

## ОБЛІК І ОПОДАТКУВАННЯ ACCOUNTING AND TAXATION

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## INFORMATION SUPPORT FOR THE MANAGEMENT SYSTEM OF HEALTHCARE INSTITUTIONS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT

### ІНФОРМАЦІЙНЕ ЗАБЕЗПЕЧЕННЯ СИСТЕМИ УПРАВЛІННЯ ЗАКЛАДАМИ ОХОРОНИ ЗДОРОВ'Я В УМОВАХ СТАЛОГО РОЗВИТКУ

*The article defines the concept of information support within the management system of a healthcare institutions (HCIs) and identifies its key components: accounting, analytical, control, statistical, regulatory, legal, personnel, and technical support. Particular attention is given to the features of accounting support, which plays an increasingly significant role in the context of implementing a sustainable development strategy. The article outlines the specifics of analytical support in healthcare management and elucidates the essence of control mechanisms aimed at identifying risks that may potentially hinder the sustainable development of healthcare institutions. The paper also explores the characteristics of statistical support within the HCI management system. The importance of regulatory and legal frameworks as integral elements of the institutional environment for information systems in healthcare management is emphasized. Additionally, the study highlights the roles of personnel and technical support as vital functional components of information provision. Finally, the article identifies key challenges in the development of information support components and proposes practical solutions to address them.*

**Key words:** information support, management, healthcare institution, accounting, analysis, control, sustainable development.

*У статті визначено актуальність формування інформаційного забезпечення системи управління закладами охорони здоров'я (ЗОЗ) в умовах сталого розвитку. Надано визначення інформаційного забезпечення та ідентифіковано його складові (облікове, аналітичне, контрольне, статистичне, нормативно-правове, кадрове та технічне забезпечення). Висвітлено особливості облікового забезпечення, яке набуває важливого значення у контексті реалізації стратегії сталого розвитку, формуючи інформацію, яка висвітлює економічні, екологічні та соціальні аспекти діяльності ЗОЗ. Вказано на необхідність інтеграції фінансових та нефінансових показників у єдину систему, що дозволить формувати обґрунтовані управлінські рішення, спрямовані на реалізацію стратегії сталого розвитку. Визначено особливості аналітичного забезпечення управління ЗОЗ, які полягають у багатофакторності оцінювання діяльності закладу охорони здоров'я. Висвітлено суть контрольного забезпечення, яке спрямовано на виявлення ризиків, які потенційно можуть загрожувати сталому розвитку медичного закладу. Розкрито особливості статистичного забезпечення системи управління ЗОЗ, яке дозволяє визначити соціально-економічну та екологічну ефективність діяльності медичних закладів. Розглянуто важливість нормативно-правового забезпечення інформаційної*

системи управління закладу охорони здоров'я як частини інституціонального середовища, у якому функціонує медичний заклад. Висвітлено особливості кадрового забезпечення системи управління ЗОЗ, яке забезпечує трансформацію інформаційних потоків у медичному закладі. Акцентовано на необхідності формування міждисциплінарних компетентностей персоналу. Визначено структурні компоненти технічного забезпечення, як однією із ключових складових інформаційної системи управління ЗОЗ до яких віднесено обчислювальну техніку, мережеве обладнання, серверну інфраструктуру, периферійні пристрої та інші необхідні технічні засоби. Визначено ключові проблеми формування складових інформаційного забезпечення та запропоновано шляхи їх вирішення.

**Ключові слова:** інформаційне забезпечення, управління, заклад охорони здоров'я, облік, аналіз, контроль, сталий розвиток.

**JEL Classification:** I18 Q01 M15

**Problem statement.** Under current conditions of sustainable development, comprehensive and systematic information support is a key prerequisite for the effective management of healthcare institutions. In particular, the availability of reliable, timely, and well-structured accounting, analytical, statistical, and other relevant information is critical, as it forms the foundation for planning, monitoring, and performance evaluation. Information support for managerial decision-making ensures the rational use of resources, enhances the quality of medical services, and aligns institutional activities with the principles of environmental, social, and economic sustainability. The introduction of modern information and analytical systems contributes to greater management transparency, improved internal control, and data integration into a unified healthcare system.

Without high-quality data collection, systematization, and analysis, healthcare institutions cannot adapt to new challenges, legislative changes, or the evolving needs of the population. In this context, the development of high-quality information support for the healthcare management system is a crucial component of its functioning in line with sustainable development principles.

**Analysis of recent research and publications.** The issues related to the development of information support for the management systems of healthcare facilities (HCFs) have been addressed by scholars such as B. Andrushkiv [1], Y. Bohach [2], O. Hahaliuk [1], N. Havlovska [5], N. Kyrych [1], O. Kiliar [1], L. Kononenko [3], N. Kryvokulska [1], L. Lishchynska [4], S. Nikolaieva [3], E. Rudnichenko [5], S. Skochylas [2], S. Yaremko [4].

