

RESEARCH ON THE TECHNIQUES FOR CONSERVATION OF TWO-DIMENSIONAL ARTIFACTS

W. A. P. Wickramasinghe

Abstract

Conservation is considered as a science that describes the interdisciplinary study of protection of various areas such as art, architecture, and other cultural works through the use of scientific methods. It is a known fact that there are several types of valuable artworks in Sri Lanka which are needed to be conserved for the archeological aspect of next generation. It has been observed that various techniques are used for conservation of those artifacts in most of the places like Colombo museum, some historical temples in Sri Lanka. The aim of this paper is to study the available conservation techniques in Sri Lanka. As the research methodology, a survey was done in the Colombo museum conservation unit for the purpose of identifying the conservation techniques which are used for historical resources. Further, some existing works in the area of conservation were studied to recognize the research area properly. In addition to that, a case study of digital photos of the murals of Bellanwila Temple taken by Lal Hegoda, was studied to identify the application of digital technology for the area of two-dimensional conservation of large mural paintings. In this paper, results of the above survey and case study will be discussed with a recommendation to study deeply in this research area to fulfil national and international requirements.

Keywords

Conservation, Preservation, Cultural Resources, Two-Dimensional Artifacts, Digital Technology

Introduction

Conservation is considered as a science that describes the interdisciplinary study of protection of various areas such as art, architecture, and other cultural works through the use of scientific methods (Conservation Science 2017). In that study, technology, structure of artistic and historic works, the materials and media from which they are made are going to be examined. It is known that this is very important area of study for safeguarding of historic cultural resources. These resources are clues which reveals the traditional nature of a particular country. Cultural heritage institutions like museums, archived institutions and libraries have taken custodianship of these artifacts for the sake of the preservation of knowledge (Yeung, Carpendale & Greenberg 2008) for future generation.

The idea of conservation was gradually formulated by establishing various institutes and forums that were primarily concerned to set up guidelines and formal practices related to this area. Since 1930, there has been an ongoing effort to understand and define the field of conservation. In October 1930, there was a conference in Rome as an important early effort to set up a document including the changing ideas and attitudes toward conservation and conservators. International Institute for Conservation (IIC) which was founded in 1950 is an independent international organization supported as a forum for communication among professionals with

responsibility for the preservation of cultural heritage. It advances knowledge, practice and standards for the conservation of historic and artistic works through its publications and conferences (NINCH Working Group on Best Practices 2002). The 2nd International Congress of Architects and Technicians of Historic Monuments, which met in Venice from May 25th to 31st 1964, approved the International Charter for the Conservation and Restoration of Monuments and Sites (International council on monuments and sites 1964). Further, American Institute for Conservation of Historic and Artistic Works (AIC) incorporated in 1972 as an international group of conservators has grown to more than 3,500 conservators (Defining the Conservator: Essential Competencies AIC 2003 2003). In 1979, the Australian International Council on Monuments and Sites (ICOMOS) adopted the above Charter, which sets forth “standard of practice for those who provide advice, make decisions or undertake works to places of cultural significance”.

It is a known fact that there are several types of valuable artworks in Sri Lanka which are needed to be conserved for the archeological aspect of next generation. It has been observed that various techniques are used for conservation of those artifacts in most of the places like Colombo museums, some historical temples in Sri Lanka such as Bellanwila Rajamahaviharaya, Kelani Rajamaha Viharaya and Sapugaskanda Rajamaha Viharaya. (Bellanwila Rajamaha Vihara 2016). In the process of applying some available techniques for conservation, there are some identified issues such as requirement of a lot of human intervention, availability of only manual documentation and a lack of latest machines to be used for the conservation processes. Another critical issue is to find difficulties to track past information quickly due to the non-availability of relevant ICT based documents (photos, written documents, charts etc.).

Aim and Objectives of the Research

The aim of the research is to identify the techniques used for conservation of two-dimensional artifacts. Accordingly, two research objectives were selected as the identification of the techniques used for conservation of historical cultural resources and then the identification of the techniques used for the conservation of two-dimensional artifacts by reviewing a case study of digital photos of murals of Bellanwila Temple taken by Lal Hegoda.

Research Problem

It has been identified the importance of conservation of two-dimensional artifacts in the Asian countries. There are two major concerns in this field naming preservation and conservation of valuable artifacts. Preservation is the protection of cultural property through activities that minimize chemical & physical deterioration and damage. This will prevent the loss of informational content (About conservation 2017). The International Institute of Conservation, London, has defined conservation as “any action taken to determine the nature or properties of materials used in any kind of cultural holdings or in their housing, handling or treatment, any action to understand and control the causes of deterioration and any action taken the better the condition of such holdings”. There is another concept called digital preservation that refers to the various methods of keeping digital materials alive into the future (Maxine 2000), according to a recent statement from the Council on Library and Information Resources (Waters 1998). According to that definition, Digital Preservation is the management and maintenance of digital objects so that they can be accessed and used by future requirements (Digital Preservation Handbook 2015). Hence, conservation is a broader area and it is a profession devoted to the preservation of cultural property for the future. Conservation activities include examination, documentation, treatment, and preventive care supported by research and

education (About conservation 2017). Looking at Sri Lanka, methods used for conservation are in primary or secondary level resulting some issues such as difficulties to access accelerated past details of the artifact in the conservation process and the difficulty to enhance the research capacity in the area of conservation. Accordingly, it is evident that the research in this subject area is a national requirement to identify solutions for those identified issues. Hence, the objective of this paper is to research on the techniques for conservation of two-dimensional artifacts.

