Geographic information systems representations in resources description and access (RDA)

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A B S T R A C T

The study aimed at linking geographic information systems and their use in library and information science, as they represent spatial and geographical information represented in processing in machine-readable cataloging (MARC) fields, which are represented in the Resources Description and Access in the form of an internationally agreed drawing or scheme, and geographic information is of interest to a wide range of beneficiaries in various fields, and to develop work in the field of libraries and information in light of the rules for characterization and availability of resources and in view of the lack of previous studies dealing with this topic; It was necessary to think about good planning to equip libraries and information centers at a high level so that they would be able to deal with information sources and the correct representation of geographical data through geographic information systems, the study was keen to apply the standards of the analytical and applied approach where all the appropriate fields to represent data geographically are reviewed. and the application of the appropriate subfields to it, the study reached the possibility of using the field 651 specifically and activating the hyperlink feature through it to display more links that include drawings, maps, data, and vital statistics associated with it, and thus the field 651 turns into an interactive feature to display bibliography, geography and information data with linking to all Pages and links via the Internet or in full-text databases as well as abstract databases, and innovative addition to the performance of field 651 to become a descriptive field and a tool for geographical and informational representation at the same time.

1. Introduction

The problem of the study is about a main question to know:

1. What is the extent of using geographic information systems in the elements of describing and making available resources in libraries and information centers?
2. What are the elements of description and availability of the resources in which GIS can be represented?

3. What are the facilities required to represent geographic information systems within the elements of Resources Description and Access?

The importance of the study stems from the importance of its topic, as GIS is one of the important and unique areas that can be used within libraries and information centers, especially concerning geographical representation within the elements of Resources Description and Access, as this was not addressed in previous studies.

The study aims at the following points:

- Introducing the importance of geographic information systems in libraries and information centers.
- The extent of the possibility of using geographic information systems in spatial representation within the elements of Resources Description and Access.
- Planning for expanding the use of geographic information systems technology in the library and

information departments and describing their decisions.

- Identify the main needs for training libraries and information specialists to deal with geographic information systems.

1.1. Geographic information systems

They are integrated systems that inventory, store, review, process, analyze and display data that depend on spatial coordinate systems, i.e. their geographical locations on the surface of the earth (Digan, 2019).

1.2. Resources description and access

They are new rules for describing and trying to build cataloging coding on the FRBR model. As for the structure used in AACR2, it was based on the rules of international codification for bibliographic description and it was based on a specialized committee representing many major bodies such as the Library of Congress, the British Library, and others (Dobreski, 2019).

1.3. Definition of geographic information systems

They are automated methods and methods for entering, storing, displaying, retrieving, processing, analyzing, and modeling geographical data, and it consists of calculators with high speed and memory suitable for storing the largest volume of information and a high resolution for a color display screen in addition to geographical data entry devices such as scanners and output devices such as high-efficiency color printers.

1.3.1. Geographic information systems software

It is a software for dealing with geographical data that includes a set of commands that manage geographical databases efficiently, and GIS programs perform several functions, including data entry, coding and preservation operations, storage and file creation operations, information control, and output operations in multiple forms, data analysis, analysis Models, and there are many ready-made programs for geographic information systems, the levels of which vary according to the size of their functions and the extent of their compatibility with various data sources (McGowan, 2020).

1.3.2. Geographical data

There are many sources of geographical data, unlike their presence in ready tables that exist in the form of maps of all kinds, aerial images, and satellite visuals, or the form of digital data from geolocation devices or through integrated station devices used in the land survey.

1.3.3. Specialists in geographic information systems

A specialized group of trained human cadres capable of dealing with geographic information systems includes specialists in data collection from its various sources, specialists in cartography, specialists in remote sensing, specialists in data entry, specialists in the positioning system on the surface of the earth, specialists in drawing Computer engineering, specialists in database management.

2. Geographic information systems jobs

2.1. Data entry

It is the process of converting data from its regular form to a form that can be used in geographic information systems, where spatial data is entered into the computer from its paper sources, whether it is maps or aerial photos, to become digital forms by numbering using styluses and scanning by the scanner and saving them in files and drawings The spatial data that have been numbered and saved need editing and arrangement processes that suit the real locations of that data on the surface of the earth, and to complete the database in geographic information systems, (McGlamery and Lamont, 1994), the metadata must be entered, numbered and edited, and the metadata is in the form of tables, pictures, or film material, and the metadata is linked. Spatial data by coding the common definition to be interacting with the spatial data when viewed, retrieved, or modified.

2.2. Data management

It is intended to store data within the system, organize and retrieve it and include the operations of editing and formatting tables, performing calculations on them, and performing database management operations.

