



RICHERS

RENEWAL, INNOVATION AND CHANGE:
HERITAGE AND EUROPEAN SOCIETY



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D6.1 Access, Participation, Learning: Digital strategies for audience engagement with cultural heritage in museums and libraries

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RICHES
Deliverable D6.1
Access, Participation, Learning: Digital strategies for audience
engagement with cultural heritage in museums and libraries



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1 EXECUTIVE SUMMARY

This report examined strategies and approaches for deepening audience engagement with digitally mediated cultural heritage, by means of case studies, interviews, and a survey of the literature and GLAM institutional documentation. The study engaged with a rich and still blooming field of research and practice, which is made every year more complex through the joint inputs and thinking of GLAM professionals and researchers. In particular, there are two broad sets of trends that have been taken into consideration for shaping this study and overviewed for better understanding and outlining GLAM strategies for audience engagement:

Firstly, the changing role of GLAM institutions in the current European socio-economic and cultural landscape, including developments such as:

- The rise of informal and non-formal learning and the increasing viability of lifelong learning paradigms. As traditional education establishments are unable to cope in real time with the demands of rapidly changing market, industry and job market landscapes; cultural and memory institutions are better positioned to fill in the gaps by providing targeted programmes, versatile and easy to adapt to audience learning needs and profiles.
- Networked and pan-institutional structures for innovation and access to cultural heritage. There are many, complex, and locally specific factors that determine the need for pan-institutional structures for delivery of complex programmes, to name just a few: the need to respond to and serve global, complex, and mobile audiences; the opportunities offered by new structures for innovation, drawing on the know-how and resources of various governmental, cultural, and industrial institutional entities. For GLAMs, becoming part of temporary or semi-permanent networks and structures comes with opportunities (greater outreach, design and delivery of more rewarding audiences' engagement programmes and experiences) as well as challenges (opening up collections, organisational and workflow constraints, IP considerations).
- Changing and expanding notions of audience: Access to cultural heritage can occur in virtual, situated and blended spaces, inside and outside the premises of cultural institutions. Moreover, addressing on-site visitors, local communities, and global audiences comes with different requirements for delivering rewarding and engaging cultural experiences.
- The experience economy and economic constraints: With its shift from products and services to memorable experiences, the experience economy has had an impact also on GLAMs. To this adds the necessity for many institutions to increase their revenues to cope with funding cuts. These factors motion GLAMs to become proactive at delivering cultural experiences that truly add value for their audiences, along with generating revenues.
- The increased ubiquity of digital and networked technologies permeating socio-economic structures and setting new bases for how organisations conduct their activities, create and deliver products and services and communicate to their clients and audiences.

Second, mixed aspects associated with the integration of digital technologies in the work of GLAMs:

- On the one hand, digital technologies generate value and can enhance anytime, anywhere outreach; attract new audiences through more engaging experiences; support different patterns of interaction and interactivity as well as user feedback, involvement and participation through platforms such as social media services and crowdsourcing paradigms; facilitate personalised learning and engagement pathways inside GLAMs or online; and promote connectedness and accessibility of collections.
- On the other, their integration is associated with challenges, including: gaps between provision of content and its access and use; sustainability issues; fragmented visions and implementation approach in between digital and analogue; extreme digital-centricness, to the detriment of institutional missions and audience needs; financial and operational challenges in integrating, maintaining and updating digital infrastructures; resistance to change, old ways of working, mentalities, methodologies and lack of appropriate skills for DT integration.

To engage with these issues in depth, the study included four in-depth case studies:

Case study 1: The case study presents the results of an evaluation of the Fine Arts System (FAS) at the Turkish National Library (TNL). It explores the relationship between users and digital libraries and investigates the role of digitisation in broadening access and increasing the demand for using the digital resources. Inaugurated in August 2014, the digital collection Fine Arts System provides access to the non-book materials - 20,000 posters and 517 paintings from the collections of the National Library of Turkey. The results of the evaluation of the FAS with different users highlighted a number of interesting trends that can guide cultural heritage institutions in developing audience-driven access policies and new ways of mediation and engagement with their audiences. A demand for more and high quality cultural content for personal or professional use was expressed by the participants. Moreover, to enhance a deeper engagement of the users with online collections it is necessary to provide appropriate and user-friendly tools to explore and apprehend the content, taking into account different motivations, supporting a variety of information needs and learning preferences and providing more personal and purposeful interactions.

Case study 2: Launched in 2011, the online collection SMB-digital gives access to scientific documentation and images of more than 160,000 objects from the rich collections of the Staatliche Museen zu Berlin. The case study explored ways in which digital technologies can help to bridge the gap between cultural heritage institutions and their audiences. It first examined the strategies that the Prussian Cultural Heritage Foundation (SPK) and the Staatliche Museen zu Berlin (SMB) apply for digitizing and making available their collections online, seeking to identify best practices. To understand if and how the online museum collection SMB-digital can engage users, a qualitative evaluation of SMB-digital was conducted with a group of professional museum guides, identified as potential users of the online collection. The results, comparable to surveys of other museum online collections, indicate that, in making available high quality resources in today's competitive online information landscape, cultural heritage institutions should adopt an audience-driven and user-friendly approach, supporting different information needs and more personal, customized experiences to build sustainable relations with their audiences.



Case study 3: Online collections, a new form of mediation adopted by cultural heritage institutions, have to offer more and/or something different than physical exhibitions. Drawing on the results of relevant European projects, such as INDICATE, and on the on-going research of the International Working Group on Digital Exhibitions; the case study seeks to determine the impact of digital exhibitions on the users and to identify the features that apply to engaging content mediation and lifelong learning. It appears that, engaging digital exhibitions should present a number of strong elements, such as a highly communicative and easy to understand title, many images and the appropriate tools to explore them. As for museum audiences, prior knowledge and personal interest influence user behaviour. Designing online exhibitions for deeper user engagement should rely less on sophisticated technology, and more on the depth and quality of the story that is told.

Case study 4: The Samsung Digital Discovery Centre at the Digital Museum was selected to analyse the role of museums in lifelong learning, and the value of digital technology integration. The case study illustrated a successful long term partnership between a museum (The British Museum) and a technology company (Samsung) to create a digital learning centre for young audiences. The study positioned the Samsung Centre as an actor in a complex ecology of learning opportunities delivered by formal as well as informal education providers. Within this ecology, the Centre cultivates innovation by designing and delivering experiential learning activities supported by thoughtful integration of digital technology, aligned to principles of object-based and participatory learning. It contributes as well to supporting a culture of lifelong learning by creating meaningful connections with the learners, and with other actors in the educational landscape, such as schools, policy-makers and agencies that ensure access to education.

2 INTRODUCTION

2.1 BACKGROUND AND CONTEXT

Cultural heritage institutions have an important role to play in curating, preserving and disseminating cultural heritage in the digital era and in shaping the society of the future. Rooted in a long and rich tradition going back to the 19th century, cultural heritage institutions are keepers of traditions and scientific, educational, economic and social values, enjoying an extraordinary trust among their audiences.

The rise of digital technologies has deeply transformed the ways in which these institutions curate, interpret and disseminate their collections as well as how they interact with their audiences. Digitisation can contribute to better communication, understanding, and preservation of our heritage. It supports research, innovation and sustainable development in the sector, and provides opportunities for personal and professional growth.

Responding to a growing demand, a large amount of curated digital heritage content has become available online on museum websites and cultural platforms, on social media and crowd-sourced platforms, on mobile devices and onsite within the museum spaces, thus making knowledge widely accessible for engagement and learning when and where the audience chooses.

The digital era dramatically changed the ways that people seek and learn information over the past years. Technological developments have accelerated social changes and opened up opportunities for cultural participation, and increased fluid, inclusive and democratic cultural practices. As recent studies have shown, younger generations are becoming co-creators, co-authors and co-producers of digital content, initiating the shift from interactive technologies towards a participatory culture.

Traditional models of communication (one way, top-down and ‘one size fits all’) have become obsolete, and digital technologies can bridge the gaps between cultural heritage institutions and audiences and deliver engaging experiences. This raises interesting questions. Do museums and libraries provide broad access to their collections taking into account the information needs, expectations and skills of different kinds of audiences? Do they convey the encyclopaedic knowledge of their collections in an engaging way? How do digital technologies transform museum learning? Are the existing learning frameworks and assumptions still valid? How do they influence encounters with different audiences? Which implications do they have for the role of museums in the 21st century, in a lifelong learning and knowledge society?

“We cannot meet the challenges of tomorrow solemnly with the logics and structures of yesterday.”¹ Cultural heritage institutions need to develop audience-driven digital strategies, a need impelled and accelerated by the wide dissemination of digital technologies. The apparent relevance of cultural heritage institutions greatly depends on their ability to satisfy these new requirements.

1 Ringholt, Niels (2015), European Expert Network on Culture (EENC), Promoting access to culture via digital means, EENC Ad hoc question, March 2015, p. 11.
www.coe.int/t/dg4/cultureheritage/culture/digitisation/EENC-Promotionofaccesstocultureviadigitalmeans.pdf.

2.2 ROLE OF THIS DELIVERABLE IN THE PROJECT

RICHES explores the important changes which are impacting on cultural heritage in the contemporary world. The project's main objective is to investigate ways to reduce the distance between people and culture, re-calibrating the relationship between cultural heritage institutions and the audiences in order to increase cultural participation, lifelong learning and creativity, and to ensure that all of Europe can benefit from the social and economic potential of cultural heritage.²

This study is at the heart of the RICHES project as it explores in greater depth the status of digital heritage mediated by cultural heritage institutions. It seeks to identify innovative ways in which memory institutions can use their digital collections to play an active role in lifelong learning society and engage with audiences, increasing access to cultural life, providing learning opportunities and fostering inclusion, social cohesion, innovation and creativity.

The study has drawn upon the project's Taxonomy, which is the foundation of RICHES research, considering definitions of pivotal concepts such as 'cultural heritage' and 'digital heritage', especially in their relation to people, individuals, groups and communities, that give meaning to cultural heritage.

The research builds upon the broad investigation of the *Context of change in which CH is held, preserved, curated and accessed* (Task 3.1) conducted in the project, in particular how digital technologies and digitisation are impacting on the curation and preservation work of memory institutions. The current study adopts a qualitative approach, seeking to analyse how digitisation influences the policies of cultural heritage institutions in relation to their audiences and its impact on the provision of services for access, participation and learning.

The research also benefits from the outcomes of the project's overarching research theme on the *Role of Cultural Heritage in European social development*, which has identified practices, methodologies and structures that can be applied to Cultural Heritage with the assistance of digital technologies and how they can contribute to the social development in Europe.

By developing an Interactive Showcase, which provides an introduction to many digital collections, the RICHES project has also helped to bring people and institutions closer together.

The results of this study will shed further light on the ways to bring cultural heritage closer to people, bridging the gap between cultural heritage institutions and today's audiences, and the implications associated with shifts towards decentred, fluid, and more inclusive practices. Its outcomes provide a broader context to the results of related research in the RICHES project focusing on co-creative and participatory practices for cultural heritage and their role in enhancing cultural participation and engagement with heritage collections.

² Based on a presentation of RICHES by Prof. Neil Forbes at the *Digital Past 2016* conference, held in Llandudno, Wales, 10-11 February 2016, www.digitalmeetsculture.net/article/riches-presented-at-digital-past-2016-new-technologies-in-heritage-interpretation-outreach/

2.3 KEY OBJECTIVES

The aim of this study is to explore the status of digital heritage mediated by libraries and museums and to identify best practices with the potential to broaden dissemination and access and increase engagement of different kinds of audiences with cultural heritage.

Responding to a growing and persistent demand for cultural digital content, memory institutions carry out large scale digitisation projects and re-use digital materials aggregated in their repositories to develop offerings for different kinds of audiences. Libraries and museums experiment with the creation of digital collections and online exhibitions, where they present precious objects and complement the digital records with, for example, stories, contextual information and interactive features seeking to increase engagement with cultural heritage.

The first research strand of the study investigates digital collections and online exhibitions developed by memory institutions. It focuses on their impact on different kinds of users in terms of needs, expectations and required skills and on their potential to increase cultural participation and audience engagement with digital heritage. Moreover, the research examines the broader context by providing valuable insights into the institutional choices that shape the mediation and communication of digital heritage.

The second research strand explores museum learning integrating digital technologies using a lifelong learning perspective to analyse and map learning engagements with museum collections. Museums develop a wide array of learning applications and programmes integrating digital technologies in innovative ways to facilitate learning in different contexts, in interactive learning spaces within the museum, on museum websites and cultural platforms, on social media and crowdsourced platforms, or on mobile devices. The aim of the research is to show how developments in the social role of museum nestle with advances in digital technologies, and how these can reconfigure and bring a strong focus on education in museums' mission providing innovative tools and platforms to engage their visitors in learning experiences. Trends in engaging visitors with collections and their contribution in increasing cultural participation and fostering inclusion, innovation and creativity are explored and exemplified.

Finally, in addition to this research report, an interactive showcase was designed and implemented to support the dissemination of the results of the research. The showcase, which is part of the RICHES Resources website, provides a demonstration of a range of digital cultural services with a particular focus on services for education and learning. All interested users have the opportunity to find information and to participate to the study by submitting information on programmes and services that they consider as best practices for cultural heritage mediation and learning. Practical recommendations for cultural heritage professionals and links to relevant institutions, resources and projects complement the interactive report.

2.4 SCOPE AND DEFINITIONS

"...access to museums and galleries allows everybody to enter another world, think of another world, see the world from somewhere else, reimagine their own world, reimagine themselves... The point of the museum is to allow the citizen to be a better citizen."

Neil MacGregor, *BBC Artsnight*, April 2015³

³ *Museums Matter*, National Museum Directors' Council, 2015, p. 2, www.nationalmuseums.org.uk/what-we-do/museums-matter/

In exploring issues of engagement with cultural heritage, this report builds upon the concepts of *access* and *participation*. These twin and even overlapping concepts in ethical and human rights based approaches to culture and cultural heritage.⁴ Movements towards the democratisation of culture, taking place starting with the 1960s and 70s, for instance, promoted ideas that everyone has a right to participate in cultural life, and were concretised in community arts and participatory arts movements (Laaksonen 2010). In several ways, these initiatives and ideas were already anticipating the participatory turn in accessing and experiencing cultural heritage, which began to take shape and intensified after the 1990s, for their focus on acknowledging and manifesting the creative potential that all people are endowed with.

In human rights based approaches, “the participation of individuals and communities in cultural heritage matters is crucial, fully respecting the freedom of individuals to participate or not in one or several communities, to develop their multiple identities, to access their cultural heritage as well as that of others, and to contribute to the creation of culture, including through the contestation of dominant norms and values within the communities they belong to as well as those of other communities.” (Shaheed 2011).

This report builds on these ideas acknowledging the conceptual links between access and participation. At the same time, the study aims to capture and analyse recent developments in cultural heritage, which shift towards more audience-centred and inclusive approaches. To this end, a distinction is operated between the two terms, where:

Access to cultural heritage is taken to signify the availability and accessibility of cultural resources, content, documentation and experiences in inclusive ways for all citizens. Providing equal access implies that no audiences are refused opportunities to interact with cultural heritage and content on grounds related to their status, social background or ethnicity or other socio-cultural features; it implies as well that the objects, experiences and content are made available for audiences in ways that maximise possibilities of understanding, knowledge building, meaning attribution and enjoyment, as long as principles and rules called for by their preservation and protection are respected. With regard to *digital access*, issues of user-friendliness as well as user needs, expectations and digital skills should be taken into account to allow purposeful interactions, discovery and apprehension of the content of cultural information systems (Stiller 2014).

Participation is defined as the voluntary involvement in cultural activities and experiences, which can take a variety of forms, ranging from attending a cultural event, giving feedback on an exhibition to sharing personal experiences or contributing to the curation of cultural heritage objects and presentations. To increase cultural participation and enable deeper experiences of digital heritage, technology alone is not enough; research and evaluation programmes are necessary to support the design of meaningful interactions, participation and equitable sharing of digital heritage among people in Europe (Krebs 2012).

2.5 APPROACH

The work on this deliverable has utilised multiple methodological approaches comprising desk research, expert interviews, users testing and site visits to gain an understanding of the issues facing memory institutions due to digital advances and the expectations of the general public and other museum and library users.

⁴ The Human Rights approach to cultural heritage is also explored within RICHES deliverable D2.2 – *Digital copyright frameworks*

The methodology builds upon the central topic of the audience response to the mediation and learning offers of cultural heritage institutions; it investigates the potential of the selected cultural services and learning programmes to broaden access to cultural heritage and to enable a deeper engagement with audiences. Specific methodology for each area of research is detailed within each chapter.

In addition to this written document, an Interactive Showcase has been developed which provides access to a numbers of digital collections on varied topics within a single location. In this way, the case studies considered within the RICHES project are not confined to research deliverables, but immediately accessible to interested users. <http://resources.riches-project.eu/research/interactive-showcase/>

The DoW indicates that this task and deliverable is led by partner KYGM. However, it was decided at the beginning of the project's second year that Work Package 6 Leader SPK would take responsibility for this area of the project's work.

2.6 STRUCTURE OF THE DOCUMENT

This document has five main chapters that follow on from this introduction.

Chapter 3 entitled Accessing collections: From authority-mediation to user-orientated functionalities, considers the renaissance of heritage collections, trends and best practices followed by case studies of the Turkish National Library and German SMB digital strategies for museums.

Chapter 4 takes the next step by considering the deepening engagement with collections in their new online forms. After considering the approach that different cultural institutions have taken to making their collections available online, a group of people of varying demographics were asked to explore the online collections of interest to them and provide feedback.

Chapter 5 considers the role of that cultural institutions can play within lifelong learning and how new technologies are providing a new way to engage with young people and with their digital expectations. In a particular a case study looking at The Samsung Digital Discovery Centre at the British Museums shows how memory institutions can integrate their collections with educational curricula.

Building upon the previous discussion, Chapter 6 considers future strategies for museums and libraries and how some institutions are bridging the gap between traditional operation and modern audience expectation and the challenges that are still ahead.

Before concluding this research document, Chapter 7 outlines the development of the RICHES Interactive Showcase that gives interested users the opportunity to find and explore the digital collections of a number of cultural institutions.

3 ACCESSING COLLECTIONS: FROM AUTHORITY-MEDIATION TO USER-ORIENTED FUNCTIONALITIES

This chapter focuses on digital libraries and digital collections, two distinct types of information systems developed by memory institutions. It examines the characteristics of both types of information systems in relation to their intended users and highlights trends and best practices that can allow us to talk about “a renaissance of digital collections”.

The two case studies presented in the chapter give insights in the ways in which two leading memory institutions, the National Library of Turkey and the Staatliche Museen zu Berlin of the Prussian Cultural Heritage Foundation develop their institutional strategies for access to and broad dissemination of heritage collections based on the reuse of digital cultural content aggregated in their digital repositories and how these impact on their digital strategies. Moreover, both case studies provide interesting insights as to the behaviours, motivations, expectations and digital skills of today’s audiences in their interactions with cultural heritage collections.

3.1 DIGITAL LIBRARIES AND DIGITAL COLLECTIONS: THE RENAISSANCE OF HERITAGE COLLECTIONS?

Libraries and museums make available large amounts of curated digital resources to a diverse range of audiences, for study and scholarly research, for discovery and creative reuse, for enjoyment, education and learning. Both digital formats are closely related to the concept of ‘digital heritage’. According to the project’s Taxonomy⁵, ‘digital heritage’ or ‘digital cultural heritage’ “refers to digital content and materials that represent, reflect or describe human knowledge and cultural manifestations, are invested with cultural value, and considered a legacy that ought to be transmitted to future generations. Digital heritage content can be produced by converting materials originally in analogue format, or can be ‘born digital’ – objects such as documents, artworks, software or websites that originate in digital format.” ‘Digital heritage’ unites various kinds of documents from the collections of different cultural heritage institutions – museums, libraries and archives.

Digital libraries

Large-scale digital repositories and aggregations such as the digital libraries emerged in the early 1990s, when the Internet started to spread creating a networked world. Digital libraries are “collections of digital objects spanning different media formats (text, audio, video, among others) and accompanied by registries, protocols or standards for classifying, storing, preserving, consulting and retrieving data.” This definition of digital libraries provided in the RICHES taxonomy refers to two other features of this type of repository, the search interface that allows information retrieval and online access via computer networks.

As the name implies, digital libraries were initially related to libraries and digitisation projects or initiatives emerging in the context of libraries. According to a definition provided by the Institute for Museum and Library Services (IMLS), a digital library was fundamentally a resource reconstructing “the intellectual substance and services of a traditional library in digital form.”⁶

⁵ <http://resources.riches-project.eu/glossary/digital-heritage-digital-repository-online-catalogue/>

⁶ Seadle, Greifeneder (2007).

This is an important aspect as it associates digital libraries with services that a library provides to its users, conform the mission of this kind of memory institution. In the definition formulated in 2014 by IFLA / UNESCO in a common manifesto for digital libraries, retrieval and exploitation services to the users remain a pivotal element of a digital library. According to this definition, a digital library “is an online collection of digital objects, of assured quality, that are created or collected and managed according to internationally accepted principles for collection development and made accessible in a coherent and sustainable manner, supported by services necessary to allow users to retrieve and exploit the resources.”⁷

In a long article on digital libraries, digital collections and the digitisation of cultural heritage information, Clifford Lynch stresses the role of communities that give value to digital libraries in contrast to digital collections, considered on the contrary as ‘raw’ materials:⁸

“I’m starting to believe that collections – at least many collections based around cultural heritage materials – don’t really have natural communities around them. In fact, one of the things that we learned over and over again (...), is that digital materials find their own unexpected user communities. That when you put materials out there, people you would never have expected find these materials from sometimes very strange and exotic places that you wouldn’t have imagined, and sometimes make extraordinarily creative or unpredicted uses of that material. So perhaps we should avoid over-emphasising pre-conceived notions about user communities when creating digital collection, at least in part because we are so bad at identifying or predicting these target communities. But I think that digital libraries are somehow the key construct in building community, making community happen and exploiting community.”

Indeed, almost fifteen years after this writing, digital libraries analysed in the context of their web-based communities is a major trend in current research in this field.⁹ Today’s digital libraries focus on attracting, strengthening and maintaining online communities by providing services tailored to their needs, a strategy that can contribute to the longevity of the projects. An outstanding example for this strategy is Europeana Cloud, a Best Practice Network coordinated by the Europeana Foundation, with the aim to build a new platform, Europeana Research, providing tools and services based on Europeana content to satisfy the needs of researchers in the fields of the Humanities and the Social Sciences.¹⁰

Such implementations of digital libraries oriented towards user communities, specific uses or content strategies aiming at maximizing their value of use are:

- specific disciplines (i.e. classical antiquity, Perseus);
- specific kinds of audiences (i.e. digital library for children, USA);
- intended uses (educational, such as Prometheus and ArtStor);
- initiatives at a national (German Digital Library for Germany or Finna in Finland or US, Digital Public Library of America) or European level (Europeana);
- museum collections.

⁷ Definition from www.ifla.org/publications/iflaunesco-manifesto-for-digital-libraries.

⁸ Lynch, Clifford (2002), “Digital Collections, Digital Libraries and the Digitization of Cultural Heritage Information”, *First Monday*, 7(5), firstmonday.org/issues/issue7_5/lynch/index.html.

⁹ Calhoun 2014, 159-177.

¹⁰ Benardou, Dallas, Dunning 2014.

Digital collections

According to experts, there is no definition of collections or of digital collections widely accepted. The International Standard ISO/DIS 18461:2015 dedicated to International Museum Statistics, defines a collection as “the body of acquired objects held in title by a museums” and a digital collection as “all objects in digital form in the museum collection, whether born digital or digitized.” A recent study aiming at providing a shared understanding of collections in federated digital resource development and finding out how collections can be best represented to meet the needs of service providers and of their user communities, demonstrated the changing meaning of collections under the influence of digitisation projects; such definition becomes even more elusive in digital environments.

Collections, however, form the basis of the work that cultural heritage institutions do – they care for and curate, present, interpret and preserve their collections for the future generations. According to Museum Association UK, there are 2500 museums in the UK, holding at least 200 million objects, with approximately 130 million of these objects in the national museums. In the UK, access to physical collections has been described as a service “provided in a haphazard and patchy manner”. Although public demand for engagement with collections is increasing, users and interested people in the UK do not experience the benefits to the 200 million objects but too seldom as a recent study has demonstrated. Approximately 90% of museum collections are in storage, meaning that the vast potential of the collections UK museums hold is barely unlocked. Moreover, in the UK, 74% of museums felt that their collections could be better used, with 52% reporting increasing public demand for access to the collections they hold. It is a fact that effective use of collections makes museums relevant and inspiring, and digital technologies can help unlock their potential by making collections accessible to all without time and place constraints. The results of a recent user survey in the UK among people wanting to access physical collections has underlined the importance that users attach to online and digital media to facilitate access to physical collections, when the holdings are listed and collection information is provided online.

The digitisation of cultural heritage collections in Europe is monitored by ENUMERATE project, currently part of Europeana, that provides statistical data on its progress, measures access and use of digital collections online. Experts have stressed the need of explicit criteria that applies to selection for digitisation and to facilitate the description of the collections when these are published and made accessible online. Selecting objects to digitize placing individual objects in context and organizing them in a collection for a specific use or for an intended audience creates meaning.

Digital collections in museums are inextricably related to research and collections documentation. As with databases of scientific documentation, museum databases were first conceived for an internal use. Technological developments, allowing for instance adding images to objects records, and associating multimedia, helped to open up scientific information kept in institutional databases to a broader audience. This is stated for instance about the collection of the British Museum, mentioning that “[t]he database is an inventory of the Museum’s collection and aims to record what is known about it. It is primarily designed to support curatorial and research work, and much of the text is specialised in nature and terminology.” Museum collection databases have nowadays evolved into essential resources and play a central role in shaping access to museum collections online: “[f]or long seen as something dull but necessary for accountability purposes, museum documentation has been transformed through digital technology into an element of museum access and communication”, as Nick Merriman points out.

However, digitisation of heritage collections alone does not automatically imply access; new methods for describing and organising digital collections are needed, revising traditions that have been established around knowledge organisation and epistemic insights for the presentation of scientific collections over the past. Cultural heritage institutions are facing challenges moving away from established patterns and seeking to broaden access, nurture engagement and redefine the value of use of their collections for a wide audience.

3.2 TRENDS AND BEST PRACTICES: MOVING AWAY FROM “AUTHORITY-MEDIATED” COLLECTIONS

“With the multitudinous rapidity of technological change, it may be easy to forget that it is only in the last quarter century that we could even dream of making this wealth of information available to anyone in the world, immediately, for free. Even today, for many museums, putting their collections online unfortunately remains a dream.”

Oberoi, Stein, Arnold 2015

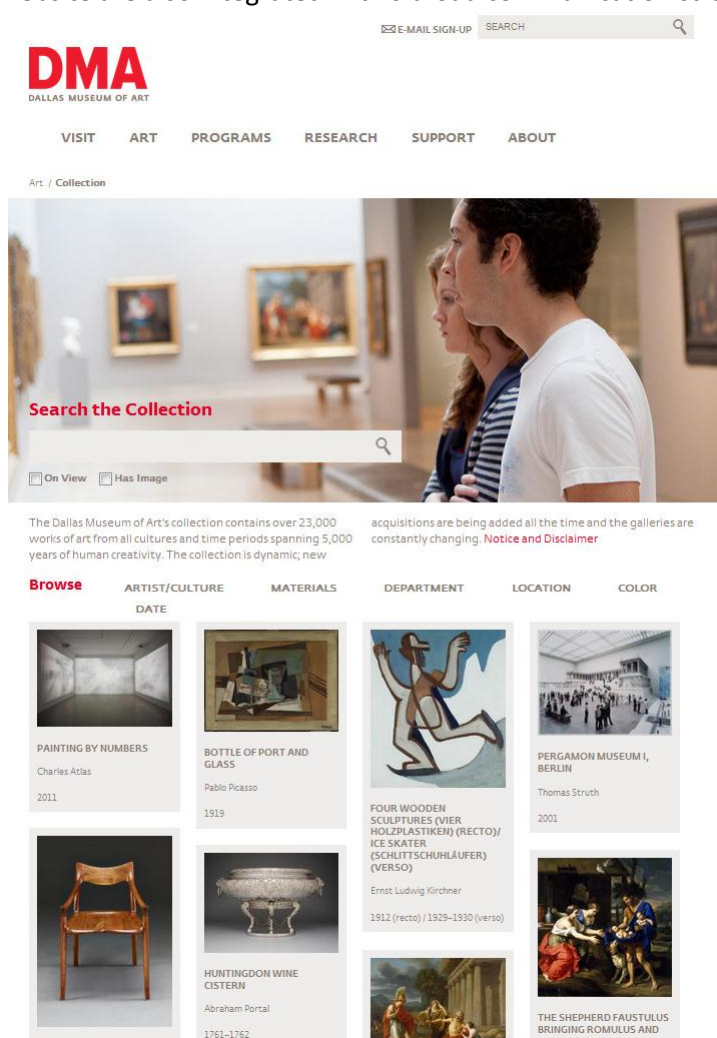
Memory institutions have been digitising their collections and caring for their preservation as well as providing access to them. This section highlights three main trends for digital collections: the use of digital technologies to overcome organisational barriers for digital access to collections, the awareness of the advantages of open access policies for increasing public engagement, and access strategies for enhancing user experiences with digital collections online.

Institutional strategies around collections: supporting richer user experiences

Museum and heritage professionals are in need of successful digital strategies and wider organisational digital policies that will enable a better access to their collections. Reusing the content in their digital repositories, cultural heritage institutions can create different services based on their digital assets. A recent study identified a range of organisational barriers, with a negative impact on the ability of the institutions to engage with audiences, such as centralised and inflexible IT services and lack of specific digital strategies within organisations.¹¹ The wish for infrastructures such as large and powerful museum databases, digital content repositories unifying the processes of content production, storage and reuse of digitised cultural heritage objects for different publications was formulated in the mid-nineties. This concept is now becoming real with the spread of digitisation and the new working processes that are introduced. Collections information can be available on different platforms and used for various services implemented with an effective management of digital assets, as the example of the Dallas Art Museum shows. This museum developed a new working method around its collection by creating a workflow from object digitisation and content production to publication and aggregation of content from its collections on the Web based on a holistic approach of collection curation, management and communication to the audiences (Oberoi, Stein, Arnold 2015). The framework suits the needs of the different departments of the institution by integrating tools such as process analytics and charts, which give museum staff the ability to monitor workflows and check progress of content production on a daily and a weekly basis, such as the number of objects digitized by department, classification, and location within the museum. This infrastructure will be further developed and used to provide better services to the audiences, allowing for flexible data modeling, refined search functionalities, such as faceted search and browsing categories for gradual content discovery.

¹¹ ‘The digital agenda and its link to access for collections is not being incorporated into organisation wide strategies, or through the development of individual digital strategies.’, Lomas, Hutcheson 2012, 8.

Sharing and re-use functionalities through the museum’s online collection and a close connection with the museum’s website are also integrated in this broad communication strategy.



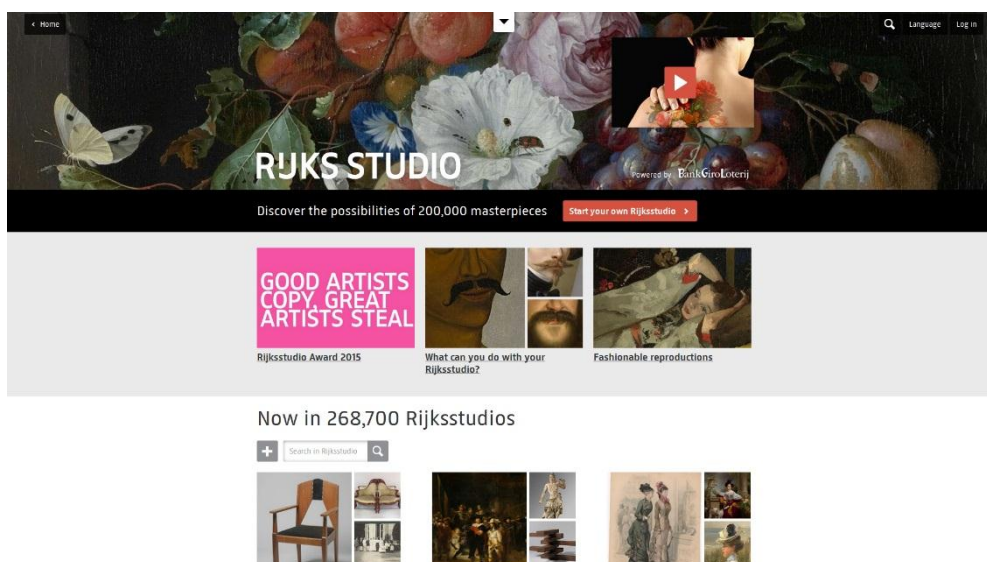
The online collection of the Dallas Museum of Art (DMA).

More open collections for reuse

A trend that gains momentum among cultural heritage institutions concerns open access to heritage collections. A recent survey on museums and copyright organized by NEMO (Network of European Museum Organisations) has underlined the increasing interest of the cultural heritage community for IPR issues. It has put forward the need for museums to be aware about the copyright status of works in their collections. Distinguishing between works under copyright and works in the public domain is necessary if cultural heritage institutions want to make available online images of the highest quality in accordance with existing copyright law and facilitate reuse, sharing and co-creation and increasing engagement with the audiences. The survey aimed at demonstrating how copyright legislation in Europe can restrict the broad dissemination of museum collections and highlight legal and technical challenges and barriers to overcome.¹²

¹² Ennaert 2015.

In the US, recent publications are highlighting the advantages for GLAMs from the adoption of open access policies, i.e. making available digitised copyrighted materials for use without any restriction.¹³ A series of case studies have been presented in a research report published by the Smithsonian Institution, including examples from US institutions (Cooper Hewitt – Smithsonian Design Museum, Dallas Museum of Art, Getty Open Content Program, National Gallery of Art in Washington, Smithsonian projects on Flickr Commons and Wikipedia, Yale Center for British Art) as well as international case studies (Biodiversity Heritage Library, British Library, National Gallery of Denmark and Rijksmuseum). The results bring forward the ways in which institutions were able to strengthen creativity and learning among their users, offer more opportunities for cultural collaboration and participation, and increase public engagement as well as awareness of their collections. Additionally, new business models emerge from the reuse of images of heritage collections, assessing the value of museum and library collections through the development of new metrics of their accountability. And also, a major requirement for the implementation of shared resources on the semantic web with linked open data are *open data*, i.e. data (i.e. images and texts) or metadata made freely available to the public with an explicit open license in order to allow their use, reuse and redistribution.



Homepage of the Rijks Studio, the application giving access to the images of artworks in the collections of the Rijksmuseum available for creative reuse.

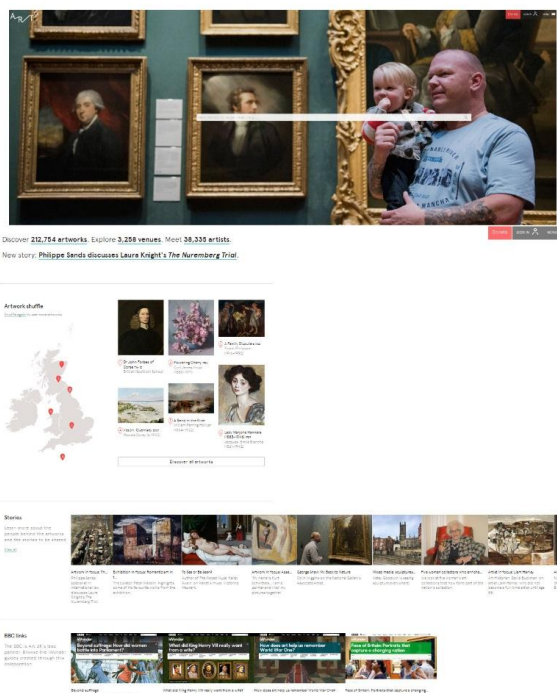
Designing for the users

Museum collections online should be more than just making works visible. Several barriers to making meaning, understanding and engaging with heritage collections online have been reported in user evaluations, such as the use of a scientific vocabulary to describe the objects, the lack of stories and contextualizing information around them, the difficulty to find specific information or the lack of an overview of the digital collection. Solutions that have been implemented focus on new types of interfaces – faceted interfaces for browsing, generous interfaces, criteria such as colour and personal feelings for browsing the collections-, or on user implication to content development by crowdsourcing indexing of heritage collections, seeking to bring in other voices than authority mediation.

¹³ Kapsalis 2016.

Moreover, semantic technologies have been introduced to make easier the relationship between the objects and find new meanings and interpretations: Research Space, a collaborative research project between three museums, The British Museum, The Yale Center for British Art and the Rijksbureau voor Kunsthistorische Documentatie (RKD) / Netherlands Institute for Art History funded by the Andrew W. Mellon Foundation, is an example of such an effort through pan-institutional collaboration.

An example of best practice for user engagement that follows another path is the Art UK project, initially based on collaboration between The Public Catalogue Foundation and the BBC and called “Your Paintings”. The website, one of the most successful projects in the UK, offers images of all public collections or art in the UK open for enjoyment, research or learning.¹⁴ In the initial phase of this project, a BBC report on Your Paintings had published a quote from a member of the public saying that ‘art isn’t a regular part of my life – BBC is’. It shows how engagement is closely related to personal motivation and identity, and can greatly benefit from the connections between people’s lives and works of art. In the new phase of Art UK, the partnership with the BBC remains, whereas the site was redesigned to be more user-friendly and pleasant to browse.¹⁵



A screen of the Art UK project showing some of the main interactive features – search art works, personal stories, BBC links, a map with the locations of selected collections.

¹⁴ In April 2016, Art UK has been awarded a GLAMI at the Museums and the Web 2016 conference in Los Angeles.

¹⁵ Crichton-Miller 2015.



3.3 CASE STUDY: THE FINE ARTS SYSTEM, ONLINE COLLECTION OF THE TURKISH NATIONAL LIBRARY

3.3.1 Introduction

This case study presents the results of an evaluation of the Fine Arts System at the Turkish National Library (TNL). It explores the relationship between users and digital libraries and investigates the role of digitisation in broadening access and increasing the demand for using the digital resources.

The TNL was legally established in 1950 although the planning-process was started five years earlier. Beyond an ordinary library, the library contributes to the Turkish culture, science, literature and the arts as a national archive, museum and research centre. It receives and collects every kind of digital and non-digital work. For this reason, the TNL can be considered as the ‘mirror’ of Turkish art and culture. Its collection consists of 3,157,761 documents, including books, printed works, rare manuscripts of art, printed documents in Arabic alphabet, daily newspapers, magazines, bulletins, annuals, posters, maps, musical notes, audio records (CD and tape), paintings, etc. Furthermore, the institute plays a strategic role in preserving and sharing heritage due to the Turkish legal deposit law.

COLLECTIONS OF THE NATIONAL LIBRARY OF TURKEY	
Printed Materials	1,360,512
Old Letter Alphabet Turkish Books	56,596
Manuscripts	27,493
Serials	1,490,981
Non-book materials	222,179
TOTAL	3,157,761

According to the regulations of the library, scholars, state and registered law personnel (including retired), registered professional chambers, press representatives, university students and graduates as well as visually impaired people can become a member of the library for free. Nevertheless, most of the online-services the TNL is offering are available without having to subscribe. According to 2013 statistics,¹⁶ the following number of subscribed members and ‘normal’ unsubscribed users ‘visited’ the TNL collections:

Users	637,832
Members	235,524
Web usage count for Online Services	785,741

The collection of the Fine Arts was chosen as a case study for its importance among the digital collections of the TNL and for its particular character. The Fine Arts System was the first attempt to digitise and make accessible all non-book materials of the TNL on one platform. Digitisation of these resources is expected to increase the usage by eliminating time and place barriers in accessing the collection, making it available to all interested citizens with a simple click.

¹⁶ www.mkutup.gov.tr/tr/Sayfalar/Hakkimizda/Istatistikler.aspx.

The Turkish Ministry of Culture and Tourism is the leading institution in preservation, digitisation and distribution and dissemination of cultural heritage in Turkey. Related departments such as the Directorate of Libraries and Publications, the Directorate of Cultural Assets, and the National Library support its work.

The mission of the Ministry of Culture and of the TNL is to provide access to cultural heritage to all citizens. The Fine Arts System represents a fine example of Turkish Art and Culture offering its users different types of visual materials such as posters and paintings.

3.3.2 Methodology

Several reports from international meetings and presentations of the Fine Arts System served as primary sources. Expert interviews with members of staff involved in the project have also been conducted. These included the Head of the department of user services, the director of the department of non-book materials being responsible for the Fine Arts System, as well as the director of IT services and other experts of these library departments. Technical information was provided by the developers of the system and the IT department.

Moreover, in-depth user testing of the Fine Arts System explored the system's functionalities, the degree of user satisfaction and feedback for improvement.

The participants of the online survey were chosen from the members of the National Library, who answered the question via email or directly in the rooms of the library. Additional interviews with users of the library were conducted in the library by chance.

The study involved ten participants, five women and five men, aged 22 to 62, with the majority around the age of 40. Their educational level included secondary education (1), high school graduation (2), university degrees (5) and post-graduate researchers (2). Their type of employment varied from students (2), employees in various public institutions and positions (2), writer (1), public officers (4) and retired (1).

The users were picked from the member list of the Fine Arts System. As the Collection of Fine Arts went online only a month before the survey was conducted, the participants were not yet experienced in working with the online system. The system allows remote access both from inside and outside the library. The participants were informed beforehand about the research purpose of the survey to improve the Fine Arts System and that no personal data was required. The results have been analysed with the help of an assistant of the statistics department.

3.3.3 Background and context

Although it is difficult to indicate the exact level of digitising projects and studies in Turkey, there have been remarkable developments in recent years. Recent initiatives, especially concerned with transferring Turkish cultural heritage to digital environments, increased. However, an evaluation of the results of these efforts reveals that they have not yet reached the professional level of other countries. The Turkish digitisation efforts concentrate on storage activities, without considering the digital library standards. Noteworthy are the digitisation studies of the General Directorate of State Archives, the National Library, the Süleymaniye Library, the Beyazıt State Library, the Atatürk Library, the Konya Regional Manuscript Library, as well as libraries that hold manuscripts, and some universities and research libraries in İstanbul, Ankara and İzmir. Fundamentally, these are projects that can be considered as pilots for testing and implementing the storage of digital images of collections, rather than being digital library projects.

When working on developing a digitisation project, it is essential to determine the standards for having a central administration on digital library works, and to generate an applicable, detailed and comprehensive international model. Before starting the work, it is necessary to prepare a correct implementation plan, to develop and implement an appropriate policy, to design a system which allows editing and making modifications, and to make sure that the necessary software, hardware and infrastructure are well-matched. In this regard, IRCICA FARABI – Turkey’s First Digital Library Management System – could be considered as a pilot implementation for the country and highlighted as Turkey’s first significant digital library initiative, which provided the opportunity to carry out processes known as the digitisation chain (analogue or digital source, scanning and capture, processing, storage, access and put into service) (Topaloğlu, 2011, 279). IRCICA FARABI was launched by the Research Centre for Islamic art, history and Culture. The preparation started in 2007 and the project was completed in 2008. The digital Ircica Library offers digital copies of books, maps, postcards, photographs, serials from Islamic art, culture and history. All users that are members of the digital library have free access to and unlimited use of its materials.

The strategic importance of the Turkish National Library



View of the National Library of Turkey in Ankara

As mentioned above, the TNL was legally established in 1950 and its role is to contribute to Turkish culture, science, literature and the arts as a national archive, museum and research centre. Its rich collections of 3,157,761 objects include books and other printed works, rare manuscripts, printed work with the Arabic alphabet, daily newspapers, magazines, bulletins, annuals, posters, maps, musical notes, audio records (CD and tape), and photographs.

All written and visual resources, other than books, are considered as non-book materials. Currently there are 31 non-book material types: postcards, maps, development and housing plans, coins, posters, paintings, photographs, portraits, illuminations, CD and DVD, doctoral dissertations, gramophone records, envelopes, lottery tickets, etc. 25 of these types are materials that can be digitised.

Digital Collections of the TNL

In recent years, several digitisation and digital access projects have been set up at the TNL. Announcements were made to get public attention for several platforms. The public awareness increased especially through the use of web tools and social media. The accounts of TNL and the ministry are the most common and efficient ways to disseminate what has been done. The most important achievement is that currently all digitised materials are accessible and searchable on the same platform.

Aims and scope of the digital collections of the TNL

The primary purpose is to allow access to the digital representations of the materials and protect the original materials. When researchers request access to the materials archived in the library, these materials are given to the reader to enable the related department to scan, photocopy or take photographs. Some of these materials are 50 to 100 years old. Every time that such fragile materials are taken out, they can be worn or damaged.

Another aim is to prevent time-consuming procedures such filling out request forms, personnel to retrieve the material from the archives or copy the image. Staff are directed to spend their time in other fields of works instead of providing material to researchers.

By using the Fine Arts System, researchers get the opportunity to continue their research on the collection 24/7, from any location. Researchers from all over Turkey can easily reach the non-book materials archives without the need to have to go to Ankara.

Another aim is to give the researchers the chance to easily submit their requests and proposals. As far as the digitisation process of new types of material is completed, they will be added to the system. Thereby the system is constantly being updated.

Issues of accessibility and inclusion are also addressed. *Talking Books* is a digital collection, where visually impaired users can benefit from the library resources or have a chance to request new audio books. Starting with the Braille system in 1955, the library has now 11 professional recording studios. The vocalising process is realised by professionals and amateurs who have a fluent accent, diction and acting abilities.

The most important digital collections and services of the TNL are:

Manuscripts

All manuscripts in the collections of the TNL have been digitised in image format as there is no OCR available in Ottoman or Arabic Language. More than 27,000 full text manuscripts and rare books are now integrated in the system with full bibliographic records. Searching by using keywords is possible and the materials are scanned with 300 DPI resolution and stored in DVDs or external drives in TIFF or PDF format. The system was developed on mysql database with Php and Java coding. The server uses open source Red Hat Linux operating system.

Serials system

Rare magazines and newspapers written in old Turkish alphabet have been digitised in image format as well and accessible for the members of the National Library. They are scanned with 300 DPI resolution and stored in DVDs or external drives in TIFF or PDF format. Again, the system was developed on mysql database with Php and Java coding. The server uses the open source Red Hat Linux operating system.

Talking books

Recorded by volunteers in 11 recording studios. The files are in mp3 format with 128 kbps. The talking books system for visually impaired people contains 5,000 audio books. The system has options to list the most popular (most clicked) books, today's five most popular clicks, last additions and books in progress.

Bibliographies

The Turkish Articles Bibliography is now searchable and contains bibliographic records from 1923 onwards, but no full text. Printed bibliographies in Old Turkish Alphabet, special bibliographies such as famous Turkish writers (Mehmet Akif Ersoy, Nazım Hikmet) are searchable in one single system.

Gramophone Records

Around 5,000 gramophone records have been digitised and added into the system after handling on the legal issues on copyrights and IPR. All audio files are in mp3 format with 128 kbps.

The next section and the rest of the case study focus on the TNL Fine Arts System, which stores non-book materials, providing a description of the system and the results of the user evaluation.

3.3.4 The Fine Arts System

Launched in August 2014, the Fine Arts System (FAS)¹⁷ is a digital collection that stores and provides access to digital representations of art works from the collections of the TNL. The current version (September 2015) provides access to 20,000 different kinds of posters – of national and international films, theatre plays, ballet performances, political events, public meetings, concerts, operas, festivals, congress, symposia, advertisements, educational, religious, documentaries, etc. Posters are mostly from the 1950s. They include examples of İhâp Hulusî Görey's work, who is one of Turkey's first artists and designers of posters. Movie posters are the famous 'yesilcam movies', that had an important impact on the Turkish audience. Moreover, FAS includes 517 paintings in different techniques dating from 1880 to 1920.



Homepage of the Fine Arts System surrounded by characteristic images of the materials offered to the users of this digital collection

¹⁷ The Fine Arts System can be accessed via this link: guzelsanatlar.mkutup.gov.tr/mk/.

They are mostly works of the painters and artists Hoca Ali Rıza Efendi, İbrahim Calli, and Esref Oren. The main subjects of these paintings are nature, environment, architecture, places and districts of Istanbul. In the near future, all non-book materials will be absorbed in the collections of the TNL, including maps and coins, and the services offered to the users will be expanded.

Aim and purpose of the Fine Arts System

The FAS was developed to provide access to the art and non-book collection of the TNL in one platform designed for researchers, and national or international users. By implementing the system, the original sources are preserved and digital copies are available anytime worldwide. Users can access and download these documents easily within a few clicks. The Fine Art System represents the first step towards making available the full non-book collection of the TNL on one single platform.

System design, access and usage functionalities

The system was designed to serve the information needs of academic staff, students and to a wider audience interested in non-book collections such as cinema and the fine arts.

While establishing the system, primary attention was given to digitise the most requested types of materials first.

The main functionalities are provided on the homepage of FAS (fig. 2): login to the system, search the catalogue by selecting a collection or material type, basic information on Turkish cinema history and relevant posters, access to the collection of paintings at the TNL, and user guide.



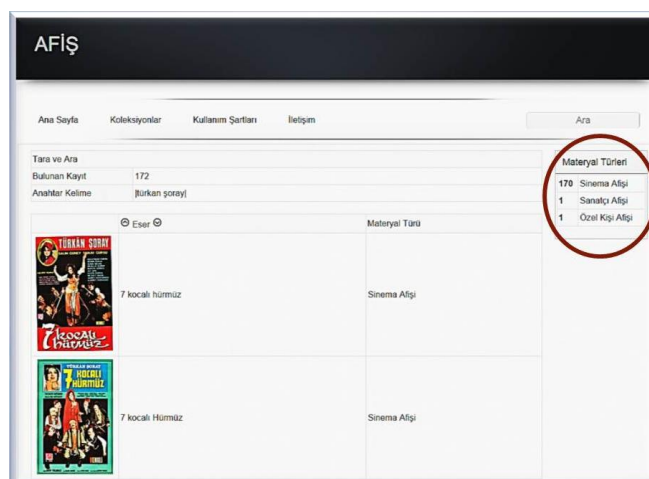
Sign up screen (up left), links to basic information on the history of Turkish Cinema, the collections of posters and paintings and users' guide (down left)

In order to access the system, a login to the database is required. If the system is used within the library, there is no need to sign up. Library members also have to sign up to the system separately to use it. Although sign up is free, a payment is required in order to download images included in the system.

Anyone who has logged in becomes a 'member' of the system. Members can browse the collections or make a quick search or an advanced keyword search in all the fields of the record (creator, producer, artist, classification number and size). The selected documents can be added to their

shopping carts. Purchasing digital images from the system is carried out through the virtual POS service provided by the Turkish Agricultural Bank. The cost per poster is 0.60 Turkish Liras for Turkish citizens and 1.20 for international users; the cost per painting is 2.50 TL for Turkish citizens, and 5.00 TL (approximately 1.75 Euro) for international users. A watermark free sample is around 600 px X 900 px, paid samples without watermark are delivered in a 100 DPI resolution.

