

The Potential of Developing a Museum Collection Management System in the Hong Kong Museum of History

Elaine W.S. Kong, University of Hong Kong, Hong Kong
Dickson K.W. Chiu, University of Hong Kong, Hong Kong
Patrick Lo, University of Tsukuba, Japan

The Asian Conference on Literature & Librarianship 2014
Official Conference Proceedings 2014

0455

Abstract

The advent of technologies has provided enormous opportunities in the field of heritage preservation and access. It also coincides with the rising demand from the general public as well as the scientific community of more immediate, more expansive, and more detailed access to cultural heritage. To cope with this change, museums should adopt more information technology (IT) in its management and services, despite various challenges. The traditional mode of running a museum is no longer adequate to fulfill visitors' needs. Thus, it is important to have a centralized system to meet this rising demand. In this paper, we study the potential of adopting a Museum Collection Management System (MCMS) with user-oriented approach at the Hong Kong Museum of History (HKMH). The result showed that it is lacking of an efficient collection management mechanism. By using the Victoria and Albert Museum (V&A) as an example (as they are using MCMS and relevant features to obtain collection information via their website), challenges and possible solutions are discussed, which will eventually help changing the whole picture of HKMH.

1. Introduction and Objective

Museums now have a new identity in the 21st Century: “Digital Museum”, “Virtual Museum”, “Hybrid Museum” and “Museum without walls” are the new labels frequently referring to this new generation of museums (Schweibenz, 1998). While labels vary, preservation of cultural heritage is still the fundamental function of museums. Numerico and Bowen (2006) reported that hundreds of libraries, museums and archives have digitized their collections and placed them on the Web to preserve and share precious materials and information. More and more museum services are going online with the spread of the Internet since the 1990s. Accessibility now has two meanings for museums: on-site and online. Regardless of which method of accessing museum materials is pre-dominant, museum information systems become an essential means of accessing museum collection.

As such, a Museum Collection Management System (MCMS) becomes the gateway to museum materials and contact point for visitors. A good MCMS should provide historical context, preservation and access to cultural heritage. Typically, a MCMS provides a number of access points to visitors for retrieving the information of museum’s collections or artefacts online, such as indexed search fields (like title, keyword, subject, materials used, period) from which both visitors and staff rely on to locate museum materials needed. In other words, a MCMS is a bridge between visitors and museum collections. By given a good first impression to the visitors, design and functionality of MCMS is crucial.

This paper is a feasibility study of adopting MCMS for HKMH. The MCMS of the Victoria and Albert Museum (V&A) is chosen as an example due to its high accessibility with user-friendly interface.

2. Background and Scope

2.1 Hong Kong Museum of History (HKMH)

The HKMH was established in July 1975 and funded by Hong Kong SAR Government, to preserve historical and cultural heritage of Hong Kong and South China (Figure 1). Apart from the main museum at Tsim Sha Tsui, the HKMH runs five branch museums which are the Hong Kong Museum of Coastal Defence, the Lei Cheng Uk Han Tomb Museum, Law Uk Folk Museum, Fireboat Alexander Grantham Exhibition Gallery and Dr. Sun Yat-sen Museum. To promote public awareness and foster greater interest in Hong Kong history, the HKMH organized a wide range of exhibitions, publications, educational programmes on history and culture.



Figure 1. The Hong Kong Museum of History (source: <http://www.discoverhongkong.com>)

2.2 Victoria and Albert Museum (V&A)



Figure 2. John Madejski Garden, Victoria and Albert Museum (Source: <http://www.vam.ac.uk>)

In 1852, one of the earliest public art museums, the renowned South Kensington Museum was founded in London. It is formerly the Museum of Manufactures established following the success of London's Great Exhibition in 1851, which under the patronage of Queen Victoria and Prince Albert, served as an international showcase for outstanding design and craftsmanship. In 1899, Queen Victoria laid the foundation stone and renamed the Victoria and Albert Museum in memory of Prince Albert (Figure 2). The museum's founding objectives - to inspire designers, manufacturers and artisans, and to bring artistic excellence to the general public - were unique, even revolutionary, at a time when European museums were intended solely for aristocrats, scholars and connoisseurs (Baker, Richardson, & Burton, 1997). According to Greenhill (1994), it specializes in decorative arts and crafts and it is thought of today's first public art museums in the UK.

