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Digital Technology and Knowledge Management in Museums

Abstract

A museum is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment[1]. It has shown systematic approach in managing the collection of varied nature, a significant leap has noticed after the emergence of digital technology. CIDOC-International Committee for Documentation has constantly been addressing the issue pertaining to use of digital technology in museums; and in this conference focus is made on knowledge management. In 20th century after a decade, new generation is becoming more techno savvy and their involvement towards creative activity is supported by digital media. Many museums have sensed the transition and embraced the revolutionary technology whereas many have no idea about technological advances and are still using pre-digital technology.

The paper aims to discuss the modern technological approach of museums towards documentation, archiving, web application, networking and dissemination of knowledge. Now the museums have become centre of learning as well place for entertainment and has have taken the place of class room; some modern museums are offering classes in its premises for all group, ranging from schools to Post Doctorate. Through video conferences it has become possible to exchange the ideas, debate and theorize the subject. It has taken responsibility to inculcate historical understanding through active engagement of new generations. In its important tools for practical training, the use of latest technology has been utilized greatly. In the conservation of artifact, during their documentation latest technology plays pivotal role in determining the extent of damage as well the remains of previous intervention. This revolution has changed the approach and results are noticeable. The paper will also highlight the use of different light such as UV lights, and raking for condition assessment in laboratory.

The advent of fast moving technology, high speed internet, high end camera, Scanning Electron Microscope (SEM) and different instruments for diagnostic purpose has changed the course of action and its impact. Besides it there are several computer programs which enabled executing the task swiftly and accurately. This all developments have attracted masses as well contributed in research activities.

[1] Hochroth (2006)

1.1

Introduction

The museum has always played a significant role in archiving, documenting and disseminating the information. The digital media has changed the notion about museums; previously, museums were considered monotonous, passive and didactic institutions. The tools used in the museums were manual so were the methods for showcasing the works. Slowly, with the advent of information technology gave a new impetus to museological endeavors. Parry opines that *the influence of digital media on the cultural heritage sector has been pervasive and profound. Today museums are reliant on new technology to manage their collections. They collect digital as well as material things. New media is embedded within their exhibition spaces. And their activity online is as important as their physical presence on site.*[2]

1.2

Pre-digital Era

Pre-digital era reminds about the manifestation of ideas and, expressions through non digital medium. Preparing an exhibition was considered a mammoth and lengthy phenomenon, each step was taking huge time resulting in delay in conceptualization. The slow pace of communication resulted in delay or misappropriated achievement in various activities. The scope of improvement and embracing an alternative was minimal. The exchange of data, plan and their preview were equally cumbersome.

1.3

Digital Age

The advent of digital technology has been considered as renaissance in the field of museums management as a new paradigm was witnessed in cultural resource management. And museum saw a leap in manifesting ideas in the gallery. Museum is now recognized as active center for learning, exhibition began conferring with visitors. *Digital Docents are becoming the standard in museums around the world - and visitors are more and more expecting to be entertained with digital.* [3]

2.1

Digital Application in Museums

The emergence of digital media opened a new vista towards change in museums. The work of museums started executing the task rapidly and; various areas of the institutions have started

[2] Rose (2010)
[3] Digital View (2010)

working digitally. From the documentation point of view, it has helped a lot, the compilation and analysis of data have become easy, the computer and its networking have also provided major support, simultaneously many scholars could work on single project in sharing mode. The Local Area Network (LAN) and some software became instrumental in *collaborative editing*[4] which resulted in enhancing the quality of work and saving the precious time. Some other features like sorting have greatly solved the problem of segregation and quantification of particular work. During the preliminary phase of conceptualization of a show, this sorting option has oriented towards reaching a decision. Sometimes it also helps in setting up the chronology and helps in installation. Museums could use barcode after updating the data base. Prior to use of barcode, *there are three major considerations to bear in mind when considering the use of barcodes. First, the barcode must be visible to the scanner to be read. Second, just because the barcode label or tag is present does not necessarily mean that the object it represents is present. This is especially true if the barcode has not been affixed directly to the object. Third, is there a viable method of attaching barcodes to objects that does damage the object?*[5]

