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Original Research

Challenges and opportunities for storing and retrieving information in Iranian public libraries from the viewpoints of librarians[1]

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Abstract

The main function of a library is the availability of information resources. To achieve this goal, it is necessary to correctly store and retrieve documents and information in libraries and information centers. This study mainly aimed to design a model of challenges and opportunities for storing and retrieving information in Iran public libraries from the librarians' perspectives. The practical research approach is based on the grounded theory in terms of the purpose. Using the grounded theory qualitatively, sampling was conducted by targeted (judgmental) and snowball (chain) techniques for the theoretical saturation of data. Interviews were done with 26 senior public library experts with experience and expertise in this field. Results of the analysis of the data obtained from the interviews show that management, policy-making, and fiscal mechanisms were the primary underlying conditions. Individual and organizational factors were influential under intermediate (intervening) conditions. The approaches of the model of challenges and opportunities for storing and retrieving information include creating an environment for the employees' growth and development and modifying the organizational structure in public libraries of Iran. The presently designed model consists of adequate dimensions and components, casual, underlying, and mediating conditions, and constituting elements, which show the central phenomenon, consequences, and strategies for implementing public policy. Finally, practical suggestions were presented for improving the storage and retrieval of information in the Iranian public libraries.

Keywords: Librarians, Storage and Retrieval, Public libraries.

Introduction and Problem Statement

The main function of a library is the availability of information resources. To achieve this goal, it is necessary to correctly store and retrieve documents and information in libraries and

information centers. The current and everyday processes of libraries are out of their traditional and old form and have been placed in a software structure to be successful in library services in the new era. Modern storage and retrieval using library software are one of these technologies used in libraries. These storage and retrieval solutions are mainly designed to respond to users' needs in search of information resources.

The designed software is essential for storing and retrieving information in all libraries and information centers. The compatibility of the prepared and compiled software related to the storage and retrieval of library information with the goals and tasks of the library will accelerate and facilitate the work of libraries. It will greatly help the information management process.

This research uses methods of storing and retrieving information in public libraries worldwide to identify the necessary features and capabilities. Challenges and opportunities for storing and retrieving information in this group of libraries were assessed through interviews with 26 senior expert librarians of public libraries. Their expert and scientific views and feedback were used to develop and improve this critical goal in public libraries. This study mainly aimed to design a model of challenges and opportunities for storing and retrieving information in Iran's public libraries from the librarians' perspectives. Accordingly, the main research question is "what are effective dimensions and components, challenges, and opportunities for storing and retrieving information in public libraries in Iran from librarians' perspectives? This study used the snowball sampling method, the advantage of which is that it is also used for identifying specialists in a scientific subject in a community. This is because these people usually know each other, and more of these people can be reached through some of them as a primary sample. This sampling is not time-consuming, and new people more conveniently communicate with the researcher because of their previous acquaintances.

It can be stated that data recovery is all the activities in the process of storage and retrieval from the moment of indexing a document for digging into the system to the moment when it is retrieved on demand (Salton, 1979).

In recent decades, advances in data collection and storage capabilities have led to large volumes of information in many sciences. Data mining is an attempt to obtain useful information from these data, and the growing popularity of data worldwide has doubled the importance of data mining. Since advanced database management technology can accommodate a wide variety of data types, traditional statistical techniques and management tools are not enough to analyze these data, making knowledge extraction from this huge data a big challenge.

There are several definitions for data mining. One is employing a computer methodology that uses various techniques to extract knowledge directly from data (Baars & Kemper, 2008). Data mining is the search for new and up-to-date information through large amounts of data and the human-computer collaborative process (Yuksel et al., 2014). Data mining is the process of exploration and analysis by automated and semi-automated tools. Large amounts of data are used to explore meaningful patterns and rules (Pranata & Skinner, 2015).

Data mining technology considers large databases a potential source of valuable knowledge for making decisions. In the data mining process, the best results are obtained when the knowledge of an expert on a problem is combined with the capabilities of a computer (Khan, 2016).

