

Preservation Assessments on Digital Cultural Heritage Resources in Malaysia

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ABSTRACT

Cultural heritage is crucial to the nation's development. A crucial component of the nation's K-economy envisions the availability of digital content exchange or content infrastructure. Digitization makes the cultural heritage resources accessible since the openness of the internet causes the resources to be available to the wide audience. The idea of providing and presenting information via electronic means and formats truly fascinates managers of information agencies worldwide. People especially the professionals are quite serious in preserving our national culture heritage because of the awareness of its importance to our legacy. Most of national cultural heritage institutions are seeing a move from the hegemony of the physical records to the hegemony of the digital objects. Therefore, the aim of this paper is to assess potential risks of digital cultural resources in Malaysia as well as to investigate the digital preservation strategies adopted by Malaysian cultural institutions. A multiple case studies approach is used to examine the potential risks of digital cultural resources in four (4) selected Malaysian cultural institutions. Data is collected through a structured interview with information professionals who are involved in digitization works in the selected cultural institutions. Findings reveal that digital cultural heritage resources in Malaysia are at risk in terms of digitization policies, selection criteria, cost, staffing, technology, storage, metadata management and copyrights. This study is very significant to professionals who are involved in archiving the digital cultural heritage as it serves as a guide for managing risks in the process of preserving valuable digital resources. The result can be a practical tool for preservation assessments of not only digital cultural heritage but also to any format of digital documents in various fields or industries.

Key Words: Preservation Assessment, Risks, Digital Resources, Cultural Heritage Resources, Malaysia

INTRODUCTION

Mohd Sabrizaa (2015) in his study reports that preserving heritage is important both for physical and spiritual reasons. The heritage such as sites and buildings has a

strong, positive influence in developing a community. Culture provides links between the past, present and future. Cultural information brings communities together as well as promotes understanding among a culture and society (Liew, 2005). Nowadays, people especially the professionals are quite serious in preserving our national cultural heritage because they are aware of its importance to our legacy. Zuraidah and Aliza (2009) define heritage as a legacy from the past, what we live with today and what we pass on to future generations. Cultural heritage can be in the form of physical artifacts and intangible attributes of a group or society that are inherited from past generations, maintained at present and bestowed for the benefits of future generations. It can be anything of national significance like architecture, landscapes, documents, and artifacts, which is handed down and preserved through generations. Lynch (2002) states that, it is becoming increasingly important to archive the valuable cultural heritage of history each year. In Malaysia, there are a number of institutions which manage the national cultural heritage such as National Archive of Malaysia, National Library of Malaysia, National Museum of Malaysia, National Art Gallery, National Heritage Department, National Heritage Registers, Malacca Museum Cooperation and so forth. Besides the government bodies, there are also private institutions involved in preserving Malaysian cultural heritage. The institutions are Heritage of Malaysia Trust, Penang Heritage Trust, Perak Heritage Society, Sarawak Heritage Society, Society Atelier Sarawak, Arts-Ed Penang and Melaka Heritage Society.

In the age of information communication technology (ICT), the natural cultural heritage has been transformed into digital format so that the resources can be exploited and shared throughout a worldwide network in a secure and cost effective manner. This situation is supported by Zuraidah (2006) in her study when she states that in order to remain competitive, every organization must find new and creative ways to stay in the "game" in today's fast changing information and communication technology (ICT) era.

Henceforth, most of the national cultural heritage institutions are now seeing a move from the hegemony of the physical records to the hegemony of the digital objects. Basically, digitization converts materials from formats that can be read by people (analogue) to a format that can be read only by machines (digital). In addition, digitization makes the cultural heritage accessible since the openness of the internet causes cultural heritage to be available to a wider audience. Digitization also plays an important role in preserving cultural heritage over time. By providing online access to digitized materials for researchers and the general public, the originals are protected from use. Subsequently, digitization is also a part of the preservation policy (Zuraidah, 2006).

Many institutions, including those who are mentioned above, have been creating or collecting digital information produced in a wide variety of standard and proprietary formats, including ASCII, common image formats, word processing, spreadsheet, and database documents. Each of these formats continues to evolve and is becoming more complex as revised software versions add new features or functionality.

