

Analysis of Scientific Research in the Library Sphere

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Abstract—The development of the library sector is closely linked to the advancement of information technologies and the processes of storing and presenting scientific research. Libraries serve not only as centers for collecting and disseminating information but also play a vital role in conducting scientific research and preserving cultural heritage. Scientific research in the field of library and information science encompasses a wide range of directions. The significance of these studies lies in the evolving role of libraries—not merely as repositories of knowledge, but as dynamic institutions actively supporting scientific inquiry and digital transformation. Furthermore, the analysis of dissertation trends provides a comprehensive understanding of national and international research priorities and reflects broader socio-economic and cultural changes. Understanding these trends is essential for shaping future library policies, educational programs, and innovation strategies. The purpose of this article is to examine the activities, scientific research, and outcomes in the field of library and information science. The article presents the findings of research conducted in this area, including a retrospective analysis of both foreign and domestic studies, as well as an in-depth review of dissertations related to the field. The study employs several scientific methods, including the analysis of statistical data, bibliometric analysis of global research in library science, and a detailed examination of research conducted in Uzbekistan. The essence of the retrospective analysis method lies in its ability to identify the most actively developing scientific areas and to draw conclusions about a country's political, economic, and cultural state based on the flow of dissertations. Moreover, it is essential to

investigate the scientific priorities for the development of the information and library sector. Based on the analysis of scientific research in library science, it is possible to evaluate how the quality of library systems is improving and how these developments influence scientific and cultural advancement.

Keywords—analytics, bibliometric analysis, education, library science, research, scientometrics.

I. INTRODUCTION

The introduction of information technologies, including digital technologies, into our society has brought significant changes in the field of librarianship, particularly through the organization of global computer systems and networks. These changes are currently the focus of library researchers worldwide. Such transformations are reflected in the scientific research of librarians both in our country and abroad. Today, the current state of librarianship, amidst ongoing innovative development processes, as well as the challenges related to libraries' adaptation to these changes, are regularly discussed in academic periodicals. In recent years, there has been a growing number of studies in the fields of computer science, information technology, digital libraries, information retrieval systems, and library services. Research conducted in these areas aims to explore how libraries can effectively integrate information technologies, improve the quality of services, and support knowledge creation in the digital age. It is

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crucial to provide recommendations based on the content of scientific works conducted in each field, reflecting the current issues within that domain. This includes the analysis of scientific work in the field of library science, examining development trends in foreign countries, and evaluating the efforts undertaken in this area within Uzbekistan.

The aim of this research is to examine the scientific studies conducted in the field of librarianship, determine the scope of the subject, analyze scientific research in the field of librarianship in developed countries from the perspectives of years, universities, and research topics, as well as assess the scope of scientific research and indicators of the subject scope in the field of librarianship in Uzbekistan. Furthermore, the study seeks to analyze the significance of research topics, the underlying causes of changes, and emerging trends in this field.

II. MATERIALS AND METHODS

In this study, the outcomes of scientific research conducted in the field of librarianship were examined through the following analytical approaches:

- Retrospective analysis of scientific research within the domain of librarianship;
- Bibliometric analysis of global scholarly publications related to librarianship;
- Analytical review of research activities and scholarly works in the field of librarianship in Uzbekistan.

A. Retrospective analysis of scientific research in the field of librarianship

Social changes within society significantly influence the content and direction of library activities, as well as the system of library services provided to readers. Events, conferences, and forums held across various disciplines—including librarianship—are increasingly focused on global issues, reflecting the current state of international librarianship. Scholars and professionals in the global library community emphasize the need to address challenges confronting libraries, anticipate future developments, and seek solutions to overcome the global crisis affecting the library sector.

Crucial, unresolved issues requiring scientific inquiry are regularly raised by scholars, researchers, and practitioners as topics of scholarly and practical importance. The outcomes of these research efforts are presented at academic conferences and symposia. Scientific advancements are reflected in the work of both international and national researchers, with the latest findings often documented in academic dissertations. Dissertations, by their nature, are regarded as original, unpublished scientific documents governed by intellectual property rights. The academic quality and thematic focus of dissertations serve as indicators of a country's scientific potential and are thus directly relevant to its current condition and future development. Through the analysis of dissertation trends, it is possible

to identify the most advanced fields of science and draw broader conclusions regarding the political, economic, and cultural state of the nation.

Scientific research in the field of librarianship has a long and gradual history of development. While initial scholarly interest in the organization and management of libraries emerged much earlier, systematic and structured research in the modern academic sense began to take shape in the 19th and 20th centuries. Globally, the first notable studies in librarianship can be traced back to 1904. In Uzbekistan, scientific research in this field began to emerge by the 1960s.