Thus, computer systems can only be used to empower experts without denying their abilities. Information technology allows the control of information, which means that

information can be collected, stored, and retrieved from various library sources in different geographical areas. This results from using digital and computer software and storage and recovery systems (Gill, 2016).

One of the major issues facing librarians is the inefficiency of the software ordered by individuals or companies. The absence of research introduces two issues as the reason for this problem; insufficient knowledge of library officials about the capabilities and features of the software and unfamiliarity of designers and programmers with traditional library systems (Ghaebi, 1995). Haji Zin al-Abedini et al. also believe that the design and implementation of software by various organizations and libraries causes a lack of integration and coordination between software and is not cost-effective due to heavy design costs, high per capita cost and the impossibility of selling, inability to support software by the library, and so on (Haji Zin-al-Abedini, Pazouki, and Davoodzadeh, 2011).

On the other hand, the importance of access to information in the new information space necessitates that librarians in public libraries can learn the best ways to search and retrieve information from electronic environments and be able to perform the reference service process with the use of what they have learned to help users (Sharif Moghadam and Alijani, 2009, p: 148).

Library resources and their provided services have undergone many changes with the advent of the Web in 1993, new reference services such as email in 1999, and concurrent reference services (such as Ask the Librarian). Virtual reference services, one of the essential elements, have gradually appeared on the websites of many libraries, including public and academic libraries (Johnson, 2004). The success of reference librarians is conditional on the initial storage of information in reputable databases. The public library reference librarian will provide access and skills to retrieve this information correctly.

Effective online virtual reference training can help increase the number of audiences. Many studies in the last decade have focused on the evolution and development of LIS (Song et al., 2020). A review of library science research progress from 2008 to 2012 reveals five major development trends in library science, one of which is the storage and retrieval of information (Zhang & Hong, 2018).

It seems that the issue of storing and retrieving information in public libraries was less addressed after this date (2012). Furthermore, it can be argued that studies previously focusing on storing and retrieving information in the form of controlled words in public libraries have been replaced by studies on improving the position of libraries in society. The next goals cannot be achieved without considering the phenomenon of storing and retrieving information in this type of library. Attention to the issue of storage and retrieval in public libraries remains at the level of data storage and retrieval, while the present society needs public libraries to store and retrieve information and not merely data if they are interested in their survival.

To achieve this in public libraries, librarians and administrators must first feel this need and work hard to improve their science and software.

Literature Review

The following studies have investigated the promotion of public libraries from the perspective of their main function, which is storing and retrieving resources and information. According to Fattahi, there are concentrated challenges faced by cataloguers at the beginning of the present century in organizing library resources, especially electronic and Internet

resources. Some of these challenges include the need to review the rules of cataloging and standards for describing electronic resources, the cataloging procedure of Internet resources and overcoming the problems caused by the tremendous growth of such resources, the development of an international metadata standard for electronic source cataloging, and the ambiguous Future of cataloging training in librarianship and information update (Fattahi, 2001).

Fattahi (2001), Taj al-Dini, Sadat Mousavi, and Soleimani Nejad (2015) presented evidence that the period of transition and change in information science and science need to be united in the future ideas of managers and librarians, and the constructive views of both groups and their complete encirclement should be integrated. This raises the issue of building a solid foundation and a bright and strong future. Regarding the promotion of libraries and the role of librarians in this promotion, Sadat Mousavi, Taj Al-Dini, and Sharif Moghadam (2014) point to the revolutionary developments in the library environment and consider the most important obstacles for librarians to learn and become familiar with IT skills to be the reluctance of high-ranking officials in sending them to learn IT skills.

