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THE PROPOSED MODEL FOR THE MANAGEMENT OF DIGITAL VIDEO ARCHIVES OF ISLAMIC REPUBLIC OF IRAN BROADCASTING (IRIB) BASED ON THE REFERENCE PATTERN (OAIS)

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ABSTRACT

This research aims at providing the proposed model for digital video management in archives of Islamic Republic of Iran Broadcasting (IRIB) based on the OAIS reference model from the perspective of archivists and archive staff in the Islamic Republic of Iran Broadcasting. This research provides the model of managing the digital video sources of Islamic Republic of Iran Broadcasting Organization based on OAIS Reference Model (Open Archival Information System) by analytical-survey method. The descriptive statistics method, one-sample Kolomogrov-Smirnov test, Friedman test, mean comparison test of two independent normal communities, one-way ANOVA, and SPSS22 statistical software are utilized in this regard. Finally, the first-order Confirmatory Factor Analysis and path analysis are implemented on the indices of OAIS reference model through Lisrel 8 software. Based on the collected data, there is a direct significant correlation between the receipt and data management, protection, archival storage, and administrative management and between the data management, protection, archival storage, and administrative management with access.

Keywords: *Digital Video Management, Islamic Republic of Iran Broadcasting (IRIB), OAIS Model (Open Archival Information System)*

INTRODUCTION

The archives of broadcasting organizations are the important sectors of those organizations and considered as the cultural and historical treasures and valuable resources in any country. Nowadays, the archives have valuable position in these organizations, so that it will be impossible or at least very difficult and ineffective to produce most of the programs without taking advantage of the rich archival sources. The archives play the crucial roles, thus some of the radio and television networks are established only by relying on the available resources of archives due to the need for strong presence in the field of providing the cultural products for community. Therefore, the target programs can be provided by spending the minimum time and cost without the need for costly resources in the production of desired programs. Some of the objectives which can be considered in a digital multimedia archive are as follows: 1) The possibility of fast searching of required references, 2) Easy and quick exchange of resources with production unit, 3) The possibility of assigning some tasks to outside of archive organization, 4) Facilitating the reference exchange between the radio and television stations and the intra-organizational and extra-organizational production units, and 5) Considering the possibility of providing the references without restrictions on releasing for people and organizations (Karimi, 2011).

The results of investigating the research background indicate that the OAIS reference model is utilized to digitize the information and archive center. The use of this model leads to the integration in the management of digital resources, saving the costs and time of setting up the digital centers. Facilitating the information retrieval and easy access to it are also other advantages of this model; and no research are conducted on the management of digital video resources in Islamic Republic of Iran Broadcasting (IRIB) based on the OAIS reference model (Open Archival Information System) so far.

This study seeks to investigate the OAIS reference model (Open Archival Information System) to provide a proposal model for management of digital videos in audio visual archives of Islamic Republic of Iran Broadcasting (IRIB).

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MATERIALS AND METHODS

This research is applied in terms of objective and descriptive-correlative according to the method. The statistical population of this study consists of all 53 audio visual archive centers in Islamic Republic of Iran Broadcasting (IRIB) according to the census. It should be noted that each of these two employees, who were familiar with the management and protection of digital information, in these archive centers responded to the questionnaires and a total of 106 questionnaires were collected. The researcher-made questionnaire is the data collection tool in this research and it is designed after investigating the Persian literature and theses including the "management of digital picture at department of national documents, National Library and Archives of Islamic Republic of Iran (National Archive of Iran) based on the OAIS Reference Model (Open Archival Information System) and the Latin thesis of OAIS, the Open Archival Information System(OAIS) as a data duration standard in the World Data Centre" and other resources in this area. The validity of data collection tool has face and content type and its reliability is measured equal to 0.97 through Cronbach's alpha. Data analysis is a multistep process under which, the data that is provided through applying the data collection tools in statistical sample, is summarized, encoded, categorized, and finally processed to perform a variety of analyses and the relationship between data in order to investigate the hypotheses. In this process, the data is refined both conceptually and empirically; and different statistical techniques play the significant role in inferences and generalizations. Finally, the first-order confirmatory factor analysis and path analysis are conducted on the indices of OAIS reference model through LISREL (*Linear Structural Relations*) software.

