UDC 004.738.5:378.4:001.895

OPTIMIZATION OF DATA SEARCH AND ANALYSIS IN INSTITUTIONAL SCIENTIFIC WEB PLATFORMS

ОПТИМІЗАЦІЯ ПОШУКУ ТА АНАЛІЗУ ДАНИХ НА ІНСТИТУЦІЙНИХ НАУКОВИХ ВЕБ-ПЛАТФОРМАХ

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DOI: 10.15673/atbp.v16i3.2928

Abstract: *The article examines the relevance of the development of digitized resources of higher education institutions (HEIs) in the context of modern trends of European integration and globalization of science. Emphasis is placed on the creation of an institutional international scientific web resource, which is important for the consolidation of scientific knowledge, promotion of international cooperation and increasing the competitiveness of institutions on the world stage. The advantages of using such resources are highlighted, in particular, ensuring open access to scientific data, increasing the visibility of research, supporting the training of young scientists and observing scientific ethics. The challenges faced by higher education institutions are also outlined, in particular, the lack of a centralized system of access to scientific information. The article proposes innovative solutions that contribute to the integration of the latest technologies, optimization of data search and analysis, as well as strengthening of international cooperation in the scientific field.*

Анотація: *У статті розглянуто актуальність розробки діджиталізованих ресурсів закладів вищої освіти (ЗВО) у контексті сучасних тенденцій євроінтеграції та глобалізації науки. Зроблено акцент на створенні інституційного міжнародного наукового веб-ресурсу, що є важливим для консолідації наукових знань, сприяння міжнародній співпраці та підвищення конкурентоспроможності закладів на світовій арені. Висвітлено переваги використання таких ресурсів, зокрема забезпечення відкритого доступу до наукових даних, підвищення видимості досліджень, підтримка навчання молодих науковців і дотримання наукової етики. Також окреслено виклики, з якими стикаються ЗВО, зокрема відсутність централізованої системи доступу до наукової інформації. У статті запропоновано інноваційні рішення, які сприяють інтеграції новітніх технологій, оптимізації пошуку та аналізу даних, а також зміцненню міжнародної співпраці в науковій сфері.*

Keywords: Digitization, university, web resource, scientific cooperation, open access, globalization of science, scientific ethics, international projects, paperless, innovative technologies.

Ключові слова: Діджиталізація, університет, веб-ресурс, наукова співпраця, відкритий доступ, глобалізація науки, наукова етика, міжнародні проєкти, paperless, інноваційні технології.

Introduction

The development of digitized resources of higher education institutions is very relevant and important in the context of modern trends in the field of management of educational institutions and the European integration of Ukraine. Consolidation of information about a higher education institution on web resources is determined by modern challenges in the field of scientific research and the globalization of science. In the conditions of rapid development of information technologies and strengthening of international cooperation, the creation and support of scientific web resources becomes a key tool for ensuring open access to scientific knowledge, increasing the visibility of scientific research and attracting an international audience. One of the important problems is the need for centralized access to relevant scientific data, publications and projects, which facilitates their dissemination among researchers, students and other interested persons. The institutional web resource provides a platform for the integration of scientific and international achievements, cooperation between scientists of different countries and industries, as well as the creation of conditions for the development of international scientific cooperation. In addition, the presence of web resources contributes to the growth of the institution's rating position, the increase in the number of citations of its scientific publications, and the increase in the number of scientific grants and partnership projects. In the conditions of competition for financing scientific research of higher education institutions and attracting the best specialists, the availability of such a resource is an important factor in increasing the attractiveness of the institution in the international arena. Thus, the research and development of an

institutional international scientific web resource is extremely relevant in view of the need to ensure access to knowledge, increase the competitiveness of scientific institutions, as well as promote the globalization and integration of science at the world level.