2.3 Scope of Study

This study will firstly introduce the MCMS design and development. As visitors may not have ideas about how the MCMS operates and they are not at the same level of understanding of the staff, its design should be user-friendly and user-oriented as far as possible. On the other hand, professional curators use the MCMS to management museum collection. Functionality and interface in MCMS should be carefully designed for both concerned parties. Through this study, curators can understand more the visitors behavior from which they can model on and design the MCMS that are suitable for most visitors according to their common needs.

3. Literature Review

With the widespread of IT since the 1990s, conservation professionals, heritage interpreters, and information technology experts have been exploring innovative ways to apply technological advances to preserve and provide access to cultural heritage. MCMS are commonly designed and developed as information retrieval systems.

Ellis (1992) introduced two major paradigms of information retrieval studies: the system-oriented (physical) and the user-oriented (cognitive) approaches. The system-oriented approach focuses on algorithm relevance that best match of queries formulated by users and the information retrieved. Most of these studies were focused on information seeking rather than individual users. For example, Belkin and Croft (1987) and Kantor (1994) focused on the varieties of matching techniques and models. Moffat and Zobel (1995) studied how to improve information retrieval systems.

Since late 1970s, the emphasis has shifted from system-oriented to reflect user needs. This user-oriented approach includes relevance judging, factors affecting users' searching performance and information retrieval as a process (Schamber & Eisenberg, 1988; Zmud, 1978).

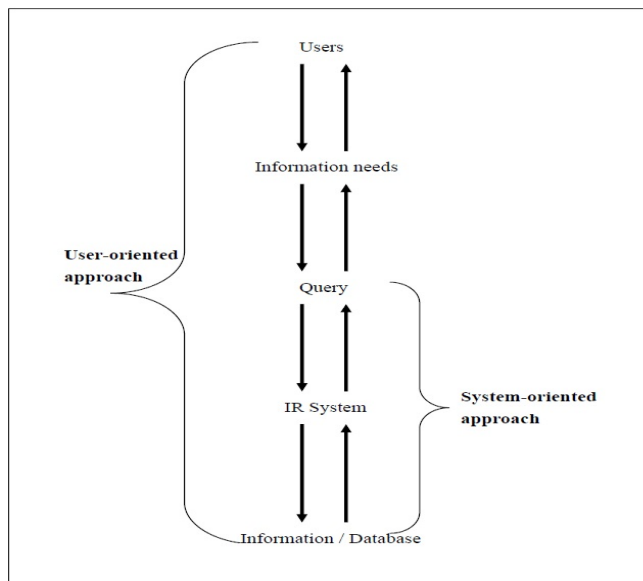


Figure 3. Information retrieval paradigms: user-oriented and system-oriented approaches

Figure 3 illustrates the information retrieval process and the major research approaches. Users express information needs, and then retrieve results related to their expression. A pure system-oriented or user-oriented approach is difficult to define individually because they are related to each other in certain extent. In this study, a combination of both system-oriented and user-oriented approach is adopted with focus on the user-oriented perspective. Both approaches contribute to the understanding of information seeking process in some aspects. However, information retrieval is a dynamic human-computer interaction that is initiated from the user. The system then matches the query and users determine and examine the information for relevance finally. The system-oriented approach focuses on how the information retrieval system matches user queries and how the information can be retrieved, and thus emphasizes only on the later part of the information retrieval process. In contrast, the user-oriented approach starts from the users' information need and how to best match of queries in the information retrieval system, and thus concerns the whole information retrieval process and can understand more about the interactions between users and the system. Also, the user-oriented approach will be useful for the system design of a MCMS.

