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Digitisation of Museum Collections.

A Worthwhile Effort?

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Digitisation of Museum Collections. A Worthwhile Effort?

ABSTRACT

Early digitisation might have been thought of as the actual technique used to create a digital surrogate of an analogue object. Today the term covers a range of activities from choice of object to be digitised through to possible end use of the digital material. Museums of any renown worldwide have taken steps to make their collections accessible on line. Researchers and the public alike expect to be able to find images of objects online at the click of a button. This paper reviews the impetus for this aspect of digitisation and investigates the consequences of these activities.

A qualitative literature review, an empirical study of directives and case study of three museum websites are used in order to test the proposition that digitisation of museum collections has proceeded without formal museum policies, but is now being driven by government directives to provide access to collections. This results in a change in focus for the museum to become knowledge rather than object oriented.

Historically there has been a move towards preventive conservation. Digitising a collection would seem to support this ethic. Once photographed the object can be archived and not handled unnecessarily. There may be further benefits in terms of conservation research including manipulation of the digital image and reconstructions otherwise not possible without significantly altering the original. Through an on-line survey the impact of digitisation on the role of the museum conservator is investigated.

It is concluded that many of the reasons for digitising found in the literature are not in fact reflected in directives, or found on the websites reviewed in the case studies. The reasons instead seem to have become consequences of having made the collections catalogues available on-line.

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Foreword

My introduction to the Internet was 20 years ago. At that time it was necessary to unscrew the telephone socket in my Taiwanese hotel room and connect to the wires using crocodile clips so that I could email progress reports to my boss, and download updated software for the machinery that we were trying to sell. Now I have been able to follow the first year of my niece's life in Australia from the comfort of my own sofa - wirelessly. I can indulge my obsession with checking the weather forecast using a device that fits into my pocket, and if I wanted to could conduct a business meeting sat in the sunshine on the Cannes sea front. We are an online society - if we want to know the answer to something, communicate with someone, check the price of something, book an airline ticket etc etc we can (and do) use the Internet.

Prior to this course of study I spent much of my working life in the automotive industry, where systemisation is key. I am always very interested to see how systemisation and procedures are being used in conservation. Use of databases in collection management is one example of systemisation. A museum conservator is one of the key users of this database, for example to find pieces in the collection, to record conservation treatments and to record condition reports in conjunction with loans. The conservator may even be responsible for taking the photographs that are used in the collection record. Now, the collections database is being made searchable on-line as part of museum's commitment to digitisation, and becoming part of the on-line information society. I wanted to understand the purpose of this digitisation: what are the aims? Are they being met and who are the users of the information?

I would like to thank my family for their support whilst I wrote this paper, not least for putting up with my occupation of the dining table for three months, and my husband for Photoshop trickery. I would like to thank my mother, and sister Maria for proofreading and grammatical explanations - living in another country for ten years can have an interesting effect on the use of your mother tongue! Thanks are due to my employers for the three-year leave of absence to pursue my studies. I would like to acknowledge the time taken by the conservators who responded to my survey, and others who answered emails and telephone interviews. Thank you finally to my supervisor, Professor Ola Wetterberg, who in spite of his heavy workload took a lot of time to support me through the writing of this paper and to ensure it was structured and, hopefully, interesting.

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1. Introduction

1.1 Background

Wilcomb E. Washburn head of American Studies at the Smithsonian presented a paper at the 1967 meeting of the American Association for the Advancement of Science where he described the need of scholars "to have easy access to a library of objects projected on a video screen in their studios". He also asked if "objects can be translated into machine language, into visual description, into scholarly analysis…need one save objects at all?" (Washburn, 1968 p.9-10). Since these visionary questions were posed there have been huge advances in technology and now museums of any renown worldwide have taken steps to make their collections accessible on-line. This paper reviews the impetus for these digitisation efforts, and investigates the benefits and possible threats of these activities.

Digitising museum collections has now developed from being a special project to an accepted core activity. The drivers are government and regional (e.g. European Union, EU) directives and policies, and public expectations.

Historically there has been a move towards preventive conservation. Digitising a collection would seem to support this ethic. Once photographed the object can be archived and not handled unnecessarily. There may be further benefits in terms of conservation research including manipulation of the digital image and reconstructions otherwise not possible without significantly altering the original.

1.2 Problem statement

Computer technology was introduced into museums (in America) in the 1960s, although limited to museums that could afford the so-called "mainframes", and many of the first applications were for accounting. Specialist data processing operators entered data via keypunch cards.

During the next decade mini-computers began to replace mainframes. Smaller and more powerful than mainframes, they still required specialists to enter the information. The 1980s brought the microcomputer smaller and more powerful again, these computers were easier to use and lower cost. Specialist data processing operators were no longer required. At the same time professional bodies were formed to support document standardisation, and the use of computers in the museum. During the 1990s there was an increasing government and public perception of the importance of the information society. Museums were concerned with inventory control, and supporting public and research access to the collections. By the start of the 21st century there was pervasive use of computer systems and networks, not just in the workplace but also at home. The public had expectations for access to information, and government policies supported that access (Williams, 1987 and Roberts, 2001).

Having built databases to manage collections information, when pressure was exerted to give the public access it seemed only logical to use information that was already digitised, and so collections databases are now searchable via the Internet. At EU level there are targets to have "all public domain masterpieces" available in the Europeana[1] portal by 2016 (Report

[1] Europeana is a portal launched in 2008 with the goal of making Europe's cultural and scientific heritage accessible to the public. It does not host any content but gives access to content stored de-centrally by the cultural institutions. There are currently more than 15 million items, including text, image and sound accessible, contributed by around than 1500 institutions. www.europeana.eu

of Comité des Sages, 2011 p.25). At national level digital strategies are being developed to support creation and preservation of digital heritage. However in spite of this ongoing effort and proliferation of portals and aggregators, very few museums have their own written policies to justify and explain the activity. Digitisation has become a routine activity but necessitates re-direction of funding and resources within the museum.

One plausible explanation for this activity is that giant portals such as Europeana are in fact acting as a pull mechanism and somehow driving the activity. Museums are being exhorted at a national level to provide data and are doing so, but there is little clear evidence about how the digital information is then being used. Furthermore there are concerns about the longevity of the digital record if there is no investment in long-term preservation to ensure that information is saved from obsolescence as technology continues to develop. Expert reviews have proposed that future uses for the data will be developed, without clearly explaining what those uses might be.

1.3 Objectives

In this dissertation I will test the proposition that digitisation of museum collections has proceeded without formal planning, but is now being driven by government directives to provide access to collections. Further the purpose is to understand how those directives and museum policies for digitisation may reflect possible reasons for making databases of museum collections available via the Internet. The intention is to understand the drivers for digitisation of museum collections, and to examine the consequences of the activity. I will look for supporting arguments in related literature, and for arguments that can be traced back to the history of collecting and cataloguing. Additionally I will investigate the impact of digitisation on the role of a conservator.

1.4 Methodology and disposition

Through a literature review I aim to investigate the possible benefits and consequences of digitisation and more importantly the reasons for digitising. I will then review policy documents to determine if those benefits and consequences are explicitly stated, and if the drivers for digitisation can be identified. Three museum on-line catalogues will be reviewed to investigate if the policies have been applied, and if the benefits and consequences are evident. Through personal communications and interviews my intention is to seek to support the reasoning that is found in the literature, and to understand the motivation for the policies. An Internet based survey will be used to reach conservators working in museums to understand how the role of the conservator is affected by digitisation, if at all.

Chapter 2 starts with a review of the history of museums: how and why did they come into being and how easy was it to gain access to the collections? This is followed by a review of the use of images in museums collections records. Early examples of catalogues are described, and how collections management moved from index cards to computer databases. Reasons for making those collections available on-line are explored, and the consequences of doing so are reviewed.

Chapter 3 reviews the DigiCULT and Comité des Sages[2] reports to the European Commission. Published eight years apart their focus is compared: is the motivation for digitisation still the same? An inquiry to support development of a national strategy in Sweden is reviewed: can the same reasons for digitisation be found here as at EU level? Statistics regarding progress in digitisation are presented.

[2] The Comité des Sages is a 'reflection' group tasked to make recommendations to the European Commission on ways to make Europe's cultural heritage available on the Internet. See also http://ec.europa.eu/information_society/activities/digital_libraries/comite_des_sages/index_en.htm

In Chapter 4 three museums are reviewed: do they have digitisation policies, can the reasons for digitisation, as reviewed in chapters 2 and 3, be found in those policies, and are the reasons reflected on the museums' websites.

The consequences of digitisation and potentials of computer technology for conservation together with the results of the survey are summarised in chapter 5. Chapter 6 discusses the findings of the previous chapters, and conclusions are drawn to try to meet the objectives defined in section 1.3 above. Chapter 7 is a summary of the dissertation.

1.5 Scope and limitations

The purpose of this study is to provide an understanding of the primary drivers for digitisation activities at museums and to review the implications of those activities. The methods used are a literature study, an empirical review of policies regarding digitisation, and a survey of conservators working with museum collections.

This dissertation discusses the creation of a database of images of the objects in a museum's collections, available via the Internet, which may be based on an in-house digitised registration system, where computers rather than traditional catalogue cards are used to record collections information.

The dissertation will not review the following issues in detail, although they may be mentioned in the text:

- choice of software
- scanning of photographic prints in museum collections to create a digital surrogate
- blogs and other social media as tools for museums to increase contact users
- preservation of digital heritage i.e. issues involved with maintaining access as technology develops.
- Copyright issues arising from on-line publishing

1.6 Source review

Within the field that has become known as "digital heritage", there are a number of recognised researchers including Fiona Cameron, Paul Marty, Melissa Terras, Jennifer Trant and Ross Parry. Appropriate to the subject, much of their material is available on the Internet as published conference papers, journal articles, as contributions to community websites, in blogs, discussion lists and as contributions to government inquiries and reports.

There are a number of annual conferences, some of which focus on software development, others on end use and research potential, these include:
ICHIM - International Cultural Heritage Informatics Meetings; EVA - Electronic Visualisation and the Arts and most notably Museums and the Web (MW). "Museums and the Web is an annual conference exploring the social, cultural, design, technological, economic, and organizational issues of culture, science and heritage on-line. Taking an international perspective, MW reviews and analyzes the issues and impacts of networked cultural, natural and scientific heritage – wherever the network may reach. Our community has been meeting since 1997, imagining, tracking, analyzing, and influencing the role museums play on the Web, and having fun doing it" (www.archimuse.com).

In the UK Nick Poole, Chief Executive of the Collections Trust is particularly active in the field. The Collections Trust website includes a lot of material - from descriptions of what digitisation involves, to contributions to EU Commission reports on cost of digitisation, and reports on progress.

There are also a number of books that collect the thoughts of key writers in the field. Three of them, referenced in this paper, are reviewed here. *The wired museum: emerging technology*

and changing paradigms, edited by Katherine Jones-Garmil. Written as technology, the Internet and the World Wide Web were starting to have an impact on everybody's life, this book explores the impact of technology on museums. It has eleven contributors who analyse the opportunities they think the technology will bring. Guy Herman, in the chapter entitled *Shortcuts to Oz* points out that the collections are the museums' primary asset; exploiting that asset on-line is vital if the museum is to retain any influence in a wired world. Howard Besser discusses possible impacts on the role of the curator and visitor numbers to the museum. Katherine Jones-Garmil is also involved in a later publication Marty, Paul. & Jones, Katherine Burton (ed.) (2008). *Museum informatics: people, information, and technology in museums.*

Another useful reference is: *Theorizing digital cultural heritage a critical discourse*, edited by Fiona Cameron and Sarah Kenderdine. This book is an anthology including works by 30 writers who "explore the relationships created within cultural complexes such as the philosophical, historical, social, artistic, biological, geographic and linguistic". Authors discuss how traditional cataloguing practices have restricted the information available about an object to the taxonomy used at a specific museum, and the knowledge of a particular curator. With the possibilities for interaction offered by a digital catalogue the content of the record, and therefore its usefulness, and documentary value is greatly expanded. The empiricist documentary position, and post structuralism/post modernist discursive context are terms used to support the theoretical analysis of cataloguing systems. There is also a chapter written by Peter Walsh describing museums as either pre- or post-photographic, an interesting notion that explains why there are so many photographs in museum archives.

Published in 2010 *Museums in a Digital Age* edited by Ross Parry collects together writing from a 20-year period to present key readings in museum thought and practice regarding digitisation.

In Borås, Sweden, a number of students at the school of library studies have chosen digitisation as the subject of their Masters thesis. For example in 2004 Malin Gumælius wrote *Vad innebär digitalisering av kulturarvet?: en ideologianalys av tre svenska digitaliseringsprojekt* (Is digitizing our cultural heritage a matter of preservation, giving access, or both? : an ideological analysis of three Swedish digitization projects). The author reviews Swedish government policies for each of the archive, library and museum fields to try to identify the ideologies behind them. She develops a model that she then tests against three Swedish digitisation projects. The model identifies three ideologies: preservation, access and also, preservation and access. She further identifies six user groups: general public, government authorities, education and research, the institute carrying out the digitisation project, its personnel and commercial bodies. Gumælius also identifies six key consequences of digitisation projects. Although written 7 years ago, I think that the information is still relevant regarding benefits and consequences of digitisation, as the policies that she uses to develop her model have not changed significantly since then.

In 2006 Therese Andersson and Ann-Katrin Nilsson conducted interviews at two museum photographic archives for their thesis, *Digitalisering av bilder vid två museer.* (Digitising of images at two museums). Their findings are summarised in section 2.4.

At Uppsala university (Sweden) Henning von Platen wrote his Masters thesis *Digitalisering inom ABM-området: fyra project* (Digitisation in the archives, libraries and museums field: four projects.) He reviewed the activities at Uppsala University Library, the Kungliga Bibliotek (Royal Library), Hallwylska Museet and Riksarkivat (National Archives) and concluded that activities had started without government directive or even internal policy. Instead the archivist, librarian or museum personnel's own desire to be able to share their collections drove digitisation. He stated that particularly in the case of archives a digitised image helps them to meet the goals of caring for the collections whilst also giving access to them.

An on-line survey was created using the website www.surveymonkey.com. At no cost it is possible to create a ten-question survey that can be sent via email, or as a link on a webpage. The results are collected by IP address, and analysed in the form of graphs. It is possible to view the individual responses, or the summarised responses to each question. (At a cost it is possible to create more questions, and have more downloadable analysis at the end of the survey.) The survey was sent electronically to the mailing lists of Svenska Föreningen för Textilkonservator (SFT, Swedish Association of Textile Conservators), and Nordiska Konservator Förbundet - Sverige (NKF-S, Nordic Conservators Society). A link and request to complete the survey was also posted on KulturvårdsForum (http://www.kulturvardsforum.se/), an on-line community hosted by the Swedish Heritage Board (Riksantikvarieämbetet, RAÄ).

Advantages of using an electronic survey are that it was easy to create and disseminate. It was in a format that was easy for the respondent to use, and not likely to get lost in a pile of papers on a desk. Times taken to complete the survey ranged from about ten minutes to an hour so busy schedules were not overly taxed. It was easy to reach a large number of potential respondents with minimal effort. The respondents only needed to open a file and answer; they were not required to return the form by post. Effort on their part was reduced.

Disadvantages include that it is not clear how many of the people who received the survey were valid targets (conservators working in museums), or of the potential targets, how many answered. The survey was written in English but it was not made clear that answers in Swedish were acceptable; this may have deterred people from responding. Language may also have affected interpretation of the questions. That the survey format is easy to use, and quick responses are possible may mean that the responses are not as thought out as they could be; on the other hand the respondent has more time to consider than in an interview situation.

1.7 Theoretical framework

The field of digital heritage is relatively young and extremely fast paced. The technologies develop faster that the rhetoric evaluating them (Paul, 2003 p.67). In Cameron and Kenderdine's anthology various writers theorise the use of the representation of art using digital imagery, the role of cultural institutions as knowledge providers, notions of social inclusion and uses of virtual reality in exhibitions. Cameron herself uses complexity and network theory to investigate the logic that is shaping museum collections and information flow. She also uses the term "epistemic relativism" when discussing object documentation. The term epistemic is used to describe a statement or judgment (cf. the term ontological which describes objects and properties). Relativists, also known as constructionists, argue against objectivity in science (Holmdahl, 2010). So with the term epistemic relativism Cameron is implying that knowledge linked to the museums objects depends on the desires, preferences and attitudes of those creating them. This in turn leads to her use of the term polysemic, implying multiple layers of meaning. The object cannot speak for itself, it's meanings and values are accorded by the observer, and for a collections database to be truly useful the museum must allow meanings and values to be ascribed by users inside and outside of the museum.

However, Cameron and other writers do not explore the reasons why museums have shared their collections database on-line, most studies start from the premise that the material is available, and so how can it be used.

2. Museum history and cataloguing practices: from boxes and cards to digital representation

2.1 History of museums and collections access

This section describes the history of museums, where and why were they opened. Who visited and was it easy to gain access to the collections? The changing role of the museum from holder and carer of collections (archivelike) to sharer of knowledge and educator (more librarylike) is reviewed. It is argued that this change in role has supported the sharing of information via the Internet.