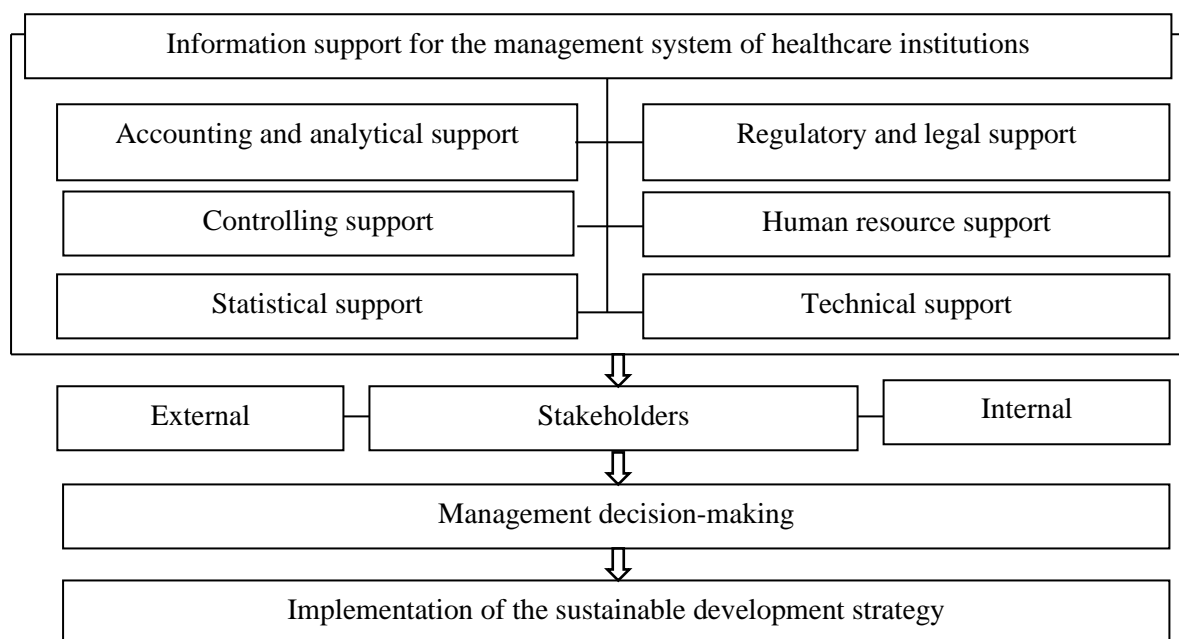
These researchers have studied the theoretical and methodological foundations as well as the practical aspects of using information technologies in healthcare [4]. Their work also examines the components of information and information and communication support in management processes [5,6]. Special attention is paid to defining the tasks of information and analytical support in healthcare facilities and to developing methodologies for assessing these systems [2].

A group of authors has developed theoretical and methodological approaches and practical recommendations aimed at enhancing the efficiency of managing the information and communication component of HCFs in the context of administrative and territorial reform [1]. Considerable focus is also placed on the formation of accounting and analytical support for healthcare management systems [3].

Nevertheless, the formation of information support systems for healthcare management in the context of sustainable development remains a relevant issue, requiring further research and resolution due to its critical role in the managerial decision-making process.

**Formulating the goals of the article.** The aim of this article is to identify the components of information support within the management system of healthcare institutions and to substantiate their content in the context of sustainable development.

**Presentation of the main material.** Information support for management in healthcare institutions encompasses a set of data and communication channels that provide governing bodies with the necessary information for effective decision-making. The key components of information support include (Fig. 1).



*Fig. 1. Components of information support for the management system of healthcare institutions in the context of sustainable development*

*Source: developed by the author*

Accounting support is a core element of the healthcare management system, as it ensures the generation, storage, processing, and provision of reliable information regarding the institution's operations in terms of resources and production processes. According to research, more than 80% of all information generated in healthcare institutions pertains to accounting activities [7].

In accordance with Article 6 of the Law of Ukraine "On Accounting and Financial Reporting in Ukraine", accounting procedures for public sector institutions are regulated by the State Treasury Service of Ukraine [8].

The accounting system provides data on the inflow and use of budgetary and extra-budgetary funds, the availability and movement of medicines, materials, and energy resources, as well as payroll and social benefits.

At the same time, in the context of the growing role of sustainable development in the functioning of healthcare institutions, the concept of sustainable development is emerging as a key paradigm for transforming management practices in the healthcare sector. Accordingly, the accounting support of the healthcare management system acquires qualitative characteristics that are conditioned by the needs of transparency, social responsibility and rational use of resources.