According to JICC (2006), digital preservation is the series of actions and interventions required to ensure continued and reliable access to authentic digital objects for as long as they are deemed to be of value. In the last two decades, digital technology has enabled people to create, use, and be enriched by information in ways that were unthinkable a generation ago. The need to preserve digital assets is only a few decades old, but it is growing and becoming more pressing by the day (Levi, 2008). Levi (2008) adds that the risks are high. Libraries, museums, universities, research centers, and other institutions that have long taken role in preserving the collective knowledge and cultural heritage can no longer ignore the digital preservation challenge.

While today's digital preservation systems will almost certainly be improved, institutions around the world are moving forward with good, well-designed plans.

Libraries, museums and archives will create, collect and make the digital cultural heritage resources available and has long-term value. The libraries, museums and archives serve not only to safeguard those resources, but also to provide evidence of one type or another of the work's provenance, which goes towards establishing the authenticity of that work.

According to National Library of Australia (2011), while digital technologies are enabling information to be created, manipulated, disseminated, located and stored with increasing ease, preserving access to this information poses a significant challenge. Unless preservation strategies are actively applied, this information will rapidly become accessible. Choices of strategy will depend upon the nature of the material and what aspects are to be retained. National Library of Australia (2011) identifies four (4) digital preservation strategies which are emulation, encapsulation, migration and Universal Virtual Computer. In this study, two of the stated strategies which are migration and technology emulation have been used to assess the digital preservation activities of Malaysian Cultural Heritage Institutions.

SIGNIFICANT OF THE STUDY

This study is very significant for professionals who are involved in archiving the digital cultural heritage as it can be a guideline for them to manage potential risks in preserving the valuable digital resources. Therefore, the result of the study will be a practical tool in managing the risks of not only the digital cultural heritage but also all documents in digital format. Besides that, the recommendations given by the professionals in risks management of digital resources can also be applied by other parties involved in the business.

In addition, the study can also be a parameter for libraries, archives and museums in order to ensure the sustainability of important, digitized information. Some of the risks may not appear before and reference to the result may also lead them to being aware of any possible or potential risks needed of their serious attention and proper management.

PROBLEM STATEMENT

As organizations rely more and more on digital technology to produce, process, store, communicate, and use information in their activities, the quantity of records being created in electronic forms has increased exponentially. The technological challenge is compounded by the continuing extension of information technology, making the cultural heritage information increasingly more diverse and complex (Lim, Ramaiah & Pitt, 2003). It is also important to note that, preservation of such information is critical. A case study conducted by Betts (1999) asserts that digital cultural heritage information is at risk of disappearing and becoming inaccessible because of the deterioration of storage media such as magnetic tapes. Other concerns include ever-changing data formats and the fact that software and hardware become obsolete quickly. Thus, what is deemed to be the greatest challenge to electronic record keeping is the evolution of technology (Coombs, 1999).

Most of the above mentioned institutions often overlook the issue of sustainability of their digitized materials. Findings from previous research revealed that there are many issues involved in the management of digitization of cultural heritage resources in the country. Therefore, in order to preserve this information, institutions must manage collections in a consistent and decisive manner. It is important to decide what should be preserved, in what priority, and with what techniques.

In addition, there are a number of risk-related issues that might be faced by cultural institutions if their digital files are not managed accordingly. Improper management of the files would trigger some risk-related issues such as availability and accessibility of information; authenticity and integrity of information; long-term storage of information; and information disaster recovery issues (Zuraidah and Aliza, 2009).

Therefore, the objective of this research is to study the content authentication of digital preservation at cultural institutions in Malaysia. In addition, this research attempts to investigate the digital preservation strategies adopted and adapted to the digital resources in the institutions.

METHODOLOGY

The methodology used in this study is qualitative in nature. Interviews were done with ten (10) information professionals consisting of librarians, archivists, curators and information technologists who are involved in digitization works. A total of ten (10) interviews were conducted with ten (10) individuals representing four Malaysian Cultural Heritage Institutions namely National Library of Malaysia (Case A), National Archive of Malaysia (Case B), National Museum of Malaysia (Case C) and National Art Gallery of Malaysia (Case D). The interviews took about seventeen (17) hours.