2.1.1 Background

To understand why access to collections might be seen as important, it is necessary to understand why people collect in the first place, where does the human obsession with objects come from and what do we hope to learn from them? Akin identifies several reasons for collecting, including that collectors wish to connect themselves with history: people collect links to their own past through photographs and holiday souvenirs, but also like to own objects linked to an historical person or event, for example a piece of the Berlin Wall. Another reason is for the "thrill of the chase": the research involved in finding an object, contact and competition with fellow collectors, and the source of pride in finding a long sought after object are motivators (Akin, 1996 p.109-114).

Alexander develops these reasons further stating that collecting seems to be instinctive for human beings, and that this may be based on pursuit of knowledge and connoisseurship or simply obsessive collecting. It has been suggested that museums claims of exhibition, education, culture and social good as their purpose are rationalisations used to justify a basic collecting passion (Alexander, 2008 p.188).

2.1.2 Private collections

As discussed above humans have a desire to collect. Greeks and Romans collected art, and in Roman cities there was public art but no access to private collections. In medieval Europe royalty and the church held collections. The Renaissance movement in Italy resulted in collections of antiquities and patronage of the arts (Lewis, n.d.).

The developing interest in human as well as natural history in the 16th century led to the development of specialised collections. These included natural history collections, portrait collections, archaeological and manuscript collections and were found in the "cabinets" of collectors. Two new words came into use: gallery (from Italian *galleria)*, which came to signify an exhibition area for pictures and sculpture; and cabinet (from Italia *gabinetto*) used to describe a room filled with stuffed animals, botanical specimens, curios and artefacts. In Germany this was referred to as a Wunderkammer, and in England more usually as a curiosity cabinet. Galleries and cabinets were rarely open to the public (Alexander, 2008 p.5). One notable exception was the collections of the Medici family in Florence. Paintings from the collection were on display to the public in 1582 (Lewis, n.d.). Keepers of collections were more likely to admit royalty, princes, ambassadors and other nobility even then by appointment only (Wittlin, 1970 p.76).

2.1.3 From private wealth to public education

In the 17th century learned societies such as the Royal Society in London (1660) and the Academy of Sciences in Paris (1666) were established. These groups promoted corporate discussion, experimentation and collecting. Their collections contributed to the formation of today's museums. Private collectors wishing to ensure continued study of their collections, started to bequeath them to the cities that they lived in, to the realm or to the learned societies. In this way collections moved from the private to the public domain (Lewis, n.d.).

So-called public museums began to open in the late 17th century. The University museum of Basel opened in 1671, the Ashmolean in Oxford in 1683 (Alexander, 2008 p.5). The Ashmolean Museum (see also 2.3.1) was a research facility for the school of Natural Philosophy, and the first people to view the collections were the Duke of York and doctors and masters of the university. When the public were admitted they had to pay a fee commensurate with time spent in viewing the exhibits (Wittlin, 1970 p.78).

In the late 18th and early 19th centuries industrialisation meant that skilled and educated workers were required: museums were a way to educate an increasingly urbanised population. Bennett argues that museums were also a political tool to reform manners and regulate social behaviour (Bennett, 1995 p.24). This period is characterised by exploration, trade and a prevailing "Spirit of Enlightenment."

The British Museum opened in London in 1759, having been established by an act of parliament in 1753 (see also 4.3). The majority of the objects came from the collections of Sir Hans Sloane. The state paid £20,000 for 80,000 objects. In accordance with Sloane's will the collection was to be maintained "intire without the least diminution or separation"[sic], and to be made accessible to the public (Smith, 2007 p.10-11). The ideals articulated by the founders reflected Enlightenment thinking that knowledge and understanding were necessary in civil society, and tools against intolerance (MacGregor, 2004). Although entry to the museum has always been free, for many years visitors had to apply for one of the limited number of tickets issued daily. Museum visitors were learned gentlemen, and access was according to court like etiquette.

2.1.4 Royal collections go public

Many European museums developed from royal collections. The Louvre was originally a palace built for the kings of France. Even before the French Revolution there had been plans to open the collections as a museum - purchases were made to complement the collections, and plans drawn up for alterations to the buildings (Wittlin, 1970 p. 82). It was however only following a decree in 1792, nine days after the fall of the monarchy, that the royal palace was turned into a public museum. Through the arts the public was to understand the Revolution's history, its purpose and aims. When the museum opened in 1793 the displays were little changed from when the building was in use as a palace and critics felt that the goal of a "school" was not being met. Napoleon appointed Dominique-Vivant Denon as museum director. He re-arranged the galleries based on chronology, art-historical methodology and national schools and in so doing changed the focus from political-ideological to historical-documentary (Schubert 2009, p.18-22).

The Prado in Spain is a building originally built to house a Museum of Natural Science. In 1819 the royal art collections were moved there from the royal palace. It was to be a "gallery of paintings and sculpture for the teaching and profit of pupils and professors; it was to satisfy the noble curiosity of natives and foreigners and to add to Spain's glory" Foreigners wishing to visit the Prado had to show their passports, and visitors were admitted only on Wednesdays and Saturdays (Wittlin, 1970 p.92).

Catherine the Great began the collections that would become the Hermitage. In 1778 she wrote, "the only ones to admire all this are the mice and me". When the collection became a public museum in 1852 tickets were only available on application to the court office.

By the beginning of the 19th century developing national consciousness was leading to the opening of National museums, for example the National museum in Budapest 1802, in Prague 1818 and in Copenhagen in 1819 (Lewis 2006, p.379). The National Museum in Stockholm opened in 1866, using collections that had already been accessible at the Royal Palace (Sörlin 1998, p.17).

2.1.5 The influence of photography

Walsh proposes that museums can be divided into pre-photographic and post-photographic. The pre-photographic include the early museums discussed here, the Ashmolean, the Prado, the Hermitage and the British Museum, founded around existing collections of originals, with the purpose to showcase imperial power and national prestige. The post-photographic museums, Walsh argues, were built to house specifically created collections rather than existing ones. Their purpose was education (Walsh, 2007 p.23-24).

The South Kensington Museum, later the Victoria and Albert (V&A), is the first major example of such a museum. Founded in 1852 it had two main goals "to elevate public taste … and to elevate society through the morally beneficial influence of great art." When originals were unavailable photographs, plaster casts and other reproductions were used instead (Walsh, 2007 p.25).

Charles Thurston Thompson was appointed as the museum's first photographer. He photographed original works, as well as originals in-situ if a cast was being made for exhibition at the museum (e.g. the 12th century portal of Santiago Cathedral, see fig. 1). He also photographed potential acquisitions; his images would be used to raise support for purchasing collections. The museum sold photographs of the collections to the public, and there was a huge demand. The older (pre-photography) museums were much slower to adopt the practice. The British Museum employed Roger Fenton (a photographer who documented the Crimean War) between 1855 and 1859, but the trustees could not see the importance of photography, and he was not replaced until 1927 (Walsh, 2007 p.26).

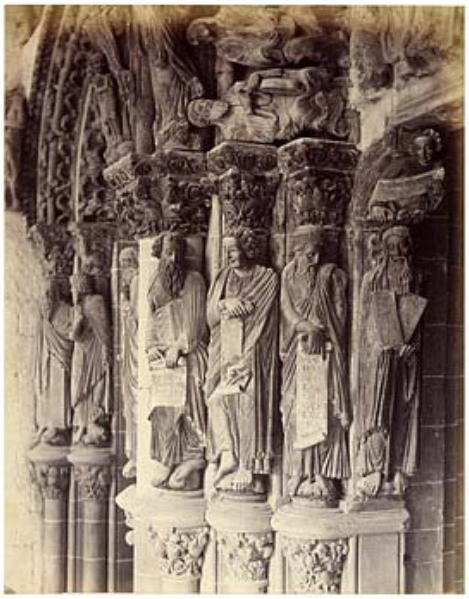


Fig 1. Portal Santiago Cathedral, Charles Thurston Thompson. Photo © Victoria and Albert Museum, London.

In North America most museums were founded a good while after the introduction of photography and following the example of the South Kensington museum, used copies and specifically photographs in exhibitions (Walsh, 2007 p.27). These practices on both sides of the Atlantic explain why museums now have vast photographic archives ready for scanning and digitising.

2.1.6 Towards information as utility

In summary museums started as a political tool to educate the populace as they moved from agricultural to urban and industrial employment. The museum has been used to reinforce national identity, and even to create those identities. Collections have been created as resource material for researchers, as curiosity cabinets, for aesthetic reasons and for pedagogic reasons. The care of history became scientific as collections were classified and studied more closely. Some early collections were specifically for research; scholars would have studied the objects on-site to increase their knowledge. Now, as politicians talk of a knowledge based economy, sharing the knowledge that the museum has about its objects has become a priority. A need has arisen to provide access to information about the objects, as well as to the objects themselves (Marty, 2007 p.4). "For a museum the website can combine research with outreach, and is the nearly complete solution for information distribution" (Mudenda, 2002 p.5).

The International Council of Museums (ICOM) defines a museum as "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" (www.icom.museum). Veirum and Christensen state that visibility and public accessibility are the main concerns of this definition. They argue that visibility on the Internet is key to sharing knowledge particularly with younger users. In societies where Internet access is high, and people are early adopters of technology (e.g. Scandinavia - in Denmark 47% of the population use mobile Internet), the popular view is "if something is not to be found on the Internet, it probably does not exist at all" (Veirum & Christensen, 2011 p.7). To engage the current generation in cultural heritage a museum must have a presence on the Internet.

2.2 Images

This section describes the use of images in a general sense. An image might be considered multi-lingual, and even multi-cultural. Is there information that we can get from a drawing of an object that we don't see in a photograph? A digitised image is a surrogate for the original, the analogue converted to digital. What are the consequences of this conversion?

We live in a pictorial culture. An increasing flood of images dominates the private and public spheres of European and non-European societies alike. Information has become more and more 'iconic'. The 1991 Gulf conflict was presented as a war of images. The attacks on the Twin Towers in September 2001 were played out as a media and iconic event. A stream of images relays the current events in Japan and Libya around the world, with people invited to contribute their own images to news websites. The entertainment industry has become a global force influencing different spheres of representation from news production to politics. We do not only exist in a saturated "iconosphere", but we contribute to shaping it. We have become filmmakers and photographers ourselves, gladly uploading those images to the Internet to share with everybody, and allowing anybody to use those images and to instantly re-edit them (European Commission, METRIS report 2009).

An image can be a memory jogger (consider the trick of visualising to aid memory), or can express complex ideas. An image can be used to clarify and summarise (e.g. a graph of results). An image can be interpreted differently by different users, and so cannot be directly translated into text. Conversely, an image can convey any number of complex messages without the aid of text. Drawings consist of lines, and engravings particularly use lines of different thicknesses and hatching to convey different textures and contours. The hand of the artist is apparent, and the drawing is the artist's interpretation. Scientific progress in the 1400s was greatly aided by the use of exact copies of drawings. When the image could be reproduced by printing rather than copied

there was no risk of information being lost. Knowledge of strange and wonderful new things could be spread, without the information contained in the image needing to be translated to text. The advent of the printing press, and therefore cheaper books, with illustrations, played an important role in the (self) education of people. For example they no longer relied on the church for learning.

The development of photography allowed an exact replication of an object. Walsh writes that photography was a much bigger and more immediate sensation in its time than the advent of the World Wide Web in ours. On August 19th 1839 the Institute de France announced the achievement of Daguerre in developing the daguerreotype. There were speeches and a ceremony to mark the historic occasion, and in the following years hundreds of "first photographs of", including the Moon. Early viewers were struck by the detail that photographs recorded, and also how perfectly a moment in time was preserved. In much the same way that digitisation is promoted today as a means of access, photographs were promoted as a means of reproducing art images and making works of art better known (Walsh, 2007 p.20).

A photograph can be more readily produced and therefore more widely used than a drawing, allowing even more rapid spread of images and knowledge (Sahlström, 1997 p.7 - 36). Photography was given a stamp of authority and veracity. In 1870 the first students at Harvard department of art history began their study of art using photographs before viewing the real works of art, since the school believed that they would then come to the originals with "a more solidly scientific understanding"(Preziosi, 2003 p.18). Great progress was made in the development of the discipline of art history and the task of looking for patterns in the development of styles and subject, once photographs of the art works allowed comparative analysis. "Photography afforded art history the possibility of becoming an ordered, systematic discipline"(Preziosi, 2003 p.26). Today the possibility for manipulation of digital images raises questions about authenticity and authority.

It should be remembered that the information interpreted from an image by a contemporary researcher might be very different from that intended by the creator of the image. For example a mosaic in Pompeii intended as a "beware of the dog" sign, might provide new information today to a historian of dog breeding (Gombrich, 1982 p.144). Similarly portrait paintings are often used to observe clothing styles, and give other information about the belongings and homes of the subjects.

"The real value of an image…is its capacity to convey information that cannot be coded in any other way" (Gombrich, 1982 p.143), and as Pope Gregory the Great wrote, "pictures are for the illiterate what letters are for those who can read" (Gombrich, 1982 p.155). Images then are a means of communication. In a museum context a drawing or photograph acts as a surrogate for the real thing. It helps to lead to an understanding of the object without having to hold that object. The image also serves to confirm ownership of a particular object.

There are still situations today where a drawing allows clearer interpretation than a photograph. For example medical illustrations give a better understanding of the inner workings of the body than a photograph. There are still circumstances in museum use where drawings are preferred over photographs. Rupert Smith's book about the British Museum includes an image of a volunteer illustrator drawing a pottery fragment (Smith, 2007 p.90). Drawings will more clearly show details regarding shape, type, method of production and style, such information as might help to identify the craftsman or artist. "Particularly important in this respect are e.g. profile drawings of pottery and drawings of decoration and sections of (often corroded/damaged) metal objects, where only a drawing can bring out important subtleties of shape and decoration, and where drawings are a vital element of documentation, often more important than photographs" (Prudames, 2011). The drawing remains however the artists interpretation, there is a risk of loss of information compared to taking a photograph.

Conversion of an analogue photograph by scanning to a digital image, or creation of a digital image in the first place using a digital camera offers further possibilities for the use of the

image. Digital surrogates allow researchers to compare items that are geographically widespread, and to virtually re-assemble collections that have been spread over a number of museums through exchanges and loans. Digital images can be enhanced in size, sharpness and colour contrast. Documents that are faded, dirty or too fragile to handle can be digitally enhanced so that the text is legible. Digitised images offer very powerful teaching tools (Smith, 1999). It is now also possible for users to take an image for their own use, and promote the values of the object for their own purposes. For example Iranian protesters angered by the representation of the Persian culture in the film *300* (Warner Brothers 2006), used images from museum collections to counter what they saw as negative interpretations, and to reinforce a sense of cultural identity (Cameron & Mengler 2009, p.192).

A digital image can only be read using a machine interface; a machine must de-code the digital data and re-present it as images on a computer screen. This means that as technology develops and the machines evolve, if digital data is not maintained so that more up-to date technology can still de-code the information then the information will be lost. This so-called "digital preservation", or preservation of the digital record is a huge and often forgotten cost for the museum (Smith, 1999).

2.3 Cataloguing

This section itemises some early examples of catalogues. The review serves to highlight the writer's intentions in publishing the catalogue, whether illustrations of the objects were used, and also to indicate the type of objects being collected. The differences between cataloguing books in a library and an object in a museum are considered. The progression from catalogue cards to computer database, to sharing that database on-line is discussed. The potential of computer databases for interaction with the user, and added value to the collections is reviewed.

2.3.1 Early examples of collections catalogues

John Tradescant published "Musaeum Tadescantianum: or, a collection of rarity preserved at South-Lambeth neer London [sic]" in 1656. The catalogue lists the objects held in a collection started by his father and continued by John. The only illustrations are portraits of John Tradescant the elder (deceased), and John Tradescant the younger.

In the foreword Tradescant summarises his reasons for publishing:

> "About three years agoe (by the perswasion of some friends) I was resolved to take a Catalogue of those Rarities and Curiosities which my father had seculously collected, and my selfe with continued diligence have augmented … They then pressed me with that Argument, that the enumeration of these Rarities, (being more for variety than any one known place in Europe could afford) would be an honour to our Nation, and a benefit of such ingenious person as would become further enquirers into the various modes of Natures admirable workes [sic]" (Tradescant, 1656).

The collections came to be known as the Ark of Lambeth and were left to the Tradescants' neighbour Elias Ashmole. He in turn bequeathed the collections to Oxford University stipulating that they should be housed in a purpose-built museum. The Ashmolean museum opened in 1683. The Musaeum Tradescantianum catalogue is now scanned and available on-line.

