

Identifying and evaluating the challenges facing the management of digital libraries

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<p>Keywords: <i>Management, digital library, digital resources</i></p> <hr/> <p>Article Type: Research Article</p> <hr/> <p>Corresponding author's Email: Rahmani.mehdi@ut.ac.ir</p>	<p>Abstract</p> <p>Background and purpose: With the advancement of science and the increased electronic resources, the need to create libraries to collect, organize and disseminate these types of resources is felt. With the growth of electronic resources, resource management has gained special importance and is one of the important areas and issues in the discussion of digital libraries. In this study, the aim is to examine the issues and challenges facing the management of digital libraries and provide solutions to solve the challenges and issues facing digital libraries and digital library management. Methodology: The current research is applied in terms of purpose and survey research in terms of method. The current research has been conducted by field method and using library techniques, and the researchers have presented digital library management approaches by reviewing the published texts on digital libraries and digital library management topics. Results: The research results showed that the most important components of digital library management include human resources, management of shared resources, author's right to update resources, cataloging and maintaining the technical structure. Also, the surveys showed that the most important challenge facing digital libraries is the issue of intellectual property and compliance with copyright laws. Conclusion: The results of the research showed that in digital libraries, as in traditional libraries, measures must be taken in the field of collecting, organizing, storing and disseminating information, and it is only possible to carry out the above-mentioned activities with a competent manager. Digital library management creates coordination between different parts of the digital library and helps the library achieve the desired goals. The digital library is facing many issues and challenges, including financial and budget issues, issues related to expert human resources, issues related to digital equipment and internet infrastructure, issues related to the author's rights and copyright, and issues related to the lack of devices. Digitization and security of important information resources and documents, and finally, issues related to the protection and maintenance of digital resources are faced, which can only be solved with the presence of a capable manager and expert human resources of the library.</p> <hr/> <p>This article has been published as open access according to CC BY-NC 4.0. All rights to publish this article belong to the author.</p>
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Introduction

The need and desires of society lead to the creation of organizations with cultural and social goals. Organizations have policies, rules, structures, strategies, and goals based on which they act to recruit, and the ultimate goal of all people is to achieve organizational goals (FAMIL-ROUHANI, GHAFFARI, DAVOUDI, and ESLAMIAN, 2011). Organizational success is the achievement of predetermined goals and policies, and this efficiency and success can only be achieved by relying on the correct management of financial and human resources (AMIRHOSSEINI, 1992). REZAIAN (1990) defines management as the effective process of utilizing financial and human resources in planning, organizing, leading, and controlling to achieve the organization's goals. Libraries and information centers are also established to collect, organize, and disseminate information. They aim to disseminate information in any place and time with any personality, gender, nationality, etc. TRUMBOO, HUMMA, SHAFI, and GUL (2012) stated that the richness of knowledge has changed the methods of accessing information, and users are always looking for easier ways to retrieve information. Therefore, digital libraries have been established to facilitate users' access and spread information as best as possible: Libraries without the time and place limitations. Therefore, to achieve library goals, the discussion of library management and digital libraries is very important.

Digital Library New Zealand (2012) defines a digital library as an electronic collection of resources accessible online, often including electronic versions of books, photos, videos, etc. The success of the digital library and the library in achieving its goals depends on using different technologies and methods to disseminate information and obtain customer satisfaction. One of the most important factors for the library's success in achieving its goals is the correct manager performance and human factors. A good manager must have general management skills (including technical, perceptual, and human skills) (RAHMANI and ASANAFI, forthcoming). The existence of a competent manager for the library leads to an increase in the satisfaction of the library staff. It provides the basis for achieving the goals of the library. In general, management is the distinguishing feature of humans and other living beings. Management is used in group work and when we are in contact with a group of objects and people (GILVARI, 2010). Humans started to form groups to perform their activities efficiently and activities that they were not able to do alone; no group will succeed without proper management. Management is one of the main elements in coordinating the organization's activities (WEIHRICH and KOONTZ, 2005). The more complex the formed group is, naturally, the importance of management also increases.

With the advancement of information technology, libraries are changing their activities from print to digital resources. In the digital environment, the goal of scientific institutions is to provide the right information to the user at the right time (SAGAR and SURESH, 2015).