In a study entitled Online Information Retrieval in Public Libraries: Staff Selection and Development for Quality Services, Rosimer refers to promoting public library staff to achieve this goal. He concludes that the realization of this action depends on the selection of employees in four categories: (1) training, (2) experience, (3) current level of knowledge/skills, and (4) ability to refer publicly. The following are three types of staff training programs: (1) general orientation for all employees, (2) training in the principles of online search, and 3) development and training of online search (Rosemarie, 1999).

Bajpa and Madasoudahan published the article Information Technology Techniques Skills, Librarian and Information Science Specialists working in the University Libraries, University of Delhi. They examined the impact of information technology capabilities on science and library science at Delhi Universities, India. The authors conclude that many libraries have a superficial knowledge of information technology, resulting from the lack of facilities and access to library hardware and software systems. Hence, librarians need to increase their skills and ability in information technology (Bajpa and Madasoudahan, 2019).

Some studies have addressed the challenges of librarians themselves. The results show that fulfilling complex information needs is possible by increasing librarians' mental and social health and technical knowledge (Bishop, 2016; Dankowski, 2018).

Generally, most of the previous studies that have led to advances in librarianship have resulted from different views on this science (Sonnenwald, Lassi, Olson, Ponti & Axelsson, 2009; Haakon, 2016; Zhao and Strotmann, 2020). A review of research on the challenges of storing and retrieving information in public libraries showed that research in the 80s in Iran was mainly related to storing and retrieving documents and organizing library resources (Kab, 2021).

Fattahi presents the most active research and articles in which the most important challenges are stated to be the redundancy of information resources in various forms, the difficulty in determining the basis for describing resources, the limited organization of the source of production, the difficulty of documenting names and topics nationally and globally, and cataloging and indexing confliction in search engines (Fattahi, 2007). Since the 90s, more attention has been paid to data storage and retrieval, especially in library data retrieval. However, what is relevant to public libraries in this decade is the study of software still focused on storing and retrieving documents (Taj al-Dini et al.,2015; Sadat Mousavi et al., 2014).

An analysis of the research progress of librarianship and information science in the new century also shows that the transition from traditional libraries to digital libraries, attention from library services to users' behavior, and the evolution of using databases and resources outside libraries are some of the developments in public libraries in the current century (Song, 2021). Moreover, the challenges in public libraries are mainly related to the socialization of libraries and the promotion of information literacy and skills of librarians in these libraries. Paying attention to virtual reference services is a new topic raised in international libraries for many years.

In this regard, the partnership between public and academic libraries dates back to 2003 (Lankes, White, Abels & Haque, 2006). The "Ask from librarian" service in the National Library of IRAN was launched in 2005 and has recently been introduced to public libraries in the face of the current COVID-19 pandemic. Since the end of 2020, the public libraries of Iran have been provided with access to the mega piper practical resource supply base. Communication infrastructure has been provided for clients virtually via email, telephone, and the "Ask from librarian" service in the library system, which can be a major move to facilitate data retrieval virtually and remotely.

Materials and Methods

The present qualitative study is based on the grounded theory approach as one of the inductive research methods. Therefore, this research with a qualitative approach follows the grounded theory of Corbin and Strauss (2008) as the research method.