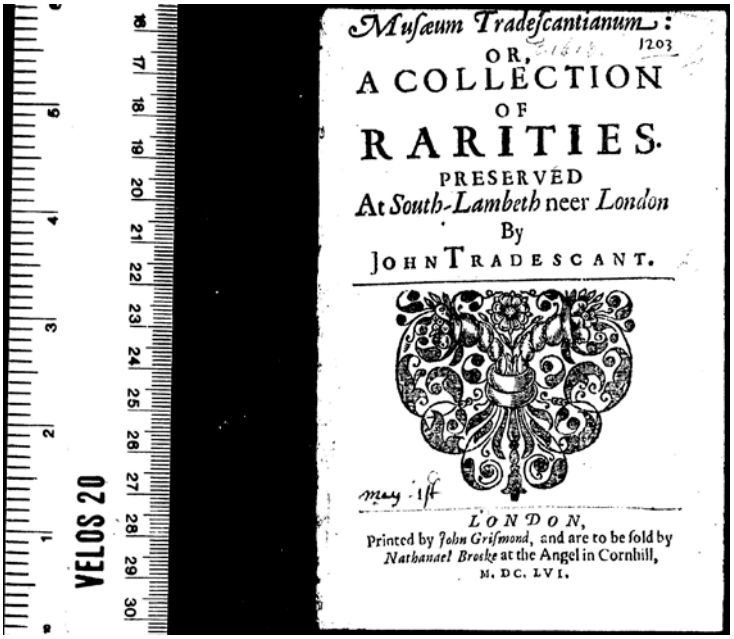


Fig 2 Scanned image of cover of Tradescant Catalogue. www.eebo.chadwyck.com

The Theatrum Pictorium (Theatre of Painting) was published in 1660 and is an illustrated printed catalogue of a major paintings collection. A team of engravers reproduced 243 paintings selected from the collections of the Archduke Leopold Wilhelm. David Teniers, a Dutch artist and also the Archduke's curator, prepared the copies of the paintings. Published in Latin, French, Dutch and Spanish, there were five editions of the catalogue, the last in 1755. It was designed to reach audiences beyond courtly circles, and was used as a reference book well into the 18th century. It had an enormous influence on the way that (art) collections came to be organised, understood and published. The catalogue also became a resource for confirming provenance of art works. (www.courtauld.ac.uk and www.philamuseum.org). Copies are still in existence held in museums and in private collections; a copy was sold at auction in 2003 for $2185 (www.pbagalleries.com).

In 1669 Robert Hubert published "A catalogue of part of those rarities collected in thirty years time with a great deal of pains and industry by one of his majesties sworn servants." In the catalogue Hubert highlights the type of people who have visited the collections:

> "the names of the rarities that are to be seen at that place, formerly called the Musique House near the west end of Pauls; you may see every afternoon that which hath been seen by those that are Admirers of Gods Works in Nature, with other things that hath been seen by Emperors, Empresses, Kings and Queens, and many other Sovereign Princes."

There are no illustrations. The objects are listed according to various categories for example "Parts of fishes". The catalogue includes details of when the exhibits can be viewed. For example, on Mondays and Thursdays "things of the sea", on Tuesdays and Fridays "things of the land". Private viewings are offered for noblemen with family and friends. At the end of the document there is a list of Kings and Empresses, it is not clear if these are benefactors, donors or simply visitors. A copy of this document held at the Bodleian Library is also scanned and available on-line (Hubert, 1669).

2.3.2 Catalogue cards

At the start of the 20th century museums introduced catalogue index cards for internal records. In 1900 Edgar Waite described how he adopted a card catalogue system as used by libraries.

Work to record information for the Zoological collection for which he was responsible at the Australian Museum in Sydney, took 18 months. He wrote: "As implied by the name, the system consists of indexing by means of loose cards…These cards stand on edge in drawers specially constructed to receive them" (Waite, 1900 p.217).

Museum catalogue cards often included drawings and watercolour paintings of the objects. Emelie von Walterstorff worked at the Nordiska Museet in Stockholm from 1903 to 1933 (Medelius, 1998 pg.190). In some cases her watercolour is now the only image of an object available in the on-line catalogue (e.g.NMA 0054124). The catalogue cards with her illustrations are now archive materials in their own right, and can be found via the Europeana portal

Fig 3. Watercolour for object record, painted by Emelie von Walterstoff. Photograph Nina Heins. © Nordiska Museet.

At Borås Museum of Textile History (Sweden), each index card includes a space for a drawing or photograph but far from all include an image. In the 1960s Magda Plack, a museum volunteer, added drawings and watercolour sketches to some of the cards. Older cards include very few fields (description, purchase, gift, exchange or deposition, storage location.) Newer cards have many more fields prompting more detailed and consistent recording. Where the new cards include an image it is a small black and white photograph which really only serves to confirm the appearance of the object, it would not allow examination of details. The most fully documented objects include black and white photographs and watercolour details. New acquisitions are now photographed in colour (usually more than one view) and the information recorded in a database, in this case SOFIE. The museum is planning to change database systems before they make any collection available on-line (Informant 1).

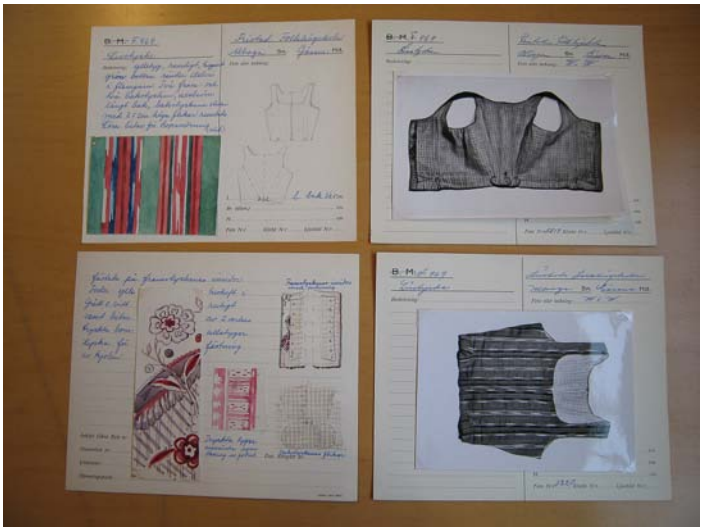


Fig 4. Borås museum catalogue card, with watercolour and photographs. (Digitally modified to show all faces of the record in one image.) Reproduced with permission of the museum. Photograph Anna Stow.

At the Ethnographic Museum in Gothenburg cataloguing of the collections using index cards was started in 1933 and finished in 1948. There were 78,000 objects each with its own card; every card also included a drawing. The then museum director Karl Gustav Izikowitz wrote to the board of directors explaining, "…photographs cannot always show the more important details of the objects" (Munoz, 2011). Today the index cards are held in the archive of the Museum of World Culture in Gothenburg, the cards have been scanned but the scanned images are not yet available via the Internet (Amnehäll, 2011).

In a card system, information is usually only accessible if the inventory number of the object is known. If the information held in the card system is transferred to a computer database the information becomes searchable, but the quality of the search depends on the quality of data entered (Marty 2007, p.8). In 1997 Katherine Jones-Garmill wrote that whilst databases offer improved tracking of items and accessing of information they do not allow accumulation over time of annotations, drawings, inscriptions etc. in addition to building a patina of information (Jones-Garmill 1997, p.51). Perhaps this explains why the cards have become objects in their own right.

With the advent of more interactive features in on-line catalogues users are being invited to add their own information, to tag images, and even to add their own images. A catalogue card generally holds information about the name of an object, its maker and a time period. In an on-line system the user can get richer information cross referencing to find answers to questions like: what can you tell me about the maker?; what else have they made?; where can I see other examples of their work?; what else is important about this period, person, style, genre? (Herman, 1997 p69). In the past the curator and museum have steered and created the values for the collection. Now with the possibilities of interaction, including tagging and folksonomy[3] the viewer can be included in the process of ascribing values and interpretations. Subjective knowledge (personal, family and collective memories) can be included in the object's record. In contrast to traditional indexing, folksonomy allows use of freely-chosen keywords instead of controlled vocabulary. Classification moves away from being subject based and loses the hierarchical structure of taxonomy (Cameron & Mengler, 2009 p.195).

2.3.3 Library cataloguing compared to museum cataloguing

A book has the same content in each copy of that book, so the object held by different libraries is identical and can be catalogued according to the same system, and searched using a common

[3] Folksonomy- collaboratively generated content see http://vanderwal.net/folksonomy.html

system. Generally, to find a book in a library only three fields are needed: title, author and subject. One catalogue can serve many libraries.

Museum objects are typically unique items, perhaps similar or parts of the same original, but their nature requires a unique catalogue number. Different information about the object is important for different users and different types of museum. This has tended to result in unique systems, and has led to investment in different database software. The opportunities for inter-museum co-operation are less obvious than between archives and libraries. Hence the comparative delay in making information available on the web, and also the differing levels of information available.

2.4 Reasons for making collections catalogues available on-line

In this section the reasons for digitisation found in literature are summarised.

A review of the literature on the subject shows the pre-dominant reason for sharing the museums database on-line is "access". In her Masters thesis Malin Gumælius carried out a literature study and identified the following main reasons to digitise:

- Preservation by protecting original object from use
- The option to destroy or dispose of the original (particularly usual with scanning of daily newspapers).
- To increase access, whilst preservation is by some other means
- As a means of marketing the original and/or increasing use of the original
- As a means of adding value (e.g. searchability, new information) (Gumælius, 2004 p.39)

Citing Deegan and Tanner, Melissa Terras summarises reasons for digitisation and advantages for the museum. Those reasons include:

- Immediate access to high-demand and frequently used items
- Rapid access to materials held remotely
- The potential to display materials that are in inaccessible formats, for instance large volumes or maps
- Virtual reunification - allowing dispersed collections to be brought together
- The potential to conserve fragile/precious objects while presenting surrogates in more accessible forms (Terras, 2008 p.102)

In their Masters thesis Anderson and Nilsson carried out interviews at two Swedish museums and identified the following reasons for digitisation:

- To make the collection accessible to the public
- To reduce wear on the materials
- To support collections inventory
- To make the collection searchable for museum staff
- To generate information through people external to the museums
- To give easier access to often requested material
- To give a better overview of a large collection, increasing public awareness of the holdings (Anderson & Nilsson, 2006 p.42&48)

In 2001 the Institute of Museum and Library Services sent a survey to the 2510 museums in America. They achieved a 23% response rate (470 responses.) The survey was repeated in 2004, and it is interesting to contrast the change in the goals of the digitisation projects (see table 1). In

just three years there is a change in focus from reducing damage to the originals to offering increased access to the collections. The high percentage that answer "goals not defined" in 2001 suggests that projects were started with no clear purpose, perhaps just because the technology was available.

2001 responses		2004 responses	
Minimised damage to original materials	32.6%	Increased access to collections	56%
Preservation of materials of importance or value	27.9%	Preservation of materials of importance or value	48.7%
Goals not defined	27.9%	Minimize damage to original materials	33%

Table 1. The changing focus of reasons for digitisation at museums in America. Source: Institute of Museum and Library Services (www.imls.gov/resources/TechDig05/index.htm).

In all museums only a very small percentage of the museums holdings, typically about 3%, are exhibited at any one time. Increased access can be seen to answer the criticism that museums are not using their collections. That criticism has been most vocal where museums are publicly funded. There is a drive to ensure that museums are accountable for the assets that they hold. A collection cannot be said to be in use if it sits in store for ten years without anybody looking at it. Jane Glaister asks in a Museum Association inquiry: "if it (an object) is not published or made available on the Internet, can that museum be realising its responsibilities towards the object and towards the public?"(Glaister, 2005 p.9). She argues for potential use of the digitised collection as a means of providing resources to museums of the future. "Museums of the future will use the digital resources created today for their own ends, just as museums today use the buildings and collections established in the past for their own purpose" (Glaister, 2005 p.14). Possible uses are starting to be developed, often as the result of so-called "hack days", or competitions. For example in late March 2011, Mittuniversitetet in Sundsvall (Sweden), organised a 24 hour competition inviting programmers to design services using public (digital) data. Four of the seven teams involved chose to use data from the K-samsök application (see section 2.5). One of the projects an "augmented reality display of archaeological finds", allowed the user to see finds discovered near to where they are using their smartphone,
(see http://www.youtube.com/watch?v=I7VQqlTJR-A for a demonstration).

Whilst Glaister was arguing for an as yet unidentified use, in 1999 the Society for American Archivists stated, "the mere potential for increased access to a digitised collection does not add value to an underutilised collection" (Smith, 1999). Abby Smith suggests that digital technology should be considered as an additional tool to those already used to enhance learning and to extend the reach of the museum, rather than as a replacement for those tools and a panacea (Smith, 1999).

How successful the museums are in achieving the goal of access is difficult to measure. How satisfied the user is will depend on whether they find the information they have been looking for, this in turn is very dependent on the quality of the information in the database. The same kind of object can be classified in different ways depending on the speciality of the museum. For example "a silver teaspoon made in the eighteenth century in Sheffield would be classified as 'Industrial Art' in Birmingham City Museum, 'Decorative Art' at Stoke-on Trent, 'Silver' at the Victoria and Albert Museum, and 'Industry' at Kelham Island Museum in Sheffield (Hooper-Greenhill, 1992 p.7).

Typically fields in databases are quite restrictive, and whilst standard key words are used, these are probably specific to each museum. This then is an argument in favour of allowing the user to add their own information, maximising context and making the digital object more easily searchable, and probably therefore more "used". Some museums have created themed searches; allowing users to search based on broader themes e.g. animals, culture, or people. Even then the

user may not find what they are looking for, or the result of the search may be confusing. When searching for a particular animal the user might be presented with the image of a plate, because the decoration of the plate includes an image of that animal (Freedman, 2003).

The concept of use is in itself an interesting consideration. When an object enters a museum collection it is typically no longer used for the purpose for which it was designed. It becomes instead a document, a source of information. What then might be the 'use' of a collection? Is it simply that it is being viewed, or must the object be part of an exhibition with its context explored and explained to be in use? Does an on-line view of the object qualify as use? Or is the object only used if the viewer takes the image for their own purposes, or adds information to the database?

2.5 The cost of digitisation

To prepare objects for photography, to edit those photographs and to upload them to a website of course carries a cost. In his report to the Comité des Sages of the European Commission, Nick Poole estimates the cost of digitising museum collections in the European Union (EU) as nearly 39 billion Euros. He states that the cost of ownership of the digital asset for ten years can be estimated at 50 - 100% of the cost of creating it. To put these figures into context he compares the cost of the Joint Strike Fighter, and of road building (see table 2.) The cost of one Joint Strike Fighter (147.41 million Euros) is equivalent to the cost of digitising 1.83 million man-made artefacts, or 2.02 million natural artefacts in museums. To build 100km of road costs on average 750 million Euros, or the equivalent cost of digitising 4% of European museums' man-made artefacts. There are estimated to be 265 million man-made objects in museums, and 307 million natural specimens (Poole 2010-a, p.75-76).

These costs could also be compared to the annual costs of storage of collections. A BBC news report detailed the following costs for London museums: Tate £465K, British Museum £86K, Natural History Museum £45K, National Maritime Museum £140K (BBC News 2011).

The expense of digitisation can be reduced by careful selection when digitising. The Archivo de Cinde in Spain has digitised only 8% of its collections but claims to satisfy 60% of user requests (European Commission DigiCult Report, 2002 p.40).

100 km of road	=	5 Joint Strike Fighter jets	=	Digitisation of 4% of European museums man-made objects	=	Digitisation of 5% of European museums natural specimens	=	4700 years storage of National Maritime Museums (London) collections

Table 2. What can you get for 750 million Euros?

Not only is digitisation significantly more expensive than storage, the cost of maintaining the digital record must not be forgotten.

2.6 Consequences of digitisation

Consequences regarded as advantages by some, may be seen as disadvantages by others. For example, interest in and therefore requests to view an object increase, but this may result in wear of the object.

In 1997 Howard Besser posed a number of questions, many of which museums are still struggling to answer today. Will visitor numbers be affected? Does a museum's perceived authority increase because more people can see the collections, or does it decrease because of the

use of the Internet? If virtual visitor numbers are higher than real visitors will more resources be put into virtual exhibitions and how does this affect collections use? Should resource allocation be based on real or virtual visitors? Will a museum become more noted for the quality of its on-line presence and experience than the collections? (Besser, 1997 p.167).

2.6.1 The meaning of the object

In his 1936 essay "The Work of Art in the Age of Mechanical Reproduction", Walter Benjamin discusses the impact of the then "new media" technologies of photography and film. He discusses how photography affects a unique work of art by making it available in more than one place and at any one time, and in so doing removes its "aura".

> "Even the most perfect reproduction of a work of art is lacking in one element: its presence in time and space, its unique existence at the place where it happens to be" (Benjamin, 1936).

It is perhaps this destruction of an art works "aura" that explains why despite a surfeit of copies and access to the image, visitors still queue to see original works like the Mona Lisa, or Van Gogh's Sunflowers.

The nature of objects changes when they enter a collection: they are typically no longer used for the purpose for which they were designed. Placing a digital surrogate of an object on a website is similar to the act of moving an object from its authentic context to the museum environment. Just as a museum collection redefines value and meaning of a new acquisition, the digital environment changes an objects frame of reference again. Whilst the "unique existence" of the object fades in its duplication, most of its layers of information remain. Education and understanding of culture is based on this information, and not exclusively on the emphatic experience of an objects presence (Müller, 2002 p.297).