4. Technical Challenges of MCMS

MCMS has opened many doors to help cultural heritage preservation in the new digital age. However, the use of technology in cultural heritage faces a number of technical challenges given its specific requirements and instability of the objects during digitization. Later on a

number of innovative means of digitization, archiving and displaying have been developed. While technological breakthroughs have helped overcome numerous obstacles in the process of digitization, there remain some considerations that have to be taken into account while planning for such endeavors. Wang, Eliëns, and van Riel (2006) identified five major technical considerations in a project of digitizing the collection of artefacts when planning for introducing IT into art preservation. While their discussion was mainly about archiving, it is still relevant to the planning of digitized cultural heritage preservation:

The arrangement of data storage - With the enormous volume of artefacts, data storage and backup plan must be considered in advance. Even the cost of archiving is expected to drop further with the falling prices of data storage, but safety, stability and contingency planning in case of damage to storage media must be thoroughly considered and planned in advance.

The diversity of materials that need to be digitized - Different types of materials, such as cave paintings, artefacts and manuscripts require different kinds of treatment. In some cases, one type of artefact merits several means of digitization. For example, cave paintings can be digitized as both 2D images and 3D spatial replica for different research and educational purposes. In addition, other types of metadata that will enrich interpretation, such as geo-informatics, have to be recorded during the digitization process. All make the digitization process more complicated.

The treatment of metadata relationships - One of the advantages of digital archive is the ability to relate one artefact or material to another. The construction of such cross-referencing relationship involves the expertise of not only software engineers but also archaeological or art experts. During the database design, all these experts should provide objective judgments and strike the balance among them.

The need for enriching context - In addition to the interrelationship of the collection, providing historical and artistic context to the archive will help not only researchers but also the general public. Regarding to digital archive, it should consider how to provide a representation of artefacts within enriched context.

The multiple designs for different users - A digital archive has to serve multiple users, such as researchers, students, curators, and general public. The requirements of different user

groups can be radically different. An online database has the capacity of catering to different users with different needs. However, its success hinges on the quality of design and execution, which depends on a careful planning from both heritage and technical experts.

5. Solutions

5.1 The MCMS of the Victoria and Albert Museum (V&A)

The MCMS of V&A includes the collections of the National Art Library, the Archive of Art and Design, and the library collections of the Theatre & Performance Department. It provides online access to over 1.1 million catalogue records, as well as over 293,000 images available to the public with high-resolution downloads. Table 1 summarizes the features, which are incorporated with advanced information retrieval techniques.

Table 1. The Features of V&A MCMS	
Features	Descriptions
Collections management	It gives V&A staff access to the collection's information including acquisitions, inventory and cataloguing. Records can be retrieved, created and edited through internal interface.
Image Library	It stores all images and provides access by searching via the V&A website.
'Search the Collections' website	It provides online searching for information of collections objects via the V&A website.
Digital Asset Management	It provides centralized management with V&A digital assets, including videos, audios, text files, publications and documents.
Web 2.0	<p>Social media tools were adopted to build community and extended knowledge. The 6 main platforms are:</p> <ul style="list-style-type: none"> • Blogs: http://www.vam.ac.uk/page/b/blogs/ • Facebook: https://www.facebook.com/victoriaandalbertmuseum • Flickr: http://www.flickr.com/groups/va_museum • LinkedIn: http://www.linkedin.com/company/victoria-and-albert-museum • Twitter: https://twitter.com/V_and_A • YouTube: http://www.youtube.com/user/vamuseum <p>with the integration of museum content generated on the other social media</p>