Library management is one of the subcategories of management that focuses on specific issues of libraries and information centers (Sharma and Singh, 2005).

Libraries and information centers are places for collecting, organizing, analyzing, and combining information and storing and disseminating information (Singh, 1994, translated by Fadaei, 1994). The definition provided about the library is a definition that relies on the practical aspect of the library and emphasizes less the basic concepts of library functions. For example, in the given definition, the location aspect of the library is emphasized. In the given definition, the importance of management is clearly described. The dynamism of libraries and information centers depends on the optimal implementation of library functions and progress in achieving its goals. Therefore, if the library and information center wants to move along with the advancement of technology and new technologies, it should use new management methods. Like other social institutions, managers of libraries and other information centers should have general management skills and be able to learn management skills in the best possible way, in addition to having specialized abilities and capabilities, and improve their abilities and skills. Also, library managers should be able to perform positively in the era of information explosion and daily changes in new information technologies. Today, everything is changing, and the activities and goals of organizations are expanding daily, and management is no exception to this rule (Gilvari, 2010).

The increasing development of information technologies and information networks and the change in the ways of presenting information has led to a change in the performance of digital libraries, and noticeable improvements are also observed in digital libraries. Digital libraries are one of the most important centers for collecting, organizing, and disseminating information, and these libraries have provided the possibility of communication between specialists, librarians, and users (Isfandiari Moghaddam and Zare'ei, 2009). Among other functions of libraries, we can mention their potential to create scientific relationships between researchers and scientists. In fact, libraries have moved from traditional to digital libraries to achieve the goal of user orientation and increase the speed in providing information to users and patrons (Naseh & Jahangir, 2006).

Today, with information technology surrounding information, we are witnessing fundamental developments and changes in library services, information presentation methods, and the practice of information technology in society. In fact, the library has found a much more important role in the cycle of information transfer. One of them is more emphasis on the needs of users and their direct access to digital information. Therefore, information technology has been able to influence the ways of storing and retrieving information, so it has transformed traditional libraries (Keikha, 2014).

The digital revolution has had a fundamental impact on the activities of libraries, including organization, storage, collection, and access to information. The use of computers and

access to the Internet has made libraries move towards digital libraries. In digital libraries, modern tools and software are used to collect, organize, and disseminate information (Norouzi and Gholami, 2016). Therefore, libraries try to align themselves with these technologies to benefit as much as possible from their capabilities to achieve their goals (TaHERI & Naghimehrtabai, 2011).

Although the activities carried out in the digital library are considered technical and specialized, the life of the digital library takes place in the virtual space without the four walls of the traditional library. Nevertheless, like any other organization without proper and up-to-date management, no digital library will be able to set goals for itself and take steps to achieve them; Because management in the digital library means ensuring programs and planning to achieve the set goals. Accordingly, in this article, the issue of digital library management has been discussed and analyzed as one of the important parts of the creation and development of this type of library.

The management of digital resources is continuous management, which includes management from the beginning of production. Knowing the bases and relations of production of these resources, establishing a guiding relationship with producers and rights owners, and copyright managing are undeniable conditions for informed and prudent management. In other words, the continuous preservation and accessibility of digital information will be possible only by determining and explaining appropriate strategies, ultimate goals, and logical and realistic functions (Taj Abadi, Abdollahi, and Bayat, 2015). Management of digital and traditional libraries are similar; in digital library management, the knowledge used in traditional library management is slightly broader. We must acknowledge the existence of public services behind the scenes and the purpose of information dissemination in the new environment. Also, the emergence of new topics on the Internet and digital libraries has its roots in the past of library science, which has led librarians, libraries, resources, users, and managers to the current situation with gradual transformation. The management of digital libraries includes maintaining digital resources, budgeting for the provision of digital resources, earning and marketing, organizing Internet and digital resources, searching, browsing facilities, and collection development (Isfandiari Moghaddam and Zare'ei, 2009).

If the policies of the digital library and the management in the digital library are adjusted appropriately and in line with the goals of the library, and if the human resources step in sync with the policy and set goals, and at different times, in-service and retraining courses are held for them to receive training, effective and quality management will govern the digital library (Isfandiari & Bayat, 2008). The correct performance of managerial tasks and success in digital library management depends on the manager being equipped with managerial knowledge and having a regular plan according to the strengths, weaknesses,

opportunities facing the library, and threats facing the library and paying attention to the needs of users.