Research into library automation started to gain momentum in the mid-20th century, marking a significant shift in how library operations were conceptualized and implemented. From the early 2000s onwards, the focus of scientific inquiry expanded considerably to include advanced topics such as the application of artificial intelligence, cloud technologies, digital libraries, big data analytics, and blockchain technologies in the library and information sector.

Overall, the state of scientific research in librarianship in both developed countries and Uzbekistan demonstrates a dynamic trajectory, with increasing attention paid to technological integration, innovation, and the evolving roles of libraries in the digital age.

B. Bibliometric analysis of research works on librarianship in the world

In recent years, the possibility of using ProQuest, EBSCO, Elsevir, Springer electronic foreign resources, databases of dissertations, including dissertations created in English in the field of scientific and educational resources created in the field of librarianship in developed foreign countries, including dissertations made it possible to study and evaluate. Including our country, Uzbekistan, has been subscribing to world information resources and using them on a large scale in the last few years [1]. The use of these databases allows to make conclusions about the latest achievements of science. It can be seen in many countries, including the USA, Germany, France and Spain, works related to the methodology and the philosophy of librarianship [2]. Among these, C.S.Finlay [3], T.Russell, C.R.Sugimoto [4], F.Shu [5], M. Buckland, C.R.Sugimoto, D.Lee, T.G.Russell, S.C.Finlay, Y.Ding [6] studies have covered similar topics.

Based on the analysis of research works by global scholars in the field of librarianship, the following key findings can be highlighted: The top ten universities of Canada and the USA, included Columbia University (5.5% of the total number of dissertations in the researched period), Florida State University (6.2%), Indiana University (4.7%), Michigan State University (5.3%), New Brunswick State University (4.3%), Rutgers State University of New Jersey (4.0%), City University of Chicago (5.2%), University of California (5.7%), University of Illinois Urbana-Champaign (6.5%),

University of Pittsburgh (9.0%), University of Toronto (3.5%) (Fig.1.)[7].

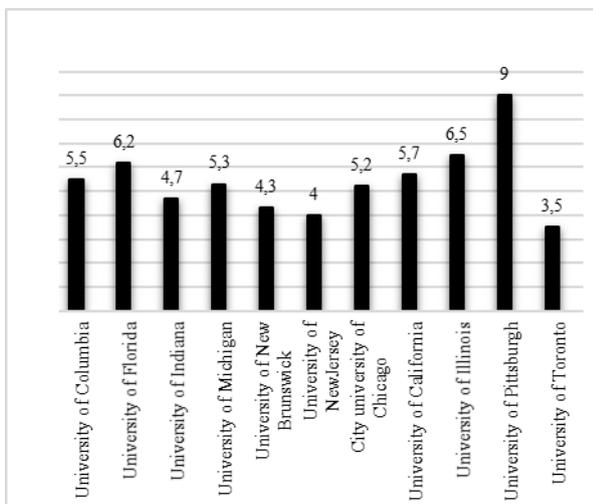


Fig. 1. Rates of dissertation defenses in librarianship at US universities.

C. Analysis of research works on librarianship in Uzbekistan

While studying the scientific research carried out in the field of librarianship in Uzbekistan, the analysis of the most relevant researched issues in the field was studied. While researching the topics of dissertations of a number of scientists, from 1969 to today, research works related to librarianship were tried to be covered on this purpose. The initial studies were mainly related to the history of librarianship, issues of development of network libraries in our country, these are: A.I.Kormilitsyn, A.Ya.Konarev, A.G.Kasymova M.Rakhimova, as well as the work of bibliography in Uzbekistan, M.Turapov, H.Mamatraimova, Book history in Central Asia and issues related to book studies was researched by M.Rustamov. The researches related to the study of librarianship in foreign countries have also been carried out, which were the works of Ibaragim Nazmi Mohamad Mukhsin, Raid Djamel Yakub Suleyman. In libraries, growing up the upcoming young generation and the studies of book reading in sociological aspects were carried out by A.O.Umarov, D.A.Ganieva and B.I.Ganieva [8].

As a result of the introduction of information technologies into the library field after 2000, several researches on the technologies used in libraries E.N,Bugibaev, bibliographic information re-processing in the corporate network J.A. Atadzhanov, issues such as ensuring information security Sh.B.Normatov and integration of library systems with other systems U.U.Karimov were carried out [9].

III. RESULTS AND DISCUSSION

In bibliometric analysis, the thematic focus of dissertations defended in the field of librarianship holds significant importance. Of these, 88 dissertations, or

2.8%, are dedicated to the theory of librarianship, while 269 works, or 8.6%, address the economics, organization, and management of library activities. Library management is closely tied to the issue of personnel training; in this regard, 263 research studies—accounting for 8.4%—have been conducted. Interest in this topic notably increased during the periods 1970–1979 and 1990–1999. Overall, the topics related to the management and organization of library services make up 17% of the total. In addition, 248 studies were conducted on library education, representing nearly 8% of the research output. Below, based on the analysis of global experience, the topics of scientific dissertations from the period between 1903 and 2004 are summarized in a table 1 compiled by the scholar Romanov.