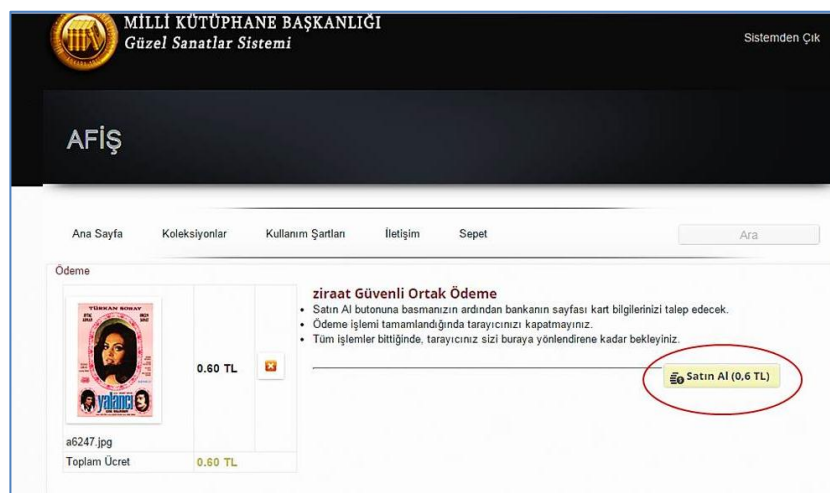
Currently, there is only a Turkish version of the FAS available.



*Results of a basic keyword search in the posters section of the FAS
(posters with Turkan Soray, a famous Turkish actress)*

If required, the users can save the materials that they have added to their cart and create their own archives or personal collection.

Furthermore, users have the possibility to communicate their complaints or requests regarding the materials that they are browsing or to give their feedback on the system or its content by using the "Give feedback on errors" tab, per telephone or e-mail.



Payment screen from the basket

From a technical point of view, the system has a user-friendly interface that offers both browse and search functionalities. Search results can be listed according to different criteria or filters – such as type of document, collection, etc. The website provides general information on the system, its

content and aims, the current state of digitisation of the materials, etc. If users need help, there is a user guide on the website and a frequently asked questions section.

The total cost for the development of the FAS was 20,000 TL, which converts to around 7,000 euros. No special budget for this system was therefore required, and the necessary funding was provided through the annual budget of the National Library for investments and projects.

As for the copyright and the use of digital materials of the FAS, the terms of use of the service conform to the framework of the Intellectual Property Law and the relevant legislation in Turkey.¹⁸ According to the relevant legislation, users can use digital images of the materials only for educational and research purposes and they have to quote the full credit in their works.

It is not allowed to copy the database content for any other reason, to share it with third parties or it being commercially reproduced and sold. The received copies are to be used solely as information or for use in scientific research. It is prohibited to make modifications on the copied database records or to do similar studies by using these records. Purchased images for commercial use, in whatever size or format, can be published, printed, copied in electronic or other formats.

According to the regulations of the amended Principles And Procedures On Benefiting From The Works Of Public Institutions And Organizations,¹⁹ following the completion of the work as a result of the usage of materials in question, the beneficiary must submit a scientific report or a sample of the published work to the authority that granted the permission. The full credits of the public institution or organisation from which the material is taken, should be mentioned in the published work.

3.3.5 Usage and impacts

The system is mostly used for research on digital content. When considering the results from the user perspective, the system in general is efficacious. There are now 2,811 members of the system, which indicates a good number for a specialised collection, and users can easily find what they are looking for. A simple search would be sufficient to reach the digitised material. Also browsing through the collections is an option for users who use the system as a hobby. The integration within the whole digital system and the main catalogue has been requested by a few participants and indeed, it is a must for an efficient usage of the system. Some results concerning “simple search option missing” indicate either an unskilled user or an unfriendly design, because there is an option for quick simple search. The following sections provide more detail on user satisfaction, positive aspects and aspects that can be improved.

Strong aspects of the FAS

¹⁸ RICHES deliverable D2.2: *Digital copyrights framework* has examined issues of copyright and access to the Digital Library of the National Library of Turkey, p. 32-36, www.digitalmeetsculture.net/wp-content/uploads/2015/09/RICHES-D2.2-Digital-Copyrights-Framework_public.pdf.

¹⁹ Official Gazette- 03.03.2006-Nr. 26097.

All of the user study participants are happy with the system in general. Positive answers are mostly on the usage of the system, design, content and the quality of the content. However, one user suggests a more user-friendly design, others requested more enriched content.

Regarding the design of the digital collection, the results show that most of the users liked it. Following a simple graphical concept, the interface is very intuitive. The design of the introduction page is very focused and supported (if needed) by the user guide. The sign-up and login screen can be found at the main page and are easy to handle. There are no misleading confusing titles, or unnecessary info. Contrasting colours are used for easy and clear browsing. Most of the participants had no problem with browsing and searching the system.

The collection of posters and paintings, a sub-page within the Fine Arts collection, received good feedback because of its rich content. Before launching the portal, the TNL completed the data records, metadata as well as data cleaning and correcting. Most of the testers were happy with the quality of the content. All items have descriptive texts indicating source, publisher, type etc., which received good user feedback too. The bibliographic and metadata records are solid.

Aspects to be improved

Participants criticised the slowness of the system and commented that parts of the contents need to be enriched. Moreover, the need for more comprehensive search and listing options have been suggested (advanced search only comes up if you decide to do your search on the left corner of the page), as well as the need for a user-friendly design and the need of integrating the Fine Arts collection within the main catalogue system of TNL including all other digital collections like manuscripts, serials etc.

Regarding the speed of the system, some users indicated in their interviews that data loading takes longer than usual. Experts from the TNL confirmed this, as the server sometimes overloads.

Some users are dissatisfied with the presentation of the search results and search options serving the advanced search, since the results can only be found if the fields 'type' and 'name' are filled in. Other users insisted there is need for more comprehensive search and listing options. Some added a need for implementing interactive tools such as sharing on social media.

However, some of the answers indicate only a shallow attention to the interface. Two users indicated that the system needs a quick search option, failing to notice that there already is such a function at the upper right corner of the page. This could hint at an unfriendly design. The advanced search option automatically appears after having searched via the quick search.

The pay-per-view system is another aspect to be improved. Some users insist on open access usage for educational and research usage. The TNL charges its national members 0.60-2.5 TL and its international members 1.20-5 TL.

Another criticism is the lack of personalisation options such as adding favourites, keeping search results, sharing with social tools. Moreover, there is no social tagging function.

Outlook

Upon the results of the conducted survey and expert interviews, TNL has decided to improve the weak and missing points of the system. As stated before, these points were: a more user-friendly platform, detailed searching options, more types of digital materials, speed of the system and one interface for all digital sources.

Since April 2016 TNL started to gather all its digital sources into one digital system that is called Digital Library System (DLS).²⁰ Thus, all digital sources of TNL will be accessible via one platform. DLS provides access to all digital sources such as manuscripts, serials, non-book materials (including fine arts) that operated under different platforms before. The new system now operates under a new automation system which improves the speed of the system. Secondly, users are now browsing the system with a much better, simple, user-friendly design.

A new searching option enables users to search for each catalogue and mark entries such as title, author, credits, performers, notes, subject, and types. The DLS now also serves all digital sources within one platform which can be browsed and searched individually, or in one platform.

3.3.6 Lessons learned and conclusion

The TNL has a strategic importance in Turkish libraries and archives, distinguished from others through its variety and rich collection. National libraries can be defined as the memory institutions of their country and culture. That is why TNL is one of the leading Turkish institutions that have massive digital and non-digital sources. Due to legal deposit law, TNL gathers copies of all material, printed or produced, that induces a variety of collection including books, serials, manuscripts, rare books, and non-book materials. At the end of 1990s TNL started to digitise its collection in order to preserve and access its sources. With the evolving status of technology, digitisation has become one of the main objectives of the library. TNL is now digitising all kinds of sources from manuscripts to gramophone records and functions as a role model of the digitisation processes in Turkey, providing guidance and consultancy to other institutions and leading the digitisation process nationwide.

FAS has been developed to digitise certain types of non-book materials that represent art works. It offers users access to non-book digital materials without any restrictions of time and place. It is one of the first comprehensive digital works in that area that includes variety of important sources such as paintings from famous Turkish painters and posters from vintage cult Turkish movies. FAS is one of the most important digitisation works in that specific subject area, reflecting Turkish art most strongly.

Thanks to the survey conducted with users of the FAS and the expert interviews held, the TNL was able to improve the structure and visual presentation of the FAS according to the needs and wishes of their users. The main and most important innovation resulting from the research is the integration of the FAS into the main catalogue of the TNL, making all digitised material of the Turkish culture represented in the archives of the TNL accessible on a single platform.

²⁰ <https://dijital-kutuphane.mkutup.gov.tr/>.

3.4 CASE STUDY: SMB-DIGITAL, DIGITAL STRATEGIES FOR BRIDGING THE GAP BETWEEN CULTURAL HERITAGE INSTITUTIONS AND USERS

Digital technologies are deeply transforming the ways in which cultural heritage institutions mediate their collections and interact with their audiences. Responding to a growing and persistent demand for the content aggregated in their repositories, institutions make large amounts of curated digital resources available for study and scholarly research, for discovery and creative re-use, for enjoyment, education and learning. Digital access to content opens up opportunities for memory institutions to develop new ways of mediation and engagement with their audiences and to allow users “to benefit from the richness and diversity of their digital collections to their own requirements”.²¹

Particular attention has been given to new ways of providing access to cultural content, spanning improved search and retrieval functionalities for accessing large datasets of cultural heritage information, as well as content representation and personalisation features designed to stimulate curiosity and increase engagement.

The case study introduced in this section explores the outreach and impact of an online collection, a specific type of museum information system that is inextricably related to collections research and museum documentation processes. It focuses on the online database collection of the fifteen Staatliche Museen zu Berlin or State Museums of Berlin (SMB), SMB-digital.²² SMB is part of the largest cultural institution in Germany, the Stiftung Preussischer Kulturbesitz (SPK), which translates as Prussian Cultural Heritage Foundation,²³ and which addresses the following questions:

- What strategies do cultural heritage institutions apply in making their digital collections available online? How do these strategies align with their mission? How do they link to institutional digitisation strategies and access policies, if any?
- (How) do institutions define their audience for online collections? How do they take into consideration their information needs, expectations and requested skills?
- How can an online museum collection stimulate interaction with audiences and increase their engagement with digital cultural content – what do users enjoy and what constraints hold users back?

One aspect of interest that drove this study looks into the engagement potential of online collections. Digital heritage platforms have, for the most part, implemented forms of access that conform to the database origin of their digital repositories and collections management systems. However, these interfaces often appear ineffective at awakening curiosity, enhancing motivation and nurturing engagement with users, as evaluations of online collections point out.²⁴ Recent studies characterised online collections as “the most uninteresting part of a museum’s website.”²⁵

²¹ Anne Fahy, “New technologies for museum communication”, in Hooper-Greenhill 1995, 82.

²² www.smb-digital.de.

²³ From now on the abbreviations based on the original German names are used in the text, i.e. SMB: Staatliche Museen zu Berlin (State Museums of Berlin) and SPK: Stiftung Preussischer Kulturbesitz (Prussian Cultural Heritage Foundation).

²⁴ Petras, Stiller, Gäde 2014.

²⁵ MacDonald 2015.

On the other hand, recent evaluations underline their role as trustworthy and curated information resource and underline the variety of uses that they support – as reference, learning resource, to prepare a museum visit or for re-use of the available digital materials in other applications and social media.²⁶ User engagement appears to be paramount to actuating the potential of online collections to be used as resource before, during, after or completely independent from an actual, physical museum visit. Innovative interfaces for browsing the contents, personalisation functionalities, such as the creation of personal collections, and availability on any digital device are only some of the features that have been introduced to online collections aiming to satisfy personal preferences and information needs, and to increase user engagement.²⁷

The case study of SMB-digital sheds light on meaningful ways to make available cultural heritage information aggregated in institutional repositories as part of a digital strategy for broadening access to heritage collections. It gives particular attention to how designing for user engagement can be done strategically, and aligned to the mission, policies and digitisation strategies of cultural heritage institutions. The case study explores the role of the online collection within the digital strategy of the SPK, and reports on the results of the evaluation of SMB-digital with a group of museum educators, aiming to highlight the potential and the constraints of online museum collections.

Approach and methodology

The case study was designed to answer two main questions: What strategies do the SPK and the SMB apply for making their collections available online? Can SMB-digital, the online museum collection, engage users and serve as a tool for learning and research, for personal and professional development? To answer these questions, a broad evaluation approach was designed that would take into consideration the selected service from both perspectives – the point of view of the institutional strategy in providing access to digital heritage collections and the point of view of the users of the cultural service offered.

The broader context of SMB-digital: Institutional policy for digitisation and access

Digitisation and access to digitised materials are a challenging undertaking for cultural heritage institutions while, at the same time, they offer a chance to re-evaluate their mission in the digital era and set new priorities. With this in mind, it was necessary to examine how the SPK responds to these challenges, and if and to what extent these are turned to opportunities for renewal and transformation. This part sheds light on the digitisation policy of the SPK, involving digital content production through large-scale digitisation projects of the collections of its museums. It goes a step further, to show how digitisation is inextricably related to a digital strategy for providing access to heritage collections for different kinds of audiences and various uses. It also highlights best practices for harvesting and re-use of digitised materials aggregated in institutional repositories allowing for a broad online dissemination of heritage collections, in line with the institution's mission and strategic goals. SMB-digital, the online collection of the museums, was selected among a number of portals and online presentations developed by the SMB, to highlight, from an institutional point of view, how these principles are put into practice in shaping access to heritage collections and nurturing user engagement with cultural heritage.

²⁶ Villaespesa 2014.

²⁷ Filippini Fantoni 2012.

How can an online museum collection stimulate interaction with audiences and increase their engagement with digital cultural content? To answer this question, the study involved working with a group of museum professionals that have been identified as potential users of SMB-digital: a group of museum guides and mediators who give guided tours in different museums and deliver educational programmes for a variety of audiences – school students, families and adults.²⁸ As Roberts underlines, the role of museum mediators and museum educators is to help people understand the collections by telling engaging and inspiring stories around each object that are meaningful to the visitors in an interactive and dialogic way. In doing so, they challenge the traditional scholarly presentation of objects by introducing new meanings: they bring visitors' perspectives into museum narratives and, as a consequence, they enable shared authority over the objects.²⁹

Museum guides, mediators or museum educators, are taken in this study to be a distinctive user group of online collections, with their specific mission and information needs:

- they mediate between curators, the museum education department and the visitors;
- they have knowledge of the information needs and attitudes of the visitors;
- they have a scientific background and a higher education level, which could motivate them to use online collections as lifelong learners;³⁰
- they need to access different resources for their professional activities, i.e. to prepare guided tours and educational programmes;
- mediators have to develop in-depth knowledge about exhibits to understand and adapt to visitors' 'entrance narratives':³¹ information stored in a museum online collection has the potential to support their work and provide them with useful information used to enhance visitor experience;
- mediators, like teachers, are re-using, re-mixing and co-creating digital resources to produce documents to meet their professional needs.³²

The museum guides and educators that participated in the study were recruited among the active guides of the SMB. Four of them responded to our inquiry sent per email to the guides' professional forum and agreed to participate to the research project. As to the participants' profiles: two female and two male, aged 36-60, with backgrounds in art history and archaeology and musicology, working as guides in several museums and in different collections (i.e. archaeology, 19th and early 20th century European painting, decorative arts and design and musical instruments), and giving guided tours in different languages – German, English and Spanish. Their professional experience as museum guides in different museum in Berlin ranged from 8-20 years.

²⁸ On the profession of museum mediators, cf. the European project "Museum mediators in Europe: 2012-2014," museummediators.eu; in the project's final report, museum mediation is defined as "a broad concept, embracing activities connected with museum education and communication, aimed at promoting a new social and more inclusive role of museums within the framework of the post-modern and post-colonial paradigm", *Museum Mediators 2012-2014*, p. 9. Indeed, new business models and engaging methods for museums guided tours are emerging through the introduction of innovative and participatory approaches and a wide use of social media, see for example, in the US, *Museum Hack*, www.museumhack.com.

²⁹ Roberts 1997, 2-3.

³⁰ On lifelong learning in museums, see chapter 6.

³¹ As acknowledged, museum visitors arrive at an exhibit or tour with their own individual experiences, memories and knowledge related to the subject — called their "entrance narrative", Tsybulskaya, Camhi, 2009.

³² Milligan 2016.

It should be noted here that the results of the evaluation cannot be generalised as the study focused on a distinctive user group with specific information needs. To overcome this limitation, and wherever possible, their responses to SMB-digital were compared with published results from the evaluation of other museum online collections with a variety of users.

Data collection

Data collection for the case study was collected through:

- Analysis of the digitisation and access strategy of the SPK based on published institutional documents and reports to account for the institution's point of view, focusing on the collections of the SMB.
- Interview with one staff member of the digital documentation services of the SMB, to gather information on the institutional policy concerning digital curation, documentation and re-use of digital content aggregated in the institutional repositories, and also to collect information for an objective description of the online collection SMB-digital prior to user evaluation.³³
- A two-hour focus group discussion with museum guides: an open and qualitative approach was used in order to understand the information needs of museum mediators, how they prepare their guided tours, which kinds of information they need, what use they make of digital media and devices for their professional needs, their communication with the educational department and among peers, and for mediation of content and communication with the visitors during a guided tour.
- An exploratory session of SMB-digital: each participant had ca. 30 minutes to explore the online collection by themselves. Although initially an explicit scenario was considered, i.e. to explore the possibility of using SMB-digital to prepare a museum tour, participants followed their own paths according to their attitudes and information needs during their interaction with the online collection.
- Semi-structured interviews of ca. 40-60 min: participants were encouraged to share their experience from the use of the online collection. A set of open questions aimed to provide a deeper understanding of and document the interaction patterns in relation to their information needs, expectations, digital practices and skills, and to evaluate the outcomes from the use of the online collection. Information on each participant (socio-demographics) was collected after each interview.³⁴

The study is organised in two parts. The first part highlights the digital strategy of the SPK with regard to digitisation, access and dissemination of its museums' collections for various audiences and presents the main features of the selected service, the online collection SMB-digital.

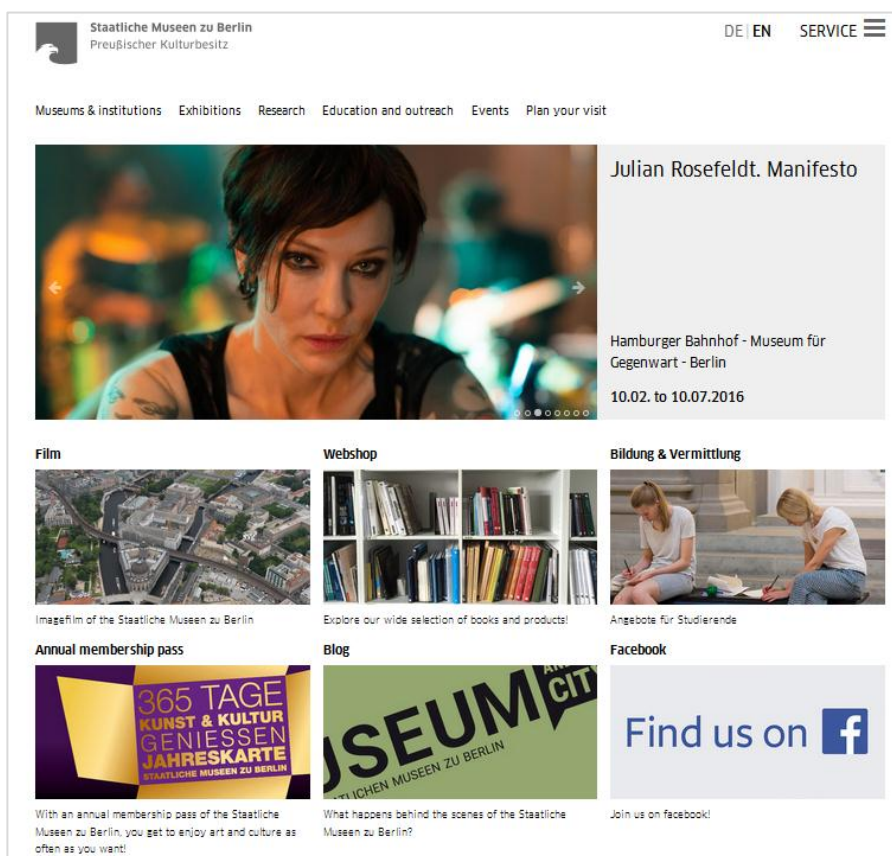
³³ Two one-hour interviews with a digital curation expert, Institute for Museum Research, SPK, in April and May 2015. Unfortunately, web analyses or any other information on the usage of the online collection SMB-digital were not available when this study was conducted.

³⁴ The focus group discussion, the exploration of the SMB-digital online collection and the interviews took place on March 3rd, 2015 at the premises of the Institute for Museum Research (SPK) in Berlin – Dahlem. Interviewers: A. Prehn, S. Wirtz and K. Charatzopoulou. The focus group discussion and the individual interviews were recorded, transcribed and analysed; quotations used in the study have been translated into English.

The second part focuses on the users; it presents the information seeking practices and digital skills of the group of museum guides, and reports on the results of the evaluation of SMB-digital with this user group.

3.4.1 An institutional strategy for digitisation and access to cultural heritage collections

The SMB³⁵ together with the Staatsbibliothek zu Berlin³⁶ (State Library of Berlin), the Geheimes Staatsarchiv Preußischer Kulturbesitz³⁷ (Secret State Archives of the SPK), the Ibero-American Institute³⁸ and the Staatliches Institut für Musikforschung³⁹ (State Institute for Music Research), are part of the SPK,⁴⁰ the largest cultural institution in Germany.⁴¹



The website of the SMB, relaunched in April 2016

³⁵ www.smb.museum/en/home.html.

³⁶ www.staatsbibliothek-berlin.de/en.

³⁷ www.gsta.spk-berlin.de/english_941.html.

³⁸ www.iai.spk-berlin.de/en/the-iai.html.

³⁹ www.sim.spk-berlin.de/en.

⁴⁰ www.preussischer-kulturbesitz.de/en.html.

⁴¹ Parzinger, von Hagel, Schauerte 2015, 101-102.

The volume and the diversity of the collections in the libraries, archives and museums of the SPK are remarkable: over 25 million books, periodicals, autographs and rare manuscripts in the State Library of Berlin, more than 38,000 meters of archival documents in the Secret State Archives, more than five million objects in the collections of the fifteen State Museums of Berlin.⁴² These rich collections form a huge repository of universal knowledge and provide ideal conditions for interdisciplinary research. Indeed, SPK is among the leading scientific and research institutions in the fields of humanities and social sciences, and a member of the Deutsche Forschungsgemeinschaft (German Research Foundation), the largest organisation for research funding in Germany.⁴³

Digitisation and consequently the adoption of digital technologies were introduced more than ten years ago to the institutions of the SPK, transforming established working practices and opening up new opportunities for renewal and innovation.⁴⁴ Challenges associated with digitisation in large memory institutions such as SPK can be practical (large volume, heterogeneity and different curatorial traditions of the collections),⁴⁵ conceptual or intellectual (definition of an access policy, management of rights) and socio-cultural (expectations, behaviours and communication models of users transformed under the influence of rapid technological changes in a network society). Memory institutions strive to adapt to these changes that have made the traditional model of ‘supply and demand’ or of top-down and one-way communication in the provision of cultural heritage services obsolete.⁴⁶

Despite the important efforts that this undertaking requires, digitisation lies at the core of the SPK. It is considered a high priority task that offers an “opportunity to make the cultural and intellectual heritage of humanity accessible to everyone,” and constitutes “an indispensable foundation for the study of cultural heritage.”⁴⁷ Furthermore, digitisation offers the chance to reassert the institution’s mission in today’s knowledge society: to promote interdisciplinary research and study of cultural heritage, to broaden access and disseminate cultural heritage online to all interested people without time and place constraints, and to develop new services for scientific communication, education and cultural participation.⁴⁸

⁴² Part of this “cosmos of culture” are also more than 2,000 employees of SPK in 2014 - the people that preserve, study, communicate and share this cultural heritage shaping the value of the institution, Parzinger, von Hagel, Schauerte 2015, 101.

⁴³ Parzinger, von Hagel, Schauerte 2015, 101-102; on research at SMB, see Schuster, Schauerte, Graf (2010); the newly founded Archäologisches Zentrum next to the Museum Island promotes archaeological research by uniting all archaeological facilities and operations of the SMB, www.smb.museum/en/museums-and-institutions/archaeologisches-zentrum/home.html.

⁴⁴ On institutional change, cf. RICHES Deliverable D3.1, Transformation, change and best practice for cultural heritage processes, www.digitalmeetsculture.net/wp-content/uploads/2015/11/RICHES-D3.1-Transformation-change-and-best-practice-for-CH-processes.pdf; RICHES European Policy Brief. The Cultural Heritage Institution: Transformation and Change in a Digital Age, www.digitalmeetsculture.net/wp-content/uploads/2016/04/EUROPEAN-POLICY-BRIEF_Institutional-Change_final.pdf; Navarrete 2014, 31-65; Digital Culture 2015; Batt 2015.

⁴⁵ Hagedorn-Saupe 2012; Hagedorn-Saupe, Schweibenz 2015, 46-47.

⁴⁶ Filippini Fantoni 2012, 40-42; Batt 2015, 46-47.

⁴⁷ Digitalisierungsstrategie SPK (2010).

⁴⁸ Parzinger 2015.

To achieve these objectives, a digital roadmap is necessary, as stated in the digitisation policy document of SPK: “New working procedures enable the institutions of SPK to fulfil the mission of the foundation in an effective way and to ensure the dissemination of the collections to the general public's interest in science and education as well as for the cultural exchange between nations.”⁴⁹

Digitisation is being conducted in a well-thought framework and according to a set of principles, common to all the institutions and collections of the SPK, that have been summarised in a policy document defining the goals for years 2011-2015.⁵⁰ They support the creation of an infrastructure and coordinate efforts that will allow evaluation, recalibration and further development, guiding the way towards the digital transformation of a memory institution from “organisational ecosystem to digital knowledge ecology.”⁵¹ The main points of the digitisation strategy can be summarised as follows.

A set of criteria for the digitisation of the collections

Digitisation of the holdings of museums and other institutions of SPK:

- is content-driven, focusing on quality and the different purposes of use of the digitised materials,⁵²
- concerns the totality of the holdings, as required by the scientific mission of the institution and an open access model chosen for the dissemination of its digital heritage collections;⁵³
- should seek a balance between quality and quantity by defining the objects and collections to be digitised in priority: i.e. their particular interest for a community of users, their outstanding role within the policy of the institution, their value for touristic or commercial development;
- should bring added value by helping to overcome access barriers to the physical collections, i.e. objects or collections temporarily inaccessible due to restoration of museum buildings or originals that are fragile and not in a state to be exhibited or accessible for scholarly research.

⁴⁹ “[...] neue Arbeitsprozesse, die es den Einrichtungen der SPK ermöglichen, in zeitgemäßer Form ihre im Stiftungsgesetz definierte Aufgabe wahrzunehmen und die Auswertung ihrer Sammlungen “für die Interessen der Allgemeinheit in Wissenschaft und Bildung und für den Kulturaustausch zwischen den Völkern zu gewährleisten”, Digitalisierungsstrategie SPK 2010, 3 and English summaries, www.preussischer-kulturbesitz.de/en/priorities/digitization/digitization-strategy.html and www.preussischer-kulturbesitz.de/en/priorities/digitization.html; Parzinger 2015, 28-29.

⁵⁰ Digitalisierungsstrategie SPK 2010; Parzinger 2015; Parzinger, von Hagel, Schauerte 2015.

⁵¹ Batt 2015, 280-287.

⁵² On the contrary, the digitisation strategy at the Amsterdam City Archives is mainly demand-driven to reduce digitisation costs and time. According to Marc Holtman, Project Leader Digitization and Digital Services at this institution, digitisation of 50,000 meters of archival materials would necessitate approximately 320 years to completion and a budget of 37.5 million Euro (workshop presentation at the final Conference of RICHES-Project, Identity Matters, Amsterdam, April 15, 2016), cf. Holtman 2010.

⁵³ Parzinger, von Hagel, Schauerte 2015, 105; e.g. exhaustive content (“exhaustivité”) was one of the criteria for large-scale databases of scientific documentation in classical archaeology, cf. Ginouvès, Guimier-Sorbets 1978, 26-27; it arises from the encyclopedic character of cultural collections, cf. Oberoi, Stein, Arnold (2015); it is a major recommendation for European cultural heritage: digitised in its entirety, it will be made widely accessible online through Europeana, cf. Commission recommendation 2011, item 15.

A project-based approach

Demand-driven and inextricably intertwined with the research and publication objectives of the institutions of SPK, these projects not only secure funding for the production of digital content, but they also promote interdisciplinary collaborations within the institutions of SPK and external stakeholders, allowing wide online dissemination and offering in-depth experiences with heritage collections.⁵⁴ This approach is best illustrated by the example of the SMB, where more than forty digitisation projects are currently underway, contributing to the development of a number of research tools – databases, digital catalogues, online publications and websites for the scientific community or interested amateurs.⁵⁵

A number of projects provide digitisation expertise, including the choice of methods and technologies appropriate to the heterogeneous types of objects and materials in the museums' collections: ancient written documents on various media such as papyri, ostraca (inscribed pottery shards), parchment, wood tablets, wax tablets from the Museum of Egyptian Antiquities, where another large-scale research and digitisation project entitled *Localizing 4000 Years of Cultural History: Texts and Scripts from Elephantine Island in Egypt* is ongoing,⁵⁶ archival material from the archaeological excavations conducted by the SMB in the late 19th and early 20th centuries (e.g. German excavations in Amarna in Egypt that revealed the famous bust of Nefertiti, excavation campaigns of Carl Humann in Pergamon, Turkey), rare early phonograph sound recordings on wax coated cylinders from the phonograph archive of the Ethnological Museum, made by the Prussian Phonographic Commission (1915–1918) in order to document speech and music of foreigners held in German prisoner-of-war camps.⁵⁷

Scientific documentation of less known collections and broad online dissemination is the aim of digitisation projects such as 'The Yousef Jameel digitisation project' aiming to catalogue, digitise and make accessible 11,000 artefacts from the collection of the Museum of Islamic Art,⁵⁸ as well as the aim of thematic projects, such as the bronze artefacts in the Collection of Classical Antiquities,⁵⁹ photographs of the Pictorialism international artistic movement of the late 19th and early 20th centuries from the collections of the Kunstbibliothek (Library of Arts) of SMB.⁶⁰

⁵⁴ On current digitisation projects, SPK Jahrespressekonferenz 2016, 18-20; Parzinger, von Hagel, Schauerte 2015, 107-108.

⁵⁵ Some of them are listed here www.smb.museum/en/research/online-catalogues-database.html.

⁵⁶ On these projects, ww2.smb.museum/berlpap, www.aegyptisches-museum-berlin-verein.de/f03.php; on the 1.5 million euros project dedicated to the cultural history of Elephantine and directed by Prof. Dr. Verena Lepper, www.smb.museum/en/museums-institutions/aegyptisches-museum-und-papyrussammlung/collection-research/research/erc-project-elephantine-localizing-4000-years-of-cultural-history-texts-and-scripts-from-elephantine-island-in-egypt.html and elephantine.smb.museum/?lang=en.

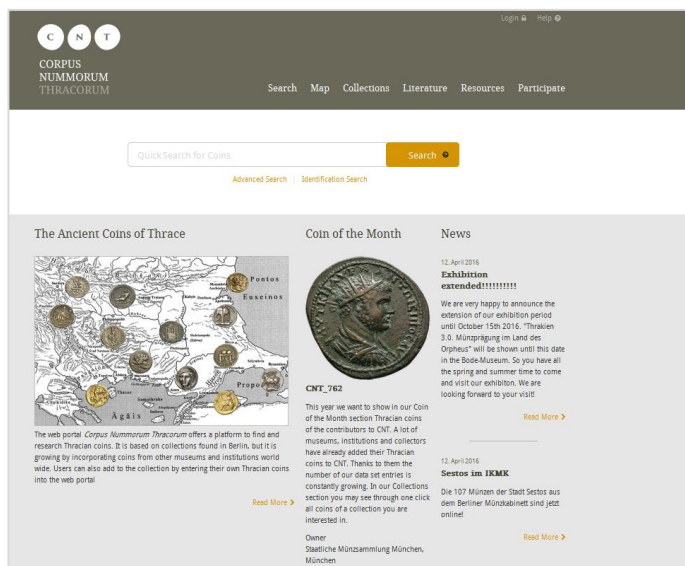
⁵⁷ They are part of the significant collection "Early cylinder recordings of the world's musical traditions in the Berlin Phonogramm-Archiv", that contributed to the establishment of the academic discipline of comparative musicology/ethnomusicology and was inscribed in the UNESCO Memory of the World register in 1999, www.smb.museum/en/museums-institutions/ethnologisches-museum/collection-research/about-the-collection.html; on the project, see www.smb.museum/museen-und-einrichtungen/ethnologisches-museum/sammeln-forschen/forschung.html.

⁵⁸ For information, www.smb.museum/en/museums-institutions/museum-fuer-islamische-kunst/collection-research/research-cooperation/yousef-jameel-digitalization-project.html jameel.hypotheses.org/?lang=en_GB.

⁵⁹ Database *Ancient Bronzes in Berlin*, ww2.smb.museum/antikebronzenberlin.

⁶⁰ piktorialismus.smb.museum.

Digitisation projects are often linked to exhibitions, as in the case of the exhibition highlighting the monetary history of ancient Thrace (in the territories of modern Bulgaria, Northern Greece and European Turkey) entitled *Thrakien 3.0. Münzprägung im Land des Orpheus*, organised by the Numismatic Collection of SMB at the Bode-Museum. The online database *The Ancient Coins of Thrace*⁶¹ issued from the project, documents Thracian coins in the collections of SMB and also enables museums, private collections and private persons to contribute their collections to the portal.



Homepage of the online database The Ancient Coins of Thrace (Corpus Nummorum Thracorum)

Finally, a number of projects explore the potential of 3D-digitisation, its uses for scholarly research and documentation of the collections as well as its potential to deepen engagement with cultural heritage and experiential learning in different contexts.⁶² Such initiatives concern the creation of a 3D-digitisation infrastructure for archaeological objects in the recently founded centre Zedikum (Zentrum für digitale Kulturgüter in Museen),⁶³ aiming to establish best practices for preservation of and access to 3D digital objects in online open repositories as well as their use in archaeological research, interpretation and broad dissemination on mobile devices. Innovative 3D-scanning using multi-perspective imaging was used to digitise 430 historical and contemporary instruments from South Asia at the Ethnological Museum, allowing for creating a complete, scientific digital archive, which will be further explored for musical instrument research in Europe.⁶⁴ A 3D scan of the Pergamon Altar, developed by the Fraunhofer Institute, offers to the users an online exploration of this important Hellenistic monument which remains not accessible due to the restoration of the museum’s building.⁶⁵

⁶¹ *Corpus Nummorum Thracorum*, www.corpus-nummorum.eu, a project funded by the German Research Foundation.

⁶² For an overview, Peukert 2015.

⁶³ www.zedikum.de.

⁶⁴ www.smb.museum/en/museums-institutions/ethnologisches-museum/collection-research/research.html.

⁶⁵ 3d.smb.museum/pergamonaltar

A focus on pan-institutional collaborations

Establishing collaborations and partnerships at a national, European and international level for the study and preservation of world cultural heritage using digital technologies is another important aspect of the policy of SPK concerning digitisation.

An outstanding example of broad scientific collaboration is the long-term research project entitled *Research Continuity and Continuity Research – Settlement-Archaeological Basic Research into the Iron Age in the Baltics*, initiated by the Museum of Prehistory and Early History of SMB and the Centre for Baltic and Scandinavian Archaeology in Schleswig.⁶⁶ It aims to re-examine historical archaeological investigations conducted in the regions of former East Prussia, to locate and virtually re-unite the objects of the Prussia Collection, previously kept in former Königsberg (now Kaliningrad, Poland) and dismantled after the Second World War. Institutions in Poland, Russia, Lithuania, and other neighbouring countries, work to reconstruct this rich archaeological landscape of the now fragmented East Baltic region, and to make it accessible to interested scholars.

The Gemäldegalerie that houses the collection of European paintings of 13th to 18th centuries, participates in the network of the Rembrandt Database, a research project of the Netherlands Institute for Art History (RKD) and The Hague Royal Picture Gallery Mauritshuis, funded by The Andrew W. Mellon Foundation. This online, pan-institutional research resource, open to all interested users and of major significance for art history scholars and students, provides documentation on paintings by Rembrandt (or attributed to him) held in museums around the world. Collaborations include also the active participation in European projects, enabling the SMB to aggregate their collections in cultural digital libraries and portals, as in the case of European projects, e.g. Europeana Fashion (2012-2015) and Partage Plus (2012-2014).⁶⁷

Documentation and use of standards

For the SPK, the implementation of a digital roadmap is inextricably related to the documentation of its collections according to appropriate community standards, to curatorial traditions and domain knowledge of each collection.⁶⁸ With regard to museum collections, documentation ensures the quality of the digital content produced (data, metadata) and enables its use for producing services to satisfy the information needs of the people working in the institution and of its audiences. Beyond a systematic description of the objects, such information frameworks record the social, technical and historical significance of the objects, linking them e.g. to persons, places, events, creating semantic networks and reconstructing their stories. Moreover, the use of standards facilitates access, interoperability and re-use of collections' information on other cultural heritage platforms.

⁶⁶ On this project, www.smb.museum/en/museums-institutions/museum-fuer-vor-und-fruehgeschichte/collection-research/research.html, www.zbsa.eu/aktuelles/nachrichten/wiskiauten-besuch and SPK Jahrespressekonferenz 2016, 20.

⁶⁷ www.europeanafashion.eu/portal/home.html, www.partage-plus.eu, see also Portals and networks, www.preussischer-kulturbesitz.de/en/priorities/digitization/networks-and-portals.html.

⁶⁸ Parzinger, von Hagel, Schauerte 2015, 105-106.

Responding to these challenges, a dedicated institution, the Institute for Museum Research of the SMB, monitors the field of digital curation; it contributes to the development of international standards and tools for museum documentation, quality principles for presentation and multilingual access to digital heritage collections and portals, standards for the preservation of digital heritage information, and, most importantly, shares knowledge and promotes the use of standards among cultural heritage institutions.⁶⁹

A model for access: open access and management of rights

In November 2013, the SPK signed the *Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities*, issued in October 2003.⁷⁰ This declaration, initiated by the Max-Planck Society for the Advancement of Science and signed by a number of German and international research and cultural heritage institutions, recognises the importance of the Internet as a medium for making scientific knowledge available to society and supports the development of open access policies for scientific publishing.

In joining the Berlin Declaration, the SPK issued a set of best practice recommendations for the implementation of the Berlin Declaration and the open access paradigm by cultural heritage institutions.⁷¹ According to these recommendations, cultural heritage institutions are committed to publish their digitised materials including associated metadata and relevant legal provisions in online, open access archives, operated and maintained by a scientific or other established institution. Their contribution to the creation of a global and interactive representation of human knowledge online for the benefit of society is further associated with public access, unlimited dissemination, interoperability and long-term preservation. In relation to the permissions of use, the recommendations state that “on condition that the authorship is correctly indicated according to the rules of copyright law and the usual practices of the scholarly community, they permit the users to copy, use, disseminate, broadcast, and publicly communicate – in any digital medium and for any legal purpose – the publications and digitised materials of cultural institutions as well as to create and disseminate work based on them.”⁷² However, digitised materials should not be made available for free when such data are being used for commercial purpose.

⁶⁹ For example, vocabularies for the systematic description of objects, contribution to multilingual tools through the German translation of the structured vocabulary *Art & Architecture Thesaurus* of the Getty Research Institute (www.aat-deutsch.de), participation to the development of the harvesting standard LIDO (Lightweight Information Describing Objects), Hagedorn-Saupe 2012, 204-205; Parzinger, von Hagel, Schauerte 2015, 112. On the Institute, see www.smb.museum/en/museums-institutions/institut-fuer-museumsforschung/mission.html.

⁷⁰ On the Berlin Declaration, en.wikipedia.org/wiki/Berlin_Declaration_on_Open_Access_to_Knowledge_in_the_Sciences_and_Humanities.

⁷¹ SPK Recommendations 2013. Other signatories of the recommendations are the Stiftung Preussische Schlösser und Gärten Berlin-Brandenburg (Prussian Palaces and Gardens Foundation Berlin-Brandenburg), the Bundesarchiv (Federal Archives), the Deutsches Archäologisches Institut (German Archaeological Institute), and the Stiftung Jüdisches Museum Berlin (Foundation of the Jewish Museum Berlin).

⁷² SPK Recommendations 2013, Recommendation 2; on „fair use“distinguishing between educational and commercial use of digital publications, Shulman, Lehmann 2004, 109, item 10.

Consequently, the SPK makes cultural heritage metadata (textual information) easily and freely accessible on a variety of digital cultural platforms and communication channels for scholarly, educational or other non-commercial use.⁷³ Systematic reference to the universally recognised system of the Creative Commons licenses on the digital images of the artefacts facilitates effective rights management and transparency for the users as to copyright restrictions, as in the case of the online collection SMB-digital. As for the images, there is a fee for their commercial use. The image agency BPK – Bildagentur für Kunst, Kultur und Geschichte, is the central media service provider of all the institutions of the SPK, responsible for the commercial exploitation of the images from all their collections.⁷⁴ This model reflects established practices for the commercialisation of images of cultural institutions in analogue environments. According to Batt, it is “a strategy of adoption and adaption of new technology to support a traditional service proposition” that has been described as a “sustaining innovation.”⁷⁵

3.4.2 The benefits of re-use: a digital strategy for wide access to digital heritage collections

As highlighted above, digitisation offers to the SPK the opportunity to broaden access to cultural heritage online without time and place constraints, and to develop new services for scientific communication, education and cultural participation.⁷⁶ Accordingly, an important aspect of the institution’s digital strategy focuses on the re-use of digital heritage collections data and metadata to achieve their broad dissemination on different platforms, reaching and engaging a maximum number of people. A best practice example of this approach based on the value of re-use of digital assets is implemented for the collections of the fifteen museums of SMB.

Their collections, created and systematically developed over the last two centuries, represent more than five million objects of art, archaeology, and ethnology from places all over the world, and also archival documents, prints, drawings and books of the art library collections, photographs and audio-visual documents, many more than can be displayed in the permanent and temporary exhibitions. Rich and diverse, these collections form a ‘universal museum’, one of the most renowned in Europe, dedicated to the preservation, research and mediation of treasures of art and culture from the history of humanity.⁷⁷

While digitisation is important, research, enrichment of data and the scientific documentation of the collections are key factors and a high priority task. The transformation from analogue collection care to professional digital collection necessitated a large-scale digital documentation project, launched in 2000 and leading to the installation of a uniform software in all the museums of SMB, standardising and unifying the information on the collections and centralising data from several existing database systems.⁷⁸

⁷³ In step with Commission recommendation 2011, item 7f, advocating “the wide and free availability of the descriptions of digital objects (metadata) produced by cultural institutions, for reuse.”

⁷⁴ www.bpk-images.de.

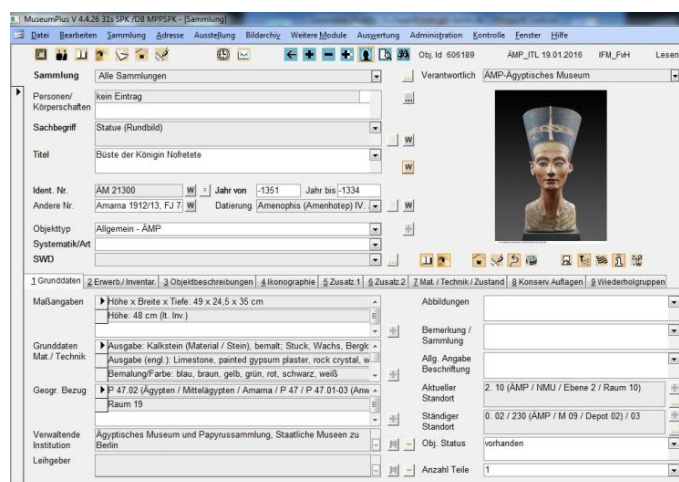
⁷⁵ As in the case of the Photo agency of the French Réunion des Musées Nationaux, www.photo.rmn.fr/Agence/Presentation. Batt 2015, 55, argues that this model may lose its ‘strategic fit’ over time.

⁷⁶ Parzinger 2015.

⁷⁷ ‘Die Staatlichen Museen zu Berlin – Preußischer Kulturbesitz bilden als eines der großen Universal Museen eine historisch gewachsene Institution zur Bewahrung, Erforschung und Vermittlung von Kunst- und Kulturschätzen der gesamten Menschheitsgeschichte’, Statut der Staatlichen Museen zu Berlin, 2001.

⁷⁸ Schauerte, Hagedorn-Saupe 2004.

Today, all SMB collections feed their data into one central collections' management and documentation system (Museum Documentation System, MDS). The system holds more than a million object records and is used by more than 400 museum employees. This standards based core documentation system serves as data repository or 'data well' for the growing number of uses and re-uses of data within the institution and on different platforms – digital libraries, online collections and portals. The MDS represents not only an important tool in the processes of scientific research, collections care and documentation, but it also supports SPK's institutional policy for re-use, wider dissemination and discoverability of digital cultural heritage information. To achieve this, interoperability and harvesting standards are used for the export of information from MDS for re-use in other portals and digital libraries, i.e. the harvesting standard LIDO (Lightweight Information Describing Objects).⁷⁹

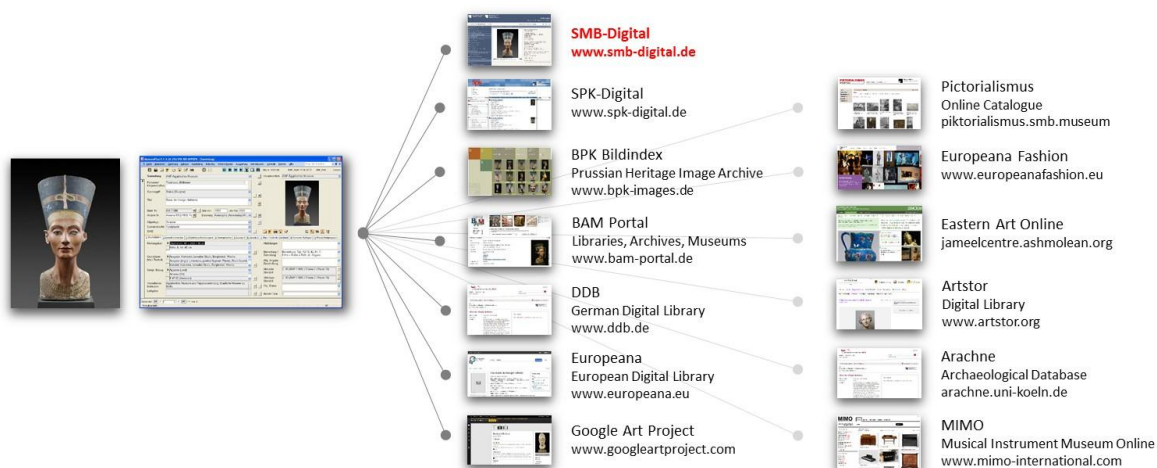


Screen of MDS with some of the fields of an object's record (Collection Management System MuseumPlus)

As Parzinger, von Hagel and Schauerte point out, online publications, unlike print publications, require flexible and easily configurable data entry and data export: the need for high quality and targeted information delivery 'just in time' is a key factor in designing the digital strategy of museums.⁸⁰ Although it may at first seem that the new, digital documentation standards and the use of controlled vocabularies and unifying documentation procedures within the SMB lead to a higher workload, at the same time it enables the museums to be represented with high quality and trusted, curated content in many different places online, creating visibility and reputation, and supporting engaging interactions with the users.

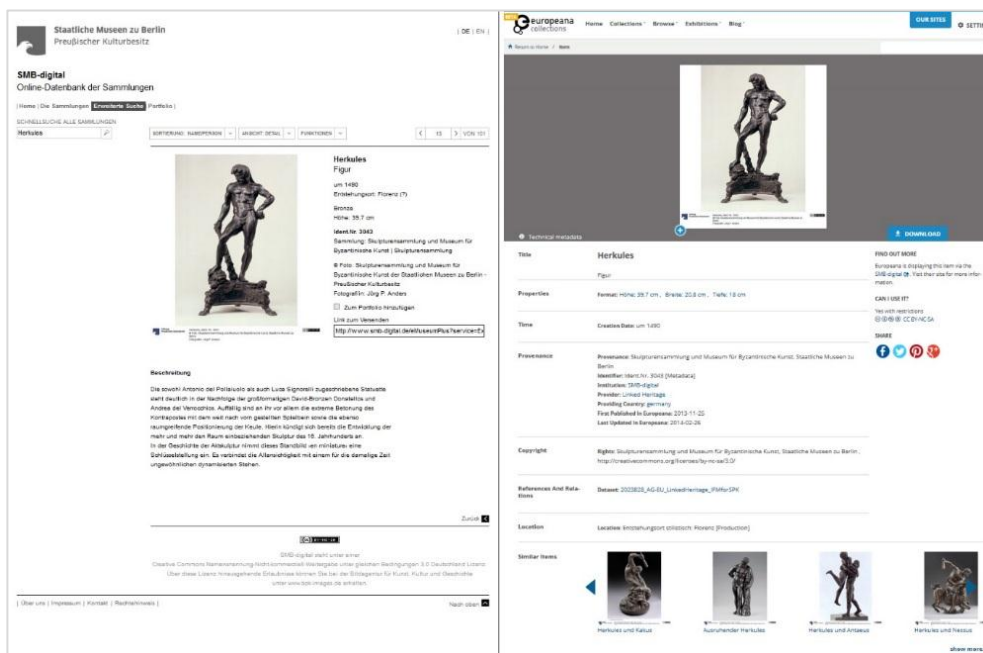
⁷⁹ On LIDO, see the information provided by CIDOC, the international Committee for Documentation of ICOM, network.icom.museum/cidoc/working-groups/lido/what-is-lido; Hagedorn-Saupe 2012, 204-205. The Institute for Museum Research of SPK is actively involved in the development of this international standard.

⁸⁰ Parzinger, von Hagel and Schauerte 2015, 105-106.



Graphic showing the cases of re-use of information from the MDS of the SMB towards different portals and digital libraries – national, European and international (April 2016)

Use of interoperability standards allows the export of data from one central system and their re-use to feed other SMB-SPK online databases, portals and catalogues. These include in particular SMB-digital, as access point to all the collections in the institutions of the SPK, thematic portals on special collections as the one dedicated to the 19th century architect of Prussian emperors Karl Friedrich Schinkel, the portal on Pictorialism photography and the collection of 20th century paintings.⁸¹



Publication formats for data and metadata for the same object on SMB-digital (left) and Europeana (right)

⁸¹ Das Erbe Schinckels, ww2.smb.museum/schinkel; Piktorialismus, piktorialismus.smb.museum; Die Galerie des 20. Jahrhunderts in West-Berlin, www.galerie20.smb.museum, a project focusing on the investigation of the provenance of the paintings for identifying artworks that may have been acquired through Nazi persecution.