At the same time, a significant factor that determines the specifics of accounting support in the context of sustainable development is the need to integrate financial and non-financial indicators into a single system. Such integration requires the adaptation of traditional accounting methods to new information requests of stakeholders (patients, staff, the state, etc.). In addition, in the context of the transition to performance-based financing, the importance of management accounting as a tool for planning, control and decision-making is growing. Accounting of expenses by responsibility centres and types of services allows to form a relevant information base for strategic management of a healthcare institution.

At the same time, the accounting system of a healthcare facility should ensure transparency of the use of funds and accountability for the efficiency and targeted use of funding. This necessitates a high level of detail in accounting data, the introduction of internal controls and automated accounting and reporting. It is also important that within the framework of the sustainable development paradigm, environmental accounting is becoming increasingly important, reflecting the costs associated with medical waste management, the introduction of energy-saving technologies and environmentally

friendly solutions. Social accounting also needs to be updated, in particular, with regard to investments in staff development, ensuring the inclusiveness of healthcare services, professional development and protection of medical staff.

Thus, accounting support as part of the information support of the HCI management system, focused on the principles of sustainable development, should be transformed from a highly specialised accounting subsystem into a strategic information tool that supports the achievement of a balance between economic efficiency, social justice and environmental responsibility of HCI.

Another important functional component of the information support of the HCF management system is analytical support. The essence of the concept of analytical support for organisational management consists of the methods used to accumulate information, methodological construction of indicators and their analytical interpretation in the management system [2].

The peculiarity of analytical support in the healthcare sector is, first of all, the multifactorial nature of performance assessment, which in HCI is determined by economic, social and medical efficiency. In addition, in the context of the sustainable development paradigm, it is advisable to assess the environmental safety of the institution by identifying relevant indicators. This approach necessitates the construction of integrated analytical models capable of combining quantitative and qualitative parameters within a single information and analytical system.

The economic indicators that are determined for the purpose of making management decisions include the cost of medical services by type, budget execution, the share of own revenues in the financing structure (for state and municipal non-profit enterprises), the efficiency of fixed assets use, the share of labour costs in the overall structure, savings (overspending) of budget funds, profitability of activities, etc.

Given the strategic importance of the environmental and social components of sustainable development, analytical support should also take into account environmental, economic and social indicators.

Important social indicators include access to healthcare services, quality of service (based on patient surveys), average waiting time for services, number of complaints and appeals, staff turnover, staff development costs, staffing levels (doctors/nurses) per 1000 people.

Environmental indicators include the amount of hazardous medical waste disposed of, electricity, heat and water consumption per 1 m<sup>2</sup>, the share of energy-efficient equipment, expenditures on energy efficiency measures, and environmental monitoring of premises.

Thus, analytical support is an informative component for making informed management decisions and includes indicators that allow assessing the degree of achievement of certain goals.

The control support of the healthcare institution management system in the context of the implementation of the sustainable development strategy acquires qualitatively new characteristics, which are determined by the need to combine traditional management functions with the tasks of long-term preservation of social, economic and environmental balance. Accordingly, control in such a system is not limited to a tool for detecting and responding to deviations, but is transformed into a strategically oriented mechanism for ensuring that the activities of a healthcare facility comply with the principles of sustainable development.

The peculiarity of control support in the context of sustainable development is its integration into all levels of management activities, which involves the use of appropriate control procedures. This approach is aimed at identifying risks that may threaten social justice, environmental safety or economic viability of the institution. Particular attention is paid to assessing the impact of management decisions on the quality of medical services, accessibility of medical care for different population groups, efficient use of resources and reduction of the environmental footprint.

Control in this context performs not only a regulatory function, but also the function of forming managerial responsibility for achieving sustainable development goals, including indicators such as reducing inequality in access to healthcare services, improving the energy efficiency of medical infrastructure, and ensuring decent working conditions for staff. In this regard, control mechanisms should be based on the principles of transparency and innovation in the use of digital monitoring technologies.

Statistical support of the healthcare institution management information system in the context of implementing a sustainable development strategy also acquires new content and functionality, as it serves not only as a tool for retrospective analysis of activities, but also as a means of making informed strategic decisions aimed at balanced socio-economic and environmental development of healthcare institutions. In this context, statistical information is the basis for assessing the degree of achievement of sustainable development goals in the healthcare sector, in particular, ensuring universal access to quality healthcare services, reducing inequality, increasing resource efficiency, and strengthening the institutional capacity of the healthcare system [9].

One of the key features of statistical support in the context of sustainable development is the combination and coordination of data from diverse sources, administrative reporting, electronic medical records, systems for accounting for human, material and financial resources, the results of sociological surveys, data from open sources and environmental monitoring. Statistical data help to monitor the activities of a healthcare institution, to manage and draw conclusions about the quality and effectiveness of treatment and prevention work [10, p. 127]

An important aspect of statistical support within the management information system is the focus on sustainable development indicators adapted to the specifics of the healthcare industry. It is about the formation of a system of indicators that reflect the level of provision and consumption of medical services, as well as the socio-economic effectiveness of management decisions, environmental efficiency of medical institutions (for example, the volume of medical waste, energy consumption, use of secondary resources).