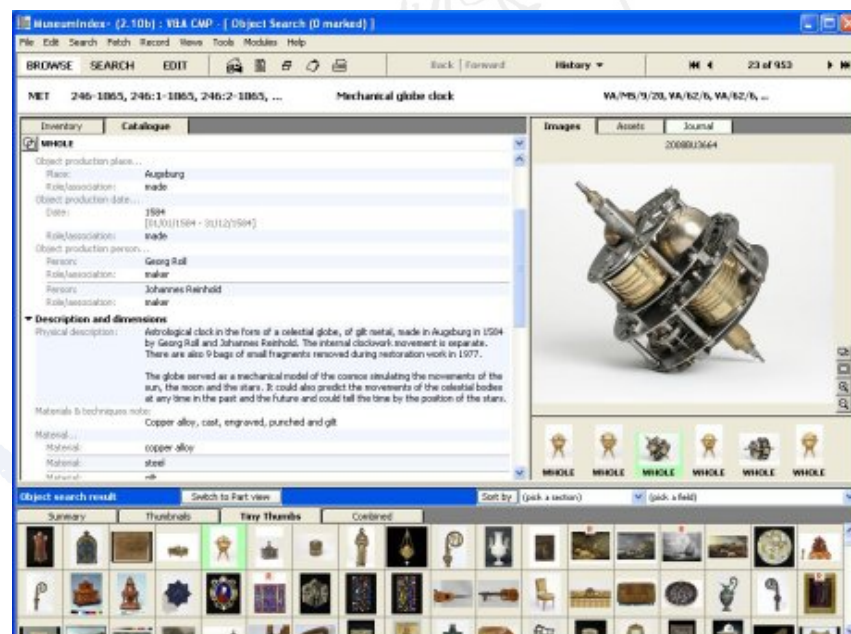


Figure 4. Screenshot of V&A MCMS
(source: <http://www.ssl.co.uk/news/v-and-a-collectionsindex>)

The MCMS of V&A was launched in July 2011. As it provided high accessibility with user-friendly interface, it had received positive feedback from the community. In 2012, the V&A has won the Collection Trust's Inaugural Collection Practice Award that demonstrated the effectiveness of MCMS between V&A and its software provider (Woolley, 2012).

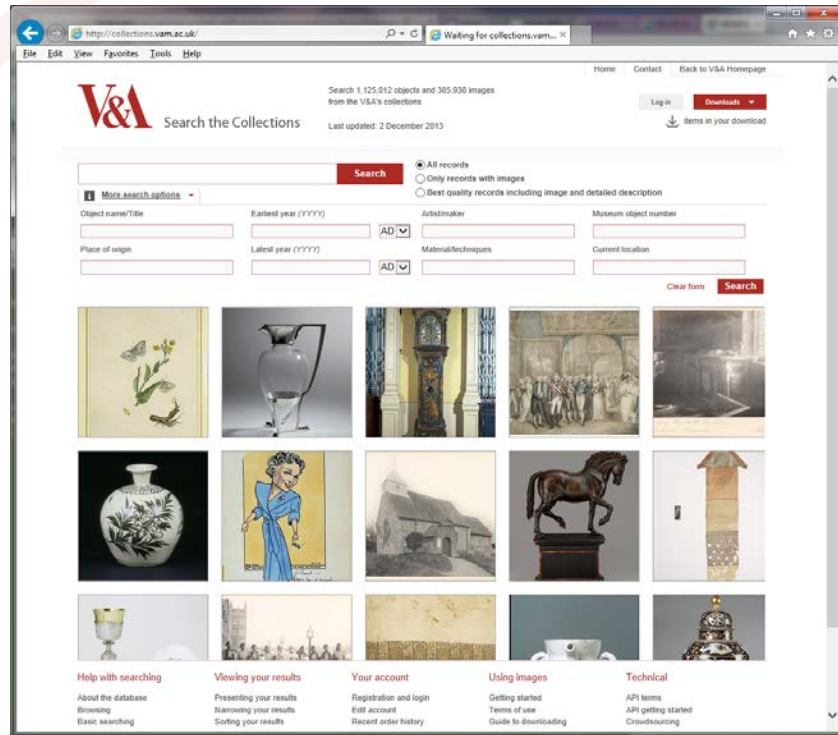


Figure 5 'Search The Collections' website (Source: <http://collections.vam.ac.uk>)

