Original Article

Hyper Text Mark-up Language and Dublin Core metadata element set usage in websites of Iranian State Universities' libraries

Firoozeh Zare-Farashbandi, Mahtab Ramezan-Shirazi, Hasan Ashrafi-Rizi, Rasool Nouri

Department of Medical Library and Information Science, Health Information Technology Research Center , School of Health Management and Medical Informatics, Isfahan University of Medical Sciences, Isfahan, Iran

ABSTRACT

Introduction: Recent progress in providing innovative solutions in the organization of electronic resources and research in this area shows a global trend in the use of new strategies such as metadata to facilitate description, place for, organization and retrieval of resources in the web environment. In this context, library metadata standards have a special place; therefore, the purpose of the present study has been a comparative study on the Central Libraries' Websites of Iran State Universities for Hyper Text Mark-up Language (HTML) and Dublin Core metadata elements usage in 2011. **Materials and Methods:** The method of this study is applied-descriptive and data collection tool is the check lists created by the researchers. Statistical community includes 98 websites of the Iranian State Universities of the Ministry of Health and Medical Education and Ministry of Science, Research and Technology and method of sampling is the census. Information was collected through observation and direct visits to websites and data analysis was prepared by Microsoft Excel software, 2011. **Results:** The results of this study indicate that none of the websites use Dublin Core (DC) metadata and that only a few of them have used overlaps elements between HTML meta tags and Dublin Core (DC) elements. The percentage of overlaps of DC elements centralization in the Ministry of Health were 56% for both description and keywords and, in the Ministry of Science, were 45% for the keywords and 39% for the description. But, HTML meta tags have moderate presence in both Ministries, as the most-used elements were keywords and description (56%) and the least-used elements were date and formatter (0%). **Conclusion:** It was observed that the Ministry of Health and Ministry of Science follows the same path for using Dublin Core standard on their websites in the future. Because Central Library Websites are an example of scientific web pages, special attention in designing them can help the researchers to achieve faster and more accurate information resources. Therefore, the influence of librarians' ideas on the awareness of web designers and developers will be important for using metadata elements as general, and specifically for applying such standards.

Key words: Dublin Core metadata standard, Hyper Text Mark-up Language meta tags, Iran State University, metadata elements, websites

Address for correspondence: Mrs, Mahtab Ramezan Shirazi, Medical Library and Information Science, The Faculty of Health Management and Medical Informatics, Isfahan University of Medical Sciences, Isfahan, Iran.
Email: shirazi5000@yahoo.com.

This article may be cited as: Zare-Farashbandi F, Ramezan-Shirazi M, Ashrafi-Rizi H, Nouri R. Hyper Text Mark-up Language and Dublin Core metadata element set usage in websites of Iranian State Universities' libraries. J Edu Health Promot 2014;3:6.

INTRODUCTION

With the advent of computers and innovative information technology, a new information and media environment was created that had a completely different nature from the traditional media environment. This, in turn, created new challenges in the standard way of organizing information that makes revision and re-evaluation of previous methods necessary.

Recent progress in providing innovative solutions in the organization of electronic resources and many researches in this area reflect the global trend in the use of new approaches in a description, where finding, organizing, searching, documenting, and evaluation of electronic resources are of importance. A new method that has been created over recent years is a mechanism called "metadata," which is the result of the efforts of librarians, information professionals and editors of Internet environment standards.[1] Metadata is a data that describes the content, form or properties of a data record or a source of information and can be used in describing completely structured resources or unstructured data, such as text documents.[2]

Among general metadata, metadata of Hyper Text Mark-up Language (HTML), are offered in the form of meta tags and have gained importance. These meta tags can determine the nature of the web page and the way a page is being indexed by search engines, and also provide users access to the page.[3] Also, among the particular metadata, "The Dublin Core Metadata" is important in describing and organizing network resources. Because of its nature, which is its ease to be created and maintained, being understandable to all and its international range and expansibility, this plan is considered superior than any other format metadata.[4] The library metadata standards are the most reliable way to achieve sustainable development in information systems. A metadata standard guarantees security and protection of information increases. Performance reduced cost of organizing of information resources and increased productivity and efficiency of libraries and information centers. In fact, the metadata standards are a common language for scientific and technical information exchange and sharing among libraries and information centers, and are also a roadmap to gather, organize and retrieve data to be exchanged.[5]