Methodology

The current research is applied in terms of purpose and survey research in terms of method. In the present study, the content analysis method was used to answer the research questions. The data collection method was that 365 articles were retrieved by searching for ten keywords in the field of digital library management in Scopus, Magiran, NOORMAGS, CIVILICA, and Tehran University publications database. According to the review of the articles and according to the objectives of the research, including the time frame, the articles should not be older than 2010 and 2019, the language of the articles should be Persian and English, and the article should be about the digital library. Therefore, 63 articles were examined. Finally, the extracted components were ranked using Shannon's entropy coefficient. Finally, the most important components of digital library management were categorized and presented.

Results

In order to achieve the objectives of the research, 63 sample articles were analyzed. The first research question was identifying the most important digital library management parts. In order to answer this question in the analysis of the content of the texts, the section of digital library management components was referred and its data were extracted. Table 1 presents the different sections.

Table 1: Categories and important indicators in digital library management

Grouping	Index	Frequency
Human resources	The need for skilled manpower	62
	Manpower training	61
	Continuous evaluation of human resources	57
Sharing and accessing information	Information sharing terms and conditions	53
	Conditions for renewing and confirming information sharing	59
Intellectual Property	Copyright of digital resources	63
	Copyright of textual sources	60
	Statements and rules of intellectual property	42
Update	Keep resources up to date	60
	Providing up-to-date and new resources	60
	Cooperation with other centers to share resources	32
	The process of cataloging digital resources	39

Listing	Continuous metadata	17
Technical infrastructure	Suitable software for digital library	60
	Suitable hardware for digital library	61
	The presence of suitable operators for the system	52
	Regular backup of digital library resources	46
	Maintenance and security of library resources	37

As it is clear from Table 1, the most important parts and concepts of digital library management include human resources, information sharing and access, intellectual property, updating, cataloging, and technical infrastructure.

What are the most important challenges and risks facing digital library management? In order to answer this question, the content analysis of all articles was done. The results are presented in table two.

Table 2: The most important risks facing digital library management

Grouping	Categories	Frequency
Build resources	Development of advanced technology for digitalization of analog sources.	27
	Designing a search and retrieval tool to compensate for the shortcomings of incomplete cataloging or ineffective descriptive information.	19
	Designing tools that increase the efficiency of cataloging and descriptive information of resources through user participation.	45
Mutual function	Creation of protocols and standards for easy integration of distributed digital libraries.	16
intellectual property	Legal considerations regarding access, copying and publication of physical and digital resources.	53
Efficient access	Simultaneous access to digital and physical resources.	42
	Developing approaches to provide heterogeneous resources in a coherent way.	19
	Making the national digital library useful for different user communities with different purposes.	37
Durability of resources	Providing efficient and flexible tools to convert digital content into suitable resources to meet the needs of end users.	46
	The development of economic models to support the National Digital Library.	14

As it is clear from table two, the most important challenge facing digital library management is related to intellectual property and legal considerations regarding access, copying, and publication of physical and digital resources. Another important challenge is providing efficient and flexible tools to convert digital content into appropriate resources

to meet the needs of end users, which is very important, and the digital library manager should pay special attention to it.

Discussion and Conclusion

Digital libraries are a new form of traditional libraries that remove time and place restrictions and allow users who need the information to access the resources they need at any place and time. In digital libraries, as in traditional libraries, measures must be taken to collect, organize, store, and disseminate information. It is only possible to carry out the aforementioned activities with a competent manager.