An interview guide was designed for a structured interview. Purposive sampling was used in this study where only four (4) main cultural heritage institutions (CHIs) in Malaysia were selected. The four selected cases were chosen because they are the main cultural institutions involved in digitization projects since 2000 under the Ministry of Information, Communication and Culture of Malaysia. The research unit of analysis is information professionals who deal with digitization of cultural heritage resources in their organizations.

The framework of data analysis in Figure 1 illustrates the structure of descriptive (within cases analysis) and comparative analysis (cross cases analysis) taken to chart elements of contrast in the four (4) case studies.

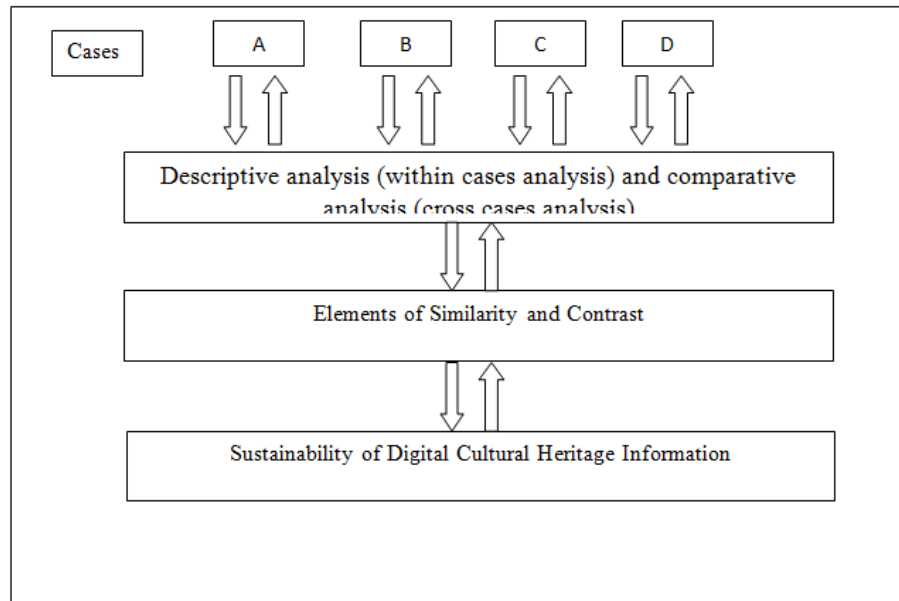


Figure 1: Framework of data Analysis

FINDINGS AND DISCUSSION

The digital preservation assessment is based on eight (8) factors selected through literature reviews of previous studies.

Risk Assessment Factors

Selection Criteria

Findings found that most of the cultural institutions select materials to be digitized based on these criteria (arranged by the most preferred criteria):

- Cultural value
- Historical value
- Materials that allow copyright access
- Materials that have digitization procedures and standard
- Materials frequently used by users
- Saving space without considering the value of resources
- Educational and research purpose

Majority of the cultural institutions select materials which have cultural and historical value as well as allow copyright access to be digitized. *WIU Libraries Digitization Policies Committee (2009)* and *Dasar Pendigitalan Koleksi, Perpustakaan Negara Malaysia (2010)* support these findings where both policies highlight cultural and historical value as the most essential resources needed to be digitized. As cultural institutions, all cases in this study are not of the high risk cases since materials selected are based on the main function of their organization.

Hirtle, Hudson and Kenyon (2009) believed that copyright is an important issue to be considered in implementing digitization projects. It is found that all respondents prefer to choose copyright free materials since they are not bounded by Copyright Act. However, as cultural institutions, they cannot limit the selection of materials to only

copyright free since there are a lot of resources out there which are valuable and they are copyrighted. Hereby, the findings show that majority of the cultural institutions are facing the risk of inaccessibility of materials due to inappropriate and incompliance to the standard procedures of digitization process.