2.3. Display data

It includes displaying spatial data and metadata where the metadata is displayed graphically in the form of columns, curves, and other charts, and preparing maps for printing to design its elements (the general frame of the map, the title, the scale, determining the direction of the north, the key of the map, and other information that will be included. Maps.

2.4. Explore the data

Through which the spatial and descriptive data are examined and the necessary inquiries are prepared before the analysis.

2.5. Data transfer

It corrects errors resulting from data evaluation, change of map projection, or transfer of spatial data transparencies from one type to another.

2.6. Data analysis

Through it, decision-making is made based on its results, and in it, a new set of maps is created that displays the various forms of analysis results that are added to geographical databases and become new layers that can be linked to each other and between them and other advanced stages.

2.7. Modeling process

Where geographic information systems are used in building 3 types of models for geographical data, namely:

1. Realistic model: This model shows a realistic picture of the evolution of the phenomenon and the factors affecting it.
2. The circular model: It illustrates the mutual relationship between a phenomenon and other phenomena.
3. Mathematical model: What is meant by it is a set of mathematical and statistical formulas and equations that calculate the relationships between the phenomenon and other phenomena and calculate the expected values of those relationships in the future.

2.8. Data output

The type of information that GIS produces depends on the user, the purpose of building the system, and the capacity of the program used in output and reporting.

3. Geographic information systems in libraries and information centers

Libraries and information centers are interested in collecting and processing information to make it available to researchers. And among this important information is geographical data that were presented in a traditional form, namely maps, and with the emergence of geographic information systems and the accompanying enormous capabilities in the field of collecting (Argentati, 1997), storing, analyzing and displaying maps in various forms.

It became an obligation for libraries and centers Information is the introduction of this technology so as not to lag in keeping pace with the technological development (Jantz, 2001), and geographical information systems are considered a fertile field within libraries and information centers for the following reasons:

- Libraries are convenient means for managing and distributing maps and information systems data, whether they are made available in paper, digital, or on CD.
- Providing geographic information systems in libraries and information centers is an important step towards trying to build a comprehensive information infrastructure in the world.
- The skill of libraries and information centers in dealing with information vessels in terms of developing, developing, and indexing groups in addition to their primary role in preservation and access, makes them work on developing and developing geographical digital groups, preserving them and making them available to those who wish to access these groups.
- The status of libraries with the beneficiaries and their constant feeling of needing it to obtain any information makes libraries always search for what the beneficiary is looking for, and thus the process of providing geographic information systems has become a must and imperative within libraries and information centers.

4. Geographic information systems specialist

An information and library specialist with knowledge of geographic information systems, their concepts and techniques, and who applies the principles of library and information science in the field of geographic information systems in terms of collecting, organizing, publishing, making available, and maintaining geographical data sources provided by geographic information systems (Kong et al., 2017).

5. Geographic information specialist jobs

- Compilation of geographical sources from the institutions and bodies producing them.
- Organizing and indexing geographical databases.
- Analyzing and responding to geographical inquiries submitted by the beneficiaries.
- Carrying out continuous maintenance of the geographical databases available in libraries and information centers.

6. Resources description and access

The role of digital technology and databases has had an important impact in changing the way libraries, museums, and archives collect resources and how information is preserved and organized on these sources. By the mid-2000s, it became clear that the reform of the Anglo-American Cataloging Rules was in its second revised edition. Substitution is sufficient, and then instead of issuing a third edition of the rules (Adamich, 2008), the joint committee for reviewing the rules took a decision in 2005 to issue a new work, change the title and agree on a new title: (RDA) under the supervision of the joint committee to review the rules, as this thinking came in

conjunction with IFLA issued two documents: the functional requirements for bibliographic records, and the functional requirements for authority records, and the aim of this new change was to design a standard that fits with the nature of the digital world, and includes a comprehensive set of guidelines and instructions that cover description and availability for all digital sources, and result in records that can be used in diverse digital environments.

This new standardization has been produced for use in the library, archive and accessible community (Dobreski, 2019), as well as the different publishing sectors due to the convergence and overlap of the professional and functional interests of each of them, and for the coordination between the metadata standards used in those societies. The final draft of this standard was issued in November 2008 and was made available for review, revision, and receipt of proposals.

The new cataloging guidelines were published under the heading Description of sources and made available in June 2010; To be a new standard for describing and making available all types of content and media in the digital world, and this standard also enables users of library indexes, museums and other information organization systems to search, define, select and purchase appropriate sources for their information needs (Wang, 2009).

The implementation of the standard was officially approved in April 2013 at the Library of Congress, and many major libraries around the world followed suit, especially with the availability of the standard toolkit online, in multiple languages, as well as English (Primich and Richardson, 2005).