TABLE 1. DISTRIBUTION OF DISSERTATIONS BY TOPICS 1903–2004 [10].

№	Topics	Total
1	Automation of library processes. Information technologies. Electron libraries.	745
2	School libraries	270
3	Organization of library work. Management.	269
4	Economy.	
5	Human resources. Librarian profession	263
6	Library services	261
7	Library education	248
8	Organization of library work abroad	234
9	Book studies. Book history	182
10	Organization of library funds	158
11	Cataloging Systematizing	155
12	Librarianship history	145
13	Bibliography	141
14	Reading. Interests of readers	110
15	Theory of librarianship	88
16	Technical equipment of libraries	18
	Total	3285

Research on the development of school libraries in foreign countries has played a significant role, with considerable attention being paid to the scientific investigation of library activities, particularly in relation to the growing generation. Notably, 745 dissertations, which constitute 23% of the total research output, focus on topics such as information technologies, electronic databases, automation of library processes, electronic libraries, and Internet-related subjects. Key issues, such as information retrieval by researchers, the formation of user requirements, and ensuring the compatibility of library services with the Internet, have emerged as prominent topics over the past 15 years. Furthermore,

over the last 25 years, intellectual property and copyright concerns have become critical areas of focus.

The history of librarianship, as well as works dedicated to librarian scholars, account for 145 dissertations, or 4.6% of the total research. Additionally, a significant body of work has been devoted to studying the state of librarianship in foreign countries, with 234 dissertations (7.5%) examining library practices across various regions. These studies primarily focus on library work in the Middle East, Africa, Southeast Asia, the former Soviet Union, and Southern European countries.

Approximately 10% of the research pertains to the development of library collections, including the completion of library funds, while 7.8% is dedicated to service-related issues within libraries. An analysis of recent dissertations indicates that nearly all aspects of librarianship have been addressed over the years, with variations of 5-10% annually, with the exception of information technology, which consistently represents 20.2% of the research output.

Recent research in the field of librarianship has included bibliometric analyses of leading organizations, prominent publishers, and key scholars, particularly M.Ashiq, S.Ur.Rehman, N.Ahmad, I.Atoum, M.Aqil, and S.Ahmad, among others. these analyses are presented and examined in scientific articles published by highly productive organizations within the field of librarianship [11].

According to it, the following organizations are defined as highly productively organizations:

The top three contributing countries were the United States of America, Australia, and the United Kingdom, with 59, 46, and 41 articles, respectively. They also highlighted that most of the published papers were related to library management, library services, knowledge management, human resources management, and staff professional development. Furthermore, most contributions were from universities (267, 79.64%) and colleges/institutes (26, 7.43%). He depicts by the table the top 10 highly productive countries in terms of publications in the field of library. There are three countries with over 20 publications. The United States of America is at the top of the list with 313 publications (62.6%),17,191,269 citations, and 5.49 average citations. However, out of these 313 publications, 89 items have not been cited yet. The United Kingdom stands in the second position, with 27 publications (5.4%), 182 citations, and 6.74 average citations, followed by Canada with 25 publications (5.0%), 142 citations, and 5.68 average citations. It is interesting to highlight that Denmark has produced only nine publications; however, it has the highest average citations (11.78%). In contrast, India is at the bottom of the list, with eight publications and only five citations.

Additionally, Han X’s research examined the evolution of research topics in library and information science from 1996 to 2019, utilizing the latent Dirichlet allocation topic model. The evolution of research topics in the field is presented in the following table 2.

TABLE 2. EVOLUTION OF RESEARCH TOPICS IN LIS BETWEEN 1996 AND 2019 [12].

The evolution of research topics over the years				
1996-2000	2001-2005	2006-2010	2011-2015	2016-2019
Digital library/services	Information retrieval	Citation analysis/impact factor	Bibliometric analysis	Citation analysis/impact factor
Academic library/librarianship	text processing	text processing	Research performance	Social media
Information systems/Information management	Organizational information activities	Information retrieval/user	Citation analysis/measurement	Organizational information activities
Citation analysis/impact factor	Information systems	Organizational information activities	Scientific collaboration	text processing
Scientific collaboration	Digital libraries/services	Government	Citation analysis/impact factor	Knowledge sharing
Information retrieval	www	Scientific collaboration	Information management	Government
Citation analysis	Network communities	Semantic analysis/models and algorithms	Government	Organizational innovation/performance
Patent analysis	Technology application	Patent analysis	Online/community	e-commerce
Information-seeking behavior	Citation analysis	Technology application	Organizational information activities	Mobile application
Information systems/design	Information-seeking behavior	Research performance	Ranking research	Knowledge management

This table illustrates that the initial research topics focused on areas such as digital libraries, services, and information management. After 2006, research topics expanded to include areas such as bibliometric analysis, impact factor, mobile applications, and artificial intelligence-based search systems.