The findings report that only two of the four cases prefer to choose digitized materials with digitization procedures and standard. Two other cultural institutions do not consider this criterion because for them, they do not need specific standard and procedures in digitizing the materials as their procedures are very simple. Nevertheless, these two cultural institutions should be aware that choosing the materials that already have the digitization procedures and standard will minimize the risk of accessibility of the digital resources later. The findings shows that our digital cultural information is at risk since some cultural institutions do not really prioritize selection of materials which include digitization procedures and standard.

Furthermore, not all cases choose to digitize materials which are frequently used by users. Digitization of high demand materials should be the main concern since clients are the utmost priority for information institutions. As stated in WIU Libraries Digitization Policies Committee (2009), items known to have high use should be given high priority, as should items known to have a high potential for use once they are digitized. The same goes to items with a specifically identified and interested audience. If the cultural heritage institutions do not provide resources based on users' information needs, it shows that the institutions do not play their role as successful information centers.

The cultural institutions in this study are also exposed to the risk of selecting the right materials to be digitized. Some cases prefer materials that can only save spaces regardless of their value. The International digitization policy such as *Dasar Pendigitalan Koleksi, Perpustakaan Negara Malaysia* (2010) and WIU Libraries Digitization Policies Committee (2009) do not highlight this as a preferred criterion since what are most important to consider is the value of the resources and not the size of them. Not all institutions consider the value of educational and research purpose even though it is an important criterion that needs a serious thought. The cultural heritage institutions might think that educational and research are not a priority since their core business is more towards providing users with historical and cultural information only.

Digitization Policy

More than half of the cases in this study do not have a standard digitization policy. Only CASE A has developed their digitization policy and it was published in July 2010 known as *Dasar Pendigitalan Koleksi, Perpustakaan Negara Malaysia* (2010). It is a complete digitization policy and was developed based on the best practices of international organization which are involved in digitization projects earlier. The best practices mentioned here are those practiced by National Library of Australia and NISO.

Except for CASE A, other cases in this study do not have a digitization policy. However, CASE B is in the process of developing their digitization policy and it is expected to be published in 2014. The on-going process of digitization policies shows that CASE B realizes the importance of having a digitization policy. However, the other two (2) cultural institutions do not have similar awareness since they do not see the need for a policy as their digitization process is not as complicated as others. The result indicates that not all cultural institutions in Malaysia have systematic standards and procedures in digitizing their resources. This is one of the risks faced by digital

resources since they are not produced in a proper way. Improper, unsystematic treatment of the resources will then affect their accessibility in the long run.

The findings reveal that even though CASE B does not have a digitization policy, they are able to minimize risks by following guidelines from National Archives and Standards Organization (NISO) and National Archives and Records Administration (NARA). According to CASE B, they choose to follow the international guideline because they want their digital resources are fulfilled international standard requirement so that the resources can be accessed internally and externally.

A study conducted by Mayesti, Rachman, and Yayan (2011) also reports that Centre of Quranic Studies Library does not have a written policy on digitization and digital preservation. However, the digitization and digital preservation activities are done by referring to a Standard Operating Procedure which contains a list of tasks and timeline that must be done by librarians. Chowdhury and Chowdhury (2003) further assert the critical need for the development of digitization and digital preservation policies or strategies since the institutions today are managing digital collections.

Besides that, Zuraidah (2006) in her study found that one of the institutions realized the importance of proper policies to guide the course of action for the achievement of their digitization initiative goals. The policies that are relevant in digitization are selection policy, access policy, content management policy, intellectual property policy and preservation policy. As for the institutions which do not having any policy, they admitted to have the intention to develop it in the immediate future. A proper policy guideline consisting of the principles and strategies of digitization is vital to support the organization's goals and objectives (Zuraidah, 2006).

Cost

As stated in the findings, all of the cultural institutions are not allocated with specialized budget for digitization. This condition is one of the barriers for Malaysian cultural institutions to excel and provide good digital collections. This result is supported by a study from Shariful (2011) which states that financial constraint is one of the major barriers in library digitization.

Majority of the cases in this study are given a one-off budget should they have any projects that need them to digitize their collections. For instance, CASE B has been given a large amount of budget for digitization to support Economic Transformation Program (ETP) in 2010.