Relevance of the research topic

The main problem of this subject area is the lack of high-quality scientific communication between scientists, researchers and students of education around the world. Due to the presence of a huge number of different fields of research in science and international activity, as well as an incredibly large amount of information circulating in them, it is quite difficult to group this information.

The creation of an institutional international scientific web resource can overcome the information crisis and provide scientists, researchers, representatives of educational institutions with a convenient mechanism for finding the necessary information, which allows establishing communication between them and saving time that can be devoted to research. But still, not all educational institutions take advantage of the opportunity to deploy specialized web resources.

In the absence of an effective electronic system, representatives are forced to rely on many different resources, web applications, etc., which lack consolidation and are accompanied by numerous limitations and risks. In this context, the study of the application of digitalization standards, in particular paperless for the development and research of an institutional international scientific web resource, is a relevant and important topic for the scientific community and practitioners.

For institutions of higher education (HEIs), the issue of transition to paperless is particularly relevant. This is due to the fact that a significant amount of documents and information is processed in the Higher Education Institution, which requires considerable time and money. In addition, paper documents can be easily lost or damaged, which can lead to negative consequences.

The transition to paperless standards for presenting all types of information has a huge potential to change the paradigm of management, rating by higher education institutions. This change is aimed at solving numerous problems that accompany traditional paper document flow and the classical approach to management. Such a transition allows more efficient processing and presentation of a large number of documents and information generated by the university. This transition contributes to increasing the transparency and availability of data for all participants of the educational process.

No less important point, the transition to paperless standards simplifies the storage, presentation, grouping and archiving of documents, reducing the costs of physical storage and forwarding of paper documentation and information. It is also important from an environmental point of view, as it reduces paper consumption and reduces the CO2 emissions associated with paper production.

It is also worth noting the peculiarities of the perception of information by users. As part of the fact that over the past few years, the vast majority of users of web resources have switched to the format of quick access to information, the use of paper copies of advertising materials makes the competitiveness of institutions impossible. Therefore, it is important to use UX/UI methods, which will allow creating a convenient and intuitive interface for users, which simplifies interaction with the system. This is important because users of the rectorate have different levels of technical literacy, and providing a convenient and accessible interface is an important factor in the successful implementation of new technologies.

Although digital systems offer a number of advantages, there are also some disadvantages that universities should consider when implementing them:

• ***Expenses.*** One of the biggest drawbacks of paperless systems is the cost of implementation and maintenance. Universities need to invest in new software and train staff to use the new systems. In addition, universities need to develop and implement new policies and procedures to support paperless systems.

• ***Security.*** Another disadvantage of paperless systems is the increased risk of cyber attacks. Universities need to implement robust security measures to protect their electronic data from unauthorized access, alteration or destruction.

• ***Reliability.*** Paperless systems depend on technology, and in the event of a power outage or technological failure, administrative operations may be disrupted. Universities should have backup plans to ensure they can continue operations in the event of a system failure.

• ***Availability.*** Not all teachers and staff have access to computers and the Internet. This can create a digital divide that puts those without access to technology at a disadvantage. Universities must provide access to the resources necessary to use a paperless system.

• ***Ease of use.*** Some paperless systems can be complex and difficult to use. This can frustrate staff and students and lead to mistakes. Universities need to choose a paperless system that is user-friendly and easy to navigate.

• ***Change management.*** Going paperless can be a big change for employees. Universities need to carefully manage the change process to ensure that everyone is aware and ready to use the new system.

Although there are weaknesses, universities can mitigate them through careful planning and implementation of the system.

Regarding security, universities can implement a number of security measures to protect their electronic data, such as firewalls, intrusion detection systems and encryption. In addition, universities should regularly train employees in basic cyber security and media literacy techniques.

Higher education institutions can increase the reliability of their institutional resources by having multiple servers and backup systems. In addition, it is necessary to develop a plan for responding to system failures and regularly make backups of important information.