One of the most important challenges faced by digital libraries is the need for more skilled and experienced staff. The presence of efficient and capable human resources can greatly help the advancement of the digital library. In order to train an efficient workforce, various units should be included in the courses of information science and epistemology students so that students can learn the basic concepts and then empower themselves by studying multiple courses in the field of digital libraries and digital library management (Salari, 2010). Although the digital library field has been approved at the master's level by the Ministry of Science, Research and Technology and has been implemented in some Information Science and Scientology departments. There still needs to be more specialized human resources in this field. Some managers of digital libraries need more expert staff to implement their goals in the library, leading to the inefficiency of digital libraries. Managers have to outsource many of their tasks and leave them to foreign companies and people who impose these high costs on the library. Also, the need for more expert staff leads to problems in the discussion of library tenure in the organizational structure. In this case, due to organizational problems and external pressures, managers have to use non-specialist forces, which leads to severe losses and damage to digital libraries. MacDonald (1998) emphasizes the attraction of expert and experienced staff in digital libraries and states that a digital library needs a librarian with sufficient knowledge and experience in digital resources and digital libraries. Therefore, one of the most important problems in Iran is the need for librarians specializing in digital libraries. The strategic planning of any library is presented to guide and develop the library in line with the vision of the top organization. In each strategic plan, goals, values, priorities, and upcoming opportunities are identified, and the organization's roadmap is drawn. Strategic planning leads to drawing the organizational policy of the digital library and outlines the strengths, weaknesses, upcoming opportunities, and threats of the digital library and helps the library manager manage the library as best as possible. By using the correct program, the library's strategy can be well considered, the available opportunities can be identified efficiently, and the available opportunities can be used according to the library's goals. Identifying the strengths and making the best efforts to strengthen them is also possible. Finally, by using

the strategic plan, it is possible to evaluate the activities of the digital library and the library's human resources, improve the weak points of the library, and organize retraining courses for the employees.

The main problem in digital libraries is related to the homogenizing process of digital media. Because digital resources require more care, and the ways of collecting and organizing them are completely different from traditional resources, and they cannot be directly entered into the library (Cleveland, 1998). In traditional libraries, controlling temperature, humidity, and chemical and biological pollution are very important. However, in digital libraries, the quality and duration of the information storage medium and the information storage format are particularly important. Considering that digital resource storage mediums change daily, libraries should constantly seek to transfer information from one information medium to a newer medium so that users can retrieve and display digital information content (Nabavi & Fattahi, 2014). This situation means that changing the data carrier and format is very costly, and there is a high possibility that a part of the information will be distorted and lost during the transfer of information from one format to another. Based on this, the existence of managers is of great importance because they accept the responsibility of choosing the information medium and formulating the library's policy. The existence of the above-mentioned problems, other technical issues, and other parts of the digital library requires a person who can lead and manage everyone and solve the library's problems with scientific management and steering measures. Therefore, it is essential that the digital library's guiding and management group is present and, with proper planning, paves the way for the activities of the digital library's technical and service departments.

Managers of digital libraries are usually faced with many challenges, some of which may indicate the need for a clear mechanism. Unlike traditional libraries, digital libraries are emerging, and the experiences that exist in managing traditional libraries have not yet been acquired in academic libraries (Lynch & Molina, 1995). Digital libraries face many challenges in various fields, including human resources, the cost of building a digital collection, the issue of digital content security, maintaining digital resources, etc. Nicholson (1995) divided digital library management problems into five groups: problems related to design, problems related to organization, problems related to human resources, management problems, and problems related to control and supervision.

Digital library management creates coordination between different parts of the digital library and helps the library achieve the desired goals. The digital library faces several issues and challenges: financial and budget issues; issues related to specialized human resources; issues related to digital equipment and internet infrastructure; copyright and copyright issues; issues related to the lack of digitization devices and the security of important information resources and documents; And finally, issues related to the

protection and maintenance of resources. These issues can only be solved with a capable manager and expert human resources. Managers should be aware of these issues and have enough knowledge to build digital libraries. In general, management has a significant impact on advancing the goals of the digital library, and the role of coordinating the various elements of the digital library is the responsibility of the library manager. If the director does not have the necessary power to deal with various programs, including technical, administrative, and educational standards, the digital library will face many problems and issues. Therefore, the general recommendation is that construction of a digital library, taking into account that it is a time-consuming, costly and challenging matter, a strategic plan should be drawn up so that the construction of a digital library is done with a comprehensive and detailed view. By compiling this program, all strengths and weaknesses, solutions, and measures in different areas, from changing attitudes to providing services to users, are predicted and operationalized.

Ethics

This research observed ethical standards, including obtaining informed consent and ensuring privacy and confidentiality. Also, while completing the questionnaires while emphasizing completing all the questions, the participants were free to withdraw from the research at any time and provide individual information. They were assured that the information would remain confidential, which was strictly adhered to.

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Conflict of Interest

According to the authors, this article has no financial sponsor or conflict of interest.

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