2.6.2 Collecting and use of collections

Particularly in the early days of digitising a fear was expressed that once the digital surrogate was created the original object would be forgotten. Similarly that as use of original material decreases collecting of original material becomes un-interesting. Conversely if the digital surrogate is not used was the cost of digitisation necessary? The museum may decide that since the digital surrogate is available, access to the original should be restricted. If digitisation results in increased interest in the original, this may result in increased wear of the object. Originals that are in a very fragile condition can nonetheless be researched and inspected using the digital surrogate (Gumælius, 2004 p.57). Cameron states that: "the real object is not under threat but acts as an alibi for the virtual (Cameron, 2007 p.58). In other words the physical object gives the digital surrogate authenticity.

It could be that if evidence of use of digitised material cannot be produced, research and services linked to digitisation may be scaled back. Already created digital collections will not be maintained and risk being unavailable in the future. "If collections are not used, should they be maintained? If they are not maintained how can they be used?"(Terras, 2008 p.127).

2.6.3 Role of the curator in documenting the object

As users add their own stories to the collections database the role of the curator will extend from objects alone to increasingly include knowledge management. The older empirical records, with standard fields such as: made by; when; material; collected when; technique etc. will still be valid. These records reflect the "reconstructionist" approach, emphasize physical description and verifiable details, and limit the possible meanings that can be derived from the object. These might be considered the objective record of the object. The meanings and classification of the

object have been imposed on it by the museums aims, and the curators own specialist knowledge. The epistemic relativist approach moderates the authority of those records by permitting the inclusion of alternative forms of analysis including non-specialist or specialist outside the museum, interpretation of the objects significance. Information recording who was involved with the object, how it was collected, who interpreted it and why and where the interpretation took place must support the empirical information. This might be considered the subjective record of the object. Expert and scholarly information must be allowed to co-exist with arbitrary and plural object information (Cameron & Robinson 2007, p.170-174).

Collections descriptions were originally written to justify acquisitions to management, and the interpretation would have been strongly influenced by the background of the curator. A social historian will have a different focus than a decorative arts curator, or a technology creator. Now curators need to consider the constructionist theories of learning and to engage users in the cycle of knowledge making, including in the description for example information about where to find other sources. They need to make sure the (digital) user is aware that interpretations change over time, and that an account may no longer be definitive.

New ways of documenting should account for the polysemic nature of objects. There should be virtual layering of meaning and contexts that can be presented in different ways depending on the user profile. The digital record of the object can be linked to current exhibitions, research papers and other sources inside and outside the museum. Increasingly documentation is non-text based including for example a video interview with the artist about their intention, or video of an archaeological dig to give context to the acquisition of the object (Cameron, 2005 p.89).

The curator must learn to manage these new understandings of the object, and make the new knowledge accessible. They must recognise that this enables new uses of the objects, and will reveal the layers of meaning the object holds for different users. Besser suggests that as users begin to make their own links the authority of the museum is eroded, as is the authority of the curator. Their role he suggests will become more like that of a film critic - commenting on users inputs rather than the collections themselves (Besser, 1994).

3. Directives and policies concerning digitisation of cultural heritage

This chapter will review Government and EU inquiries, reports and recommendations, and work in Sweden to try to establish a national policy for digitisation. Stated benefits and consequences of digitisation are discussed and statistics regarding percentages of collections digitised are presented. The DigiCULT report is presented and the policies reviewed against this. Are the recommendations from the report, written in 2002, reflected in today's policies? The Report of the Comité des Sages - Reflections on bringing Europe's Cultural Heritage On-line, published in January this year, is compared to the DigiCULT report. Have recommendations changed? What progress has been made? At the end of 2009 the Swedish Government invited feedback from the culture sector regarding establishing a national strategy. The results have been summarised and a Secretariat established at the National Archives. Does the feedback from the Swedish Institutions reflect that in the other reports? Statistics showing the percentage of collections that have been digitised are presented.

3.1 DigiCULT report

The DigiCULT report was a strategic study aimed at providing European archives, libraries and museums (ALMs) with a roadmap of technological, organizational and political challenges facing them between 2002 and 2006. It had an overall objective of increasing the value of digital cultural heritage resources by making them more accessible to a broader audience with the use of information and communication technologies (ICT). With the help of 180 international experts the study identified the most pressing issues and challenges as:

- Sustainability of e-services
- Technical interoperability
- Threat of technology gap
- Human capital.

Through the network of the World Wide Web and ICT based devices such as mobile phones archives, libraries and museums have the potential to reach, and be reachable for completely new audiences worldwide. Users of cultural information can potentially search and retrieve innumerable resources.

The general view of the experts involved in the study suggests that providing access to cultural heritage resources has become a new focus for European memory institutions. The study states that cultural collections are at their best when used. The result then is a paradigm shift from building collections to providing access. Does providing access equal use of, and therefore increased value of the collections? The report foresaw that changing patterns of cultural consumption in the information society would centre on communicating over computer and wireless networks, the result being that cultural heritage resources will only be valuable in the future if they are accessible in digital form.

Early in 2000 EU member states had cultural heritage policies that differed slightly but had the same objectives: to digitise cultural heritage resources making them accessible for a broader audience and thus increasing their value. The study found however that digital resources actually remain within a very limited user group, the scholarly community. It was mainly researchers and scientists who generate new content in the form of published articles. These are then linked to the object adding information to the database. Other users need to be encouraged

to become actively involved in contributing and participating in the process of establishing knowledge.

In Europe 85-90% of museum financing comes from public funds. The DigiCULT experts estimate that only about 5% of cultural heritage resources in ALMs are exploitable. Digitisation cannot be self-sustainable. The report recommends that national governments need to express a clear commitment to future sustainability of cultural e-services that make use of digital objects, without expecting cultural heritage institutions to be self-sustaining. The governments need to understand that they are paying for intellectual value not commercial value.

The report's second key recommendation is that the European Commission needs to promote use of standards (data structure standards, data content standards, language etc.), by making standard compliance a funding requirement. The standards enable cross-sector search and retrieval, i.e. easier access for the user.

The report also identifies the technology divide in the sector. Smaller memory institutions e.g. a local history museum, do not have sufficient resources (human, financial, technical) to digitally catalogue their collections. Future EC programs must support them so that the gap between the very large and well-recognised museums and these small institutions is not widened. Also, to ensure that the materials users have access to is not biased towards the holdings of the larger institutions since it is they who have populated the portals and search engines.

The final recommendation concerns the employees of the museums. In today's knowledge society the value that a museum adds to the digital object is the descriptions, contextualisation, explanation, interpretation and stories that involve potential users. The museum has knowledge and expertise. Museums, supported by government, need to ensure that employees have the skills required to share that knowledge in the digital domain (Mulrenin, 2005 and European Commission, 2002).

3.2 Report of the Comité des Sages

This so-called "high-level reflection group" was assembled to "make recommendations to the European Commission, governments and other EU agencies concerning how best to capture, foster, share and celebrate the diversity and excitement of European culture and creativity online" (Poole, 2010-b p.8). The group comprised Maurice Levy (CEO of Publicis, a French advertising and communications company), Elisabeth Niggermann (Head of the German National Library), and Jaques de Decker (a writer). They reported to Neelie Kroes, the Commission Vice President for the Digital Agenda, and Adrioulla Vassilou, the Commissioner for Education, Culture, Multilingualism and Youth (press release Europa.eu). In particular the Comité looked at three areas: funding sources; interactions between public and private organisations; solutions for digitisation of public domain and in-copyright material (Poole, 2010-b p.9).

To quote from the foreword of the report:

> "As Jean Monnet said, if "*Europe were to be reconstructed, I would begin with culture rather than the economy*". The cultural heritage of the old continent nourished the education, the formation, the spirit of the generations which preceded us and we feel the responsibility to transmit this rich (indeed, one of the richest in the world) heritage to future generations and to make sure it will be preserved, enriched and shared.
> With no exaggeration, we can state that what is at stake is a common good of humanity and not just of Europe"(ec.europa.eu).

The report makes recommendations in a number of areas: access, finance, sustainability and copyright. A number of key points are:

1. Access: Public domain material (i.e. not affected by copyright) should be digitised using public funding and made as available as possible for access and re-use.

2. Member states should ensure that all public funding for digitisation is conditional on subsequent free accessibility of digitised material through Europeana.
3. By 2016 member states should have brought all their public domain masterpieces into Europeana.
4. Europeana must be actively promoted among the general public and in schools.
5. The preservation of digitised and born digital cultural material should be the responsibility of cultural institutions, as it is now for non-digital material.
6. The public sector has the primary responsibility to fund digitisation. Private funding partnerships are encouraged but should not be seen as a substitute for public funding.

The panel stresses that member states must take action and not wait for a private actor to digitise Europe's common cultural heritage for them. They summarise their vision with one word "access". In a society that expects to find everything on the web, what is on the shelves, in the archives and in the exhibition halls of cultural institutions will fall into oblivion if it is not digitised and offered alongside born digital works and the rest that the Internet offers. There is a danger that parts of the European heritage are lost if they cannot be consulted with today's methods and tools. The group identified that only 22% of those institutions that digitise collections have long-term preservation plans in place. This means that the investment so far in digitisation could all be for nothing when material cannot be accessed as technology develops.

The Comité recognises that digitisation is a considerable financial investment, but proposes that there are opportunities for stimulating economic growth and job-creation. These would perhaps counter the more ethereal and less easily defined goal of "access". They suggest that there will be spin-offs in technology development, and job creation due to the labour intensive nature of digitisation. They point out that digital cultural content can become important for tourism, education and new technologies, for example mobile phone applications. The storage, preservation and processing of the digital material is another possible area of development and growth. The Comité does however qualify this by pointing out that these economic benefits cannot be accurately measured or forecast (Comité des Sages, 2011).

3.3 Towards a national strategy for digitisation, electronic access and digital preservation in Sweden

The information in this section is taken from Promemoria (memorandum) KU2009/2152/KT available at www.regeringen.se.

3.3.1 Background

In November 2009 the Swedish government requested various authorities, museums and media companies to contribute to the development of a national strategy for digitisation, electronic access and digital preservation (KU2009-2152-KT). A summary report was issued in February 2011. Twenty-one regional museums and twenty-seven other organisations including various authorities (e.g. Heritage Board), other institutes and media companies replied. The responses of the regional museums are summarised in a report prepared by the Kulturrådet (Arts Council). All of the responses received are summarised in a memorandum issued by the Kulturdepartementet (Department of Culture). The memorandum makes reference to the Art Council report. Respondents are predominantly from the museum sector, but archives and libraries are also represented.

3.3.2 Definition

Many of the respondents point out that there is no agreed definition of digitisation and so provide their own to clarify their answers to the inquiry. The definitions range from there being a catalogue entry with descriptive text, in a computer based database, to this data being available together with a high quality image of the object accessible on the internet. That the respondents have to provide a definition would seem to be a weak point in the inquiry and makes it difficult to compare the results received.

3.3.3.Digital preservation

Digital preservation (i.e. preservation of the digital record) is recognised as a key issue and one where co-operation and preferably centralisation is required.

3.3.4 Standardisation

It is further recognised that there needs to be more standardisation of data, terminology and authorities. Such standardisation would enable the building of a national database, common to all Swedish museums, similar to the LIBRIS database used by all libraries in Sweden. A common database is more user friendly for users outside of the museum, and also supports centralised digital preservation efforts.

3.3.5 Selection

The choice of material that has been digitised to date has been based on a mix of objects where the original is in poor condition and digitisation is seen as a means of preservation, and objects that are frequently requested by researchers or the public. All respondents with collections have digitised their collections catalogue in some way, but museum catalogues are not compatible other than they may use the same database software. In most cases this digitisation has involved the transfer of information from original catalogue cards to databases, either by hand (typing) or by scanning. The government initiative K-samsok has had a normalising effect, but only for those museums that were involved with the project. The majority of institutions publish on-line everything that they have digitised and that is not protected by copyright or ethical considerations. Regional museums say that large parts of their collections have been digitised but that the information is targeted towards internal users and needs to be adapted for use by a wider audience.

3.3.6 Use of digitised materials

The general opinion is that interest in the collections has increased since they were available on-line. Requests for high-resolution images have increased, those available on-line tend to be low resolution. Museums usually charge for these copies, but only to cover costs. The Riksarkivet (National Archives), reports that visitor numbers to their research room have reduced by 30% over the last decade, whilst the use of on-line services has increased fivefold. Institutions whose target group is the general public see a larger increase in website visitors than those whose target group is researchers and students. This latter is explained by the number of researchers and students being fairly constant over time. These same institutions are interested in third parties, commercial or otherwise, using the museums source material to present in turn to their own target groups.

3.3.7 Plans and policies

The majority of institutions do not have formal plans regarding digitisation, although many recognise a need or have targeted the creation of a plan.

3.4 Statistics

3.4.1 Sweden

The following data is taken from the Kulturrådet (Art Council) report "Kultur i siffror".

Year	Number of objects	% digitised	% available via internet
2006	-	10	-
2007	-	13	5
2009	70 268 548	14	9.5

Table 3. Digitisation of museum collections in Sweden.

The report also states that only 25% of the 64 museums surveyed have a written plan for digitisation (Statens Kulturråd, 2010).

3.4.2 Europe

The following graphs are taken from the NUMERIC report, prepared for the EU Commission by the Chartered Institute of Public Finance and Accountancy, UK (CIPFA).

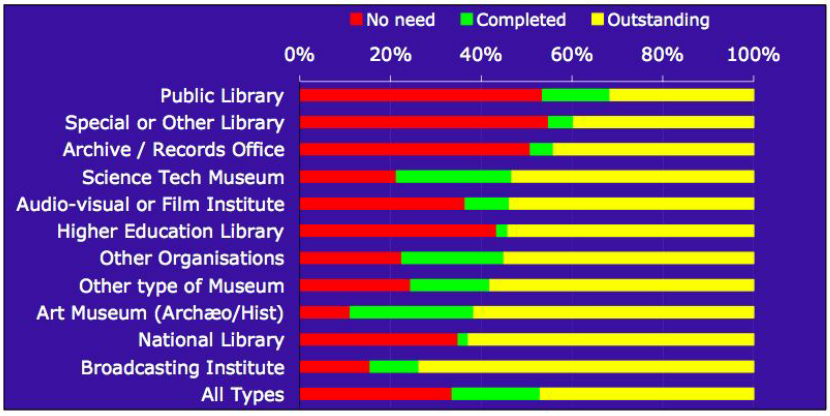
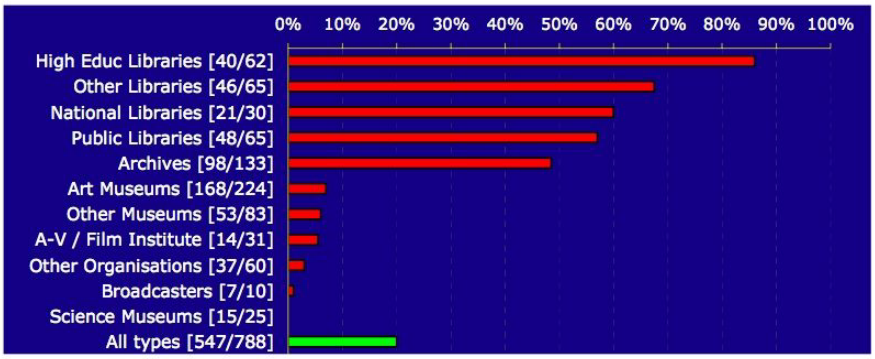


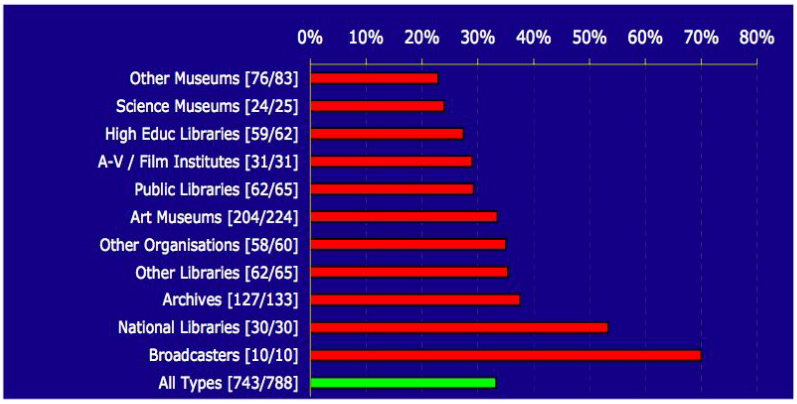
Table 4. Progress towards digitisation of ALM collections in Europe. ("No need" refers to items that are available in other collections and are not digitised to avoid duplication). (©European Union [CIPFA], (2009). http://cordis.europa.eu)

Note that museum digitisation may include simply having in-house databases for collections management; these are computer based and therefore in digital format, whilst at other institutions a digital surrogate of the object has been created.



[The first figure in brackets indicates the number of institutions responding to the question, and the second shows the total number of questionnaire responders. The bars in the diagram show the average (median) proportion of digitised materials that are available on the internet.]

Table 5. Proportion of digitised materials available on the Internet. (©European Union [CIPFA], (2009). http://cordis.europa.eu)



[The first figure in brackets indicates the number of institutions responding to the question; the second is the total number of survey respondents. Some will not have indicated that they possess a plan; the proportion that did is indicated by the bars in the chart.]