Background of the study

In the field of metadata elements in the web, many different researches were conducted, some of which are as follows. Park and Richard (2011) in the study titled "Metadata assessment in e-theses and dissertations of Canadian institutional repositories" to discuss issues related to the changes and inconsistencies in the data presented in the literature used Dublin Core. Results showed that the elements used were in a significant level of inconsistency and variability and that there was no homogeneity in the adoption of metadata elements between institutions and centers.[6] Sun (2011) did a case study titled "Batch loading in metadata creation." He created

a kind of metadata at the Hoboken Public Library in New Jersey. Findings of the survey showed that a properly designed workflow depends on the success of metadata batch loading, and plays an important role. Other findings indicated that the metadata director is required to cooperation with professionals and accurately organize and transmit information.[7]

Saadat and Jowkar (2009) in the study titled "Dublin Core metadata element set usage in national libraries' websites" examined 69 websites related to national libraries in 61 countries of the world. The Dublin Core metadata element set (DCMES) is divided into three components: Content description, intellectual property and rights, and structural manifestation. The results showed that 14 of all the National Libraries Websites (NLWs) use DCMES (20/3).[8] Alimohammadi (2004) did a measurement study with the aim of exploring the presence of keywords and description meta tags on a selected number of Iranian websites. Findings of the survey showed that 31.5% and 24.6% of the Iranian web pages have keywords and description meta tags, respectively.[9]

Mohamed (2006) did a study titled "The impact of metadata in resources discovering and on the search, retrieval and classification of web pages." The results show that the elements described in rating categories and keyword pages by the search engines have a significant role.[10] Zhang and Dimitroff (2005) did an experimental research. This research showed that influential factors of metadata implementation impact search engine optimization, and analyzed their impacts on Internet search engines, recommending practical methods for improving search engine optimization in light of metadata implementation. Toward these aims, 46 web pages were modified from a selected original web page and were posted on the Internet. The URLs of these processed web pages were placed to 19 search engines. An analysis of results showed that metadata is a good mechanism to improve the visibility of a posted web page in the search engine results lists.[11] Nowick (2002) specified the number of web pages incorporating HTML meta tags for websites linked to the University of Nebraska Agricultural Network Information Center Plant Science Page. To carry out the study, 749 websites were reviewed. Results showed that 175 (23.4%) use the keywords meta tag and 156 (20.8%) use the description meta tag.[12] Drott (2002) examined 60 collaborate websites in 2000 and 2001. An analysis of the findings showed that the quantities of meta tags use were equal for keywords and description (35%) in 2000. However, use of the keywords and description meta tags changed to 41.6% and 31.6% in 2001.[13] Vineyard (2001) analyzed a sample of web pages viewed between February 24 2001 and March 12 2001 in order to develop a snapshot of how embedded metadata is being used on the World Wide Web. Five terms were chosen for this study and the search engines chosen for this study were AltaVista, Hotbot, and Google. The first 20 web pages returned by each search were included in the sample. Of the 299 pages examined, 212 (70.90%) contained at least one meta tag and only 7 (2.34%) of the 299 pages examined showed evidence of using the Dublin Core metadata.[14]

Considering the fact that resources and Internet users are significantly increasing, attention to organization web resources through the development of metadata is significant. Gradually, digital resources as sources of information are considered and, thus, metadata specialists in libraries are essential to user's access to library resources and academic centers.

On the other hand, collecting, organizing, and transferring data, which is the main source of education and research quality of universities, is the basic task of university libraries, which is affected by advancements in information technology and the Library and Information Science. Library websites are expected to represent the library and its services on the Internet. They are an implement in Information Science, converting library services from local to global.

Considering the effectiveness and benefits listed for the metadata, we can easily realize the importance of using web resources and web page. Therefore, this study intended to compare the Central Libraries' Websites of Iran State Universities of HTML and Dublin Core metadata elements usage to determine the gap between current and desired status of the "to use of metadata elements."

