flow: information input,

internal information processing, information outflow. At the stage of receiving information, it is necessary, first of all, to classify the main sources of obtaining information [21].

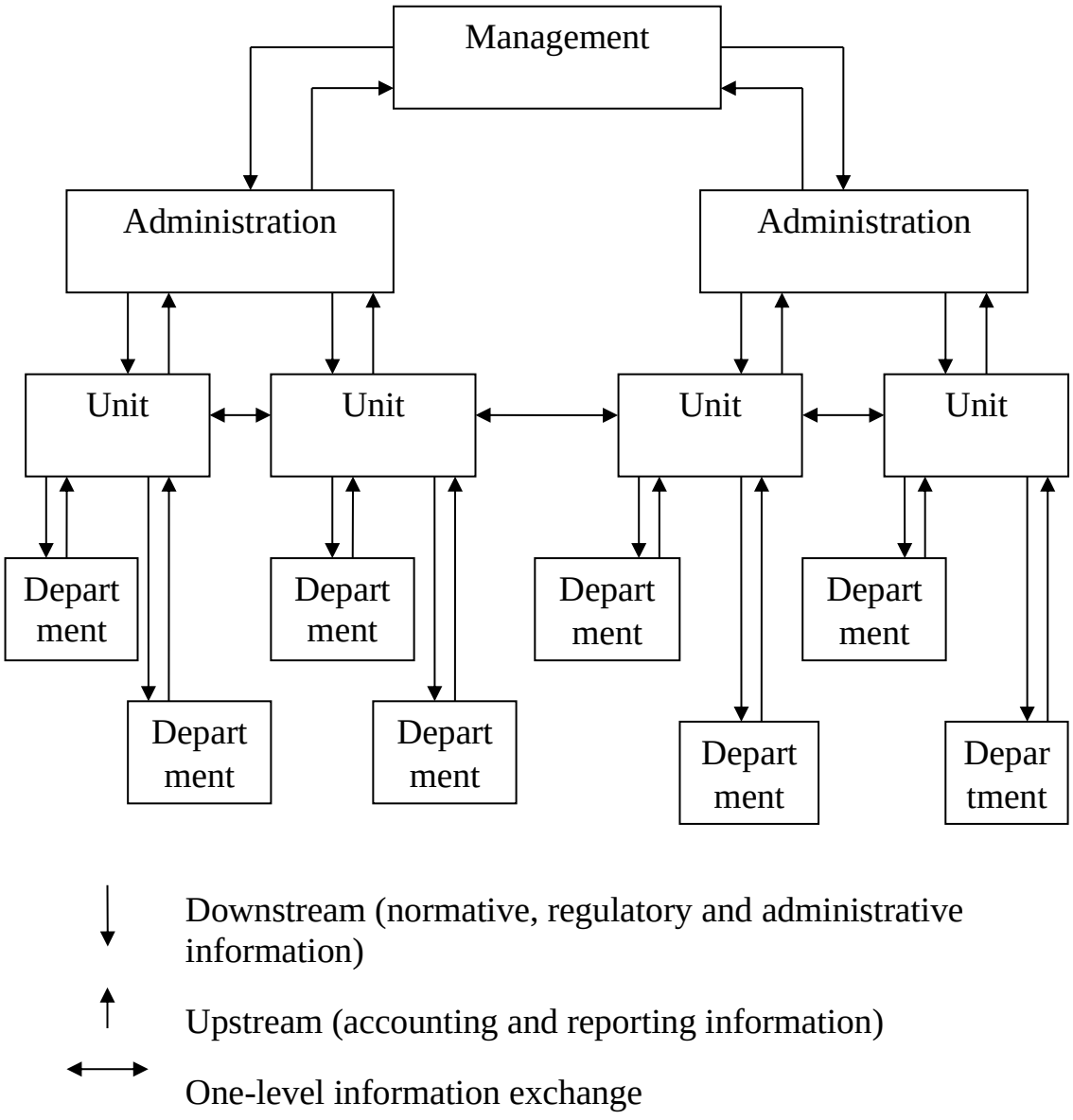

Fig. 2.3. Scheme of information exchange of the control circuit pharmaceutical organization

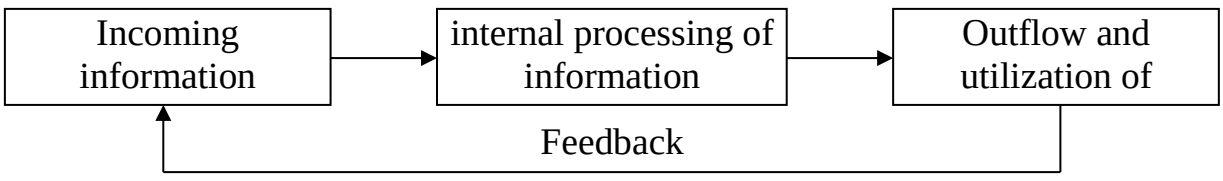

Fig. 2.4. The structure of the information flow of the pharmaceutical organization

In particular, the main sources of information for a pharmaceutical organization are: mass media; authorities and results published by them; market and advertising; competitors; customer reviews; pharmaceutical organization itself.

Mass media allow you to learn general trends in the economy, as well as to get an idea of the parameters of macroeconomic development. Authorities are the source of normative acts, they issue and publish laws, resolutions, instructions. The market and advertising provide information about new products, works, and services in demand on the market. Information about new technologies can be obtained from competitors, and new niches of the pharmaceutical organization's activities can be selected based on the analysis of competitors. Customer reviews allow the company to improve its products, increasing the degree of customer satisfaction [8].

The stage of internal processing is actually the basis of business, the efficiency of the company as a whole depends on the processing of information in the process of its internal turnover within the framework of the pharmaceutical organization. Currently, there are various systems for organizing internal information processing. In particular, it is possible to highlight:

- corporate information systems;
- systems of balanced indicators;
- decision support systems;
- automated control systems.

The activity of any of the listed systems is aimed at increasing the efficiency of the pharmaceutical organization, but each of them has certain characteristics.

The concept of a corporate information system covers the entire variety of information systems operating in a pharmaceutical organization, starting from the level of the simplest production controllers and ending with management at the administrative level. Due to various circumstances, there are difficulties in creating a unified information system of a pharmaceutical organization designed to support all levels of management. The most common case is the existence of several loosely interconnected information systems that function at different levels of management.

To classify the information systems of a pharmaceutical organization, three characteristic levels of management can be distinguished [11]:

- mechanism management (level 1);
- automation of the production process (level 2);
- administrative planning and management (level 3).

A balanced scorecard complements financial indicators that measure past performance with measures of future performance factors. Scoreboard objectives and metrics are the result of organizational foresight and strategy. Tasks and meters allow you to see the activities of a pharmaceutical organization in four directions: finances, consumers, internal business processes, learning and growth. These four areas provide the basis for a balanced scorecard.

2.2. Research of information flows as marketing tools to improve the efficiency of the pharmacy

Information in the conditions of the developed market has always played an exclusive role for the successful promotion of the product.

One of the features of the pharmaceutical market is a large amount of marketing information. Today, the domestic information market has reached a state where any client can choose a performer who satisfies him with a combination of price and quality of services provided. Awareness of the necessary resources, the possible consequences of the decisions made, and the availability of methods of their implementation acquires a decisive role. The range of issues facing the domestic subjects of the pharmaceutical market is huge, and all of them require decisions that cannot be made without comprehensive information [3].

The study of the current state of the use of information marketing technologies made it possible to present the process of drug promotion on the pharmaceutical market in the form of an open system of information and communication flows, which is based on the relationships of subsystems of the internal sphere and establishes a connection with the external environment.

For a structural and logical study of the main factors of the external environment, it is necessary to use the PEST analysis. Entry into the system of information flows is represented by various types of resources: commodity, informational, financial and personnel, exit from the system is determined by two levels of effectiveness of the implementation of information flows: an intermediate level — social efficiency (satisfied demand for pharmaceuticals) and final efficiency (communication and economic).

The internal environment is represented by three subsystems: communication, promotion and target audience. It was established that in the process of drug promotion, not only the subjects of the pharmaceutical market, but also organizations representing the advertising market: advertising, media agencies, etc., participate. At the same time, it was found that the communication subsystem of the pharmaceutical market is represented by two structures: subjects of the pharmaceutical market and manufacturers, distributors, retail chain, consumers, subjects of the advertising market that offer services for creating communication, services for the production of advertising products, services from studies in the field of communications. We discovered and marked the specifics of existing information flows on the pharmaceutical market. The general concept of the movement from the producer to the consumer has undergone some changes due to the high social significance of the segment (pharmaceutical market), as well as its strict regulatory component. Features of information flows in the pharmaceutical market are presented in fig. 2.5.