RESULTS AND DISCUSSION

Results

The research findings suggest that from 106 samples, 50% are archivists and 50% archive employees, 50% female and 50% male, 2.8% diploma, 9.4% with associate degree, 59.9% bachelor, 27.4% master, and 0.9% PhD, 14.2% have less than 5 years of experience, 27.4% from 5 to 10 years, 34% from 11 to 15 years, 17.9% from 16 to 20 years, 5.7% from 21 to 25 years, and 0.8% from 26 to 30 years.

Table 1: The fit indices of factor analysis for dimensions of OAIS reference model

| Fit indices of factor analysis for dimensions of OAIS reference model | | | | | | | | | |
|---|----------|----|-------------|---------|-------|------|------|------|------|
| Dimensions | χ^2 | df | χ^2/df | P-value | RMSEA | CFI | AGFI | GFI | NFI |
| Receipt | 53.88 | 16 | 3.36 | 0.000 | 0.084 | 0.93 | 0.86 | 0.89 | 0.89 |
| Archival storage | 30.39 | 12 | 2.53 | 0.002 | 0.068 | 0.96 | 0.97 | 0.96 | 0.93 |
| Data management | 19.37 | 6 | 3.22 | 0.003 | 0.082 | 0.95 | 0.83 | 0.99 | 0.92 |
| Administrativemanagement | 357.99 | 90 | 3.97 | 0.000 | 0.087 | 0.92 | 0.99 | 0.94 | 0.94 |
| Protection | 116.61 | 35 | 3.33 | 0.000 | 0.077 | 0.96 | 0.93 | 0.99 | 0.90 |
| Access | 37.20 | 10 | 3.72 | 0.000 | 0.090 | 0.98 | 0.96 | 0.99 | 0.97 |

According to the Table 1, the chi-square per degrees of freedom in all dimensions of OAIS reference model is in the interval of [5, 1], thus it is concluded that the conceptual model corresponds with the observed data. The value of RMSEA (Root mean square error of approximation) is less than 0.090 for all aspects of OAIS reference model, and since the maximum permissible limit of this index is 0.09, the suitability of this model is confirmed by this statistic. The values of GFI (Goodness of fit index), AGFI (Adjusted Goodness of fit index), and Bonett-Bentler index (BBI) or normed fit index (NFI) and CFI (Comparative Fit Index) are obtained equal to 0.9, and since the minimum permissible limit of each statistic is 0.7, the suitability of this model is confirmed.

4-5-Research Hypothesis Test

First hypothesis: There is a statistical prioritization among six dimensions of OAIS reference model for management of digital videos in archives of Islamic Republic of Iran Broadcasting (IRIB) from the perspective of archivists and archive staff.

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Friedman test is utilized to test this hypothesis;

Table 2: The results of comparison test on the OAIS reference model rates

| | Results of Friedman test |
|--------------------|--------------------------|
| No. | 106 |
| Test statistic | 61.946 |
| Degree of freedom | 5 |
| Significance level | 0.000 |

According to the table above, the significance level of Friedman test is obtained equal to 0.000 which is less than $\alpha=0.05$, thus according to the rule, the equality of priorities for components of OAIS reference model is rejected at the confidences level of 95%, thus there is a significant difference between the prioritization of OAIS reference model components according to the studied sample. These priorities (based on the repetition frequency) are presented in Table 3. The Diagram shows the intuitive priority of OAIS reference model components in studied sample.