Ease of use is one of the most important points when implementing electronic document management. The system should be convenient for the user, the employee should quickly and easily navigate it. If you are creating a system from scratch, you need to conduct a survey among people who will work with the service. Let everyone make suggestions about the functions that should be in the system. If ZVO plans to implement an already ready-made system and chooses among several options, it is necessary to show employees the available options and choose the most convenient for work. In addition, universities should provide training to staff and students on how to use the system.

In conclusion, the study of the use of self-generated information systems in work processes is a relevant and important topic that can significantly improve documentation management and optimize the work of educational institutions. The results of this study can become the basis for further initiatives in the field of higher education management and contribute to the development of a modern educational environment.

Analysis of research and publications of recent years

After analyzing some studies in the field of digitization of activities of higher education institutions, one can be convinced that the topic is currently very relevant, as the processes of digitization and the transition of various institutions to paperless systems are currently underway. Therefore, the topic requires extensive analysis of analogues of resources, services and programs. The research analysis was carried out thanks to the search for such resources, which are used for electronic document management in various educational institutions, and not only.

The article [1] discusses the issue of organizational behavior, that is, the study of how people think, feel and act in an organization, as well as how they are affected by activities and changes within the organization. This term is related to the study of individual and group dynamics of an organization, as well as its character. In the era of digital technologies, the behavior of the organization has a great influence on the behavior of employees, and the implementation of digital technologies in their work can significantly affect the behavior of the organization.

It is critical that everyone in the organization realizes that work process change is a shared mission that makes the organization more competitive through resilience, traceability, security and interoperability. It is necessary to openly convey to all employees the main advantages of the new work culture, as well as its new processes, available tools, implementation schedule, and above all to create space for doubts and collective reflection.

A paperless work system will not succeed if its leaders are not exemplary. Implementing electronic document management requires leaders who will demonstrate the benefits of this process through their behavior and new habits.

As with all change processes, it is important to develop a culture of error where employees are not afraid to make a mistake. It is extremely important to experiment without fear with all new tools and new ways of working.

In [2], a study was conducted to find out the extent to which staff in Osun State Public Technical Colleges use paperless technologies for work and whether the level of use affects staff productivity.

Regarding the extent of use of paperless technology by GTC staff in Osun State, the study found that staff in public technical colleges only use paperless technology to a small extent, but despite this, the study predicts a significant increase in staff productivity. Unfortunately, the use of modern technologies is not sufficiently developed in developing countries.

The results of this study show that even a small use of digital technologies can improve work processes. if these processes are scaled up, it will significantly increase the quality of technical education and thus affect national development.

Institutional International Web of Science Resources (IISWR) are a relatively new class of Web resources. They represent the third generation of institutional web resources, where technological, technical, historiographical and sociological aspects of the creation, development and maintenance of web resources are considered. IISWR are web resources created by scientific institutions and aimed at the international scientific community. Before the advent of the WWW, only domestic academic institutions had such web resources. National systems science web resources currently exist as a second generation.

The literature on the design and development of institutional or national/territorial web resources was analyzed. These literature sources relate to the design, development, maintenance, translation and promotion of educational web resources and sources relating to the conception, design, development, maintenance and promotion of national web resources. It is concluded that there is a lack of literature on the design and development of IISWR, which would take into account the problems and needs of the international scientific community. The need to design and develop an IISWR is first presented in the form of a sequence table of motivation, consideration and possible effects/results.

The definition and scope of an institutional international scientific web resource covers the need for consistent, up-to-date and openly accessible research information from various scientific stakeholders. This includes researchers, research managers and administrators, policy makers, research councils, technology transfer organisations, the media and the general public

Currently, research information is concentrated in institutional and personal websites, project information systems, and databases managed by commercial providers. The lack of large amounts of publicly available data that can be analyzed and processed by machines creates a problem. In addition, the preservation of research information is burdensome, resulting in unnecessary additional work for researchers.