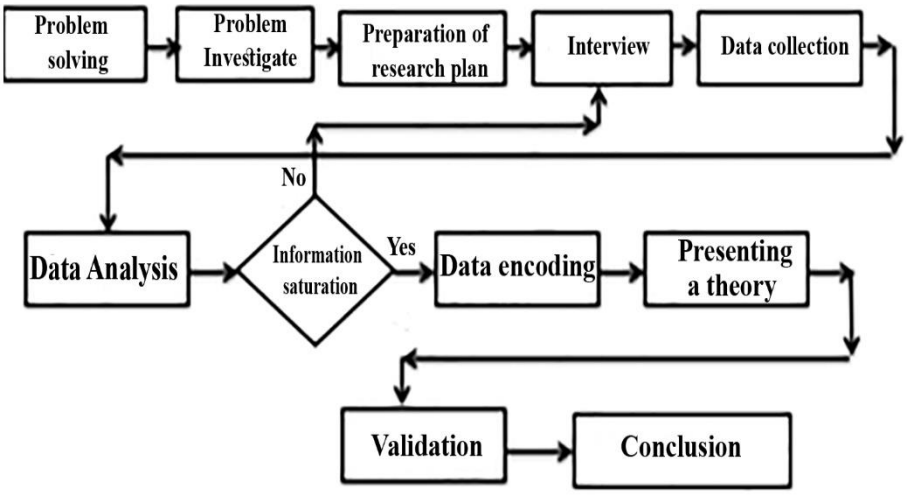

Figure 1: Steps and activities of the present study

Participants: The "grounded theory" deals with a specific situation instead of a large statistical population. The subject and issue of the research determines the scope of research work. This study's population consisted of experts and librarians of public libraries in metropolises of Iran, Mashhad, Hamedan, Yazd, Urmia, Tabriz, Semnan, Ahvaz, Ilam, and Ardabil. The city's largest and most significant library, i.e. the city's central library, was selected for each metropolis. Among the library staff (n = 202), 26 senior experts and specialists of these libraries were sampled by the snowball method (chain reference) and included in interviews as the data collection tool.

In this research, therefore, the most important issues in information storage and retrieval

were extracted after problem-solving during in-depth interviews with experts related to elites and simultaneous note-taking in the field. These principles were later discussed in various discussions and approved by many experts. Before the beginning of the interviews, the subject and objectives of the research were informed to the interviewees.

In general, the following are some of the methods of data collection in this research: The study of books, publications, and specialized texts by searching databases, libraries, etc., to achieve theoretical foundations and simultaneously use various experiences of other researchers, using interview techniques with professors, managers, experts, and elites of the organization, and the use of archival studies by analyzing existing documents.

Validity and reliability of measurement tools

A. Instead of using the terms validity and quantitative validity, most qualitative methodologists use the criterion of "reliability" or "trustworthiness " to evaluate the quality of qualitative results. In simple terms, reliability is the degree to which one can rely on qualitative research findings and trust their results. Lund (2016) believes that the reliability criterion includes four separate but interrelated criteria: Credibility, Dependability, Confirmability, and Transferability.

B. Quality in qualitative research: The credibility criterion of research (quantitative or qualitative) has no value without scientific accuracy and loses its acceptability (Corbin & Strauss, 2008). The credibility criterion is proposed to evaluate research based on the grounded theory instead of the validity and reliability criteria.

Table 1
Evaluation of research findings

Criterion	Definition	Description and conclusion
Trustworthiness	The extent to which the research results represent data.	Provide interview reports to supervisors and consultants, and coordinate the interpretation of interview texts.
Transferability	The extent to which it is possible to apply research findings in similar situations.	Snowball sampling, the adequacy of collected data, and the observers' comments indicate that the reader can evaluate the transferability of the findings to other similar situations.
Reliability	The extent to which the findings are monopolized by time and place; consistency is achieved in the desired explanations.	The interviewees expressed their precise opinions and views, and the researcher could gain the necessary experiences.
Validity	To the extent that the interpretations are not influenced by incorrect information or evasion of interviewees.	The interviews were conducted in a friendly office environment and they provided their information.
Confirmability	The extent to which the interpretations arise from the interviewees' opinions and are not influenced by the	The researcher studied all the interviews and, in addition, the extracted categories were confirmed by 10 experts.