Table 6. Percentage of European ALM institutions with a written plan for digitisation (©European Union [CIPFA], (2009). http://cordis.europa.eu)

3.4.3 Comment

As can be seen the percentage of material digitised by Swedish museums is on a par with museums in the rest of Europe, as is the percentage of collections that can be searched via the Internet. The number of museums with a written plan for digitisation is also comparable. (For a review of the survey see http://cordis.europa.eu/fp7/ict/telearn-digicult/sig-stat_en.pdf, where weaknesses in the survey method and recommendations for improvement are made).

That such small percentages of collections are available on-line can be partly explained by funding and resource concerns. It also raises questions about selection of material to be digitised. If no more investment is made, does this data represent the best of the collections? According to table 5 about 5% of material that has been digitised by museums is available on-line. This is not a significant increase on the 3% of holdings typically on show in a museum. Whilst the 5% is accessible worldwide, at anytime, there is a danger that it represents only large, well-known collections from museums that can afford to finance digitisation.

4. Case studies

In this chapter strategies at museum level are reviewed. Do those strategies explain why the museums are investing in digitisation? Do those reasons reflect the national and EU level thinking described in the previous chapter? When the museums' collections are viewed on-line does what the user finds reflect the intentions of the museum? Sweden's Nordiska museet (Nordik museum) is chosen to represent a museum started with the collection and drive of an individual collector to save objects from obscurity and preserve history for future generations. The Swedish National Museums of World Culture represent a relatively new government-funded museum authority with a remit to attract a younger audience, represent diversity, and whose collections were established in a colonial past. The British Museum is chosen as a comparison to Nordiska. Established with the collections of a private individual for the "use and benefit of the publick", when the British Museum first opened access was in fact very restricted and controlled. The British Museum trustees did not introduce photography when it was first developed, waiting instead until the 1960s. How do they use digitisation now to increase access to their collections?

4.1 Nordiska museet

Information from this section is taken from Stiftelsen Nordiska museet Dnr A12-797/00 available at http://www.regeringen.se/sb/d/13149/a/145559.

4.1.1 Nordiska museet - response to "development of a digitisation policy for Sweden."

The following is a summary of the report provided to the Department of Culture by the board of *Nordiska museet* (the Nordik museum) in response to the government review as described in section 3.3.

The Nordik museum is Sweden's largest cultural history museum. Item number one in the collection is a woollen skirt purchased by Artur Hazelius when travelling in the Dalarna region of Sweden in 1872 (see fig. 5). His purpose was to rescue what could be rescued of the *allmogen* culture (peasant culture, or folk art), a culture that was disappearing with increasing industrialisation and urbanisation of the population. A year later he opened the Scandinavian Ethnographic collections in Stockholm. The collections grew and in 1907 were moved to the newly christened Nordiska museet. The collections became the property of the Swedish people and were managed by a board of trustees. Today the museum has over 1.5 million objects, and in a modern translation of Hazelius's motto "känn dig själv" (know yourself), invites visitors to "get to know their history, to learn about their roots in order to better understand their present, and be better prepared to meet the future". Hazelius was also the founder of the Skansen open air museum, which opened in 1891, and became an example for similar museums the world over (www.nordiskamuseet.se).

The museum's response to KU2009/2152/KT numbers some 29 pages and starts by pointing out that the museum is in fact an archive, a library and a museum; three institutes in one. The board considers the digitisation of the three different areas separately to show that there are different considerations in each type of collection. Issues concerning the museum objects are summarised here.

As stated the collection comprises 1.5 million objects, representing Swedish cultural history from 1520 to the present day. The entire collection is registered in a database known as

Primus. The database can be consulted on site at the museum by researchers, in the museums study room. At the time of the response (April 2010) only 5% of the collections can be accessed on-line, this via DigitaltMuseum, a portal common to all Primus users. This portal in turn feeds to K-samsök (and Kringla), and from there to Europeana. Digital images can also be found as part of special web exhibitions, which often reflect current actual exhibitions in the museum.

Approximately 25% of object entries include at least one recent digital image. Most of these were created during SESAM and ACCESS projects. Photographs were also taken when collections were moved to new storage. Digitisation may also be used as preservation, by creating a surrogate, for perishable materials such as plastics and daguerreotypes.

The original catalogue cards have been scanned but not all are available on-line. These cards include text and/or a black and white photograph, or a drawing of the object.
The board summarise their priorities as:

- Increased access to the museums collections and knowledge
- Improved conditions for preservation of the collections

They state that access for internal and external users depends on the collections being registered, documented and digitally accessible. A successful effort to increase accessibility depends on a parallel commitment to digitising and development of methods for care and storage of collections.

The museum has a checklist for digitisation, and uses the MINERVA project[4] good practices handbook, but they have no comprehensive digitisation plan. Digitisation is instead steered by activities such as moving collections, digitisation as preservation and externally funded projects. The board recognise that digitisation requires extensive resource, and competence.

4.1.2 Nordiska museet collections online

There is a link to searchable collections on the museum's homepage, and also via the tab "samlingar" (collections). The user is then redirected to the Digitaltmuseum website which hosts the catalogues of Primus database users. The text on the Nordiska webpage invites the user to search, but also to visit the museum to learn more. The user can choose to go directly to Digitaltmuseum or via themed searches e.g. fashion pictures, painted wall hangings. Inside the Digitaltmuseum portal the user is invited to add comments and keywords (tags), while links to social media sites allow sharing. There is also a comment on the page from the Nordiska: "The collections catalogue has been built over a long period of time and by many different people. Therefore the quality of the information can vary. Contact us if you find errors, or want to complement the information". The images can be ordered but even for non-commercial use there is a charge.

[4] MINERVA is a network of EU Member States' Ministries to discuss, correlate and harmonise activities carried out in digitisation of cultural and scientific content for creating an agreed European common platform, recommendations and guidelines about digitisation, metadata, long-term accessibility and preservation (www.minervaeurope.org).

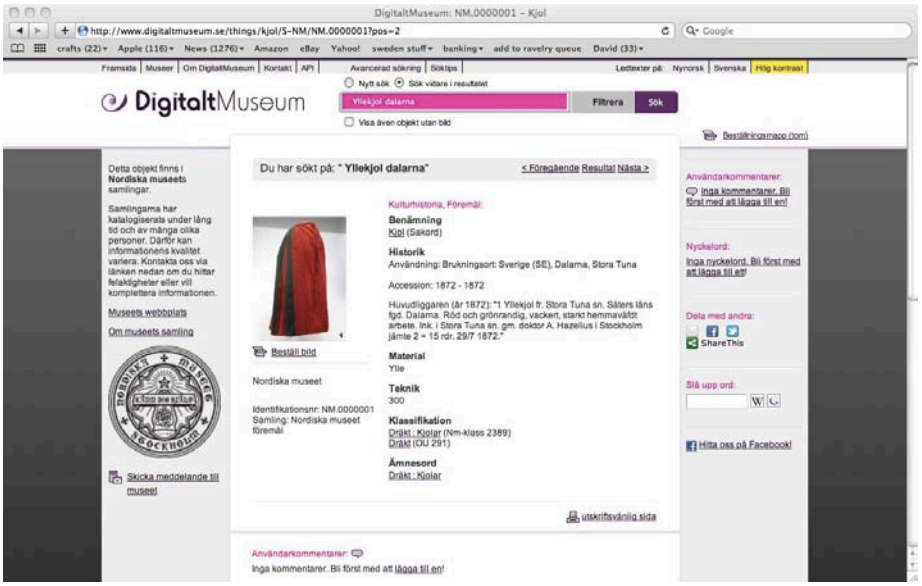


Fig 5. Nordiska Museet object number 1, as shown on Digitaltmuseum portal . Note links to social media and possibility to add own comments. ©Nordiska Museet.

The website also features "web exhibitions", either stand alone or created to support current actual exhibitions. Some collections images are used, but context and storytelling is not used as effectively as the British Museum site (www.nordiskamuseet.se).

4.2 Statens museer för världskultur (SMVK)

4.2.1 SMVK - reponse to "development of a digitisation policy for Sweden."

The following is a summary of the report provided to the Department of Culture by the "över intendent" of the Swedish National Museums of World Culture, in response to the government review as described in section 3.3 (Statens Museer för Världskultur, Dnr 333-2009 available at http://www.regeringen.se/sb/d/13149/a/145559).

The state-financed public authority Statens museer för världskultur (Swedish National Museums of World Culture) was formed on January 1 1999, following a parliamentary decision in 1996, and includes the Etnografiska museet, Östasiatiska museet and Medelhavsmuseet in Stockholm and the then Ethnographic museum in Gothenburg. The newly-built Världskulturmuseet (VKM, Museum of World Culture) opened to the public in Gothenburg in December 2004, with the collections of the old Ethnographic museum as it base. Some of the long-term goals (to 2015) for the authority, derived from the *regleringsbrev* (government mandate) are:

- By 2015 all collections will have been assessed and the key collections will be digitally registered with text and image.
- By 2015 knowledge pertaining to the collections will be secured and developed, and also be available to the public.
- By 2015 50% of visitors will be under the age of 30, and otherwise representative of Sweden's demographic structure.

This last is interesting in terms of this paper: does the younger target audience influence digitisation activities at the museums?

The collections from the four museums together total 460,000 objects. The collections are wide ranging and include archaeological objects from Egypt, Cyprus, Rome, Greece and China, and

ethnographic objects from Latin America. The level of documentation varies across the collections: some are very well documented, others not at all. Digitisation of the documentation was carried out in the early 1990s, mostly through the government SESAM and ACCESS employment opportunity projects. Digital imaging of the objects has been a priority.

The report from SMVK is quite self critical pointing out that until 2009 the databases holding the digital information were for internal use only, and then only by a restricted number of the employees. The contents can therefore be quite difficult for others to interpret. Digitisation is incomplete and the quality of what has been done needs to be improved. The target is to have a natural flow of work so that when information about the collections is used and/or generated as a result of for example exhibition work, loans, seminars etc. that information should be automatically documented, digitised and archived in the museum authorities information system, thereby becoming searchable and accessible. The SMVK authority is seeking 6.4 million kronor in government funding to complete digitisation of the collections.

The current plan is that placement, keywords and images of the objects will be digitised and where provenance is known this will also be part of the record. Targets state that 70% of the records will include keywords, 50% will include at least one digital image, and location of the object will be recorded in the museums' database by 2015. Currently 27% of the records include a digital image.

SMVK estimates that one full-time photographer can photograph 5000 objects in a year. Inventory and documentation of 6000 objects also takes one years work. There are 340,000 objects across the four museums that still need to be photographed. To reach the goal of digitising 50% of the collections by 2015 additional resources are required, not just photographers but also staff to enter the collections data and metadata. Selection of materials to be digitised has so far been driven by other ongoing activities. For example re-location of collections, water damage, exhibition, cleaning after insect attack and so on.

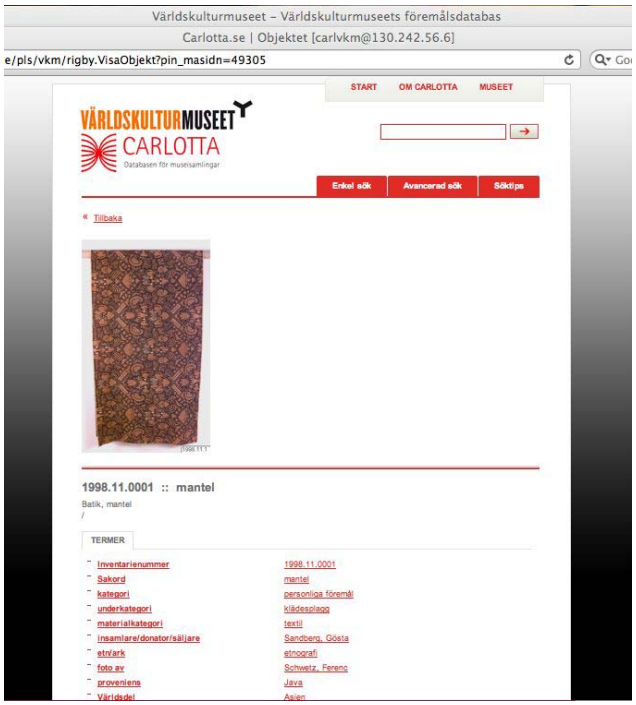


Fig 6. Screenshot of VKM Carlotta, showing object 1 in the Gösta Sandberg collection. Note the restricted categorising, no links to social media or opportunities for users to add their own comments. © 2011 Statens museer för världskultur

The catalogue database used by the museums is called Carlotta, and is also used an increasing number of museums in Sweden (twelve on June 3, 2011). Work with Carlotta started at the Etnografiska museum in 2008, and at Världskulturmuseet in 2009. The other two museums will migrate their databases to Carlotta during 2010 (note: report is dated April 2010). Now that all four museums have the same software it will be possible to standardise routines and terminology.

The Carlotta records at Etnografiska and Världskultur museums have been available on-line since 2009: Medelhavs and Östasiatiska collections will be made available during 2010. K samsök has been harvesting information from the accessible databases since January 2010, and in turn feeds to the Europeana portal.

4.2.2 SMVK collections online

The website of the museum authority is www.smvk.se, where there are links to each museum's website, but no direct link to their collections. There is a button linking to "Virtual Collections of Masterpieces", which has used images from the collections. This is a website built by the Asia Europe Museum Network and is a project that uses the Internet to promote mutual understanding and appreciation between the peoples of Asia and Europe.

Etnografiskamuseet (Ethnographic museum)
This museum's website has a button on the home page "sök i museets samlingar" (search the museum collections). This takes you straight to the Carlotta database, which has 114,302 object posts (of 220,000 objects in the collection), with 119,527 digital images (as of April 15 2011). From the homepage you can also choose a "samlingar" (collections) tab. Here there is an explanation of what Carlotta is, that entries are taken directly from historical documents (original catalogue cards), and may seem old fashioned or difficult to understand. The database has been developed for internal use and there have been no adaptations for other users now that it is being published to the Internet. Users are invited to contact the museum if they find faults, or wish to complement the records. So when searching in the database the text is that from the catalogue fields. There is no possibility to tag or comment.

Världskulturmuseet (Museum of World Culture)
The Carlotta database is reached from the "forskning and föremål" (research and objects) tab. The same text as above describing Carlotta is found. Also the phrase "när befintlig documentation lagts in i databasen (digitaliserats)…" (when existing information was added to the database (digitised)…), suggests that this is how the museum is defining digitisation: when an electronic record is created in the database. It is also stated that "the collections have been digitised to make them available via the museums website for international researchers and interested members of the general public".

In this database there are 102,113 object posts, and 82,394 digital images (as of April 15 2011). This is a post for nearly the entire collection. There is no mention of Kringla or Europeana, but a quick test of searchability showed that it was much easier to find for example the Gösta Sandberg collection in Kringla, than in Carlotta. This easier searching would increase access and use of the collections.

Östasiatiskamuseet and Medelhavsmuseet (Near Eastern Antiquities Museum and Mediterranean Museum)
The collections of these museums are now searchable online. The goal reported in the KU2009/2152/KT response has been met, however the websites are not reviewed here.

4.3 The British Museum

4.3.1 History

The founding of the museum has been described in section 2.1. It has also been pointed out that the trustees of the museum were reluctant to employ a photographer in the 1800s, at a time when other museums were starting to use photography to document and promote their collections.

When it opened in 1759 the trustees of the museum had defined a set of criteria based on education, behaviour and appearance to define the "publick", for whose 'general use and benefit" the collections should be available. To tour the museum it was necessary to fill in a form and return another day to collect the ticket, hence the visitor had to be literate. Further, the qualified applicant should be "learned and curious and have the recommendation of a trustee." The museum was only open three days a week, and closed in August and September, entry was free. Different aspects of access were argued to justify the museums position, namely the number of hours that the museum was opened compared to the admission procedures. There is documented evidence of the public's criticism of access in newspapers, periodicals and debates in Parliament. In the 18th century the public began to question the museums policies and demanded in newspapers that the trustees become more open and give an account of their practices and procedures (Cash, 2002 p.3). Today policies, governance and strategy are all available via the website. Instead of devising policies to control access the board is trying to attract more visitors. Admission is still free and the museum is open daily from 10 to 17.30.

4.3.2 Strategy to 2012

The British Museum does not have a specific policy for digitisation, but in the "Strategy to 2012" document published in 2008, has four key objectives, one of which is to manage and research the collection more effectively.

> "The Museum will improve the documentation of the collections through … Collections Online, building to 1m images and 2m records online from 2011. It will enhance its storage of the collections by seeking to ensure that 85% of collection storage space is of a very high standard by 2012, building to 100% within ten years" (Strategy to 2012).