MATERIALS AND METHODS

This study is applied-descriptive and data collection tool is the researcher-formed checklists. The total number of Universities of Ministry of Health and Medical Education is available at: http://www.behdasht.gov.ir, which includes 46 universities. After searching their own websites and using the Google search engine, it was determined that only 32 universities have Central Libraries' Websites. Also the total number of universities under the Ministry of Science,

Research and Technology is available at: http://www.msrt.ir, which includes 79 universities. After searching their own websites and a search using the Google search engine, it was determined that only 66 universities have Central Libraries' Websites. Therefore, the final statistical community includes 98 websites of the Iran State Universities of Ministry of Health and Ministry of Science and the method of sampling is the census with two parts. Part one is for selected meta tags of HTML and part two is for 15 elements of the Dublin Core standard. Information was collected through observation and direct visits to a website, first viewing the site and then its source, and data analysis was prepared using the Microsoft Excel software, 2011.

RESULTS

Findings of the study indicated that the amount of usage of HTML meta tags on the Central Libraries' Websites of Ministry of Health have allocated a greater percentage compared with that of the Ministry of Science. The most commonly used elements in the Ministry of Health are description and keywords, both with 56%, and the lowest presence is for date, title and formatter, with 0% each. This indicates that they do not use these elements. Also, the most commonly used elements in the Ministry of Science are keywords (45%) and description (39%), and the lowest presence is for date and formatter, with 0% [Figure 1]. In this case, both the ministries are similar to each other in the implementation of elements, as the highest percentage is for keywords and description elements and the lowest percentage is for date and formatter elements.

The findings of amount of HTML meta tag usage in 32 universities of the Ministry of Health displayed that the universities of Mashhad (76%), Kermanshah (61%), Tehran, Rafsanjan, Zabul and Zanjan (with 53% each) have
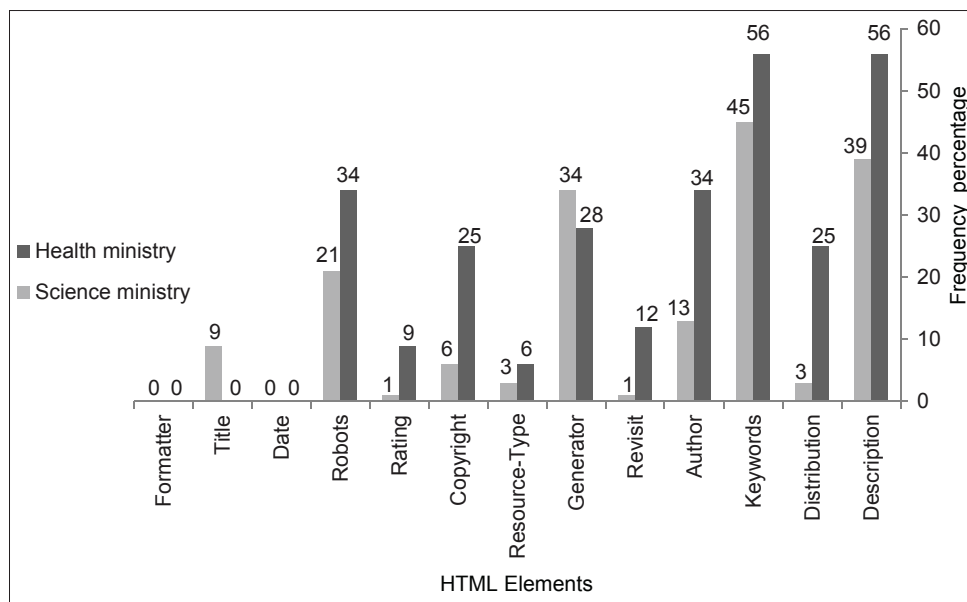

Figure 1: Frequency percentage of Hyper Text Mark-up Language elements (NAME attributes) in the Ministry of Health and Medical Education and Ministry of Science, Research and Technology

allocated most usage percentage of HTML elements (NAME attributes) and that the universities of Urmia, Bushehr, Tabriz, Fasa, Qazvin, Kurdistan, Guilan, Golestan, Lorestan, Yasouj and Yazd (with 0% each) have allocated the lowest usage percentage of HTML elements [Figure 2].