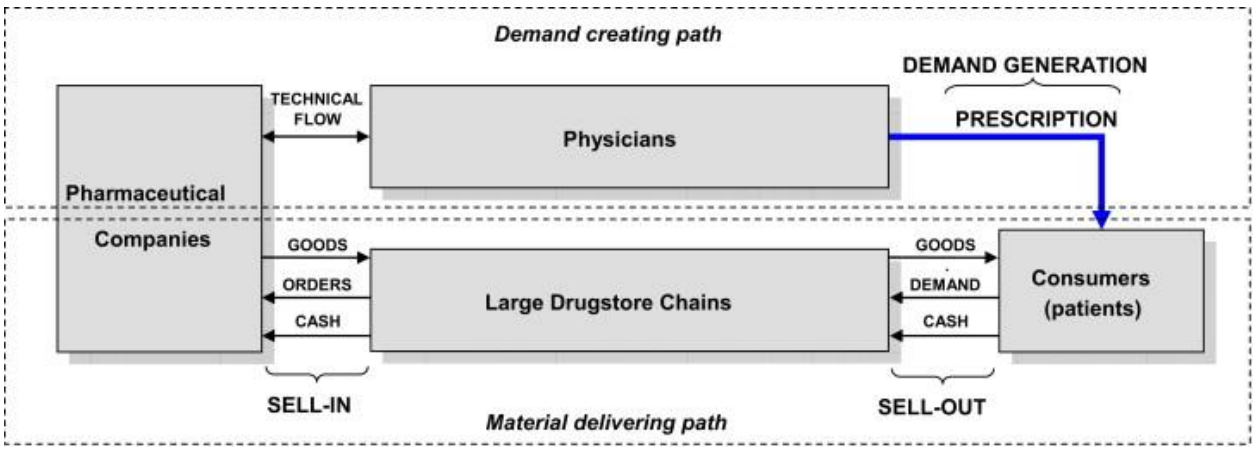

Fig. 2.5. Peculiarities of information flows in the pharmaceutical market

Information flows are divided by us into three components from the producer to the final consumer. The toolkit that provides movement is advertising and special promotions aimed at the buyer in the pharmacy. The activity of the information flow is limited by legal acts (Law "On Medicinal Products", Law "On Advertising", etc.), which indicates its indirect applicability, for example, only in relation to over-the-counter medicinal products or dietary supplements. In this regard, this connection is of a weak nature. A mistake in the direction of the flow (wrong target audience, wrong advertising medium) can turn into irreparable losses for both the producer and the consumer (missed opportunity for recovery) [11].

The manufacturer is a doctor. A stronger bond of interaction, as the communication model is built at the level of two specialists. Advertising and promotion serve as tools, however, clinical information plays an important role.

The strongest connection is observed at the level — manufacturer — institutional consumer. This concept includes not only the generally accepted parameters of communication subjects — pharmacies and distributors, but also the format of interaction with state authorities (the Ministry of Health) is gaining more and more strength. Therefore, the connection with the institutional consumer is the strongest. However, we have identified weaknesses in its functioning. Thus, the Ministry of Social Development has a limited range of necessary information for making the necessary decisions. Medical statistics (incidence, personnel, etc.), reports on the state of the infrastructure (pharmacies and domestic manufacturers) are practically the entire list of analytical information that the ministry possesses. Such information is not enough for a clearer vision of the market situation, forecasting demand and monitoring the fulfillment of prescriptions.

In this regard, we proposed a model of interaction of the subjects of the pharmaceutical market, which allows comprehensive use of the accumulated information about the market.

The core of this interaction is an independent audit of all processes taking place on the market. Market subjects separate their information field, which gives them the opportunity to respond in a timely manner and make adequate business

decisions. The main driving force of the pharmaceutical market, which affects all structural indicators and the dynamics of its development, is innovative medicines.

The share of these medicines is steadily increasing year by year. Thus, in 2023, the increase in the share of the mentioned medicines on the pharmaceutical market amounted to more than 50%. The introduction of information flows into the real sector of pharmacy contributes to the formation of a new economic order. In this regard, we conducted a survey of 52 respondents in order to study the use of information flows in the field of medicine circulation.

For this, we developed a questionnaire consisting of two logical groups of questions: the first group includes questions to obtain information about the respondent's identity (gender, work experience, etc.). The second is a question to find out the attitude towards the use of information tools in the activity of a pharmacy.

The heads of 52 pharmacies were involved as respondents (Appendix). It was determined that 95% of respondents are women and 5% are men (Fig. 2.6).

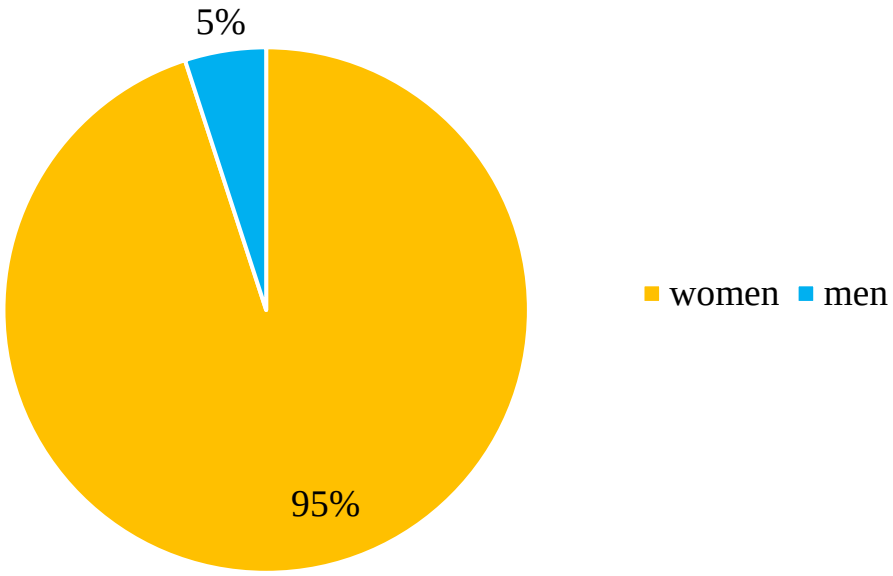

Fig. 2.6. Analysis of respondents' gender

It was established that 15% of pharmacy managers have work experience from 6 to 15 years, 45% — from 16 to 25 years, 27% — from 26 to 35 years, 11% — more than 35 years, and only 2% — up to 5 years (Fig. 2.7).

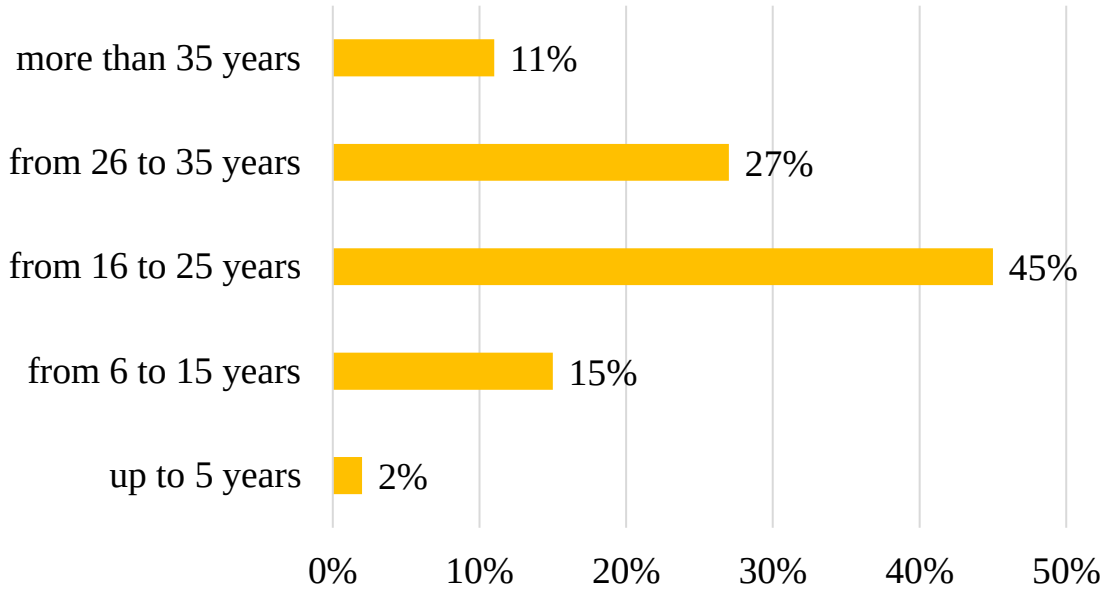

Fig. 2.7. Analysis of work experience of pharmacy heads

It was found that 83% of the pharmacies participating in the study have computer equipment (Fig. 2.8).