The measure of success for this objective is that the 1m/2m target will be reached by 2011.
The objective of enhanced access focuses on developing capacity for increased visitor numbers, and involvement of peoples from around the world. So for the British Museum making collections available online has not been strategically linked to an access objective. Elsewhere in the strategy document it is stated that investment will be required to build the world's leading museum in the digital and online world, recognising the need for an online presence, but instead the focus seems to be on the use of digital media rather than digitisation. From the objective relating to audience:

> "Digital media will be central to increasing engagement with the Museum's collections. This extends and enhances a physical visit to the Museum: before, during and after a visit, as well as providing virtual access to the collection for people who would never be able to come to the Museum. By 2012, the Museum's physical presence in London will be complemented by a globally accessible media resource, including multimedia products, digitised archives and broadcast programmes which will make the Museum's world-class collections available to a global audience. As a result, visits to the Museum's main web site should double to over 14m by 2012. This will require at least one and maybe multiple partnerships with world-class media or technology companies" (Strategy to 2012).

The rhetoric is interesting here - the use of the term engagement in the collections, rather than the focus on access found in previous directives and policies. The aim is to make the collections available through a variety of digital media, not just searchable collections. For this goal the measure of success is six million onsite visitors and 14 million visits to the British Museum website.

The strategy document also includes a section about succession planning and staff training, which addresses the "human capital" concern expressed in the DigiCULT report (see 3.1).

4.3.3 The British Museum collections online

The collections database is found directly via a "search the collections" button on the homepage, or under the "research" tab of the museum website. This indicates that the potential user that the museum envisages is scholarly rather than from the general public.

Digitisation of the British Museum collections began in 1979 in the then department of ethnography. Essentially information from paper records dating back some 250 years was transferred to a computer database. Standards and data fields are in line with SPECTRUM as compiled by the Collections Trust. Adding digital images to the records began at the end of 2004. In 2007 the database was made available via the Internet. At that time there were 257,000 records, of which 107,500 included images. On April 2 2011 there were 1,933,263 objects (of a total holding of some eight million), 586,493 of the records include one or more images.

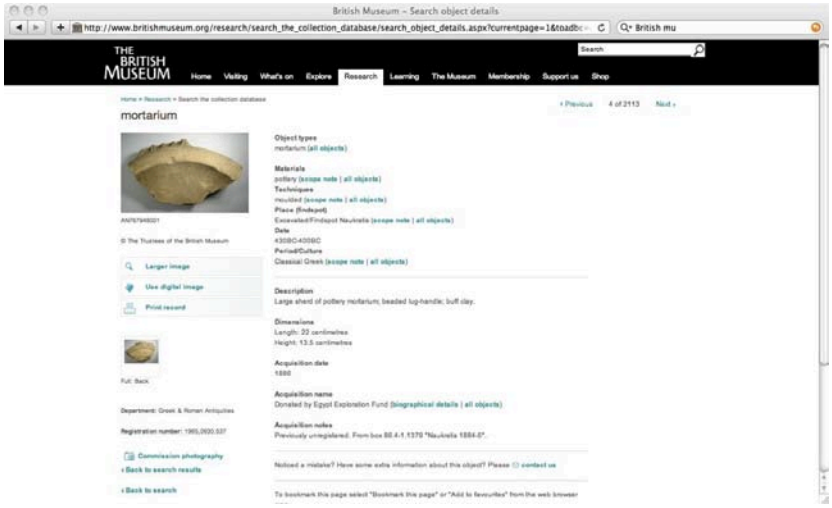


Fig 7. Screenshot of British Museum Collection on-line, object is from the collection where an illustrator was also involved (see section 2.2). © Trustees of The British Museum. Note more easily accessible classification than VKM, possibility to comment but no links to social media.

The images are also used on the "Explore" page of the website where the user is invited to explore themes, galleries and cultures, and to take a virtual tour. These pages provide context and stories for the objects and are aimed at the non-research user, giving wider understanding of the collections. These pages feature links to the collections database, and also to the museum shop.

Within the collections database descriptions are limited to fields driven by the cataloguing database e.g. object type, material, technology, acquisition date etc. The images are available for free download (after user registration), for non-commercial use. For a fee special views and photographs of a particular object can be commissioned. The database search page includes a button prompting donations to support the digitisation process.

Around 6000 of the images are also available via the www.bimages.com website, offering high-resolution images for commercial use.

The British Museum website does not highlight either Culture Grid or Europeana (www.britishmuseum.org).

5. Impact of digitisation on the role of the conservator

5.1 Conservation and digitisation

In this section the impact of digitisation on, and the use of information technology in conservation is reviewed, both in terms of conservation documentation and possibilities for conservation using digital images. Possible benefits and consequences are proposed.

Access to a digital image of an object achieves huge increases in accessibility without requiring physical handling, and therefore potentially damaging and wearing the original. For the conservation profession there is a risk that the digital surrogate replaces the original and so conservation of the original is no longer a priority. The more optimistic view is that workload will actually increase as objects are conserved before photographing. This is particularly true of paper objects where the text on the article is often what researchers are most interested in. To make that text legible it may be necessary to clean and repair the paper. There is also a risk that the preservation priority moves from the collections to the digital surrogates - digital preservation requires an entirely different skill set from object conservation. Additionally in these times of cost management, conservation may have to compete with digitisation projects for resource (Webb, 2000).

Digitised images offer possibilities for "virtual conservation," an image can be digitally retouched to preview results of a proposed treatment. Options where the repair is clearly visible can be compared with more discrete treatment options, allowing discussion of results with stakeholders before the actual work is carried out. In this way, potential for misunderstanding the results of the treatment can be reduced. Reconstructions of an object can be created digitally without damaging the original. Additionally different reconstruction options can be tried at minimal cost. Three-dimensional scanning techniques particularly offer great possibilities for digital manipulation, and testing of theories (see for example http://www.research.ibm.com/pieta which describes virtual reconstruction of a Michelangelo sculpture). If photographs are taken every time the object is inspected, used, or exhibited a history can be built up allowing the conservator to monitor changes in the condition of the object.

The conservator can use the Internet to access a network of colleagues to share and discuss possible treatment methods, review recommendations for preventive treatments, storage conditions etc. (Rose, 1999). On-line possibilities also allow environmental conditions in storage areas to be checked remotely - even sending an alarm to a mobile phone if required.

The vast majority of work in a museum happens behind the scenes. Conservators have often been leaders in opening their workplaces, or working in public view, so that visitors can understand their work, helping to clarify the role of the museum in the preservation of culture. Museum web sites and blogs offer huge potential for sharing and reporting on projects. The images produced for conservation reports should also become part of the searchable record of an object. Whenever a conservation treatment is carried out the values of the object are altered, it is therefore an ethical imperative to record the nature of the treatment. Today conservation reports are created on a computer and are therefore easily shared with researchers (Trant, 2008).

Fig 8. Conservation of Nelson's Jacket. ©National Maritime Museum

Much of the work done so far in Sweden to digitise collections was carried out under the auspices of SESAM (1995-1998) and ACCESS (2005-2009) projects[5]. These were government funded employment opportunity projects. At a cost of close to a billion kronor, around 70 thousand objects, (or 14 % of all object collections in Swedish museums, there are also photographs and archive materials (Statens Kulturråd)) are now available on-line. Recently those on-line collections have been linked through K-samsök[6], an Application Programming Interface (API), and are searchable via the Kringla[7] portal (www.Kringla.nu). Via K-samsök collections can also be searched using the Europeana portal. Conservators were not involved in much of the work of the SESAM and ACCESS projects (or if they were, not as conservators). An opportunity was missed to carry out a comprehensive collections inventory by having a conservator work alongside those handling the objects in order to photograph them. Conservators could have documented the condition of the objects and their storage conditions, estimated costs and set priorities for future conservation activities.

5.2 Objectives of survey

The survey results are reviewed in order to show benefits and consequences of digitisation for conservation looking at impact on workload, impacts for collections care and impacts for collections access and use.

5.3 Analysis of results

A total of 20 responses were received: the majority of respondents work at national museums with textile collections. Conservators working with paintings, ceramics, archaeological materials, art on paper and general collections also responded. Two thirds of the respondents work for an institution where collections are available on-line (there may have been responses from more

[5] Government funding is still available for employment creation. The Kulturarvs-IT fund administered by the Riksantikvarietämbetet (RAÄ, Swedish Heritage Board) provides for employment of a team leader to supervise five others, who would otherwise have difficulty finding employment (http://www.raa.se/cms/extern/aktuellt/regeringsuppdrag/kulturarvs_it.html).

[6] K-samsök (eng: SOCH – *Swedish Open Cultural Heritage*) is an aggregator linking Swedish museum collection databases.

[7] Kringla is a search engine maintained by RAÄ which allows user to find data supplied by LIBRIS, K-samsok, Google maps, Europeana and Panoramio.

than one conservator at the same institution). Where the collection was not yet on-line, there were plans to make it available in the near future.

Just over half of the conservators state that digitisation (creating records that can be accessed on-line) does not impact on their role. Ways in which it does impact include:

- having responsibility for taking photographs
- increased number of loan requests and hence preparation of objects for loan
- adding a conservation record to the object information.

Fifteen of the conservators state that objects do not receive conservation treatment prior to photography. It is more usual that the object has received treatment for exhibition or loan, and the photograph has been taken at this time. It would be interesting to repeat the survey, targeting conservators working in archives and libraries to understand how digitisation affects the treatment decision. The goal there will be to provide text information that can be scanned and perhaps searched on-line using optical character recognition (OCR) software. It may be more important that the object receives conservation treatment prior to digitisation.

Comments by the survey respondents regarding whether digitisation is routine or a special project suggest that funding is a key issue. Even where digitisation is now routine it is not prioritised. This implies that the actual process of digitisation is now established e.g. which views to photograph, what file format to use, which metadata is required etc., but digitisation has not yet become a routine during object handling or inventory. More in-depth inquiry is required to investigate if resource is being taken from conservation in favour of digitisation or vice versa. The number of questions that could be included in the survey was limited, but it would have been interesting to investigate if any of the respondents had been involved in the SESAM and ACCESS projects, in what role, and whether they see a need to introduce a similar program now. If so what goals and targets should be set for such a program?

It is not clear from the responses that digitisation results in more requests to view objects, although two of the respondents have noticed increased loan requests, which in turn results in increased work load.

There is limited use of the images beyond the database other than in exhibitions and catalogues. One institution has tried 3D imaging and another has involved an expert from outside the museum to enhance information about a collection of axes.

Two thirds of the respondents agree that digitisation might be seen to promote and support preventive conservation, since objects can be accessed without risks to the original. The comments supporting the answers suggest, however, that in general there is no substitute for handling the original in order to understand it, and that this use of the collections is positive. The database of images serves as a tool to select the object of study. It is further noted that expected increased demand for access to the collections as the result of making them available on-line, requires extra resource to support researchers during an on-site visit.

The survey questions and answers are reproduced in the appendix.

6. Discussion and conclusions

In this chapter the relationship between the reasons for collecting, use of images in collections management, government directives, and the creation of a database of images of the objects available via the Internet are considered. Access is compared to engagement. Different types of users are considered, and the way in which engagement can lead to interaction introduced.

My intention in writing this dissertation was to understand why museums invest resource in digitising their collections. To answer this I have also considered: who is the intended user? Is that user being reached? What progress has been made?

Throughout my research "to provide access" has been the recurring theme and motivation given for digitisation. Källman describes it as a question of democracy (Informant 2). Museums maintain collections for the benefit of all. The Internet is an important tool in sharing the collections and allowing the user to benefit from them.

Museums are often referred to under a collective Museum, Library, Archive (MLA) banner. Policies applied to one tend to spread to the others. It seems to me that in terms of strategy and processes libraries and archives have in some way had the advantage in not having their collections already available in digital form. They had to plan how to digitise their collections, whilst museums decide to use their collections management tool with digital images of the objects. The collections held by libraries and archives are typically books, documents and photographs. These objects lend themselves to scanning, and potentially to semi-automated scanning processes. Many institutions have even outsourced the work of scanning to increase efficiency and the quality of the results. It can be seen from the graphs in chapter 3 that whilst only 5% of museums' digitised materials are available via the Internet, archives and libraries are at 50% or higher. The use of the library and archive digital material is more easily conceived than that of the museums. For example if text is readable after scanning, and can be searched using Optical Character Recognition (OCR) software, the on-line user can easily search for and identify documents that include key words, or are written by an author they are interested in. Records of birth, marriage and death can be searched and the user connected to their history. Photographs in archive collections are usually of places and people. These are more easily connected to our own past than for example a photograph of a Mesopotamian pottery shard, and so it is easier to understand and find potential re-uses of the digital surrogates. Taking these factors into account I would argue that archives and libraries have been able to work against clearer goals and strategies than museums, with more clearly envisaged users and uses of the digitised data. Whilst the ways of using and interacting with text and objects are obviously fundamentally different, even out of the digital context, once libraries and archives had started to digitise there was pressure on museums to do likewise as a result of the grouping of institutions under the MLA banner.

A key finding of von Platen was that digitisation activities had proceeded without a written policy or plan from the museum (von Platen, 2002). This finding is reflected in the NUMERIC report, in the summary of replies from the Swedish museums to development of a national strategy, and in Poole's report to the EU Commission (Poole 2010-b). Instead it seems that information that was already in digital form i.e. the collections database, has been used to populate museum websites and in turn feed to portals and aggregates. This use of museum collections has become accepted and expected. With requirements to report progress at national and EU level it could be argued that digitisation is primarily being driven by those requirements. National strategies are required to direct co-operation between the different parties involved, to enable better use of the digital material, and to secure resources to ensure the longevity of the digital record.

In table 7 (see page 49) the reasons for digitising found in the literature are cross-referenced with the DigiCULT, and Comité des Sages reports, and with the three case study museum policies and websites. It can be seen that"Access" is the common denominator, and primary motivation found for digitisation. The Oxford English Dictionary defines access as:

1. verb - to gain access to (data etc. held … in a system)
2. noun - the action of going or coming to or into; coming into the presence of, or into contact with; approach, entrance
3. noun - the habit or power of getting near or into contact with; entrance, admittance, admission (to the presence or use of) (www.oed.com).

There will be different kinds of users seeking access: academics and non-academics. In a paper presented at this year's Museums and the Web conference, Ross and Terras report the results of an electronic survey that they carried out to identify users of the British Museum collections on-line (COL). The survey was presented as a pop-up to users of the COL, and the researchers collected 2657 responses. 50% of those who answered confirmed that they are using the database for academic research, whilst 18% answered "personal interest" as their reason for use. Answers were received from 57 countries, the majority from the UK and America.

If the key users of the information are academic it is important for the information providers to understand how they are searching the database, and what results they are expecting. The results of this survey suggest that the searching by academics has a strong visual element. The users are placing a large emphasis on viewing images to confirm that they have found the object they were looking for. The survey respondents were not seeking integration of social media applications into the COL (Ross & Terras, 2011).

The survey was linked to the COL pages under the research tab of the website. As proposed already this positioning of the COL reflects the expected user of the database. It would be interesting to repeat the survey on the "Explore" page of the website to understand the users there.

Collecting entails selection according to the values of the collector, otherwise the process is simply one of accumulation. The categories and classification systems, and the choice of objects that become our cultural heritage, result in structured and restricted information (Svanberg 2009, p.10-11). Digitisation and subsequent inclusion of information originating from outside the museum, has the potential to help museums serve the research community, without restricting the results to outdated interpretations.

To reach users beyond academia it is necessary for the museums to consider how those users will find the collections information. Today's Internet user expects information to be "in their workflow" (Europeana Strategy 2011-2015), not to have to go and hunt for it. Although "access" is not explicitly mentioned as a reason to make collections available on-line on the Nordiska Museet website, the archive section of the institution has taken steps to publish some of their material via Wikipedia. Speaking on Swedish radio in November 2010, Jonas Hedberg, a curator at the museum, states that they want to make people more aware of what is available in the collections. He suggests that whilst researchers are aware of the databases and how to find information, the museum recognises that the majority of users will in fact use search engines outside of the museum. He hopes that schools in particular will benefit from this initiative, and also that by having images available to a wider audience than is using the museum website, there is the possibility for more people to complement information about the images (Swedish Radio P4 Stockholm, 2010).

Rolf Källman stated that one of the most exciting projects that he has been involved in was releasing some of the RAÄ archive to Flickr Commons. He feels that it is important that the

digital material is where the users are, and that this may well be outside of the museums' own websites and the aggregators. By using collaborative web spaces such as Flickr Commons the museums are more likely to get feedback and comments on the material, thus building the museums knowledge base (Informant 2) and answering the DigiCult point regarding generating information through external users.

Ross and Terras and the findings of the DigiCult report have shown that researchers are very aware of on-line collections. The intention of the European Commission is that Europeana becomes the site of choice for searching Europe's cultural heritage. It is arguable that many members of the public are probably less aware of that portal than they are of museum websites. Those responsible for national strategies need to decide how their national portals (e.g. Kringla and Culture Grid), and Europeana should be promoted. They also need to ensure that institutions of all sizes are represented, so that the portal is populated with data from small local museums as well as large well-recognised national institutions.