During the research, the evolution of research topics in the field in Uzbekistan over recent years was analyzed using this model. The data is presented based on the following table 3.

TABLE 3. EVOLUTION OF RESEARCH TOPICS IN LIS UZBEKISTAN

The evolution of research topics over the years			
2000-2005	2005-2011	2012-2016	2016-2020
Digital library/serv	Information retrieval	Mobile application	Citation analysis/impac

ices			ct factor	In recent years, Uzbekistan's library sector has experienced notable progress, with increased scientific activity, especially in the context of digital transformation, library modernization, and the development of information and library services. Currently, the most relevant research directions in this field include:
Information systems	Information systems/design	Information retrieval	Bibliometric analysis	<ul style="list-style-type: none"> • Study of International Experience – analyzing global best practices and their applicability to the local context.
Librarianship/school libraries	Digital libraries/services	Technology application	Ranking research	<ul style="list-style-type: none"> • Support for Education and Science – exploring the library's role in supporting academic and scientific advancement.
Academic library/librarianship	Information systems	Scientific collaboration	Information retrieval/user	<ul style="list-style-type: none"> • Digitalization of Libraries – including the digitization of collections, methods for preserving and providing access to rare and unique documents (particularly in national and university libraries), and the development of digital libraries, such as the National Electronic Library of Uzbekistan, studied in the context of accessibility and usage.
Information-seeking behavior	Information-seeking behavior	Scientific collaboration	Social media	<ul style="list-style-type: none"> • Electronic Catalogs and Databases – research on the implementation of international metadata standards (e.g., MARC, RDA). • Development of Libraries as Cultural and Information Centers – investigating the library's evolving role in community engagement and cultural preservation. • Libraries in Higher Education Systems – analyzing how university libraries provide academic support and contribute to the development of students' and faculty members' information culture. • Scientific Research Activities in Libraries – studying the role of libraries in fostering a research environment, particularly in the context of universities transitioning to international education standards. • Issues Related to Human Resource Development and Professional Training – focusing on library staff development and continuing education.

From these analyses, we can conclude that scientific research in the field of librarianship in Uzbekistan is still in its developmental stages and is gradually increasing. The topics of scientific research are also beginning to align with those of global research. In other words, when examining the evolution of these topics, we observe that they have slightly differed over the years. This can be attributed to the fact that the concepts of automated libraries and digital libraries began to emerge in Uzbekistan only after the year 2000.

TABLE 4. ANALYSIS OF RESEARCHES IN THE FIELD OF LIBRARIANSHIP IN UZBKEISTAN (1960-2024)

Researches' theme and number of each decade									
№	Topics	Decades							Total
		1960-1969	1970-1979	1980-1989	1990-1999	2000-2009	2010-2019	2020-2024	
1	Automation of library processes. Information technologies. Electronic libraries.				8	27	62	89	186
2	School libraries		2	5	11	16	12	23	69
3	Organization of library work abroad				2	3	12	18	35
4	Book study. Book history	9	12	37	23	12	10	9	112
5	History of book studies	3	2	25	8	12	19	18	87
6	Bibliography	16	15	25	19	27	18	13	133
7	Reading. Interests of readers	6	12	16	32	21	16	21	124
	Total								746

The number and topics of scientific works conducted by local scholars from 1960 to 2024 are summarized in the following table 4.

IV. RECOMMENDATIONS

In order to advance any field, scientific research plays a critical role, as science serves as a driving force for development. In particular, the study of the experiences of developed countries and the integration of innovative ideas into science and education provide a significant impetus for the overall growth of the sector.

V. CONCLUSIONS

The development of research in the library sector is a crucial step towards modernizing libraries, enhancing their role in science, education, and society. By studying and analyzing the research experiences and topics in foreign countries, particularly the American school of librarianship, and comparing them with the current state of scientific research in the library field in Uzbekistan, the following conclusions were drawn:

- Strengthening the research base and establishing research groups at universities and major libraries (e.g., the National Library or university libraries);
- Establishing grants and competitions to support research in the fields of library science and information sciences;
- Supporting research, particularly at the intersection of librarianship, IT, sociology, pedagogy, and history;
- Developing international cooperation and organizing joint research projects with foreign universities and libraries, becoming more actively involved in programs by IFLA, EIFL, UNESCO, and other international organizations;
- Encouraging publications in international journals on library and information science;
- Developing human resources by creating platforms for the exchange of experience and research.

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