External sites, digital libraries and portals are enriched with additional ‘data streams’, for example: the German Digital Library (Deutsche Digitale Bibliothek, DDB); the European digital heritage platform Europeana; the Google Art Project of the Google Cultural Institute; the image digital library Artstor; the portal Eastern Art online – Yousef Jameel Center for Islamic and Asian Art of the Ashmolean Museum; the digital collection Musical Instruments Museums Online MIMO; Arachne, the central Object database of the German Archaeological Institute (DAI); and the Archaeological Institute of the University of Cologne, just to name some.⁸²



The portal Eastern Art Online – Yousef Jameel Center for Islamic and Asian Art of the Ashmolean Museum, University of Oxford, is enriched with data from the Islamic collection of the SMB

Overall, this strategy serves the key objectives of the SPK: open access to large parts of the collections, to the knowledge and meanings associated with them. It facilitates the re-contextualisation of the SMB museums’ collections within larger aggregations of cultural heritage information in digital libraries and portals, expands the visibility of the institutions and supports the discoverability and re-usability of cultural heritage by all interested users. Finally, the strategic re-use of data from the museums’ collections according to international standards for cultural heritage information supports the development of linked data and semantic technologies on the web. As Parzinger, von Hagel and Schauerte underline, the wide online dissemination of the heritage collections of SPK introduces a previously unknown transparency of their holdings, contributing to the democratisation of knowledge.⁸³

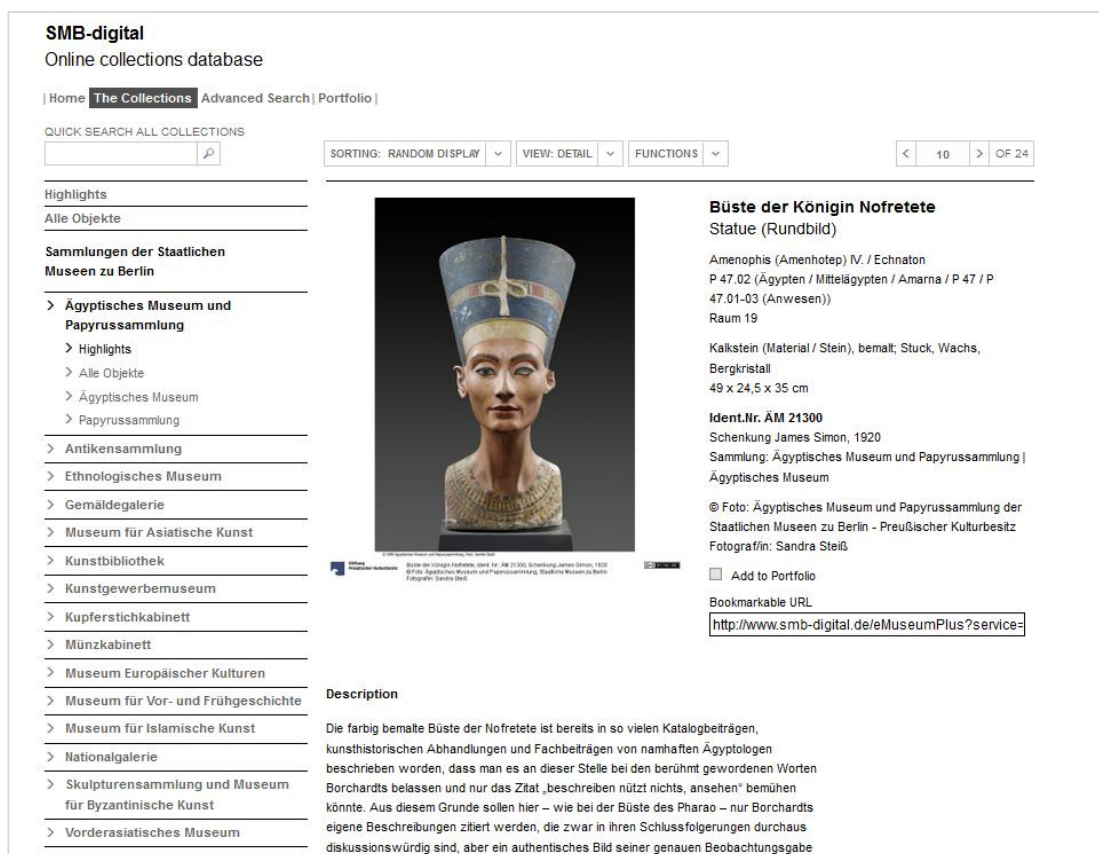
⁸² German Digital Library (DDB), www.deutsche-digitale-bibliothek.de/?lang=en; Europeana, europeana.eu; Google Art Project, www.google.com/culturalinstitute/project/art-project?hl=de; Artstor, www.artstor.org; Eastern Art online, jameelcentre.ashmolean.org/collection; MIMO, www.mimo-international.com/MIMO; Arachne, arachne.uni-koeln.de/drupal.

⁸³ Parzinger, von Hagel, Schauerte 2015, 117; Batt 2015, 272-274.

3.4.3 SMB-digital, the online collection of the SMB

As a result of the aforementioned, ongoing digitisation activities and digital curation of the collections of the SMB, scientific documentation and images of 163,000 objects are now accessible through the online database SMB-digital.⁸⁴

Launched in December 2011 as first iteration of an online collection at the SMB, SMB-digital has become one of the largest online museum collections in Germany. The information in this online database is directly exported from the MDS, with over one million objects' records. The content of SMB-digital is dynamically and regularly updated with new records as selected fields (sub-sets of data fields) and types of information are provided to online users directly from the museums' internal collection management system through a front-end user interface. Consequently, as it is the case with other museum online collections worldwide, SMB-digital contains information that has been recorded with the aim to curate and scientifically document the objects in the collections of all SMB museums. Systematic and dynamic updates of digital content are a major advantage of any online collection. While printed catalogues aim to be long-term valid references, online publications are much more a service, which is evaluated by the quality, accuracy and up-to-date (continuously updated) relevance of data.⁸⁵



The screenshot shows the SMB-digital online collections database interface. At the top, it says 'SMB-digital Online collections database'. Below this are navigation links: 'Home', 'The Collections', 'Advanced Search', and 'Portfolio'. There is a search bar with the text 'QUICK SEARCH ALL COLLECTIONS' and a search icon. To the right of the search bar are dropdown menus for 'SORTING: RANDOM DISPLAY', 'VIEW: DETAIL', and 'FUNCTIONS'. Further right are page navigation controls: '< 10 > OF 24'. On the left side, there is a 'Highlights' section with a link to 'Alle Objekte'. Below this is a 'Sammlungen der Staatlichen Museen zu Berlin' section with a list of collections: 'Ägyptisches Museum und Papyrussammlung', 'Antikensammlung', 'Ethnologisches Museum', 'Gemäldegalerie', 'Museum für Asiatische Kunst', 'Kunstabibliothek', 'Kunstgewerbemuseum', 'Kupferstichkabinett', 'Münzkabinett', 'Museum Europäischer Kulturen', 'Museum für Vor- und Frühgeschichte', 'Museum für Islamische Kunst', 'Nationalgalerie', 'Skulpturensammlung und Museum für Byzantinische Kunst', and 'Vorderasiatisches Museum'. The main content area displays a search result for 'Büste der Königin Nofretete'. It includes a photograph of the bust, a title 'Büste der Königin Nofretete Statue (Rundbild)', and detailed information: 'Amenophis (Amenhotep) IV. / Echnaton', 'P 47.02 (Ägypten / Mittelägypten / Amarna / P 47 / P 47.01-03 (Anwesen))', 'Raum 19', 'Kalkstein (Material / Stein), bemalt; Stuck, Wachs, Bergkristall', '49 x 24,5 x 35 cm', 'Ident.Nr. ÄM 21300', 'Schenkung James Simon, 1920', 'Sammlung: Ägyptisches Museum und Papyrussammlung | Ägyptisches Museum', '© Foto: Ägyptisches Museum und Papyrussammlung der Staatlichen Museen zu Berlin - Preußischer Kulturbesitz', 'Fotograf:in: Sandra Steiß', 'Add to Portfolio', 'Bookmarkable URL', and a URL: 'http://www.smb-digital.de/eMuseumPlus?service='.

Information provided on an object's digital record – the portrait of Nefertiti, one of the highlights of the Egyptian Museum and Papyrus Collection (Neues Museum)

⁸⁴ At the time of the user evaluation of SMB-digital, in March 2015, there were ca. 148,000 records available.

⁸⁵ Parzinger, von Hagel, Schauerte 2015, 106.

The content of SMB-digital is in German and an English version of part of the collection is under development. The user-interface is available in English and German. The users can browse the records of the objects of all the collections or their highlights, the same for each collection. At the level of object presentation, different views of the objects' records are available: lists with images and different levels of basic information or a full record, as seen in the example above.

For each object, basic information for its identification in form of fields is provided, as in the majority of museum online collections, as this is the minimum information extracted from the collections' documentation system. Types of information are shown on the example of the portrait of Queen Nefertiti: title, object type, date of creation and location, materials and dimensions, inventory number, way of acquisition and the museum collection to which it belongs, image credit, a bookmarkable, persistent URL to the record's webpage. The record usually includes a text description, whose length can vary, especially prepared for the online collection, and one or, rarely, more images,⁸⁶ independently of the object's importance or significance. Moreover, digitised materials issued from ongoing digitisation projects regularly enrich the online collection with engaging visual content, such as 3D images of the musical instruments of the Ethnological museum, and other multimedia assets, as the audio samples from the early 20th century phonograph archive of the same museum.

SMB-digital provides a simple search automatically conducted in all the fields as well as an expert search with combination of different criteria – collection, name of creator or person related to the object (for example, the name of a collector), title of the object, keywords, dating, provenance, material. Users have the possibility to select records of objects and create their own personal collection (called 'portfolio'). Educational, scientific and other non-commercial re-use of images and texts is granted to the users under a specific Creative Commons CC: BY-NC-SA license.⁸⁷

As its features imply, the SMB-digital online collection could be a particularly useful resource for researchers, scholars and students as well as for all users interested in the areas covered by the precious collections of the SMB. Moreover, the educational vocation of the online collection was a clear specification already at the time of the introduction of the MDS and the first ideas concerning the creation of an online collection.⁸⁸ Evaluation results of similar online museum collections with a broad and encyclopaedic character, such as the collection online of the British Museum (COL), demonstrate that indeed these kinds of audiences use extensively and benefit most from these easily accessible, scientifically validated resources.⁸⁹

Although a relatively small percentage of the records of SMB-digital are available in another language (English), it is worth noting that, according to the available statistics, the users of SMB-digital come from around the world, showing the impact and the potential of this collection.⁹⁰

⁸⁶ Specifications for images: one dimension 800 px, 100 DPI.

⁸⁷ This license allows users to "remix, tweak, and build upon your work non-commercially, as long as they credit you and license their new creations under the identical terms," cf. creativecommons.org/licenses/by-nc-sa/4.0/; and for the German version 3.0, creativecommons.org/licenses/by-nc-sa/3.0/de/

⁸⁸ Schauerte, Hagedorn-Saupe 2004.

⁸⁹ Ross, Terras 2011.

⁹⁰ Users from countries of Europe (42), Africa (14), USA, Canada, South America (16), Asia (22), Australia and New Zealand were recorded in 2015.

3.4.4 Information needs and digital practices of a group of museum guides

How can an online museum collection stimulate interaction with audiences and increase their engagement with digital cultural content? What do users enjoy and what are the barriers to user engagement and the constraints that hold users back? The first step was to understand the professional needs of the group of museum guides, their information needs and digital practices and then analyse their search strategies during their exploration of SMB-digital. The results are presented in this part of this study. As Roberts underlines, the role of museum mediators and museum educators is to help people to understand the collections by telling engaging and inspiring stories around each object that are meaningful to the visitors in an interactive and dialogic way.⁹¹

In seeking information to prepare a guided tour and create engaging stories around the objects to share with the visitors, the interviewed museum mediators are using a variety of methods, summarised in the table below. Their choices depended mostly on personal motivation and research interests, and less on age or gender. The level of digital literacy varies; it appeared to be related to age but, most importantly to personal interests and preferences as well as to practical considerations (i.e. hardware and devices, cost of an Internet connection that is necessary for an adequate infrastructure) to access digital cultural sources of information.

Preparing a new guided tour

Several methods are used for preparing a guided tour, from floor plans of the exhibition, to galleries lists of objects with their exact location in the cases, and scenarios outlining the successive stages of the guided tour, together with its themes and the objects illustrating them. Choice and integration of digital media for documentation purposes were found to be related to personal attitudes and needs, however the younger participants were more open, spontaneous and creative in their adoption of digital tools and their practices for preparing a collections tour. Documentation of the exhibition is done with different media, mainly photographs and videos, or floor plans where the path of their tour is marked. Part of the preparation are high resolution photographs taken at the exhibition or scans of images of the objects from books allowing them to viewing each object in-depth and in detail at home. Additionally, use of digital audio guides available in each museum and in different languages helps to find the adequate descriptive terms and their translations in other languages.

⁹¹ Roberts 1997, 2-3.



From a guided tour in the Altes Museum (one of the museums of SMB) on the Museum Island in Berlin, during the “Lange Nacht der Museen” on August 29, 2015

To gather information on the objects, the participants access online museum catalogues and open, user-generated resources such as Wikipedia. Online resources must provide a fast access to information, which is important when they are preparing a tour in a new exhibition under time constraints. The interviewees also felt that they were not sufficiently aware of the existing digital resources covering their subjects of interest and that they needed support to acquire such knowledge and awareness. They also considered that tracing digital resources useful for their needs would be time consuming. Nevertheless, they think that most of the information resources relevant and indispensable for their research are still mainly in print.

Communication with the museum education department

There aren’t yet any guidelines or a common policy for preparing and providing digital materials to museum guides to support their work. Younger staff members of the museum education department are using digital platforms for storing and sharing information with the guides and for preparing different documents for them such as book scans or exhibition floor plans, with object location and short descriptions. Mailing lists and the web-based management tool Doodle facilitate the arrangement of internal meetings.

Use of digital media and devices in guided tours

As for the use of digital media to enrich guided tours with museum visitors, it depends on the digital literacy and personal means of each guide. Only two of the interviewees systematically use digital media and mobile devices in their tours. The selection of information to communicate and of the medium to convey it is also a personal choice. The interviewed guides had many ideas and were experimenting with new ways to integrate digital media to improve visitor experience and social interaction challenging conventional methods of content mediation. As access to deeper information is not always available in the museums’ exhibition galleries, tablets are used to provide richer information through high-resolution images and details of the objects; contextualising information such as images of related objects; or through videos on YouTube highlighting the making and the use of objects.

One guide reported that she plays music through a portable speaker connected to a smartphone to make her presentations of the collections of musical instruments livelier and more engaging.

Digital devices and multimedia resources are not only used to enrich the visitors’ learning experience, but also as a means of creating and nurturing social relationships and shared meanings in the course of the museum visit, thus strengthening cultural participation. As C. da Milano writes, “Although it is certainly material culture that provides a starting point for the process of learning in museums, it is the creation of social relationships and shared meanings that defines it.”⁹² Interaction and communication for groups and mediators using digital media within the museum have been found to significantly enhance the social context of learning.⁹³

Constraints to the use of digital devices during the guided tours were considered the higher costs and the personal investment in time as well as the insufficient museum network infrastructure (WLAN is not available in the SMB museum galleries) and, the museum guides would appreciate even more support from the museum education department.

Needs	Working methods	Analogue media used	Digital media used
Preparing guided tours for different kinds of audiences	Visit of the exhibition Detailed observation of the objects Documentation of the exhibition with various methods (photographs, text notes, floor plans with comments, etc.) Photographs of selected objects Work at home with the documentation and additional resources List of objects Scenario of the tour	Print materials Books	Museum audio guides Digital images Museum websites SMB website Digital videos Museum online collections Wikipedia / User-generated content Google Wikipedia, multilingual articles

⁹² Da Milano 2013.

⁹³ Sayre, Wetterlund 2008.

Needs	Working methods	Analogue media used	Digital media used
Communication with the museum's education department		Meetings	Emails Doodle tool for meetings Digital documents in various formats (PDF, text documents, images) Data cloud to store and access the documents (Google docs)
Peer communication		Meetings	Online forum Emails Smartphones
Mediation to visitors	Dialogue and exchange with the visitors Questions asked of the visitors as a method for engagement and two-way communication Telling stories around the objects	Information material within the exhibition (maps, wall texts) Visuals – images for comparison (print)	Tablet Smartphone Speakers Mobile internet access to information within the museum galleries YouTube Museum websites Museum online collections

Table summarising the findings of the focus group discussion on the information needs and practices of the museum guides interviewed

3.4.5 Exploring the potential of SMB-digital for user engagement, research and learning

The information needs of the interviewed museum mediators as presented in the previous section, are characteristic of the information needs and practices of academic user groups that are among the most frequent and assiduous users of museum online collections, according to the results of audience segmentation of museum online collections with a multidisciplinary, encyclopaedic vocation, similar to SMB-digital (Ross, Terras 2011). The following analysis focuses on the motivations, the ways to access the content of SMB-digital, and the wishes of the interviewed museum guides, highlighting the potential of and the barriers to engagement with this online collection, as our users experienced them.

Motivations

Under the influence of recent developments in museum visitor studies, analysis of the users of online museum resources focuses on their motivations for visiting the website and the quality of the experience they might have during the visit. Beyond the traditional demographic audience segments, personality or identity-related motivations, as have been expressed by museum researcher John Falk (Falk 2009), are particularly relevant for this method of investigation. According to Falk, five broad categories reflecting the views that people have of themselves – Explorers, Facilitators, Experience Seekers, Professional Hobbyists, and Rechargers – capture the essential motivations behind museum visitors' choices and shape their visiting experience.

Attempts have been made to apply this model for online audience segmentation to better understand the motivations of online visitors and how these can have an impact on their engagement. Accordingly, a survey among online visitors of the website of the Indianapolis Museum of Art (IMA) identified five motivational categories: plan a visit to the museum, find specific information for research or professional purposes, find specific information for personal interest, engage in casual browsing without looking for something specific, or make a transaction on the website (Filippini Fantoni, Stein, Bowman 2012). Focusing precisely on the online collection of the Tate, *Art & Artists*, a recent research of its digital audience aiming to understand visitors' motivations and their usage of the online collection, defined four main motivations: intellectual, for users wishing to learn and find specific information, aesthetic/emotional, for those seeking inspiration, planning a visit, and social, for people looking for information to share on social networks (Villaespesa 2014).

An analysis of the motivations of the users in this study indicates a mainly professional interest to SMB-digital, a type of visit that should be termed 'intellectual' according to the motivational categories proposed for the visits of *Arts & Artists* online collection, and has been also identified in the study of the IMA website. However, the qualitative method used in the case study could yield more detailed information as to the characteristics of the experience that each user had with the online collection. This was highly personal, related to individual learning preferences and to the level of digital literacy of each user. Moreover, these criteria determined the selection of ways of accessing the online database and the information-seeking interactions.

Patterns of access and online experiences

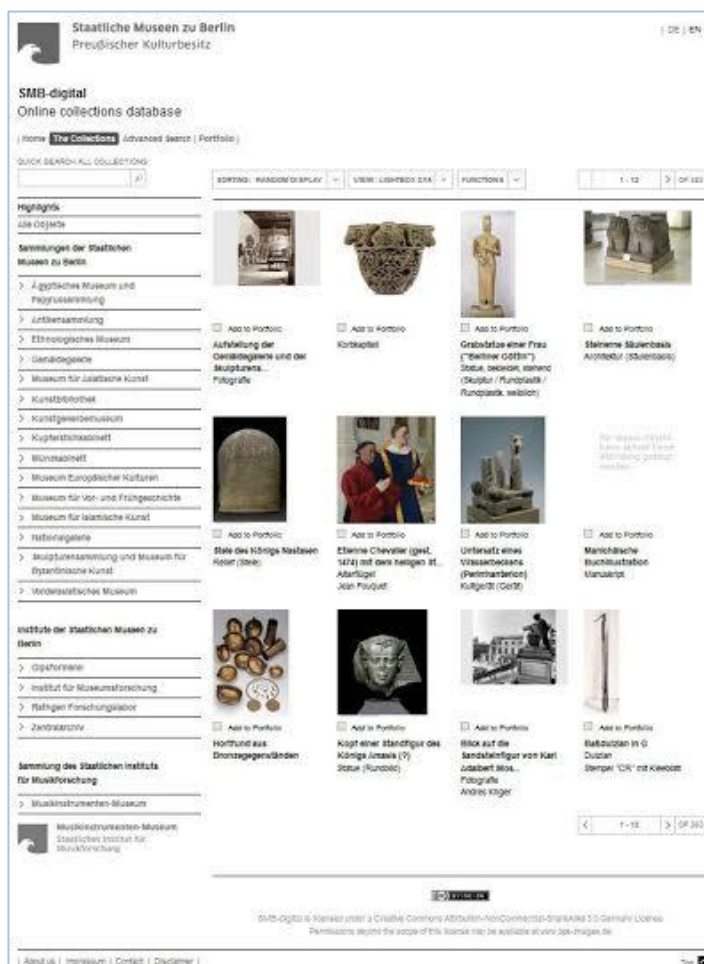
Browsing was the starting point for exploring the collections using the proposed overviews and highlights. This overview was found (more or less) satisfactory as it facilitated the discovery of objects and collections that the users did not previously know.

Whereas for an older participant not keen on using online resources, browsing has been an engaging emotional and inspiring experience, it gave the other three members of the group impulses to seek specific information about an object or a topic afterwards.

"I scrolled down the collections and then chose the Old National Gallery (Alte Nationalgalerie), and only at this point I noticed that I could also sort [the works] according to certain categories, and I decided to have them sorted according to names. After that, I looked if there was anything from Karl Blechen, because I really like him, and then indeed many things came up. (...) I figured out what a great amount of incredible things from him are in the collections of Prints and Drawings (Kupferstichkabinett), things that no one ever gets to see, because they are kept in storage (...). I wanted to return to Karl Blechen, but then I saw a painting of a certain C. Cantian, who had something to do with architecture – the big granite basin in front of the Altes Museum was made in his factory. Is this really a portrait of him?"

I thought it would be great to show this at a guided tour in the Altes Museum, as the basin stands in front of it. And, then something came to mind, something that I have often thought about the rigorousness of each single collection (...), if we could only abolish these borders separating one collection from another.”

(Male participant, 60 years)



SMB-digital, screen for browsing collections' highlights

Seeking specific information has been a preferred way of accessing the information in SMB-digital, to accommodate the professional needs of the participants with a higher level of digital literacy. As it has been reported about the scholarly information-seeking behaviour in the British Museum online collection, efficient search and quick access to information was considered of utmost importance (Ross, Terras 2011). The museum guides in this study searched for factual information – about specific objects, object types, materials, techniques or subjects. The level of digital literacy of each participant conditioned the selection of the appropriate type of search, simple or advanced.

Advanced search was used correctly only in one case (female participant, 36 years). In any case, all participants considered the search functionality a less satisfactory feature of SMB-digital.⁹⁴

"For my work I need quick access to what I am searching. As someone who is just interested in the content of the museums, I find this overview of the collections very useful, but when I am searching for something more specific, this is not useful."

(Female participant, 50 years)

"I started the session by exploring the collections, (...) and then I saw the Central Archive. I thought, wow, they have a collection of photos! This is cool! However, I realised that there were 4,326 photos (...). That is an extremely large amount. I thought that if photos from past exhibitions exist, they must be in there, so I tried to find them. I actually wanted to find a photo of the inside of the Altes Museum. That was impossible... I switched then to the advanced search and gave "Altes Museum" in full text and "Central Archive" as collection. No results again."

(Female participant, 36 years)

As in the case of experienced learners or museum visitors with a higher educational level, prior knowledge influenced the information choices of our users, as their exploration of SMB-digital frequently concerned collections and objects that they were familiar with (cf. Appendix – Section 8.3, the museums, where they work). Prior knowledge plays an important role as stage of the learning process in the construction of new knowledge and understanding, and has been extensively studied as a major factor of museum learning (Roschelle 1995, Falk, Dierking 2000, discussing the personal context of museum learning). However, deep experience of the physical collections led in this case to specific expectations from the content of the online collection, frequently perceived as direct reflection of the physical collection, and, consequently, as 'not complete'.

"I first tried to find some information about the pieces of furniture in the Kunstgewerbemuseum (Museum of Decorative Arts). It was a test, because I know furniture very well and I wanted to see, which objects I could find and which information was available for them."

(Female participant, 50 years)

User	Simple search	Advanced search	Browse
User 1 (F, 50 y.)		Roentgen (Cabinetmaker, 18 th c.) Art from Asia Furniture	Overview of collections
User 2 (F., 36 y.)	Granulation Pergamon Museum War destruction Reconstruction Neues Museum AND War destruction Market Gate of ancient Miletus	Altes Museum AND Central Archive Pergamon Museum AND War destruction Pergamon Museum AND Collection Central Archive Pergamon Museum AND Reconstruction	Overview of collections Institute for Museum Research Rathgen Research Laboratory Central Archive Alte Nationalgalerie (Old National Gallery) Pergamon Museum

⁹⁴ Some of the expressions used to describe search: It did not work, I did not understand it, I found it relatively troublesome, etc.

User	Simple search	Advanced search	Browse
User 3 (M., 60 y.)	Clay figurine AND Altes Museum		Overview of collections Highlights Museum of Prints and Drawings (Kupferstichkabinett) Old National Gallery (Alte Nationalgalerie), sorting with names / persons: - Karl Blechen (19 th c. painter) - Christian Gottlieb Cantian (19 th c. architect and sculptor)
User 4 (M., 40 y.)	Head of Pericles Pergamon Altar Venus Aphrodite		Overview of collections Collection of Antiquities Asian Art Museum

Overview of the functionalities used by the participants and subjects that they looked for

Different studies have demonstrated that a major problem in accessing large cultural heritage information aggregations remains the search functionality, mainly because it does not take into account user information seeking patterns (Petras, Stiller, Gäde 2014). Recent user research of the online collection of the Metropolitan Museum of Art has shown that online visitors wish to access the content in different ways, to search across data and on different levels, and would greatly appreciate links to related information. An analysis of the terms used for search (artists, art movements and schools, dates, places, cultures, types of objects) showed that the answers to these queries were irrelevant. Consequently, access to the online collection was redesigned. A faceted interface for access was implemented, combined with quick and efficient search that helps to establish relationships between works of art, supporting connections and discoverability of information. The search functionality was improved by adding vocabularies of terms, allowing for effective retrieval.⁹⁵ Enriching the lists of search terms under subjects and thematic categories was also suggested by users of the *Arts & Artists* collection of the Tate (Villaespesa 2014: 18). The evaluation of the search outcomes of the online collection of the British Museum during an online user survey yielded many positive answers (66.5%), with only a third of the users (30%) reporting unsuccessful queries (Ross, Terras 2011). These findings are in agreement with the suggestions expressed by our respondents, wishing the addition of keywords in more fields (e.g. types of objects, materials, while right now lists of terms are available only in two fields of the advanced search, Collection and Name/Person), and appropriate conceptual tools for organising the rich content of SMB-digital. Such tools would give control to the users over the content facilitating its gradual exploration according to personal learning preferences.⁹⁶

“Well, I would say that it lacks a sort of meaningful organisation. For example, here I could very well imagine that someone says “I want to look only the statues”, or “I want to see only the pottery”, or “I want to see metal vessels”, but here everything is still fairly arbitrary.”(Male participant, 40 years)

⁹⁵ Rainbow, Morrison, Morgan 2012; this type of interface is provided in another online portal of SPK, SPK-digital, www.spk-digital.de.

⁹⁶ Similar tools, known as advanced or cognitive organisers, facilitate museum learning, Hein 1998, 138-139.

Yet, the answers of the participants also reflect the information seeking behaviours of the majority of people, using the Internet in their everyday activities. They expect a fast and relevant answer, as the ones that Google and Wikipedia provide. This finding demonstrates the impact of global services on people's lives and behaviours. As Batt argues, "in the digital space, if the resource does not immediately match the user's needs, they will almost certainly immediately go elsewhere. If the online boundary exchange is to accommodate a wide range of different needs with maximum effect, far greater collective understanding of what is meant by learning will be necessary" (Batt 2015: 277).

"When I am visiting the online collections of the Louvre or the British Museum or the National Gallery in London or of my favourite museum, the Victoria & Albert, I have many more options and better search functionalities.

(Female participant, 50 years)

In this competitive information landscape, museum online resources should be audience-driven for their digital strategies to support different information needs and learning preferences and provide more personal, customised experiences (Milligan 2016, Batt 2015: 279, Villaespesa, Stack 2015, Filippini Fantoni 2012, Warwick, Terras, Nyhan 2012: XV). Several cultural heritage institutions have ameliorated the browse and search functionalities of their online collections in order to satisfy the need for fast delivery and precise information for their users (Rainbow, Morrison, Morgan 2012).

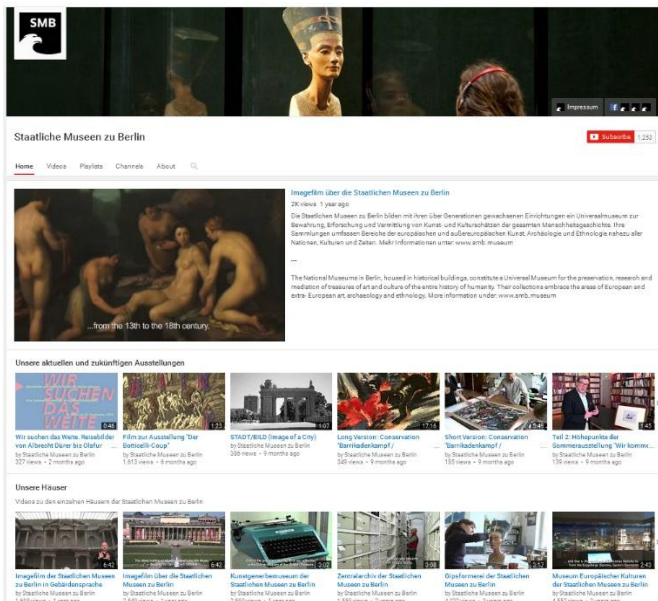
Wishes for deeper engagement: more content and media, contextualisation and re-use

Expectations expressed by the participants were mostly associated with their professional and educational work, and their related research interests. They contribute to a better understanding of the requirements that guide the creation of online cultural heritage resources. They give insights as to how museum collections can increase their impact on their audiences, and consequently their social value, how they can create deeper engagement and have a positive impact on learning, personal and professional development of their users.

All members of the group expressed a wish for including more highlights and emblematic objects, information underlining their significance within the particular collection and beyond, and enriched with longer texts and bibliography.⁹⁷ This finding confirms that the role of texts for conveying a wealth of information about the objects remains important, especially for scholars and students, as user evaluation of the Tate's Art & Artists online collection has demonstrated (Villaespesa 2014). The images of the objects provided were appropriate and, in general, of good quality, but did not facilitate studying the artefacts. A richer visual documentation was expected that would help figure out technical details of the objects such as marquetry or inlays, to understand complex figural scenes, to explore small objects or view in detail objects photographed in groups, deepening engagement and learning with the collections. A larger number of images for each object, high-resolution, including details, and with the ability to zoom-in, were considered as a desirable tool for an online collection serving scientific purposes, in line with the expectations of scholarly users of similar online resources (Villaespesa 2014, Ross, Terras 2011). Relevant combination between texts and images was another requirement for such a system. For example, in the cases where more than one object is represented on the same image, the description in the text should refer to the image.

⁹⁷ This complies more with print media and less with the standards of information systems that implement a uniform and standardised presentation of information.

Shulman and Lehman (2004: 108) considered this a ‘crucial point’ in designing digital cultural resources for learning and scholarly research as it can increase their learning potential and facilitate the discovery of many interrelations. Finally, links to audio-visual resources such as videos on YouTube were proposed to substantially enrich the content of SMB-digital making it more comprehensible and engaging for a broader audience.



The YouTube channel of the SMB offers rich multimedia content (left); YouTube video of the Metropolitan Museum on the Roentgens' Berlin Secretary Cabinet, Museum of Decorative Arts (SMB) was a suggestion for the content of SMB-digital (right)

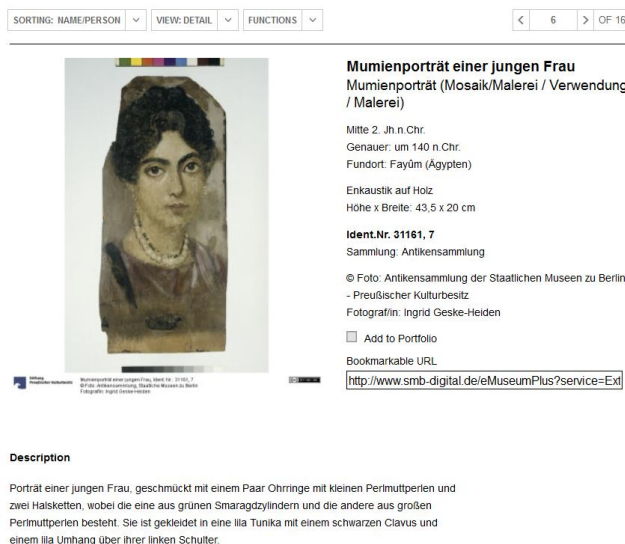
Participants explicitly expressed a wish for contextualising information of the content. Descriptions of the collections, information about the museums, thematic overviews, and general introductions to the art of a period, an art movement or to object categories would facilitate understanding and enhance the educational role of the online collection. To make the resource more accessible to a broader audience with no prior knowledge of the collections, scientific terms used in the texts describing the objects should be avoided or explained.⁹⁸ It is clear that these wishes draw upon the long experience of museum guides in museum education and, where different kinds of conceptual tools such as wall texts, floor plans, orientation aids, thematic panels, and other aids that elucidate the intellectual or thematic structure of an exhibition. Their aim is to facilitate the learning experience of the visitors by informing them about what to expect, what there is to see, what is most important to focus on, and the reasons for this.⁹⁹

⁹⁸ Cf. description of the Market Gate of ancient Miletus, www.smb-digital.de/eMuseumPlus?service=ExternalInterface&module=collection&objectId=829869&viewType=detailView.

⁹⁹ On advance or cognitive organisers in museums, Hein 1998, 138-139.

“I would love to see some more contextual information. Let’s look at this precious mummy-portrait. Why do I find it under “earrings” [query, simple search]? Because the woman who is painted is wearing earrings? I would like to read an explanation – what is a mummy? Why is it so rare? Why is it so important? What is encaustic painting? Why was it found in Egypt? The description is good but it lacks contextual information.”

(Female participant, 36 years)



Mumienporträt einer jungen Frau
 Mumienporträt (Mosaik/Malerei / Verwendung / Malerei)

Mitte 2. Jh. n. Chr.
 Genauer: um 140 n. Chr.
 Fundort: Fayûm (Ägypten)

Enkaustik auf Holz
 Höhe x Breite: 43,5 x 20 cm

Ident.Nr. 31161_7
 Sammlung: Antikensammlung

© Foto: Antikensammlung der Staatlichen Museen zu Berlin
 - Preußischer Kulturbesitz
 Fotograf/in: Ingrid Geske-Heiden

Add to Portfolio

Bookmarkable URL
<http://www.smb-digital.de/eMuseumPlus?service=ExI>

Description

Porträt einer jungen Frau, geschmückt mit einem Paar Ohrringe mit kleinen Perlmutterperlen und zwei Halsketten, wobei die eine aus grünen Smaragdzylindern und die andere aus großen Perlmutterperlen besteht. Sie ist gekleidet in eine lila Tunika mit einem schwarzen Clavus und einem lila Umhang über ihrer linken Schulter.

Record of a mummy portrait from the Collection of Antiquities, SMB

Links to the descriptions of the fifteen museums of SMB and their collections are now available on the new website of the SMB, launched in April 2016. They could provide some of the desired context and facilitate knowledge and understanding of the online collection.¹⁰⁰ Additionally, ongoing work on SMB-digital concerns the implementation of links to related objects from one object’s record, as in the case of musical instruments from South Asia at the Ethnological Museum.¹⁰¹

In their recommendations on the development of digital resources from cultural heritage institutions, Shulman and Lehmann were arguing that “[s]cholars not only expect access to an increasingly larger part of cultural heritage in digital form but also demand that comparative, multifunctional and interdisciplinary aspects of the material be made available. There is a clear need of strategies which aim at digitised resources to take these demands into account now and in the future” (Shulman and Lehmann 2004, 107). The creation of new meaning and knowledge by interlinking dynamically cultural heritage resources available on the web would be nowadays best supported with semantic technologies and linked data.¹⁰²

¹⁰⁰ www.smb.museum/en/home.html As of this writing, there are links from the collections’ descriptions on this website towards the corresponding collection and its highlights on SMB-digital, but not on the opposite direction.

¹⁰¹ For example, www.smb-digital.de/eMuseumPlus?service=ExternalInterface&module=collection&objectId=258280&viewType=detailView

¹⁰² RICHES deliverable D4.1 - *European identity, belonging and the role for digital CH*

Moreover, the need to relate the online collection to the physical exhibition by providing information on the location of the objects within the exhibition was clearly expressed by all participants. This would help guides to plan a tour and visitors to better organise their visit, especially from abroad, who are clearly among the users of SMB-digital. Although relevant information about the collection to which an object belongs to is provided on its record, there are some cases where such connection cannot be clearly established. This is particularly true for the Collection of Antiquities, which is presented in three museums of the Museum Island, the Altes, the Pergamon and the Neues Museum. Adding and updating the exhibition status of the objects on the online collection would inform the online visitors that some exhibits may not be accessible. This information is definitely an added value for the services provided by online collections, and it is part of the digital practices associated to them.¹⁰³

Two of the participants used the ‘Portfolio’, a tool for creating a personal collection.¹⁰⁴ Although they both considered this kind of personalisation service particularly relevant for their working methods – allowing to select, save, download, re-use digital materials or remix them with their own media assets to produce documents to meet their professional needs – they commented on the limitations of this particular tool, as it did not offer the possibility to save the collection for a later use nor export the content in another application.

“If I could export the portfolio in a format that I could use to work on it further, like for example a Word-file or any other common format, this would be useful for my work.”

(Female participant, 50 years)

“When I am putting a portfolio together, then I want to continue using it in some way, and not have it only for one session. I would then either download or print the portfolio, so that I can show it during the tour – that would be desirable for me (...). This is something which we surely can, because the copyright is written under everything, and therefore I could show during my tour for example a painting.”

(Female participant, 36 years)

Personal collections have proven very useful for collaborative and participatory work in a learning environment (Sayre 2009). However, evaluations have shown that to engage users in the co-creation of digital cultural heritage, such tools should support a wide range of user-related functionalities and applications (Marty, Sayre, Filippini Fantoni 2011).

Assessing the value of the online collection

Although at least three of the interviewed museum guides reported that they are systematically using digital resources of museums for their professional work, it is interesting to note that none of them were aware of the existence of SMB-digital. All of them spent at least thirty minutes exploring the collection, browsing and scrolling lists of objects, using different presentations, or searching for specific information. This duration may seem too long compared to other website visits.

¹⁰³ Implemented on the majority of museum online collections; cf. Louvre, *Base Atlas*, one of the first online services with information about 30,000 objects and their location in the museum, cartelfr.louvre.fr/cartelfr/visite?srv=crt_fm_rs&langue=fr&initCritere=true.

¹⁰⁴ The two other participants found the name ‘Portfolio’ not suggestive enough for this kind of functionality, and they did not try it.

Nevertheless, visit duration of more than fifteen and up to more than thirty minutes has been reported for approximately one third of the online visitor’s sample of the Tate’s *Arts & Artists* online resource (Villaespesa 2014, 18). Despite the barriers to engagement that have been reported or the wishes that were expressed for SMB-digital, our participants discovered new information previously hidden or concealed, useful for them or with regard to other kinds of audiences, as the following quotations highlight.

User 1 (F, 50 y.)	It is not bad, but it can be improved. I was surprised to discover the existence of this online collection [SMB-digital]. I think that it is the right thing to do, but it is still in the beginning.
User 2 (F, 36 y.)	It might be useful for me, yes, definitely.
User 3 (M, 60 y.)	It makes a clear impression, it is simple and plain. It is relatively easy. It has to be carefully looked at, because there are incredibly many things in it and it is not immediately clear what is important (...). People, who are interested, and most of them know how to use the Internet today, can satisfy their interest and be really pleased from the rich content of the collection. (...) I personally found things that I wasn't aware of their existence and I thought they were extremely interesting.
User 4 (M, 40 y.)	Well, not for work. Or, to put it this way, only partly for work and I would still have to use other resources, so I would rather take a print catalogue to find more informative texts about an object, because the inventory number provided here is not helpful for me.

3.4.6 Case study conclusions

“Museums will and must continue to be mission-driven with goals of their own. The real question becomes, is it possible to ensure that more of the outcomes museums are able to conclusively document are ideas, understandings or behaviors that both visitors *and* the museum think are important?” (Falk and Dierking 2012, 304)

This case study explored ways in which digital technologies can help to bring cultural heritage closer to people and bridge the gap between cultural heritage institutions and their audiences. It first examined the strategies that the SPK and the SMB apply for digitising and making available their collections online, seeking to identify best practices. The analysis shed light on the main features of the online museum collection SMB-digital within the institutional strategy for providing access to digital heritage collections, and its relation to collections research and documentation processes. To understand if and how SMB-digital can engage users and serve as a tool for learning, research, personal and professional development, a qualitative evaluation was conducted with a group of professional museum guides and mediators, identified as potential users of the online collection.

The analysis has demonstrated that digitisation at the SPK is being conducted in a well thought through framework, aligned to the mission and policies of the institution. The aims of the digitisation of the museum collections are to promote interdisciplinary research and study of cultural heritage to broaden access online and reach all interested people without time and place constraints, and to develop new services for scientific communication, education and cultural participation.

The digitisation framework defines four areas of action with regard to the collections of the SMB. It provides a set of criteria defining which collections should be digitised in priority, seeking a balance between quality and quantity, and uses the advantages of digitisation to overcome access barriers to the physical collections. Moreover, it includes demand-driven digitisation projects to promote the study of the collections through interdisciplinary research and pan-institutional collaborations. Digital curation of the collections, conducted according to appropriate community standards, ensures the quality of the digital content produced (data, metadata) and enables its use for different services for a variety of audiences. Finally, an open access model is adopted, with textual metadata free accessible for scholarly, educational or any other private use, whereas there is a fee for the commercial use of images.

This carefully planned digitisation roadmap supports the implementation of best practices for the broad online dissemination of the collections of the SPK to reach a widest possible range of audiences. All museum collections feed their data into one central, standards based, core documentation system that serves as data repository or 'data well'. Use of interoperability standards facilitates the export of data from this central system and their re-use to feed other SMB-SPK online portals, catalogues and databases, as well as external sites, digital libraries and portals (such as the German Digital Library, Europeana, the Google Art Project, etc.).

SMB-digital, the online collection of the SMB, is an example of the implementation of this strategy for access to the museums' collections. It publishes scientific documentation and images of 163,000 objects with basic information in the form of fields, complemented frequently with a textual description and at least one image. The content is in German and an English version is under development. SMB-digital provides browsing functionalities, simple and advanced search and the possibility to create a personal collection (called 'Portfolio'). Educational, scientific and other non-commercial re-use of images and texts is granted to the users under a specific Creative Commons CC: BY-NC-SA license. In line with the encyclopaedic and universal character of the SMB museums' collections, SMB-digital could be a particularly useful resource for researchers, scholars and students as well as for all users interested in the areas covered by the rich and diverse collections of the SMB.

The first step to explore if and how an online museum collection can increase audience engagement with digital cultural content, was to analyse the information needs and the related digital practices of the selected group of museum mediators.

It revealed that they use a variety of methods for digital and analogue in-depth documentation of the artefacts, re-using, re-mixing and co-creating digital resources to produce documents to meet their professional needs: prepare a guided tour, create engaging stories around the objects and share them with the visitors on their tours often on portable digital devices. Digital literacy level and use of digital cultural resources varied among the participants; it appeared to be related to age but, most importantly, to personal motivation and preferences as well as to practical constraints (i.e. cost of hardware, devices, Internet connection). The analysis of their information needs indicates that the group's motivation to use SMB-digital would be mainly professional, connected to scholarly information seeking behaviours.

The second step consisted the patterns of access and use of the online collection SMB-digital by the participants. Two ways of accessing content were used: browsing as a starting point for a gradual exploration of the collections using overviews and highlights, and seeking information about specific objects, object types, materials, techniques or subjects using simple and advanced search. Prior

knowledge and deep experience of the collections influenced information seeking choices. Knowledge of the physical collections served as a basis for the evaluation of the search results, giving the feeling that the online collection was 'not complete'.

The results of the use of SMB-digital, together with the wishes and expectations expressed by the users for deeper engagement with the online collection, can be summarised as follows:

- successful queries, fast and relevant answers are expected from a cultural heritage resource aiming to promote the study of cultural heritage;
- appropriate tools, such as vocabularies of terms and links among objects and entities of content, are necessary to support users in finding connections among the diverse collections and facilitate learning;
- wealth of information, long and comprehensive texts, different images for an object with zoom-in functionalities and details, audio-visual materials and their relevant combination increase the learning potential of digital collections;
- contextualising information in form of collections' descriptions, thematic overviews, and general introductions to the art of a period, an art movement or to object categories would facilitate understanding and enhance the educational role of the online collection;
- relation to the physical exhibition by giving (and updating) the location of the objects in the exhibition would facilitate the use of the online collection to prepare a visit, and is considered a standard for online collections;
- personal collections, as the 'portfolio' of SMB-digital, should support a wide range of user-related functionalities allowing to select, save, download, re-use digital materials or remix them with their own media assets to produce documents that meet the users' needs for co-creation in cultural heritage.

The results of this evaluation are comparable with the outcomes of surveys of other museum online collections, especially those concerning the scholarly and educational use of these resources. Yet, the answers of the participants reflect also the impact of global online services, such as Google and Wikipedia, on the information seeking behaviours and expectations of the majority of people that use the Internet in their everyday activities. In designing and making available curated and high quality online resources, cultural heritage institutions should consider the challenges of this competitive information landscape. They should respond to the challenge by providing museum online resources that are audience-driven and user-friendly, supporting different information needs and learning preferences and more personal, customised experiences.

3.5 CONCLUSION

The two case studies of this chapter highlight challenges that cultural heritage institutions are facing in digitising and making their collections available online, and the strategies that they develop to broaden access to cultural heritage online. Moreover, despite the different backgrounds and profiles of the users that participated in the evaluations, both case studies provide interesting insights as to the behaviours, motivations, expectations and digital skills of today's audiences in their interactions with cultural heritage collections.

The TNL and the SMB are both leading, internationally recognised cultural heritage institutions. Despite their different traditions due to the type of each institution (library or museum) they are both 'collecting institutions' of the 21st century with an important public mission: curate, enrich and preserve rich and diverse collections, and make them available to the audiences.

Both institutions consider digitisation as a major challenge necessitating a long-term strategy. Although their digital ‘roadmaps’ are dependent upon national frameworks for curating cultural heritage materials, managing access and intellectual property rights,¹⁰⁵ and despite the different degree of adoption of international standards, they present quite a few commonalities. Both institutions set priorities for digitisation, seek a balance between quality and quantity, implement cost-effective working procedures, and initiate ambitious projects that promote collaborations for the study of national and world cultures. They both develop online platforms accessible without time and place constraints sharing a wealth of information that was previously unavailable or concealed, and, at the same time, help to preserve sensitive, perishable materials that are kept in storage.

The results of the evaluation of the FAS and the SMB-digital online collections with different groups of users highlighted a number of interesting trends that can guide cultural heritage institutions in developing audience-driven access policies and new ways of mediation and engagement with their audiences. These findings and recommendations are summarised here.

- A demand for more and high quality cultural content for personal or professional use was expressed by the participants of both surveys, as a result of their interactions with the proposed cultural heritage online resources.
- Enhancing a deeper audience engagement with online collections requires taking a step beyond access. It necessitates providing appropriate and user-friendly tools to explore and apprehend the content, taking into account different motivations, supporting a variety of information needs and learning preferences and providing more personal and purposeful interactions.
- User behaviours and digital practices are greatly influenced from everyday use of online global information services, such as Google and Wikipedia, as well as other curated cultural heritage resources, challenging memory institutions to take into consideration a competitive international information landscape when designing information systems
- Accessibility and inclusion policies implemented in the online resources of both institutions are associated with traditions in each type of institution, i.e. the *Talking Books* of the National Library of Turkey, or the ongoing translation of the content of SMB-digital in English. Such solutions should be more systematically addressed to achieve a broad and meaningful access to the resources of cultural heritage institutions to all interested people.
- Users wish information systems that enable them to find connections among the different collections leading to new meanings and interpretations and a deeper understanding of cultural heritage. Integration of different digital resources in a larger aggregation as implemented by the TNL, and integration of other available digital resources in the case of the SMB can activate such connections and break data silos.

¹⁰⁵ An open access model for SMB-digital, charging a fee only for commercial use of the materials, and a paying access to the digital resources of the FAS for any intended use.



- Audiences are critical, they are aware of the global trends for open access, more transparency and democracy and less authority mediation. They re-use or co-create cultural heritage materials available online, they experience a participatory culture and social media; it is natural that they want to feel included and part of the development of cultural heritage resources, understand the reasons behind choices or be informed about the progress of the digitisation and updates. Taking into consideration these trends about online audiences can help memory institutions to build communities and sustainable relations around their digital collections.

Developing audience-centred digital strategies is a way for cultural heritage institutions to respond to the challenges that the advent of digital technologies is posing, using digital technologies to their advantage, to enhance their social and public value in the 21st century.

4 DEEPENING ENGAGEMENT WITH COLLECTIONS: NEW FORMS OF ONLINE EXPERIENCE?

4.1 INTRODUCTION

The late 1990s saw many different notions and ideas of how museums might use the Internet. One possibility included a way to offer a new form of virtual exhibitions. Virtual Exhibition – then still partly on CD-ROM – was meant to reach people who were reluctant to visit cultural institutions, offering them a possibility to delve into something in-depth from the comfort of their own home. It would provide them with an opportunity to get to know international museums and exhibitions without long trips, or enable people with physical limitations to access exhibitions and contents at any time.¹⁰⁶ Those pioneering days of the Internet, however, are over.

The first detailed USA publication about designing online exhibitions in 2002,¹⁰⁷ shows that not only museums but also libraries and archives see opportunities to present their collections through the use of multimedia. In the past 15 years, various European projects have also published handouts¹⁰⁸ and recommendations intended to support museums, libraries, and archives with multimedia. The most recent publication that deals exclusively with the state of online exhibitions from European museums, libraries, and archives was published at the end of 2015 as part of the publication series *Uncommon Culture of Athena Plus Project*.¹⁰⁹

As part of *Athena Plus* the involvement of a working group led to the development of the MOVIO Tool,¹¹⁰ which offers assistance for recycling and re-use of the digitised collection items. Not only were technical solutions developed, but content guidelines were expanded as well.