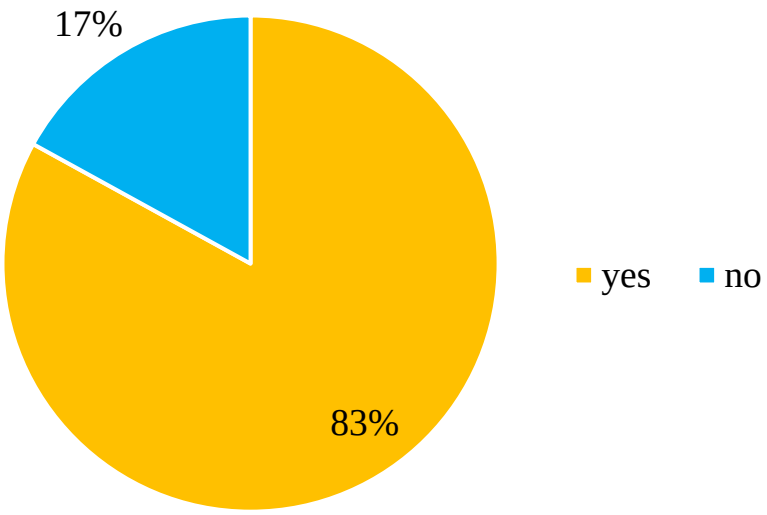

Fig. 2.8. Analysis of the availability of computer equipment in the researched pharmacies

It was found that 55% of the investigated pharmacies have more than two computers, and 45% have one computer (Fig. 2.9).

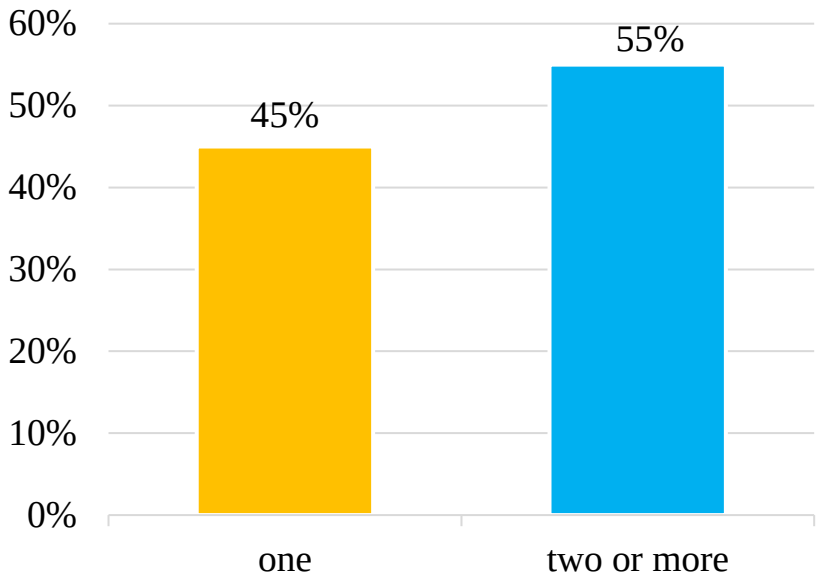

Fig. 2.9. Analysis of the number of computers in the researched pharmaies

It was established that 92% of pharmacies use the Internet in their practical activities (Fig. 2.10).

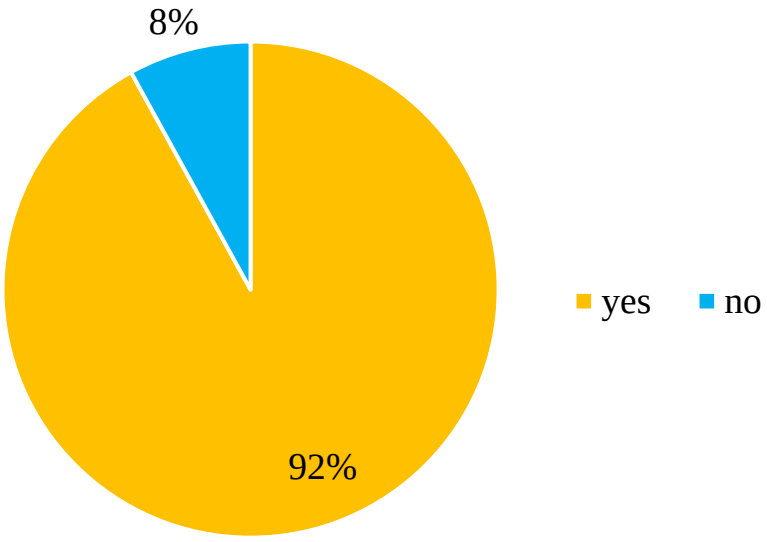

Fig. 2.10. Analysis use of the Internet in practical activities

CONCLUSIONS TO PART II

1. The peculiarities of creating an information flow of a pharmaceutical organization have been studied.

2. In order to improve the efficiency of the work of pharmacies, a study of information flows as a marketing tool was conducted using a questionnaire of 52 heads. It was determined that 95% of respondents are women and 5% are men.

3. It was established that 15% of pharmacy managers have from 6 to 15 years of work experience, 45% — from 16 to 25 years, 27% — from 26 to 35 years, 11% — more than 35 years, and only 2% — up to 5 years.

4. It was found that 83% of the pharmacies participating in the study have computer equipment.

5. It was found that 55% of the investigated pharmacies have more than two computers, and 45% have one computer.

6. It was established that 92% of pharmacies use the Internet in their practical activities.

PART III
PRACTICAL APPROACHES TO THE AUTOMATION OF PHARMACIES AND PHARMACY NETWORKS

3.1 Study of the features of automation of pharmacy

Any pharmacy is a complex commercial enterprise, the key feature of which is the product itself. Pharmacies and pharmaceutical warehouses have to work with a huge nomenclature: drugs come in different dosage forms, the difference in price offers from different distributors and manufacturers, the need to track and reassess the remaining stock in the warehouse, etc. as in any large retail outlet, but additionally there is state control over pricing and specific models specific to the pharmaceutical business — all these processes can and should be automated.

Complex programs for automating pharmacies and pharmacy networks, as a rule, consist of separate modules, each of them is responsible for automating certain tasks or processes of pharmacies and pharmacy networks.

When automating a pharmaceutical facility, it is necessary to take into account: 1. ATC (Anatomical Therapeutic Chemical classification) selection of medicines by symptoms / diseases. Compliance with this classification must be maintained. At the same time, the end user does not search according to the ATC criterion — he searches according to symptoms or a disease. Accordingly, the system should allow having 2-4 trees of categories (classification systems) in parallel, so that it is convenient to search for the necessary medicine.

2. Pricing. There are products that are sold according to different price models: some are discounted, some are subject to state regulation and cannot be sold at prices "more expensive than" or "markup not higher than *%". There are also products that are sold according to the "manufacturer sponsored discount" model, in which the difference between the retail price and the economically justified price is covered by the supplier. Depending on the stage of the pharmacy's life cycle, it is also necessary to manage the pricing policy. If the pharmacy is just opening, it has more promotions. If there is a strong competitor next to the pharmacy, it is the same. Thus,

pricing for a pharmacy chain is not an easy task, and a pharmacy business automation system should provide an opportunity to manage pricing models, provide analytics on the effectiveness of individual models and product categories, and — highly desirable — see profit/loss forecasts before re-evaluation.

3. Accounting and recalculation of the price on the fly. Different models of accounting and re-accounting are used in pharmacy chains. These are batch accounting, and recalculation according to the schedule, and recalculation in the event of external events (change in the dollar exchange rate, change in regulatory norms, etc.), expiration of the product's expiration date. Accordingly, accounting, revaluation of balances, dynamic pricing, operational ordering of goods and transport logistics both within the network and from suppliers must be considered.