Table 3: Prioritization of OAIS reference model components

| Components of OAIS reference model | Average rating | Priority |
|---|----------------|----------|
| Receipt | 3.96 | 3 |
| Archival storage | 3.98 | 2 |
| Data management | 4.27 | 1 |
| Administrative management (supervision) | 2.85 | 6 |
| Protection | 3.06 | 4 |
| Access | 2.88 | 5 |

Second hypothesis: There is a significant difference between six dimensions of OAIS reference model for management of digital videos in archives of Islamic Republic of Iran Broadcasting (IRIB) from the perspective of demographic variables (archivists and archive staff, people with different educational levels and with different work experiences).

Table 4: Point estimation of descriptive statistics

| | | No. | Mean | Standard deviation | Mean deviation |
|---|------------------|-----|------|--------------------|----------------|
| Receipt | Archivist | 53 | 4.02 | 0.507 | 0.069 |
| | Archive employee | 53 | 3.77 | 0.693 | 0.095 |
| Archival storage | Archivist | 53 | 4.01 | 0.594 | 0.081 |
| | Archive employee | 53 | 3.77 | 0.680 | 0.093 |
| Data Management | Archivist | 53 | 3.99 | 0.544 | 0.074 |
| | Archive employee | 53 | 3.82 | 0.669 | 0.091 |
| Administrative management (supervision) | Archivist | 53 | 3.73 | 0.446 | 0.061 |
| | Archive employee | 53 | 3.59 | 0.669 | 0.091 |
| Protection | Archivist | 53 | 3.72 | 0.533 | 0.037 |
| | Archive employee | 53 | 3.62 | 0.551 | 0.075 |
| Access | Archivist | 53 | 3.66 | 0.567 | 0.077 |
| | Archive employee | 53 | 3.44 | 0.734 | 0.100 |

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The mean comparison test on two independent communities is utilized to examine the hypothesis about the significant difference between the archivists and archive employees' views on six dimensions of OAIS reference model in order to manage the digital videos of archives in Islamic Republic of Iran Broadcasting (IRIB); the t-test for two independent groups is utilized to examine the difference between two independent groups or samples of normal distribution. As shown in Table 4, the mean of all components of OAIS reference model is higher in archivists than the archive staff and the deviation of all components of OAIS reference model is lower in archivists than the archive staff. This indicates the concentration of responses and archivists' agreement about the components of OAIS reference model.

Table 5: Results of Levene's test (equality of variances)

| | Test statistic | Significance level |
|---|----------------|--------------------|
| Receipt | 3.604 | 0.060 |
| Archival storage | 0.733 | 0.394 |
| Data Management | 3.455 | 0.066 |
| Administrative management (supervision) | 8.026 | 0.006 |
| Protection | 0.356 | 0.552 |
| Access | 4.013 | 0.048 |

According to the table above, the significance level of Levene's test for equality of variances in two population is more than $\alpha= 0.05$ for components, namely, the archival storage, data management, and protection. Therefore, according to the rule, the hypothesis of equality of variances for these components is accepted with the confidence of 0.95, and the significance level of Levene's test for equality of variances in two population is less than $\alpha= 0.05$ for components, namely, the administrative management and access. Therefore, according to the rule, the hypothesis of equality of variances for these components is rejected with the confidence of 0.95 (understanding the status of variances for both communities is the prerequisite for testing the comparison of mean in both communities).

Table 6: The results of mean comparison for components of OAIS reference model at different levels of organizational post

| | Test Statistics | Degree of freedom | Significance level | Mean difference | Confidence interval of 95% Minimum level Maximum level |
|---|-----------------|-------------------|--------------------|-----------------|--|
| Receipt | 2.132 | 95.355 | 0.056 | 0.251 | 0.017 0.485 |
| Archival storage | 1.922 | 102.180 | 0.057 | 0.238 | -0.007 0.484 |
| Data Management | 1.408 | 99.816 | 0.162 | 0.166 | -0.068 0.402 |
| Administrative management (supervision) | 1.330 | 104 | 0.186 | 0.147 | -0.072 0.366 |
| Protection | 0.978 | 103.885 | 0.330 | 0.102 | -0.105 0.311 |
| Access | 1.667 | 104 | 0.098 | 0.212 | -0.040 0.465 |