Another important group that is involved with online exhibitions with members from all over Europe, sees its task as follows: “An [international working group](#) takes up Digital Exhibitions as a topic, suggests a [definition](#), discusses current practices and experiments with the standardisation of appropriate [metadata](#).”¹¹¹

There are not data on how many online exhibitions are currently being shown in Europe. However, there is some information from individual countries, albeit without specified context. For example, in 2011, Danish colleagues at the International Conference *Museum and the Web* reported the fact that approximately 30% of Danish museums would create a virtual tour of their museum or a part of the collection.¹¹²

¹⁰⁶ For discussion on the use of new media in and outside of museums, see e.g.: Gernot Wersig: Museum for Far Away Publics: Frameworks for a New Situation. In: Petra Schuck-Wersig, Gernot Wersig, Andrea Prehn: Multimedia-Anwendungen in Museen. Mitteilungen und Berichte aus dem Institut für Museumskunde, Vol. 13, pp.10-18; Nina Tovish: Museum Visits in the Multimedia Age – One Museum’s Options. loc. cit. pp. 19-24.

¹⁰⁷ Martin R. Kalfatovic: Creating a Winning Online Exhibition: A Guide for Libraries, Archives, and Museums. American Library Association 2002.

¹⁰⁸ See e.g.: www.minervaeurope.org/publications/qualitycommentary/qualitycommentary050314final.pdf.

¹⁰⁹ Monika Hagedorn-Saupe (ed.): *Uncommon Culture* > VOL. 6, NO. 1 (11) (2015): VIRTUAL EXHIBITIONS <http://journals.uic.edu/ojs/index.php/UC/issue/archive>.

¹¹⁰ <https://athenaplus.wordpress.com/2014/06/03/create-your-own-digital-exhibitions-using-movio/>.

¹¹¹ www.digitalexhibitions.org.

¹¹² www.museumsandtheweb.com/mw2011/papers/the_use_of_social_media_in_the_danish_museum_l.

German museums primarily offer information to facilitate visits and visit arrangements. Likewise, in 2013 (the last comprehensive survey of online German museum activities), a quarter of all 3,161 responding museums had displayed items on their website in order to show what their collections contain.

Virtual exhibition offerings of German museums	2013 (N=3,051)* (N=2,349)** ¹¹³	2008 (N=2,787)* (N=1,994)**	2001 (N=1,537)**
Museums that have shown online exhibitions	41 (1.3%)*	75 (2.7%)*	¹¹⁴
Museums with virtual building tours	209 (13.2%)**	283 (14.2%)**	281 (18.3%)

A status quo developed for many applications that were tested as online exhibitions in recent years. Until today, online exhibitions are still more likely to be experimental niche products.

Definitions of online exhibitions

The Encyclopaedia Britannica¹¹⁵ limits virtual exhibitions to the opportunity to present digitally enhanced properties online:

“Extensive sites offering ‘virtual exhibitions’—that is, online tours of certain key exhibits—are maintained by some institutions, such as the [Science Museum in London](#) and the University of California Museum of Paleontology in Berkeley. Still other museums or administrative organs provide access to databases on collections—for instance, the Joconde database, maintained by the French Ministry of Culture, from which information can be obtained on important works of art held by more than 60 French museums.

Use of the word *museum* during the 19th and most of the 20th century denoted a building housing cultural material to which the public had access. Later, as museums continued to respond to the societies that created them, the emphasis on the building itself became less dominant. Open-air museums, comprising a series of buildings preserved as objects, and [ecomuseums](#), involving the interpretation of all aspects of an outdoor environment, provide examples of this. In addition, so-called [virtual museums](#) exist in electronic form on the Internet. Although virtual museums provide interesting opportunities for and bring certain benefits to existing museums, they remain dependent upon the collection, preservation, and interpretation of material things by the real museum.”

Even more differentiated are the definitions from various work groups that have become involved in the continued development and spread of online exhibitions.

¹¹³ See also: Statistical overall survey of the museums of the Federal Republic of Germany for the year 2001. Materials from the Institut für Museumsforschung, Vol. 55, Berlin 2001, p. 54. Statistical overall survey of the museums of Germany materials from the Institut für Museumsforschung for 2008, Vol. 55, Berlin 2009, p. 52. Statistical overall survey of the museums of Germany materials from the Institut für Museumsforschung, Vol. 68, Berlin 2014, p. 60.

¹¹⁴ At this point in time the offering of online exhibitions wasn’t surveyed.

¹¹⁵ www.britannica.com/topic/virtual-museum#ref191344.

In the manual¹¹⁶ for the MOVIO Tool the technical requirements come first:

“An online digital exhibition is a hypermedia collection made up of digital items which are: • Linked together by a common thread, an interdisciplinary topic, a concept, an idea, an anniversary, a special event, or a physical person • Displayed in 2D and/or 3D • Occasionally stored in distributed networks • Made accessible through the potential provided by modern technologies, thanks to a system architecture designed to provide user-centred, absorbing experiences • Dynamic products that can offer additional services and be updated periodically A thematic route is a particular aspect of an online virtual exhibition that can be: • An autonomous and independent product • A way to enhance and enrich the knowledge disseminated through the digital online exhibitions. Thematic routes do not claim to be exhaustive, but they meet the need to “suggest” to users a possible interpretative framework that will help them grasp a particular topic and discover new aspects of it.”

In her definition, Suzan Hazan emphasises the institutional connection of the virtual museum and the online exhibitions: “A virtual museum therefore is based on this definition by association, and can be described as a digital entity that draws on the characteristics of the museum, in order to complement, enhance or augment the museum experience through personalization, interactivity, and richness of content.”¹¹⁷

The working group of digital exhibition on the other hand calls for a clear design for online exhibitions and a unique perspective on connections and context, as only curators can offer:

“A **Digital Exhibition** is based on a clear concept and is well curated. It assembles, interlinks and disseminates digital multimedia objects in order to deliver innovative presentations of a theme, or series of themes, allowing user interaction to a great extent.”¹¹⁸

4.2 TRENDS AND BEST PRACTICES FOR DIGITAL EXHIBITIONS

Online exhibitions can offer something different to physically accessible exhibitions. The list of benefits and possibilities of the medium that the MOVIO working group sees for online exhibitions is long and includes the following aspects.¹¹⁹ Online exhibitions:

- help to promote the cultural heritage preserved by institutions;
- are a learning tool which helps to increase knowledge;
- make an amount of documents and items accessible that is much greater than what any physical exhibition could ever manage to display;
- make the most valuable and fragile works and documents accessible, without putting national and international cultural heritage at risk;
- help users to enjoy documents and works that may not be accessible otherwise;
- make it possible to view parts and details of works that could not otherwise be seen, not even through the direct observation of the original;
- remain accessible over time, since they are not limited to the duration of the actual event

¹¹⁶ Movio: Handbook on *virtual exhibitions* and virtual performances. Available at: <https://athenaplus.wordpress.com/2014/07/31/movio-brochure-available-for-download-on-the-athenaplus-website/>.

¹¹⁷ Suzan Hazan: The digital exhibition – Considered in the Long Term. *Uncommon Culture*, 2015; Vol. 1; p. 13-19.

¹¹⁸ Working Group Digital exhibitions, museumsdokumentation.de/joomla/resources/definition.

¹¹⁹ Movio Handbook loc. cit.

- can be visited by users from all over the world, who may not be able to visit an actual exhibition;
- are dynamic in nature, since they can be modified even after they have been created, both with regards to planning aspects and to their activities and contents;
- can be enhanced through the contributions of users;
- are less expensive than actual exhibitions and can be staged even with limited budgets;
- may serve as an online archive for information related to the material exhibition;
- can have a positive influence on the tourism industry.

Online exhibitions have benefits for both curators and producers of the online exhibitions, such as protection and taking care of objects, personnel cost savings, as well as for a potential audience. This however, requires another perspective and presents the hosts with other tasks.

Employees of the British Tate Jennifer Mundy and Jane Burton enthusiastically describe the possibilities offered by the design and implementation of online exhibitions:

“The obvious but important fact is that they (the Online-Exhibitions) can be visited by anyone anywhere in the world at any time, and so offer a fantastic platform for museums with their educational mission. They also reach non-visitors, those who through geography or inclination do not come to particular museums but who are happy to browse websites. Online exhibitions also provide extraordinary pedagogic opportunities, bringing together texts and related materials at the point where someone is viewing an object. They also offer layered information, allowing people to delve as deep as they wish and to read as much or as little as seems appropriate (the *Gallery of Lost Art* has approximately 180,000 words). Very importantly, with zooming, images can be seen in more detail than is ever possible in galleries. And with a creative design team, the look and experience of the site can be as special and distinctive as that found in the best of in-gallery exhibitions, but without the usual inconveniences (e.g., poor views of the objects, crowded spaces, and fatigue).”¹²⁰

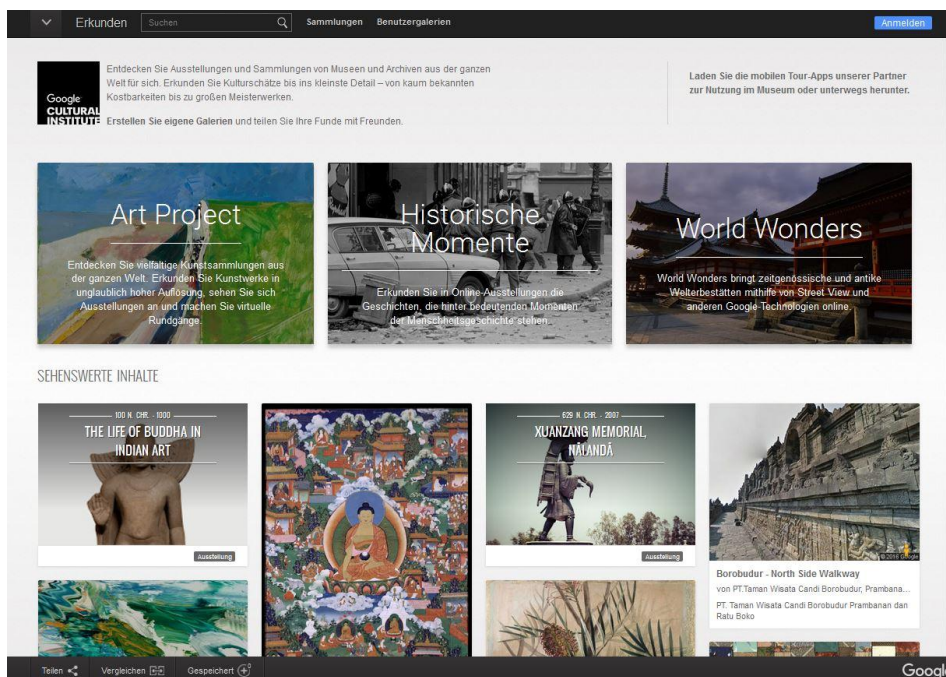
As with physically accessible exhibitions, so too various types of online exhibitions evolved over the years. Technical possibilities are used in the process, but substantive orientations also determine the typology of online exhibitions.¹²¹

Probably the currently most international and comprehensive project bringing together museums, collections, artists, objects, and themes in online exhibitions, is the Google Cultural Institute portal.¹²² In addition to virtual tours of museums worldwide, also from the SMB, among others, there are a number of online exhibitions created in cooperation with the Google Cultural Institute and shown on their website, as well as on the sites of the participating museums.

¹²⁰ The Tate developed the online exhibition *Gallery of Lost Art* in a large-scale online project. See: Jennifer Mundy, Jane Burton: Online Exhibitions. <http://mw2013.museumsandtheweb.com/paper/online-exhibitions/>.

¹²¹ This website made an archive for online exhibits and digitised collections: www.coudal.com/moom/index.php.

¹²² www.google.com/culturalinstitute/?hl=de.



Homepage of the Google Cultural Institute

The Google Cultural Institute committed itself to three different kinds of online exhibitions. There are virtual tours of museums and collections (Art Project), thematically curated exhibitions constructed according to a common system with a horizontally mounted image and text sequence and, more of a presentation than an exhibition, a collection of photos and street views with images of various real places in this world.

A non-exhaustive study (January 2016) on the homepages of European museums provides an overview of the diverse range of online exhibitions in the museum context.

In summary it can be said that many large European museums offer some type of online exhibitions. Examples can usually be found under the menu item 'Education'. Most have in common that the type 'Virtual Tour' is indicated as such, whereas the phrase 'Online Exhibition' is not used. An exception is the Jewish Museum in Berlin, which referred to its online exhibition made available in January 2016 as 'Online Exhibition'. The five online exhibitions are also put on the same level as the announcements and information about the physical special exhibitions.

One result of the study is the continued finding of how fluent the transitions are between a simple Internet presentation with lots of information and a more curated format that is closer to an exhibition. Perhaps this is the reason why the name online exhibition is so rarely used.

The classic virtual tour: National Gallery of London

The National Gallery in London is a 24-hour museum thanks to the possibility of a virtual visit. Visitors can roam through 18 rooms with the click of the mouse and take a closer look at paintings with the help of a zoom feature. However, there is no additional information. This type of online exhibition presentation visually includes the interior of the museum as a building, such that it approaches the feeling of a physical visit. It adopts that certain museum feeling, but lacks other visitors, the sounds, and even the smell.



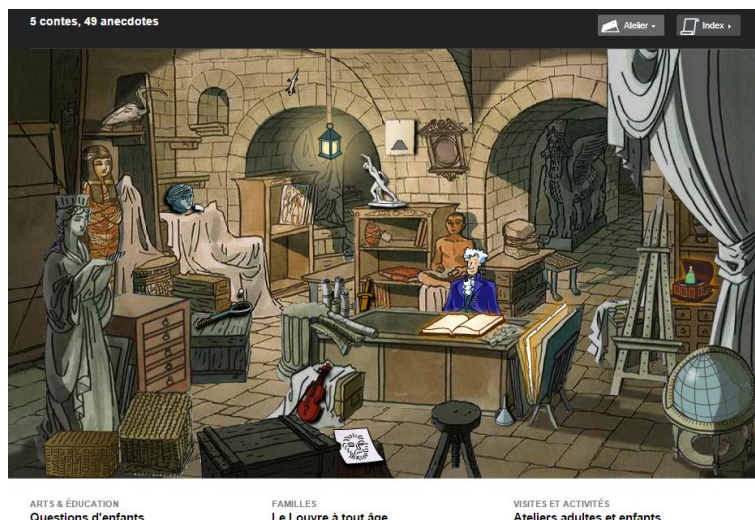
Virtual tour to the National Gallery in London

Online exhibition as tutorial: Tate

The 'Learn' menu of the Tate website is more of a portal than a learning platform. There is plenty of written information, image, film, and sound with various themes for a variety of audiences. These work through a wide array of media and according to the target group films, games, and links to objects from their own collection or to the collections of other museum. Every topic can be researched as in-depth as the user would like (with some participation possible), because there are various levels and hierarchies of information available.

Storytelling: Louvre example

On the homepage of the Louvre there are many offerings that can be described as online exhibitions. For example, a virtual 3D tour provides an overview of the building structure and the different collections. There is information on the individual works of art that are exhibited in various spaces and departments. The menu item 'Learning' also includes a number of multimedia possibilities, such as very close zoom into the details of selected artworks. A visitor to the exhibition space will never be able to get as close to the Mona Lisa as with the option *Œuvres à la loupe* (works under a magnifying glass). There are also digital guides and thematically grouped smaller online exhibitions. The entire offering is aimed at different audiences. The storyteller recounts five fairy tales and 49 anecdotes about selected objects for children.



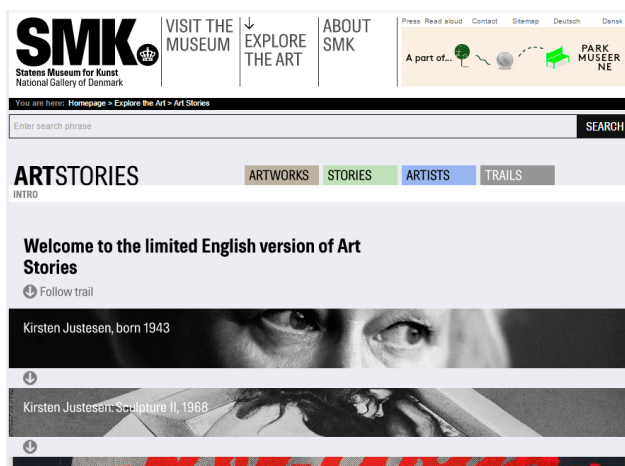
From the educational offer of the Louvre, a storytelling application for young audiences

Building bridges: Swedish National Museum

The Swedish National Museum in Stockholm currently has restricted access due to renovations. This is balanced by a collection of online exhibitions. These exhibitions, curated by topic, however, show little more than what would be seen even with a visit to the National Gallery: the image with some information, such as artist names, size, measurements, provenance information.

Bringing objects together: Statens Museum for Kunst, Copenhagen

The National Gallery of Denmark Statens Museum for Kunst offers a curated and technology-based virtual exhibition under the menu item ‘Explore the art’, without calling it ‘online exhibition’. Currently shown there is the topic of women in art from across various perspectives. Women as the motif and women as the artist are brought together and can be viewed across multiple access points to the content, as with exhibitions attended in person. The information is also retrievable on various levels according to personal interest.



Art Stories, narratives about the collections of the National Gallery of Denmark, Copenhagen

Opening up storage rooms: Jewish Museum in Berlin

In January 2016, the Jewish Museum Berlin set up five online exhibitions with biographies on its website. Photos and other objects from the collection illuminate with different thematic orientations the history of Jewish citizens after 1933, for example, the research into the Marcuse family or the biographies of Jewish ceramists. The exhibitions are connected to the Google Cultural Institute.



Jewish Women Ceramicists from Germany after 1933, a digital exhibition of the Jewish Museum in Berlin on Google Cultural Institute

Enriching the visit to temporary exhibitions: Digital of the Stadel Museum, Frankfurt a.M.

Rationale of the jury for the awarding of the Grimme online Award in the category Culture and Entertainment. Rationale of the jury:

“People who stare at peaches: Rarely has an offering in the category “Culture and Entertainment” so usefully combined quality content and elegant design. While more and more museum portals are piling up truckloads and more frequently overflowing amounts of information, the Digitalorial on the exhibition “Monet and the Birth of Impressionism” impressed with its reduction to a period and its painters, from Monet to Renoir.

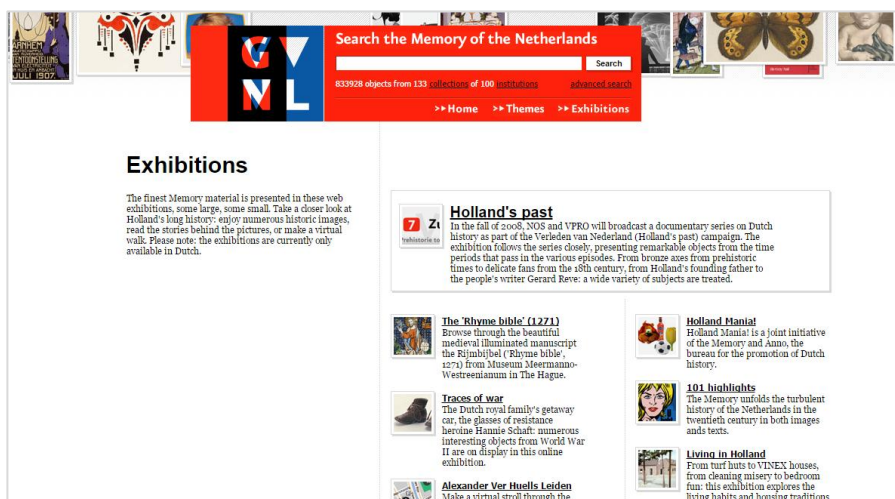
The current exhibition of the Städel Museum is formatted on the web with very unique, simple aesthetics. The selective use of technology playfully guides the eye to the important details. In this way visitors discover the story of this period of art on their own and at their own pace: Images unfold before your eyes, quotes and appealing texts provide the art historical classification, and compact audio information takes on the role of on-site curator.

The winner isn’t just online: With fast access extra information about the exhibition, the hurdles for the analog museum are being lowered. Because, if this multimedia preparation course is so engaging, then the exhibition itself gives hope for greatness.

In short: That’s where modern art and the communication of art are going and that’s how contemporary museum education works. In particular, the jury would welcome it if this format were to continue—and if in future Digitalorials not only big names, but also lesser known artists were to be presented.”

Combining themes, objects, and media: Museums, libraries, archives, and research institutes in the Netherlands

A very ambitious project is a consortium of 100 Dutch institutions with 133 collections and nearly 840,000 objects, exhibiting the history of the Netherlands online. The exhibitions offer both images of objects with additional information, as well as films and audio recordings.



Online exhibitions from the Dutch cultural portal "Memory of the Netherlands"

4.3 CASE STUDY: DIGITAL EXHIBITIONS AND USERS

Ever since the introduction of interactive and media-based stations in museums, there have been discussions around the value of these elements as part of mediation and communication. Early and regular studies on the use of media-based mediation elements in particular were carried out in the Deutsches Museum¹²³ in Munich and at various universities, e.g. the University of Tübingen.¹²⁴ Online exhibitions were also investigated and quality criteria¹²⁵ as well as recommendations for design¹²⁶ were created. The studies necessary for these were likely carried out as part of self-tests. Therefore, for the case study for acceptance of online exhibitions, an investigation design was created that permitted conclusions from the perspective of the users/visitors who were neither proven specialists nor media designers.

4.3.1 Approach and methodology

To study the interest in online exhibitions, selected contents, and the latest technical trends, a case study with twelve study participants of all ages and education and professional backgrounds was carried out, using a qualitative approach for an elaboration and presentation of the user's perspective.

¹²³ A special mention ought to be made here about the work of Prof. Dr. Annette Noschka-Roos. See e.g.: <http://www.deutsches-museum.de/forschung/wissenschaftl-mitarbeiter/prof-dr-annette-noschka-roos/>.

¹²⁴ See: www.wissen-und-museum.uni-tuebingen.de/das-projekt/.

¹²⁵ The quality criteria of the EU project MINERVA generally refer to the website of cultural institutions. See: www.minervaeurope.org/publications/qualitycriteria.htm.

¹²⁶ See e.g.: Werner Schweibenz: http://swop.bsz-bw.de/volltexte/2012/1064/pdf/online_exhibition_2012_schweibenz.pdf How to design a bad online exhibition with the best intentions. Notes from the literature. www.museumbund.de/fileadmin/fg_doku/termine/2010_Oktober_Herbstagung/Beitraege/Schweibenz_FG_Dokumentation_Herbstagung_2010_Online-Ausstellungen_Schweibenz_20101012.pdf.

In the absence of existing studies with findings on the acceptance of online exhibitions, an explorative approach of a qualitative study was chosen. In addition to the rules for the design of qualitative interviews according to the specifications of Philipp Mayring and his proposal for evaluation as part of a qualitative content analysis¹²⁷ of interviews, the proposals of usability consultant Jakob Nielsen were also applied. Since the early 1990s, Jakob Nielsen has been working on ways to prepare information using media in order to reach the highest degree of user friendliness. His research methods, theses and recommendations since the 1990s regarding the usability of interactive media have been ground breaking.

Jakob Nielsen's method for investigating websites is called *Thinking Aloud*.¹²⁸ More important than working through a questionnaire or interview guide is encouraging the participant to talk about their thoughts. The method is a mixture of interview and participant observation. Twelve people took part in the test. They represented different groups, for example with and without a university degree, Digital Natives and Digital Immigrants, women and men, more or less closely related to the cultural sector.

Assumptions – hypotheses

Assumptions were developed prior to the interviews, based on the general guidelines of the RICHES-Task 6.1 – *Digital libraries, collections, exhibitions and users* - in which media offerings of museums were to be investigated in case studies.

Investigating the overall effectiveness of online exhibits does not lend itself to the same methods as studying physical museum visits. Taking into account for example, the *Contextual Model of Learning* by US researchers John H. Falk and Lynn D. Dierking,¹²⁹ it becomes clear that two of the most important pillars are missing from learning, or meaning making, when visiting online exhibitions. Falk and Dierking assume that the optimal learning situation to appreciate the contents of a museum primarily occurs as part of an actual visit. They divide it into personal, sociocultural, and physical context. However, John H. Falk also recognises the influence of digital technologies on learning:

“In particular, we feel that such technologies, when designed well, can have the potential to positively impact visitor meaning making, by (1) enabling visitors to customise their experience to meet their personal needs and interests; (2) extending the experience beyond the temporal and physical boundaries of the museum visit; and (3) layering multisensory elements within the experience, thereby enriching the quality of the physical context.”¹³⁰

¹²⁷ Philipp Mayring: Qualitative Inhaltsanalyse. In: Günter Mey, Katja Mruck: Handbuch der qualitativen Forschung in der Psychologie. Wiesbaden 2010. Philipp Mayring's summary on qualitative content analysis can be read here: [http://dtserv3.compsy.uni-jena.de/_c1257d8500431ec9.nsf/0/C2D81EADBF5D207C1257D85005669E2/\\$FILE/Mayring-QualitativeInhaltsanalyse.pdf](http://dtserv3.compsy.uni-jena.de/_c1257d8500431ec9.nsf/0/C2D81EADBF5D207C1257D85005669E2/$FILE/Mayring-QualitativeInhaltsanalyse.pdf).

¹²⁸ See e.g.: Elizabeth Charters: The use of thinking-aloud Methods in Qualitative Research. An Introduction to Thinking-Aloud Methods. In: Brock Education, Vol. 12, No. 2, 2003.

¹²⁹ See e.g. John H. Falk and Lynn D. Dierking: Learning from Museums: Visitor Experiences and the Making of Meaning. Walnut Creek, 2000.

¹³⁰ John F. Falk and Lynn D. Dierking: Enhancing Visitor Interaction and Learning with Mobile Technologies. In: Loic Tallon and Kevin Walker (pub.): Digital Technologies and Museums Experience. Handheld Guides and other Media. Lanham 2008, pp. 27-28

Falk and Dierking also see the field of learning through new media as not sufficiently explored.

Assumptions at the start of the case study included:

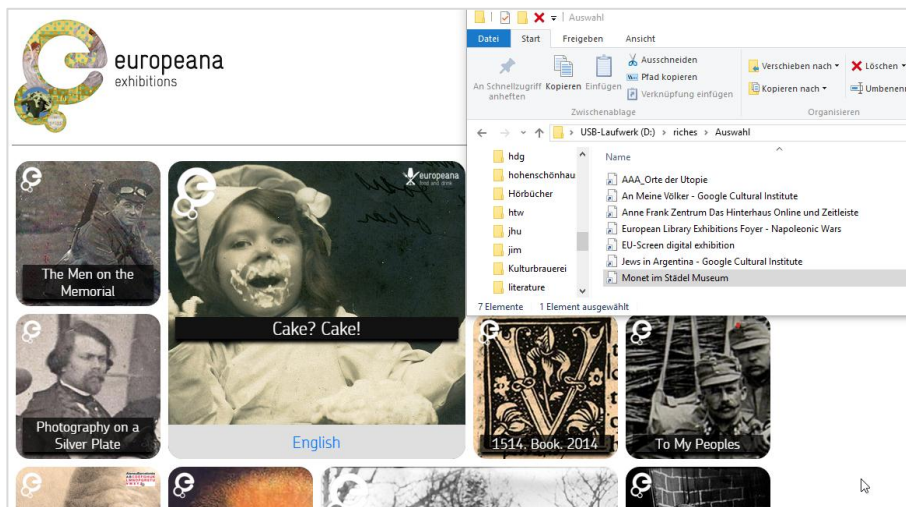
- Online exhibitions do not yet have a high profile. This medium, which certainly has advantages in the rapid creation of wide-ranging free access, is currently used neither by laymen nor professionals in the cultural scene as a source of information or entertainment purposes.
- As with physical exhibitions, prior knowledge and personal interest play a major role in the selection and reception of an exhibition. As with a physical exhibition, it is also about free choice learning, in which selection according to personal interests plays a major role. This also means that the more specialised the selected content of an exhibition is, the fewer ‘followers’ it will have.
- The two major pillars of the physical and sociocultural contexts disappear when visiting online exhibitions one one’s own. These could be replaced by the importance of free access, because place, time and togetherness are irrelevant when viewing online exhibitions. Learning through online exhibitions is not enabled by other people, but rather replaced by quiet, convenient access, e.g. through sitting and looking, as well as freely chosen opportunities for deepening one’s information, e.g. through the ability to look up unknown words.
- Visitors of online exhibitions sense whether an exhibition was designed for them, e.g. because they were seen as an adequate means to present content and to reach a broad target group, or whether the online exhibition is only a ‘by-product’, for example of a digitisation measure.
- Visitors expect more from an exhibition online. Online exhibitions that offer differentiated technical possibilities and use them effectively and deliberately, receive a higher level of acceptance than online exhibitions that are no more than an assemblage of a few photographed objects and/or information.
- Too much unsorted information is a burden for visitors to online exhibitions. This also occurred to the jury of the Grimme Online Awards: “more and more museum portals are piling up truckloads and more frequently overflowing amounts of information”¹³¹

4.3.2 Setting

To provide visitors the widest possible range of themes, the test subjects were offered two different approaches to online exhibitions: the portal with online Exhibitions on the Europeana website and a list of selected titles of online exhibitions.

¹³¹ See: www.grimme-institut.de/html/index.php?id=1926

Thus, the test subjects were given the choice: Title or Exhibition poster?:



Selection of online exhibitions on Europeana

In a few cases the test sites were only in German, in every case in English, and in some online exhibitions that ran through the Europeana portal¹³² the exhibitions were in the national language of the organisers of the exhibition, for example, in French, Russian, Slovenian, Italian or Dutch as well.

Test objects 1 – online exhibitions of the title list

The list of exhibition titles was based on a compilation of various online exhibitions from different sources, for example, from the home page of the Städel in Frankfurt, the virtual visit to the Anne Frank House in Amsterdam, or even an online exhibition put online by the Landschaftsverband Rheinland as part of the European commemoration of the First World War in 2015.

Each of the exhibitions had its own design. The following images were shown to the test subjects after choosing the title:



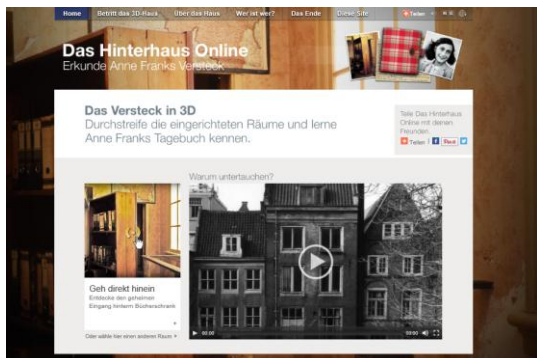
www.ortederutopie.eu

Entry point to different ‘protagonists’ of the artistic and cultural scene in the Rhineland at the beginning of the 20th century, with the main theme of artists in the Rhineland during the First World War. Insights into texts and object images varied extensively depending upon the person.

¹³² The Europeana Exhibitions pages state: “All exhibitions are available in English. Translations into other languages are done with the help of volunteers, contributing partners, and sometimes professional translators. We apologise if the exhibition you want to view is not available in your chosen language. If you want to help translate an exhibition, please contact us here.”



www.google.com/culturaleinstitute
Österreichische Nationalbibliothek and Google Cultural Institute *To my people*: horizontally guided exhibition



www.annefrank.de
A virtual tour through Anne Frank's hiding place in Amsterdam with detailed information and technical possibilities, such as zooming in on details.



www.theeuropeanlibrary.org/exhibition/napoleonic_wars
The European Library Exhibitions *Napoleonic Wars*: Entry point to the issues, but also to objects and media, such as portraits, written records, or maps.



www.monet.staedelmuseum.de
The online exhibition *Monet and the Birth of Impressionism* is part of a longer-term concept of the Museum Städel in Frankfurt am Main to promote special exhibitions through a virtual exhibition and to provide and obtain insights after the exhibition. It is designed to be experienced vertically. You can zoom in on images and open information if desired.



www.google.com/culturaleinstitute
Jews in Argentina is an online exhibition of the Centro Marc Turkow | AMIA Jewish Community in Argentina. The structure corresponds to a photo exhibition with texts that go into greater detail.

Two of the exhibitions of the title list are also accessible on the Europeana portal for online exhibitions, namely an exhibition on *Napoleonic Wars* from the *European Library Exhibition Foyer* portal and an exhibition from the Google Cultural Institute, which was available in German-language format on the title list as *An meine Völker* and as part of the Europeana portal with the title *To My People*. This duplication was chosen deliberately. It served as an additional test of how important the appeal of a title is, e.g. in one’s native language, and how independent the interest in an online exhibition from the first graphical impression is compared with that offered via the Europeana portal.¹³³

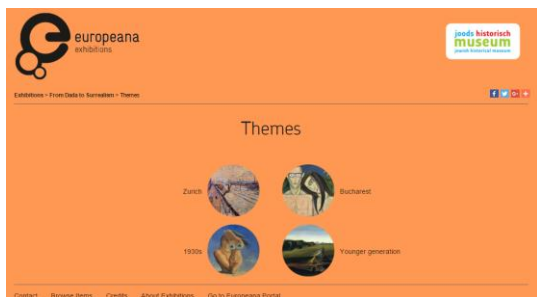
Test objects 2—online exhibitions on the Europeana portal

Europeana itself describes this portal as follows: “Our virtual exhibitions are showcases of the content available on Europeana. Provided with extensive curatorial information, they allow you to learn and discover even more about the displayed items.”

The Europeana online exhibition portal presents exhibitions that have come up in the context of European projects, such as the exhibition *Cake? Cake!* or *Recording and Playing Machines*. Europeana also offers the page as a platform for exhibition projects from others organisations, e.g. for the European Library, Athena, Biodiversity Library, or the EUscreen portal. Additional online exhibitions on the Europeana portal were productions that have arisen from individual institutions on their own, such as: the exhibition *Pablo Picasso* from the Fine Arts Archives—Croatian Academy of Sciences and Arts, or in cooperation with the Google Cultural Institute like the exhibition *To My People* from the Österreichischen Nationalbibliothek.

The wide range resulted in different formats in the design of exhibitions and a wide range of topics.¹³⁴ Overall, the test subjects were able to choose from 42 different titles and themes of the Europeana exhibition; there were seven exhibitions in the title list.

The design also showed at least seven different formats.



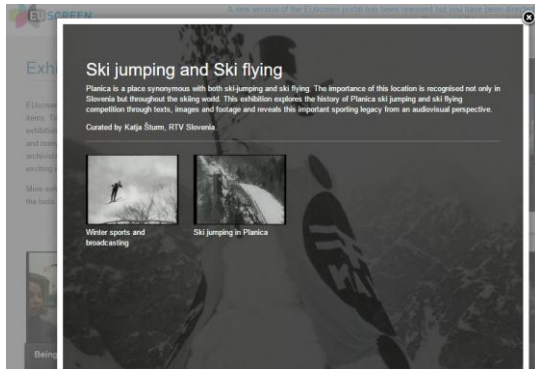
Europeana Exhibition *From Dada to Surrealism*: Selection and entry point according to topics.

¹³³ <http://exhibitions.europeana.eu>.

¹³⁴ This broad alignment supports the aspect of the personal context through prior knowledge, personal interests, etc. deemed important for learning by Falk and Dierking.



Open Partner Exhibition—Hallwyl Museum, Stockholm and Google Cultural Institute horizontally-guided exhibition: *A Trip To Egypt*.



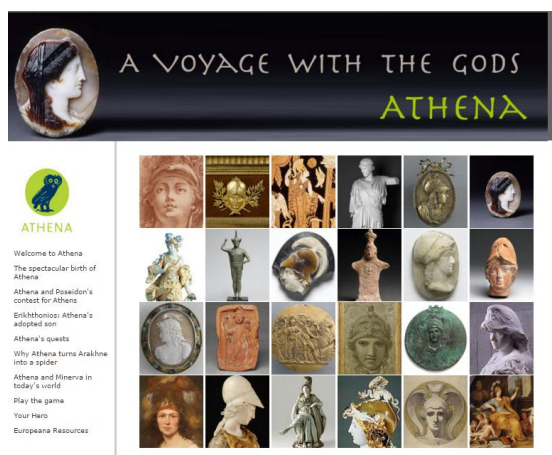
Open Partner Exhibition—EUscreen portal *Ski Jumping and Ski Flying*: Photos and film contributions from European television programs on various topics, in this case ski jumping in Slovenia.



Open Partner Exhibition—The European Library Exhibitions *Buildings*: Entry point via map, exteriors of European libraries, but also via menu options, such as 'Buildings' or 'Reading Rooms'. This online exhibition is primarily a digital photo album.



Open Partner Exhibition of the Fine Arts Archives—Croatian Academy of Sciences and Arts *Pablo Picasso*: horizontally-guided exhibition with many photos, texts, and hyperlinks.



Open Partner Exhibition EU Project Athena A *Voyage with the Gods*: Menu bar with different themes (i.e. 'Athena's quests') and participative elements ('Play the game', 'Your hero'), and media, the images scroll vertically.



Open Partner Exhibition Biodiversity Library *Poisonous Nature*: Entry point among main topics, such as 'countries', 'languages', or about species. The images scroll vertically. Extensive 'libraries' populated with digitised books are with all online exhibitions from the Biodiversity Library.

Performing the tests

The test subjects were initially told that

- they were not being tested, but rather the online exhibitions were;
- they could spend as much time until they would lose interest and quit with selecting and viewing the exhibits;
- it was very important to express their impressions and thoughts instantaneously, without aversion.

There were still a few questions held for after the test, such as age, level of education, foreign language skills, and the general amount of time the subjects spent online. An important aspect here was the personal assessment of their literacy and needs in using the Internet and other digital media as well.

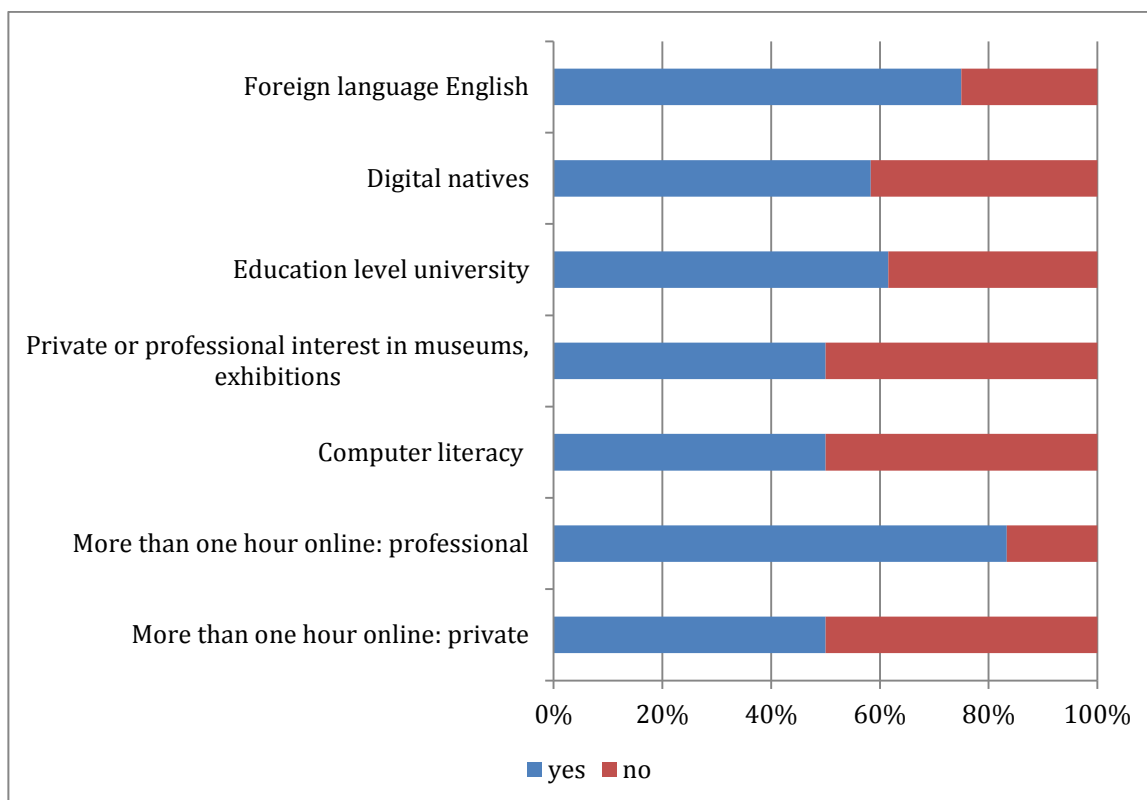
Most tests were carried out in private, but three tests were done on official PCs. What was important here was that the subjects were familiar with the device so that there was no limitation in its use.

Demographic make up of the test persons

When selecting the interviewees' attention was paid to the fact that the participants came from different backgrounds, were not uniformly interested in culture, museums, and exhibitions, covered different phases of life and some had varying degrees of computer literacy.

Overall, tests and interviews were conducted with twelve people. About half of them were women. The youngest was 17 years old and the oldest interviewee was 65 years old. The average age was 36.9 years; hence more than half of the subjects were so-called digital natives.¹³⁵

All test subjects spoke German. It was the native language for ten of the twelve participants. All but two people had at least basic knowledge of English. Additional languages familiar to the test subjects included French, Russian, and Turkish.



4.3.3 Results of the evaluation

The observation and interviews were written down and analysed in detail. Statements were examined in main categories and sub-categories with their anchor examples.¹³⁶ In particular, the core issues of use and learning effects, as they were formulated in the RICHES Task 6.1, were taken into consideration:

Access/Attracting power/Title list or Europeana portal?

The screen with the Europeana Exhibitions portal¹³⁷ and a title list of the online exhibitions were presented to the participants as an entry point to determine which access would appear more

¹³⁵ According to Palfrey/Gasser digital natives were born after 1980. John Palfrey, Urs Gasser: Born Digital: Understanding the First Generation of Digital Natives, Basic Books, 2008.

¹³⁶ See e.g. Philipp Mayring: Qualitative Inhaltsanalyse. Grundlagen und Techniken. Weinheim 2010.

¹³⁷ <http://exhibitions.europeana.eu>.

attractive (attracting power)¹³⁸ to the participants: access via images/‘Exhibition posters’, which could hint at content, the written word or the title.

The results show that images as well as titles were attractive. 60% of the participants chose an entry point via the pictures likely functioning as exhibition posters from the Europeana site and just 40% via the list of titles.

The participants most likely to search via the title list as a first entry point were those who either knew no English or feared that their foreign language skills would not suffice, noticeably reactions such as: “Oh, everything’s in English. I won’t do so well in that one.”

It was observed however that for the Europeana entry site, not only images served as motivational triggers, but the titles and topics were nearly as important. The wealth of themes and images was perceived very positively by most participants. This includes comments such as: “Access via photo and theme makes me curious.” There were two rather negative comments about the design of the home page to the online exhibitions of Europeana. Both comments show that the wealth of online exhibitions with its various ‘posters’ may be perceived as confusing.

In addition to the images, the titles of the exhibitions from Europeana online exhibition were also perceived. This is already a first indication of the importance of the choices for language offerings with online exhibitions as part of European Community projects. The range of languages thus ensures accessibility or a limited user base.

Attracting power¹³⁹/Exhibition categories/Subjects

Two-thirds of the subjects ultimately looked at exhibitions via both approaches, the Europeana portal and the title list. Two people who decided on the exhibitions based solely on the title list, both said that they usually have little interest in browsing online. They would search for specific information. A title without images comes off more “like a title of a book” and therefore exudes more seriousness.

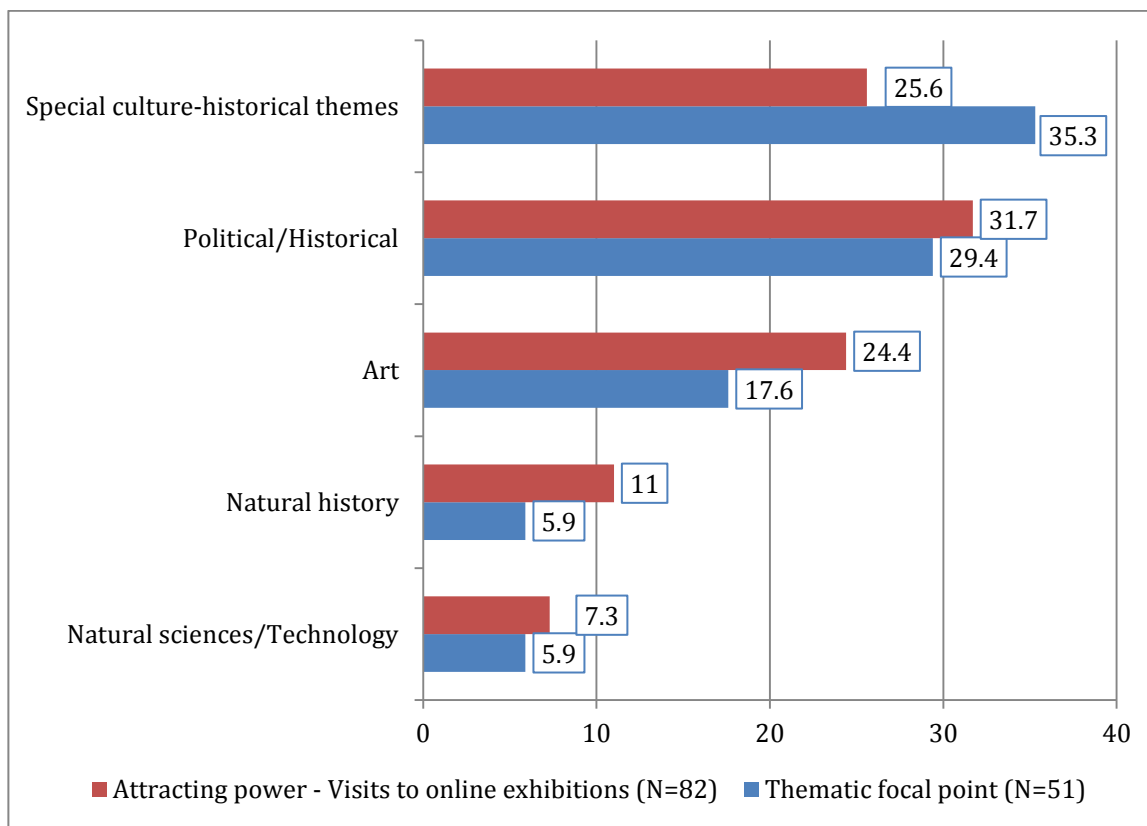
Overall, the twelve participants made 82 visits to exhibitions in 51 different exhibitions. Of these 49 exhibitions were available to choose, two more were viewed within the EUscreen portal, reachable through the Europeana portal.

The range of online exhibitions submitted to the participants mainly consisted of exhibitions that had a political/historical theme (35.3%) and almost 30% of the exhibitions that had reviewed a special culture-historical topic. Online art exhibitions actually made up a smaller part of the presented offering (17.6%) and there were also only a few exhibitions from the fields of natural history (5.9%) or natural sciences and technology (5.9%).

¹³⁸ According to the definition of Roger S. Miles, attracting power here is understood to mean that which the attracting power as an attractive force understands from the entirety whole selection of exhibitions. See Roger S. Miles et. al.: The design of educational exhibitions. London 1982.

¹³⁹ Hooper-Greenhill, loc. cit., 2013

Exhibitions with thematic focus for selection and exhibitions viewed



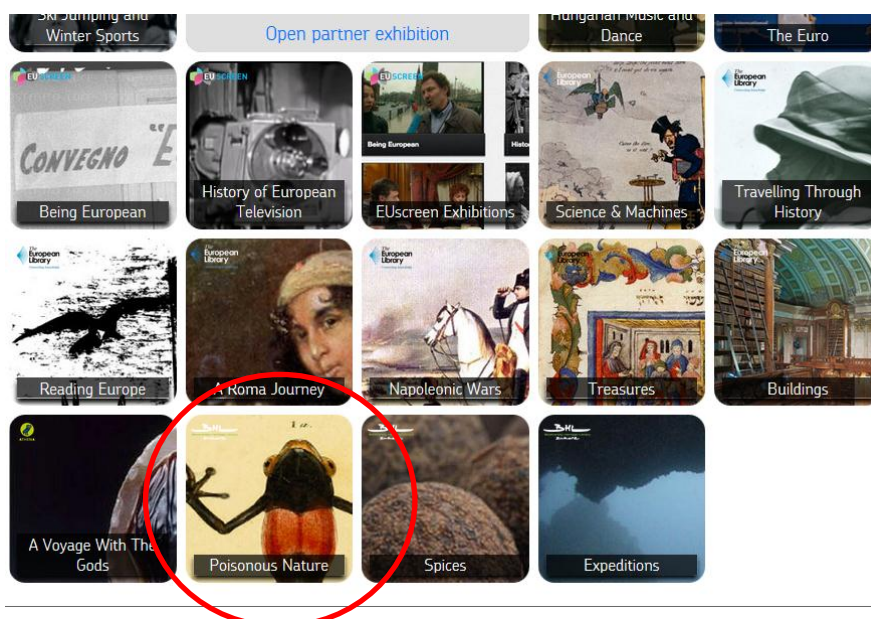
Overall, almost all exhibition areas were perceived with equal interest. However, compared to the offering, there existed a special fondness for political and historical themes in art exhibitions and natural history content. Only the offering of culture-historical subjects appeared to be low. Here, the wealth of offerings could have made itself felt.

Most of the participants didn't know each other and came from different professions and sociocultural backgrounds. This was to ensure a variety of interests. This assumption was confirmed during the study.

In their first reaction, one of the participants missed exhibitions of contemporary art. This interest was in fact not actually covered in the spectrum of the proposed online exhibition. Most participants were essentially quite impressed, however, by the wealth of the offering and by the various themes. Even the youngest participant, 17 years old, commented: "Those are all interesting topics on the home page at Europeana. Really cool."

Attracting power:¹⁴⁰ Exhibition titles

The title of an exhibition already determines the attracting power and is part of the appeal of exhibitions.¹⁴¹ Those visited the most of the 49 exhibits included a familiar name in the title (Anne Frank, Claude Monet, Napoleon). The exhibition entitled *Places of Utopia* stimulated most curiosity regarding what the title could mean. The frequent interest in the exhibition *Poisonous Nature*, which was quite inconspicuous among the other exhibitions, was a surprise.



More online exhibitions from Europeana's online Exhibitions

Perhaps this is due to the small thrill included in the title. One of the participants added this to their decision to take a closer look this exhibition: “For the exhibition *Poisonous Nature* there was information about what might be dangerous to me. For example, there was information about sea snakes. Fortunately, they’re only in the Philippines and I won’t be going there any time soon.”

The participants are likely to have oriented their selection of exhibition titles according to their personal interests. Such was the case with the student of economics, who was the only one who looked at the exhibition *The Euro*. The 17-year-old student who regularly enjoys skiing holidays chose, among others, the exhibition *Ski Jumping and Winter Sports*. The biologist chose the exhibitions *Darwinism: Reception in Spain and Catalonia* and *Expeditions* as well. This supports the evidence from Falk and Dierking that learning begins with the possibility of being able to decide what content you encounter, depending on personal interest and prior knowledge (personal context).

¹⁴⁰ Attracting power is understood here in the sense of Roger Miles, according to which “Attracting power is measured by expressing the number of people stopping at an exhibition.” Quoted in [Eilean Hooper-Greenhill: Museums and Their Visitors. Routledges, 2013](#)

¹⁴¹ See e.g.: Ann Landy: Title Fights: How Museums Name Their Shows. In: ARTnews, December 2013. www.artnews.com/2013/12/09/how-museums-title-shows/.