Nevertheless, a one-off budget for digitization will limit the institutions' capacity to digitize their collections. This is as such since the budget can be spent on a limited number of collections only. In other words, the special projects must have a certain target for digitization. In the project given to CASE B, the institution has managed to digitize two (2) billion collections based on the approved budget.

According to the findings, most cultural institutions do not have other alternative budget for digitization apart from the one given by the ministries. It is found that only CASE A has an alternative budget which is known as Trust Account. This shows that only CASE A has taken the effort to minimize the risks in relation to budget for emergency cases.

It is important for an organization to measure their Return of Investment (ROI) after they have invested certain huge budget for instance, in digitization projects. In basic terms, according to Kaufman and Watstein (2008), ROI is “the income – or value – received as a result of an amount invested in an asset”. In this study, most cultural institutions measure ROI by providing and sending the statistics of the digital collections usage, borrowed and bought by clients. This is an effective way for the institutions to reduce the risks of investing money in unbeneficial projects.

Most cultural institutions in this study could not afford to hire staff specialized in digitization works. Thus, they only hire temporary and contract staff only when they have digitization projects. According to Hazen, Horrell and Merrill-Oldham (1998), labor expenses, for instance, often reflect only a pro-rated price per page that overlooks the real cost of a full-time employee.

Staffing

Findings stated that majority of the cultural institutions hire staff based on academic achievement and experience. These two (2) criteria are very important since the staffs that have suitable academic qualification and at least minimal experience are capable to produce quality works. However, Zuraidah (2006) explains that human factor is equally important as an asset and resource to an organization. Without knowledge, skills and the right attitude of the professionals, the initiatives to produce good, quality work will go nowhere and eventually collapse. Therefore, the findings reveal that in terms of staff selection, the cultural institutions are not exposed to risks since they recruit their staff based on their abilities, qualification and experience.

The result also reveals that the staff in cultural institutions are lacking of training in digitization works. Only one of the institutions takes training as an important part for their staff, whereas the other cultural institutions focus more on attending conference and symposium. Attending conference and symposium is a good exposure for the staff. However, hands-on training is more effective as it gives a clearer view of digitization process in a non-risk condition. It is a bad situation for one of the cultural institutions which does not give formal training on digitization to the staff. This is because the management always changes staff from time to time. The situation has a bad impact on the digitized materials since the staff cannot develop or upgrade their skills to produce good and high-quality digitized collections.

Shariful (2011) states that skilled manpower is essential for the library digitization activities, without it will be the untouched dream for the libraries all the time. Libraries need smart, intelligent personnel with adequate technical and ICT knowledge for the digitization process. Not all cultural institutions have a benchmark of other organizations advanced in digitization to look at their digitization process. Only one of the cases occasionally benchmarks the best practices for learning purposes. Community Mental Health Oakland Country Authority (2011) defines best practice as “a compilation of evidence based practice, promising practices, emerging practice, value-based practice, and practice-based evidence.”

As such, the adoption and implementation of “best practices” appears to have reached epidemic proportion (Sanwal, 2008; Toderò, 2002; Argyris, 2000). The allure of a best practice is the leaders’ belief that there is truly one best practice and that implementing another organization’s successful practices is a sort of magic bullet (Sanwal, 2008). Therefore, findings show that only two cultural institutions paid a visit to

best practice organizations as a consideration in cutting the risks of having inappropriate digital cultural heritage information.

In general, knowledge management can be defined as the achievement of the organization's goals by making the knowledge factor productive (Beijerse, 2000). It is a systematic management of knowledge-related activities, practices, programs and policies within the enterprise (Wiig, 2000). Knowledge management activities aim to effectively apply an organization's knowledge to create new knowledge to achieve and maintain competitive advantage (Alavi & Leidner, 2001; Mason & Pauleen, 2003). In this study, findings reveal that all cultural institutions practice the concept of knowledge management, especially after they have attended related courses. They apply the sharing of knowledge in a special meeting to share the new knowledge and skills from the courses, workshop or training. One of the cases, which is CASE A has a special channel for practicing knowledge management which is by sharing their knowledge and ideas in a knowledge bank database.