In addition, 21st century team science is global and interdisciplinary, requiring a scalable, interoperable, and multi-layered data representation model for research information systems

The network has become the most important source of information for researchers [4], offering various traces of scientific activity. However, the current data available online are not yet expressive and easy to consume, highlighting the need for improved approaches to data analysis and a coherent measurement system for science.

In [5] emphasizes the importance of search engines being able to easily find and understand research content in order to increase its visibility and accessibility. This highlights the importance of optimizing web resources to ensure they are effectively indexed and searched by major search engines, thereby improving their reach and influence in the academic community.

In addition, [6] emphasize the need for standardization and interaction in scientific information systems for effective publication of research data. They discuss the importance of using standards like CERIF and platforms like VIVO to store and deliver research data, emphasizing the role of the Linked Data Network in combining publishing platforms and standards. This highlights the benefits of using standardized systems and platforms to increase the accessibility and reusability of research data, ultimately contributing to the development of scientific knowledge.

Institutional international scholarly web resources play a crucial role in creating connections between databases on the web and creating applications that provide additional services. Conventional interfaces such as PubMed and DSpace-based systems, simple REST-based interfaces, SPARQL endpoints, and URL dereferences are required for data access and linkage. In addition, a system's search capabilities are closely related to its database architecture, with HBase or CouchDB being the common choice, especially for big data, due to their high scalability, fault tolerance, and reliability.

In addition, the Web Observatory infrastructure brings the principles of the early Internet to the emerging research data ecosystem by enabling the creation of custom or project-specific catalogs of research data. This allows researchers and organizations to retain control over the description, ownership, and access to their own research metadata, removing major practical barriers to sharing and reusing research data [3-6].

Developing reliable, easy-to-use software tools for extracting and providing structured research information, and structuring research information according to the principles of linked open data, can increase data availability, thus facilitating global research collaborative efforts [3-6].

Description of the experimental (analytical) research component

To ensure the activity of any institution in the 2020s, it is advisable and mandatory to be represented in the web space in all areas of activity.

Accessibility: Users have direct access to websites through the browsers of any device connected to the Internet.

Internet connection: Since the sites work in a browser, they require the presence of the Internet, otherwise they do not make sense.

Linking: A website URL can be easily shared between users by email, SMS, private message or social media post. Site owners may place hyperlinks to other sites on their pages. Add-ons do not have this property.

Updates: The website is more dynamic in terms of the update process. Any changes in design or content become visible to users instantly without any action on their part.

Due to the fact that the experimental data of the activities of higher education institutions are usually classified as big data, before developing a software product, it is advisable to perform data analysis to determine possible tools that will be used by university employees in the future. It should be noted that administrative employees of ONTU were involved to confirm the correctness of the analysis results.

According to the Law of Ukraine "On Higher Education", scientific, scientific-technical and innovative activities in institutions of higher education are an integral part of educational activities and are carried out with the aim of integrating scientific, educational and industrial activities in the system of higher education.

Data analysis technologies based on the application of classical statistical approaches have a number of disadvantages. The corresponding methods are based on the use of averaged indicators, on the basis of which it is difficult to find out the true state of affairs in the field under study.

Knowledge Discovery in Databases (literally: "discovery of knowledge in databases" - KDD) is an analytical process of researching significant volumes of information with the involvement of automation tools, which aims to reveal the structures, dependencies and relationships hidden in a set of data.

Data Mining (literally: "Development, extraction of data" — DM) — the study of "raw" data and the detection in them with the help of "machines" (algorithms, means of artificial intelligence) of hidden non-trivial structures and dependencies that were not previously known and have practical value and suitable for human interpretation.