As shown in the table, the significance level of comparing test for components of OAIS reference model is more than $\alpha= 0.05$ in archivists and archive staff, thus according to the rule, the hypothesis of equality of variances for these components is accepted in archivists and archive staff, and it is concluded that six dimensions of OAIS reference model for management of digital videos in archives of Islamic Republic of Iran Broadcasting (IRIB) are equal from the perspective of archivists and archive staff. The one-way ANOVA is utilized to test the difference between the views of people with different levels of education

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and work experience of six dimensions for OAIS reference model for management of digital videos in archives of Islamic Republic of Iran Broadcasting (IRIB). Table 7- The results of mean comparison for components of OAIS reference model at all different education level

| Source of changes | | Sum of squares | Degree of freedom | Mean square | Test statistics | Significance level |
|---|-------------|----------------|-------------------|-------------|-----------------|--------------------|
| Receipt | Inter-group | 0.798 | 4 | 0.200 | 0.513 | 0.726 |
| | Intra-group | 39.266 | 101 | 0.389 | | |
| | Total | 40.064 | 105 | - | | |
| Archival storage | Inter-group | 0.640 | 4 | 0.160 | 0.373 | 0.827 |
| | Intra-group | 43.329 | 101 | 0.429 | | |
| | Total | 43.969 | 105 | - | | |
| Data Management | Inter-group | 0.507 | 4 | 0.127 | 0.329 | 0.858 |
| | Intra-group | 38.942 | 101 | 0.386 | | |
| | Total | 39.449 | 105 | - | | |
| Administrative management (supervision) | Inter-group | 1.505 | 4 | 0.376 | 1.160 | 0.333 |
| | Intra-group | 32.761 | 101 | 0.324 | | |
| | Total | 34.265 | 105 | - | | |
| Protection | Inter-group | 0.418 | 4 | 0.105 | 0.347 | 0.846 |
| | Intra-group | 30.438 | 101 | 0.301 | | |
| | Total | 30.856 | 105 | - | | |
| Access | Inter-group | 2.039 | 4 | 0.510 | 1.170 | 0.329 |
| | Intra-group | 43.999 | 101 | 0.436 | | |
| | Total | 46.038 | 105 | - | | |

As shown in the table, the significance level of ANOVA test for components of OAIS reference model is more than $\alpha = 0.05$, thus the hypothesis of equality of OAIS reference model components is accepted at different education levels at confidence level of 95%, and it is concluded that six dimensions of OAIS reference model for management of digital videos in archives of Islamic Republic of Iran Broadcasting (IRIB) are equal from the perspective of people with different education levels.

| Source of changes | | Sum of squares | Degree of freedom | Mean square | Test statistics | Significance level |
|---|-------------|----------------|-------------------|-------------|-----------------|--------------------|
| Receipt | Inter-group | 4.715 | 5 | 0.943 | 2.667 | 0.026 |
| | Intra-group | 35.349 | 100 | 0.353 | | |
| | Total | 40.064 | 105 | - | | |
| Archival storage | Inter-group | 2.499 | 5 | 0.500 | 1.205 | 0.312 |
| | Intra-group | 41.470 | 100 | 0.415 | | |
| | Total | 43.969 | 105 | - | | |
| Data Management | Inter-group | 0.996 | 5 | 0.199 | 0.518 | 0.762 |
| | Intra-group | 38.453 | 100 | 0.385 | | |
| | Total | 39.449 | 105 | - | | |
| Administrative management (supervision) | Inter-group | 1.778 | 5 | 0.356 | 1.095 | 0.368 |
| | Intra-group | 32.487 | 100 | 0.325 | | |
| | Total | 34.265 | 105 | - | | |
| Protection | Inter-group | 1.129 | 5 | 0.226 | 0.760 | 0.581 |
| | Intra-group | 29.727 | 100 | 0.297 | | |
| | Total | 30.856 | 105 | - | | |
| Access | Inter-group | 1.353 | 5 | 0.271 | 0.606 | 0.696 |
| | Intra-group | 44.685 | 100 | 0.447 | | |
| | Total | 46.038 | 105 | - | | |