Criterion	Definition	Description and conclusion
	researcher's bias.	
Consistency	The extent to which the findings are consistent with the mental structure of individuals toward the phenomenon under study.	The main criteria of the research were achieved, and the categories were controlled and refined here.
Understandability	The extent that shows the research findings represent the real world of the interviewees.	The research findings were provided to three interviewees who presented the same views and opinions.
Generalizability	The extent to which the findings encompass various aspects of the study's phenomenon.	Interviews were open with enough time and free.
Controllability	The extent to which the research focuses on the controllable dimensions of the phenomenon under study.	Conducting 26 interviews with experts, their active participation in the interview process, the usefulness of the interviews, and achieving acceptable results

Results

Coding process

Open coding is an analytical process in which concepts are identified to discover the characteristics and dimensions of each concept. The two key activities in open coding are conceptualization and categorization. Axial coding aims to integrate data that has been shredded in the open coding phase. In axial coding, one of the open coding categories is selected as the main category or phenomenon and is placed in the center of the process, after which the other categories are linked to it (Corbin & Strauss 2008).

Selective coding results (theoretical narration of the research model)

The final coding stage in grounded theory is "selective coding, which is used to integrate and refine categories. At this stage, the main categories of research come together and produce a larger theoretical design to theorize the research findings. Selective coding is the last step in the grounded theory process that leads to developing a final theory. During the selective coding process, a single social category is selected, and all other categories return to this category. Based on this central category, a single trajectory is formed around which all information is organized.

The final central category that emerged during open, central, and selective coding is discussed in this section. This central category conceptualizes the relationship between the three levels of coding and helps describe the characteristics of the categories. At this coding stage, the theorist writes a theory of the relationship between the categories obtained in axial coding. This theory describes the phenomenon under study abstractly (Corbin & Strauss 2008). The following are the results of the analysis of the research questions

Question 1: What are the governing context and underlying conditions of the model of challenges and opportunities for storing and retrieving information in Iranian public libraries from the perspectives of librarians?

The analysis of the first sub-question shows that the context, or the basis of the desired model, is management and policy-making, the attitude of trustees and policy-makers, and financial and legal mechanisms.

Question 2: What are the intermediary conditions of the model of challenges and opportunities for storing and retrieving information in Iranian public libraries from the point of view of librarians?

The analysis of the second sub-question shows that the intervening conditions in achieving the desired pattern are effective individual conditions, adequate organizational conditions, effective management conditions, and effective infrastructure and process conditions.

Question 3: What are this process's constituent elements and central phenomenon?

The analysis of the third question shows that the central category of the model is information storage and retrieval (high productivity, organizational health).

Question 4: What are the causal conditions of the model of challenges and opportunities for storing and retrieving information in Iranian public libraries from the perspectives of librarians? The analysis of the fourth question shows that intra-systemic factors (individual and organizational factors) and extra-systemic factors (economic, social, and cultural) are identified as causal factors and conditions.

Question 5: What are the strategies of the model of challenges and opportunities for storing and retrieving information in Iranian public libraries from the perspectives of librarians?

The analysis of the fifth question shows that the strategies of the model are to create an environment for employee growth, the need to finance employees, the mechanism for reforming the organizational structure, and the mechanism for reforming culture.

Question 6: What are the implications of the model of challenges and opportunities for storing and retrieving information in Iranian public libraries from the perspectives of librarians?

The sixth question's analysis shows that the mentioned model's consequences are individual, organizational, and social.