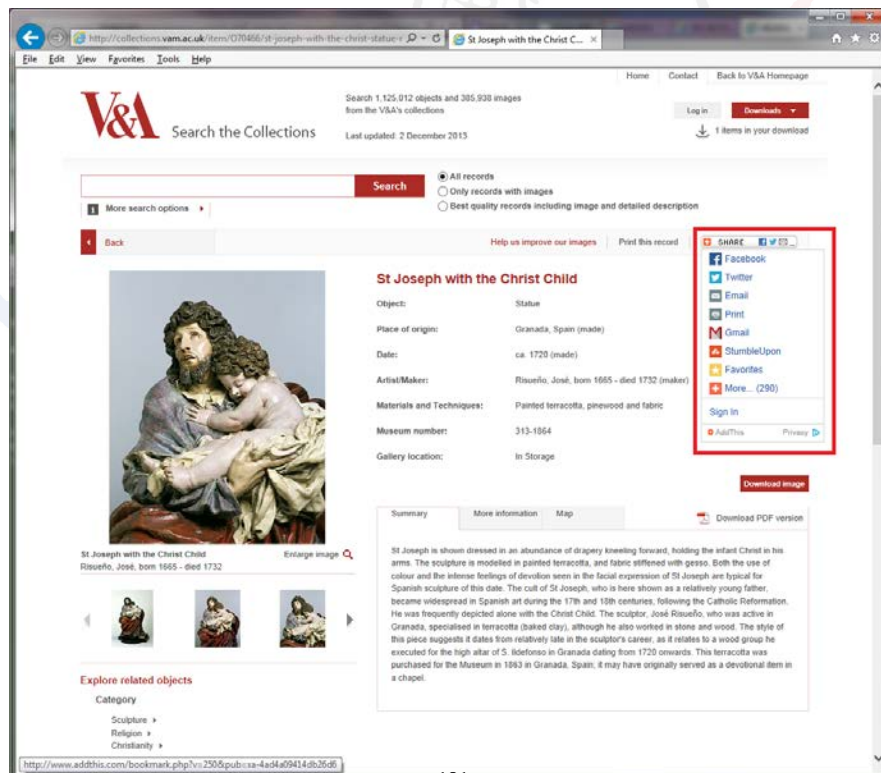


Figure 6. Web 2.0 social media tools integrate of museum content
(Source: <http://collections.vam.ac.uk>)

MCMS in V&A centralize the administrative tasks and increase productivity. MCMS integrate all administrative works in a single system, which streamline the workflow and ensure the data consistency by eliminate redundant task with duplicate data entries.

5.2 Development of MCMS in Hong Kong Museum of History (HKMH)

Before studying the development of MCMS in HKMH, a desktop study, site visit and interview with HKMH's staff had been conducted to review the current approach adopted by HKMH in museum management. The result of current approach summarized in Table 2.

Collection management	Only historical photographs were digitized (Figure 7). Others collection information were recorded by Microsoft Access for internal use. http://mhmcms.lcsd.gov.hk/aspnet/asp/entree.aspx
Data management	All metadata stored in the internal database can only be accessed by authorized users.
User interface	Website was revamped in May 2013 with Web 2.0 social media tools such as Facebook, Twitter and Weibo for knowledge sharing purpose.
Searching	Search functions on the top menu bar provide searching for document, such as tender notices and press release. It does not allow users to retrieve collection information.

Table 2 Summary of current approach of HKMH



Figure 7. A screenshot of 'Historical Photographs' search

Table 3. Some Suggested Essential Features for HKMH MCMS

Features	Descriptions
Collection management	<ul style="list-style-type: none"> Provide overview of the information objects and support research, cataloguing, event and exhibition planning, inventory management and documentation activities.
Data management	<ul style="list-style-type: none"> Export all metadata which are stored in the central database for access by authorized users. Supports multimedia editing of all digitally stored data image, audio, video, text, etc. Manages access right to protect digital information against unauthorized access through watermarks.
User interface	<ul style="list-style-type: none"> User-friendly interface enables users without need for programming skills. Allow web-enabled retrieval of collection's data and available to a wide audience 24x7. Link up Web 2.0 social media tools such as Facebook and Twitter, for knowledge sharing purpose.
Searching	<ul style="list-style-type: none"> Allow users to retrieve information quickly and efficiently with menu tabs, pull-down lists, selection of multiple fields and advanced search functionality including cross-collection searches, hierarchical search and full-text search.
Reports	<ul style="list-style-type: none"> Draw statistical data for analysis and export to flexible file formats such as Excel, Access, PDF, etc.