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Table 8- The results of mean comparison for components of OAIS reference model in people with different years of work experience. As shown in the table, the significance level of ANOVA test for components of OAIS reference model is more than $\alpha=0.05$, thus the hypothesis of equality of OAIS reference model components is accepted in people with different years of work experience at confidence level of 95%, and it is concluded that six dimensions of OAIS reference model for management of digital videos in archives of Islamic Republic of Iran Broadcasting (IRIB) are equal from the perspective of people with different years of work experience.

Finally, according to the obtained results in response to the research question and the proposed model, it can be concluded that according to the Figure 1, the receipt has a direct strong and significant impact on the data management, a direct strong and significant impact on the archival storage, the direct weak and significant impact on the protection, direct weak and significant impact on the administrative management.

Furthermore, the protection has a direct moderate and significant impact on the access; the administrative management has a direct strong and significant impact on the access; the archival storage has a direct strong and significant impact on the access; and the administrative management has a direct weak and significant impact on the access (Figure 1).

Therefore, according to some other factors, which affect the issue and are not among the studied variables in this research, it can be conclude that the conceptual model of research has a good fit with data.

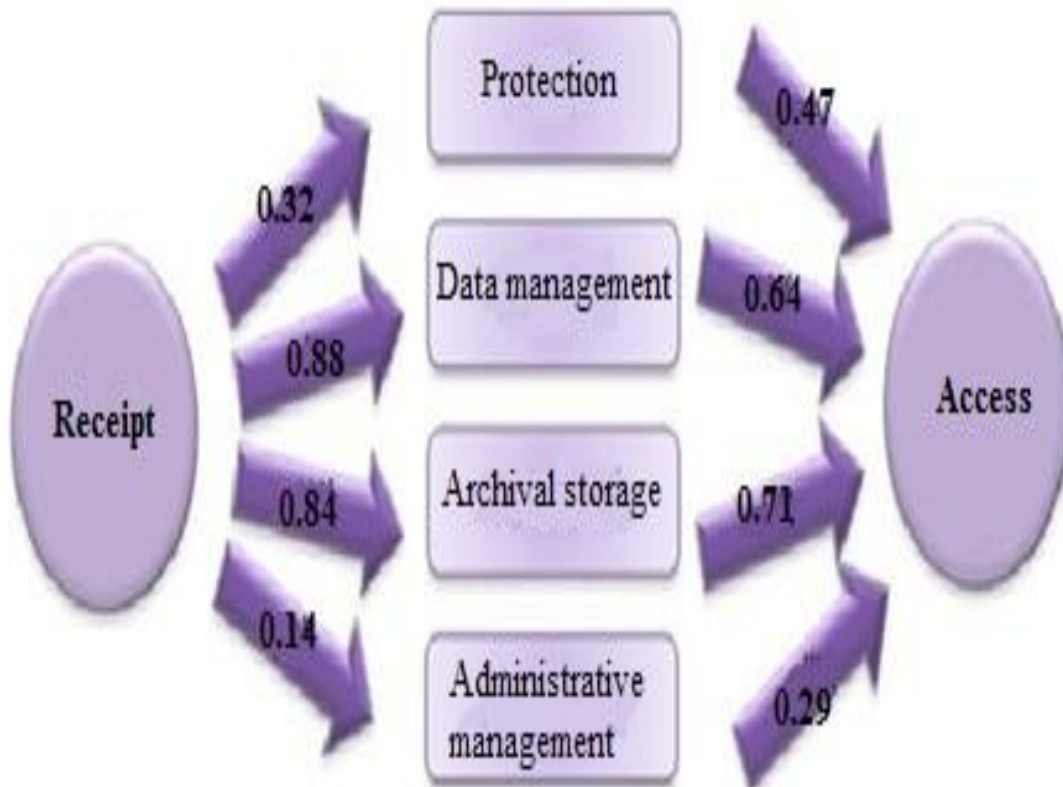


Figure 1: Results of path analysis

The following model (Figure) is extracted according to the expert panel members. It should be noted that the validity of new model according to the experts' view is as follows:

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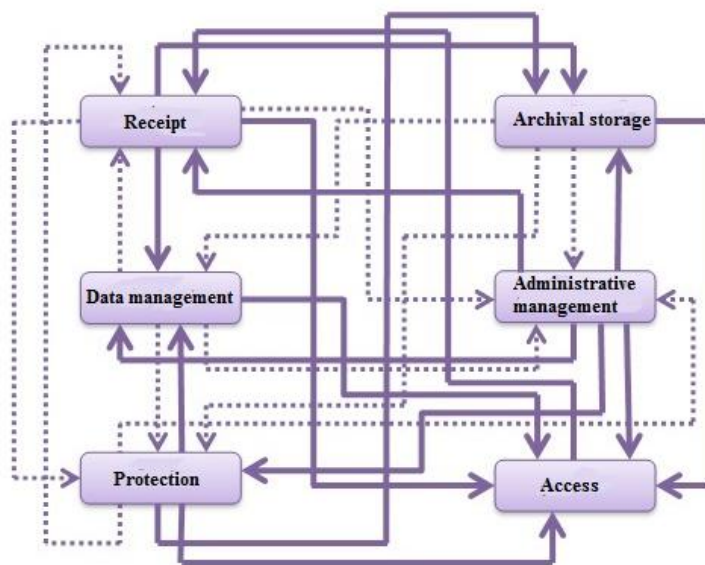


Figure 2: Proposed model

According to the Figure 2, it is concluded that the receipt has the strong impact on the archival storage, data management, and access and weak impact on the administrative management and protection. The archival storage has no impact on the receipt, has the weak impact on the data management, administrative management and protection, and strong impact on the access. The data management has no impact on the archival storage, weak impact on the receipt, administrative