Technology

Zuraidah (2006) asserts in her study that digitization is a costly exercise requiring high investment usually from public funds. There are significant risks to these investments due to the adoption of inappropriate technologies and standards. This can result in creating resources which are quickly obsolete and unusable or which require the investment to be repeated within a short time frame. In addition, Lusenet (2002) states that basically there are three ways in which digital materials become inaccessible which are degradation of the media on which they are stored, obsolescence of software - making it impossible to read digital files and introduction of new computer systems and peripherals that cannot handle older materials.

A digital resources management system is a multi-layer architecture to support the service and management in digital library or institution based on Linux and other open source software. A good system should function as a platform for developing digital library like applications; provide information model to organize digital objects; store different types of digital data; support efficient access to these data by index and navigation; support loading of data resources and creation of metadata; and support interoperability through OAI, Z39.50 (Zhou, 2004). Findings report that only one of the cases does not have a specialized system to manage the digital collections. This means the other three (3) institutions are aware of the significance of having a digital resources management system.

In term of linkage and interaction between other institutions, only CASE A has an agreement to share the collections with other institutions. Even though the digital collections can only be accessed via intranet, they allow outside institutions to access their digital contents. However, the process of cooperation requires the outsiders to follow their rules and regulations to avoid risks. Other cases in this study do not allow outsiders to access their digital contents. The outsiders have to be at their institutions if they want to access the resources.

Storage

All of the cultural institutions store their digital resources in-house. They could not afford to keep the digital collections in the service providers' servers. This poses a risk to the cultural institutions since they do not have other backup servers should

anything happens to their building and existing servers. The finding also reveals that digital resources in one of the institutions have been cracked due to the absence of firewall installed in the server. Firewalls are the cornerstones of corporate intranet security. Once a firewall is acquired, a security or system administrator has to configure and manage it to discover an appropriate security policy for specific needs of the company.

Scalability

According to Mayesti, Rachman, and Yayan (2011), the computer storage capacity will determine how many data and files could be stored inside. Findings of this study found that only one cultural institution has a storage which is not scalable. Other storages in the other three (3) institutions are scalable. However, a research done in Indonesia also found that their capacity of storage is also not enough. Mayesti, Rachman and Yayan (2011) reported that if the storage only has a small capacity, storage of digital files will also be limited.

Webb (2003) explained that virus attack has become a crucial problem in digital preservation. Viruses may cause damage to the integrity of digital collections (file corrupt). Kahn (2004) stated that the best protection to solve computer problems (which has been caused by virus) can be done by installing antivirus software at each computer and network. The findings revealed that most of the cultural institutions in this study are concerned about antivirus and always keep it updated from time to time.

Metadata

The role of metadata in ensuring long-term access and management is analyzed, described, and commented upon by other researchers, including Alemneh (2002). Maintaining usable and sustainable digital collections necessitates maintaining high-quality metadata about those digital objects. The two aspects of cultural institutions data quality are the quality of the data in the objects themselves, and the quality of the metadata associated with the object. The poor metadata quality can result in ambiguity, poor recall and inconsistent search results, which requires for robust quality assurance mechanisms. These mechanisms are necessary features for well-functioning cultural institutions which provide digital collections. In order for end users to benefit fully from the development of digital libraries, responsible and viable service providers need to address metadata quality issues.

Low quality metadata can render an information institution almost unusable, while high metadata quality can lead to higher user satisfaction and increased usage. A quality metadata can also be measured by metadata scheme that an organization is using. The finding of this study reveals that one of the cultural institutions has a metadata scheme. However, the metadata scheme used is considered not user-friendly as it is not suitable for non-profit organizations such as cultural institutions. This situation contributes a risk to the digital resources since it can lead to data losses and other consequences. Yet, if compared to other institutions which do not have metadata scheme, the risk that this institution has is much minimum.