Research Methodology

In this research, literature review was done to identify existing works in this area and a survey was done at the Colombo Museum conservation unit to get the understanding of the techniques used for conservation. Further, it was reviewed a case study, the Bellanwila Murals documented by Lal Hegoda for the purpose of identifying the techniques used for two-dimensional artifacts conservation.

Literature Review

It has been identified some researches which have been done related to this area. Work has been done in the area of preserving art in the digital context (Yeung et al. 2008). This paper discusses an overview of the broader digital preservation challenges such as machine dependency, speed of change of the technology, diversity of media, and flexibility of making changes, the need for active preservation (What is digital preservation? n.d.). In summary, it has been further identified that the existing issues are still not sorted out completely. Further, that research has provided only some approaches that would lead to minimize the effect of the above challenges.

The digitization for preservation demonstrates an important mechanism for access and exhibition of documents and artifacts. There are some of the museums in the world that are turning to create online digital repositories which can be accessed easily (Paul, Laura, & James n.d.). Here are some examples for that.

- **Google Arts & Culture Project**

Google art is one of the projects done in this area. Google Arts & Culture is an online platform through which the public can access high-resolution images of artworks housed in the initiative's partner museums. (Google Arts & Culture n.d.). Actually, it provides people the opportunity to experience artworks individually and a platform to become involved in conservation. It concentrates on preserving all forms of artwork and developing new applications that can enhance the audience's experience.

- **World Digital Library**

This is a project implemented by the U.S. Library Congress with the support of United Nations Educational, Cultural, and Scientific Organization and cooperation with numerous libraries, museums and other institutions around the world. (World Digital Library n.d.). It is another example for the digital repository to make available on the Internet, free of charge and in multilingual format, significant primary materials from cultures around the world, including manuscripts, maps, rare books, musical scores, recordings, films, prints, photographs, architectural drawings, and other significant cultural materials.

- **The British Museum**

The British Museum has an online inventory of their research catalogues in different area of artifacts. (The British Museum n.d.). 2000 new images are added every week to the database by expanding the possibility of online searching more artifacts for researches and educators.

- **Digital Archiving Project**

Conservation techniques applicable to the physical heritage are not appropriate for the intangible heritage. It is necessary therefore to establish digital archives by recording these cultural expressions on both visual and audio media to facilitate their survival and transmission to future generations. UNESCO has therefore started the process of recording and archiving these forms of cultural expressions with the most advanced digital technology in order to preserve the images and sounds of these masterpieces. (Outline of Digital Archiving Project 2017)

Discussion

1. Survey done at the Colombo Museum Conservation Unit

Authors were able to conduct a survey using interview / direct discussion technique at the Colombo museum which is one of the important places in Sri Lanka where historical and valuable artifacts have been kept for safeguarding them for the next generation. Collected data were analyzed. It was identified that all the artifacts / objects can be mainly classified into two broad categories as inorganic and organic. Accordingly, stone, ceramic, porcelain are named as inorganic objects and wood, leather, paper, textiles with other things derived from living being and plants are named as organic objects. Further, there can be many objects that containing both inorganic and organic parts.

It was further recognized that there are some factors of deterioration of these objects. They can broadly be categorized as Climate, Chemical and Biological factors.

It was acknowledged that these factors must be controlled by analyzing the environmental conditions in case of chemical factors. Accordingly, temperature, humidity and the day light are harmonious if they are not controlled using standard values that were recommended by the conservators. Further, fungi, insects are always ready to attack especially organic type of objects and their damages can be managed by using some prescribed chemicals as well as using some traditional mechanisms used in Asian countries.

Further, there is a requirement to ensure the International Charter for the Conservation and Restoration of Monuments and Sites (International council on monuments and sites 1964) at the stage of applying any techniques to conserve these artifacts.

2. Case Study: Digital images of Bellanwila Temple developed by Mr. Lal Hegoda

In this research, digital images of Bellanwila Temple developed by Mr. Lal Hegoda were taken as a case study. Authors were able to interview him many times with a pre-designed question and it was helpful to discover the background details for the conservation. Further, it was able to interview a team member who did the image editing part of the project. According to the information found, due to the water leakage from the roof of the Bellanwila Temple to the mural surface and the spreading of fungus on the mural surface, major threats were there to harm the murals gradually. Therefore, a requirement arises to conserve them for the next generation. As

a solution for the identified issues, an idea came to digitize all murals for the purpose of safeguarding them for the nation. But it was recognized some issues in digitization of images such as the difficulty to cover the entire area of some murals due to very large size (more than 30 feet length / width), no sufficient background space in the temple to focus them correctly and the availability of mixture of natural and turnstone lights within the temple area that would prevent to get actual existing color and contrast of the mural. Therefore, a special mechanism had been used to minimize the above issues and to obtain digital images with all existing details such as color, contrast while stopping the image distortion and color unbalance.