Enabling access to the collections on-line supports use of the collections database as a means to reinforce the reasons for collecting described in chapter 2. Those reasons will be important for the non-academic user of the information. Searching a collections database gives the user the opportunity to connect to history. They may find objects linked to their own family, where they live, their hobby and so on, reinforcing a sense of identity and belonging. They have the opportunity to add and correct information thus contributing to the historical record. By inviting experts from outside the museum to contribute, the museum has the opportunity to increase and improve the knowledge base (see for example the involvement of an expert in a collection of axes described in the comments of the responses to the survey, Appendix 1). To some extent the "thrill of the chase" element can still be found. With so much information the search can be wider than before. I would propose that the "thrill" of finding the image you have been seeking is still as great as when searching physical collections, or perhaps even enhanced if you find that object image in a remote location. Without the Internet the search could not have been completed, and the satisfaction not achieved.

Pursuit of knowledge and connoisseurship is definitely answered by the use of the collections database. It should be remembered however that the knowledge available is usually restricted to the closed language of the museum, and the quality of the information recorded. The record may be incomplete. Obsessive searching and browsing could perhaps replace obsessive collecting. With a whole world of databases to peruse the search can be endless.

As discussed in chapter 2 the image of an object now represents that object. This changes the public relationship to the collections in fundamental ways, and how the images might be reused must be considered when quality requirements are determined. Museums have published catalogues to increase awareness of their collections from as early as the mid 1600s. Early catalogues usually did not include illustrations. Images in collections management were primarily to support internal work at the museum, and to identify objects in the collections. Computer-based collections record management allowed museum staff to spend time using the records rather than creating them. It also ensured that the record system is documented, not held in the memory of the curator. Photographs were added to the database record to support identification and conditions records. As computer records were made available on-line the museum's tool has become the object surrogate. The image is still being used for identification but with an audience beyond the museum walls. The form that the use takes determines the requirements for the image. Low-resolution images are sufficient if the user wants simply to view and confirm that yes, this museum has this object, or to perhaps download an image for a school project. If, however, the end-use is in line with those to stimulate the economy as foreseen by the Comité des Sages then demands will be higher.

To capture the interest of the non-researcher as they search museum collections on-line the museum needs to offer more than simple access. In their strategy document the British Museum considers access in terms of the museum building and being able to attract and accommodate more visitors. For digital material they instead use the term "engagement", which can be defined as:

> Engagement - the act of engaging. To engage:
> 1. to bespeak or secure (something) for one's own or another's use or possession.
> 2. to attach by pleasing qualities, to attract, charm, fascinate
> 3. to cause to be held fast, to involve, entangle (www.oed.com)

Engagement would seem to suggest more effort on the part of the museum to attract the user; they are seeking to involve the user rather than simply presenting the information. This is reflected in the extended use of the images on the "Explore" page of the British Museum website, and the use of storytelling and context. By simply presenting the collections database unaltered on the Internet museums are indeed providing access - they are allowing the user into the presence of the information that they have. The museum must however also allow the user to add information and interpretations and enhance the object record, accepting that there may be more interpretations of the object than that given by the museum, and that every object is polysemic. This perhaps then becomes a "use" of the digitised collections: to build knowledge.

In their recently published Strategic Plan 2011-2015 Europeana have also introduced the term "Engage" as part of a four-step strategy, they will seek to "cultivate new ways for users to participate in their cultural heritage" (www.europeanconnect.eu/news).

Once the user has become engaged with the collections database they can be encouraged to interact in such a way that the museum also benefits. On a museum's own website an important aspect in collaboration with the user is allowing contributions in the form of tagging, in this way a shared approach to classification is invited. The tag becomes part of the metadata linked to the object record, that is data about the data, which enhances the searchability of the record. Whilst traditional classification systems are hierarchical and defined in advance, a folksonomic classification evolves organically; it is not owned or controlled. Traditional classification is binary, an object either fits a category or not. Users are able to tag objects with words that reflect their own experiences and understandings of an object. The language used can help curators to understand how to target material more specifically to audiences. The words used also become a record of contemporary vocabulary (Cairns, 2011). Folksonomies offer museums a chance to engage the user in the on-line database. Allowing tagging is a way of removing perceived barriers of entry to the museum.

Funding is a common concern reflected in directives, policies and response to the survey. Källman suggests that a co-ordinated effort such as the secretariat in Sweden will enable a review of how resources are currently being used, and avoid parallel activities (Informant 2). Poole has estimated the cost of digitising all objects in European museums as 39 billion Euros. Currently much of the activity is government funded. In their response to the government enquiry SMVK requests 6.4 million kronor to continue their digitisation efforts. More recently DIK (the union representing employees in the culture sector in Sweden) proposed that the government should commit 200 million kronor to support digitisation of Swedish cultural heritage, and called for a permanent ACCESS program (www.dik.se). Elsewhere, sponsorship is being used as a means to finance specific projects.

As government funding and sponsorship becomes harder to come by museums need to use the digital data in such a way as to become self-financing. Perhaps the European directive, and resulting national legislation, for use of Public Sector Information (PSI) can inspire them (http://www.epsiplatform.eu/). This directive supports the reuse of maps, meteorological, legal,

traffic, financial and other data created in the public domain. Reuse examples include real time traffic information, and bus timetables combined with maps to be downloaded to a smart phone. According to a survey in 2006 the potential market for PSI reuse is estimated at 27 billion Euros. The PSI directive does not apply to material generated by cultural institutions. However, events like the Culture Grid hack days, "Appening" in Sweden, and recently the "Dutch Culture Linked Open Data Event 2011" (http://www.dcl11.net/) suggest that the sector is taking the initiative and starting to develop and seek end uses for their digitised material. The PSI directive makes provision for charging for the data that is being used; allowing museums to charge would help to cover costs and to complete digitisation faster.

It can be seen in table 7 that there are not many points of intersection between the reasons to digitise found in the literature, in the policies or on the website. The reasons to digitise found in the literature are not reflected in the other data sources reviewed. This can be explained in a number of ways. Strictly speaking none of the museums reviewed has a policy for digitisation. Databases were introduced as collections management tools, the data is available in digital form and so when pressure comes to be accountable for their collections, sharing that information on-line is one way to do it. This can be contrasted with the situation in libraries and archives where action had to be taken to create the digital surrogates, which together with the nature of their collections explains why their efforts seem more planned and co-ordinated. The reasons to digitise museums collections then become consequences of the decision to use existing digital material rather than direct reasons to make the collections available. For example, if the museum has documented the object, access to the information on-line may be enough for the researcher's purposes and they do not need to see the actual object, thereby reducing handling and reducing wear. Similarly, if the target is to digitise the entire collection it is reasonable to assume that each item will be examined and so collections inventory can be supported. This in turn may lead to a decision to de-accession an object, but there is no evidence that museums are using the fact that an object has a digital surrogate as a reason to dispose of the object.

The survey reviewed in chapter 5 showed that digitisation impacts little on the role of a museum conservator. As a result of publishing the holdings requests for loans may increase. There seems to be little time or funding for combining digitisation with collections condition inventories. Active conservation treatments are prioritised for objects that are used in exhibitions or are loaned. In general those responding to the survey agreed that preventive conservation is supported by digitisation, but that access to the originals should still be promoted.

Now that the data is available, co-ordination at government level is essential to ensure that resource is provided to promote and better understand use of the data, and also to support long term preservation of the digital record. Museums need to be open to the possibilities of user input and to understand that this will enhance the record rather reduce their own position of authority. They also need to recognise that use will increase if the data is available via websites outside of the museums control.

Digitisation of museum collections can only be said to be a worthwhile effort if the digital records are viewed, enhanced and re-used. The goal of providing access to cultural heritage must evolve into engagement of users other than researchers and interaction with the users.

	DigiCULT	Comite des Sages	Nordiska		State Museums for World Culture			The British Museum	
						website			
reasons to digitise			policy	website	policy	Etnografiska	VKM	policy	website
preservation by protecting the original from use									
allows disposal of the original									
increased access	X	X	X			X	X	(X)[1]	
marketing tool						X			X
future use of digital material		X							
added value (searchability, new information)	X								
support collections inventory									
generate information through external users	X			(X)[2]		X	X		X
better overview of large collection, increasing public awareness about holdings									
concerns									
lack of funding	X	X	X		X				
need for standards	X								
training of employees	X							X	
long-term preservation of digital record	X	X	X		X				
portals									
promotes K-samsok and Kringla									
promotes Europeana		X							

Notes
1. Engagement rather than acess
2. On DigitaltMuseum site

Table 7. Reasons to digitise crossed referenced with directives, policies and websites

7. Summary

In chapter 2 the history of museums has been reviewed. The reasons for their establishment were mostly political. Using the curiosity cabinets of early private collectors, or collections built by royalty, governments had a tool with which to educate their citizens as nations were established and countries became increasingly urbanised and industrialised. The building and construction that these latter processes involved unearthed many archaeological finds, which were then also housed in museums and reinforced a shared history. The first museums used original objects, but from the opening of the South Kensington museum and onwards plaster casts and photographic surrogates were also used. The target was no longer to show the wealth of the nation (or the patron), but instead to educate. This could be compared to the current justifications for digitisation - the images produced are surrogates being used to provide access to collections and knowledge. A key difference is that the museum visitor in the virtual world can browse through (potentially) millions of objects and choose and develop their own contexts. In museums the knowledge and context linked to the objects is managed by the museums and their curators.

The use of images in collections records has been reviewed. The use of drawings and photographs has been discussed, as has the development of cataloguing. From Tradescant onwards published catalogues were a means of sharing contents of the collections. As computer databases were introduced those were instead mostly tools for the museum staff, and even then often a limited number of users. The registration of objects has used keywords often unique to the museums and dependent on the authority of the curator. The database is already digitised so as pressure to share information via the Internet mounts, it seems logical to start with what is already available. Publishing the computer-based catalogues provides quick access to the collections information, but the closed environment that the information has been created in does not necessarily make the collections useful and useable to many beyond the world of scholars and researchers. With current possibilities for users to add their own information and keywords, the records start to reflect a contemporary and open taxonomy. Links and references more relevant to users outside the museum world (i.e. those who are the target of the increased access) are developed and the collections are made more accessible.

The process of digitisation has developed from a special project to a routine activity, but nonetheless depends on funding being available. Either resources are channelled away from other museum activities, or sponsorship is required. Sponsorship implies selection of special objects or collections to be digitised. On what basis can this selection be made - should only the masterpieces be digitised, or does this lead to a dictating of taste and loss of information regarding objects that are not digitised? There seems to be very little data regarding how digitised collections are being used. If evidence cannot be produced funding might be cut, and in effect all digitisation carried out so far might go to waste as investment in digital preservation is also cut.

The DigiCult report published in 2002 is reviewed in Chapter 3, as is the report of the Comité des Sages from 2010. Both are EU initiatives to support digitisation in the heritage sector. In 2002 the focus was access to and use of the collections resulting in increased value of the collections. The report identified a number of challenges including sustainability of e-services, technical interoperability, threat of a technology gap, and human capital. The report showed that users of digitised material tended to be scholars and researchers. The collections are more accessible for these users but are not reaching a wider audience - does this result in increased

value? The report identifies a need for standards to be developed to enable better searching. Steps need to be taken to ensure that smaller institutions can keep up, and that staff at all levels can acquire the requisite skills for using the new technology effectively.

The Comité des Sages report from 2010 still focuses on providing access to collections. They conclude that objects that are not digitised will be forgotten and collections that cannot be consulted using today's tool (the Internet) will be lost. At the same time they recognise that investment in long-term digital preservation is essential, a point that was not so strongly highlighted in the DigiCULT report[8]. The key for the Comité is promotion of Europeana, a central portal for European Heritage. Countries have developed aggregators that feed into Europeana, and these go someway to reducing the need for standardisation. API possibilities have developed since the DigiCULT report and it is now easier to harvest material.

The DigiCULT report sought a commitment from government to invest in the digitisation process. The Comité recognises that private funding partnerships are essential, but cannot replace public funding. They suggest that there will be future uses for all of the digitised material being generated that will stimulate economic growth and job creation.

About 5% of material that has been digitised by museums is available on-line. This is not a significant increase on the 3% of holdings typically on show in a museum. Whilst the 5% is accessible worldwide, at anytime, there is a danger that it represents only large, well-known collections from museums that can afford to finance digitisation.

In Sweden responses to the government inquiry regarding creation of a national strategy highlight the need for centralised support for long-term preservation. Lacking from this inquiry is any justification and/or explanation for the digitisation process. The respondents are not asked to explain what they hope the outcome will be: they simply confirm that they are digitising collections. Indeed the lack of formal plans at the majority of institutions supports this. Digitisation appears to be being carried out for digitisations sake, and to provide data for K-samsök and Europeana. These aggregators are creating a pull effect. If they indeed are the users' choice of search tool, collections that are not available to the portals will not be used. The risk is then that material available to users becomes biased to organisations that have populated the portals, as highlighted in the technology gap concerns of the DigiCULT report.

Results from the NUMERIC report reflect the differences in definition and method of digitisation in the ALM sector. The survey also highlights the relatively low percentage of all holdings that are available via the Internet. Together with a low level of institutions that have a written plan for digitisation it is still unclear where the impetus is coming from. How are museum directors justifying the expense if other than to provide data for surveys such as this? Are measurements of progress towards digitisation of collections actually driving that digitisation?

New initiatives focus on centralised databases and portals. This would seem to be the way to offer the user access to a maximised number of objects and to support long-term preservation. By offering tagging and sharing possibilities, new information, and thereby increased value, can be added to the object record. The copyrights on the Europeana site are very open, expanding the development possibilities for this digital material, and hence supporting its creation in the first place, and should serve as a model for other portals and websites.

Chapter 4 compares strategies and collections on-line at Nordiska Museet, State Museums for World Culture (SMVK), and the British Museum. None of the museums has a documented digitisation policy. The Nordiska Museet makes their collections available via Digitalt Museum, a portal common to users of the Primus database. This puts the user slightly at arms length from the museum, but still allows feedback and complementing of the records. The SMVK group of

[8] Long-term data preservation is being addressed at an EU level by the CASPAR program. Its capabilities are being tested by UNESCO, and the European Space Agency, among others, after all MLAs are not the only sector generating large amounts of digital data (see www.casparprserves.eu).

museums has or will have collections on-line directly searchable from each museums website, but what the user sees is pretty much the same record as the museum staff sees. There has been no attempt to adapt the material. Users are invited to email the museums if they want to correct or add to the records. The British Museum has a similar collections on-line database, intended for use by researchers. In addition the website has an "Explore" section where the information is presented in a way that gives a wider understanding of the collections. None of the websites highlights Europeana or national aggregators and portals.

Conservation of physical objects might be one of the areas that loose funding to digitisation. A surrogate has been produced and the original is no longer a priority. It could be argued that this supports preventive conservation practice. As long as good storage conditions can be maintained intervention is not required. Digitised images provide opportunities to investigate different conservation alternatives, before any conservation treatment is carried out. In this way misunderstandings regarding the results of the treatment can be reduced. Conservation treatment reports can themselves become part of the information linked to an object record.

The survey reviewed in chapter 5 showed that digitisation impacts little on the role of a museum conservator. As a result of publishing the holdings, requests for loans may increase. There seems to be little time or funding to combine digitisation with collections condition inventories. Active conservation treatments are prioritised for objects that are used in exhibitions or are loaned. It would be interesting to understand the workload of a paper conservator working in an archive in comparison. In general those responding to the survey agreed that preventive conservation is supported by digitisation, but that access to the originals should still be promoted.

In chapter 6 the stated objectives of the dissertation are examined in relation to the findings of the paper. As shown by von Platens paper, museums have proceeded with digitisation without any written policy. National strategies are required to enable better use of the digital material that has been migrated from the internal collections management tools to the Internet, often with no adaptation. Gumælius identified access as a key reason for digitisation, but museums need to consider the nature of this access. Is the purpose simply to present the object record, or is there a need to engage the viewer by adding context, and story telling.

Some of the reasons for collecting reviewed in chapter 2 can be identified in the museums collections databases on-line. The user can connect to history, and experience a thrill in finding a long-sought object. It is certainly possible to pursue knowledge and connoisseurship, perhaps even obsessively.

Images in the databases were added primarily for the museums' internal use, and allow identification of the objects in the collection. They are available for further end uses, and act as object surrogates. Further end uses are being explored, often at specially organised events for programmers.

Lack of funding is a highlighted concern, and with little evidence to show who is using the material available on the Internet this would seem justified. The cultural heritage sector perhaps needs to take inspiration from the European Public Sector Information directive and seek uses for the digitised material that can generate income to support the digitisation efforts.

In conclusion many of the reasons for digitising found in the literature are not in fact reflected in directives, or found on the websites reviewed in the case studies. The reasons instead seem to have become consequences of having made the collections catalogues available on-line.