Also, the findings showed that among the 66 universities of Ministry of Science, universities of Shahid Beheshti (61%), Economic Sciences (53%) and Birjand, High Technology Kerman, Birjand Thechnology, Damghan, Lorestan, Tabriz Islamic Art with (46%) highest usage percentage was allocated to HTML elements (NAME attributes) [Figure 3]. However, universities Arak, Urmia, Alzahra, Isfahan, Imam Sadiq, Ilam, Bojnord, Bu-Ali Sina, Imam Khomeini, Studies in Basic Sciences Zanjan, Jahrom, Persian Gulf, Chabahar Maritime, Razi, Zanjan, Sistan and Baluchestan, Dezful Technology, Sahand Technology, Shahrod Technology, Allameh Tabataba'I, Science and Technology, Sari Agricultural Sciences, Gulestan, Guilan, Vali-e-Asr Rafsanjan, Art, Isfahan Art and Yasouj (with 0% each) had allocated the lowest percentage of HTML elements usage. Because of the great number of universities in the Ministry of Science, cases with zero percent usage (0%) have been omitted from Figure 3.

Also, findings showed that none of the Central Libraries' Websites of both Ministry of Science and Ministry of Health have used Dublin Core metadata. There are functional similarities between some DC elements and general HTML meta tags. Some examples of these similarities and overlaps between HTML tags or meta tags and DC elements are description meta tag and description DC element, keywords meta tag and subject DC element, author meta tag and creator DC element,

generator meta tag and identifier DC element and formatter meta tag and format DC element.[8] Therefore, websites that have used each of these corresponding elements are close to the DC standard, and it is more likely for the websites with format used for indexing to use DC standard in the future.