4. Loyalty programs and promotions. Pharmacies are increasingly switching to discount and bonus programs with personal conditions for each client, based on his past purchases, probable diagnoses, etc. It is convenient for the client to receive personal offers for goods that he often or regularly consumes. It is profitable for a pharmacy to make promotional packages that will be beneficial for customers and at the same time help sell the goods that need to be sold.

5. Open APIs and security. A modern system, on the one hand, should be completely open for integration with APIs. For example, in order for the insurance company to be able to place an order via API, instead of calling the call center of the pharmacy chain. On the other hand, data security and transaction security are important.

6. Offline operation of systems. Despite the fact that 4G and 5G networks are changing the possibilities for accessing the network, the problem of offline work is still relevant. Key operations: work with the cash register, work of the loyalty program — should not depend on network access, operations should take place even in the absence of a signal and synchronization should take place at the moment when the connection is restored.

7. Built-in ordering system for suppliers. At the moment, import and export of price lists are automated using Morion codes — the codes of medicines in the

catalog of the company of the same name. They are practically analogous to state codes and are the most common in the pharmaceutical market. It is important for a pharmacy to be able to quickly receive price lists and form an order based on the optimal price. Examples of tools for automating pharmaceutical orders are LIKIS or its analogues, which allow selection of suppliers according to specified criteria: as a rule, this is the minimum price.

8. Integration with pharmacy aggregators. Such services as Liki24, Tabletki.ua, MedBrowse, Apteka911, etc. They allow buyers to find medicines in the nearest pharmacies, order them online, check the availability of the product or contact pharmacies, order delivery. You can not only post your price lists and product offers, but also monitor the activity of competitors.

9. Support of the "Affordable Medicines" program. If the pharmacy is a member of the state program "Affordable Medicines", records must be kept of reimbursement of the cost of medicines that patients receive under this program free of charge.

10. Support of cash register equipment. The possibility of connecting and working with cash register and fiscal equipment: barcode scanners, label printers, payment transaction recorders, POS systems, etc.

11. Internet pharmacy. It is important not only to create a pharmacy website, but also to work out all the necessary integrations with already existing accounting systems (for example, 1C) and automation for timely automatic data updates, to connect a CMS or ERP system. All components must be compatible. There are several examples of popular programs for automating pharmacies, presented on the market of Ukraine and near abroad. As a basis, we took such characteristics as the popularity of the software, functionality and maximum compliance with the requirements and tasks of running a pharmacy business. The "Pharmacy" software complex is a software product for the automation of individual pharmacies and pharmacy chains. Functional capabilities are divided into blocks: pharmacist: intuitive interface, convenient search (by barcode, batch code, name or manufacturer), complete information about the product, analogs and synonyms,

online balances, discount programs, hospital prescriptions and insurance companies, franchise accounting, working with doctors , cash book; for the manager: automatic recognition by Morion codes, incoming control, automatic mark-up, mass revaluation and inventory without stopping sales, online reservation of goods, formation of output documents and much more; for the manager: automatic import of documents from e-mail, automatic calculation of needs, distribution of invoices by pharmacies according to the filter, optimization of balances between departments, automatic distribution by suppliers; in addition, blocks for a marketer, analyst, customization of reporting, compatibility with accounting programs, control of pharmacy employees, dynamics of changes in key indicators of pharmacy work, etc.

The program allows you to transfer data from other accounting systems, directories are updated daily, software versions are regularly updated. 1C: Pharmacy is a solution for automating both a single pharmacy and pharmacy networks. In the version "1C: Pharmacy" expands the functionality of the typical solution "1C: Retail" to work with a specific assortment (medicines, medical products) and business processes (post-series accounting of medicines, control of counterfeits and expiration dates, control of pricing rules, etc.). Main functional blocks: the structure of the retail network. The program allows you to work in the mode of distributed information databases (DIB) at two levels: by pharmacies and by operator workplaces; accounting of operations for several organizations; maintenance of the directory of nomenclature. Accounting for drug series, the ability to store additional information about drugs (VAT rate, country of origin, etc.), separate accounting for the movement of goods, accounting for analogs, control of falsified and expired drugs, bar coding, etc.; pricing management and discount management unit; accounting for the movement of goods; registration of sales; HR; system of reporting and analysis of enterprise activity; block of work with trade equipment.

Along with support the program supports integration with external information and accounting systems of 1C. Paracels — a program for automating pharmacies, is one of the most popular due to the functionality-price ratio. Suitable for automation of single pharmacies or small chains. The main features of the

program: a ready-made database of drugs for 32,000 items (there is no need to enter them manually, as in the "1C: Pharmacy" program, for example) and a database of analogues; Morion code support; automatic posting of invoices from suppliers; automatic mark-ups (mark-up adjustment, TsRG); inventory without stopping sales; pharmaceutical order, price comparison of suppliers and selection of the minimum price (similar to LIKIS); electronic prescriptions, support of the "Affordable Medicines" program, social programs; report generator, reporting and analytics module; module for working with discount cards; data transfer from other reporting systems ("1C: Pharmacies", "Morion Pharmacies", etc.); data exchange module with 1C; the possibility of connecting and operating cash registers and fiscal registers. Unlike "1C: Pharmacy", the program was originally developed for pharmacies, not retail.

Skarb is a program for automating pharmacies and pharmacy chains with support for all accounting functions: from the initial arrival, sale and to the optimal order of the product. In "Skarb", automation is carried out from the point of view of warehouse accounting. Main functionalities: the availability of a ready-made database of medicines (about 20,000 items) with analogs and applicable markup restrictions; automatic "pull-up" of revenue invoices, import of supplier prices; management of mark-ups, control of marginal mark-ups and state-regulated prices; goods management: upon arrival, prohibited series, sales terms, mark-up of goods separately and in groups, transfer of goods to separate warehouses and pharmacy points, re-evaluation (automatic and manual) are controlled; automatic formation of defects when ordering goods; retail sale: search for medicines by barcode (internal and factory), base, price, etc.; reporting, including reports on minimum balances, statistics of sales, purchases, forecasting, etc.; there is data exchange with 1C: accounting, however, only individual items (1 item for the amount) are unloaded, not detailed ones; module for working with discount cards; connection of cash register equipment, etc. There are additional modules (purchased separately), some mandatory updates are also paid.

ANR-Apteka is an automated business process management system for retail pharmaceutical enterprises. Implemented on the basis of "1C: Enterprise 8.2", it was originally developed for the automation of the pharmacy network. Main modules: product posting: serial accounting, incoming control, control of defective and prohibited series, return to the supplier, storage of electronic quality certificates, pricing and markup management, cost calculation, etc.; pre-sale preparation: printing of price tags, labels, local coding, barcodes; moving between storage locations: from the stock department to the trading floor, forming invoices based on defects, etc.; inventory module; product revaluation module: markdown, markup; write-off (with an indication of the reason); management of discounts: prescriptions, work with doctors, insurance companies, etc.; retail sales: product search, including substitutes, identification by name, bar code and local code, product reservation, keeping customer cards, returns from customers, etc. ; module for maintaining non-cash settlement; cash register; work with suppliers: contracts, payment schedules, bank statement; data export to external systems; data exchange between base and remote pharmacies; reporting.

Additional modules, for example: electronic sales invoices, inventory management, forming orders to suppliers, mutual settlements, discount program and others, are purchased separately.

We analyzed foreign language software in neighboring countries. On the market, there is a fairly large number of programs for automating pharmacies and pharmacy chains. They all support roughly the same set of features, we've picked out a couple of interesting ones that are different.

InfoApteka — supports drug labeling (one of the requirements for monitoring drug movement), as well as: automatic pricing of goods and control of mark-ups, which will not allow to go beyond the limits established by regulatory acts when forming the value of goods; designer of analytical reports; in addition, there are 7 additional modules (purchased separately).

UNIKO — basic capabilities include: document flow with suppliers. Useful functions: receiving electronic invoices, checking invoices according to the

reference databases "Price Register" and "Removed Database", etc.; integration with marketing associations and share transmitter; additional functionality includes integration with card projects and loyalty programs from Pfizer, Eli Lili, Astra Zeneka, Sanofi, Loimaks, ProApteka; access to the RLS own drug database, which contains more than 100,000 items in the nomenclature, and a number of other opportunities.