Consider the differences between Data Mining and OLAP tools. OLAP technology is aimed at supporting the management decision-making process and is used to find an answer to the question: why are some things the way they really are? At the same time, the user himself forms a model-hypothesis about the data or the relationship between the data, and then, applying a series of queries to the database, confirms or rejects the proposed hypotheses. Data Mining tools differ from OLAP tools in that, instead of checking the interdependencies expected by the user, they can build models on the basis of the available data themselves, which make it possible to quantitatively and qualitatively assess the degree of influence of various researched factors on a given property of the object. In addition, DM tools make it possible to formulate new hypotheses about the nature of hitherto unknown, but actually existing, dependencies between data.

OLAP tools are used in the early stages of the KDD process because they provide a better understanding of the data, which in turn ensures a more efficient outcome of the KDD process.

The main goal of KDD technology is to build models and relationships hidden in the database, that is, those that cannot be found by conventional methods. It is worth noting that not only routine operations (for example, checking the statistical significance of hypotheses), but also operations that until recently were by no means routine (generation of new hypotheses) are transferred to computers. KDD makes it possible to see relationships between data that have been overlooked by researchers.

KDD technology makes it possible not only to confirm (reject) empirical conclusions, but also to build new, previously unknown models. The found model will not be able to claim absolute knowledge for the most part, but it provides the analyst with some advantages already due to the very fact of identifying an alternative statistically significant model, and also, perhaps, becomes a reason to search for an answer to the question: does the identified relationship really exist and is it causal? And this, in turn, stimulates in-depth research, contributing to a deeper understanding of the studied phenomenon [12].

Therefore, the most important goal of applying the KDD technology to the study of real systems is to improve the understanding of the essence of their functioning.

Usually, information and data used in the development of web applications can be grouped by categories or other principles by clusters. On the other hand, data used in web resources cannot be separated from other software products of the institution. In the work, in addition to mandatory functional components, the main data requested and used more often than other users were investigated. As the data collection is multidisciplinary, it was decided to use the functionality of the software as an Orange data analysis tool.

Note that the knowledge discovery process is not completely automated — it requires the participation of the user (expert, decision-maker). The user must be clear about what he is looking for, based on his own hypotheses. After all, instead of confirming an existing hypothesis, the search process often contributes to the emergence of a number of new hypotheses. All this is denoted by the term "discovery-driven data mining" (DDDM), and the terms Data Mining, Knowledge Discovery generally refer to the DDDM technology.

At the second stage, the data obtained as a result of using the tool module was analyzed.

Based on the structure and characteristics of the data, it was decided to choose two tools:

• Cluster analysis

• Sieve method

The term cluster analysis is used to denote a set of methods, approaches and procedures developed to solve the problem of forming homogeneous classes in an arbitrary problem area.

Methods of data analysis, a component of which are methods of cluster analysis, do not use a priori assumptions about the probabilistic nature of the source information and are guided only by heuristic considerations about the nature and features of the studied population of objects.

Cluster analysis (or automatic classification, pattern recognition without a teacher) occupies one of the central places among data analysis methods and is a set of approaches, methods and algorithms designed to find some division of the studied population of objects into subsets of similar objects. At the same time, the initial assumption for the selection of such subsets, which have received the special name of clusters, is only an informal assumption that objects belonging to one cluster should have greater similarity between themselves than with objects from other clusters.

The task of clustering is to divide the objects from x into several clusters, in which the objects are more similar to each other than to the objects of other clusters. In metric space, "similarity" is usually defined by distance.

Clustering methods can be classified into distinct and indistinct. Exact clustering methods divide the original set of objects x into several disjoint subsets. At the same time, any object with x belongs to only one cluster.

Fuzzy cluster analysis methods allow any instance to simultaneously belong to all defined clusters, but to varying degrees.

The conceptual relationship between cluster analysis and the theory of fuzzy sets is based on the fact that when solving the tasks of structuring complex systems, most of the formed classes of objects are fuzzy in nature. This blurriness consists in the fact that the transition from belonging to non-belonging of elements to given classes is gradual rather than abrupt. Therefore, the most adequate answer in such cases should be sought not to the question: "Does this element belong to this or that class?", but to the question: "To what extent does this element belong to this class?".