The findings show that the most usage percentage of corresponding DC elements are description and keywords (with 56% each) in the Ministry of Health universities and keywords (45%) and description (39%) in the Ministry of Science universities. We can conclude that centralization in both Ministries of Health and Science are for the description and keywords elements and that they have the same possibility of using and applying DC standard [Figure 4].

The comparison of using corresponding DC elements with HTML among the universities of Ministry of Health showed that universities of Tehran, Rafsanjan, Zabul, Zanjan, Shahid Beheshti and Mashhad (with 80% each) have allocated the highest usage percentage and universities of Urmia, Bushehr, Tabriz, Fasa, Qazvin, Kurdistan, Guilan, Golestan, Lorestan, Yasouj and Yazd have had the lowest usage percentage (0%). Also, in the Ministry of Science Central Libraries' Websites, universities of Birjand, High Technology Kerman, Birjand Technology, Economic Sciences, Damghan, Lorestan and Tabriz Islamic Art (80%) have allocated the highest usage percentage corresponding to DC elements with HTML. The lowest usage percentage were for the universities of Arak, Urmia, Alzahra, Isfahan, Imam Sadiq (as), Ilam, Bojnord, Bu-Ali sina, Imam Khomeini, Studies in Basic Sciences Zanjan, Jahrom, Persian Gulf, Chabahar Maritime, Razi, Zanjan, Sistan and Baluchestan, Dezful Technology, Sahand
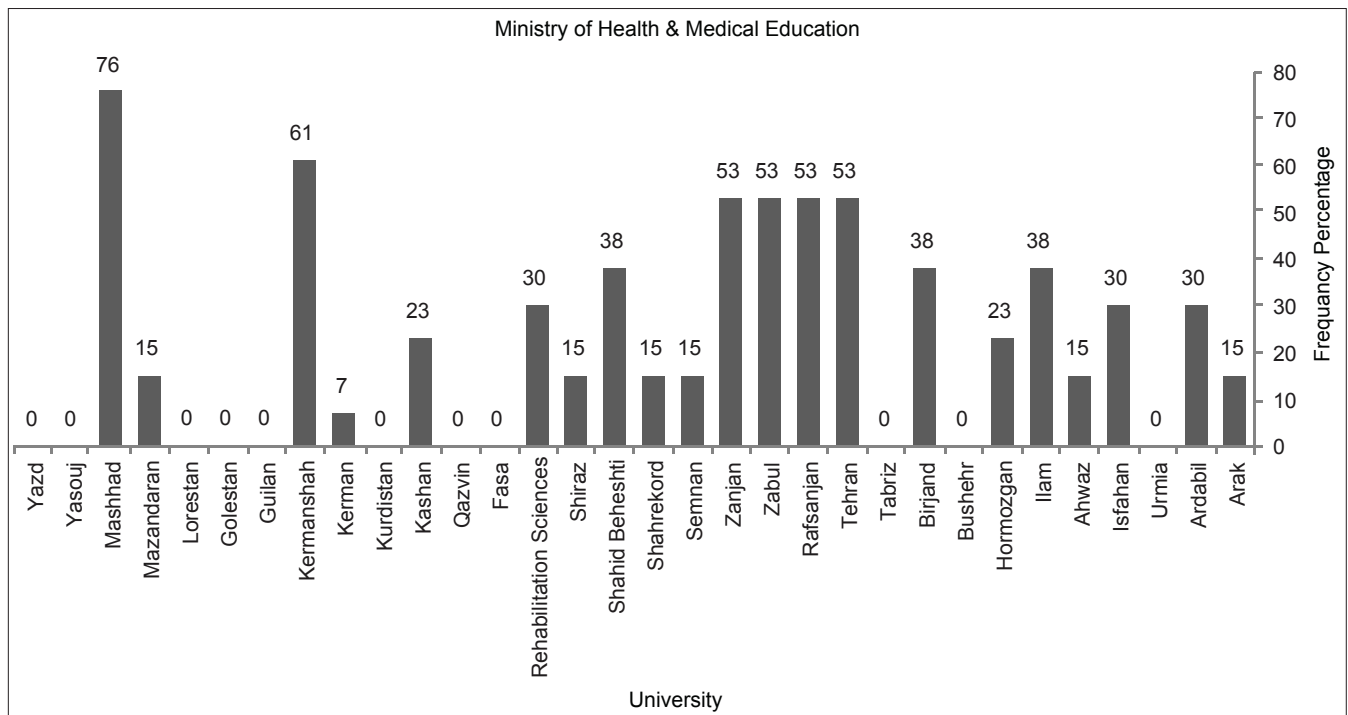