Through the desktop study and interview, it is revealed that the application of IT in HKMH's management is very limited. Development of a MCMS in HKMH will be a cost effective solution in data and collection management and enhancement of visitors' experiences. In particular, HKMH have several branch museums, which can be benefitted from scale of economies. To develop synergy and diverse utilization of information technologies in museum collection management work, well-planned functional and technical requirements specifications should be prepared. After studying their requirements, some suggested proposed features are given in Table 3.

6. Limitations and further work

There are a number of limitations in this study. The major one is the reluctance of the HKMH to disclose their internal information in detail, such as collection management standards and IT development plan, giving that some information may be of a sensitive nature. Therefore, indirect channels in gathering the necessary information for this study had been made and unable to present a relatively comprehensive comparison to V&A.

A second difficulty encountered is the administrative constraint imposed by the HKMH, which made it impossible to conduct large-scale evaluation exercise. Despite of this limitation, by referencing to V&A, some significant features of MCMS as well as its values and limitations explored.

Among all, two particular areas can be further investigated. (1) In finding out the effectiveness of using MCMS in museums, future study on user experience can be conducted so that the study can be focused on the information retrieval process rather than technical issues. (2) Another area of study is to future investigate in museum management perspectives, such as (i) experience in MCMS implementation, (ii) experience in project management, and (iii) the impacts of other Web 2.0 tools such as Facebook, Blogs, Twitter and YouTube in museums context.

7. Conclusion

The use of digital technologies in preservation of culture heritage promises great possibilities while carrying a number of potential pitfalls. While technological innovation benefits collaboration and knowledge sharing between different institutes in the heritage sector, it also brings challenges to them.

In the view of conservation, digital technologies not only offer a way of state-of-the-art presentation, but also allow visitors who would never be able to physically visit the artefacts due to issues of sustainability or accessibility to appreciate the artefacts in an innovative and interactive way.

Whatever technology we used for cultural heritage, it is hoped that the digital trend can enhance heritage appreciation through effective presentation, anytime, anywhere. At the same time, visitors would be alerted of the uncertainty of the future of the fragile artefacts, and help raise awareness of conservation and sustainable visitation.

References

Baker, M., Richardson, B., & Burton, A. (1997). *A grand design: the art of the Victoria and Albert Museum*. Harry N. Abrams.

- Belkin, N. J., & Croft, W. B. (1987). Retrieval techniques. *Annual review of information science and technology*, 22, 109-145.
- Ellis, D. (1992). The physical and cognitive paradigms in information retrieval research. *Journal of documentation*, 48(1), 45-64.
- Greenhill, H. E. (1994). *Museum and gallery education*. Leicester :: Leicester University Press.
- Kantor, P. B. (1994). Information retrieval techniques. *Annual review of information science and technology*, 29, 53-90.
- Moffat, A., & Zobel, J. (1995). Information retrieval systems for large document collections. *NIST SPECIAL PUBLICATION SP*, 85-85.
- Numerico, T., & Bowen, J. P. (2006). *Copyright Protection and Cultural Heritage: Steering digitization between public archives and search engines*. Paper presented at the EVA 2006 London Conference Proceedings.
- Schamber, L., & Eisenberg, M. (1988). Relevance: The Search for a Definition.
- Schweibenz, W. (1998). *The "Virtual Museum": New Perspectives For Museums to Present Objects and Information Using the Internet as a Knowledge Base and Communication System*. Paper presented at the ISI.
- Wang, Y., Eliëns, A., & van Riel, C. (2006). *Content-oriented presentation and personalized interface of cultural heritage in digital dossiers*. Paper presented at the International Conference on Multidisciplinary Information Sciences and Technologies (InSciT2006) October.
- Woolley, J. (2012, 28-06-2012). V&A MUSEUM WINS COLLECTIONS TRUST'S INAUGURAL COLLECTIONS PRACTICE AWARD. Retrieved November 2, 2013, from <http://www.collectionslink.org.uk/discover/collections-development/1383-vaa-museum-wins-collections-trusts-inaugural-collections-practice-award->
- Zmud, R. W. (1978). AN EMPIRICAL INVESTIGATION OF THE DIMENSIONALITY OF THE CONCEPT OF INFORMATION*. *Decision sciences*, 9(2), 187-195.