As a result of the marketing research, we found that the following programs are used in the production activities of Ukrainian pharmacies: "Pharmacy" (26%), "1-C Pharmacy" (24%); "Paracelsus" (20%); "Treasure" (15%); "ANR-Apteka" (10%); a system that automates the accounting of goods receipt (5%) (Fig. 3.1).

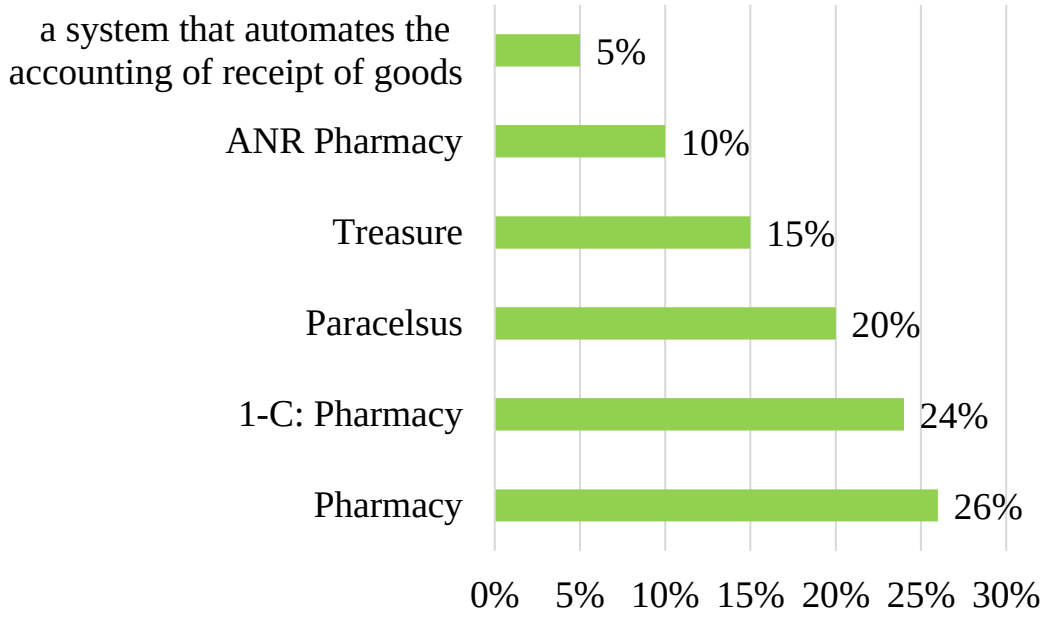

Fig. 3.1. Analysis of the use of automated programs in the production activities of pharmacy institutions

The modern pharmaceutical market is developing so quickly that what was considered a breakthrough just a few years ago has turned into a standard today. Automation of the pharmaceutical industry helps companies establish production and sales, manage product quality, establish communications with pharmacy chains and individual sales representatives, avoid "gray" and opaque schemes on the market, and much more.

Programs for pharmaceutical automation are developed considering the specifics of the tasks and processes of this niche: CRM systems for pharmaceutical companies, hospital sales management systems, ERP systems, document management systems, etc. CRM for pharmaceutical companies, in particular, allows you to collect in one interface all the necessary management tools, as well as analytics and databases on doctors of medical and preventive institutions and pharmacies. At the level of pharmacies and pharmacy chains, automation programs help increase work efficiency, speed and quality of customer service, manage branches, organize employee communication, training, etc.

Complex automation of pharmacies allows you to work with warehouse stocks, have access to drug registers, organize accounting, establish communication with buyers, manage advertising campaigns and loyalty programs, etc. This also includes the automation of cashier workplaces in pharmacies, self-service systems, labeling of medicines during in-house production, automation of accounting for the movement of goods in the pharmacy, and much more. Ready-made systems will most likely hold back and slow down the pharmacy. And in the case of refinement, there is a risk that over time this system will begin to resemble a blanket or begin to "fall apart", threatening the loss of data if the pharmacy has already "outgrown" it. Any revisions are making changes within the already written functionality, which is always expensive and not always effective.

If you want to do something groundbreaking, it is better to immediately bet on your own system — trust the development of custom solutions. Moreover, an experienced developer not only thoroughly knows the features of his software, but also takes responsibility for the quality of not only the product, but also its implementation and support, which is an advantage of turnkey solutions. Some companies are engaged in the development of solutions for the automation of business processes, highly loaded systems, systems using artificial intelligence and more. Specialists have experience in creating solutions of varying degrees of complexity depending on business requirements: they consider the peculiarities of each niche and individual wishes. In addition, the study raised the problem of

pharmacy merchandising, namely the idea of open display in pharmacies. It was established that most of the interviewed pharmacy managers (68%) responded negatively to the self-service system in pharmacies, 26% were indifferent to the way the goods are displayed in the pharmacy, and only 6% approved the idea of open display in pharmacies. Sharp competition in the regional pharmaceutical market forces to actively engage in the promotion of pharmaceuticals, which is necessary to ensure the social efficiency and competitiveness of pharmacy institutions.

3.2. Analysis of gaps in information flows at the retail level

In order to substantiate the recommendations on the use of information flows at the level of the retail sector of the regional market, we developed a methodical approach consisting of four stages and implemented in the first direction of the research program. At the same time, in the first place, the following were defined: the basic theory, the purpose of the study, the sample, research methods.

The second stage included the definition of types of gaps, their description and diagnosis of the identified types according to sociological research data due to the discrepancy between the level of service provided in the respondent pharmacies and its perception by pharmacy visitors. The third stage consists in the construction of optimal models of information flows for pharmacy organizations based on the elimination of identified gaps in the activities of pharmacy organizations. On the fourth step, the social efficiency of the pharmacy organization was studied as a result of the influence of information flows.

As a result of the questionnaire conducted in the respondent pharmacies, four types of gaps were revealed. A gap in knowledge, its analysis showed that for drug users, such means of promotion as discounts (43.0%), media advertising (6.0%), service culture (33.0%), sales promotion (18.0%) are preferred, and, according to pharmaceutical workers, the most significant for the population are discounts (46.0%), service culture (38.0%), media advertising (15.0%), sales promotion (1.0%) (Fig. 3.2).

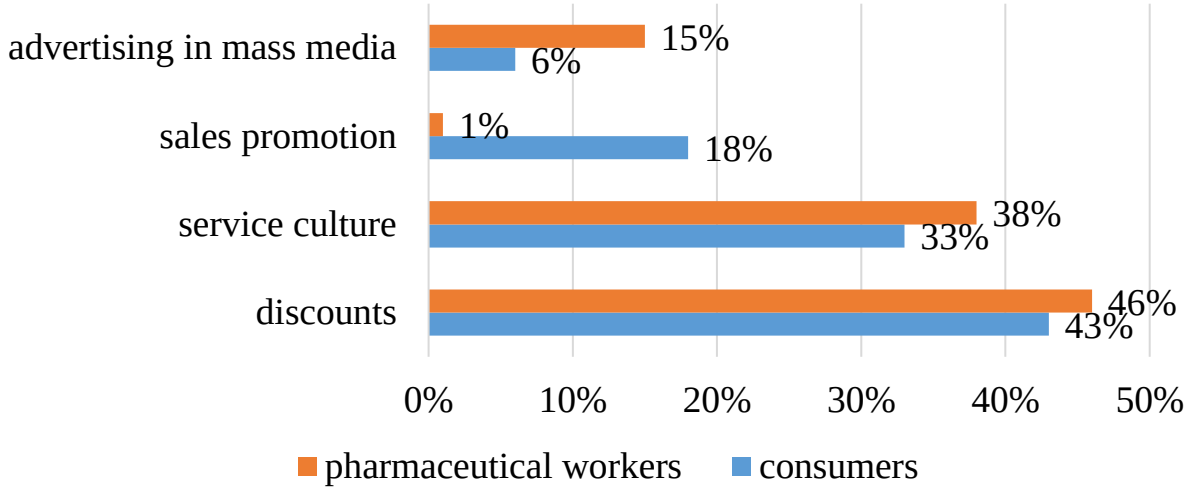

Fig. 3.2. Analysis of gaps in knowledge among the most important means of promotion

The gap in standards revealed that pharmacy organizations traditionally treat advertising as the most effective way to promote products in the retail chain, while consumers are more attracted to sales promotion. As part of sales promotion, both pharmacy workers and visitors consider the most effective measure to be free additional services, for example, expert doctor consultations (51%), but in relation to other measures, home delivery of medicines and blood pressure measurement, the opinions of the public and pharmacy workers were divided and accounted for 40% and 29% and 9% and 20%, respectively (Fig. 3.3).