Figure 2: Frequency percentage of Hyper Text Mark-up Language elements in Universities of Ministry of Health and Medical Education
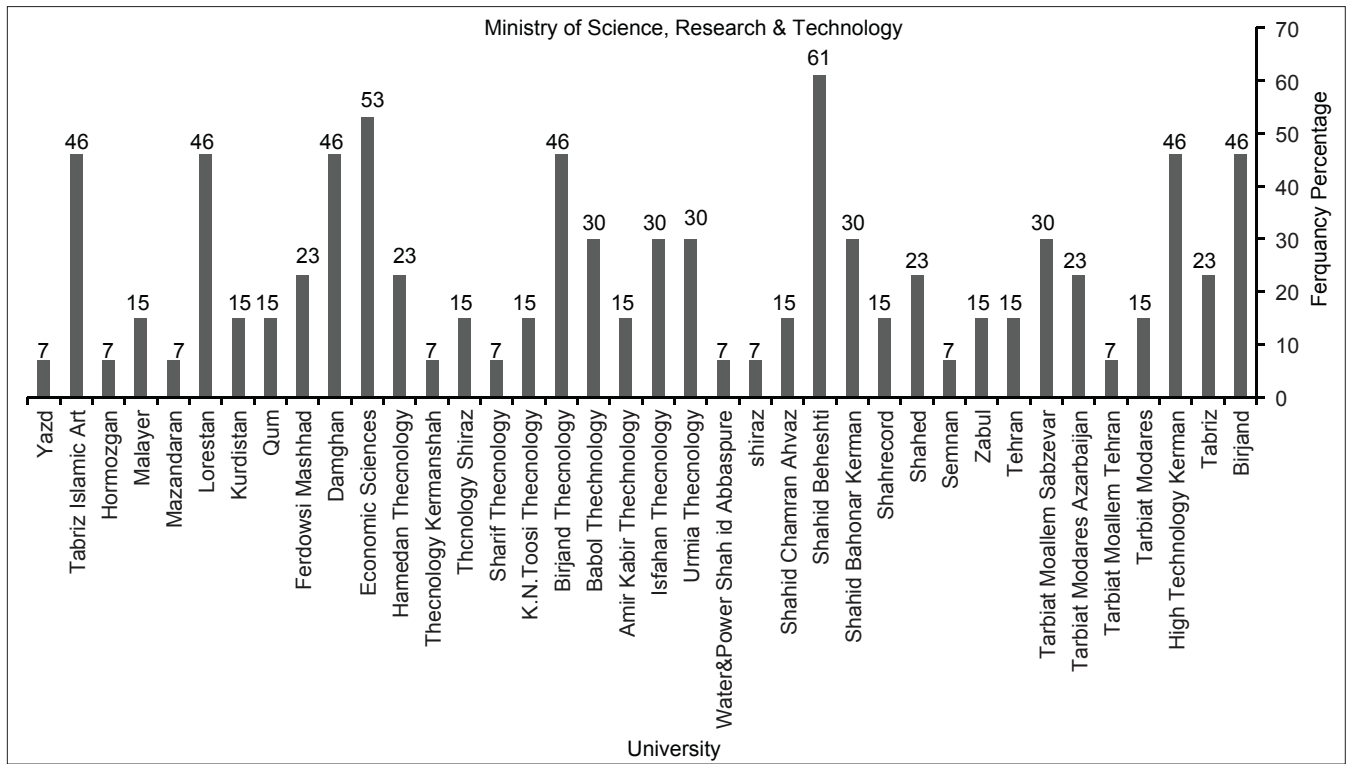
Figure 3: Frequency percentage of Hyper Text Mark-up Language elements in Universities of Ministry of Science, Research and Technology
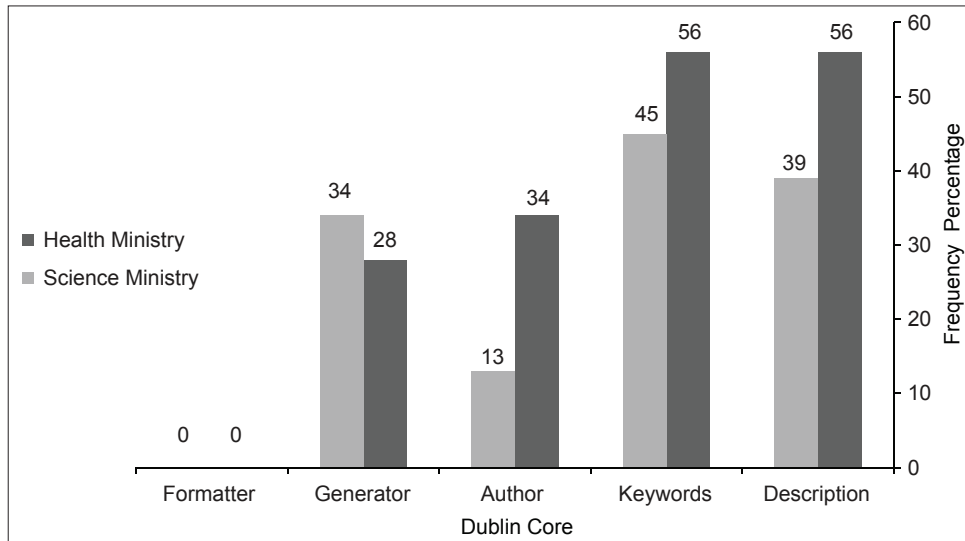