Exhibition Title	selected / viewed
<i>Title List</i>	
An meine Völker	3
Anne Frank Centre—The Secret Annex Online	7
European Library Exhibitions Foyer - Napoleonic Wars	
<i>EU-Screen digital exhibition</i>	
Jews in Argentina – Google Cultural Institute	2
Places of Utopia	6
Monet and the Birth of Impressionism	5
<i>Europeana Exhibitions</i>	
1514.Book.2014	2
A Roma Journey	1
A Trip to Egypt	
A Voyage With The Gods	
Art Nouveau	2
Being European	
Buildings	4
Cake? Cake!	1
Darwinism: Reception in Spain and Catalonia	2
European Film and the First World War	
European Sport Heritage	1
<i>EUscreen Exhibitions</i>	
Expeditions	3
Explore the world of Musical Instruments	
From Dada to Surrealism	2



Exhibition Title	selected / viewed
History of European Television	
Hungarian Music and Dance	3
Leaving Europe: A new life in America	2
Napoleonic Wars	6
Pablo Picasso	3
Photography on a Silver Plate	1
Poisonous Nature	5
Reading Europe	
Record and Playing Machines	1
Rome in Festa	2
Royal Book Collections	
Science & Machines	2
Ski Jumping and Winter Sports	2
Spices	2
The Euro	1
The First World War – Places for Transit	
The men on the Memorial	
The Past But Not As You Know It	2
To My Peoples	3
Travelling Through History	
Treasures	
Untold stories of the First World War	1
We know this was by heart	
Weddings in Eastern Europe	1



Exhibition Title	selected / viewed
Wiki Loves Art Nouveau	
Wiki loves Glam	1
Yiddish Theatre in London	1
<i>EUScreen</i>	
Food and Drink	1
The velvet revolution	1

Six of the online exhibitions shown in the study dealt with the First World War, of which the exhibition *To My People* was viewed most often. In this case the participants also made no distinction between whether it involved the reference on the Europeana portal or on the title list that bore the German title *An meine Völker* of the exhibition. Almost all other exhibitions on the subject contained the keyword ‘war’. Perhaps this was the reason why hardly any of the exhibitions were viewed.

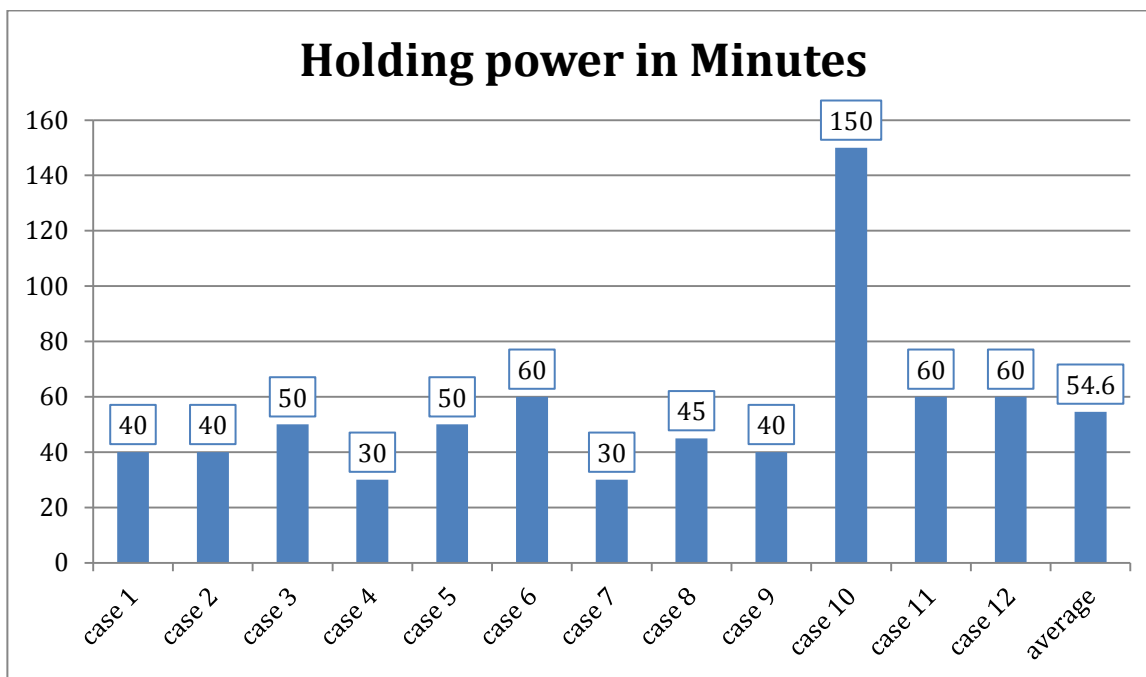
Seven of the exhibitions on the Europeana portal also contained the keywords ‘Europe’ or ‘European’ in the title, for example, *Being European*, *History of European Television*. These keywords did not have specific appeal for the participants, and these exhibitions were hardly noticed. Only the exhibition *European Sport Heritage* and *Leaving Europe: A new Live in America* garnered some interest. In both cases, however, different keywords were decisive for the interest (“‘Leaving Europe’ interests me. This looks like history. It’s probably my grandparents’ time.” “‘Sports’. Let’s see what they’re about.”)

Holding power¹⁴² per exhibition

The participants were able to decide how long they wanted to interact with the suggested online exhibitions. Once they lost interest, they were supposed stop viewing. Participants had been made aware of this ‘rule’ at the beginning. It applied to the viewing of each page, individual exhibitions, and for the time frame of the study. This meant we were able to distinguish between the period of activity with the offered exhibitions overall and with the holding power of individual exhibitions.

The interest of viewing online exhibitions in most cases lasts 40 to 60 minutes, which led to an average holding power of approx. 55 minutes.

¹⁴² There are very different approaches to measuring the visits and attention span with museum visits. See e.g.: Stephen Bitgood: *Attention and Value: Keys to Understanding Museum Visitors*. Walnut Creek, 2013. Here’s holding power defined by Roger Miles: “Holding power is measured by noting the length of time people remain at the exhibition.” Quoted by E. Hooper-Greenhill: *Museums and Their Visitors*. Routledge 2013.

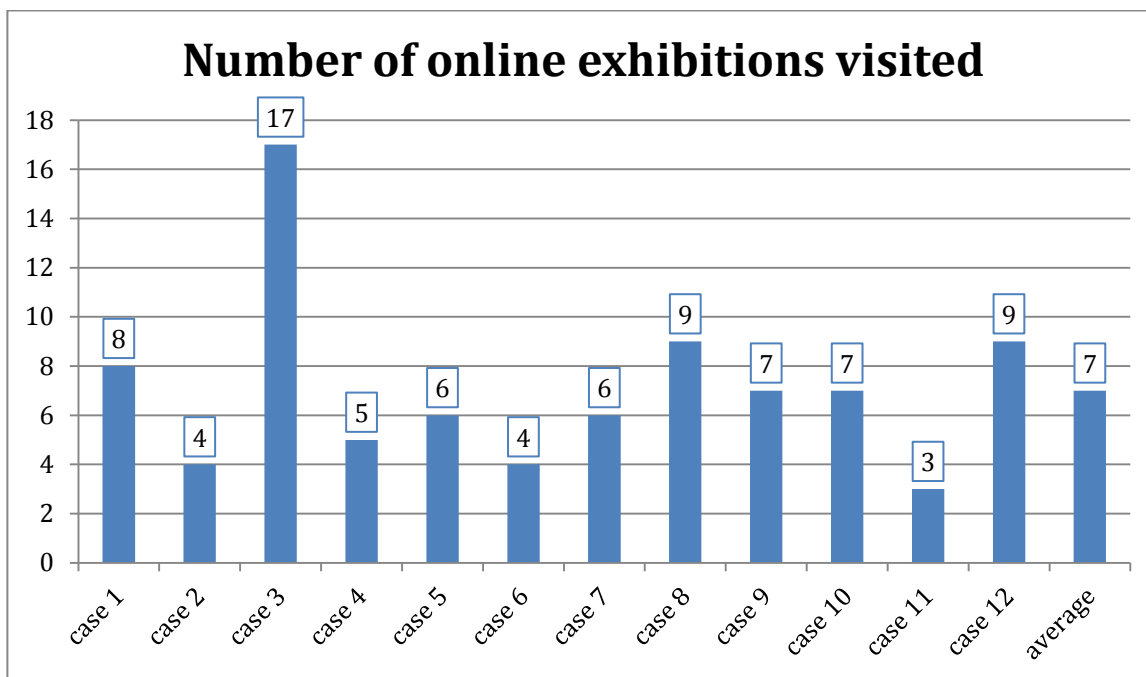


The artificial conditions under which such an observation is taking place must certainly be taken into account. It was observed that for the two participants who only spent 30 minutes with the online exhibitions, they would never have had the idea of looking at one of the exhibitions in other circumstances, but did not want to end the study after their first impression. Had this been a test of museum visitors, then these individuals would have been referred to as a group of non-visitors.

An average museum visit can be said to last, on average, 90 minutes. This value can hardly be transferred to online exhibitions. The creators of online exhibitions usually know about the evaluation from the record of use that can be obtained, for example, from Google Analytics, that duration of stay for online exhibitions can be very short. Thus a Google Analytics evaluation of the protocols of four online art exhibits in 2014 by the Online Museum of the Flemish Art Collection shows an average stay of 2.5 to 3 minutes.¹⁴³

In many cases the exhibitions on the Europeana portal were already designed for a shorter duration given the wealth of information and images. This brevity seems to be chosen consciously and realistically, because the participants of this test showed only fairly short interest for most of the self-selected exhibits. The multitude of online exhibitions viewed in the average time of 55 minutes alone shows a transitory pattern of viewing. It can certainly be said that the participants quickly grew weary and inattentive when viewing the pages and started looking for new topics. This applies to the reception of the individual online exhibitions, but also the whole process of the test sequence. This 'jumping' was partly also addressed in comments: "I'm tired now; I don't like it any more." It was also noted that they felt like they were being watched and that their perception was entirely within their general habits: "Normally, I'd be long gone from here (from this online exhibition)."

¹⁴³See: Peter Wouters: Virtual Exhibitions from the Flemish Art Collection. In: Monika Hagedorn-Saupe, Maria Sliwiska (ed.): Uncommun culture. Virtual Exhibitions. Vol. 6, Issue 1, 2015, p. 97.



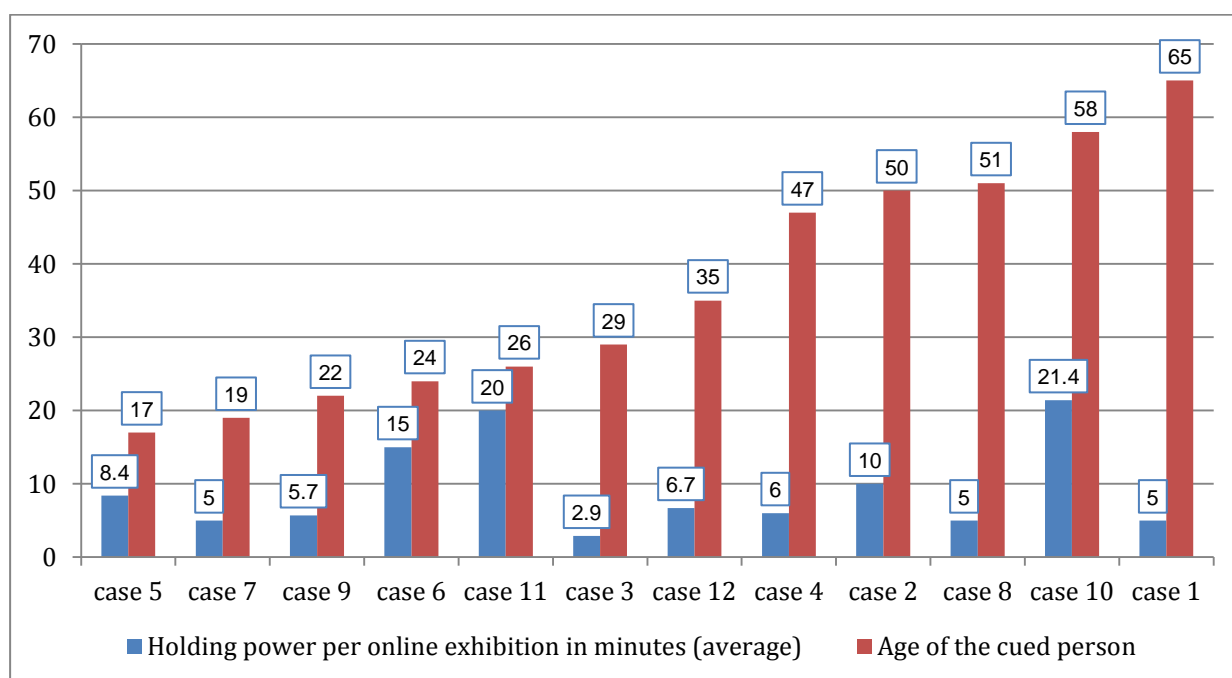
One might assume that younger subjects, being used to fast images and an even faster learning, would have appeared as throwaway visitors in this case in particular; and that a 29-year-old participant who indicated that she got her first computer when she was 7 years old and who is online 24 hours a day, who viewed 17 different exhibitions in 50 minutes, quickly got an impression, commented, and moved on to the next exhibition. This participant, however, was the exception. The results point to the fact that, depending on the exhibitions discovered, personal interests in themes tip the balance for holding power. If something of interest was not discovered immediately, then the exhibition was quickly abandoned:

“Looked at the title and thought *Untold stories of the First World War* was the most exciting. Also thought there might be something interesting about Turkey¹⁴⁴ there. Didn’t see any information or pictures about Turkey though, only information that Germans spent their own private gold on the war, and so made sacrifices too. Otherwise, I thought the page was pretty superficial and boring.”

Case	Number of visited online-exhibitions	Holding Power in Minutes - testing time	Holding power - Average of minutes visiting an online-exhibition	Age
Case 5	6	50	8.4	17
Case 7	6	30	5.0	19
Case 9	7	40	5.7	22
Case 6	4	60	15	24

¹⁴⁴ The participant was a Turkish citizen and grew up there as well.

Case	Number of visited online-exhibitions	Holding Power in Minutes - testing time	Holding power - Average of minutes visiting an online-exhibition	Age
Case 11	3	60	20	26
Case 3	17	50	2.9	29
Case 12	9	60	6.7	35
Case 4	5	30	6.0	47
Case 2	4	40	10	50
Case 8	9	45	5.0	51
Case 10	7	150	21.4	58
Case 1	8	40	5.0	65
Average	7	54.6	7.8	36.9



First impressions played a big role and apparently determined how long an online exhibition will hold a viewer’s interest. There may be technical reasons for this, for example, from long loading time of pages or the suggestion that it might be exhausting, that it might present a lot to read, or even because the title may have made them think of something else. Unfortunately, there do not seem to be any dominant and regularly recurring reasons.

For example, for a first impression of an online exhibition the following comments were made, both positive and negative:

- “If there is too much text, I'll leave right away. Access via images is interesting though.”
- “I can't hear anything, is there sound for the film? There has to be, but we have probably don't have a sound card.”
- “Unfortunately there's no overview for the exhibition *Photography on a Silver Plate*. Although you can scroll, but you never know where you are. I'm searching by topics and not by appearance.”
- “But what I'm not finding is an introductory text. I don't enjoy having a movie just launched for me, then I have less of a say in deciding.”
- “I'm waiting here for the movie, but nothing opens. It's frustrating.”
- “The initial screen from the exhibition *Buildings* looks interesting, I like the map like well enough, but what is this about here? Does it have to do with the fact that I don't know English?”
- “The topic of *Food and Drink* definitely sounds interesting, but there's nothing that appeals to me.”

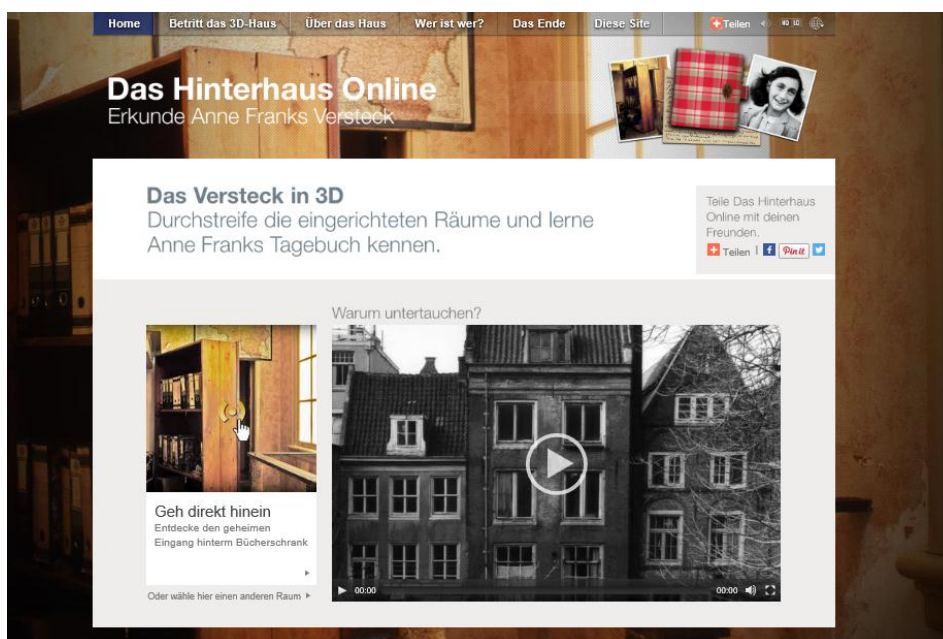
Acceptance of the five most visited online exhibitions during the test

The online exhibitions that were viewed the most were:

- Anne Frank Centre—The Secret Annex Online
- Places of Utopia
- Napoleonic Wars
- Poisonous Nature
- Monet and the Birth of Impressionism

This does not mean that all the exhibitions were watched closely. It is easy to distinguish between exhibitions that do not meet the expectations set by their titles among the participants and exhibitions that were surprising and were therefore viewed longer.

Anne Frank Centre—The Secret Annex Online



Anne Frank Centre, homepage of the online exhibition The Secret Annex online

The hiding place of Anne Frank in Amsterdam as an online exhibition *Anne Frank Centre—the Secret Annex Online* was viewed seven times and primarily because of the name and the institution, which are familiar to many people.

There were many comments and quite a long holding power. In that case the online exhibition likely received positive or neutral comments (18) rather than negative (14).

The combination of technical possibilities (when they worked), contents and information was appreciated. The technology did not work for all participants, e.g. the introductory movie would not play.

When watching the online exhibition *The Secret Annex Online* it occurred to several participants whom this site might be useful for what the target group could be, and how one could benefit from it. Perhaps this led to the positive perception and observation that they would look at it again at their leisure outside of the test.

Cued person	Positive comments	Appeared inconvenient
Case 2	A bookcase as a door, aha, and you can look around.	The film is too fast.
	Oh, I can look closer and zoom.	I don't hear anything (participant had no sound card). The site probably doesn't work properly without sound.



	The 3D floor plan is okay because I can look around in peace.	I would indeed have liked to look around, but the mouse always disappears.
		It's all going too quickly for me here, it's more of an exhibition for gamers.
Case 3		I can't do anything here probably without Flash Player. Too bad, would have interested me.
Case 4	That there is such great information about the Anne Frank House, I had no idea before.	
	We didn't make it there when we were in Amsterdam. Had we known in advance what there is to see there, we would have made more of an effort.	
	As a teacher this is all wonderful instructional material.	
	That you can compare the historical photos with current ones, is great.	
Case 5	I've been to the Anne Frank House before. It really looks like that.	The page looks like you could do more with it longer. I would have liked to look at it, but now I'm not interested any more. I'll look at this sometime when I have some peace and quiet.
Case 8	I didn't think of the house where Anne Frank lived when I saw the title <i>Secret Annex Online</i> . I've heard a lot about it, now I've also seen the house.	
	I'd like to look at the page again when I'm alone and have some time.	



Case 11	I feel like a teenager in school, but now I can not only read, but can also go exploring myself. I would have loved this as a teenager.	It irritates me that a video starts without me having done anything.
	The site has pizzazz.	But even if you can sympathise, it's useless if you don't learn anything about the people.
	Even as a 'guest' you have a nagging feeling, from the perspective of the people who had to withstand such closeness.	If the movie doesn't work, then you should offer an alternative text at least.
	Now I found the information about the people and am satisfied. They lined up beautiful quotes taken from the diary along with it.	Too bad that the videos don't work. It simply takes too long to load.
	It's good to have an overview of the 3D house, so you know where you are.	
Case 12	I like that there are short texts about the people, but if you want you can get more information from longer texts.	Now I've seen the movie—which at 5 minutes is pretty long—I've read through an introduction, now I would like to go into the house, where is the introduction page?
	I like the quotes. They make it authentic.	Unfortunately, the technology for finding out more doesn't work (Zoom + Information).
	The idea that one can walk through the house and look at the furniture, etc. is great.	
		Gamers will certainly feel more comfortable here, but these tours make me dizzy.
		The blue circles with the stories are not easy to catch. That gets boring quickly.

Places of utopia



Places of Utopia, online exhibition presenting the life and work of seven theatre artists in the beginning of the 20th century.

The exhibition that shows the seven artists, writers, and intellectuals in their creative period at the beginning of the 20th century, was selected and viewed by six participants. Three of the participants visited the online exhibition for about five minutes and one even for twenty minutes.

A commentary with twelve positive statements faces 22 observations with critical remarks.

The individually presented protagonists and associated spaces were designated for this exhibition, while in addition to this, images, excerpts from letters, poems etc., were in part read aloud. The participants liked this quite a bit and appealed to their own creativity (“It makes me want to draw again”). However, at the time of the test, Summer 2015, the exhibition was not yet fully complete, which the participants noticed. The longer the participants interacted with it, the orientation apparently became more difficult. This was true of the formal orientation (“I switched here now and don’t know where I’m supposed to go along here.”), as well as for the content (“Although I have theatre knowledge, I can’t think of anything.”). Some comments point out that the rules for analogue interaction are applied in parts to the exhibition (“That’s too much text for me for the project description, couldn’t it have been made shorter? At least show the bar for how long the text is.”)

Cued person	Positive comments	Appeared inconvenient
Case 2	Getting started is easy though.	Will it start soon? Is that an introduction movie or a page? (No sound card)
	You find your way quickly.	At first I thought, I can orient myself well, but the more I watch, the more difficult the orientation is for me. Only the characters

Cued person	Positive comments	Appeared inconvenient
		below help me, with them I know where I am.
	I know Else Lasker-Schüler. It's always good to recognise something.	What it's about in detail, somehow you don't know. Stage sets, perhaps?
Case 3		I switched here now and don't know where I'm supposed to go along here. I focused on Else Lasker-Schüler, but I see no direction, and substantive orientation either. This doesn't appeal to me.
Case 6	...the exhibition is really cool. I've never seen anything like it.	The music is annoying in the long run.
	A nice selection of people and drawings.	The texts are hard to understand. Or is it that my native language is English?
	Especially with <i>Einheit der Künste</i> , there were beautiful pictures. The design with the drawings reminds me of a children's book.	It takes a lot of time to understand the pages and also to read the text and you get more information in detail from Wikipedia.
	I could perhaps use the site for my German studies course.	In general, the images are too small. They're also not in focus. One can hardly connect the images and the text.
		There are different media and I would have liked to have had them more together.
		I do not know how many sites I can still watch here. I find hierarchy important.
Case 8	The title is interesting, also the character (Else Lasker-Schüler).	I am not an art-man. I do not really know what to do with this site.



	I liked the photo series. They are well drawn.	
Case 11	<i>Places of Utopia</i> —that sounds exciting, as far as content goes, I can't think of anything.	Now this is too much text for me for a project description, couldn't they have made it shorter? At least show the bar for how long the text is.
	The entry appeals to me because something happens right away.	First turn off the music, then I can concentrate better.
	The site is interestingly designed. The drawings are a pleasant presentation. It makes me want to draw again.	Is this just a virtual exhibition or do I get information on events and exhibitions that I can visit in 'for real'?
		Else Lasker-Schüler, Henry van der Velde, August Macke, Louise Dumont, Georg Kaiser Osthaus and Sturm are inactive?—First the women, but nothing works, again with the image arrow—doesn't do anything either, just slide-show with arrow, am I too stupid or is it the site?
		Although I have theatre knowledge, I can't think of anything.
Case 12		The introduction movie is exhausting.
		Else Lasker-Schüler—either 'the arrow' or 'more'—because I can't decide if I just hit the 'more', then nothing happens. There are so few places where information is announced and then nothing happens.
		With all the images and options it is difficult for me to concentrate.

		Louise Dumont, then the closing credits are right there. Am I still in the menu item 'The Great War' or am I somewhere else now?
		Karl Osthaus and Erwin Sturm only in gray? Are the pages for both not yet finished?
		Now where are the <i>Places of Utopia</i> ? Those are just spaces, cities. I only see people here.

Napoleonic wars



Napoleonic Wars, an online exhibition of the European Library

Half of the participants were interested in the exhibition *Napoleonic Wars* from the European Library. However, there was no one who has stayed here longer than three minutes. Four of the six participants did not get beyond the entry page. In two cases, because the online exhibition is in English only, in other cases, because the subjects thought the introductory site was boring (“So, only my first impression of the first page and I know I’ll find nothing interesting here. I immediately go out again. Nothing for me.”)

Cued person	Positive comments	Appeared inconvenient
Case 3	Now that's a good entry page with the image previews as an overview.	Unfortunately, the images were not adjusted. I would have liked to have zoomed in and looked at the details.



	Technically simple solutions, you shouldn't always have to click on 'next', but can simply go to the edge of the picture.	There is no information about the images.
Case 4	I'm going to France for a year, so I'm looking for themes having to do with France.	I would have liked to have tested my French, but the page is likely only in English. I can't do that. So I'll have to just leave again.
Case 7		So, with only my first impression of the first page and I know that I'm not going to find anything of interest to me here. I'll leave immediately again. That's not for me.
Case 8		Napoleon Wars? I can't imagine what that might be about. Ah yes, everything's in English. Well, I don't understand anything there. Back out again.
Case 9	The idea of the exhibition is very good.	The title is quite unspecific. It is it about all wars that Napoleon ever led?
		The lack of information about the images struck me first on the Napoleon introductory page. Do I now have to click on each and every image in order to know what they're about?
		The exhibition is likely for someone who already knows about this and wants to learn more. That's boring for laypeople.
Case 12		This doesn't look appealing at all, let's get out of here.

Poisonous nature



Poisonous Nature, online exhibition from the Biodiversity Library

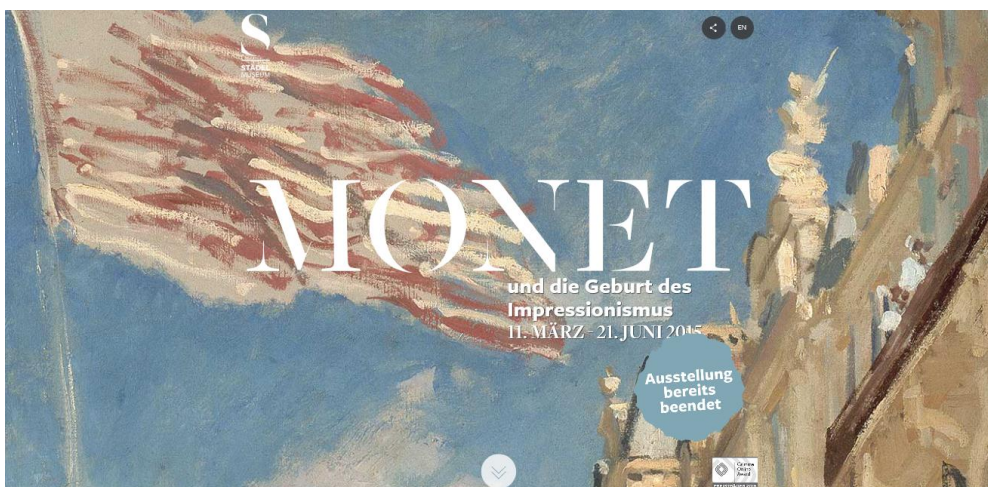
The online exhibition *Poisonous Nature* from the Biodiversity Library was so appealing based upon the title and image that five participants looked at the pages. Two people however left the site immediately after a first glance.

The four positive comments are faced by nine comments with suggestions for improvement. However, there was only one person who looked at the online exhibition in great detail, a professional scientist who was able to make many suggestions from his perspective.

Cued person	Positive comments	Appeared inconvenient
Case 3		The site is set up differently than the other pages I have been looking at. Now I have to reorient myself again.
		Now how did I come across this book? Do I even want to read a scanned book online?
Case 6	I don't understand a lot of science, but the <i>Poisonous Nature</i> page looks interesting.	I could spend a lot of time on this site, but how would I have normally found it? Where can I find such sites that are interesting that I'm not explicitly looking for?
	I'm finding a lot of things here that I didn't know. For example, that potatoes are toxic or that crazy mushroom.	

Cued person	Positive comments	Appeared inconvenient
Case 7	In the exhibition <i>Poisonous Nature</i> there was quite a bit of new information for me, for example, about sea snakes.	
Case 8	The frog looks really cute. Let's see what the page brings?	Crawlies? No, I'm not on it.
Case 10		There is the choice of the German language, but it refers only to German-language books that are scanned here. This is misleading.
		In the overview, I don't see any logic in terms of species. And you get a crisis with the terms that should have been in Latin. That's universal. This is too unscientific for me.
		I would have liked to have a search function here and a better introductory page, that for example differs by plants and animals and by subgroups.
		And if you pick up a book and look it up, it wouldn't be better. In the overview you should have gotten an indication and been able to go directly to the tables of contents. We learned while studying (biology) that we should be guided by the overview pages and tables of contents.
		My search for snakes was not directly the most successful. This is a site for people with good eyes. And I'm finding nothing about rattlesnakes or vipers. These are important animals, when it comes to poisons in nature.

Monet and the Birth of Impressionism



Monet and the Birth of Impressionism, introductory screen of the online exhibition (digital) accompanying the physical exhibition in the Stadel Museum.

Monet and the Birth of Impressionism was visited intensely and for a long time, by five of the 12 twelve participants, much like the online exhibition on Anne Frank’s hiding place in Amsterdam. This online exhibition was one of the examples with substantive and time-manageable content and so it was the only online exhibition in this setting viewed by four of the five subjects from beginning to end. There was no one (as happened in the exhibition *Napoleonic Wars*) who immediately ‘left’ after a first look at the home page.

A lot was commented on when viewing the online exhibition. 15 positive comments are faced by 13 comments indicating areas for improvement. In this case there are apparent contradictions, when one person, for example, is at first critical about the possibility to zoom and scroll, but then discovered the benefits of this technique later on.

Nearly all the participants however seemed impressed by this exhibition and the desire to see more content or additional exhibitions like this one can be understood to be praise.

Cued person	Positive comments	Appeared inconvenient
Case 2	Ah, this time I need to scroll down. If you know it, it's easy.	What’s this exhibition called again? Why do I get a caricature as the first picture if this is about Monet?
	There are only two symbols here (more and +). That is practical.	I'm waiting for the movie (there is an audio file, participant has no sound card), but nothing opens.



	The details of the text (text appears only by activating the plus) remind me of sites for children. There is also very little text here. You would do that for children, too.	I was first irritated when scrolling and zooming. Every time I think that it's another picture and then it's just a detail. I think I would have preferred a separate command for that. I would feel self-determined.
	It seems to me the Monet-site is made for a classical culture audience. The viewing habits are somehow picked up on.	I would like to know more about the artist Monet. For that I have to scroll up and then go back over all the images and so on...I would have liked to have had menu items that I can immediately access.
	I like the quotes a lot. They are a nice size. You can get through them quickly.	You should be able to go deeper into the content. It's missing multi-step information levels.
	I really like the idea with the locomotive. You can really put yourself in there, imagining the chaos, the chatter. And how the surface changes in the puddles when you zoom in closer.	
	The zoom function promotes scientific curiosity.	
Case 3		The Internet connection in the Monet exhibition takes too long. Normally I would be long gone.
		The entire page is too animated for me. And then also the big quotes that everything is too intrusive.
Case 8	That's a great site. Everything you can see and do.	All of a sudden I have to scroll down in the Monet exhibition. I first have to get used to that.



	I wouldn't have thought that there's such a thing with an art exhibition online that I'd find exciting.	But it takes a long time until you get to see the first image from Monet.
	I've never seen images like this up close. From a distance, they are people and from up close they are dashes. Crazy!	
	The exhibition was well-organised, beautiful themes.	
Case 11	Monet is accessible to anyone who's heard the name. So it's very nice that you don't start at zero.	I am a text reader. And the text material here is too short for me.
Case 12	The texts are well done: only general words, then more in-depth.	Oh, the exhibition already over? I can't go and look at it myself any more? Oh, digitally it's still there.
	I like the aesthetics of the site. Even the functions are aesthetically designed and you can use the site intuitively.	When listening to the audio, I'd like information as to how long as the audio will run, so I can decide for myself whether I start it at all.
	One can use the site intuitively.	Whether I have any more time, interest for audio recordings?
	I like being able to view image details. You get curious, but you are not flooded by information.	But the conclusion is a bit of a let-down. When you think now something's coming, but then it's just material.
	Ah, radiographs, those I find interesting. You see what it could have become and that it used to be different.	
	The comparison of the images of the cathedral of Rouen is not badly done. That's pretty interesting.	
	Are there more of such exhibitions?	

4.4 CONCLUSIONS AND RECOMMENDATIONS FOR THE DEVELOPMENT AND DESIGN OF ONLINE EXHIBITIONS

The museums make no clear distinction between the concepts of an online exhibition. This concept is used for virtual tours (National Gallery, London), learning materials (Danish site), for own special websites that are actually intended as exhibitions).

The museum websites must be publicised more widely. Even for people who have a personal or professional interest, they do not belong to the well-known online repertoire. There was no single participant who had ever watched an online exhibition.

The distinction from other information options is not very clear to users, or what users will get out of visiting an online exhibition. What does an exhibition add to Wikipedia for example? Museums have an image to be places of high quality—even if they are boring. This consideration of quality would have to be transferred to online exhibitions.

Museum visitors only take a quick look at pictures. The same applies to online exhibitions. Especially young users are used to short image sequences and do not need long to capture sites and images. Texts bore them faster, they read less.

The title of an online exhibition is extremely important; this was true for the title list and for the selection in the cover image presentation at Europeana. Thus, the topics determine, and not the images. However, the topics cannot be too specific.

Users primarily find those applications such as zooming and virtual tours interesting. Here the users can see the added value rather than in a combination of information and objects from different sources or in a huge amount of data and information.

Online exhibitions are offered on many websites by major European and nationally important museums. However, they are rarely referred to as such. The user accesses the site out of personal interest. So if people are asked whether they visit online exhibitions, they deny it. Perhaps they have already visited series of pages of different museum websites referred to as exhibitions, without having explicitly noticed this (example, National Gallery of Denmark).

The duration of stay at the online exhibition is short. Exhibitions have an average duration of stay from 60 minutes to 90 minutes, depending on the size. An online exhibition will only in exceptional cases provide more attracting power than 10 minutes. Usually the visit lasts two to three minutes (see also Peter Wouters: Virtual Exhibitions from the Flemish art collection, *Uncommon Culture*, p. 97). This could have something to do with the general reception behaviour of websites, and with the personal interest in topics (the test partially shows artificial interest) and probably also with the feeling that you get a free program, which you can visit at any time.

The *Contextual Model of Learning* (John F. Falk, Lynn D. Dierking) can partly be transferred from being a hypothesis for learning outside a school environment to the visit of online exhibitions. In particular, the assumption that knowledge and experience sharpen the perception was evident in the selection of exhibitions. However, comments also show that learning from each other when viewing the online exhibitions is missed, whereas Falk and Dierking underline that the social interaction is an important aspect of a museum visit.

The online exhibitions were repeatedly compared with other online information sources, in particular Wikipedia. On the one hand, it was noted that on Wikipedia you can find the desired information faster. On the other hand, the participants saw the particular importance of online exhibitions in the depth of information.

The individual exhibitions were mostly assessed by the possibility to deepen the information. Some interviewees found it inconvenient to get information through visiting online exhibitions.

(German) users do not seem to like exhibitions that are associated with companies such as Google. They have less trust in the content and assume that this makes the quality poorer. In particular, they feel monitored and were annoyed, for example, when they left the online exhibition *To My People*, and later wanted to see it again, due to the setting by the Google Cultural Institute, the exhibition opened in the same place where it was left.

It does not matter whether a production is old (developed years ago) or new (launched just before the test). The online exhibition *The Secret Annex Online*, allows online visitors to zoom into the AnneFrank House since 2001, fascinated those test-participants who visited it, whereas the online exhibition *Places of Utopia*, which was available online only in 2015 and presented a very sophisticated design, left some participants somewhat perplexed. What lacked, despite the introduction movie, was guidance. In particular, most participants who visited this online exhibition were disappointed because they had been made curious by the title *Places of Utopia* but could not find any 'anchoring point' of thought. Almost no one could say what exactly they had expected, but in any case not a discussion of the topic of artists and visionaries and the First World War. However, they liked the central figures in a sketched environment, which distinguished this exhibition from others.

The great number of topics makes portals of online exhibitions interesting. For online exhibitions the main point is not the object but the information and the information media. This means that language is an important prerequisite for recognition, much more so than for exhibitions attended in person where the object is more important. The participants who spoke little or no English, felt restricted in the choice of exhibitions.

Throwaway behaviour when watching, unfocused watching and quickly tiring probably have to do with general viewing habits when using the Internet and with personal interests to be satisfied. Also, some interviewees felt somewhat rushed in the test situation. A longer holding power only happened when the participant knew why they wanted to take a closer look at an online exhibition and there was more than just a fleeting interest in the subject matter.

The participants always speak about websites, not about online exhibitions. The 'exhibition' phenomenon is not perceived as such and is communicated via the homepage only by a few museums. An exception is the programme of the Jewish Museum Berlin, where the online exhibitions are actually announced as online exhibitions. When launching the exhibitions, the Press and Public Relations department advertised the new programme of the museum.

Online exhibitions should consistently maintain a clear formulation and regular use of the word. New perspectives are opened, and different relationships are shown through curating the contents. This is an essential difference from an information source like Wikipedia, to which participants always compared the online exhibitions.

Some visitors were not thrilled by the online exhibitions, but it is good to bear in mind that the participants did not normally like or visit museums very often. These users could not be reached with the sample of online exhibitions that have been tested here. A quick glance at the home page of the exhibition *Napoleonic Wars* or at the page *Poisonous Nature* was enough to realise that the means used here do not differ from those of a museum exhibition and are therefore unlikely to interest this user group.



Some participants were not very enthusiastic about the opportunity to visit online exhibitions because they lack the atmosphere of the museum. They say they are missing the other people, the atmosphere, the 3D objects, underlining Falk and Dierking’s theory of how important the social component is for cultural reception.

Online exhibitions are perceived as positive when they:

- are curated and are explicitly conceived as an exhibition;
- are clearly designed;
- can be viewed in a certain, particularly, in a short time;
- use the technical features that create added value compared to the alternatives of a museum visit;
- have something unexpected, for instance, that people in Monet pictures are only lines when you look at them closer or zoom them in.

Well-crafted online exhibitions have, if they can inspire their audience, a radiating force. None of the participants, even those working in the cultural sector, had seen the online exhibitions before the test. Although not all participants could be persuaded to continue working with this medium, some comments and observations have shown that visitors liked the well-designed online exhibitions and were willing to continue to work with this medium.

The work of various national and European working groups handling the design and the programme of online exhibitions is an important contribution to the quality assurance. Especially valuable is the contact with museums and other institutions that organise exhibitions, which find with these working groups contact and exchange partners.

5 LEARNING WITH COLLECTIONS: SHAPING A CULTURE OF LIFELONG LEARNING IN MUSEUMS

This section uses a lifelong learning perspective to analyse and map learning engagements with museums collections. It shows how developments in the social role of museum nestles within advances in digital technologies to reconfigure and bring a strong focus on education in museums' mission and provide new tools and platforms to engage their visitors in learning experiences. Trends in engaging visitors with collections are discussed. The case study illustrates a successful long-term partnership between a museum (The British Museum) and a technology company (Samsung) to create a digital learning centre for young audiences: the Samsung Digital Discovery Centre (SDDC). The study provides a detailed analysis of the educational offer, design approach and contribution of SDDC to shaping a culture of lifelong learning for young audiences visiting museums.

5.1 MUSEUMS IN ECOLOGIES OF LEARNING OPPORTUNITIES

Museums started to reconsider their social mission and agenda in the 1980s, emphasising the role of knowledge production and dissemination and relations with their audiences. Whilst objects and collections continued to be important, the knowledge offered through object mediation, interpretive content and other forms of documentation gained importance, so that museums would come to be seen as “storehouses of knowledge as well as storehouses of objects” (Cannon-Brookes 1992, p.501). Coupled with an increased focus on audiences and the rise of visitor studies, these trends paved the way towards a major shift in the social mission of museums, from authority-driven and curatorially controlled processes of interpreting and communicating collections, to audience-centred approaches.

Societal shifts happening in parallel contributed to foregrounding the educational mission of museums. Whilst traditionally education was entrusted to scholarly institutions, the transition towards knowledge-based societies and economies, increased ubiquity and pervasiveness of digital technologies, and the major pace at which societies change saw the curricula of schools lagging behind. The inability of schools to catch up and adapt, and prepare new generations of work-ready citizens opened up the arena for other actors to enter the educational arena. It also brought to the fore new ways of seeing, learning and education in the life trajectory of individuals and in society as a whole. Traditional divisions between education and work, learning stages, and even learning spaces became unviable: to keep step with change and to continue to thrive in societies evolving at fast pace, individuals need to embrace learning as a lifetime endeavour. These notions are embodied in notions of ‘lifelong learning’, which are expanded below in relation to the role of museums as providers of lifelong learning opportunities.

The premise of lifelong learning is that to succeed in today’s society; individuals have to pursue learning constantly and in a self-directed way throughout their lifetime, within and beyond formal education. Engaging in constant vocational and professional development is crucial for keeping oneself updated and upgrading one’s skills to match the requirements of a society and job market in constant evolution (Sharples, 2000). For this research, lifelong learning is defined as the pursuit of learning at all life stages, driven and directed by the individual (Hooper-Greenhill and Moussouri, 2000). It does not only cover adult learning, but takes place from pre-school years, when the motivation, abilities, and predispositions that lay the foundations for self-directed lifelong learning can be cultivated (Faure, 1972; Hooper-Greenhill and Moussouri, 2000; Sharples, 2000).

Lifelong learning has been adopted as a framework for policies and programmes at European level¹⁴⁵ and also in some European nations, including the UK. The UK Government's Green Paper *The learning age: A renaissance for Britain* (1998) lays out a rationale for adopting lifelong learning as a framework for ensuring the training of a "well-educated, well-equipped and adaptable workforce" that can keep up with the growing and constantly evolving sets of knowledge and skills required for the jobs of the new economy. Even more ambitiously, the paper argues:

"Our vision of the Learning Age is about more than employment. The development of a culture of learning will help to build a united society, assist in the creation of personal independence, and encourage our creativity and innovation" (Secretary of State for Education and Employment, 1998).

The perspective on lifelong learning used in this report builds on an ecological perspective, which emphasises the role of diverse institutions in providing learning resources (Knowles, 1981: 135-136) and spaces and opportunities (Sefton-Green, 2013:5) to the lifelong learner. The learner is the central actor, an agent that is able to profit from and adapt the variety of resources offered to draw the necessary knowledge and skills needed at different stages in their personal and professional lives. This resonates with the notion of a culture of lifelong learning, inclusive of values and attitudes shared by both learning providers and learning beneficiaries that acknowledge the continuous process of learning and the role that diverse social actors play in promoting it.

Developing lifelong learning as a culture of learning implies encouraging its pursuit by individuals on the one hand, while on the other providing opportunities, tools, and infrastructures for enabling individuals to access learning anytime, anywhere, across the continuum of formal, non-formal and informal learning (European Commission, 2001):

- *Formal learning* takes place in organised environments, is structured, has firm objectives and outcomes and is typically associated with certification.
- *Informal learning*, or 'learning by experience' is unstructured, often unintentional and results from day to day interactions and activities at work or in social circles.
- *Non-formal learning* is an intermediary concept, designating learning that is intentional and taking place through programmes and activities that are planned, but are taking place outside formal education environments and normally do not lead to any credentials (European Commission, 2001; Werquin, 2010).

Learning in museums is usually referred to generically as *informal learning*. However, using the above definition, it is more appropriate to look at it as covering different places on the spectrum, offering structured and unstructured learning activities, some pursued intentionally and some unintentionally by visitors. For instance, learning is unintentional when a group of visitors attends an arts exhibition to enjoy some time together, yet at the same time they learn about specific artists and arts concepts such as Impressionism. The programmes developed by museum education departments, on the other hand, often have structured objectives and defined learning outcomes, especially when they address school audiences. These activities are closer to the non-formal side of the continuum.

¹⁴⁵ See European Commission's 2001 Communication *Making a European Area of Lifelong Learning a Reality*.

In relating museum learning to lifelong learning, two aspects deserve attention: *the process*, bringing about the notion of learning styles and *the learning outcomes*. The nature and the outcomes of learning in museums are different from the learning in formal educational settings. Active construction of meaning from experience, rather than merely acquisition of knowledge and skills, are at the centre of museum learning (Hein, 2006; Hooper-Greenhill and Moussouri, 2000). A definition that captures the centrality of experience and meaning-making has been advanced by the UK Campaign for Learning and adopted in the *Inspiring learning for all* framework developed by the UK Museums, Libraries and Archives Council (MLA):

“Learning is a process of active engagement with experience. It is what people do when they want to make sense of the world. It may involve increase in or deepening of skills, knowledge, understanding, values, feelings, attitudes and the capacity to reflect. Effective learning leads to change, development and the desire to learn more” (UK Campaign for Learning).

Experiential learning frameworks recognise that all learners are different, and on this basis museum activities respond to diverse interests, prior knowledge, and ways of learning. Different learning theories have been used to inform museum education research and develop exhibits and activities. For the case study on the Samsung Digital Discovery Centre (SDDC) at the British Museum, the instructional design approach has been analysed in relation to Kolb’s model of experiential learning and the notion of *learning styles*, drawing on a framework modelled following Gardner’s theory of multiple intelligences.

Kolb’s experiential learning model (2015/1984) evidences two ways of engaging with an experience: *concrete experience* and *abstract conceptualisation*, and two ways of transforming experience: *reflective observation* and *active experimentation*. Experiential learning is thought as a process going through all four stages in a cycle of experience, observation, conceptualisation, and experimentation. Yet different learners may prefer or engage better with specific stages of this cycle. For instance, hands-on learning privileges a combination of *concrete experience* and *active experiment*: while some people engage better with theory application into practice, putting together *abstract conceptualisation* and *reflective observation*, others learn better in settings which involve a concrete experience and a reflective observation of experience, for instance while examining an experience in a group discussion.

Howard Gardner’s theory of multiple intelligences (1983) had a profound and still very vibrant influence on education, and has been specifically adopted in many museums to inform the design of exhibitions and learning activities. The theory posits that humans understand the world and construct meaning from experience differently, using and developing eight intelligences: linguistic, logical-mathematical, spatial, musical, bodily-kinaesthetic, interpersonal, intrapersonal and naturalist. The theory has been used as an analytical and design tool for museum education. For instance, learning activities can be designed to both stimulate and develop visual intelligence (Hooper-Greenhill and Moussouri, 2000).

The question of *process* is also central to assessing the *outcomes* of museum learning. As Hein (1995) argues, if we look at museum learning in a constructivist vein (“how the learner constructs meaning out of experience”), then to understand the nature of the learning taking place it is crucial to examine the activities of the learner, and how they formulate their own understandings from the museum experience. There are several frameworks and approaches for assessing learning outcomes for informal or non-formal learning, for instance the *Generic Learning Outcomes Framework* developed within the *Inspiring Learning for All* framework for assessing learning impacts in museums, archives and libraries (Hooper-Greenhill et al., 2003; inspiringlearningforall.gov.uk).

For this research, the aim was not to conduct a formalised assessment, but to understand how the prefigured outcomes of SDDC learning experiences can be linked to lifelong learning. To this purpose, this report makes reference to the key competences for lifelong learning endorsed by the European Commission. The recommendation *Key competences for lifelong learning* (European Parliament, 2006), defines *competences* as a combination of knowledge, skills and attitudes.

Eight such competences are put forward as key to successful employment, but also for personal fulfilment, social inclusion, and active citizenship:

1. *communication in the mother tongue*: abilities to express in written and oral form and interact with others in different contexts;
2. *communication in foreign languages*: language abilities, but also capacities for mediation and intercultural understanding and communication;
3. *mathematical competence and basic competences in science and technology*, including an understanding of the natural world, humans' impact upon it and our shared responsibility towards it;
4. *digital competence*: skills in ICT use;
5. *learning to learn*: the capacity to structure and direct learning individually, aware of personal needs and the opportunities out there;
6. *social and civic competences*: competences that equip individuals to take part in social life and working life, as well in civic life. This includes the knowledge of concepts such as *democracy, justice, civil rights*;
7. *sense of initiative and entrepreneurship*: includes creativity and innovation skills, and the ability to identify and seize opportunities, formulate and work towards the attainment of objectives;
8. *cultural awareness and expression*: sensibility and understanding of the value of, and the capacity to express ideas and experiences in different media and artistic forms for instance music and performing arts (European Parliament, 2006).

The case study on the SDDC illustrates how museums can design digital learning engagements that enable visitors and users to acquire or shape these competences.

5.2 PREMISES ON THE ROLE OF DIGITAL LEARNING ENGAGEMENTS

Before going mapping the trends and best practices in museum learning, it is necessary to place the role and impacts of digital technologies (DT) in the broader social, economic and cultural context in which museums function. Four key premises need to be considered.

Firstly, digital technologies permeate not only museums, but increasingly our societies and our economies, being nestled within processes of accelerated evolution and change. This has several implications for museum learning. As technological devices become more affordable, usable, connected and efficient, they become integral parts of personal, social and professional lives. They mediate social relationships and communication, shape attitudes and behaviours, and affect rhythms and routines. Mobile phones, for instance, for many users become personal extensions, enabling all time connectivity and mediating social and professional lives. Increased adoption of technology also creates expectations and shapes the ways users and visitors think about museums and what they should provide:

“We live in a digital society so there is now an expectation of digital experience and modes of communication functioning in a digital context for many. Digital tech is a good tool for doing very much the same things as traditional learning programmes but presented differently, in a way that hopefully engages people operating in the digital society. It appeals to what has become a natural predisposition for immediacy and an expectation of the qualities of digital.” (Expert interview, 16)

Moreover, accelerated processes of change at social and economic level create needs for continuous professional development and acquisition of new knowledge and skills. Educational institutions keep up with the requirements of the job market only with difficulty.

New sets of skills ranging from digital literacy and entrepreneurship to problem solving and collaboration in teams are required, for which traditional curricula provide only scarcely. In this context, informal education establishments are advantaged by the possibility to adopt swifter approaches and reconfigure their educational offer at a faster pace in response to social and job market needs and requirements.

A second important aspect to consider concerns a broader perspective on the impact of digital technology on learning. Both the integration and impacts of digital technology need to be seen in a broader context, including formal, non-formal and informal learning spaces, providers and resources.