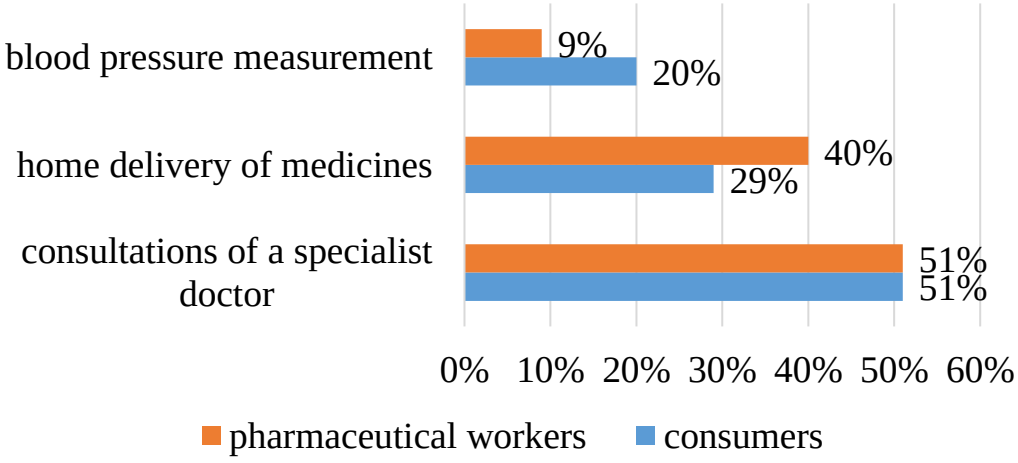

Fig. 3.3. Analysis of gaps among the most effective sales promotion measures — free additional services

The analysis of the gap in service determined that only 26% of the visitors of the surveyed pharmacies were satisfied with the quality of service, and, according to pharmacy employees, such consumers should be 90% (Fig. 3.4).

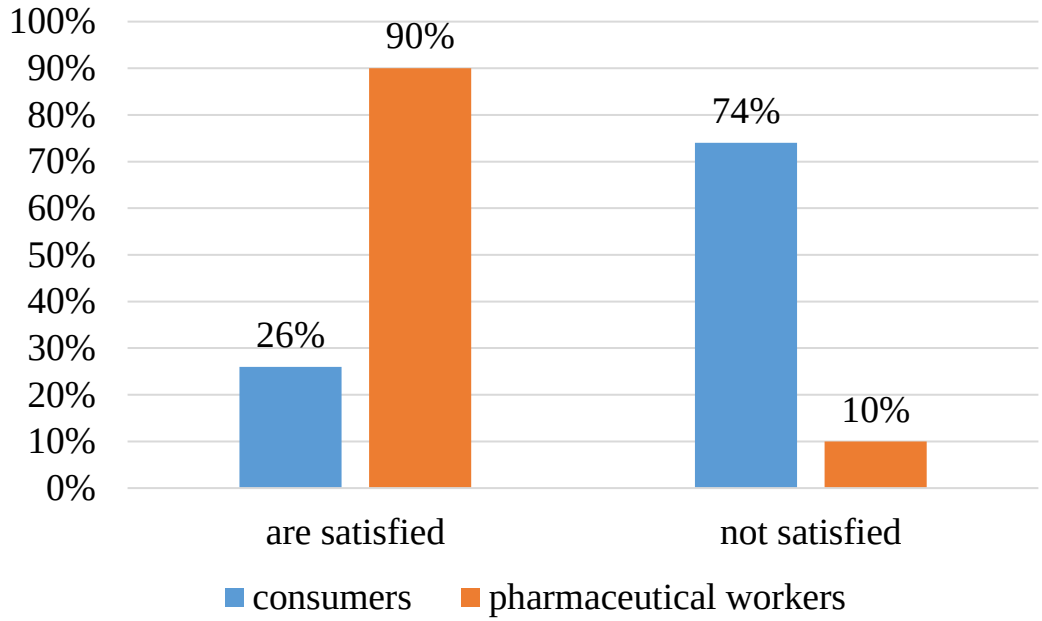

Fig. 3.4. Analysis of gaps in the analysis customer satisfaction with service quality

Communication breakdown. It was established that the absence of a medicinal product in the pharmacy assortment during the campaign for its promotion determined the negative attitude of the majority of surveyed pharmacy visitors to advertising — 10%, while 55% of respondents have a positive attitude, and the rest (35%) are indifferent (Fig. 3.5).

According to pharmacists, 5% of pharmacy users have a negative attitude towards advertising, 60% of respondents have a positive attitude, and the rest (35%) are indifferent.

On the basis of the identified and described types of gaps, the optimal models of communication flows for the pharmacy organization were substantiated. It was established, in particular, that for the formation of an optimal model of information flows aimed at eliminating the third type of gaps, the following methods are effective: advertising, sales promotion, direct marketing, public relations.

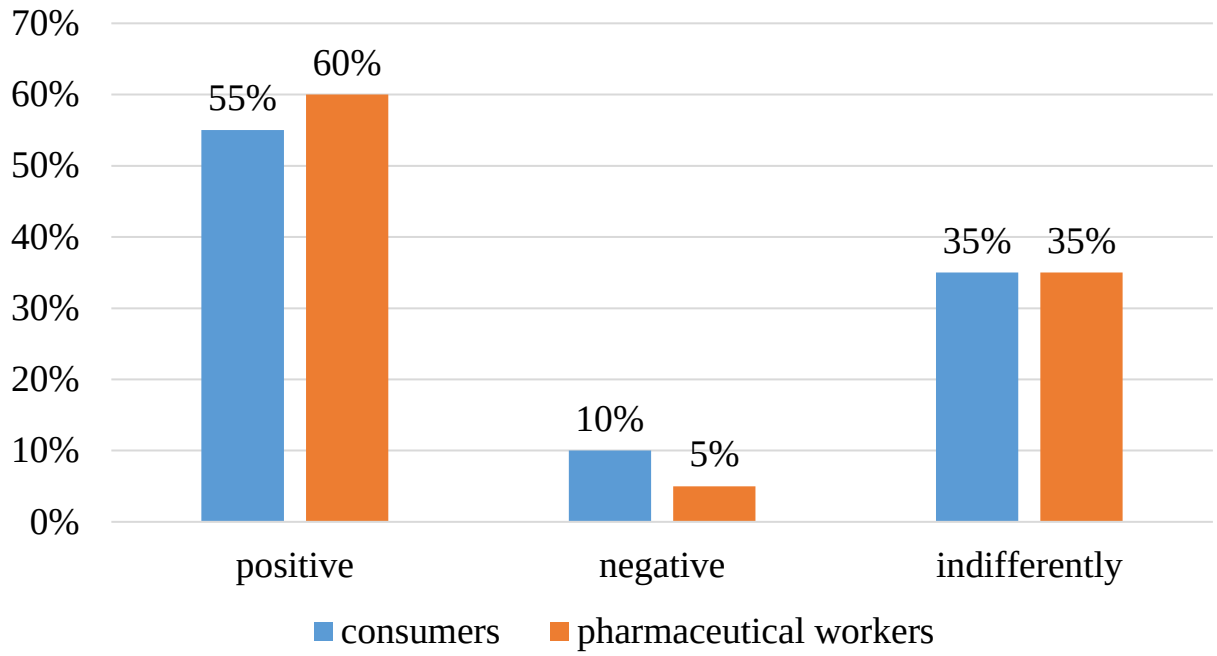

Fig. 3.5. Gap analysis about the attitude of pharmacy visitors to advertising

Based on the results of the study, recommendations were developed for monitoring and marketing research of information flows to promote the efficiency of the pharmacy, which are implemented in the activities of the pharmacy.

Thus, the practical use of the obtained research results will increase the social efficiency of the pharmaceutical organization.

CONCLUSIONS TO PART III

1. It was found that the following programs are used in the production activities of pharmacies: "Pharmacy" (26%), "1-C Pharmacy" (24%), "Paracelsus" (20%), "Skarb" (15%), "ANR-Pharmacy" (10%), a system that automates the accounting of receipt of goods (5%).