Figure 4: Frequency percentage of Dublin core elements (NAME attributes) in Ministry of Health and Medical Education and Ministry of Science, Research and Technology

Technology, Shahrod Technology, Allameh Tabataba'I, Science and Technology, Sari Agricultural Sciences, Gulestan, Guilan, Vali-e-Asr Rafsanjan, Art, Isfahan Art and Yasouj (0%).

DISCUSSION AND CONCLUSION

Overall, the results showed that none of the websites have used DC standard and that just some of them have used corresponding DC elements with HTML. But, HTML meta tags had a better presence in the Central Libraries' web pages.

Although reviewing of past researches indicate that a few of them survey all of the DC elements and HTML meta tags, but the results of this study are in agreement with Vineyard, whose findings show very little usage of DC and HTML elements.[14] The results also match with Saadat's study, which shows very few usages of DC elements.[8]

The highest percentages of usage among HTML elements have been keywords and description, which in this case is consistent with Alimohammadi study.[9] Also, a part of this study is in

agreement with Drott[13] and Nowick's studies, whose results showed that keywords has a higher percentage than description meta tags, with a 20-40% range,[12] and we can see significant growth (40-50%) for keywords and description (56%) in the Ministry of Health and keywords (45%) and description (39%) in the Ministry of Science.

Due to the importance of HTML meta tags in description and resources discovering in the web environment, and the confirmed effectiveness of metadata for retrieval, searching and creating a good mechanism to improve the visibility of a posted web page as stated by Zhang and Dimitroff,[11] and Mohamed on the one hand, and the importance of university libraries in maintaining, disseminating and promoting scientific and technical information on the other hand, the lack of usage of these elements is the cause for concern and should be taken under consideration.[10]

Everyone recognizes that the academic libraries have a significant contribution in preservation, dissemination and promotion of scientific and technical information; therefore, using strategies for better organization of websites for easier information retrieval by users are required. Metadata elements are among the factors affecting the organization of information resources. According to the results of this study, none of the Central Libraries' Websites of both the Ministries of Science and Health have used Dublin Core metadata, and only some of them have used overlaps elements between HTML meta tags and DC elements. Thus, applying these elements is required in the design of Iran Central Libraries' Websites, and this matter must be brought to the attention of relevant authorities. HTML meta tags have shown moderate presence in the two Ministries; therefore, the influence of librarians' ideas on awareness of designers and developers of the World Wide Web will be important for increasing the usage of metadata elements in general and applying the standards specifically. Also, development of metadata could make information resources description and websites indexing by search engines easier. Because resources and users of the Internet are growing significantly, and because of the importance of metadata elements for improving information retrieval and search, website designers and programmers pay great attention in using metadata. Undoubtedly, the presence of professional librarians in the metadata elements along with designers is necessary. As mentioned, because the Central Libraries' Websites are an example of scientific web pages, special attention in designing them can help the researchers achieve faster and more accurate information resources. This important goal could be achieved through correct indexing and use of metadata elements.

REFERENCES

1. Intner SS, Lazinger SS, Weihs J. Metadata and Its Impact on Libraries. Westport, Connecticut: Libraries Unlimited; 2006. p. 50-60.
2. Haynes D. Metadata for Information Management and Retrieval. London: Facet Publications; 2004. p. 20-30.
3. Alimohammadi D. Meta-tags: Still a matter of opinion. Electronic Library 2005;23:625-31.
4. Quam E. Minnesota Metadata Guidelines for Dublin Core Metadata: Training Manual, 2002. Available from: http://www.bridges.state.mn.us/bestprac/training.pdf. [Last accessed on 2011 Apr 20].
5. Hirwade MA. A study of metadata standards. Library Hi Tech News 2011;28:18-25.
6. Park EG, Richard M. Metadata assessment in e-theses and dissertations of Canadian institutional repositories. Electronic Library 2011;29:394-7.
7. Sun L. Batch loading in metadata creation. Electronic Library 2011;29:538-50.
8. Saadat AA, Jowkar A. Dublin core metadata element set usage in national libraries' web sites. Electronic Library 2009;27:441-7.
9. Alimohammadi D. Measurement of the presence of keywords and description meta-tags on a selected number of Iranian Web sites. Online Information Review 2004;28:220-3.
10. Mohamed Kh. The impact of metadata in resources discovering. Online Information Review 2006;30:155-68.
11. Zhang J, Dimitroff A. The impact of metadata implementation on webpage visibility in search engine results (Part II). Information processing and management 2005;41:691-715.
12. Nowick EA. Use of meta tags for Internet documents. Journal of Internet Cataloging 2002;5:69-75.
13. Drott MC. Indexing aids at corporate websites: The use of robots.txt and meta tags. Information processing and management 2002;38:209-19.
14. Vineyard P. An analysis of embedded metadata usage on the World Wide Web. A Master's Paper for the M.S. in L.S. Degree, 2001. Available from: http://www.neoref.ils.unc.edu/2698.pdf. [Last accessed on 2011 Jun 17].