Another functional component of the information support for the management of healthcare facilities is regulatory and legal support, which in the context of the implementation of the sustainable development strategy is part of the institutional environment that forms the legal framework for the effective functioning of healthcare facilities.

The peculiarity of regulatory support in this context is its multilevel nature, which implies synchronisation of national legislation with international regulations, in particular, those of the World Health Organization (WHO), the UN, the EU in the field of sustainable development, digital healthcare and patient protection. This requires a systematic review of the national healthcare legal framework in terms of focusing on the digitalisation of healthcare services, cybersecurity, personal data protection and equality of access to information and healthcare services.

Of particular importance is the legal regulation of transparency and accountability in the management of healthcare information systems, including the establishment of clear rules for the collection, processing, storage and dissemination of medical information, taking into account ethical standards and legal guarantees of confidentiality. Accordingly, the legislative framework should provide legal certainty regarding the rights and obligations of all stakeholders, including healthcare managers, IT professionals, healthcare workers, patients and public authorities.

A specific component of the information support of the Healthcare Institution management system is staffing, which in the context of implementing the sustainable development strategy determines the ability of the healthcare facility to adapt to new socio-economic, environmental and technological challenges. In the context of digitalisation of management processes, human resources are of particular importance, as it is human resources that ensure the transformation of information flows in the HCF system.

The peculiarity of staffing the management information system is the need to develop such interdisciplinary competencies of the staff as mastery of modern digital technologies (electronic medical records, telemedicine, cloud services, etc.) and understanding of the principles of sustainable development. This necessitates the modernisation of the system of training, advanced training and continuous professional development of personnel, with a focus on digital skills.

The structure of the human resources of Healthcare Institution should include certain categories of specialists, such as healthcare analysts, IT specialists with experience in medical information systems, sustainability managers, personal data protection and information security specialists. Their activities should be coordinated within an integrated management system that combines digital transformation with ethical, environmental and social standards.

In a modern Healthcare Institution management system, a key element of information support is technical support, which determines the efficiency of processing, storing and transmitting medical information. Its structural components are computers, network equipment, server infrastructure, peripherals and other necessary facilities.

High-performance computer systems ensure timely processing of large volumes of clinical data, analytical reports and management information. Network equipment guarantees stable and secure data exchange between the hospital's departments, which is critical for coordinating the provision of medical services. Server solutions allow for centralised storage of medical records, ensuring their accessibility and protection in accordance with the requirements of personal data legislation.

Thus, technical support forms the material and technological basis for the functioning of information systems in a healthcare facility, contributing to the adoption of sound management decisions and the quality of medical care.

Despite all the advantages of the information support components, in practice there are significant shortcomings both on the part of information systems and on the part of information itself as a management resource.

On the part of information systems, the key problems remain:

- Lack of integrated platforms and standards, which limits the exchange of data between departments, management levels and external structures.
- Insufficient level of automation in some institutions.
- cybersecurity vulnerability due to the use of: outdated or imperfect technical support, which often does not meet security requirements in the face of growing volumes of personalised data.

As for the information itself, the following shortcomings should be highlighted

- Incomplete and fragmented data on patients, resources, and performance, which makes it impossible to comprehensively assess the effectiveness of medical care.
- Poor data quality due to errors in data entry and duplication of records;
- limited availability of information for decision-making;
- Lack of sustainability indicators in information arrays, as most data are not adapted to track social, environmental and economic outcomes, which complicates the implementation of sustainable development principles in management.

Accordingly, to ensure sustainable healthcare development, it is necessary to:

- 1) integrate information systems for unified data management;
- 2) standardise and structure information to improve its quality;
- 3) automate management processes for efficient use of resources;
- 4) strengthen cyber security of information;
- 5) develop digital competence of the staff;
- 6) introduce sustainable development indicators into information systems for strategic monitoring of social, economic and environmental results.

**Conclusions.** In the current conditions of implementation of the sustainable development strategy, the effective functioning of a healthcare institution is impossible without a holistic and high-quality information support of the management system. Information support, which integrates accounting, analytical, control, statistical, regulatory and technical components, should be transformed into a strategic tool for supporting management decisions. Its quality is determined not only by the level of technological infrastructure, but also by the completeness, structuredness, reliability and relevance of the data used to assess the economic, social and environmental aspects of operations. Overcoming the identified shortcomings requires the integration of digital solutions, data unification, the creation of a system of sustainability indicators, and the improvement of digital literacy of staff. Only with a comprehensive approach to information management can a healthcare institution adapt to the challenges of the times and ensure its operation in accordance with the principles of sustainable development.

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