2. The analysis of the gap in knowledge showed that for drug users, such means of promotion as discounts (43%), media advertising (6%), service culture (33%), sales promotion (18%), and, according to pharmaceutical workers, discounts (46%), service culture (38%), media advertising (15%), sales promotion (1%) are the most significant for the population.

3. The gap in standards revealed that pharmacy organizations traditionally treat advertising as the most effective way to promote products in the retail chain, while consumers are more attracted to sales promotion. As part of sales promotion, both pharmacy employees and visitors consider the most effective measure to be free additional services, for example, specialist doctor consultations (51%), but in relation to other measures, home delivery of medicines and blood pressure measurement, the opinions of the public and pharmacy workers were divided and accounted for 40% and 29% and 9% and 20%, respectively.

4. The analysis of the gap in service determined that only 26% of the visitors of the surveyed pharmacies were satisfied with the quality of service, and, according to pharmacy employees, such consumers should be 90%.

It was established that the absence of a drug in the pharmacy's assortment during the campaign for its promotion determined the negative attitude of the majority of surveyed pharmacy visitors to advertising - 10%, and 55% of respondents have a positive attitude, and the rest (35%) - indifferent. According to pharmacists, 5.0% of pharmacy users have a negative attitude towards advertising, 60% of respondents have a positive attitude, and the rest (35%) are indifferent.

GENERAL CONCLUSIONS

1. The concept of building a single information space in organizations is revealed. The essence and main types of economic information are characterized. The peculiarities of creating an information flow of a pharmaceutical organization have been studied.

2. In order to improve the efficiency of the work of pharmacies, a study of information flows as a marketing tool was conducted using a questionnaire of 52 managers. It was determined that 95% of respondents are women and 5% are men. It was established that 15% of pharmacy managers have 6 to 15 years of work experience, 45% - from 16 to 25 years, 27% - from 26 to 35 years, 11% - more than 35 years, and only 2% - up to 5 years. It was found that 83% of the pharmacies participating in the study have computer equipment. It was found that 55% of the investigated pharmacies have more than two computers, and 45% have one computer.

3. It was established that 92% of pharmacies use the Internet in their practical activities. It was found that the following programs are used in the production activities of pharmacies: "Pharmacy" (26%), "1-C Pharmacy" (24%), "Paracelsus" (20%), "Skarb" (15%), "ANR -Pharmacy" (10%), a system that automates the accounting of goods receipt (5%).

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5. The gap in standards revealed that pharmacy organizations traditionally treat advertising as the most effective way to promote products in the retail chain, while consumers are more attracted to sales promotion. As part of sales promotion, both pharmacy employees and visitors consider the most effective measure to be free additional services, for example, specialist doctor consultations (51%), but in relation to other measures, home delivery of medicines and blood pressure

measurement, the opinions of the public and pharmacy workers were divided and accounted for 40% and 29% and 9% and 20%, respectively.

6. The analysis of the gap in service determined that only 26.0% of the visitors of the surveyed pharmacies were satisfied with the quality of service, and, according to pharmacy employees, such consumers should be 90.0%.

7. It was established that the absence of a drug in the pharmacy's assortment during the campaign for its promotion determined the negative attitude of the majority of surveyed pharmacy visitors to advertising - 10.0%, and 55.0% of respondents have a positive attitude, and the rest (35%) - indifferent. According to pharmacists, 5.0% of pharmacy users have a negative attitude towards advertising, 60.0% of respondents have a positive attitude, and the rest (35%) are indifferent.

REFERENCES

1. Бабічева Г. С., Жадько С. В. Вивчення маркетингових інформаційних потоків в діяльності аптечних мереж. *Актуальні проблеми розвитку галузевої економіки та логістики* : матеріали IX міжнар. наук.-практ. internet-конф. з міжнар. участю, м. Харків, 28 жовт. 2021 р. Харків : НФаУ, 2021. С. 14-23.

2. Глєбова Н. В., Ковальова В. І. Основи управління інформаційційною діяльністю підприємства. *Управління якістю в фармації* : матеріали XV наук.-практ. конф. з міжнар. участю, м. Харків, 25 трав. 2021 р. Харків : НФаУ, 2021. С. 43-45.

3. Дослідження сучасних трендів розвитку цифрової логістики у фармацевтичній галузі / А. Г. Лісна та ін. *Соціальна фармація в охороні здоров'я*. 2022. Т. 8, № 1. С. 34-50.

4. Євтушенко О. М., Гриненко А. М. Світовий досвід застосування цифрових технологій у процесі надання фармацевтичної допомоги (фрагмент дослідження). *Соціальна фармація в охороні здоров'я*. 2022. Т. 8, № 4 С. 14-22.

5. Зарічкова М. В., Должнікова О. М., Музика Т. Ф. Обґрунтування системи показників соціального паспорта в аптечному закладі. *Управління, економіка та забезпечення якості в фармації*. 2019. № 1 (57). С. 11–20.

6. Зарічкова М. В., Мішина І. Ю. Дослідження сучасних функціональних обов'язків фармацевтичних працівників та набуття ними навичок, адаптованих до умов сьогодення. *Соціальна фармація в охороні здоров'я*. 2023. Т. 9, № 4. С. 39-54.

7. Лісна А. Г., Посилкіна О. В. Аналіз стану впровадження цифрових технологій у діяльність фармацевтичних ланцюгів постачань. *Соціальна фармація в охороні здоров'я*. 2023. Т. 9, № 2. С. 35-45.

8. Пестун І. В., Мнушко З. М., Євтушенко О. М. Інтернет ресурси як джерело фармацевтичної інформації. *Підготовка спеціалістів фармації в рамках концепції «Навчання протягом життя (Life Long Learning)»: наука,*

освіта, практика : матеріали II наук.-практ. інтернет-конф. з міжнар. участю, м. Харків, 21–22 жовт. 2020 р. Харків : НФаУ, 2020. С. 173-174.

9. Правові та етичні дилеми інформаційного забезпечення споживачів гормональних контрацептивів / І. В. Пестун та ін. *Соціальна фармація в охороні здоров'я*. 2023. Т. 9, № 4. С. 11-21.

10. Andriienko N. V., Sahaidak-Nikitiuk R. V., Demchenko N. V. Analysis of the psychosocial climate in the pharmacy workforce and prospects for its improvement. *Соціальна фармація в охороні здоров'я*. 2022. Т. 8, № 4. С. 36-45.

11. Ayaou A., Zhadko S. V. The role of information support in improving safety of drug therapy and insuring rational use of drugs in Germany. *Фармакоекономіка в Україні: стан і перспективи розвитку* : матеріали XI наук.-практ. інтернет-конф., м. Харків, 24 трав. 2019 р. Харків : НФаУ, 2019. С. 143-144.

12. Babicheva G. S., Jarmouni M. Analysis of information provision of the population in the process of sale of pharmaceutical products. *Соціальна фармація: стан, проблеми та перспективи* : матеріали VIII Міжнар. наук.-практ. дистанц. конф., м. Харків, 27 квіт. 2023 р. Харків : НФаУ, 2023. С. 411-412.

13. Causes and legal aspects of the off label drugs emergence : literature review / K. O. Kalko et al. *Pharmacologyonline*. 2021. Vol. 3. P. 179-186.

14. Dzuba M. A., Shcherbina O. V. Precise translations in the field of pharmacy are important sources of information. *Topical issues of new medicines development* : матеріали XXVI Міжнар. наук.-практ. конф. молодих учених та студентів, м. Харків, 10-12 квіт. 2019 р. Харків : НФаУ, 2019. С. 461-462.

15. Haushar T., Tereshchenko L. V. Analysis problems of the modern information technology in health and pharmaceutical for african continent. *Topical issues of new medicines development* : матеріали XXVII Міжнар. наук.-практ. конф. молодих учених та студентів, м. Харків, 8-10 квіт. 2020 р. Харків : НФаУ, 2020. С. 318-320.

16. Kireyev I. V., Zhabotynska N. V. Modern tools for the implementation of distance learning. *Pedagogy in modern conditions: collective monograph*. Boston : Primedia eLaunch, 2020. P. 222-225.

17. Korolova O. A., Hrechana A. O., Vlasov S. V. The main tendencies of the development of information support of sites of cosmetic and cosmetology branches of Ukraine and Israel. *Topical issues of new medicines development* : матеріали XXVI Міжнар. наук.-практ. конф. молодих учених та студентів, м. Харків, 10-12 квіт. 2019 р. Харків : НФаУ, 2019. С. 416-417.