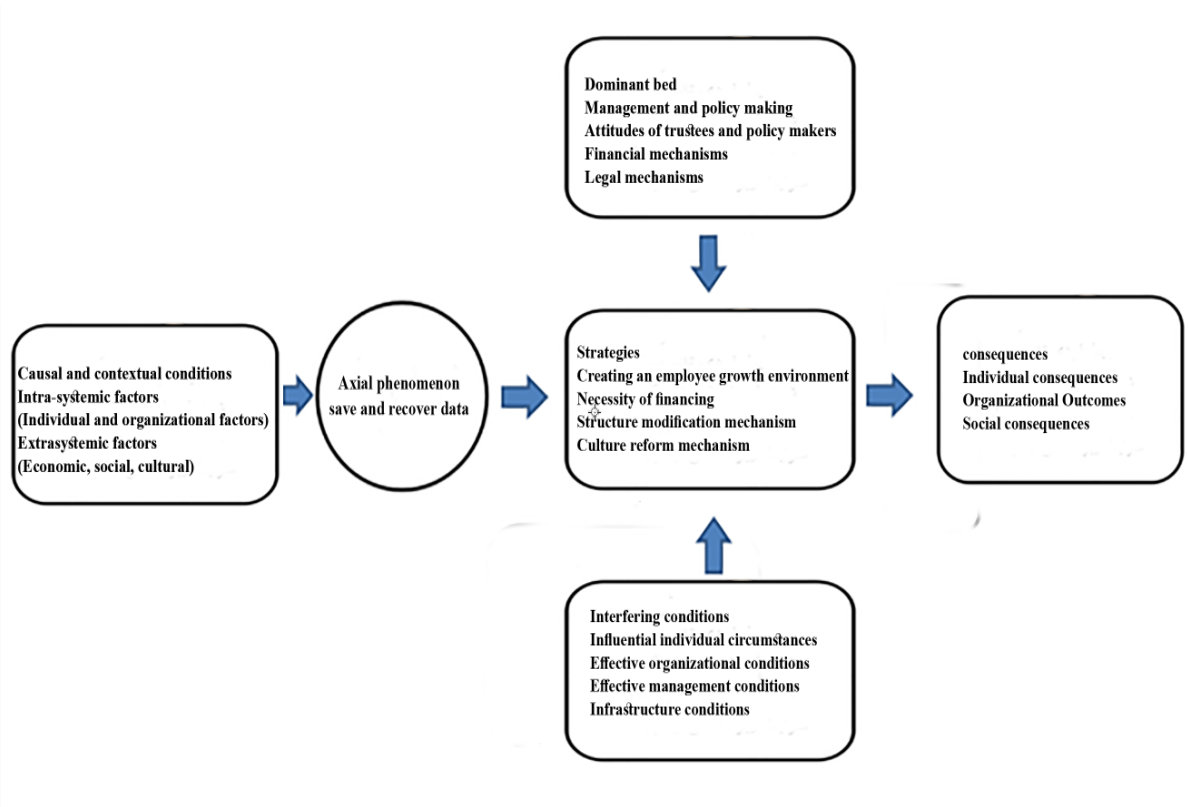

Figure 2: The axial coding paradigm model of storing and retrieving information in the Iranian public libraries

The following theorems are obtained based on the components of the selective coding step:

Theorem I: intra-systemic factors (individual and organizational factors) and extra-systemic factors (economic, social, and cultural) are identified as causal factors and conditions.

Theorem II: The central category of the model is information storage and retrieval (high productivity, organizational health).

Theorem III is the context, the basis of the desired model, management, and policy-making, the attitude of trustees and policy-makers, and financial and legal mechanisms.

Theorem IV: The intervening conditions in achieving the desired model are effective individual conditions, effective organizational conditions, effective management conditions, and effective infrastructure and process conditions.

Theorem V: model strategies, creating an environment for employee growth, the need to finance employees, the mechanism of reforming the organizational structure, and culture reform.

Theorem VI: The consequences of this model are individual, organizational, and social consequences.

Discussion

According to experts in this field in public libraries, it seems that storing and retrieving information in this type of library is semi-traditional in Iran. Although it has made significant progress over the years, it is not enough compared to global developments.

On the other hand, these developments have favored small and rural libraries more. Implementing the same management policies between small and large libraries and central

libraries has led to measures to store and retrieve all information carriers, such as manuscripts, publications, photographs, etc., in the central public libraries. The continuation of this process will weaken the storage and retrieval of these resources.

Using "SAMAN[2]" integrated software for a variety of information resources and placing limited fields, which are only responsible for storing and retrieving documents in a book form, can be a major threat to these collections because the most common services of the library as its main task is to provide information and local documents in which it serves. These collections, especially if collected over some time (sometimes over more than a century), create valuable historical collections that are also of interest in their contemporary time (Feather, 2017).