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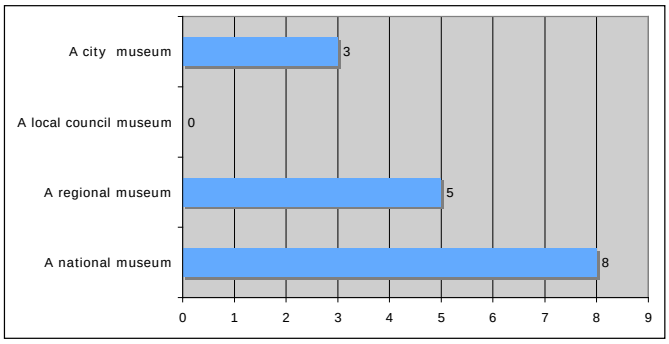
Appendix 1 - Survey

Total completed questionnaires: 20. All translation Swedish to English, Anna Stow

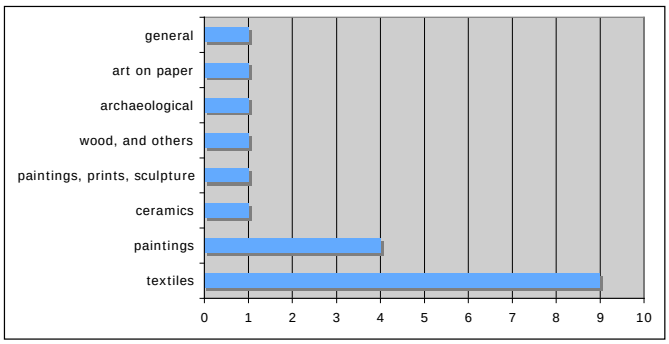
1. What type of organisation do you work for?



Other :
- foundation 1
- Educational institute 1
- Private owned national museum 1
- Private studio 1
- A regional storage centre for 4 main museums 1

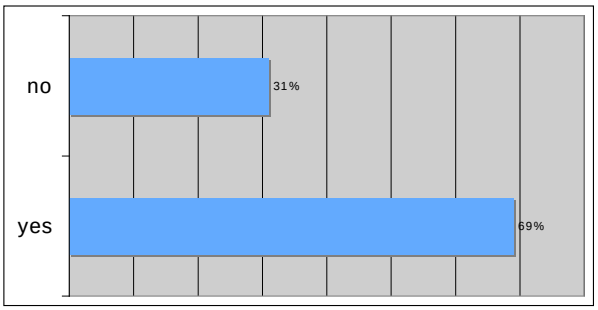
Answered question 16, skipped question 4

2. What is the main object group that you work with?



Answered question 19, skipped question 1

3. Does your organisation make its collections available on the Internet as a searchable database?



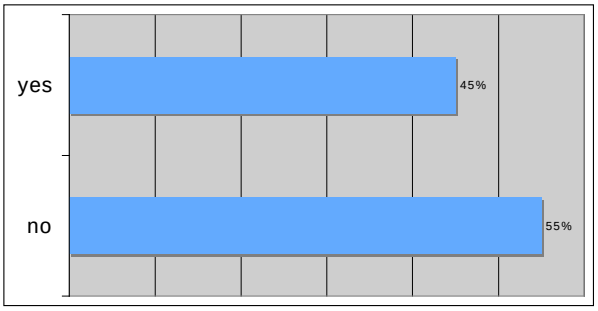
Answered question 19, skipped question 1

4. If no, are there plans to do so in the future?

response	%	Count
yes	100	6
no	0	0

Answered question 6, skipped question 14

5. Does digitisation (creating records that can be accessed on-line) impact on your role as a conservator?



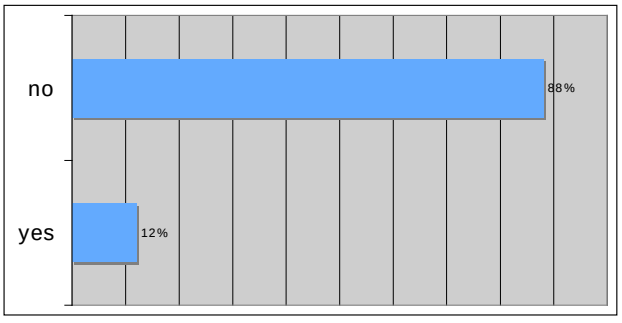
Answered question 20

Comments:

- fotografering och registrering ingår i mina arbetsuppgifter. (Men kanske kan ses som en del av en konservators arbetsuppgifter.) (Photography and registration are part of my duties (But can perhaps be seen as part of a conservators responsibilities)) 3/25/11 10:02PM
- I work in a project with a curator, a photographer and our registrar to correct and add information and pictures to our new database. In near future parts of the collections will be searchable on the website. My work includes the handling of art going for photo, cleaning and sometimes other treatment before photo. I add/correct information on materials. I also add a condition report on every object but this is not going to be public information.3/26/11 3:42A
- The pictures are not detailed in that way3/27/11 8:37PM

- A little, but the database is a vital tool for our own use. We probably use it more than the public.3/28/11 2:23PM
- I take many of the photographs3/28/11 4:34PM
- Vi har fått ökande antal låneförfrågningar. Vi har ökat antal frågor om föremål både inom och utomlandet. (We have received an increased number of loan requests. We have an increased number of requests both within Sweden and overseas).3/28/11 7:30PM
- Fler brevförfrågningar Fler utlån (More written questions, more loans).3/28/11 7:31PM
- If conserved objects were put on-line, It would be easier to find reference material for conservation issues, treatments, etc.3/28/11 8:22PM
- We have not noticed any demands on us.3/30/11 2:44PM
- Om någon vill ha en fotografi av ett föremål är det jag som ska leta upp det i magasinet, ta fram det, kontakta vår fotograf, organisera arbetet och ta betalt av kunden. Men det här kräver så klart att någon på något sätt vet att föremålet finns här, kanske har en släkting skänkt det. Det händer kanske någon gång varje eller vartannat år. Museet har en föremålsdatabas men bara ett litet antal textilier är inskrivna där. Däremot finns en stor del av museets övriga samlingar införda. Databasen är dock inte av sådan typ att vi i nuläget kan lägga ut informationen på internet. I nuläget finns det mer akuta saker att jobba med vad gäller samlingarna än att digitalisera. Föremål läggs in i databasen efter hand som de skänks till museet eller om det är ett föremål som redan finns i samlingarna när det tas fram för utställning eller på annat sätt aktualiseras. (If somebody requests a photograph of an object it is me who finds it in the archive, contacts the photographer, organizes the work, and collects payment from the customer. This of course requires that somebody in some way knows that the object is here, perhaps donated by a relative. This happens sometimes every, or every other year. The museum has an objects database but only a small part of the textile collection is registered. On the other hand a large part of the rest of the collections are entered. The database is not currently in a form that can be shared on the Internet. There are currently more urgent things to work with regarding the collections than digitization. Objects are registered in the database when it is donated to the museum or if already part of the collection when it is used in exhibition or used some other way.) 4/5/11 4:36PM
- Getting the conservation record digitised and linked to the objects makes it easier to get an over-all picture of preservation status, investigate possible correlations between preservation status and other object parameters such as material, burial conditions, treatment history etc.4/6/11 2:06PM
- My work does not include accessing my records on-line.4/7/11 2:52PM
- The goal has always been to reach as many interested as possible. Technical interferences have delayed the project.4/8/11 3:41AM

6. Do objects receive conservation treatment prior to photography for records creation?



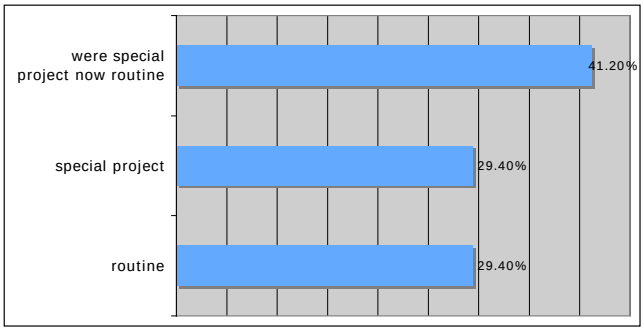
Answered question 17, skipped question 3

Comments:

- Most objects are somewhat cleaned, but in some cases more treatments are executed. If the damage is too extensive, we take a picture but it will not be public.3/26/11 3:42AM

- don't know3/28/11 5:10AM
- Yes and no. In principle all of our objects (archaeological) were conserved in the 1960s and 70s. Photography has not been consistent and some photos are taken before and some after. We are currently documenting all our object groups systematically which includes full photo-documentation.3/28/11 2:23PM
- Newly registered objects do usually not receive a conservation treatment because of lack of time. But some objects get a new picture in our database when they have been prepared for exhibition (after conservation treatment and mounting)3/28/11 4:34PM
- If objects were photographed only after conservation it would not give a truthful picture of the object in question.3/28/11 8:22PM
- No money3/30/11 2:44PM
- Not necessarily but if the need for treatment is acute or objects are going on display or loan.4/6/11 2:06PM
- Sometimes but objects are mostly photographed prior to treatment.4/7/11 2:52PM
- Photography is part of the chain in our treatment of the object on its way into the store. Conservation is too expensive and time consuming, when the goal is to save as many objects as possible from the inferior climate in cellars and attics. The objects are frozen and vacuum cleaned. Sometimes mirrors and glass, covering pictures or paintings, are cleaned to get a better quality of the picture taken. A kind of conservation.4/8/11 3:41AM

7. How would you describe collections digitization activities within your organization?



Answered question 17, skipped question 3

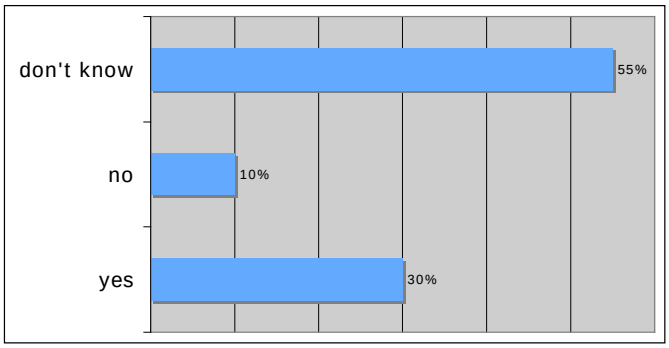
Comments:

Both routine and special projects3/25/11 9:49PM

- I mån av tid. I vissa sammanhang, t.ex. utlån och inför utställning är det rutin. Men jag registrerar inte allt jag får mina händer, det hinner jag inte.(when there is time. In connection with for example loan or before an exhibition it is routine. But I don't register everything that passes through my hands, I don't have time.) 3/25/11 10:02PM
- The project is financed via research money, i.e. all external money. There is no added finance from the museum or the governing authority for this work. The financing from the governing authority (Kulturförvaltningen) has only covered buying the database (MuseumPlus). People to work with it has not been a priority...3/26/11 3:42AM
- The museum has not enough funds to support a member of staff to only work with digitization3/27/11 8:37PM
- The task is divided between a couple of people. The curator registers the object, the conservator or an assistant takes the picture and the IT group makes it available on our website.3/28/11 4:34PM
- Accessprojektet3/28/11 7:31PM

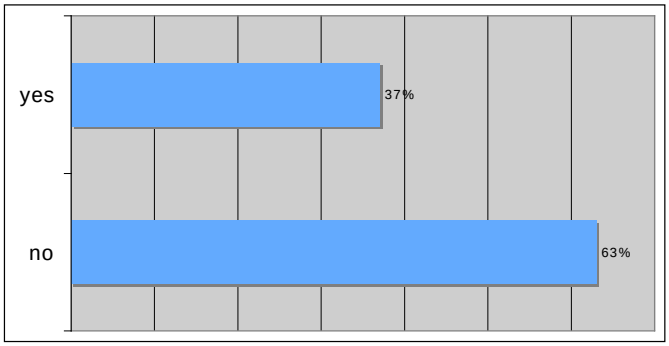
- Our case is a bit different as we are an institution giving education in conservation.3/28/11 8:22PM
- A group disabled are working continually3/30/11 2:44PM
- Digitaliseringen, som i så fall innebär fotografering, sker bara om någon vänder sig till oss och vill betala för en bild. Fotografier digitaliseras däremot kontinuerligt av en särskild avdelning på museet. (Digitising in the form of taking a photograph occurs only when somebody requests a photograph, and is willing to pay. Digitising of photographs is on the other hand an ongoing activity in a special department at the museum.)4/5/11 4:36PM
- Started out as a special project years ago but is now routine. However the process is very slow and not always prioritised.4/6/11 2:06PM
- See above.4/8/11 3:41AM

8. Does your organisation see increased requests for access to objects that can be viewed on-line?



Answered 20

9. Has your organisation used digital images of objects in the collection for other purposes e.g. reconstructions, research, digital conservation to test outcome of proposed treatment?



Answered question 19, skipped question 1

Comments:

- don´t know 3/25/11 9:49PM
- Research. We have added information on a lot "hidden information" to the records that has solved some mysteries in the collections. 3/26/11 3:42AM
- For example in looking for identification of artist or object. 3/27/11 8:37PM
- archaeological research and documentation. But serious researchers will request a visit to the

objects themselves. 3/28/11 2:23PM

- I didn´t really understand the question. 3/28/11 4:34PM
- Only in few cases. 3/28/11 8:22PM
- Bilderna används ibland på hemsidan, i utställningar eller skrifter. (Pictures are sometimes used on the website, in exhibitions and publications.) 4/5/11 4:36PM
- Reconstructions have been tried from 3-D imaging, and 3-D images used as a tool for evaluation of dimensions stability in retreatments of wooden objects. 4/6/11 2:06PM
- For ex. the axe project. A black-smith and researcher obtained a CD with the pictures of all the types of axes in our collection. He will use it in education, to make replicas and to distribute to other historical interested smiths. Our smith furnished us with information about our axes that we would never have been able to reach from historians alone.4/8/11 3:41AM

10. Digitising a collection might be seen to promote preventive conservation, since objects can be accessed without risk to the original.

		Strongly	Quite strongly	Not much	Not at all
Agree	**%**	**26.3%**	**63.2%**	**10.5%**	**0%**
	count	**5**	**12**	**2**	**0**

Answered question 19, skipped question 1

Comments

- Dels kan man identifiera och titta på föremålet utan att plocka fram det. Men i och med att föremålet är sökbart digitalt så "finns det också". När man har stora samlingar så tenderar föremål försvinna i mängden. På detta sätt kan folk bli medvetande om att de finns.(Partly one can identify and look at an object without having to actually take it out of storage. But since the object is searchable digitally it "exists". With a large collection objects are easily misplaced. In this way people know that the object exists.)3/25/11 10:02PM
- I agree strongly, but not necessarily to the later part of this statement. I find the main promotion to preventive conservation lies in the fact that the collections "come alive" with pictures and information on the Internet. The more museums can show what treasures are in their custody, the more understanding and interest will come out of it. We can already see, in the museum, that when a work of art has a picture the curators will ask for it! 3/26/11 3:42AM
- Only applies to queries from outside the museum. The staff still have to manhandle the objects for exhibitions. But is useful when planning an exhibition without having to pull objects out of storage.3/27/11 8:37PM
- See comment above. Digitization helps a researcher to a general search through the material, but examining the actual object has proved more useful. The photographer is not usually the researcher and is likely to concentrate on different aspects of the object, which may not be useful to the researcher.3/28/11 2:23PM
- I do agree because a lot of people are satisfied with a picture. But on the other hand, showing our collection online has created an awareness of some of the objects. Students have found objects that they probably never would have found otherwise, and this makes them want to come and view the object (which means handling and moving and stronger light). But I think that is a good thing!3/28/11 4:34PM
- Man kan välja snävare från början3/28/11 7:30PM
- Å ena sidan besparar man samlingen onödigt slitage å andra sidan finns risken att tillsynen inte blir lika regelbunden om bilder ersätter rutinmässiga kontroller (On the one hand the

collections are saved from unnecessary wear, but on the other there is a risk that inspections will not be as regular if the image replaces routine examination) 3/28/11 7:31PM

- This is a good starting point but one has to see the object in life if conservation treatment is in question. But if one is just looking for certain type of objects for conservation this is a good starting point. Depends on the situation.3/28/11 8:22PM
- There are quite strong forces in the museum world that claims that the best way to experience collections (even if we digitise) is by opening up the museum storage areas.3/30/11 1:51PM
- The demand is still on the original to be exposed.3/30/11 2:44PM
- Om föremålsdatabasen finns tillgänglig på internet kommer vi förmodligen få fler förfrågningar och föremålen plockas därmed fram mer och slits då. Vi är dock i den situationen att vi inte har resurser att hantera sådana förfrågningar, så om databasen hade varit offentlig idag hade vi fått säga nej till sådana förfrågningar. En förutsättning för att lägga ut föremålsdatabasen på internet är att anställa folk som ska arbeta med samlingarna. (Min tjänst är uppdragsfinansierad och jag tar in konserveringsjobb från externa kunder.) (If the objects database is made available via the Internet we will probably receive more requests and objects will therefore be handled and worn. We are however in a situation where we don't have resources to handle such requests, so if the database were available we would have to refuse such requests. A requirement to make the database available on the Internet is to recruit more people to work with the collections. (My position is financed by commissions, and I take conservation assignments from external customers.))4/5/11 4:36PM
- The need and thrill for direct access to the original objects for will never be wholly satisfied through digitised objects and we would not want that either would we? But definately agree with the above.4/6/11 2:06PM
- A picture alone cannot tell all about the object to an expert. In the case of our smith above, by holding the axe in his hands he knew that the (former) user was left-handed. He could tell whether the axe was forged by hand or mainly a machine product or whether it was repaired and in a certain way. A picture tells about the style and age, not about the use; the immaterial values. The picture serves at choosing from a list.4/8/11 3:41AM