To find out a solution for the first and second issues, panoramic image was suggested (Kokate. Wankhede & Patil Rohit 2017). It is an image that was built in cases where entire image or mural can't be focused at once. In that case, entire mural was segmented to small parts in columns and rows. Figure 1 and figure 2 show two such segments of the largest mural in the temple having 38 width and 24 height. Figure 3 shows another segment of a large mural in the temple. Then each and every segments of the image were focused separately to get overlapped set of digital images for the purpose of producing a panoramic image of the mural. In case of the third drawback, it was proposed to do some photo shooting in night with the condition of balanced background day light. Finally, all the segments were merged to produce the full image with all required details using a computer software. Here, there was a major concern to get the digital images of individual segments by keeping the camera parallel to the wall and the ground to avoid the merging issues of those segments at the stage of panoramic image production. Further, it was very important considering the area of color distortion of the digital image at the developing process. As far as photography is concerned, although the actual color of the image is stored correctly in the sensor of the digital camera, printing process doesn't confirm the output of actual color of the image without color distortion. So, an alternative method had been used in the above procedure, by using a gray scale in foreground of each and every segments of the image. So, all the segmented images were taken with the known gray scale in the foreground. As the color of the gray scale is known, entire image color was balanced to the level of known gray scale. Then, it was assured that actual color of the digital image was attained in all the segments when it was balanced to the level of the known gray foreground color.



Figure 1: Somabandu Vidyapathi (1990-1998). Mural in Bellanwila Temple, Bellanwila (Image: <http://sarathchandrajeewa.blogspot.com/2013/04/bellanwila-murals.html#more>)



Figure 2: Somabandu Vidyapathi (1990-1998). Mural in Bellanwila Temple, Bellanwila (Image: <http://sarathchandrajeewa.blogspot.com/2013/04/bellanwila-murals.html#more.>)

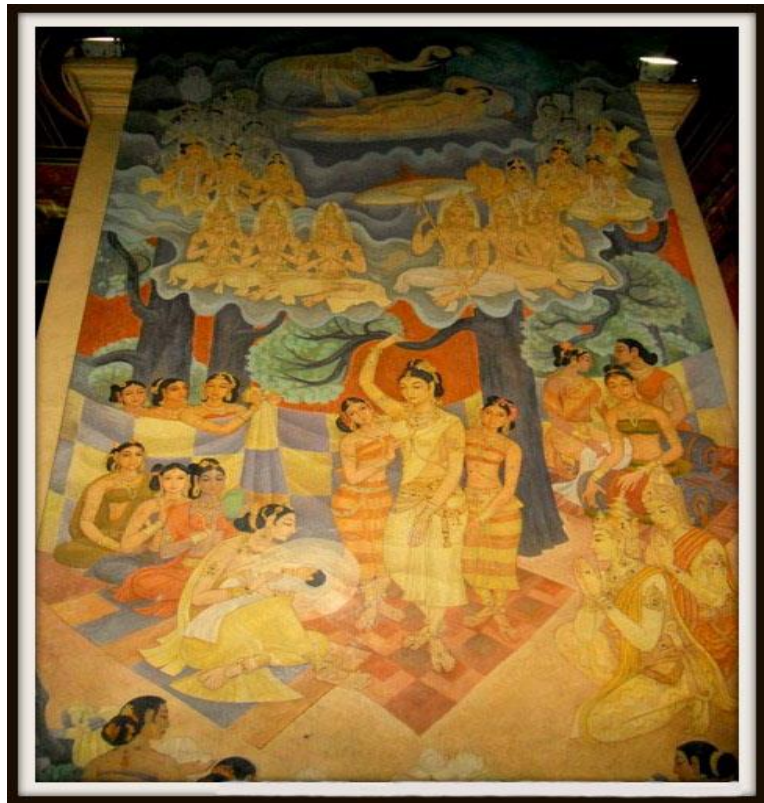


Figure 3: Somabandu Vidyapathi (1990-1998). Mural in Bellanwila Temple, Bellanwila (Image: <http://buddhistplacesinsrilanka.weebly.com/bellanwila-raj-maha-viharaya.html>.)

Conclusion

In this research, authors were able to achieve the set objectives by using the literature review of existing works, conducting a survey and reviewing a case study. Therefore, it was able to identify the techniques used for conservation of cultural resources, especially, two-dimensional artifacts. These finding definitely make foundation to continue the research in the area of two-dimensional conservation to satisfy the national and international requirements.

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