On the other hand, successive changes in library software remove many of the prominent fields from these information sources. Another problem of public library institutions' policies is the time-consuming and lengthy process of inquiring and entering information and storing information in public libraries that will prevent storage as a result of timely retrieval of resources and is discouraging for library visitors. In the results of in-depth interviews with experts in this field, attention to the storage and retrieval of information in public libraries was considered necessary as one of the basic pillars of these libraries. However, it seems that the institution's attention to socialization and visibility in virtual spaces, strengthening and paying attention to the children and adolescents section of this type of library, etc., have caused less attention and less budget allocation to store and retrieve information in public libraries. Besides, there is a need for a significant budget for this important issue to strengthen the tools of data storage and retrieval and training of expert staff for this goal. This is because information organization has always been one of the main concerns and functions of the library and information profession and has played a fundamental role in the process of information management (production, distribution, and dissemination) (Fattahi, 2007).

Another positive move by public libraries has been focusing on virtual reference services in recent years. This has led public libraries to go beyond limiting the resources available in their libraries and upgrade their data recovery services by linking to resources in databases.

The virtual reference desk has been set up to provide a new service to public library members, meet research needs, and answer study questions in Iranian public libraries. In this project, it is possible to search more than 125 million records of digital sources, answer study questions and information advice to members, and provide information resources, including Persian and Latin journals, conference articles, e-books, dissertations, etc., from 1800 databases worldwide. Members of public libraries can search for their needed resources in the Mega paper Scientific Resources Database at https://megapaper.ir and receive them through selected libraries providing document delivery services via email. According to the experts of these libraries, success in this regard requires the necessary training for librarians, continuous information to members and users of libraries, and communication with other educational and research organizations. Furthermore, reviewing and using the experiences of successful libraries in developed countries will be effective in this regard.

A review and comparison of the results with the research background led to the following results. In the present study, the participants mentioned the role of managers in storage and retrieval challenges as the main components. In line with the research of Taj al-Dini et al. (2015), the role of technology and managers in the challenges is discussed, which is consistent with Sadat Mousavi et al. (2014). In terms of the need for training and skills with academic

training and in-service training, the present study is in line with the research of Bajpa and Madasudhan (2019).

Conclusion

This study mainly aims to investigate the challenges and opportunities for storing and retrieving information in Iranian public libraries from the perspectives of librarians. This research has been done with a qualitative approach based on the grounded theory. Data were collected using semi-structured interviews and analyzed by the Strauss and Corbin method and a paradigm model. Sampling was performed by a theoretical method using targeted techniques and snowballs, based on which interviews were conducted with senior organization experts who had experience and expertise in the field of science and research. The results of the analysis of the data obtained from the interviews during the open, centralized, and selective coding process led to the development of a fundamental theory of data in the field of data storage and retrieval in public libraries. The model designed in this research includes the dimensions and components of effective, causal, contextual, mediating conditions and constituent elements that show the central phenomenon, consequences, and strategies of public policy implementation. Finally, practical suggestions are presented for improving information storage and retrieval status in Iranian public libraries.

Practical and research suggestions

This research focuses on the challenges and opportunities of storing and retrieving information in public libraries of Iran from the perspectives of librarians using a qualitative method. Therefore,

- It is suggested to investigate the same subject in other provinces and organizations of Iran.
- It is suggested to study the challenges and opportunities of storing and retrieving information in public libraries of Iran from the perspectives of librarians about cyberspace and electronic space in the provinces of the country.
- It is suggested to study the model of challenges and opportunities for storing and retrieving information in Iran's public libraries from the librarians' perspectives using quantitative methods and factor analysis.

Endnote

1. This article is an excerpt from a doctoral dissertation.
2. Comprehensive library management software, by the General Directorate of Information Technology and in cooperation with the General Directorate of Libraries of Public Libraries, has been designed and implemented aiming at solving the problems of libraries in using library software and implementing a comprehensive system, web-based, integrated, and centralized management of public libraries in Iran.

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