The key is to consider that not just museum education, but learning in general is transformed by digital technology. As museums deem themselves to be places of informal learning, and as they provide opportunities for resource based learning, the impact of digital technology should be understood in this broader perspective, not just with regard to the effect of the digital on educational programs strictly taken. (Expert interview, 20)

A third premise comes to counteract the technology-intensive concentration of the first two premises: whilst acknowledging the importance of technology ubiquity, pervasiveness and impact, there is a need to acknowledge that museum education ultimately continues to be about people and relationships. Transformation is brought not only by technology and the ripples it creates in societies and economies; new perspectives, approaches and value sets are emerging that are shaping education. The role of the learner as central agent in the learning experience, the importance of expanding agency for learning and catering for participatory and constructive learning approaches are all aspects of educational paradigms that are adopted and adapted at different rates and rhythms by various educational providers.

Fourthly, whilst change and evolution are central arguments to understanding the role of technology in learning, there needs to be acknowledgement that change does not imply exclusive novelty, nor replacement of the approaches, tools and spaces that configured educational exchanges in the past. Novelty is layered on existing bases, and some of these bases are ingrained and solid, such as institutional structures, workflows, and roles. A side of this is that new media do not completely obscure nor replace old media, and low technologies continue to be relevant as they are integrated and used along new forms of media:

For me the ‘added value’ [of integrating digital technology] is that new forms of media are now accepted next to the old media and they live in a dialogue as well as in a combat to the classic forms of knowledge transfer and museum education. (Expert interview, 18)

5.3 TRENDS AND BEST PRACTICES

This section maps trends and best practices that configure the changing role of museums as learning providers and the educational offer for the lifelong learner. Four dimensions are used to cluster and structure the trends:

1. new structures for learning provision;
2. learning technologies, platforms and tools;
3. new learning spaces;
4. changing audience relationships and participatory engagements.

5.3.1 New structures for learning provision

The open culture movement encourages shifts from hierarchical to decentralised, distributed structures controlled by communities or clusters of diverse social and economic actors. At the same time, communication, exchanges and joint productive work are significantly facilitated by digital technologies (KnowledgeWorks 2015). These shifts open up opportunities for new temporary, permanent or semi-permanent structures for learning provision that can span several institutions or engage differently traditional structures in museums. Of interest are distributed structures created through partnerships and collaborations between museums and a diverse range of institutional and social actors with diverse approaches and benefits:

- technology companies;
- the creative industries and cultural entrepreneurs;
- educational institutions;
- local communities and the third sector;
- other museums.

A review of such initiatives and their outcomes reveals a complex landscape of goals, methodologies, outcomes and challenges encountered. Some are focused strongly on designing and delivering learning resources, whilst some embed collaborations in broader-scope knowledge exchanges necessary to develop innovative products, services, and programmes.

Partnerships with technology companies benefit museums primarily for provision of digital technology devices, software, content and skills. Some have a clear focus and involve partners temporarily to co-create and produce outcomes such as exhibitions, digital artefacts or digital learning experiences. For example, The Science Museum in London and Google partnered for innovating engagements with science experiments in the frame of a temporary exhibition. *Google Chrome Web Lab*¹⁴⁶ included five interactive experiment stations: Data Tracer, Universal Orchestra, Sketchbots, Teleporters, and Lab Tag Explorer. The exhibition was accessible both online and onsite, and it welcomed 5 million online visitors and 200.000 visitors onsite in the first six months.

Of interest are longer-term collaborations. *Louvre-DNP Museum Lab*¹⁴⁷ results from the collaboration between Dai Nippon Printing (DNP) and the Musée du Louvre. Launched in 2006, the project uses sophisticated multimedia displays to provide original ways of viewing and interacting with artworks from the Louvre. Exhibitions are staged in an exhibition space in Gotanda (Tokyo), or are organised as travelling exhibitions.

¹⁴⁶ <http://www.chromeweb.com/>.

¹⁴⁷ <http://www.museumlab.eu/>.

*The Hermitage Museum Project*¹⁴⁸ is a long-term partnership, started in 1997 between IBM and the State Hermitage Museum. The partnership resulted in the creation of an onsite Education and Technology Centre, and image creation studio and visitor information kiosks. Special digital library software was also created as part of this collaboration.

Google Art Project,¹⁴⁹ promoted by Google Cultural Institute in collaboration with several cultural institutions, provides support for digitisation of collections and a platform for presenting and sharing museum collections, historic artefacts and monuments and world wonders online. Projects are constantly being revised and extended; new technologies and visualisation techniques are tried out and implemented. One of the latest partnerships was signed between the Google Cultural Institute and the British Museum, which contributed to making available online over 4,500 objects,¹⁵⁰ providing virtual walkthroughs using virtual indoor Street View footage and high definition views of British Museum Treasures such as a rendition of the famous Chinese Admonitions Scroll.¹⁵¹

Partnerships with the creative industries and cultural entrepreneurs have the potential to stimulate creativity, encourage knowledge exchange, recover and revive heritage resources and archival material, and ultimately configure new testing grounds for innovation (Woolley et al. 2015). This type of partnership is generative for learning provision even when the goal of the partnership is not directly concerned with designing learning engagements. Insofar as they support dialogues between museums and sectors of the economy that are deeply marked by change and driven by creativity and innovation, these collaborations indirectly support museum learning, by generating awareness of the knowledge and skills needed in today's creative economy. In time, and provided knowledge is circulated within and across museums these can spur learning initiatives that link with creative entrepreneurship.

Collaborations and partnerships with educational institutions are commonly supported through various national and European funding schemes in the frame of two to five year projects. They can also focus on developing a specific installation or learning programme. For instance, Timespan Museum and Arts Centre in the North Highlands of Scotland collaborated with St. Andrews University Open Virtual Worlds Research Department to create a virtual reconstruction of a site from the time of the *Highland Clearances – Caen Highland Township 1813*.¹⁵² An immersive exhibit using Kinect technologies has been installed in the Timespan Museum.

Collaborations with communities and third sector actors are manifestations of a broader trend, through which museums seek to strengthen their relevance and the relationships with communities in their territory. Collaborations can take a variety of forms, and are often targeted at special groups in the community, for instance by age, or by social status (disadvantaged communities). *Talking objects*¹⁵³ is a project started in London in 2007 through partnerships between the British Museum and local community and youth organisations, and then extended to UK museums nationwide. The driving idea is to engage visitors in close interaction and interpretation of museum objects and creative explorations.

¹⁴⁸ <https://www.research.ibm.com/haifa/projects/software/hermitage/>.

¹⁴⁹ <https://www.google.com/culturalinstitute/u/0/project/art-project>.

¹⁵⁰ <https://www.google.com/culturalinstitute/u/0/collection/the-british-museum>.

¹⁵¹ <https://www.google.com/culturalinstitute/u/0/asset-viewer/admonitions-scroll/nwE-8S72ewLhIA>.

¹⁵² <https://blogs.cs.st-andrews.ac.uk/openvirtualworlds/reconstructions/caen/>.

¹⁵³ http://www.britishmuseum.org/about_us/community_collaborations/partnerships/talking_objects.aspx.

The project offers a toolkit¹⁵⁴ to help museums implement it, offering recommendations and methods for visitor involvement and detailed advice on the organisation of sessions.

Whilst the examples provided above illustrate partnerships between two types of institutions, there are also formats in which several institutions coming from diverse sectors cooperate with museums partners. Such forms of collaboration are encouraged by European and national funding schemes. For instance CATH (Collaborative Arts Triple Helix)¹⁵⁵ is a project funded by the UK Arts and Humanities Research Council's (AHRC) 'Creative Economy Knowledge Exchange' programme. Its mission is to support the co-creation of digital prototypes in Triple Helix types of collaborations, bringing together academics, SMEs, and Small Cultural Organisations. *Enterprising Science*¹⁵⁶ is a project driven through a five-year partnership between the Science Museum Group, King's College London and BP. It aims to raise young people's interest and engagement with science, using the concept of social capital: the combination of science interests, competences, knowledge and social networks that an individual has access to (Archer et al. 2015). The project aims to have broad societal impacts by shedding light on how schools, homes and museums can best support raising the science capital of young people.

It is important to question how such partnerships are generative for all actors involved beyond the provision of immediate outcomes. The potential of such partnerships is to generate new approaches, methodologies, spaces and tools for learning, drawing on the expertise, know how and resources of diverse sectors. Ground breaking outcomes can be produced such as tailored learning environments and pathways; responsive learning environments that adapt dynamically to learner evolution and needs; or smart learning spaces equipped designed to stimulate social awareness can be foreseen (KnowledgeWorks 2015). Yet even more importantly, these partnerships are amongst the most significant factors for taking steps towards rewarding and functional learning ecologies. Some of the challenges that hinder the success of such encounters – such as different ways of thinking and working, diverse experiences and vocabularies – once bridged, can be changed into generative spots for creating dialogues, exchanges and cross-fertilisation of knowledge among diverse actors that approach learning provision from very different angles. To see this happen, it is necessary to see beyond single initiatives and understand their cumulative impacts along time. It is also important to create channels and frameworks for exploiting and disseminating the outcomes of such encounters, to generate growing awareness and inspire new initiatives.

The toolkit *Museums and Creative Industries: Mapping Cooperation* (2015) sketches the basic reasoning behind cooperations between museums and creative industries from both sides. Examples from museums in Latvia point out the benefits of these connections, and the challenges encountered in bringing cooperations to fruition.

¹⁵⁴ http://www.britishmuseum.org/about_us/community_collaborations/partnerships/talking_objects/talking_objects_toolkit.aspx.

¹⁵⁵ <http://www.cathproject.org.uk/>.

¹⁵⁶ <http://www.sciencemuseum.org.uk/educators/special-projects/enterprising-science>.

The report formulates a series of recommendations for collaborations between museums and creative industries that are replicated herein:

1. Generate awareness of the benefits of cooperation for museums, industries and the public.
2. Cultivate an open internal culture in museums, as a pre-requisite of cooperation. This can be at odds with the more conservative spirit that oftentimes characterises museum cultures.
3. Good conditions for cooperation are created by the support and involvement of cultural management institutions.
4. Set up and use formal and informal platforms and spaces for meeting and networking.
5. Digitisation of collections is important in this type of cooperations, especially for cooperations with design (Creative Museum 2015: 31-2).

5.3.2 Learning technologies, platforms and tools

The latest edition of the New Media Consortium (NMC) Horizon Report for Museums (NMC 2015) lists six selected educational technologies that are hypothesised to significantly influence and drive museum decision-making and agendas for technology integration in learning provision. Educational technologies are defined as “tools and resources that are used to improve teaching, learning, and creative inquiry” (NMC 2015: 34). It is significant that the technologies selected and the larger list from which experts selected those most likely to impact, are not defined merely as devices or software, but range from consumer technologies (mobile apps), to learning technologies (mobile learning and Massive Online Open Courses (MOOCs), to digital strategies. On a similar note, this report argues that in thinking about and analysing the role of technologies for learning, there is a need to take a broad outlook that encompasses basic devices, platforms and software as well as strategies for technology use.

The six technologies singled out by the NMC experts with a view to adoption within five years are:

Bring Your Own Device (BYOD), referring, in the museum context, to the practice of visitors bringing their own devices such as smartphones or tablets for downloading and consuming digital content on the museum premises. One significant associated impact of BYOD is that museums prioritise investments in large-scale networks in their technology strategies, able to support the large amounts of visitors some museums receive each day. The implications of **Wi-Fi availability** are that activities or digital learning programmes that use location-based services or real time fast content streaming and download can now be supported. An expert interviewed for this study underlines the value of Wi-Fi connectivity on museum premises:

Providing access to fast and reliable (and free) Wi-Fi is increasingly seen by visitors onsite as a basic utility service – like electric light. Investing in this kind of infrastructure provides a conduit for many different types of services both for the public and for the organisation. From delivering direct and connected access to learning and interpretation resources and social networks to supporting security and conservation activities – reliable Wi-Fi is key. (Expert interview, 15)

Games and gamification refers to integrating games, game mechanics and patterns in experience design. Gaming is a booming cultural industries sector, a major object of research and practice in education and recognised for the potential to raise user engagement and immersion. Game-based learning in museums can be custom made or adapted. A successful example of a custom game is provided by the British Museum’s SDDC game *A gift for Athena*.

Produced in collaboration with Gamar, this is an augmented reality mobile game optimised for both Android and iOS devices, which encourages children to look attentively at objects and imaginatively reconstruct the context and missing parts (see more information on learning benefits in the SDDC case study in section 6.4; or the page which describes the game for the Museums & the Web conference)¹⁵⁷. An example of an adapted game is *Minecraft*, which became hugely successful with museums as well. *Tate Worlds*,¹⁵⁸ for instance, provides *Minecraft* maps that display virtual environments depicting or inspired by Tate museum collections.

Location-Based Services (LBS) support dynamic optimisation of content according to the location of the user. Until recently, museums had difficulty using LBS to their full potential, as floor plans locations could not be distinguished. Recently, however, indoor geolocation makes it possible to precisely locate position, facilitating special programmes as well as the optimisation of traditional products such as audio guides.

For instance, through indoor geolocation precise instructions can be delivered on where to find the next artwork in a tour, starting from the visitor's exact location. Also the content and suggested artworks or information delivered through apps and audio guides can be dynamically adjusted to the user position. As the SDDC case study introduced later in this section argues, some activities such as gallery-based augmented reality trails, which require precise identification of location, benefit from indoor geolocation as well.

Makerspaces, one of the most cherished developments from the Maker Movement, are increasingly adopted in museums as well as libraries. Makerspaces use hands-on approaches, craft, construction and design activities to engage with building complex digitally enhanced artefacts (e.g. e-textiles), designing, modelling or engaging with higher-level conceptual issues. They provide an immersive space for learning, where users are engaged not only mentally but also physically. This is aligned to experiential learning frameworks that museums adhere to, and benefit both the process of learning (engagement, focused attention, collaboration) and outcomes ranging from content knowledge to applied skills (digital literacy, 3D-printing and modelling) and personal, social and communication skills (collaboration in teams, problem solving). Makerspaces can be organised as temporary spaces (e.g. Digital Design Weekend at the V&A) or as permanent spaces in museums and libraries. They are at times conflated with digital learning, innovation or creativity centres in museums, which will be described in more detail further in this section.

Natural User Interfaces (NUI) are more of a come back than an emerging trend. As the Horizon Report argues (NMC 2015: 44), devices using NUI are already mainstream, such as tablets and smartphones. New developments add to these, such as holographic projections. Natural language interfaces can afford automatic translation services. Given the high percentage of foreign visitors to museums, this development can have huge potential to improve the experiences of foreign visitors. NUIs also have the advantage of making technologies transparent and therefore bringing museums collections and engagements with objects to the fore, which can afford deeper, more immersive and more rewarding experienced for visitors (NMC 2015: 44). Applications include: enabling disabled people to create art with the mind;¹⁵⁹ the virtual reality user interface called *Augmented Interactive Reality*, developed by California based company Atheer, which enables detection of a user's hands through smart glasses.

¹⁵⁷ <http://mw2015.museumsandtheweb.com/bow/a-gift-for-athena/>.

¹⁵⁸ <http://www.tate.org.uk/about/projects/tate-worlds-art-reimagined-minecraft/tate-worlds-games>.

¹⁵⁹ www.go.nmc.org/mindart.

The Internet of Things (IoT) – referring to linking physical and digital worlds through the web and smart sensors – has already a number of applications in museums, due to the fact that enabling sensors and chips are inexpensive. Integration of iBeacons, an Apple technology, enables seamless access to content and participation in online activities. The longer-term impacts of IoT adoption, however, are in linking and networking museums and their collections across physical and digital worlds, promising to provide anytime anywhere access and learning. Technology mediation such as interaction afforded through mobile phones and apps can also be replaced with direct contact with objects and collections. IoT was used by the San Francisco de Young Museum to offer multimedia tours using Google Glass, using GuidiGo, a mobile storytelling platform that uses AR and Bluetooth technologies. Contextual audio-visual information was instantly delivered to visitors as they approached exhibits (NMC 2015).

Other emerging trends and considerations in technology adoption emerged from expert interviews and literature survey.

Firstly, experts interviewed argue that established technologies and platforms continue to hold relevance. Technologies that are already widely used, those technologies that “people use to navigate the world” (Expert interview, 11), are easy to manipulate by visitors and can mediate more rewarding interactions. Professionals therefore place attention not necessarily on adopting new technologies, but on improving the interaction with existing ones. Audio guides, for instant, which hold a great potential for offering easy to digest learning experiences, can be delivered on slicker devices, and connect audio provision with multimedia content on device screens. The boundary lines between audio guides and mobile apps is blurring, as many museums launch apps that offer possibilities for onsite and offsite content consumption.

In addition, it is important to consider how technologies support rather than divert attention from original objects and content:

Regardless of which technical solution is applied, it is important to stay focused on the original story to be told and not to overwhelm museum visitors with hi-tech solutions that become an attraction in itself, leaving what is really important behind. (Expert interview, 7)

Experts advise that museums need to be present and share content in places and platforms that are already populated, online and offline. For instance, social media platforms such as Facebook, Instagram and Pinterest:

We don’t need to re-invent new opportunities at each of our institutions, rather participate in larger initiatives and create excellent content that be sustained outside our institutions (where the expertise really lies). (Expert interview, 11)

Museum experts are also aware of the danger of adopting gadgets that do not stand the test of time. Instead, it is important to shift the focus from emerging technologies to emerging experiences, which can be created for visitors with technologies old and new. The focus is not on technological novelty, but on to-the-point experiences that are rewarding for a museum and its visitors. The design of rewarding learning experiences can draw upon multiple technologies brought together by innovative concepts.

5.3.3 New learning spaces in museums

Special spaces in museums dedicated to learning are not a new concept. Recent developments in how they are organised, the interactions they afford, and the role of digital technologies make them worthy of attention. These spaces can be called digital learning centres, learning labs, digital centres or just learning centres, and increasingly come to integrate new concepts such as Makerspaces. A distinction can be drawn between traditional learning centres in museums and digital counterparts, by the stronger focus they place on integrating digital technology and embedding it in the educational offer. Nevertheless, the lines of distinction between digital and regular or traditional learning centres are porous. At present, many large museums incorporate digital activities and technologies in their educational offer through learning centres, even if they do not offer a digital-focused learning environment. In reverse, digital learning centres may have shifting priorities with respect to technology integration, going from techno-centric programmes to scenarios in which technology plays a marginal role, or inspires ways of engagement that are put together with analogue media.

One of the first digital learning centres was the Micro Gallery at the National Gallery of London. Launched in July 1991, designed as a digital gateway to the museum's collection. Located in the museum's Sainsbury Wing, the space was equipped with 19 touchscreens embedded in the wall, with seats for one to three people.

The touchscreens provided access to a digital catalogue of the National Gallery's collection. The collection was accessible through artist, artwork, geographical location and type of artwork. It featured extensive information about artworks and artists, and high-resolution digital reproductions of artworks. The Micro Gallery remained open for 14 years, and its catalogue was later made available on CD-ROM in 1999. The Micro Gallery was innovative for its time and inspired other museums to give more thought to innovative uses of digital technology to provide new ways of accessing their collections.

While it can be considered among the first digital learning centres, according to the developers, the Micro Gallery was rather "a very large publication" (Rubinstein, 1992). It did have a central learning goal, yet it was intended primarily as an alternative access mode to the museum's collection. Meanwhile, digital learning centres evolved with a stronger focus on educational programmes and activities. While they still have museum collections at their core, programmes and activities are designed to engage visitors in meaningful explorations of the areas covered by the museum (art, history, culture, science) through diverse educational approaches, hands-on experiences, contacts with professionals and artists, and a wide range of technologies.

The value of the Digital Learning Centre's educational offer does not merely reside in the integration of digital technologies, but in the way this is used strategically to give shape to learning experiences that are immersive, engaging and impactful. The design of such experiences is underpinned by diverse pedagogical philosophies, theories and approaches, which can be made explicit by DLCs or can be identified from the core principles observed in instructional design. Experiential learning, critical pedagogy, inquiry-based learning, challenge-based learning, constructivism, reflective learning and connected learning are some of the approaches mentioned or noticed in the work of DLCs. The SDDC case study illustrates in practice how DLC translate principles of object-based learning and constructivism in the design of digital learning experiences.

A framework widely used by learning labs in the USA is HOMAGO (Hanging Out, Messing Around, and Geeking Out). Embedded in a connected learning theoretical approach, HOMAGO puts forward a model for engaging young adults in learning experiences by expanding a pattern of social media usage that Ito and colleagues found in a long-term study of teenage social media practice (Ito et al. 2009). The *YOUMedia Learning Labs Network* uses this framework in an approach inspired by the Maker Movement, to promote educational engagements ranging from science education to graphic design, video and music. YOUMedia at the Chicago Public Library was the first to implement this approach in a library.¹⁶⁰ Aiming to develop skills in Science, Technology, Engineering and Mathematics (STEM) and digital media, the Chicago Library lab philosophy explicitly links the educational mission to lifelong learning:

“We see the library as a node on a teen’s pathway to lifelong learning, and we connect teens to other learning opportunities that will lead to skill-building as well as college and career development.”¹⁶¹

The programme of the Chicago Library Lab is based on four elements:

- blending structured and unstructured activities;
- using the HOMAGO framework for activities, allowing teens to move between them;
- staff creates opportunities for learning, however teens are free to choose;
- personal connections are developed between mentors and teens.

In 2011, the USA-based Institute of Museum and Library Services (IMLS) and the John D. and Catherine T. MacArthur Foundation launched the programme *Learning Labs in Libraries and Museums* with a national competition call. The programme envisaged the foundation of learning spaces for teens and with an outlook to further connecting these in national learning networks. Initiatives had a seed funding of 100,000 USD, however most of the initial sites continue to operate. Examples are *The MiX* at the Science Museum of Virginia¹⁶² and the Dallas Learning Lab. The latter is a collaboration between a science and art museum and attempts to promote STEAM (Science Technology Engineering Arts Mathematics) education.

The benefits of engaging youth with learning experiences in learning labs and digital learning centres, as documented by a series of reports, include:

- creating lasting relationships between children, teens, youth, schools and museums;
- new networks between different kinds of institutions that can spearhead innovation in learning – towards ‘learning ecosystems’ (Sebring et al. 2013);
- perceiving it as a safe and welcoming environment, digital skills uplift, academic skills uplift, better idea of opportunities for life and work.

One final aspect to consider is the difference between one off engagements in learning centres (as promoted typically by museum learning centres) and the continuous engagement model used in the USA-based learning labs. The latter promotes more durable connections and can use the mentorship model to track progress of teens learning. Continuous evaluation is also better afforded by the second model.

¹⁶⁰ <http://youmediachicago.org/>.

¹⁶¹ <http://www.chipublib.org/youmedia/>.

¹⁶² <http://www.smv.org/join/themix>.

5.3.4 Audience relationships and participatory engagements

The participatory museum (Simon 2010) is an influential book for museum professionals and scholars that promotes participatory approaches and two-way communication with the public as a way for museums to improve visitor engagement patterns, become more relevant in today's societies and cultivate lasting relationships with their audiences. Simon offers four approaches for designing participatory programmes and activities:

- involving audiences within museum-controlled processes, for sharing ideas, stories, comments;
- devising collaborations with audiences, where people can become partners in projects ideated together and then run by the museum;
- co-creating with audiences, which implies visitors partner become equal project partners from the beginning until the end of the project;
- providing spaces for visitor activities such as crafts.

This book captures what is now a blooming phenomenon characterised by visitor involvement and participation in diverse processes having to do with managing, communicating, mapping or classifying collections. These processes have wide-ranging implications for museums and their educational mission. Participatory, constructivist and experiential learning models find expression and practical application in new ways of engaging with visitors, insisting on learning practices which are learner-led and contribute to construction of meaning from experience (Hein 2006; Hooper-Greenhill & Mousouri 2000).

Digital technologies, in particular social media services are important elements, as they can mediate and support processes by which visitors can dialogue, interact, contribute and network in communities of aficionados around museums (for instance on SNS such as Facebook, Twitter and Instagram).

Crowdsourcing – still a term to be reclaimed by cultural heritage (Owens 2013) – was originally defined as “the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call” (Howe 2006). Between 2006 and 2011, forty definitions of ‘crowdsourcing’ have been proposed (Estellés-Arolas & González-Ladrón-de-Guevara 2012). Several authors suggested taxonomies and classifications of crowdsourcing in the cultural sector. Oomen and Aroyo (2011) put forth a taxonomy following the Library of New Zealand’s Digital Content Life Cycle, which includes six steps: creating, describing, managing, discovering, using and re-using. Based on these steps, Oomen and Aroyo propose a taxonomy around four types:

1. curation and transcription;
2. contextualisation;
3. complementing collection classification; and
4. co-curation and crowdfunding.

Carletti et al. (2013) map crowdsourcing activities around two broad trends:

1. Crowds being solicited by institutions to engage with or intervene in existing assets and the way they are classified and curated. Activities encompass curation (e.g. tagging, selection, classification); revision (e.g. correcting or transcribing manuscripts); and location (e.g., mapping exhibits).

2. Crowds asked to contribute novel resources, which can range from documentation of personal life to documentation of history (e.g. 9/11 memorial narratives in *Make Story*) or augmenting locations with digital assets such as photographs (e.g. *Sound Map* and *Pin-a-tale* promoted by the British Library).

Decker (2015) argues that museums have a long tradition in ‘tapping’ the crowd by asking feedback from audiences, in form of evaluations or comment cards. He defines three forms of crowdsourcing for audience engagement and participation: 1) initiating new content (e.g. uploading images such as selfies), 2) reworking collections (e.g. transcription projects), and 3) interacting with existing content (e.g. tagging online collections). Decker proposes a framework for crowdsourcing connected with existing or long-established practices in analogue form.

Engagements placing users in control, which involve them in activities of deconstructing, intervening or re-using digital counterparts of collections to create new artefacts, can be seen as a unique manifestation of user participation. Examples range from content re-use on online platforms to hands on engagement with replicas and prints in Makerspaces. These activities are permeated by an ethos that conflates with the maker ethos of tinkering, innovating, and free sharing (Hatch 2013). They can be termed ‘hacking collections’. The term ‘hacking’ gained notoriety in the field of computing, referring to external interventions in computer programmes, often in malicious and subversive ways. The usage of the term expanded in the past years beyond the field of computing, in particular in association with the Maker Movement. The term now includes someone who modifies anything from a computing programme or device to a home appliance in playful and creative ways, but also someone who creates programmes or mixes things around in ways that push the limits of what is considered doable and possible.

Hacker cultures are defined by an ethos of creative and artistic intervention, aspiration to excellence, and playful circumvention of the limits of programmes, systems and devices to make up something new (Verna, 2004). In museum contexts, ‘hacking collections’ indicates the ultimate shift in engagement patterns, where users intervene with collections in creative ways, where their agency is expanded and the distance between curatorial authority and users’ positions is further reduced. These engagements also hold the potential to inspire creativity and revive museum collections for re-use by contemporary artists, makers and designers.

Despite the proliferation of participatory engagements, their **impact** and **value** are still debated. Crowdsourcing and content re-use are thought to question the traditional roles and relationships between custodians of culture and knowledge authorities and their audiences, as well as notions around the authenticity and value of museum objects (Bayne et al. 2009). They are also thought to mark shifts towards more inclusive, visitor-centred processes of curation and interpretation. For instance, crowdsourcing can lead to creating new epistemological and classificatory frameworks (Geismar 2012) such as those resulting from tagging projects. Yet these trends need to be adequately assessed with respect to the scope and the mission of the museum. Despite opening up to audiences, curatorial authority is not questioned; curators continue to hold the knowledge and together with museum professionals create the context for crowdsourced engagements. The impact of crowdsourcing lies, rather, in proliferating decentralised processes by which museums engage with publics and communicate content in ways that are both attractive and lead to results that audiences appreciate.

Some authors argue that the impacts are related to reinstating societies and communities as true owners of cultural heritage. Kramer (2014) speaks of ‘figurative repatriation’ (Kramer 2014), giving collections back to society, as well as creating new sets of relations between museums, communities and the broader society. This notion has been adapted to speak about towards ‘digital repatriation’ in the context of indigenous communities (Christen 2011) – museums giving back indigenous objects to communities in digital form.

Other reported impacts and benefits of crowdsourcing encompass: widening public engagement with heritage (Ridge 2013); potential to increase accessibility and connectedness of cultural heritage institutions; and helping institutions fulfil their missions through public involvement (Owens 2013). These are shadowed by studies questioning the value of participatory engagements. An insightful case is that of selfies and selfie sticks. On the one hand many museums embrace selfie practices to attract young visitors, leading to phenomena such as the *#Museumselfie Day*. On the other hand, selfies are considered as well narcissistic manifestations, and their contribution to visitor engagement with the museum space and collections has been questioned.

5.4 CASE STUDY: THE SAMSUNG DIGITAL DISCOVERY CENTRE AT THE BRITISH MUSEUM

In 2009, the British Museum and Samsung Electronics signed a five-year partnership agreement to develop a range of new digital learning programmes for the museum’s family and school audiences. The programmes were offered through the Samsung Digital Discovery Centre (SDDC), opened in March 2009. Within the first five years after its opening, the SDDC welcomed more than 51,000 participants aged three to 18 years old, and around 5,000 schools every year. In 2013 the Samsung sponsorship was renewed for another five years, including a provision of new digital technologies to support the Centre’s aims for expanding and improving its educational offer.

This study set out to understand how a digital learning centre such as the SDDC responds to growing societal needs for lifelong learning and development of skills and aptitudes in venues and spaces that are no longer confined to formal education establishments. In particular, it aimed to shed light on the instructional design approaches and digital interaction patterns that proved effective and can inspire future museum-based digital learning practices. The following questions were asked:

1. To what extent and how does the SDDC support lifelong learning?
2. How do SDDC informal education programmes support, complement and enhance formal education practices?
3. What strategies and approaches underpin the integration of digital technologies in the informal education activities offered, and to what effect?
4. Within what parameters and constraints, how, and with what impacts does the SDDC cultivate innovation in informal education?

The research was conducted when the SDDC had just embarked on the second stage of the sponsorship period. Having reflected on the achievements and challenges of the first years, plans were renewed and made more ambitious to include more engaging educational experiences, and reach out to a greater number of schools. This was a timely moment therefore to look at the way the Centre managers constantly renew and revise their approaches in response to different factors: requests for new skills in society, changes in the national curriculum for schools, and the provision of new technologies affording different interaction patterns.

The analysis positions the Samsung Centre as an actor in a diverse and complex ecology of learning opportunities offered by formal and informal education providers. Supporting a culture of lifelong learning boils down to creating meaningful links and connections on the one hand with the learners, and on the other with other actors involved in the educational landscape – schools, policy-makers and agencies that ensure access to good education at a local level. Within this ecology, the Centre cultivates innovation by offering experiential learning engagements in which digital technology is integrated thoughtfully, informed by principles pertaining to object-based and participatory learning.

After a description of study concepts and methods and the SDDC educational offer, the report offers a structured analysis and interpretation in three parts:

- Section 4 shows how the SDDC learning activities are linked to essential knowledge and skill areas for lifelong learning, and then goes on to outline the principles and strategies that underpin the design and facilitation of learning activities.
- Section 5 focuses on the role of digital technology in learning activities. Starting from the idea of using technology as a tool, it distils a series of digital interaction patterns and shows how these are conducive to learning outcomes. Further, it reviews a series of challenges and unexpected happenings around technology integration and offers insights from the SDDC experience for working through and around these.
- Section 6 looks at the impacts of the SDDC, arguing that beyond quantifiable impacts, the Centre contributes to spearheading innovation in informal learning and creating a culture of learning in museums by targeting the acquisition of key competences and creating a bond to the lifelong learner.

The concluding section distils considerations that can inspire and inform further practice in museum-based digital learning.

5.4.1 A venue for learning through discovery

This section outlines the place of SDDC in the British Museum, the strategic vision that animates its activities, the spaces and technologies used in learning activities and the array of learning activities offered.

The Samsung Centre in the museum ecosystem

The SDDC is part of the *Schools and Young Audiences* team, which is in its turn part of the museum's broader education department, called *Learning, Volunteers and Audiences*. The Centre is run by a small team, made of two education managers, two weekend supervisors and several session facilitators, under the leadership of the Head of the *Schools and Young Audiences* team. The team is responsible with designing, managing and evaluating learning sessions and works mostly independently, however it embraces the principles and works as well in close cooperation with the *Schools and Young Audiences* and the *Learning* departments for developing special programmes and activities.

The SDDC has a distinctive place in the *Learning* department, delineated by its focus on digital and the core audiences it addresses – families and schools. At the same time, it is aligned to the strategic vision of the *Learning* department, which dwells on two key principles: focus on the collection and providing meaningful ways of accessing and engaging with it; and visitor-centeredness, meaning that those access and engagement strategies need to be responsive to audience profiles, needs and interests.

These two principles are declined in four strategic aims, which the SDDC helps to fulfil as follows:

1. *Broadening access to museum collections*: The Centre addresses schools and families. It aims to attract those audiences that may demonstrate lack of interest in museums, such as teenagers. Also, programmes are free, which means that disadvantaged schools and audiences can join in.
2. *Deepening engagement*: This is one of the strongest value added points brought by the SDDC. The use of digital technologies combined with pedagogical approaches that value participation and inquiry-based learning contribute to offering new ways of engaging with museum collections.
3. *Ensuring sustainability*: This is about ensuring that the approaches and programmes are sustainable in the long run. For the SDDC, this reflects in thinking strategically about the role of the digital in its educational offer so that digital integration is sustainable (e.g. ensuring easy maintenance, long-term use, compatibility, cross-platform apps, etc.)
4. *Advocacy*: The SDDC raises the profile of the museum's educational offer and contributes to positive word of mouth about the museum. Also sharing digital artefacts made by children reverberates in further educational practices in schools and reaches communities around schools (students, teachers, parents).

Digital learning through discovery

SDDC is about encouraging learning through discovery, an aspect which is embodied in the centre name. As one of its managers remarks, this captures the vision on digital learning advocated by the Centre, but also the internal approach to designing and delivering learning:

“[The SDDC] has the word 'discovery' in it, it is important because it is encouraging not only visitors to discover and explore new things, but also on our side of things internally we're always discovering new things about our collection and new things about technology and how we can apply technology for learning.

So it's a real living centre. And that is particularly in our family sessions. (..) It is a thriving, changing programme of events to highlight new finds, new thoughts and new technologies.” (Interview with SDDC Learning Programmes Manager, 23/07/15)

The digital has an important part to play in taking this approach: digital technologies are used to deepen engagement and deliver activities which support playful, interactive and collaborative learning. At the same time, the digital is not an end in itself, it is a tool which role is to support greater engagement and access while not overshadowing the collection and the learning content. To enable digital learning through discovery, the SDDC team adopts pedagogical approaches and engagement strategies that make the best of technology potential, particularly derived from constructivism, participatory learning and inquiry-based learning theories.

Spaces and technologies

The SDDC physical location consists of a digital studio equipped for hosting digital learning sessions. Moreover, many SDDC sessions are designed to include exploration in the museum galleries, apart from studio-based activities. The technological infrastructure and tools are therefore fit for supporting both studio-based work and gallery explorations. In 2011, the range of technologies included laptops, Android smart phones, a smartboard, still cameras and HD video cameras, audio recording equipment, 3D television, and a green screen. In 2013, when Samsung renewed its sponsorship for another five years, more sophisticated technologies were added, including Galaxy tablet devices.

The provision was made for trying out and experimenting with new technologies, but also to respond to the 2014 changes in the English national curriculum. One of the chief changes was within the Computing curriculum, which expects a more solid digital literacy basis, including learning how to code during primary school.

In the galleries, technologies are used for media capture, close examination of objects or mobile-guided gallery trails punctuated by games and quizzes. The supporting devices are mobile phones, tablets, audio and video recorders and digital cameras. Activities in the digital studio focus on content editing and composition using laptops, mobile phones or tablets, or content visualisation using the smartboard or 3D television. The studio also includes a green screen, which is used in some sessions to produce digital photographs and videos in which participants are featured in imagery displayed on museum objects.

The educational offer

SDDC offers digital learning sessions free of charge for schools and families. It also addresses teenagers aged 13 to 19 as a category on its own. The sessions focus on one or more cultural areas covered by the museum collections, and including Ancient Egypt, Asia, Ancient Rome, Ancient Greece, pre-Columbian civilisations in the Americas, and Africa.

School sessions come in three formats: full-day (lasting from 10.30 to 14.00 with lunch break), 90 minutes or self-led sessions. Sessions are offered during the scholarly year, and are designed to support subjects or areas of the English national curriculum, targeted at specific class levels or Key Stages.¹⁶³

For instance, curricular subjects commonly targeted by SDDC learning activities include History, Geography, Religious Education, Music, Art and Design, and Computing. The SDDC has a growing KS1 and early years audience, and is currently developing its provision for secondary school level. Special sessions are offered for students with Special Educational Needs (SEN). Teachers have to book the sessions in advance. Support sheets are provided online for each session, which describe the session aims and outline, the curricular areas it covers, key themes and vocabulary introduced, and give tips, ideas and resources for teachers to prepare for the session or to follow up on it.

Family sessions are offered during weekends. They last from 30 minutes to two hours, and can be conducted in the galleries, in the SDDC digital studio or a combination of these. Just as for school sessions, they come in workshop format, led by a facilitator, or can be self-led. Sessions address children over five, over seven or teens. Themes are diverse and constantly updated, and focus on engaging with British Museum collections in playful ways. Of special interest are the *Innovation Labs*, launched in the summer of 2015. These are experimental spaces where families are invited to try out a new technology, a new approach, or are involved in activities designed in collaboration with a new creative partner.

¹⁶³ The English national curriculum is organised around key stages (KS), as follows:

- Early years (3 to 5 y.o.)
- KS1 (School years 1-2; 5 to 7 y.o.)
- KS2 (School years 3-6; 7 to 11 y.o.)
- KS3 (School years 7-9; 11-14 y.o.)
- KS4 (School years 10-11; 14 to 16 y.o.)

Source: <https://www.gov.uk/national-curriculum/overview>.

Families are not pre-selected, as the team wants to ensure that activities are innovative and experimental, but also suitable for regular audiences.

Teen sessions are offered during weekends. Their subjects are chosen to reflect areas of interest for teens, for instance 3D-scanning, animation, or photography.

The range of activities offered is regularly evaluated and reflected upon. In response to this evaluation, the offer for all audience is revised, renewed and added to where necessary to ensure that it continues to be innovative, inspire and engage all audiences.



Innovation Lab focused on digital fabrication, 5 July 2015

5.4.2 Learning content and design approach

This section outlines how the SDDC activities are designed, covering the knowledge and skill areas targeted and the approach to designing learning sessions.

Knowledge and skill areas

The Centre aims to cater for those sets of knowledge and skills that are recognised as important in society and, in the case of schools, by the English national curriculum. All learning activities are collection-focused and designed to enable participants to engage and interact in new, meaningful ways with the museum objects. As the Head of Schools and Young Audiences remarks: “It’s all about trying to increase access and understanding of our collections and our temporary exhibitions for our audiences. This is at the heart of everything. Everything is around objects.” (Interview, 23/07/15)

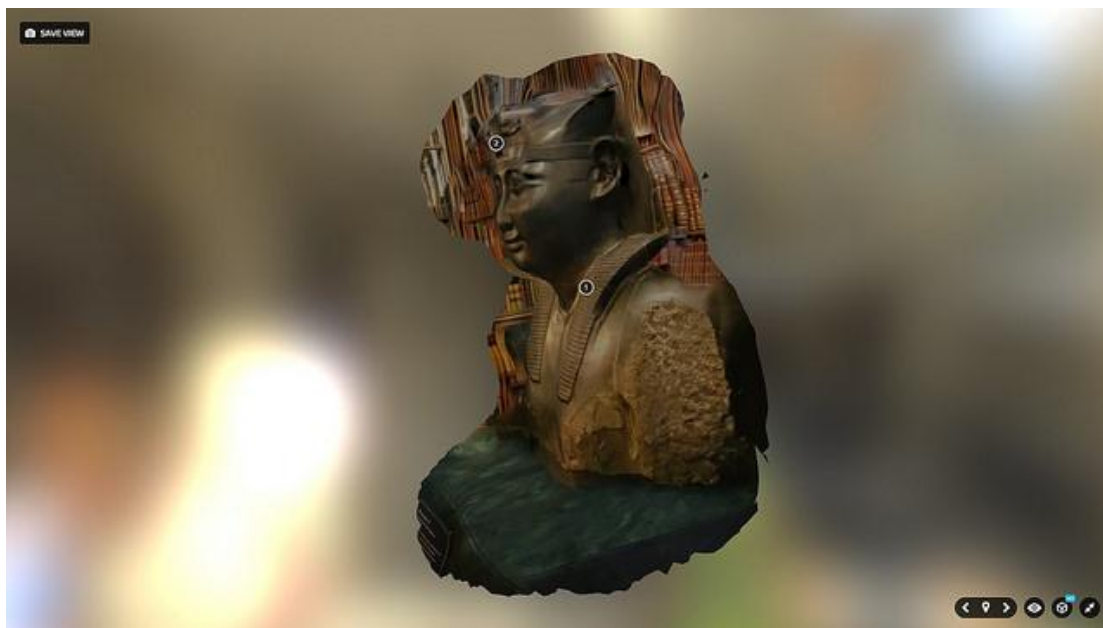
Learning activities explore content related to one or more cultural areas covered by the museum collections. Most sessions focus on a specific culture or cultural area, while some take a comparative perspective to examine objects, events or customs in different areas. For instance, the school session *Clothes from around the world* invites Early Years and KS1 students to playfully examine traditional clothing from different world regions, dress up, and take digital photographs.

The session *Around the world in a day* focuses on objects designed at the same moment in time in five different ancient cultures. Students then choose an object and create a multimedia broadcast about it.

Some cultural areas, in particular Ancient Egypt and Ancient Greece, have a particular appeal for audiences. This is due to the importance and fame of objects in these collections (e.g. Ancient Egyptian objects, mummies and Parthenon sculptures), but also because they relate to subjects taught in the English curriculum, such as History. While the SDDC offers various sessions covering these areas, efforts are made to attract interest towards other areas of the collection as well, linking meaningfully with the school curriculum. For instance, the session *Music of Africa* links to Music and Computing curricular areas for KS1. Children listen to African music, handle and play African musical instruments, and record and edit a short piece of music. At the same time, they are introduced to key topics about African geography and cultural life, getting to examine differences in cultural celebrations in different regions of Africa. Offered since 2009, the session *Symbols and statues in Buddhist belief* managed to attract teachers’ attention towards an area of the collection (Ancient India), which did not have the level of appeal that Ancient Egypt and Ancient Greece had. The session targets the curricular areas of Religious education and Computing for KS2 students. It introduces key concepts about Buddhism and the life of Buddha, as well as building skills in digital video, digital photography and multimedia presentation design.

The range of skills and competences targeted include:

- applied manual skills such as drawing, object design, or playing a musical instrument;
- digital literacy skills, going from abilities to use certain devices and software (e.g. video production, video editing, 3D-animation and printing) to more generic digital and information literacy competences, for instance capacity to review critically, select and employ information for a desired purpose;
- life and career skills such as creativity and collaboration, social interaction and group work skills.



3D model of Egyptian artefact, created during a 3D-scanning session

It is important to state that the SDDC does not aim towards a comprehensive building of skills which can take years to perfect. Sessions are short, compact, and intense moments when diverse pre-existing skills can be honed, expanded, or strengthened. Differently, the foundation for new skills are laid that can be enhanced in future learning engagements.

The skill areas are periodically revised, to keep aligned to social and technological advancements and their impacts on requirements for new skills and competences. To this purpose, the SDDC managers take guidance from published documents by the UK Department for Education, and the Department for Culture, Media and Sport, and the National Endowment for Science, Technology and the Arts (NESTA). For instance, the SDDC was quick to follow up on the increasing interest in design and making, and have begun to explore the challenges of big data.

“We know that big data is going to be a really important area for schools in terms of developing skills for young people to take into the workplace. There is a kind of skills deficit in terms of data visualisation, data analysis and data communication at the moment, and organisations like NESTA and the government are looking to see how that skills gap can be filled. We want to be part of that conversation by testing out a data type of session with secondary school students.” (Interview with SDDC Learning Programmes Manager, 23/07/15)

Alignment to trends does not preclude keeping the focus on the museum’s collection, as one of the learning programmes managers explains:

“Our programme and our learning department is all about deepening engagement with the British Museum collections. So we would only do a data type of session if it was significant, if it helped to achieve that aim, if it helped to deepen engagement with our collections. We think that there is definitely potential there because the museum is a place of data, we have eight million objects, I think maybe two million of those have information, detailed information about them so that's one kind of dataset, and there are all sorts of datasets in the museum, so we think it does have that potential to meet aims of teachers but also enhance understanding of our collections.” (Interview with SDDC Learning Programmes Manager, 23/07/15)

Design principles and strategies

The design of learning activities abides by a series of common considerations and design principles, which ensures that the SDDC educational offer is coherent and consistent with the museum's broader offer and the vision that animates the Centre's activities. These principles are further listed and commented below.

1. an object-based learning framework;
2. learning through participation;
3. modelling activities around audience profiles;
4. catering for different learning styles;
5. technology as tool;
6. experimentation, iteration and constant improvement.

An object-based learning framework

In an object-based learning framework, museum objects are used as links for accessing the vast amount of knowledge about the ways of life, culture, and history of the populations whose traces are present in the British Museum. Objects, therefore, provide a tangible evidence of a historical era, an event, a setting or a character.

This link can be used in several ways in the design of sessions: to drive students' interest and curiosity; prompt them to look closely, examine and investigate the meanings associated with object features and imagery; imagine the use of the object in its original location; or discuss, debate and work in groups to shed light on and interpret its meanings. The focus on objects also inspires rewarding activities that involve content production. For instance, in *Make a mosaic mask*, families can design a mosaic mask on tablets, inspired by Aztec gods, print it and take it home. Similarly, in *Every drawing tells a story*, families look closely at objects from the museum handling collection and create drawings using special software on tablets and smartphones. Sessions using green screen technology invite families to see how it feels to be represented on objects or scenarios that reflect the museum collection.

Learning through participation

Learning activities are modelled following the principles of participatory learning, constructivism and inquiry-based learning theories. Central to these theories is the acknowledgement that learners bring their own knowledge base, assumptions, but also interests and a propensity to learn in a particular way. The theories recognise that "learning is a collaborative activity between the instructor and the learner and that both are bringing valuable tools and background knowledge to the activity. That it is not strictly just the instructor or the teacher teaching, pouring their knowledge into empty vessels." (Interview with former SDDC Learning Programmes Manager, 20/06/15)

In the framework created by these theories, the museum and its educators step back in the role of facilitators, who create the right opportunities, stimuli and tools for learning experiences to happen. The role of the facilitator is essential not in a directive, but in a supportive though not less significant way. Differently from the traditional authoritarian figure of an educator or instructor who transmits knowledge, the facilitator's main part is in "mediating and facilitating some sort of creative response on the part of the young people." (Interview with former SDDC Learning Programmes Manager, 20/06/15)

Activities are designed to encourage participants to explore actively, ask questions, and discover rather than being offered ready-made answers and information. Talking at, and offering ready-made answers are avoided:

“We are very aware that we are not a formal education institution, we are not a school and being a museum education provider means that we are able to play around with those possibilities of how it is best to teach and how it is best for others to learn. So, we would like to get away from some of the slightly more traditional 'teacher stands at the front imparting knowledge'. And of course there is a place for the educator and there are certain elements that do need to go across but we are really trying to examine how we can do that and how it is best to make sure that all different types of learning styles are catered for.” (Interview with SDDC Learning Programmes Manager, 23/07/15)

As one of the facilitators remarks, this approach shifts the focus from the educator to the child, and encourages them to find their own answers:

“It really should follow the children's lead in a way, so that they are involved, that they are making their own decisions, (..) they are actually doing the things and finding out for themselves. (..) And just getting groups to communicate, getting children to work in groups, getting them to find out ideas, getting them to think and questioning is very important. (..) Giving them ownership over what they do.” (Interview with SDDC Museum educator, 23/07/15)

Modelling activities around audience profiles

While object-based learning and the participatory approach apply for all audiences engaged in SDDC activities, the content, activities and the type of engagement are defined and modelled according to the developmental stage and the audiences addressed.

School sessions are conceived as learning activities complementary to the scholarly curriculum. They address a particular school level or Key Stage, and have clearly defined learning goals and outcomes aligned to curricular areas. To ensure that school sessions are aligned to the curriculum, the SDDC team carefully reviews the curriculum for the KS or area targeted. Advisory panels including teachers are also consulted as part of the design process.

While there is a firm link to the curriculum, there is also an important element of novelty: SDDC activities offer new perspectives and approaches, or the opportunity to engage with materials and content that are not available in schools or not commonly used in school learning.

“For schools, what we are looking to do is better serve schools and teachers to help them deliver the curriculum with us. And increase their understanding of how object-based learning can facilitate learning, for them. (..) And with teachers as well, it is about skilling them up and building their capacity to use objects.” (Interview with the Head of Schools and Young Audiences, 23/07/15)

The SDDC also offers school audiences an opportunity to work with digital technology that is often not available on their premises, and help children build digital literacy and digital production skills. Apart from content areas in disciplines such as History, Geography or Religious education, sessions commonly target skills in Computing, ranging from learning video and audio production techniques to designing and producing multimedia presentations.



Fig.34: School children in the galleries and in the SDDC digital studio

At the same time, sessions account for very brief learning episodes. It therefore becomes important to provide some clues for teachers to integrate and follow up on the sessions in their teaching practice. This is done by making online support notes available for teachers, which they can consult before booking an activity. The notes indicate how teachers can prepare for a session, and how they can follow up on a session. Moreover, most activities result in a creative output, usually produced in groups of students. Outputs are sent back to schools in digital or analogue format. These are often examined in the classroom after a session, and in some cases used for events where parents can be invited.

Engagement patterns are also designed differently according to the developmental stage. For instance, hands-on manipulation and kinaesthetic learning are favoured approaches for Early Years students, whereas students in KS1 and 2 have a natural curiosity and are eager to listen to adults, ask questions, and inquire actively into a subject. These inclinations are taken into account in the design of sessions that blend Q&A and inquiry-based content exploration.

Sessions for families are designed to inspire and support learning in fun and engaging ways. As the Head of *Schools and Young Audiences* points out, an important aspect when proposing sessions for families is to make the museum feel like a welcoming space, where families are comfortable about exploring and learning at their own rhythm and in their own style:

“A lot of it is about making the museum feel like approachable. And that families belong here. It is about creating and inspiring delightful sessions for families when they come to the museum. But treating them like an important learner too in their own way. Families learn in different ways, very fun, creative, and aesthetic. In different ways from what people think of as traditional learning in terms of acquiring knowledge.” (Interview, 23/07/15)



Marker scanning during the session Passport to the afterlife, a mobile Augmented Reality trail for families

To do this, sessions are conceived to invite families and young children to try out, get involved in first person, explore the galleries in game-like activities, use recording devices to create digital content, recreate historical designs or drawings, or create their own exploration trails in the galleries. Hands-on manipulation and making are an important component. In the session *Shadow puppets animation*, families decorate puppets in the ancient Javanese tradition of shadow puppetry. Thereafter, they use voice and video recording to create short films with their puppets. Similarly, in *Animate Celtic craft*, families recreate Celtic designs using different materials, and then make a digital animation.

Importantly, sessions are designed to involve the *family as a whole* rather than children alone. Children and adults are encouraged to work, explore, and create together. In more complex activities, tasks can be split among parents and children.