2.2

Radio Frequency Identification (RFID)

Next to barcode, Radio Frequency Identification (RFID) is popular in inventory management system; it has electronically transmitted information to track the movement of materials. *The most common application of this technology has been in Art Museums and Galleries where the RFID transponder can be easily affixed to the backing board, stretcher, or frame of an artwork without damage. Not only is this technology helpful for the conducting of inventories and tracking object movement, but it is also an effective security tool that can be used to track artwork, notify security of the movement or disturbance of an object, and create an alarm situation if an attempt is made to remove an object from the museum building. One of the benefits of RFID technology over barcodes is the ability to read the transponder without it actually having to be visible to the reader. One of the drawbacks is that metal and water can effectively block the signal if it is between the RFID tag and the reader.*[6]

2.3

Photography

The photography is one of the significant area in the museum management, it records the description as well condition of the objects. After the introduction of digitally equipped camera photography has contributed largely in various activities of museums. The visitor also enjoyed new set of experiences during visit and could record their experiences in own camera. Digital camera allowed to record pictures in different formats according to need of museums, for an

[4] Website Microsoft (2011)
[5] Ed. Denver (2010)
[6] Ibid

instance the photography for publication purpose required a different parameter whereas for documentation purpose need different one. Photographic evidence is highly required during any misahappening or deterioration. In order to analyse the damage, previously taken snap is required for detailed analysis. The photographic record is highly useful in consultation during research and conservation of artifacts. At the time of theft and forgery by creating the duplicate of same, visual evidence help in preventing such malpractices. Other recent techniques have potential to bring some more change, according to Artusi *Reflectance Transformation Imaging (RTI), and related emerging technologies such as Algorithmic Rendering (AR) along with its next generation Collaborative Algorithmic Rendering Engine (CARE) tool, are crafted to be compatible with current working cultures and digital-imaging skill sets.*[7]

3.1

Digital Media in Conservation

The digital tools in conservation of artifacts have become indispensible in diagnosis as well in treatment. There are several inventions including real-time monitoring system for suction tables[8] , and in-wall electrical resistance moisture monitoring device. Other analytical tools and techniques (non-destructive and micro-sampling) of works include the analysis of discoloration of white lead pigment, image analysis and infrared investigation. Dan Kushel asserts that "Radiography helps us discover the intricacies of subjects under evaluation. Through detailed imagery, we can decode the many layers of a painting, the structural properties of a piece of pottery, or even the age of a paper artifact".[9] Some modern tools like scanning electron microscope (SEM) is also useful, the image of an object is formed using a beam of electrons rather than visible light. The SEM can magnify objects 100,000 times or more and produce detailed three-dimensional images. *The environmental scanning electron microscope (ESEM) has the capabilities of the SEM—and one critical advantage. investigate the response of samples of the Dead Sea Scrolls to fluctuation in relative humidity.*

Other uses include:

- *determining the elemental composition of paint in cross-sections;*
- *direct examination of swelling and shrinkage of clay in adobe;*
- *dynamic study of corrosion on lead exposed to formaldehyde vapors;*
- *salt crystallization and its impact on building stone.*[10]

3.2

Conclusion

[7] Ed. Mudge et al
[8] http://vitaleartconservation.com/about.htm
[9] Art Conservation with Computed Radiography: Buffalo State College
[10] http://www.getty.edu/conservation/science/about/esem.html

The digital technology has larger role in cultural resource management, its need is seen almost all sphere ranging from imaging, archiving, analyzing, and disseminating data. The major contribution of high end technology has been felt in conservation science, several examples of micro level study has been seen across the world. The didactic purpose of this technology has also changed the course of action and this world became a village. A frequent interaction of thought, sharing of knowledge and discussion on various issues has been observed. The days ahead promise new deliberation and innovation leading to enhancing the quality of knowledge.

3.3

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3.4

Notes

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