The requirement to find an unambiguous clustering of the elements of the studied problem area is quite rough and rigid, especially when solving weakly structured problems of system analysis. Fuzzy clustering methods relax this requirement. The requirement is relaxed by introducing fuzzy clusters and their corresponding membership functions, which take values from the interval [0, 1] into consideration.

In general, the task of fuzzy clustering is to find a fuzzy partition of the set of elements of the studied population that form the structure of fuzzy clusters present in the input data. This task boils down to finding measures of belonging of the elements of the universe to the sought-after fuzzy clusters, which collectively determine the fuzzy breakdown of the original set of elements.

Based on the results of the data sampling, a cluster model of the dependence of the degree of education on the categories of literature, its types and formats was built.

The cluster model reflects the use and availability of educational and scientific materials in the scientific and technical library and their demand by bachelors (green), masters (red) and doctors of philosophy (blue). Such a model allows you to determine cluster elements for each level of education depending on the field of knowledge, authors and types of literature, and implement the information used in the development of a mobile application.

The best general-purpose factorization algorithms in use today are Quadratic Sieve (QS) and Digital Field Sieve (NFS). Experiments have shown that NFS is a really good algorithm for factoring numbers with at least 120 decimal digits (400 bits). The quadratic sieve was developed by Karl Pomeranz in 1984. The quadratic sieve (QS) algorithm is an integer factorization algorithm and, in practice, is the second fastest known (after the general digital field sieve) and is significantly simpler than the quadratic sieve digital field. This is a general-purpose factorization method, that is, its

execution time depends only on the size of the input integer, and not on the features of its structure. The study is dedicated to the QS algorithm of the quadratic sieve, the creation of its optimization and the development of a software implementation for the quadratic sieve algorithm.

Scientific novelty of the obtained results

The institutional international scientific web resource offers a new approach to the organization of scientific activity and cooperation on a global scale, making a significant contribution to the development of modern science. The scientific novelty of such a resource lies in the following aspects:

1. Integration of interdisciplinary knowledge: Traditional scientific platforms usually specialize in certain fields of knowledge. The proposed web resource creates a unique opportunity for the integration of knowledge from different disciplines, contributing to the development of interdisciplinary research. This is especially relevant for solving complex scientific problems that require the involvement of knowledge from various scientific fields.

2. Use of the latest technologies: The introduction of artificial intelligence (AI) and machine learning (ML) tools to analyze scientific data and search for new scientific ideas greatly expands the capabilities of researchers. For example, automated literature analysis systems can identify new trends in science and predict potential research directions, which is an innovative approach in scientific activity.

3. Support of open science: The web resource actively supports the concept of open science, providing free access to the results of scientific research, data and methodologies. This not only facilitates the dissemination of knowledge, but also encourages wider participation in the scientific process, including scientists from developing countries and independent researchers. Thus, the resource contributes to the global availability of scientific information and increasing the level of scientific cooperation.

4. Enhanced opportunities for collaboration: The web resource provides an interactive environment for collaboration between researchers from different countries and institutions. This includes tools for collaborative work on scientific projects, real-time data exchange, and the organization of virtual conferences and workshops. This form of cooperation goes beyond traditional models, opening new horizons for international scientific research.

5. Improved peer review system: A new approach to peer review of scientific works, based on an open and transparent process, allows a wider range of experts to be involved in the evaluation of works, which increases the objectivity and quality of scientific publications. This is an innovative step that promotes ethics in the scientific community and reduces the number of low-quality publications.

6. Global dissemination of research results: Thanks to multilingual support and accessibility to users from different regions, the web resource contributes to the global dissemination of scientific knowledge and research results. This opens opportunities for scientists from all over the world to publish and disseminate their work, ensuring equal access to scientific information.