management and protection, and strong impact on the access. The administrative management has strong impact on the receipt, archival storage, data management, protection, and access. The protection has a weak impact on the receipt and administrative management, but strong impact on the archival storage, data management and access. The access has strong impact on the receipt, but no impact on the archival storage, data management, administrative management and protection.

Discussion

According to the experts, there is a significant prioritization among six dimensions of OAIS reference model for management of digital video in archives of Islamic Republic of Iran Broadcasting (IRIB) and the components are as follows respectively: Data management, archival storage, receipt, protection, access, administrative management and supervision. There is no difference between six dimensions of OAIS reference model for management of digital videos in archives of the Islamic Republic of Iran Broadcasting (IRIB) at the confidence level of 0.95 from the perspective of archivists and archive staff, people with different educational levels, and people with different years of work experience. The results of this study confirm the OAIS model reference from the perspective of archivists and archive staff for management of digital videos in archives of the Islamic Republic of Iran Broadcasting (IRIB). The most important factors are as follows: Data management, receipt and, archival storage, protection, administrative management (supervision) and access. This result is consistent with the results of research by Samiei (2010) who analyzes the OAIS reference model as the only standard of digital protection in digital storage; he also proposed the implementation of this standard in digital library software. This result is consistent with the results of research by RasouliJamberi (2011) who has identified the most important elements of managing digital photos at department of National Archives, National Library and Archives of Islamic Republic of Iran (National Archive of Iran) based on the Open Archival Information System (OAIS) and has introduced the following cases as the main elements in these regard: The creation of descriptive metadata, producing the archival information packet, backup, physical access control, setting the storage patterns, user-free transmission and conversion strategies of interaction with archive and making the resources and similar cases available. This result is not consistent with the results of