All cases in this study include the descriptive metadata for their digital resources. As stated in Chapter Two, descriptive metadata encompass a range of information from basic elements such as the title and subject to more advanced elements such as geographic or temporal coverage and relationships (UMDM, 2011). There are three (3)

cultural institutions which include technical metadata to their digital resources. According to IBM (2011), technical metadata are data about the processes, the tool sets, the repositories and the physical layers of data under the covers. They cover data about run-times, performance averages, table structures, indexes, constraints as well as data about relationships, sources and targets, up-time, system failure ratios, system resource utilization ratios, performance numbers. However, findings show that most cultural institutions do not consider technical metadata as important to them. As for the Intellectual Property Right (IPR), there is only one case which does not include it. Besides, not all cultural institutions consider history metadata as an important part to be included. However, according to Atlassian Confluence (2011), history is important to the present since the current situation for metadata management within the institutions, and some of the challenges to be faced in the future may reflect past strategies.

In addition, IPR is an important element of metadata that needs to be considered by cultural institutions. Most of the institutions realize the importance of including or putting the IPR element on the digital document. Since all cases do not allow outsiders to access their digital resources, they automatically do not allow integration of the resources. The metadata elements also do not provide multi-language and multi-national network.

Copyright

Copyright assessments play a defining role in digitizing projects and must be addressed early in the selection process. Therefore, a watermarking technique is used to insert copyright information into digital images so that ownerships can be declared. A watermarking technique is to prevent digital images of rightful owners from being illegally commercialized or used, and it can also verify the intellectual property right (Lee, Lin, Su & Lin, 2008). The findings reveal that most cultural institutions embedded visible watermarking but only one of them embedded invisible watermarking. Invisible watermarking is more effective than visible watermarking as it allows the document to be traced back to its rightful owner and to the point of unauthorized use (Su, Hartung & Girod, 1998).

Digital Preservation Strategies

As stated in the introduction, National Library of Australia (2011) identifies four (4) digital preservation strategies which are emulation, encapsulation, migration and Universal Virtual Computer. However, only two (2) strategies are involved in this study which are **migration** (*format migration* and *migration of media*) and **technology emulation**.

According to Mayesti, Rachman, and Yayan (2011), format migration is done by migrating the old media used to store information to the new one. The findings revealed that this digital preservation strategy is applied in CASE B, C and D. Migration of media or is also known as replication. It refers to the copying of data on a defined material which has a similar logical structure. It was found that only CASE A performs this strategy where digital collections from the server are copied and replicated into Compact Discs.

Technology emulation is a strategy carried out by all respondents in CASE A, CASE B, CASE C and CASE D. They create Virtual Compact Disc which is a standalone at each computer for data backup. The effort are regarding with Granger

(2000) who described that emulation software, operation system, or hardware. The findings reveal that all the institutions emulate by using software and hardware.

RECOMMENDATION

By referring to the results of this study, it is found that the process of digitization at Malaysian cultural heritage resources is inappropriate and does not follow the standard procedures to maintain the long-term accessibility of the resources. Therefore, in order to increase the quality of digital resources in the cultural institutions, the following suggestions are pointed out:

1. Develop coordinated National Digitization Policy and National Digital Preservation Policy
2. Increase the allocation of total of budget for digitization especially for cultural heritage resources and digital preservation
3. Train and re-train staff actively in order to upgrade and improve their skills and knowledge in digitization projects
4. Recruit a sufficient number of staff who are not in top of other responsibilities
5. Provide sophisticated technological facilities for digitization
6. Established metadata scheme

CONCLUSION

The digitization process of cultural heritage resources in Malaysia especially at the main cultural institutions is still not up to the standard/unsatisfactory as international institutions. One of the major factors which contribute to this problem is financial constraints or insufficient budget allocation. Every single part can be operated perfectly if institutions have sufficient budget to employ the process. The allocation can automatically cover the installation of quality digital resources system, recruitment of sufficient skilled and knowledgeable staffs, construction of complete and sophisticated facilities, a systematic and metadata scheme and embedding of both visible and invisible watermarking to the digital resources. In a nutshell, a framework showing digital preservation assessment exposed to the digital cultural information is really necessary for cultural institutions so that they are always aware of it to avoid deterioration of the valuable information sources.

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