Teen sessions stand out in the SDDC educational offer for the alternative approaches to engagement and facilitation of learning. As a former SDDC education manager explains, teens are at a moment in their life when they question, even defy authority figures, and resent being directed and taught in an authoritative way. They may have little interest in material culture, or what the museum has to offer. Instead, they are much more preoccupied with understanding themselves, struggling to find and express an identity and come to grasps with decisions about their future. In response to these characteristics, teen sessions are designed to take the teenagers' point of view. While they may be less interested in the museum as a venue for access to material culture, teens are interested in the experience that such a venue can provide, especially if it ties in with their interests. SDDC sessions therefore are highly experiential, and give attention to process as much as they do to content.



Motion capture animation workshop for teens

Second, sessions are conceived to link to areas that are interesting for teens and are furthering their agenda rather than imposing the museum’s agenda. For example, in the session *Teens 3D-scanning skills workshop*, teens aged 15 to 18 learn about the use of 3D-scanning in museums, enhance their 3D-scanning skills and make their own 3D scan. In the session *Teens timelapse animation skills workshop* teens aged 13 to 15 learn to use stop-motion animation software under the guidance of a professional animator, working to animate clocks in the British Museum’s collection.

Thirdly, facilitation is modelled on a master-apprentice type of interaction that was found to be particularly rewarding for engaging teens. Recognising the developmental stage where teenagers are, they are looking to make connections with adults not as instructor and student but as almost like master-apprentice. They want to see adults who are engaged in activities that the adults find truly satisfying, people who are passionate, creative professionals who are passionate about their work:

“And through an encounter, and ideally through some sort of making or creating, again participatory learning experience, teenagers then come to recognise, come to learn something about an area of the creative arts and particularly the way in which creative arts practitioners look at the world and see the world that they hadn't before.” (Interview with former SDDC Learning Programmes Manager, 20/06/15)

Catering for different learning styles

One of the advantages of using digital technology in a participatory learning paradigm is that activities can be designed to support different learning styles:

“Participatory learning is about creating, facilitating, making with the assumption that learning happens through that type of engagement and participation. That type of learning better applies to different learning styles as opposed to only supporting verbal learners who are often favoured in schools and in school curriculums, because so much of school learning is focused on reading and writing and reports. The nature of school work very often prejudices the verbal learners. Whereas the moment you come out of the classroom, in any context, there is suddenly the possibility and opportunity to engage learners that have different styles.” (Interview with former SDDC Learning Programmes Manager, 20/06/15)

Many SDDC sessions offer opportunities for engaging with learning content that emulates Kolb’s experiential learning cycle (2015/1984, see Section 5.1). For instance, some school sessions are designed as a combination of gallery-based observation of objects, guided by games, quizzes and digital content capture; and studio-based work in which students manipulate, edit and compose multimedia artefacts drawing on their experience. These sessions are designed to offer opportunities for children to engage with learning content in different ways along the experience continuum, often repeating or going to the same piece of content or material and handling it from different sides, for instance: observing an object, learning about the history of the object through a video, recording stories or impressions about the object and back to the studio creating multimedia narratives or posters about that object.

SDDC sessions also support alternative learning modalities, and in particular visual, kinaesthetic, and social learning. Sessions are periodically reviewed to make certain that different learning styles are accommodated:

“For our school sessions we have done another process of review just to make sure that different ways of learning particularly social learning are integrated. So if there was a session that we felt maybe there was too much of a focus on the teacher talking to the whole group, we would then kind of sub-divide it and develop it so there was more group work integrated. So say you were a student that learns well by themselves, or you were a student that learns best in pairs, or one in a group of four or five. You would have the opportunity to learn that subject in all of those different social settings.” (Interview with SDDC Learning Programmes Manager, 23/07/15)

Social learning is supported in most learning activities that have a component of group work related to either exploration, making and building together, or debate and discussions on the outcomes of creative activities.

Particularly rewarding is the use of Augmented Reality (AR) technology for visual and kinaesthetic learning. AR interaction motions close attention to space and objects – real and virtual – and through different challenges and games encourages the user to identify shapes and layers, match parts, complete an image, or decode symbols and graphics. For instance, the AR app *A gift for Athena* is used by KS2 students to explore the Parthenon sculptures interactively and playfully.

Different games and challenges are embedded in the app which appeal to the visual sense and processing of visual information: for instance recognising the different layers in a Parthenon sculpture, or matching a sculpture to its place in the Parthenon architecture (see *Text box 4* below).

Technology as tool

Digital technology is central to Samsung Centre's educational offer, yet its integration is never motivated by the mere intention to use a new device, software or app. Technology is used strategically as a tool to enable new ways of engaging and interacting with the museum collections. The emphasis is less on the technology *per se*, and more on the interaction styles it affords and how these can be integrated in the design of learning sessions that encourage participants to ask questions, examine and learn about the collection. As the Head of *Schools and Young Audiences* remarks, "digital should work best if used where it is best, where it can enhance sessions. And we know what digital works well for, for instance collaboration, co-creation, for sharing, for differentiation and personalisation of learning. So we should be using it where it is strongest for our audiences." (Interview, 23/07/15)

Digital interaction and mediation are particularly rewarding when employed in a framework informed by constructivism and participatory learning. Technology then becomes an actor in an experiential learning framework where teachers or instructors become facilitators, and students take the lead in pursuing and leading their learning experience through inquiry, exploration and making.

Experimentation, iteration and constant improvement

The SDDC configures its educational offer dynamically to respond to the social mission of the museum, relevant trends in society and education, and the evolving needs of its audiences. The instructional design is informed by *Lean and Agile* methodologies, both of which are swift, responsive, and have iteration and constant improvement at the heart of their approach. Lean methodology is customer-centric, emphasises the importance of delivering value defined from the customer's point of view, simplicity in working and eliminating unnecessary workload or product features (termed 'waste'), and a constant drive towards perfection through iteration. Agile development methodology advocates product development in short work cycles, called iterations or sprints, providing a chance to periodically assess goals against the progress made and thus make the development process responsive in real time to factors and challenges not evident at the start.

Inspired by these methodologies, the SDDC approach to design is responsive and dynamic. When first offered, learning sessions are iterated a few times, and feedback is integrated from participants until reaching a formula that meets expectations. Once sessions are integrated in the regular offer, they continue to be improved. At the same time, they also have to account for a series of constraints, especially for schools. Since school sessions are advertised online and accompanied by support notes that describe them in some detail, they cannot be updated very often. The team may gather feedback and even re-design sessions, but except minor changes they will have to wait until the end of the school year to implement significant changes. As different from school sessions, the family sessions are not dependent on a curriculum, have fewer design constraints and can be changed more often. They are rolled out every two months, and there is greater space for experimentation and updating.

Feedback for improving sessions is gathered through evaluation and the observation of sessions by SDDC education managers. The main means of evaluation is through forms filled out by teachers at the end of a session. Several other means have been used in the past to gather feedback, for instance gathering the opinions of older students, or examining the artefacts produced by participants.

At the moment the SDDC education managers are looking to change and improve their evaluation methodology. One goal is to introduce evaluation as part of the session itself, embedded in the learning experience. There are plans to also do evaluation with the students involved on a larger scale.

To be able to make good use of technology and respond to social trends, it is important as well to be on the look out for the way technologies are used in education and social life outside the museum. New technologies and interaction styles that are attractive to target audiences are reviewed to ensure that the way the activities are designed speak the language of the audience addressed, and present an appeal:

“We should also be learning a lot, digital is so much part of our everyday lives now, it's how we communicate, it's how we interact with each other. I think museums need to really understand how technology is used outside of museums as well, how people are interacting with a particular technology. How do social media work for families, and how is that translated in a museum context? I think this is really important to understand, to be able to use those kinds of similar techniques, but within the museum.” (Interview with the Head of Schools and Young Audiences, 23/07/15)

5.4.3 Modelling digital interaction for object-based learning

Digital interaction patterns

In the SDDC approach, technology is used as a tool in a learning framework that is defined jointly by:

- focus on the collection, therefore aligning with an object-based learning framework;
- constructivist, participatory learning and inquiry-based learning theories.

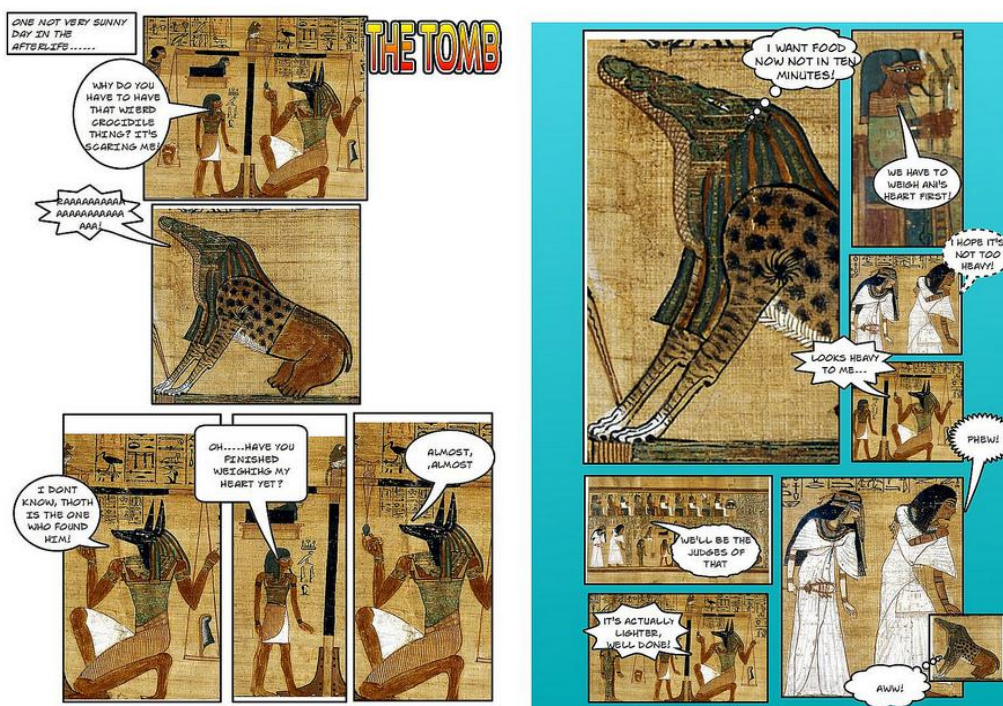
The definition of learning goals, learning content areas, and skills development targets thus contributes to configuring a structure in which digital interaction patterns are integrated. A series of key digital interaction patterns have been distilled from the SDDC experience. They do not exhaust the range of interaction patterns used in learning activities, which is configured dynamically and refined through experience and integration of different technologies. Rather, these patterns are used to examine how technology is used concretely as a tool to support a certain activity (e.g. gallery exploration), a learning style (e.g. visual learning) or bring about a learning outcome (e.g. collaborative skills). Most learning activities employ several of these patterns, blended in frameworks with clearly stipulated learning goals. Patterns are listed in no particular order, though the first two – *creative engagement* and *digital content visualisation and exploration* tend to be among the most widely employed and versatile patterns. Technology as tool for:

1. creative engagement;
2. digital content visualisation and exploration;
3. guided gallery trails;
4. visual learning;
5. collaboration and social learning.

1. Creative engagement

When using technology as a creative tool, there are two essential moments that can be modelled into learning experiences: capture and creation. *Capture* refers to the production of digital content through a variety of means, including voice recording, digital photography, video recording, etc. It can also involve students recording themselves or being recorded when engaging in a performative context or a making activity such as drawing. Capture brings value to learning both as process and product. The process of capturing, like in recording one’s voice, or taking digital photographs of museum artefacts, heightens the level of attention and engagement, more so when capture moments are integrated in more complex tasks, for instance gallery trails structured through games and quizzes. The product, the digital artefact created, offers a way of keeping track of the experience, it provides a record which can be used in different ways after the capture moment: it can be kept for memory, examined to understand the experience better or look closely at the objects captured; or it can be manipulated and edited to produce an elaborate multimedia artefact.

Creation refers to the manipulation, editing, and composition of digital content. It can be done with ready-made media assets and digital content, or with content captured by students themselves, or by someone else recording a student activity. Creation activities are very varied, and both ask for and enhance different skills, ranging from audio editing to video editing and abilities to use a digital authoring tool. Some creative sessions aim to impart skills in using specialised software or hone advanced digital editing competences such as 3D-scanning or 3D-animation.



Comics created with imagery from Egyptian tombs

The capture-creation pattern is used in several SDDC sessions as a framework for blending gallery exploration with studio-based work – a macro-structure for session design, which has proven repeatedly to be one of the most effective formats for engaged learning.

Text box 1. School session Symbols and statues in Buddhist belief (KS2)

The full-day workshop *Symbols and statues in Buddhist belief* (formerly called *Multimedia Magic*) links to the KS2 curricular areas of Computing (making a multimedia presentation) and Religious Education (reflecting on spiritual issues). The session introduces themes related to Buddhism and the life of Buddha and aims to build skills in digital photography and video and making effective multimedia presentations.

The session is modelled around a capture-creation framework, bringing together guided gallery exploration and studio-based creative work. Students gather in the Ancient India Gallery to receive a brief introduction to the themes and activities of the day, and then split into groups and use a tablet computer to explore the gallery in a structured way. A multimedia presentation on the tablet provides children with information about the life of Buddha and Buddhist religion and prompts them to engage in different activities, working in groups. The tasks on the multimedia trail prompt students to look closely at objects, in order to identify those that resemble pictures in the presentation. Different content capture tasks are included: making an audio recording about one's favourite Buddha; working in pairs to make a video about generosity and being generous; analyse the Buddha's smile and take pictures of each other trying to smile like the Buddha; and making a video of a Buddhist stupa while circling it.

Once the digital content is captured, students break for lunch and reunite in the SDDC digital studio. The afternoon session starts with a debriefing on the morning activities. Students discuss the concepts and the objects that they have explored during their gallery visit. They receive a crash course in using the multimedia authoring tool *Glogster* and then work in groups to build a multimedia presentation using the media assets created during the morning. Two-three presentations are screened at the end of the session, and all outputs are sent to schools after the session (read a detailed analysis of this session and its learning impacts in Doll, 2012).

2. Digital content visualisation and exploration

Digital technology is particularly rewarding for object-based learning, as it enables different ways to recreate or evoke context around the objects studied. Digital media can be used to portray historical reconstructions of the object in use, picture its original environment, or portray stories and events that link to the object. The exploration of digital content can be done on different devices, and integrated in individual and group work, or for whole-class activities in the case of schools. In the SDDC, digital content is delivered in the studio via 3D television, laptops, and a smartboard, and via mobile technology (tablets and mobile phones) during gallery visits. An effective way to use digital content exploration is to integrate small snippets of information especially in audio-visual format in more complex tasks and activities which prompt students to take action and capture, create, or examine something closely, or discuss in groups what they have seen and understood (see *Text boxes 2 and 3*).

**Text box 2. School session Decoding Ancient Egyptian tomb painting (KS2)**

Formerly known as *Life after death in Ancient Egypt*, this session explores Ancient Egyptian beliefs about the afterlife, and the themes of life after death, the afterlife, and the Ancient Egyptian burial practices, using imagery from Nebamun's tomb, displayed in the British Museum's Ancient Egypt galleries. The session compliments the KS2 curricular areas of History (Ancient Egypt), Computing, and Citizenship (reflecting on spiritual and cultural issues). The session lasts for 90 minutes and is held in the SDDC digital studio. While it does not include a visit to the Egyptian galleries where Nebamun's tomb paintings are displayed, teachers are encouraged to take students to see the paintings before or after the learning session.

Activities blend elements of inquiry, exploration, digital media manipulation and content creation:

- Inquiry-based exploration of subject matter: A 3D-animated film about Nebamun's life and slides from the tomb paintings are used as triggers to challenge students to explore the themes of death and the afterlife, linking to their own experience. Visual Thinking Strategies are used by the facilitator to encourage students to explore, decipher and put forward their own interpretation of the paintings.
- Close-up visual examination: students work in groups to explore and find clues in the paintings, using mobile devices.
- Crash course for learning to use a multimedia authoring tool: Students are taught the basics of using a multimedia authoring software – *Comic Life*, for making comics from images.
- Digital media manipulation and content creation: Students work in groups of two or three (arranged by their teacher) and use visual media assets and pictures of themselves taken during the session to create their own version of the afterlife. Laptops or Samsung Galaxy tablets are used.
- Sharing the creative output: during the session given the short timeframe only one or two groups get to show their creative output to their peers. However, creative outputs are sent out to schools after the session, both in digital and hard copy formats.

3. Guided gallery trails

Learning sessions that are partially or entirely held in galleries often employ a thematic structure that prompts participants to follow or create a path through the gallery. Guidance can be provided through mobile devices, either tablets or mobile phones (e.g. by means of Augmented Reality apps or other apps, multimedia presentations that structure a path with tasks and activities) or by combinations of paper worksheets and mobile technology (e.g. using the mobile device to get prompts on objects to examine and tasks to complete, and then marking results on a paper worksheet). Activities blend digital and social interaction and can include: examining closely and photographing objects; identifying objects looking at pictures on the screen; recording oneself or one's peers while speaking about a related subject; quizzes about content delivered through an app; game-like social activities using prompts or information delivered through the app, etc. (See *Text boxes 3 and 4*)

Text box 3. Mobile app for the temporary exhibition *Hajj: Journey to the Heart of Islam* (KS3-5)

Designed as a learning activity for the temporary exhibition *Hajj: Journey to the Heart of Islam*, this session linked to the KS3-5 curricular areas of Religious education, History and Islamic art. The learning aims were to enable students to understand the importance and the process of Hajj in Islamic religious thought through an experiential approach.

A native Android application was designed and developed in-house and delivered on a Samsung Galaxy smartphone to guide the exploration of the exhibition. The trail lasted for 60 minutes. Each student was provided with a Galaxy phone, but throughout the trail there were many occasions for group work and collective interaction. The app guided students into a personal journey that followed the steps of the Hajj, the pilgrimage to Mecca, along seven stages: Motivation; Preparation; Journey; Being together; the Ka'ba; Rituals of Hajj; and Impact. This structure traces the journey of a Muslim pilgrim, starting from the call or motivation to visit Mecca, and going through the ritualised activities that have to be followed throughout the journey. The emulation of this journey was an important element for involving students in first person, and evoking the experience of 'being there'.

For each of the seven stages, activities blended exploration of multimedia content delivered through the phone with a variety of tasks and activities, both analogue and digital, that students undertook individually and in groups, and including:

- *Preparation*: Finding in the gallery images that they had to take with them as pilgrims to Mecca, and photographing them. Listening to a prayer in Arabic and then recording it reading aloud the English transcript.
- *Journey*: Teaming up in convoys to take different routes to Mecca, and drawing a *Mahmal* (ceremonial palanquin) on the smartphone.
- *Being together*: Watching videos of pilgrims to Mecca, speaking about sharing and eating together. Role-playing in groups.
- *Rituals of Hajj*: Students had to re-enact rituals using the phone or moving through the gallery. For instance, for the ritual *Sai* they had to correctly identify and mark on their screen the audio-guide numbers of seven objects. Once the task was completed, the reward was seeing the *Zamzam* ritual bottle be filled with sacred water. For the ritual *Stoning the pillars*, students were asked to choose seven negative qualities out of a list, which they would like to give up, and then simulated on their phones throwing pebbles to pillars for each of the seven negative qualities, which made them disappear.

(Read a detailed analysis of this session and its learning impacts in Von Aesch, 2012)

4. Visual learning

Looking closely at objects is important in an object-based learning paradigm. One of the disadvantages of using digital technology is that it often detracts attention from the object, motioning it towards screens and devices. Some digital interaction activities however are designed to respond to this creatively, and instead make students more attentive to objects.

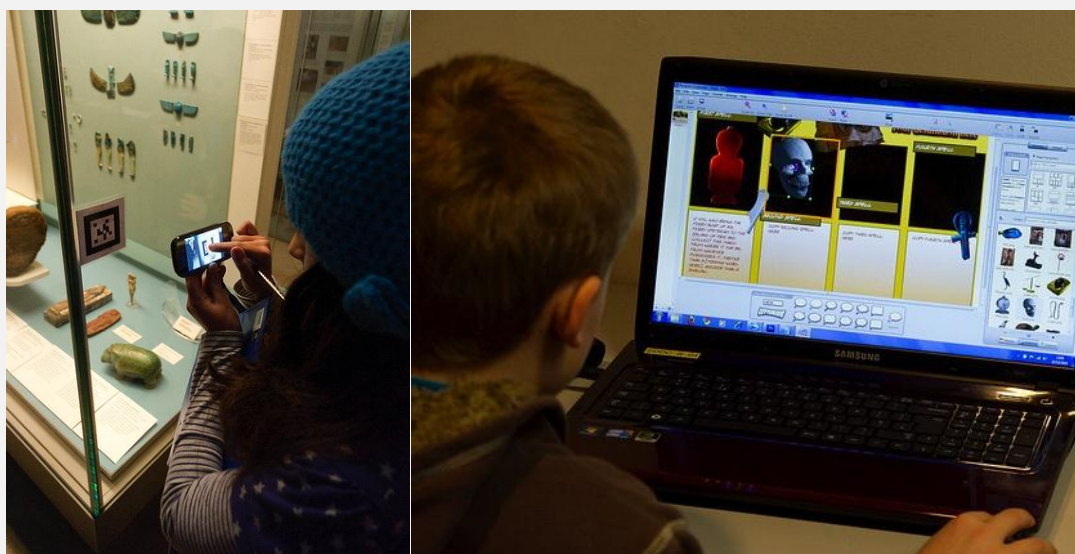
For instance, in some activities students are prompted to identify objects in the gallery that match the pictures displayed on mobile devices, or engage in physical interactions inspired by object characteristics. In the session *Symbols and statues in Buddhist belief*, pairs of students are encouraged to examine the facial features of Buddha statues and try to imitate the expression and smile while taking pictures of each other. AR technology is particularly rewarding for bringing visitors closer to objects. In the teen programme *Cultures in Contact*, AR technology was employed in a learning framework in which teens were first engaged in doing research around objects in the galleries, and then making short movies based on the gallery activity. AR was used to find objects in the museum, and then visualise animated 3D cubes and pictures of objects superimposed on the real objects located in the gallery space, through the live view mode of the *Junaio* AR browser. The live view mode appeared to be one of the most attractive features of the activity, keeping participants immersed and engaged. Similarly, seeing a combination of virtual objects on the screen and real objects in the gallery added to the learning experience (See more in Mannion, 2012; also *Text box 4*).

Text box 4. Augmented Reality trails and games

Since 2010, The SDDC experimented with the use of AR in the galleries. Different interaction modalities were tried out: marker-based AR (scanning printed markers to reveal objects on screen); location-based AR; and displaying virtual art during gallery exploration.

Passport to the afterlife is a family activity that challenges participants to decode spells from the Ancient Egyptian Book of the Dead. AR interaction is integrated in a two part structure:

- Families follow a trail in the Egyptian galleries with Samsung phones provided by the SDDC. They identify and scan printed markers to reveal 3D objects on the mobile phone screens. The objects represent hidden words from spells, which they collect by means of a paper worksheet.
- The information gathered is brought to the digital studio, where families are assisted to create a digital poster with spells from the Ancient Egyptian Book of the Dead.





Marker scanning, computer-based creative work, and digital poster developed during the family session *Passport to the afterlife*

Talking objects: Museum as object (December 2010) involved 15 teenagers in designing their own trails through the museum. After being taken on a tour by a historian, teens split into groups to design and build their own thematic trails and populate them with content through images, text and video. AR technology was used to reveal content by scanning markers, similar to *Passport to the afterlife*.

A gift for Athena is a mobile app created by the SDDC with the games company Gamar. The app (available for both Android and iOS) uses AR to enable students to explore the Parthenon galleries. A formal activity for schools is designed using this app, which is self-led and addresses KS2 students. The app provides an introduction to the annual Panathenaia festival, which celebrated the birth of Athena. The game invites students to be part of the festival procession. Through game-like activities and challenges, they explore the architecture of the Parthenon and the location and meanings of the sculptures. AR is used to help participants discover parts of the Parthenon that are not visible, or examine sculptures attentively. For instance, the *Silhouette* challenge (see vimeo.com/95501915) asks students to pay attention to the shape of a sculpture and how it fits in the building pediment. The students see an empty silhouette of a sculpture, and need to find the real sculpture in the gallery. Upon finding it, they are given more information about the sculpture. In the *Collecting* challenge (vimeo.com/95471372), players look for objects from the Parthenon frieze, helped by clues. Once they find an item, children have to scan it and if this proves to be correct they can see a reconstructed version of the item displayed on their screen.

5. Collaboration and social learning

Several collaboration patterns are afforded by digital media, or by combinations between digital and analogue media. Most SDDC activities have students work in groups at several stages during learning activities. They can, for instance, be teamed up around a single device to explore objects in the gallery (e.g. *Text box 1*) or work in teams to simulate a journey, each with their own mobile device (*Text box 3*). Working in teams serves to cultivate skills for teamwork and collaboration, as well as social interaction skills.

Grouping and group activities have different dynamics depending on whether activities are designed for families, schools or teenagers. In families, the tendency is for children to take centre-stage, while parents happily become facilitators. As Mannion (2012) remarks, this means that digital-analogue activities such as combined phone/tablet and paper worksheet activities can work well, as children tend to handle digital devices and parents can support them by completing worksheets or doing other activities that keep track of or support the child engaging in the digital activity. This can be more challenging in school groups or among teens, where controlling the device can be coveted. Research done at the SDDC suggests that to ensure smooth cooperation groups should be small (maximum 3 members) and in school activities friendship groups work better than ability groups:

“In friendship groups – and this happens with families too, people within the group are happy to take on roles, to facilitate a kind of holistic experience, the group making progress towards its goal. (...) Parents are happy to take on the role like recorder, wherein they are recording information onto a worksheet, which is much less exciting than carrying the mobile phone and scanning the objects using AR. But parents are happy to do that because they recognise that they are trying to cooperate with their family members or companions in order to accomplish something together. In friendship groups this is similar. People take on roles much more willingly, which then facilitates the learning activity.” (Interview with former SDDC Learning Programmes Manager, 20/06/15)

Dealing with technical challenges and the unexpected

The experimental approach to designing learning activities means that the limits of technology are constantly tested. This sometimes results in challenges at several levels – technology management, budgeting, maintenance, running, or practical issues with digital interaction arising during the implementation of learning sessions. The solutions and ideas to work around these challenges and move projects forward, prove that creativity and a clear sense of purpose are key ingredients for ensuring successful delivery of digital learning sessions. A few examples will illustrate these points:

Mix resources for the best outcomes: When working on a new projects, it is important to have a clear idea about learning priorities, and how different resources can support the learning outcomes of the session. The AR session *Passport to the afterlife* integrated AR interaction into a family activity, combined with using low technology (paper worksheets) and a multimedia publishing task at the end. The session included using bespoke animated 3D objects that would be revealed through marker scanning in the galleries. In addition, models were acquired online and adapted by a freelance animator. Programming was done in-house and a free AR browser (*Junaio*) was used for web hosting.

Solving creatively technical constraints or failures: A common issue is raised during sessions that require streaming in the galleries. While at present (Winter 2016) the British Museum has introduced free Wi-Fi connection in its galleries, in the past streaming had to rely on 3G connection, which was poor in some areas of the museum.

Solutions were found by limiting the sessions to gallery areas that had a strong signal. Preloading content on mobile phones before an event such as a gallery trail is another solution (Mannion, 2012).

The project *Cultures in contact* aimed to use location-based AR, however this was challenging because GPS positioning was not possible in the galleries. Instead, a hybrid approach was used – markers were scanned by participants to mark their position in the gallery and trigger the visualisation of virtual objects on Galaxy tablets overlaid on objects in the gallery. This solution had its own challenges, as once the user’s position was signalled, the virtual content displayed was anchored in that position, and did not adapt to the user’s movement. The team solved the issue creatively by marking a colourful spot on the floor as the scanning position, and placing volunteers who could advise and assist teenagers explaining how it all worked.

Accounting for group dynamics in replicating digital interaction patterns: Some session aspects or technical features are spontaneously liked or disliked by different audiences or participants. When replicating engagement or interaction patterns, responses can be different. For instance, in *Passport to the afterlife* the combination of smartphone and paper trail worked well with families: typically children managed the phone and scanned markers, and parents followed up and marked the collected objects on the paper worksheet. In *Cultures in contact* the same combination digital device – paper worksheet was tried out in a different and more complex learning framework, and using tablets instead of phones. Questions about objects were displayed on tablet screens, while answers had to be jotted down on paper worksheets. In this case however, the intended purpose of the worksheet and tablet were confusing for teenagers, and issues were raised by collaboratively managing the task. This case was illustrative for how diverse audiences respond differently to similar interaction patterns, and pointed to the importance of carefully considering group dynamics in the design of sessions.

5.4.4 Shaping a culture of lifelong learning for young audiences

“For the first time in history, education is now engaged in preparing men for a type of society that does not yet exist.” (Faure, 1972: 13)

Underpinning this study has been the idea that a culture of lifelong learning dwells on two essential components. First, the willingness and commitment of the individual to lifelong learning, and second, the provision of a diverse “ecology of learning opportunities” (Sefton-Green, 2013:5) or “learning resources” (Knowles, 1981: 135-136) – formal, non-formal and informal. Bringing these two together is a matter of bridging and connecting among different actors in the educational landscape and among these and the lifelong learner. Ultimately, the learner is central in these processes: whilst presented with a variety of formal, informal and non-formal learning opportunities put forth by various institutions, each individual configures their own learning ecology, creating connections between the various offers according to personal needs, goals, interests and preferences (Sefton-Green, 2013). In this perspective, the contribution of the SDDC to lifelong learning can be seen along two axes:

1. Responding to the needs of and connecting to the lifelong learner. This can be done by catering for key competences for lifelong learning through targeted programmes, but finds its most rewarding expression in forging a bond or connection with the learner, creating an openness towards (museum) learning that can lead to numerous and evolving learning opportunities throughout one’s lifetime.

2. Bridging, connecting to and complementing the work of other actors in the educational landscape, notably formal education institutions. A very important aspect in this respect is cultivating and spreading innovation that reverberates across the formal, non-formal and informal learning continuum.

These points are further unpacked below.

Shaping key competences for lifelong learning

SDDC activities contribute to cultivating key competences for lifelong learning, which can be related to the framework endorsed by the European Commission (European Parliament, 2006).

Communication competences are at the heart of learning activities. Students are required to express and communicate ideas, explain or defend them, communicate well within the group to ensure they are producing a meaningful output, present their work in front of their peers, etc. Through some activities they also learn to develop messages and communicate them through digital media, or visually. Activities also encourage participants to engage with ideas, content and material that represent diverse cultural viewpoints, therefore enhancing their capacity for intercultural understanding.

Digital competence. Activities hone information and media literacy skills. Information literacy covers the abilities to access information rapidly, evaluate critically the accuracy and relevance of information, and identify the adequacy of information sources. SDDC activities cultivate these abilities through different strategies, and especially by creating learning moments when participants have to look for information, arrange, or manipulate it to craft a multimedia artefact. With respect to media literacy, learning activities may cover both media analysis and creative media production. Students learn to use digital as a tool to look for, assess, or communicate messages and information.

Learning to learn. The way the programmes are designed encourages learners to take initiative and responsibility for their learning. Learning activities are not formally tested. Rather, students are asked to use the knowledge in immediate follow-up activities that require their utmost attention. Students not only have to pay attention, but also to be quick at converting and interpreting information. This contributes to teaching them to lead their own learning activities, and see quickly how learning has an immediate, tangible use.

Social and civic competence. Sessions hone social and collaboration skills: Most learning activities require participants to work in a group at some point. The dynamics of group work differs according to the audience involved and the type of activity, e.g. exploring galleries, examining objects, capturing media, or designing a multimedia presentation. In all cases, however, members have to work together for a shared goal. Each member may contribute differently towards this goal, some may have a more exciting part to play, and others a support role. Yet by learning to commit to the successful delivery of a shared output, students also commit to playing their part well, and supporting the others' contribution. They learn that what their team members do is just as important as their own part for the outcome to be achieved. Moreover, some sessions introduce specific subjects, themes and terms related to citizenship and civic life, looking at historical examples from nations such as Ancient Greece or Ancient Egypt.

Sense of initiative and entrepreneurship. Several competences are cultivated in here:

Creativity and innovation skills: Participants are encouraged to think creatively and act on their ideas. Most learning sessions include a hands-on creative component where students are asked to ideate and produce a (digital) output that can be a video piece, a multimedia broadcast, a poster, a multimedia presentation, etc. Seeing a tangible result of their efforts enables them to link between ideas and the practical implementation of their ideas.

Critical thinking and problem solving: Learning sessions ask participants to engage with, rather than merely receive, information. Information is provided as a result of their inquiry, can be debated in the group, or becomes the foundation for a creative activity. In order to go about with creative tasks, participants have to examine closely, dissect, question, reframe and complete the information available. This encourages them to think about data and information in a critical way, ask questions, debate, and recognise their own role in producing and circulating information. Some sessions are designed to hone problem solving and investigation skills. In the session *Museum investigators* students learn about techniques used by museum scientists to examine objects. *Roman Britain treasure challenge*, which is conducted via video conference, is designed as a series of challenges about archaeological finds that students have to complete while working in teams, going from choosing the tools to use for archaeological excavations to decoding Roman coins.

Time and goals management: The nature of the SDDC activities is that they are short and contained yet have clearly set goals, often resulting in the production of a creative output. Having a clear sense of purpose encourages participants to make the best of the time available, and acknowledge the importance of setting goals to drive their work.

Cultural awareness and expression. The British Museum offers learners the possibility to come into contact with historical representations and objects from diverse nations and cultures, expressed through different ways of thinking, celebrating, expressing and creating. Moreover, sessions invite learners to articulate a creative response: not only to absorb information about the represented cultures, but to engage with knowledge, relate to their own experience and construct meaning from their engagement, often expressed through the design of an artefact.

The degree to which these educational outcomes are attained has to be examined, however, in the right light, mindful of the fact that the SDDC learning experiences are one-off engagements. They are intense moments integrated in very diverse life and educational journeys. Whilst sessions have precise targets with respect to knowledge and skills to be cultivated, they are not aimed to build knowledge and skills in a definitive way. They are orientated towards harnessing and strengthening existing knowledge and skills, providing basic coverage for new skills, and especially opening up perspectives and directions for learning, settling bases on which students and teachers can build further.

Engaging the lifelong learner. One of the most elusive yet significant impacts of the SDDC is the creation of a relationship or a connection with lifelong learners which can be enduring and rewarding beyond one or two visits with one's family or school. By engaging in a learning experience perceived to be inspirational, creative, immersive and worthwhile, children are prone to develop a positive connection to the museum and likely to come back in later years. As a former Learning Programmes Manager remarks:

“Having a positive first experience at the museum establishes an absolutely crucial connection, it plants a crucial seed, which means that children are much more likely to establish a lifelong learning relationship with the museum as a place for learning. If they have been through a really enjoyable digital learning experience, then children who wouldn't ordinarily form a positive view of the museum develop a positive connection and therefore they are much more likely to go to a museum in the future. It sows the seed for them to see the museum as a place for them and as a source and a venue for informal learning, even when they become adults.” (Interview with former SDDC Learning Programmes Manager, 20/06/15)

For nurturing this connection, it is important to make participants feel comfortable in the museum premises and encourage them to “develop a sense of entitlement and a sense of ownership of the museum spaces so that they felt comfortable enough to come back at the museum at some point in the future saying 'I know this place, this as much my place as it is the curator's place, or the creative practitioner's place. This is as much my space, my place, as a member of the community, as it is these adults'.” (Interview with former SDDC Learning Programmes Manager, 20/06/15)

Bridging informal, non-formal and formal learning

Schools are important audiences for the SDDC: The Centre receives around 10,000 combined family and school visitors every year. In the first four years of operation, it received around 5,000 students per year. Recently, the efforts to expand the outreach for school audiences raised this figure to 7,500 students reached in the academic year 2014/15. The Centre is seeking to expand its school outreach further. Evaluations carried out with teachers throughout the years reveal a generally high and very high level of satisfaction with the sessions. In addition, the growing request for SDDC sessions by schools is in itself an indication of the satisfaction of the teachers and learners involved.

Activities bridge and complement formal education in several ways: Firstly, by cultivating content knowledge and skills as described above. For school audiences, digital literacy skills in particular are becoming increasingly important, as technology-related subjects are being added or expanded in curricula. Secondly, by committing to offer harmonious, engaging and satisfactory experiences for learners. These experiences carry with them the seeds that can be further exploited in future learning, whether for knowledge, skills building or following up on a passion that is discovered or ignited in the museum premises. Part of it is encouraging participants to come up with a creative response, a personal reaction and expressive output which indicates that the learning experience has left a trace in one's memory:

“The creative response is about process and not about outcomes, not about the result, but also not necessarily about the content. Although this is technically supposed to be about the object or around the object, ultimately there has to be freedom within that. (..) And that has to be a legitimate learning outcome. (..) Equally if it is very difficult then to say that the way that they have engaged with the content may not come out in the creative response they do within those five days, this does not mean to imply that they might not come back to it at some point later in their lives. The fact that they have worked with content from the museum, they have worked with an object, and they have done it in the museum space, this is actually a really crucial point.” (Interview with former SDDC Learning Programmes Manager, 20/06/15)

A memorable experience then provides a link, a trace that can be followed up, as an education facilitator remarks:

“They will definitely think back to it. Some schools come in at the beginning of their topic, some will come in the middle, and some will come at the end. If they come at the beginning they would use this in so many ways. Because school trips are the things that hopefully excite the children more than anything, get them thinking differently, they are outside of their normal surrounding which I think instantly makes it more memorable. So I think we've got a really important job to make that topic or that area exciting for them. That they then can go off and learn a bit more either in class or independently as well.” (Interview with SDDC Museum educator, 23/07/15)

Feedback volunteered by teachers who had attended SDDC sessions with their classes reveals that learning experiences are often continued in the classroom, especially by examining and showing the creative outputs produced by students during the sessions. In some cases artefacts are shared throughout the school, or even led to organising events where parents were called to view them.

Thirdly, an aspect to consider is the impact that such short engagements may have on teachers' practice. For many teachers, the SDDC provides the opportunity to offer their students a learning experience that cannot be accommodated in school: the museum space itself and the richness of artefacts and stories, the technologies used, but also learning approaches that may not be used by teachers in their day to day teaching life. These experiences provide a flavour of effective learning that can be done differently from traditional education, and may impact on teachers' practice in unexpected ways. SDDC managers are fully aware of the potential their sessions have on instilling innovative ways of thinking and teaching. A potential link to teachers' practice is again represented by the last part of sessions with a creative component: after students groups finish their artefacts, two to three groups will have the occasion to show their work to the class. Even if it is just a small number of students whose work will be presented, this is a way to model the activity for the teacher. If willing, a teacher can follow up in class and use this model to create an occasion for sharing digital artefacts with the class and discussing upon them. The SDDC therefore provides unobtrusive but powerful ways for innovating teaching practice.

Cultivating innovation in informal learning

Within the British Museum, the SDDC was conceived in the first place as a venue for innovative learning, prone to come up with novel ways of providing access and engagement with museum collections. The driving engine for constant cultivation of innovation is the partnership between a cultural institution and a technology company.¹⁶⁴ One of the rewarding aspects of the partnership is that constant improvement, evolution, and experimentation are afforded by the provision of latest technologies. While, as remarked above, technology is not the end point in designing and delivering learning experiences, all the achievements of the Centre are possible due to the availability of technology, which provides the affordances around which new content interaction patterns are designed.

¹⁶⁴ The partnership between the British Museum and Samsung Electronic has been shortlisted for or awarded several awards:

35th annual Arts & Business Awards - Long Term Partnership Award (2014);
 Mobile Entertainment Awards – Best Augmented Reality Campaign (2014);
 UK Sponsorship Awards – Best Education and Learning Sponsorship (2015).

The SDDC educational offer can be regarded as innovative from several angles:

- Design of learning experiences that offer elements of novelty in the way they combine participatory learning approaches with skilful integration of digital technology. An important aspect is how these sessions support different learning styles often not privileged in schools such as visual, social and kinaesthetic learning.
- The type of content knowledge and skill areas covered, which are defined and re-defined in a responsive way following societal trends, whilst often school curricula are lagging behind.
- New ways of interacting with content and new digital interaction styles. These are often afforded by using new technologies, from AR to 3D-printing.

Innovation is spread starting with the participants involved in sessions, including school audiences (teachers and learners), teens and families. As outlined above, a key point is the contribution that SDDC experiences bring to innovating teachers' practice. Moreover, the SDDC puts through ideas, models, and formats which are inspiring for the broader community of museum educators. At an even wider scale, the SDDC is one of the actors that contribute to bridging the skills gap between the education and the job market, by offering the possibility to build up skills asked for by latest social and economic trends and technological advancement. Examples are the interest in organising big data sessions, or sessions on making and crafts, or the emerging topics and technologies explored in the *Innovation Labs*.

5.4.5 Case study conclusions and considerations for practice

This case study examined how a digital learning centre in a cultural history museum can contribute to supporting lifelong learning. Whilst there is a widespread understanding of lifelong learning as intimately connected, even focused on adult learning, this study adopted the view that lifelong learning starts from pre-school years, when the predispositions, inclinations, abilities and motivation for lifelong learning can be cultivated. The analysis showed how the Samsung Centre at the British Museum contributes to shaping a culture of lifelong learning by:

- Giving basic training or honing a wide range of key competences for lifelong learning. Key competences are targeted related to digital literacy, communication, cultural awareness and expression, and social and collaborative skills among others. The sessions offered by SDDC are short experiential engagements where existing competences can be strengthened, or the foundations of new ones can be created.
- Creating the premises for a lifelong connection between the individual learner and museums. By providing engaging, satisfactory learning experiences, the Centre positions or re-positions the museum in the learner's mind as a welcoming, comfortable and stimulating place for studying in a fun and engaging way. This creates an opening towards museums as places of learning, and inclinations to look out for or seize opportunities for museum learning throughout one's lifetime.
- Linking with and complementing formal learning. Schools are an important audience for the SDDC. The centre reaches out to schools by offering activities that complement the curriculum, and bring as well an element of novelty: engaging with technologies that are not available or not integrated in school learning, or patterns of engagement that differ from traditional scholarly practices. Activities also stimulate and inspire teachers' practice, by pointing to new pedagogical strategies or indicating ways of following up and expanding the impact of the short learning episodes

- Stimulating and spreading innovation in informal learning. Innovation is related to the design of learning activities, which blend digital interaction in a learning framework configured by object-based learning and participatory learning elements. The subject areas and competences targeted are defined as well in response to social and technological trends, helping to bridge the gap between job market requirements and educational provision.

One of the most significant lessons offered by the SDDC is the way it configures its educational offer balancing requirements from three areas: 1) the social mission of the museum, maintaining a firm focus on the collection; 2) the needs, interests and profiles of diverse audiences; and 3) evolving trends in society and technology use, which result in requirements for new skills, or the configuration of new ways of digital engagement and interaction. Through attention to these areas, the Centre constantly revises and improves its educational offer, managing to keep ahead and aligned to societal trends without losing its commitment to the museum mission and audience engagement strategy.

Responsiveness is made possible by the design approach adopted by the SDDC, which leaves space for experimentation, and which is a fertile ground for cultivating innovation. The starting point for trying out new sessions can be found in a new technology (e.g. AR technology), a new learning outcome (e.g. digital animation or 3D-printing skills), responding to a societal trend in either education or technology use (e.g. big data), or be driven by changes to the national curriculum in the case of school programmes. The swift approach to design inspired by Lean and Agile methodologies, means that new types of sessions can be tried out, iterated a few times and further improved and integrated in the regular programme, or dropped, depending on the response or the evolution of the SDDC plans. For example, over the years, the integration of new technologies provided occasions for changing modalities of engagement or designing altogether new sessions. When Samsung delivered Galaxy tablets for the Centre, activities that previously used laptops were re-designed around tablet interaction modalities. Experiments were made as well with new technologies such as AR, 3D-animation, 3D-printing, etc. Some of these were tried out in one-off programmes or sessions (e.g., the AR project *Cultures in contact* delivered in 2011, in collaboration with the British Museum's *Learning* department), or offered in conjunction with temporary exhibitions (e.g., the mobile app for students designed in-house for the exhibition *Hajj: Journey to the heart of Islam*); others became part of the broader educational offer (e.g., the AR app *A gift for Athena* was designed and developed in cooperation with the company Gamar to experiment with AR technology, and then maintained in the programme for schools).

5.5 CONCLUSIONS

This section analysed developments in learning engagements with museum collections, emphasising the role of digital technologies in supporting and driving new forms of learning. It argued that one way to assess and set steps to realise the potential of museums as learning places, is to employ an ecological perspective in a lifelong learning paradigm. In this stance, museums are actors in an ecology of learning opportunities centred on the lifelong learner as active agent pursuing their own learning pathways and to this end selecting from a wide variety of resources and experiences. The role of museums is not only to provide educational opportunities, but increasingly to create connections to the lifelong learner, becoming predilect places where cultural interaction, entertainment and education are jointly pursued.



Trends and best practices underpinning new ways of learning with collections have been reviewed, along four dimensions encompassing new structures, technologies, spaces, and new relationships with audiences. Emerging technologies such as the Internet of Things and types of participatory engagements have been assessed in relation to their learning potential. The case study of the SDDC at the British Museum provides an illustrative example of how principles of participatory and experiential learning can be put into practice into digital learning strategies and programmes. Apart from catering for a wide range of competencies for young visitors, the SDDC also contributes to creating lifelong connections with learners, by making learning fun, interactive and collaborative. Two important aspects of the educational mission of museums in a lifelong learning framework are therefore approached: offering learning resources and opportunities; and engaging, connecting and driving interest in the lifelong learner.



6 DIGITAL STRATEGIES AND AUDIENCE ENGAGEMENT: BEST PRACTICES AND RECOMMENDATIONS

“Being a successful museum in the twenty-first century will be different from being one in the twentieth century, which in turn was different than being successful in the nineteenth century. Each and every museum must rethink how it does its work if it wants to thrive in the radically altered marketplace and society of the twenty-first century. Just as those in the vanguard of the last century pioneered revolutionary strategies that were highly successful, in fact that redefined what it meant to be a museum – for example, the creation of interactive science centers and children’s museums- creative museum professionals are already inventing new models for this century.” Falk, J. and Dierking, L. (2012), *The museum experience revisited*, 296

The report thus far put forth a way of conceptualising user engagement patterns as an incremental shift from provision of access to enhanced user participation in engaging with heritage collections. As argued before, both *access* and *participation* are terms saturated with meaning and conceptually very rich. In several approaches, such as human rights based ones, access and participation overlap: access to culture is meaningless without citizen *participation* in cultural activities. When it comes to patterns of engagement with cultural heritage afforded by digital technologies however, access and participation acquire different meanings. Digital access to cultural heritage can encompass provision of cultural information, access to digitised collections and interpretive content. Participation, on the other hand, implies that audiences become active and involved, their ways of thinking and decisions matter. They may have a say in the type of programmes developed by a museum, contribute in processes of classification and interpretation, or in curating exhibitions, such as in crowdsourced curation initiatives.

Thinking of shifting user engagement from provision of access to facilitating participation means that in the past years Gallery, Libraries, Archives and Museums (GLAM) institutions have gone a long way to open up spaces for dialogue, reduce the distance from which they communicate and interpret, and finally allow audiences to contribute in more or less direct ways in engaging with, interpreting, curating or responding to collections and the knowledge that they put forth. This implies notable shifts in attribution of power and authority over knowledge production and interpretation, from centralised to distributed structures, and from curator focused to more inclusive, visitor-centred interpretation and curation (Bayne et al. 2009). Whilst the breadths of these changes is still debatable and the role and authority of cultural institutions and expert curators is difficult to question, one important aspect that emerges from these recent trends is the need for GLAMs to become strategic and coherent in the way that they use digital means to engage with their audiences. This bespeaks the need to define institutional strategies for integrating digital technologies in activities, engagement initiatives and programmes, and organisational structures. The formulation and implementation of digital strategies enable cultural institutions use digital media and channels in ways that are aligned to their institutional mission and effective in terms of reaching out to their audience engagement and educational aims. They also afford greater coherence at the level of organisational processes that support the design and delivery of cultural programmes and products.

This chapter looks at the role of digital strategies in enabling cultural institutions to fulfil their mission and engage better and more effectively with their audience. The main message is that GLAMs both integrate and benefit differently from the integration of digital technologies for user engagement. There are no recipes for success, while the panorama of opportunities for digitally engaging with audiences becomes broader, richer and more diverse. GLAMs need to be selective, strategic, coherent and consistent in identifying and implementing new ways of engaging with their audiences. Taking the time to understand and define the role of the digital possibilities in relation to the institutional mission, defining those and putting them into practice can make an organisation more effective, as well as saving time and resources.

The chapter engages further with these issues and covers three main aspects:

- Firstly, it discusses the role that digital strategies play in enabling institutions to fulfil their social mission, drawing on the experience of a series of institutions whose strategies have been analysed.
- Secondly, it examines and maps strategic directions for user engagement, drawing on a survey of digital strategies from European and non-European museums.
- Finally, it offers a series of recommendations that should be read not as recipes to implement, but rather as aspects to consider when institutions realise the need for developing a digital strategy.

6.1 THE ROLE OF DIGITAL STRATEGIES

In the 2015 edition of the NMC report, developing digital strategies is listed as one of the solvable challenges, those that we understand and know how to solve (NMC 2015: 22-23). As the report acknowledges, and as insisted upon by other relevant studies (e.g. Ludden 2014), digital strategies need to be seen at scale, as more than strategic directions of digital programmes. Their breadth and scope is commensurate with the role that a specific institution assigns to digital practices. For instance, for Tate in the UK, the formulation of the digital strategy was done based on a holistic approach, seeking to transform all activities, from ticketing to content delivery, and following the principles, being:

- audience-centred and insight-driven
- constantly evaluated and enhanced
- well designed and architected
- distributed across multiple platforms
- open and sharable
- sustainable and scalable
- centrally governed and devolved across the organisation.¹⁶⁵

¹⁶⁵ <http://www.tate.org.uk/research/publications/tate-papers/19/tate-digital-strategy-2013-15-digital-as-a-dimension-of-everything>.

For many institutions however, digital applications are either an add-on or conceived as a distinctive component, separate from other activities of the museum, for example limited to marketing and online communication. A recent survey (Axiell ALM 2015) among 71 GLAM institutions reveals that the majority of institutions are aware of the importance of creating a digital strategy for user engagement, and only 13% reckon this is not important for the institution. 60% are in the process of developing it, while for 6% the digital strategy has already been drafted, but is not being implemented and has no effect in driving museum activities.