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research by Bekarat (2003) who has only defined the integrated reference model which affects the OAIS reference model and its additional features including the quality, usefulness, encoding and behavior of digital objects. Furthermore, this result is not consistent with the results of study by Sample (2004) who has only investigated the integration of Metadata Encoding and Transmission Standard (METS) and OAIS reference models as well as the way of automating the digital protection operation in system of new digital objects at libraries of University of Edinburgh. This result is consistent with results of research by Lee (2005) who has provided the procedures for creating the protection standard called the OAIS reference model in archives and has described the limitations of this standard for creation and maintenance of archives, users' long-term access, and understanding the information in archives. This finding is consistent with the results by Spence (2006) who has provided the experimental method for creating the protection and transmission standard of integrated digital objects and meta-data from the perspective of small organizations after investigating the appropriateness of OAIS reference model for application in small organizations. This result is consistent with the results by Altenhover (2006) who introduces the OAIS reference model as the homogeneous solution for long-term protection and access to digital objects. This result is also consistent with the results by Nordland (2007) who has confirmed the compliance with OAIS reference model for retention of information resources in International Development Research Center (IDRC). This finding is consistent with the results of research by Kim and Yoon (2009) who have explained the necessity of creating the digital archive of OAIS reference model as a standard, based on which there is a framework for digital archives, for digital photo archive. This result is in line with the findings by Lagton (2012) who has confirmed the compliance of OAIS practical model among the members in the World data center.

REFERENCES

- Altenhöner R (2006).** Data for the Future: The German Project "Co-operative Development of a Long-term Digital Information Archive" (Kopal). *Library Hi Tech* **24** 574-582.
- Bekaert J, Hochstenbach P, De Kooning E and Van de Walle R (2003).** An analysis of packaging formats for complex digital objects: Review of principles. *Proceedings of the Society of Photo-Optical Instrumentation Engineers (SPIE)* **5242** 324-332.
- Kim H and Yoon Y (2009).** A multi-level metadata structure for image archiving. *Proceedings of the 11th International Conference on Advanced Communication Technology* 1449-1452.
- Laughton P (2012).** OAIS functional model conformance test: A proposed measurement. *Program* **46** 308-320.
- Lee CA (2005).** Defining Digital Preservation Work: A Case Study of the Development of the Reference Model for an Open Archival Information System. Unpublished PhD Dissertation, University of Michigan, Ann Arbor, MI, Available: http://www.ils.unc.edu/callee/dissertation_callee.pdf.
- Nordland L (2007).** The Long and short of IT: The International Development Research Centre as a case study for a long-term digital preservation strategy. Master's Thesis, University of Winnipeg.
- Rassouli Z (2011).** Management of digital photos in the National Library of Iran based on the AIS Reference Model. PhD Dissertation, Al-Zahra University, Tehran.
- Sami M (2010).** A study of the state of digital preservation in member libraries of the International Internet Preservation Consortium (IIPC): A proposed model for the National Library of Iran. PhD Dissertation, Science and Research Branch of IAU, Tehran.
- Sample N (2004).** Developing a digital preservation strategy at Edinburgh University Library. *VINE* **34** 33-37.
- Spence J (2006).** Preserving the cultural heritage: An investigation into the feasibility of the OAIS model for application in small organizations. *Aslib Proceedings* **58** 513-524.
- Verheul I (2006).** *Networking for Digital Preservation*. Current Practice in 15 National Libraries (IFLA Publication Series) Available: <http://www.ifla.org/VI/7/pub/IFLAPublication-No119.pdf>.