The application of this standard requires many preparations, including training, preparation of applied models, preparation of work guides, and translation if the field of application is in an environment other than the English-speaking environment, and even though the application began more than six years ago in most libraries around the world, and therefore the necessity restructuring concepts and perceptions about the impact that the new standard will have on libraries, and the extent of its scientific, research and economic feasibility and its impact on library indexes when applied, especially in national and university libraries that are currently moving towards applying the standard to prepare their indexes, which is an inevitable change that the indexes should witness in light of technological developments which seeks to make bibliographic data available and discoverable in a web environment Martindale (2004).

Following up on the latest international standards and codes and their development, and the need to apply them and rely on them in describing and making all information media available and covering the various levels of publication and new media in the future is a prerequisite for achieving full availability of all forms of knowledge resources acquired by libraries and information centers through:

- Providing accurate and comprehensive knowledge about the RDA standard, as the latest standard for describing sources of information on the international scale, and it has replaced the Anglo-American cataloging rules, by exploring, analyzing, and presenting the structure, characteristics, and components of the new standard as one of the basic requirements for its application and implementation.
- Learn about plans to implement the (RDA) standard in libraries and information centers.
- Standing at the challenges facing indexes and the widening gap in knowledge and technology related to the standards and technologies used in libraries and information centers, with the most prominent obstacles to the application of the (RDA) standard.
- Identify ways to overcome the problems of applying the standard in libraries and information centers.
- Monitor the experiences of some national and university libraries in describing their collections and making them available in the digital environment.
- Submitting and displaying application forms for the (RDA) standard on various types of information sources.

7. Define the field and scope of application

An additional entry to the topic the entry element has a geographic name, as additional entries are allocated to the subject for a bibliographic record to provide availability according to the cataloging rules and the rules for building approved theses such as Library of Congress subject headings, American medical subject headings, so that field 651 can be used by anybody that allocates subject headings depending on lists and authority files specified in the second cursor position or the $ 2 sub-field (Khurshid, 2002). Likewise, the names of the competent authorities used individually or followed by additional substantive entries are placed in field 651. As for the name of the competent authority that expresses a church entity, it is placed in field 610. The authority is in Field 610, and the geographical names that are used in the head of the compound subject (example: Egypt in the Qur'an) are placed in field 650. An applied example is as follows:

651 # 7 $ a Nile, $ 2 qrmak
651 # 4 $ a Salmiya (Kuwait)
651 # 4 $ a Constantine (Algeria)
651 # 7 $ a Karnak (Egypt), $ e pictured. $ 2 qrmak
651 # 7 $ a Irbid (Jordan) $ v maps. $ 2 qrmak
651 # 7 $ a Saudi Arabia $ x Description and travels $ v Articles and lectures $ 2 qrmak
651 # 4 $ a Libya $ x date $ y1551-1912.
651 # 4 $ a Tunisia $ x borders $ z Algeria.

8. Results

The study shows the importance of using geographic information systems in all scientific

disciplines, especially in libraries and information centers, whether in the aspects of the application in terms of obtaining geographical and spatial information, or when replacing forms of maps and spatial panels, as GIS can comprehensively represent the presentation of data in the form of Geographical locations and related data that can be stored and distributed in an integrated manner with the ability to update it continuously and spread it widely across databases for many beneficiaries, The study also shows the effectiveness of the standard of description and availability of resources in the bibliographic description of information sources, and the possibility of geographical and spatial representation of the criterion for describing and the availability of resources through the description elements in field 651 of machine-readable cataloging, Through this linking and the practical representation of geographical locations, the practical transition can be made through hyperlinking between the geographical name and the immediate transfer of the stored data. For example, it is possible to link a topic related to France as a place with the subject subdivision of economic conditions in addition to the chronology of the modern era, so that a comprehensive map of the situation can be displayed. The economic sector of France during the modern era with the most important commercial and industrial centers, so that an enormous collection of data and statistics and many spatial links covering the objective aspects of the main topic, with satellite images, population maps, analyzes, and related studies, are attached to it, Consequently, the link between the criteria for describing and the availability of resources in its objective treatment, as well as the application of machine-readable cataloging rules, is one of the possibilities for taking full advantage of GIS applications in libraries and information centers.

9. Recommendations

Through the study, the following recommendations can be drawn up:

1. The need to expand the use of geographic information systems in libraries and information centers, especially concerning spatial databases.
2. Expanding the application of the standard description and availability of sources in describing information sources.
3. Re-design of integrated systems software for libraries based on machine-readable cataloging. Training of library and information specialists on the use of geographic information systems.
4. Spreading the use of integrated automated systems in libraries and linking them with geographic information systems.

Compliance with ethical standards

Conflict of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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