Thus, the institutional international scientific web resource is an innovative tool that changes approaches to scientific activity, contributing to the development of open science, international cooperation and integration of interdisciplinary knowledge. Its implementation can become an important step in the construction of a new scientific ecosystem, focused on global challenges and the needs of modern society.

According to the results of the research, it was concluded that to solve these problems, it is necessary to use software tools and all the possibilities of information technologies. Based on this conclusion, similar systems that could potentially solve these problems were analyzed and the advantages and disadvantages of these systems were analyzed.

Based on the results of the analysis of analogues, it was concluded that the given analogues cannot fully fulfill the tasks and do not have the necessary functions, so it was decided to develop a software product with the desired functionality.

The result of the analysis of the publications of recent years is the receipt of recommendations on the implementation of the web application in the activities of the university.

On the basis of the conducted research and following certain stages of implementation, research program support was made. This system allows you to perform the assigned tasks and can increase the effectiveness of teachers in the administrative field of the university.

Practical significance of the obtained results

It should be noted that software support for research is an improvement of existing systems, analyzing their functions and implementing them into a system for research.

The practical significance of the development of an institutional international scientific web resource is manifested in several key aspects that significantly increase the effectiveness of scientific activity and contribute to the development of global scientific cooperation.

1. Increasing the accessibility of scientific knowledge: The development of a web resource provides wide and open access to scientific publications, research data and results, which is especially important for scientists in countries with limited resources. This promotes a more even distribution of scientific knowledge on a global scale and allows researchers to freely access advanced scientific discoveries and technologies.

2. Strengthening international cooperation: The web resource provides tools for effective communication and cooperation between scientists from different countries and disciplines. The possibility to organize virtual conferences, webinars and joint research projects helps to establish new partnerships, which facilitates the exchange of ideas and experiences at the international level. This is particularly useful for interdisciplinary research, where interaction between different scientific disciplines is critical.

3. Optimization of scientific search and analysis: Integration of intelligent algorithms for search and analysis of scientific information allows researchers to find relevant materials faster and perform analysis of large volumes of data. This significantly reduces the time required for research preparation and increases the quality of scientific works due to better organization and structuring of information.

4. Increasing the visibility and citation of research: The web resource contributes to increasing the visibility of scientific works thanks to the use of open access standards and indexing of publications in international databases. This, in turn, increases the likelihood of works being cited by other scientists, which positively affects the scientific reputation of researchers and their institutions.

5. Support of scientific ethics and transparency: The development of the resource includes the implementation of mechanisms for compliance with scientific ethics, including ensuring transparency in publications, preventing plagiarism and ensuring data confidentiality. This is important to maintain high standards of scientific activity and credibility of the publications posted on the platform.

6. Improving the process of education and training of young researchers: Thanks to access to a large volume of scientific materials and the opportunity to participate in international projects, young researchers receive valuable experience and knowledge necessary for a successful career in science. The web resource becomes a learning platform where they can learn about advanced scientific practices and techniques.

Thus, the development of an institutional international scientific web resource has significant practical significance for the development of science, contributing to the improvement of research efficiency, the globalization of scientific knowledge, and the strengthening of international cooperation.

General conclusions

The implementation of the project of the institutional international scientific web resource has led to significant improvements in scientific activity. The platform provided effective access to scientific publications and data, simplifying the process of searching and processing information. Thanks to the support of international cooperation, the resource has become an important tool for knowledge exchange and joint work between researchers from different countries. The policy of open access contributed to the dissemination of scientific achievements and ensured equal access to knowledge. The integration of innovative technologies, such as automatic data analysis and adaptive design, has increased the usability of the resource. Implemented security measures guarantee information protection and user privacy. The platform also supports the development of young scientists, promoting their integration into the international scientific community.

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Отримана в редакції 26.07.2024. Прийнята до друку 17.08.2024. Received 26 July 2023. Approved 17 August 2024. Available in Internet 23 October 2024.