18. Kubarieva I. V., Pilyuha L. V. Modern aspects of the information and legal support of the pharmaceutical sector of healthcare. *Соціальна фармація: стан, проблеми та перспективи* : матеріали V Міжнар. наук.-практ. інтернет-конф., м. Харків, 25-26 квіт. 2019 р. Харків : НФаУ, 2019. С. 181-183.

19. Modern medical and pharmaceutical problems of off label drug use : literature review / S. M. Drogovoz et al. *Pharmacologyonline*. 2021. Vol. 2. P. 55-61.

20. Multi-faceted Commercially Sourced Pd-Supported Reduction : A View from Practical Experience / V. V. Burianov et al. *Журнал органічної та фармацевтичної хімії*. 2022. № 4. С. 3-20.

21. Nessonova M., Velma S. Database Management Systems in Pharmacy : methodological Recommendations for in-class work. Kharkiv : NUPh, 2021. 41 p.

22. Nosachenko M. P., Zborovska T. V. The development of energy saving measures as a basis of ensuring energy efficiency in higher education institutions in healthcare of Ukraine. *Вісник фармації*. 2024. № 1. С. 97-102.

23. Podkolzina M. V., Kurylenko Yu. Ye. Analysis of the information component when working with public procurement of medicines in the countries of the world. *Соціальна фармація : стан, проблеми та перспективи* : матеріали VI Міжнар. наук.-практ. інтернет-конф., м. Харків, 23-24 квіт. 2020 р. Харків : НФаУ, 2020. С. 383-384.

24. Posilkina O. V., Litvinova E. V., Lisna A. G. Scientific and practical approaches of formation of logistic innovative systems in pharmaceutical companies. *ScienceRise: Pharmaceutical Science*. 2020. № 5 (27). P. 24-29.

25. Problems of searching and using specific information in internet resources and at distance learning sites associated with the correctness of the translation from the original sources (with examples of terms used in the medical-biological and cosmetology fields) / O. Filiptsova et al. *Застосування інноваційних технологій та методів навчання при викладанні фундаментальних та мовних дисциплін у вишах* : тези доп. Всеукр. наук.-практ. інтернет-конф., м. Харків, 16 берез. 2023 р. Харків : НФаУ, 2023. С. 59-63.

26. Purykina N. Y., Storozhenko G. V., Philiptsova O. V. Exploring different ways in which first-year students memorize and reproduce text and graphic information. *Topical issues of new medicines development* : матеріали XXVII Міжнар. наук.-практ. конф. молодих учених та студентів, м. Харків, 8-10 квіт. 2020 р. Харків : НФаУ, 2020. С. 197-198.

27. Research design formation to determine quality indicators of potential API, 2. Quality risks arising in the process of scaling the synthesis procedure / N. Bevz et al. *ScienceRice: Pharmaceutical Science*. 2020. № 6 (28). P. 41-49.

28. Research of ways to improve the effectiveness of remote sales in pharmacies / I. V. Bondarieva et al. *Соціальна фармація в охороні здоров'я*. 2023. Т. 9, № 2. С. 56-62.

29. Use of cloud technologies to ensure maximum reflection in the educational process / V. D. Yaremenko et al. *Modern research in science and education* : Proceedings of the 1st International scientific and practical conference, Chicago, 14-16 September 2023. Chicago : BoScience Publisher, 2023. P. 131-136.

30. Zhirova I. V., Tereshchenko L. V., Kalaycheva S. G. Analyses of the information technologies development in health and pharmaceutical providing of the population. *Соціальна фармація: стан, проблеми та перспективи* : матеріали V Міжнар. наук.-практ. інтернет-конф., м. Харків, 25-26 квіт. 2019 р. Харків : НФаУ, 2019. С. 315-316.

APPLICATIONS

Appendix A


Міністерство освіти і науки України
Міністерство охорони здоров'я України
Національна академія медичних наук України
Одеський національний університет імені І. І. Мечникова
Фізико-хімічний інститут імені О. В. Богатського НАН України
Одеський національний медичний університет
ТДВ «ІНТЕРХІМ»
Сучасна фармація:
реалії сьогодення та
перспективи розвитку
ТЕЗИ ДОПОВІДЕЙ
Всеукраїнської науково-практичної
конференції з міжнародною участю
9-12 квітня 2024, Одеса

cont. app. A

Міністерство освіти і науки України
Міністерство охорони здоров'я України
Одеський національний університет імені І. І. Мечникова
Фізико-хімічний інститут імені О. В. Богатського НАН України
Одеський національний медичний університет
ТДВ «ІНТЕРХІМ»

Сучасна фармація: реалії сьогодення та перспективи розвитку

ТЕЗИ ДОПОВІДЕЙ

Всеукраїнської науково-практичної конференції
з міжнародною участю

9–12 квітня 2024, Одеса

ОДЕСА
ОНУ
2024

According to the resolution of the Cabinet of Ministers of Ukraine dated November 30, 2016 № 929 (in the wording № 1362 dated December 22, 2023) "On approval of the licensing conditions for conducting economic activities for the production of medicines, wholesale and retail trade, import of medicines (except for active pharmaceutical ingredients)" it has been set out the requirements for the proper conduct of electronic retail trade of medicines [1].

It's interviewed 110 consumers, 82 % – female and 18 % – male, 85 % of them from 20 to 35 years. As per survey's results, the most popular ways of purchasing medicines are direct visits to pharmacies (79 %), especially among older citizens. Next line – pre-booking online and picking up the order at the pharmacy (71 %). At the same time, only 20 % of Ukrainians have ordered medicines for home delivery via the pharmacy websites (72 % – self-collection, 17 % by Nova Poshta service). 89% of consumers usually compare prices of medicines before buying them (75% on Tabletki.ua). The main barriers to ordering medicines for home delivery via the Internet are unwillingness to pay for the delivery (52 %) and proximity of location (38%).

Conclusions. There is a positive trend among the population to use easy ways to buy medicines through pharmacy websites, but the issues of preventing falsification of medicines and the specifics of their dispensing with prescription remain relevant.

References

1. The resolution of the Cabinet of Ministers of Ukraine dated November 30, 2016 № 929 (in the wording № 1362 dated December 22, 2023) "On approval of the licensing conditions for conducting economic activities for the production of medicines, wholesale and retail trade, import of medicines (except for active pharmaceutical ingredients)"
   URL: https://zakon.rada.gov.ua/laws/show/929-2016-%D0%BF#Text

STUDY ON THE UTILIZATION OF INFORMATION FLOWS IN PHARMACIES

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In today's world, where information has become the most valuable resource, the use of information flows in the pharmacy sphere determines the efficiency of operations and the level of customer satisfaction. Pharmacies, as key participants in the health care system, not only provide access to medicines, but also play an important

role in providing informational support, consultations and expanding medical education among the population. Research on the use of information flows in pharmacies aims to reveal the essence of this process, identify factors affecting its effectiveness, and offer recommendations for optimizing the use of information flows in order to improve the quality of service and meet customer needs. In this context, conducting research becomes extremely important for the further development of the pharmacy industry and ensuring maximum benefit for consumers. The aim of work is to study on the utilization of information flows in pharmacies. The peculiarities of creating an information flow of a pharmaceutical organization have been studied. One of the primary considerations in creating an information flow within a pharmaceutical organization is ensuring compliance with regulatory requirements. Pharmacies operate within a tightly regulated environment, with strict guidelines governing data privacy, product labeling, and reporting standards. Therefore, any information flow must adhere to these regulations to avoid potential legal and financial repercussions.

The sensitive nature of pharmaceutical data, including patient information, drug formulations, and clinical trial results, necessitates robust data security measures. Pharmaceutical organizations must implement encryption protocols, access controls, and regular security audits to safeguard against data breaches and unauthorized access. Failure to prioritize data security can expose the organization to significant risks, including reputational damage and loss of intellectual property.

Pharmaceutical organizations often utilize a diverse array of systems and technologies to manage various aspects of their operations, such as research and development, manufacturing, distribution, and sales. Creating an information flow requires seamless integration between these systems to ensure smooth data exchange and interoperability. Challenges may arise due to differences in data formats, incompatible software platforms, and legacy systems, necessitating careful planning and coordination to overcome integration hurdles. Effective communication and collaboration are essential components of an efficient information flow within pharmaceutical organizations.