An important aspect concerns the relationship between the digital strategy and the institutional mission. In the survey cited, 29% of respondents indicate that the digital strategy is related to but distinct from the institutional strategy, and 24% that it is integrated into their institutional strategies. Large-scale cultural institutions such as Tate, Smithsonian Institution and the British Museum place the alignment between digital strategies and their institutional mission at the core of their approach. For instance, Tate insists on its coherent approach to all museum activities and programmes:

“Everything we do, from the programme we present in our galleries and with partners in Britain and around the world, to the books, products and food we sell in our shops and restaurants, supports our mission: to promote public understanding and enjoyment of British, modern and contemporary art.” (Tate’s mission and vision to 2015, online communication)¹⁶⁶

This same coherence is present in the development of the digital strategy, aligned on the one hand with the institutional mission, and on the other being ramified to encompass museum activities from content communication to business model design and sales: “Through embracing digital activity and skills across the organisation Tate aims to use digital platforms and channels to provide rich content for existing and new audiences for art, to create and nurture an engaged arts community and to maximise the associated revenue opportunities. We will achieve this by embracing digital activity and developing digital skills across the organisation.” (Tate Digital strategy, Digital as a Dimension to everything, April 2013)¹⁶⁷

When such holistic approaches are employed, defining and implementing a digital strategy may require organisations to rethink their organisational and managerial processes, workflows and roles, as will be commented further in this chapter through the experiences of Museum Victoria in Australia, the Smithsonian Institution and Tate Museum in the UK. Shifting to a macro-level, the importance of being consistent and strategic about the integration of the digital goes beyond the institution itself, and even beyond the relation between the institution and its public’s *sensu stricto*. When access to culture is considered at broad societal level, then it is important to look at how institutions in a locality, region, nation or even continent contribute and complement each other to put through a consistent cultural offer. Their efforts are impacted upon, as well, by arts and cultural policies and governmental funding schemes and priorities. In Australia, for instance, a recent survey on GLAMs reveals that there is a lack of consistency in the way digital innovation programmes are designed and carried out; the report recommends strategic approaches and more interest in facilitating digital access to collections (NMC 2015).

¹⁶⁶ Tate mission as communicated online. www.tate.org.uk/about/our-work/our-priorities.

¹⁶⁷ www.tate.org.uk/research/publications/tate-papers/tate-digital-strategy-2013-15-digital-dimension-everything.

This is counter-balanced on the same continent by initiatives that seek to encourage cooperation and consistent action in the cultural sector, for instance the development of an Arts Accord between federal, state, and local governments to improve support for culture and strengthen the bases for cooperation.¹⁶⁸

Another example of synergetic action is provided in Europe by Europeana, the large-scale European programme that set out with a mission to offer digital access to European cultural heritage. The outcomes reached by the programme in five years include building a digital infrastructure that provides access to around 33 million objects from more than 2,500 institutions (Europeana 2015). The Europeana Strategy 2015-2020 reads:

“Our vision is an infrastructure that connects Europe’s culture digitally in the same way that roads and railways do physically. A laboratory that innovates for our new world using the richness of our past. We need a backbone that allows us to store, to access, to improve and to share. A place where copyright is respected, but ease of use is the mantra. We need to become the cultural innovators servicing the holders of cultural heritage and the users in equal measure.” (Europeana, 2015)

6.2 KEY DIRECTIONS AND PRIORITIES

There are no rigid pathways to conceiving and designing digital strategies for cultural institutions. Most importantly, the profile, size, resources and social mission of the institution will make a difference. The Director of Web and New Media Strategy at the Smithsonian Institution singles out three factors to be taken into account in designing the digital strategy of a cultural institution: scope, referring to the type of work being undertaken; scale refers to the breadth of the activities, and the impact that is aimed for; and speed, referring to how rapidly these ideas can take shape and be implemented (Edson, n.d.).¹⁶⁹ There is great diversity as well in the priorities that an institution may choose to invest in. For instance, the Axiell ALM 2015 survey among 71 cultural institutions singles out the following priorities for audience engagement:

- providing educational opportunities: 86%;
- making information on activities and programmes available online: 66%;
- making the museum accessible: 64%;
- reaching diverse audiences: 61%;
- enhancing visitor experience via mobile devices: 50%;
- creating quality cross-platform experiences: 40%.

In relation to this, institutions choose to invest in different tools, platforms, and programmes for engaging with their audiences. The same survey mentions the following priority investments for the GLAMs surveyed:

- metadata standards for online collections: 63%;
- digitisation standards/planning: 59%;
- digital assets management: 53%;
- curriculum and other standards for educational purposes: 50%;

¹⁶⁸ Australian National Arts and Culture Accord, <http://mcm.arts.gov.au/national-arts-and-culture-accord>.

¹⁶⁹ Interview with Michael Edson, <http://www.intk.com/en/ideas/michael-edson-smithsonian>.

- accessibility standards and inclusive designs: 50%;
- linked open data: 23%.

Below, the development of digital strategies by GLAMs is commented upon in relation to four key themes.

Holistic approaches and digital transformation

As outlined above, Tate stands out as one institution that embraces a holistic approach in crafting its digital strategy, where the aim is to use digital means strategically to transform the way museums aim to fulfil their social and educational mission. For Tate, this encompasses five pillars:¹⁷⁰

1. Content, encompassing digitisation of the collection, digital research publications, online learning resources and digital gallery experiences.
2. Digital community, where the digital is used strategically to engage audiences with art through social and communal activities, with initiatives including blogs, social media presence, learning and social collections (e.g. Tate Collectives¹⁷¹ for young audiences).
3. Revenues, encompassing an integrated approach to developing digital products and services, for instance e-ticketing, ecommerce (e.g. the online shop and Tate Enterprises),¹⁷² multimedia tours downloadable on visitor devices, digital fundraising and customer relationship management.
4. The organisation incurs a shift from centralising digital agendas in a unique department to including digital activities in the strategies of all departments. At this level, three areas require change: staff skills, new workflows and ways of working (e.g., cross-departmental collaboration), new governance and leadership structures.
5. Analytics and performance assessment, which require the development of key performance indicators for each area that undergoes change.

Given the deep institutional changes that a vision such as Tate's incurs, this holistic approach implies deep transformation in the institution. Digital approaches are no longer confined to a department and a definite set of platforms and tools. Rather, they permeate the entire organisational structure and become a dimension of all the activities carried out in the museum, from marketing to collection management and education.

Institutions such as Museum Victoria in Melbourne, Australia, acknowledge the breadth of change that this vision requires. Museum Victoria developed a Digital Transformation Strategy 2015–2020 as one of five strategic directions of Museum Victoria's Strategic Plan 2013–2018. The aim was to provide the foundation for a coherent approach to integrating digital across museum structures and activities, encompassing visitor experience, business model, staff competences and project management (Pryor, 2016). The process of developing the digital transformation strategy occurred in the following phases:

- project articulation workshop, where the definition and scope of the digital transformation were defined, and stakeholders identified;

¹⁷⁰ <http://www.tate.org.uk/research/publications/tate-papers/19/tate-digital-strategy-2013-15-digital-as-a-dimension-of-everything>.

¹⁷¹ <http://www.tate.org.uk/node/245839>.

¹⁷² <http://www.tate.org.uk/about/who-we-are/tate-structure-and-staff/tate-enterprises>.

- definition phase, where the plan for the digital transformation project and the communication plan were defined;
- discovery phase, in which the results of research on digital trends were analysed and consultation workshops were held with over 100 internal and external stakeholders;
- execution phase, where digital aspirations were drafted, and ideas were prioritised and classified;
- approval phase, in which the strategy was approved and communicated (see Pryor 2016 for a detailed description of the process of developing the digital transformation strategy).

As the experience of Museum Victoria suggests, the process of defining and approving a digital strategy is long and may require the involvement of stakeholders beyond those in leadership or strategic management positions in the museum, or even stakeholders outside the museum. A transparent, participatory approach to developing a digital strategy was taken, for instance by the Smithsonian Institution. Shaping the digital strategy was challenging for the sheer size of the institution, which includes 28 museums and research centres and 6000 employees. One of the fundamental aspects taken into account was an assessment of the contemporary social and digital trends in the social environment and understanding how the mission of the museum can align to those directions. This was complemented by an open and public-oriented process for developing the strategy in 2008-2009: evolving conversations were cast via a public wiki which invited conversations, comments and debates. The process was rewarding, though not deprived of challenges, as it implied giving up institutional control for transparency and dialogue, commented Michael Edson, former Director of Web and New Media Strategy of the Smithsonian Institution (Edson, n.d.).¹⁷³

The examples provided above all come from large-size institutions, and also ones that embraced digital approaches as a core component of their activities. However, it can be argued that the adoption of a digital strategy by GLAMs is always transformative for an institution, even when the scope of digital integration is reduced, or associated to the activities of a unique department. If digital integration serves for a museum to increase its social and public relevance (Ludden 2014), then to craft a meaningful digital strategy requires an institution to be informed and aligned to broad societal trends and sensitive to the needs of its audiences. This is not a one-off but an on-going process, it implies continuous dialogue and if coherence in communication is sought after, then some principles and values need to be adopted across the entire organisation and GLAM staff, and not uniquely associated with a digital department or person in charge with digital activities.

Diverse audiences require diverse strategic approaches: from local communities to the global citizen

In the above-mentioned survey on engagement strategies, 86% of institutions surveyed responded that they are best at engaging with visitors on-site, 19% before the visit, and only 7% after the visit (Axiell ALM, 2015). On-site visitors continue to be at the core of cultural institutions' engagement strategies. To this adds the increasing interest in involving local communities in cultural activities, seen as a way to build relations between museums and their local audiences, and to give voice to local communities in processes of cultural interpretation and meaning making (Vermeeren et al., 2016). At the same time, the aspiration of institutions such as the British Museum is to become museums "for the global citizen", as stated in the 2020 Strategy of the British Museum (British Museum, 2015).

¹⁷³ Interview with Michael Edson, <http://www.intk.com/en/ideas/michael-edson-smithsonian>.

Addressing onsite visitors, local communities, and global audiences are not mutually exclusive approaches to audience engagement, yet they require targeted strategies and different priorities for digital investment. Interesting insights with respect to the importance of strategic audience engagement and the kind of vision they can be embedded in comes from looking at the different strategies employed by two New York based museums: The Metropolitan Museum of Art and the Brooklyn Museum (Giridharadas, 2014). The Brooklyn Museum is well known for designing and delivering a series of engaging initiatives for involving global citizens in crowdsourced curation. An early example (2008) is *Click! A Crowd-Curated Exhibition*,¹⁷⁴ which invited local and online communities to be part of curating the exhibition *The changing faces of Brooklyn*. After several similar initiatives that sought to involve global audiences, analysis revealed that local engagement was far more intense and enduring than global engagement, and that from local citizens, the ones most interested and engaged were the ones in the Brooklyn area. Shelley Bernstein, the former vice-director of digital engagement and technology at the Brooklyn Museum states:

“The farther away you were, the less deeply engaged you were in scale and scope. The closer you are, the more engaged you were. It has caused us as an institution to completely rethink what we do in terms of digital engagement.” (quoted in Giridharadas, 2014)

This rethinking implied cutting down on social media presence, and instead re-directing investments and efforts towards building community in the locale. Differently, the Metropolitan Museum of Art invests strategically in reaching a global audience. In addition to its average six million visitors onsite each year, the Metropolitan Museum of Art has 29 million website visits, and reaches 92 million people through Facebook (Giridharadas, 2014). Part of the museum strategy is to open up to its audiences not only its collections, but also the often raw ways of managing, interpreting, and curating, for instance by publishing details in the process of acquisition of new works and encouraging museum staff and curators to be active on social media.

Becoming strategic about social engagement and community-building over social media

Another notable trend concerns new ways of strategically defining the mission and activities of the social museum. The use of social media services and crowdsourcing paradigms has become mainstream and is being increasingly adopted by GLAMs. Yet after years of experience in trying out diverse approaches, some institutions become more strategic about their social engagement mechanisms and channels. This may even imply retracing one’s steps and closing channels and services that no longer serve their purpose.

The strategies of institutions such as the Brooklyn, which shifted gears from a heavy social media focus to a more selective, attentive use of platforms and channels, points to the importance of testing out and understanding what really works for an institution, and investing in those channels and platforms that work well, and work for a certain kind of content. In a blog post from 2014,¹⁷⁵ Brooklyn’s former museum vice-director for digital engagement explains why the Brooklyn Museum made a strategic decision to leave platforms such as HistoryPin and Flickr, where engagement was found to be low. Flickr content was moved to Wikimedia Commons, where possibilities to engage with that content meaningfully were much higher, for instance by associating images to articles. Instead, the museum continues to engage with platforms such as Tumblr (for its visual richness) and Wikipedia (for its public visibility), and preferred YouTube over iTunesU.

¹⁷⁴ <https://www.brooklynmuseum.org/exhibitions/click/>.

¹⁷⁵ <https://www.brooklynmuseum.org/community/blogosphere/2014/04/04/social-change/>.

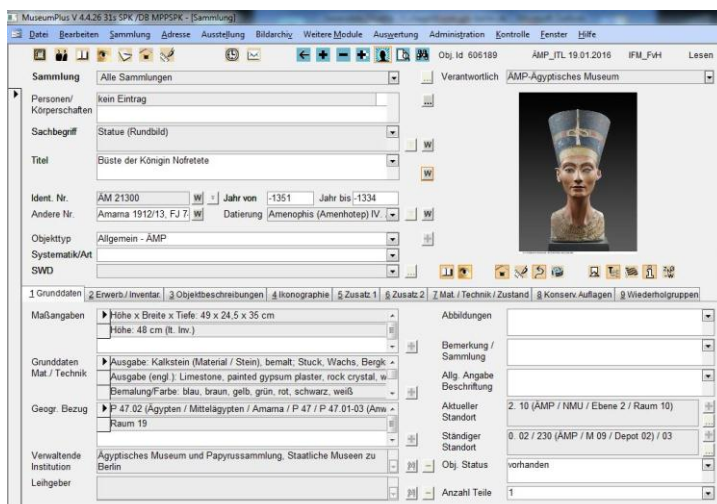
The benefits of re-use: digital strategies for broadening access to digital heritage collections

Digitisation efforts for broadening access to cultural heritage have been ongoing now for more than a decade. Still, to make digitisation a worthwhile effort, merely providing access to digital collections is not enough, and strategies need to be put in place for making the content usable, engaging, and accessible by audiences in environments and scenarios that are aligned to their needs and interests. To examine these issues, the next section looks at the digital strategy adopted by the SMB (Staatliche Museen zu Berlin) to broaden and make more meaningful digital access to its collections.

The collections of the fifteen museums of SMB have been created and systematically developed in the last two centuries. They represent more than five million objects of art, archaeology, and ethnology from places all over the world. The rich and diverse collections form a ‘universal museum’, one of the most renowned in Europe, dedicated to the preservation, research and mediation of treasures of art and culture from the history of humanity.¹⁷⁶

The transformation from analogue collection care to professional digital collection management is an ongoing process at the SMB that started already in the 1990s. While digitisation is important, research, enrichment of data and the scientific documentation of the collections are key factors and priority tasks. Moreover, to achieve this, data from several database systems developed at the fifteen museums had to be unified and centralised.

Today, all SMB collections feed their data into one central Collection Management System (MDS, Museum Documentation System). MDS holds more than 1 million object records and is used by more than 400 museum employees. This unified and standard-based core documentation system serves as data repository or ‘data well’ for the growing number of uses and re-uses within the institution and on different platforms – digital libraries, online collections and portals.

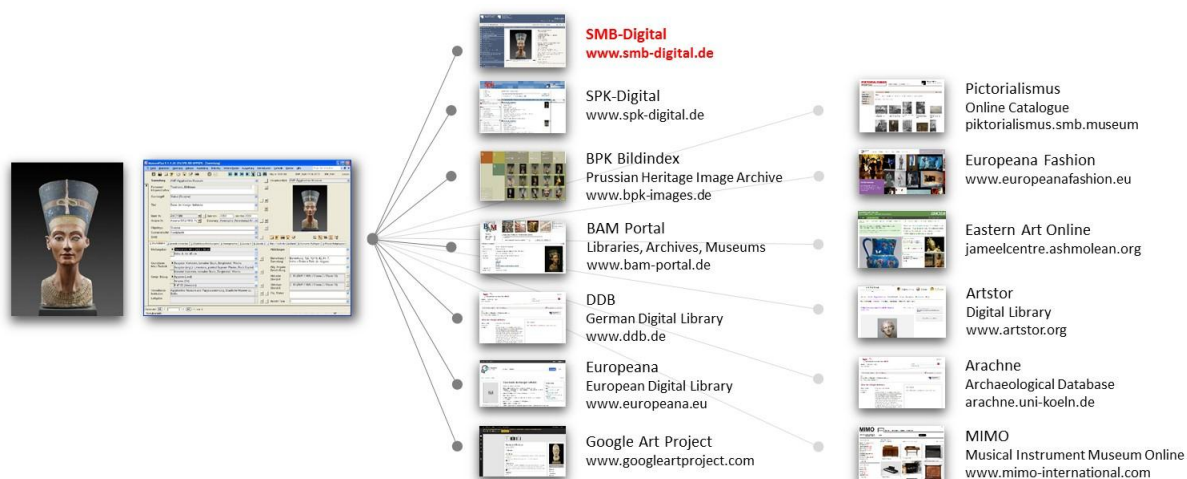


¹⁷⁶ „Die Staatlichen Museen zu Berlin – Preußischer Kulturbesitz bilden als eines der großen Universal Museen eine historisch gewachsene Institution zur Bewahrung, Erforschung und Vermittlung von Kunst- und Kulturschätzen der gesamten Menschheitsgeschichte“, Statut der Staatlichen Museen zu Berlin, 2001.

Screen of MDS (Collection Management System MuseumPlus)

As Parzinger, von Hagel and Schauerte argue, unlike print publications, online-publications require flexible and easily configurable data entry and data export: the need for high quality and targeted information delivery ‘just in time’ is a key factor in designing the digital strategy of museums. Although it may at first seem that the new digital documentation standards, the use of controlled vocabularies and unifying documentation procedures within the SMB lead to an increased workload, it enables the museums to be visible with high quality and trusted, curated content in many different places online, thus creating visibility, reputation and supporting the cultural heritage community and users in general.

The MDS represents not only an important tool in the processes of scientific research, collections care and documentation, but it also supports SPK’s institutional policy for re-use, wider dissemination and discoverability of digital cultural heritage information. Accordingly, interoperability and harvesting standards are used for the export of information from MDS for re-use in other portals and digital libraries, i.e. the harvesting standard LIDO (Lightweight Information Describing Objects).¹⁷⁷



Graphic showing the cases of re-use of information from the Museum Documentation System of the SMB towards different portals and digital libraries - national, European and international (April 2016)

Data from one central system is exported and re-used to feed other SMB-SPK online databases, portals and catalogues, such as SPK-digital or the portal dedicated to the 19th century architect Karl Friedrich Schinkel. External sites and portals are fed with additional ‘data streams’: the German Digital Library (Deutsche Digitale Bibliothek, DDB), the European digital heritage platform Europeana, or Google Art Project¹⁷⁸ of the Google Cultural Institute.

¹⁷⁷ On LIDO, see the information provided by CIDOC, the international Committee for Documentation of ICOM, www.network.icom.museum/cidoc/working-groups/lido/what-is-lido; Hagedorn-Saupe 2012, 204-205. The Institute for Museum Research of SPK is actively involved in the development of this international standard.

¹⁷⁸ <https://www.google.com/culturalinstitute/u/0/project/art-project>.

Overall, this strategy serves the key strategy of the SPK: open access to large parts of the collections and the knowledge associated with the collections, transparency and democratisation of cultural heritage, contextualisation of the collections within larger aggregations of cultural heritage information in digital libraries and portals, expanded visibility of the SMB museums, leveraging the re-use of data from its collections and opening up the way for linked data and semantic technologies on the web.

6.3 DEFINING AND IMPLEMENTING DIGITAL STRATEGIES: RECOMMENDATIONS

The process of defining digital strategies is in itself an enduring and resource-consuming process, which may require long-term planning and intensive stakeholder consultations. Nonetheless, the real challenge for GLAMs is to use strategies to drive their activities and programmes in practice. In the survey by Axiell ALM (2015), 6% of respondents acknowledge that the digital strategy has already been drafted, but is not being implemented and has no effect in driving museum activities. For only 9%, the digital strategy is referenced regularly by digital and other staff. This section provides a series of recommendations coming from surveyed literature, case studies developed in the RICHES project, and interviews with museum professionals and educators. They are focused on defining and implementing digital strategies, and are proposed not as recipes, but as a series of lessons learnt from the experience of institutions that have integrated digital and learned from both successes and failures.

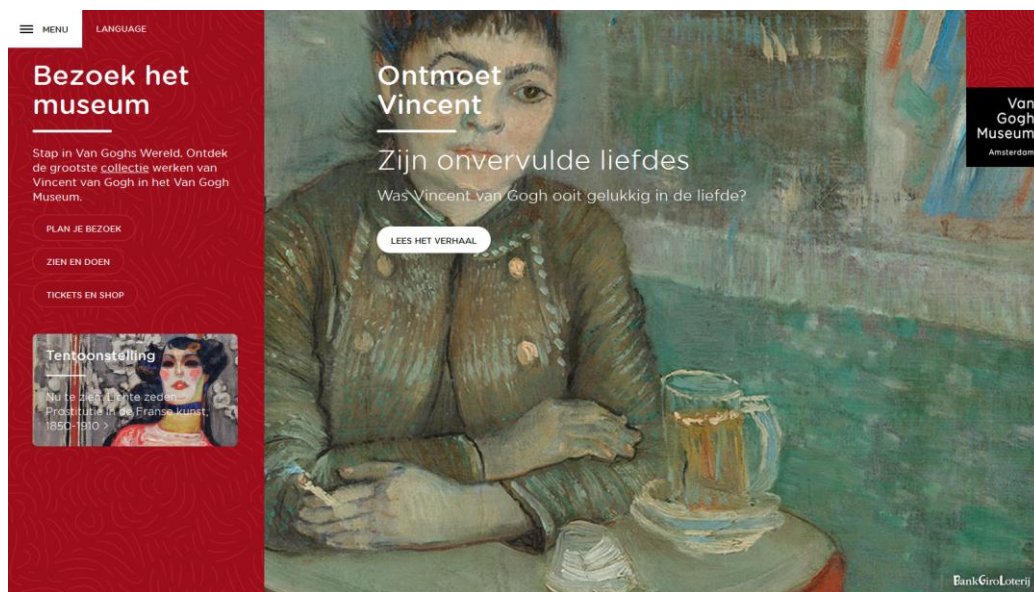
Embracing a holistic vision, aligned to the institutional mission

While the digital strategies that GLAMs develop may not be as transformative as the ones embraced by the Tate and the Victoria Museum, there is a need to think of the digital strategy as an extension of the institutional mission and vision. The challenge is to blend a future-oriented vision, concerned with long-term development with one concerned with immediate action (NMC 2015), all while staying aligned with the institutional mission. As a museum expert interviewed argues:

“Organisations are under the misapprehension that producing a digital programme/products will be quick, cheap and easier than other methods. This is wrong! Producing high-quality digital products is complex and skilful work, takes time and commitment, and will demand sustained effort, money and management in the long-term.” (Museum expert interview, 15)

At the Van Gogh Museum in Amsterdam, digital is always integrated as part of a broader vision and strategy:

“Digital is a means, and one of the most important things is that whatever we do we always think what is our audience and with what kind of content, connection, knowledge we want to reach out to them, what we want to open up, to achieve. And we hardly ever choose just to do digital, it is always part of a larger education strategy or an education plan, but there's always the blend of digital and analogue and sort of designed together. And one of the best things we do sometimes is, we find digital is not what we need to reach our audience in some ways, and sometimes digital adds value where no other method or use can help us.” (Museum expert interview, 13)



The website of the Van Gogh Museum, homepage

Assessing whether an organisation is digitally ready

A series of structures, resources, workflows and expertise need to be in place for the integration of technology. One of the interviewed museum experts brings up a series of questions to inquire whether a cultural organisation is digitally ready:

“Do you have digitally literate staff in post? Are your current processes and structures going to support digital production or hinder it? Have you identified key roles and responsibilities? Who will lead this and make the tough decisions that will need to be made? Have you decided on your long-term strategy and goals that you want digital to support? Have you ensured you have set aside time, money and adequate resources to enable you to produce high-quality and sustainable digital products and services? Have you determined what success will look like, how will you measure it and know you have achieved it?” (Museum expert interview, 15)

Being digitally ready as an organisation is a work in progress, and does not finish with the adoption of a digital strategy. Digital readiness parameters are important not as a checklist, but for driving attention to how infrastructures, tools, processes, roles, workflows need to be put in place, supported or connected to enable an organisation to deliver more value through digital integration.

Non-digital-centric-ness

Despite the central role of technical infrastructures and networked platforms, digital strategies for cultural institutions or networked initiatives of cultural content provision are ultimately about people, not about platforms and technologies (NMC 2015). On a similar note:

“Technology should not be the end purpose, but integrated in a manner mindful of the mission of the museum, learning goals, institutional strategies, and the needs and interests of audiences.” (Museum expert interview, 11)

Non-digital-centric-ness is a mindset, but one that has significant implications for how digital integration processes are undertaken, or digital activities conducted. The importance of placing audiences and institutional missions before technology was emphasised repeatedly in the expert interviews carried out in this study. This affords crafting fresh and relevant ways of thinking about how digital can deliver value; it may imply for instance designing programmes that combine new and old media, or, as in the experience of the Brooklyn Museum being selective about those channels and tools that truly deliver value for audiences.

Embracing change, renewal and openness as part of the strategic vision

As technologies change, and new programmes will have to be designed, working with technology will require constant evaluation and updating:

“Audiences don’t change that much, but technology does so there is a need to design well for your audience, but to accept that the technology and channels of delivery you are using today will need to be re-evaluated on an ever decreasing timeline (2-3 years) to ensure they continue to reach your target audiences and to meet expectations.” (Museum expert interview, 15)

To cope up with change, there is a need to separate between content, interaction and digital embedding. As the same museum expert interviewed recommends: “Assume technology will continue to change at a rapid pace, factor this into your planning and ensure your content and concepts can be separated from the tools and services you are providing today, so that you can modify and upgrade in the future more easily.” (Museum expert interview, 15)

At operational level, there is a need to have a reliable infrastructure, standards and processes for maintenance and updating.

Infusing a culture of openness in the organisation

The adoption of digital strategies carries with it a series of values that may be defined and made explicit, or taken for granted. A significant value is that of openness, which can be associated to ideas of open access, but also calls attention to more decentralised, inclusive and visitor-centred processes of heritage management, curation, and communication.

As Michael Edson formerly of the Smithsonian Institution argues:

“From what I've observed about how successful humanistic enlightenment activities are being done on the web, this moment can be much more powerful, if immediately the organisation thinks globally, thinks ‘Internet by default’ and thinks ‘open’.” (Edson, n.d.)¹⁷⁹

Bringing attention to efficient work in multidisciplinary teams

Part of the transformations brought about at organisational level is that the design of digital programmes and services involves cross-departmental collaboration and cross-disciplinary collaboration:

¹⁷⁹ Interview with Michael Edson, <http://www.intk.com/en/ideas/michael-edson-smithsonian>.

“It is for IT designers, not curators or educators, to decide which particular digital solutions would match best a certain context or programme. It is obviously up to museum educators to determine the aims and expected results of a certain programme but it requires IT expert knowledge and experience to apply the most adequate digital means. This seems obvious only if we accept technology as one of the ways to solve a problem, not a solution in itself.” (Museum expert interview, 7)

It is important to be sensitive to making this process effective, by devising ways to communicate across different ways of thinking and vocabularies, and streamlining decision-making processes in multidisciplinary teams.

Capitalising on existing assets and resources and prior digital programmes

Digital strategies enable organisations to bridge skilfully between the long-term and the short-term and if designed effectively to make best use of existing assets and resources. Being engaging may require constant renewal of programmes and services, however this can be done effectively by building on existing realisations; for instance, content re-use (see SMB-Digital example above), building online or gallery-based experiences that link to the online collection, or devising gallery and online-based and activities that provide new, engaging pathways to access existing content (see SDDC case in Section 5.4).

Using effective, flexible and user-centred design methodologies

Methodologies such as user-centred design, Lean, and participatory design have the user at the centre, and are bound to come up with interesting and engaging solutions for users (Museum expert interview, 10). As described in the SDDC case study (section 5.4), embracing this type of methodologies is also effective for being iterative, enabling museum staff to see the outcomes of their actions and work towards gradually improving programmes and products against audience feedback.

6.4 CONCLUSIONS

In the frame of this report, digital strategies represent for GLAM institutions the pinnacle of coherent, cohesive and effective integration of the digital for enhancing their relevance for the public and delivering value. As Michael Edson formerly the Smithsonian Institution argues, the challenge is to understand not only how cultural institutions can take advantage of the opportunities opened up by digital and social media, but “how, when, with what urgency... can we transition the way we think about our jobs from what I've been calling the broadcast model, where we, the experts, we decide what problems will be solved, we decide how to solve them, we build the solutions, and we deliver them to a passive audience – how and when will we transition from that model to the model where citizens really are our co-creators” (Edson, n.d.).¹⁸⁰ This, Edson continues, is not about small, superficial changes, but about how to scale the impact of cultural institutions on society. There are two important implications of this vision as related to digital strategies:

¹⁸⁰ Interview with Michael Edson, <http://www.intk.com/en/ideas/michael-edson-smithsonian>.



Firstly, it speaks about how the digital strategy of museums and other memory and learning institutions is tied to their social mission in contemporary times. As argued at the beginning of this chapter, cultural institutions are operating in a rapidly changing environment, which makes their position more prominent, but which also places an additional responsibility on them particularly as key players in the knowledge society and providers of informal education opportunities.

The digital strategy is to be seen as a direct extension of the institutional mission and strategy, and a way of realising these by adoption of the digital in coherent and consistent ways.

Second, the implementation of digital strategies implies deep changes at organisational level. As the experiences of Tate Museum in the UK and Museum Victoria in Australia suggest, adopting a digital strategy implies organisational transformation – spanning the adoption of new values, roles, workflows and models for audience engagement, down to revenue generation models and communication strategies. Drafting a digital strategy is a first step in this process, and if done consistently, the process of drafting a digital strategy can in itself become a way for the organisation to better define its social position and relevance by involving key internal and external stakeholders (see Pryor, 2016). In particular, when participatory models of knowledge production and heritage curation are embraced, the organisation needs to adopt new values, attitudes, and ways of thinking about and delivering its societal contribution, transitioning from authoritative, GLAM-centred to inclusive and audience-centred models.

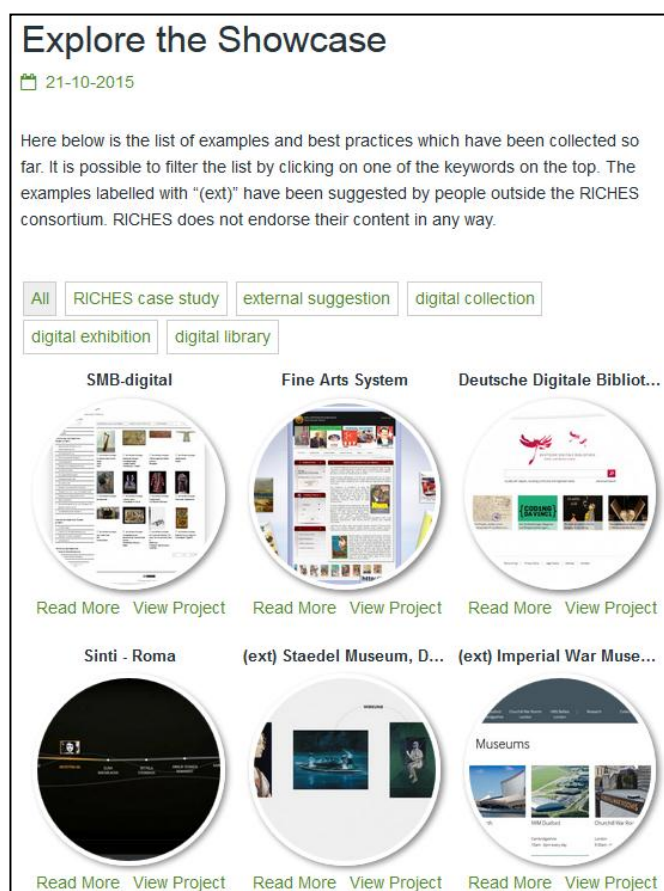
7 INTERACTIVE SHOWCASE

This deliverable has analysed the status of digital heritage mediated by memory institutions, such as libraries and museums, investigating how digital technologies are transforming the ways in which cultural institutions mediate cultural content and interact with their audiences.

This has considered cases of re-use of cultural content aggregated in digital libraries for the creation of specific applications, i.e. digital collections and digital exhibitions, with the aim of evaluate the potential of museum and library online information systems to stimulate interaction with their intended audiences and increase their engagement with digital cultural content.

A further research strand has focused on museums as places for education and learning and on their role in lifelong learning society. It explored the ways in which museums can contribute in increasing access to cultural life and fostering social cohesion, innovation and creativity, by integrating collections, spaces and learning programmes into a new joined-up framework which connects formal and informal learning providers.

As a result of this analysis, a number of innovative services and best practices have been identified and published in the RICHES Interactive Showcase, accessible on the project's website, resources.riches-project.eu/research/interactive-showcase.



Explore the Showcase
21-10-2015

Here below is the list of examples and best practices which have been collected so far. It is possible to filter the list by clicking on one of the keywords on the top. The examples labelled with "(ext)" have been suggested by people outside the RICHES consortium. RICHES does not endorse their content in any way.

All RICHES case study external suggestion digital collection
digital exhibition digital library


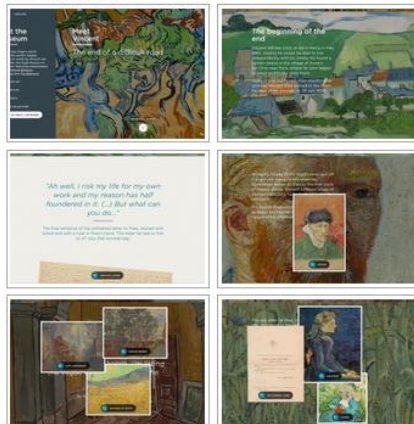
SMB-digital Fine Arts System Deutsche Digitale Bibliot...
Read More View Project Read More View Project Read More View Project

Sinti - Roma (ext) Staedel Museum, D... (ext) Imperial War Muse...
Read More View Project Read More View Project Read More View Project

RICHES Interactive Showcase – Explore

This showcase is an online interactive space where interested users can contribute to the case study research providing feedback or suggesting new examples of best practices to be taken into account. Content and functionalities are organised as follows:

- A description of the background and of the research that led to the selection of the services that are showcased.
- A list of examples and best practices which have been collected so far, each one with a specific record page containing some basic information, an image gallery and the link to the online resource (choose “all”).
- A form where it is possible for any interested user to suggest new innovative services that are worth to be added to the showcase.
- Criteria or filters applied to the presentation of the examples are the type of application (e.g. online collection, digital storytelling, digital exhibition, etc.) and the contributor (RICHES partner or external suggestions by any interested user). The RICHES case studies within the task 6.1 correspond to a specific filter.

<p>Fine Arts System</p> <p>📅 21-10-2015 📁</p> <p>Provider Turkish National Library</p> <p>Language Turkish</p> <p>Description The Fine Arts System is a digital collection that provides service to the users since 5. August 2014. Turkish National Library is the provider of the content. It includes mainly posters and paintings but considered to add all non book materials that covers maps, coins, later. 40 different types of posters covering movies, political, concerts, operas, etc. and 10 different types of paintings that includes acrylic, oil, gouache etc. is now online. The collection now includes around 20.000 posters and 517 paintings.</p> <p>Keywords fine arts, posters, paintings, digital collections, non-book materials</p> <p>Link http://guzelsanatlar.mkutup.gov.tr/mk/</p> <p>Images [Show slideshow]</p> 	<p>(ext) Van Gogh Museum</p> <p>📅 21-10-2015 📁</p> <p>Provider Van Gogh Museum, The Netherlands</p> <p>Language English, Netherlands</p> <p>Description Vincent Van Gogh's life and works of art.</p> <p>Keywords Vincent van Gogh, contemporary art, painting</p> <p>Link http://www.vangoghmuseum.nl/en</p> <p>Images [Show slideshow]</p> 
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Interactive Showcase Record pages

The website is intended to attract a range of audiences:

- Museum and library professionals
- Teachers, education professionals and associations, EU and national
- AHSS (Arts, Humanities and Social Sciences) experts and researchers;
- SMEs working within the digital cultural economy and industrial associations and organisations dealing with creative industries;
- General public

The RICHES project has reflected upon its various research tasks, including the case studies within this deliverable to identify an interesting selection of websites:

- SMB-digital
- Fine Arts System
- Deutsche Digitale Bibliothek (DDB)
- Sinti – Roma
- Time Machine, a digital storytelling exhibit at the Neues Museum, Berlin
- Staedel Museum, Digital Collection
- Imperial War Museums
- Van Gogh Museum
- Die Welt der Habsburger
- EUScreen
- The British Museum Collection Online
- Monet and the birth of Impressionism
- 1860 - 2015, Jews in Argentina
- The Secret Annex Online: Discover Anne Frank's hiding place
- Orte der Utopie
- The Metropolitan Museum of Art - Online Collection
- Explore the World of Musical Instruments
- America on the Move
- Under the Influence of the Heaven: Astrology in Medicine in the 15th and 16th Century
- The J. Paul Getty Museum Collection Online
- Museumsplattform NRW
- The Guggenheim Collection Online
- The Louvre, Virtual Tour and Collections
- Digital Museum Tokyo
- The Men On The Memorial. The stories of Skelsmergh's First World War dead
- 1839 – 1860 - Photography on a silver plate
- Biodiversity Library Exhibition
- Europeana




- Europeana 1914-1918
- Europeana 1989
- Euromuse
- Inventing Europe

Send us your suggestions

📅 21-10-2015

If you wish to **suggest new services or examples**, you have come to the right place! Please, leave us your opinion, we would love to hear your thoughts*!



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Click on the button below to suggest a new service, case study, example or best practice

Suggest new example press ENTER

The image shows a screenshot of a web page with a white background and a thin black border. At the top, the heading "Send us your suggestions" is in a dark blue font. Below it is a green calendar icon followed by the date "21-10-2015". A paragraph of text invites users to suggest new services or examples. In the center, there is the RICHES logo, which includes a colorful graphic and the text "RICHES RENEWAL, INNOVATION AND CHANGE: HERITAGE AND EUROPEAN SOCIETY". Below the logo, a bold instruction asks users to click a button to suggest a new service, case study, example, or best practice. At the bottom, there is a teal button with the text "Suggest new example" and "press ENTER" in a smaller font to its right.

RICHES Interactive Showcase – Send your suggestions

As this is not a showcase that is limited only to RICHES partners to populate, entries are welcome from interested parties. All they need to do is provide a service description, a screenshot, tags/keyword and any other comments. The entry will be considered and added to the showcase, as appropriate.

The relationship between the project and each website is that RICHES is showcasing the individual collections through a link to the institution’s website; the project has no responsibility for the content of any of the websites.

The RICHES Interactive Showcase provides easy access to a range of online collections. With so many institutions digitising collections of various types, in various ways, it is not easy for those that that might be interested to keep up and to know what is available. The Interactive Showcase therefore provides a place where collections of interest can be found and a point from which further exploration can take place.

8 CONCLUSION

In the next decade, museums will make a transformational shift from seeing “digitality” as an area of specialization, separate from and in addition to traditional means of doing their work, to digital as an inextricable element of their being, interwoven into every element of museum-ness.”¹⁸¹

This report examined strategies and approaches for deepening audience engagement with digitally mediated cultural heritage, by means of case studies, interviews, and a survey of the literature and GLAM institutional documentation. The study engaged with a rich and still blooming field of research and practice, which is made every year more complex through the joint inputs and thinking of GLAM professionals and researchers. In particular, there are two broad sets of trends that have been taken into consideration for shaping this study and overviewed for better understanding and outlining GLAM strategies for audience engagement:

Firstly, the changing role of GLAM institutions in the current European socio-economic and cultural landscape, including developments such as:

- The rise of informal and non-formal learning and the increasing viability of lifelong learning paradigms. As traditional education establishments are unable to cope in real time with the demands of rapidly changing market, industry and job market landscapes; cultural and memory institutions are better positioned to fill in the gaps by providing targeted programmes, versatile and easy to adapt to audience learning needs and profiles.
- Networked and pan-institutional structures for innovation and access to cultural heritage. There are many, complex, and locally specific factors that determine the need for pan-institutional structures for delivery of complex programmes, to name just a few: the need to respond to and serve global, complex, and mobile audiences; the opportunities offered by new structures for innovation, drawing on the know-how and resources of various governmental, cultural, and industrial institutional entities. For GLAMs, becoming part of temporary or semi-permanent networks and structures comes with opportunities (greater outreach, design and delivery of more rewarding audiences’ engagement programmes and experiences) as well as challenges (opening up collections, organisational and workflow constraints, IP considerations).
- Changing and expanding notions of audience: Access to cultural heritage can occur in virtual, situated and blended spaces, inside and outside the premises of cultural institutions. Moreover, addressing on-site visitors, local communities, and global audiences comes with different requirements for delivering rewarding and engaging cultural experiences.

¹⁸¹ <http://futureofmuseums.blogspot.de/2015/08/baby-steps-towards-tomorrow.html>

- The experience economy and economic constraints: With its shift from products and services to memorable experiences, the experience economy has had an impact also on GLAMs. To this adds the necessity for many institutions to increase their revenues to cope with funding cuts. These factors motion GLAMs to become proactive at delivering cultural experiences that truly add value for their audiences, along with generating revenues.
- The increased ubiquity of digital and networked technologies permeating socio-economic structures and setting new bases for how organisations conduct their activities, create and deliver products and services and communicate to their clients and audiences.

Second, mixed aspects associated with the integration of digital technologies in the work of GLAMs:

- On the one hand, digital technologies generate value and can enhance anytime, anywhere outreach; attract new audiences through more engaging experiences; support different patterns of interaction and interactivity as well as user feedback, involvement and participation through platforms such as social media services and crowdsourcing paradigms; facilitate personalised learning and engagement pathways inside GLAMs or online; and promote connectedness and accessibility of collections.
- On the other, their integration is associated with challenges, including: gaps between provision of content and its access and use; sustainability issues; fragmented visions and implementation approach in between digital and analogue; extreme digital-centricness, to the detriment of institutional missions and audience needs; financial and operational challenges in integrating, maintaining and updating digital infrastructures; resistance to change, old ways of working, mentalities, methodologies and lack of appropriate skills for DT integration.

In this context, GLAMs stand out as more and more important social actors, and ones that could benefit significantly from using digital technologies to fulfil their social and institutional mission. Yet, as recently confirmed again by a recent UK-based report on culture (Digital culture 2015), cultural institutions benefit differently from the integration of DT. Those that are strategic, holistic and consistent in their approach, the early adopters and the experimenters are likely to benefit more than those that are lagging behind or consider digital just an add-on for special projects or for communication activities. Based on an overview of these developments and expert interviews, this study concluded that one of the fundamental aspects to be taken into account by institutions is the importance of being strategic, coherent, and visionary in the integration of digital technologies. This bespeaks the need to define and implement digital strategies aligned with the mission of institutions. As one museum expert interviewed argued:

“Digital needs to be thought about holistically and applied in a strategic and joined up manner. Cultural organisations often struggle to apply this kind of thinking and instead find it easier to revert to a short term tactical response – focusing on the out put of single and unconnected projects rather than a long-term strategic approach, which will support all aspects of digital planning and delivery.”
(Museum expert interview, 15)

Another cultural expert interviewed for the study (16) suggested that non-strategic approach to DT integration are likely to derive from a lack of understanding with respect to the role that DT fills out in the cultural institution and for its activities, and is prone to manifest differently in big and small institutions.

Larger institutions, for instance, may have included the role of DT in their mission statements and long-term strategies. Some may have specialised departments that support digital activities throughout the organisation. Smaller museums, on the other hand, are conditioned by the lack of resources and expertise. Digital activities may be carried out by just one person, volunteers, or lack completely.

To engage with these issues in-depth, the study included four in-depth case studies:

Case study 1: The case study presents the results of an evaluation of the Fine Arts System (FAS) at the Turkish National Library (TNL). It explores the relationship between users and digital libraries and investigates the role of digitisation in broadening access and increasing the demand for using the digital resources. Inaugurated in August 2014, the digital collection Fine Arts System provides access to the non-book materials - 20,000 posters and 517 paintings from the collections of the National Library of Turkey. The results of the evaluation of the FAS with different users highlighted a number of interesting trends that can guide cultural heritage institutions in developing audience-driven access policies and new ways of mediation and engagement with their audiences. A demand for more and high quality cultural content for personal or professional use was expressed by the participants. Moreover, to enhance a deeper engagement of the users with online collections it is necessary to provide appropriate and user-friendly tools to explore and apprehend the content, taking into account different motivations, supporting a variety of information needs and learning preferences and providing more personal and purposeful interactions.

Case study 2: Launched in 2011, the online collection SMB-digital gives access to scientific documentation and images of more than 160,000 objects from the rich collections of the Staatliche Museen zu Berlin. The case study explored ways in which digital technologies can help to bridge the gap between cultural heritage institutions and their audiences. It first examined the strategies that the SPK and the Staatliche Museen zu Berlin (SMB) apply for digitising and making available their collections online, seeking to identify best practices. To understand whether and how the online museum collection SMB-digital can engage users, a qualitative evaluation of SMB-digital was conducted with a group of professional museum guides, identified as potential users of the online collection. The results, comparable to surveys of other museum online collections, indicate that, in making available high quality resources in today's competitive online information landscape, cultural heritage institutions should adopt an audience-driven and user-friendly approach, supporting different information needs and more personal, customized experiences to build sustainable relations with their audiences.

Case study 3: Online collections, a new form of mediation adopted by cultural heritage institutions, have to offer more and/or something different than physical exhibitions. Drawing on the results of relevant European projects, such as INDICATE, and on the on-going research of the International Working Group on Digital Exhibitions, the case study sought to determine the impact of digital exhibitions on the users and to identify the features that apply to engaging content mediation and lifelong learning. It appears that, engaging digital exhibitions should present a number of strong elements, such as a highly communicative and easy to understand title, many images and the appropriate tools to explore them. As for museum audiences, prior knowledge and personal interest influence user behaviour. Designing online exhibitions for deeper user engagement should rely less on sophisticated technology, and more on the depth and quality of the story that is told.

Case study 4: The Samsung Digital Discovery Centre at the Digital Museum was selected to analyse the role of museums in lifelong learning, and the value of digital technology integration. The case study illustrated a successful long-term partnership between a museum (The British Museum) and a technology company (Samsung) to create a digital learning centre for young audiences. The study positioned the Samsung Centre as an actor in a complex ecology of learning opportunities delivered by formal as well as informal education providers. Within this ecology, the Centre cultivates innovation by designing and delivering experiential learning activities supported by thoughtful integration of digital technology, aligned to principles of object-based and participatory learning. It contributes as well to supporting a culture of lifelong learning by creating meaningful connections with the learners, and with other actors in the educational landscape, such as schools, policy-makers and agencies that ensure access to education.

The case studies depict as well successful ways (though not deprived of challenges) for defining and implementing digital strategies.

The National Library of Turkey and the Staatliche Museen zu Berlin of the SPK are both leading cultural heritage institutions, and internationally recognized. Despite their different traditions due to the type of each institution – library or museum – they are both ‘collecting institutions’ of the 21st century with an important public mission: curate, enrich and preserve rich and diverse collections, and make them available to the audiences.

Both institutions consider digitisation as a major challenge necessitating a long-term strategy. Although their digital ‘roadmaps’ are dependent upon national frameworks for curating cultural heritage materials, managing access and intellectual property rights, and despite the different degree of adoption of international standards, they present many commonalities:

- both institutions set priorities for digitisation, seeking a balance between quality and quantity, implementing cost-effective working procedures, initiating ambitious projects that promote collaborations for the study of national and world cultures.
- the main priority of their digital strategies, as implemented on their online platforms, the Fine Arts System and SMB-digital respectively, is to offer access to a wealth of information that was previously unavailable or concealed, without time and place constraints, and, at the same time, help to preserve sensitive, perishable materials that are kept in storage.

In the case of the SDDC, the Centre activities are aligned to the vision and mission of the British Museum broader education department, called *Learning, Volunteers and Audiences*. The Centre stands out in the department for its focus on digital and the core audiences it addresses – families and schools. At the same time, it is aligned to and serves to carry forward the strategic vision of the *Learning* department, which dwells on two key principles: the focus on the collection; and visitor-centeredness, meaning that access to the collection and engagement strategies need to be responsive to audience profiles and interests. These two principles are declined in four strategic aims for the SDDC:

1. Broadening access to museum collections, by attracting specific and new audiences
2. Deepening engagement and participation, focusing on digital learning experiences
3. Ensuring sustainability, bespeaking the need to think strategically about the role of the digital in the SDDC educational offer so that digital integration is sustainable
4. Advocacy and raising the profile of the museum, in particular by delivering rewarding educational experiences for the young audiences involved.

9 APPENDIX

9.1 ABBREVIATIONS

AHRC	Arts and Humanities Research Council
AR	Augmented Reality
BP	British Petroleum
BPK	Bildagentur für Kunst, Kultur
BYOD	Bring Your Own Device
CATH	Collaborative Arts Triple Helix
COL	Collection Online (British Museum)
DAI	Deutsches Archaeologisches Institut (German Archaeological Institute)
DDB	Deutsche Digitale Bibliothek
DIS	Draft International Standard
DLCs	Digital Learning Centres
DLS	Digital Library System
DNP	Dai Nippon Printing
DT	Digital Technologies
EC	European Commission
FAS	Fine Arts System
GLAMs	Galleries, Libraries, Archives, Museums
HOMAGO	Hanging Out, Messing Around, and Geeking Out
IBM	International Business Machines Corporation
IMA	Indianapolis Museum of Art
IMLS	Institute of Museum and Library Services
IoT	Internet of Things
IPR	Intellectual Property Rights

ISO	International Organization for Standardisation
IT	Information Technologies
KS1, KS2	Key Stage
LBS	Location-Based Services
LIDO	Lightweight Information Describing Objects
MDS	Museum Documentation System
MIMO	Musical Instruments Museums Online
MLA	Museums, Libraries and Archives Council
MOOCs	Massive Online Open Course(s)
NEMO	Network of European Museum Organisations
NESTA	National Endowment for Science, Technology and the Arts
NMC	New Media Consortium
NUI	Natural User Interfaces
RKD	Netherlands Institute for Art History
SDDC	Samsung Digital Discovery Centre
SEN	Special Educational Needs
SMB	Staatliche Museen zu Berlin
SMEs	Small and medium-sized enterprises
SPK	Stiftung Preussischer Kulturbesitz
STEAM	Science Technology Engineering Arts Mathematics
STEM	Science, Technology, Engineering and Mathematics (STEM, previously SMET)
TNL	Turkish National Library
UK	United Kingdom
USA	United States of America
WLAN	Wireless Local Area Network

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Access, Participation, Learning: Digital strategies for audience engagement with cultural heritage in museums and libraries



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9.3 PARTICIPANTS' PROFILE

9.3.1 Case study SMB-digital

Interviewee	1	2	3	4
Gender	Female	Female	Male	Male
Age	50	36	60	40
Graduation	MA	Dipl.	PhD.	MA
Studies	Art History, History, Musicology	Cultural Studies	Classical Studies, Art History, History	Classical Studies
Years as Guide	21	8	9	16
Active in Museums	Museum of Decorative Arts (SMB), German Historical Museum, Music Collections, National Gallery and more	Collection of Antiquities	Museum Island	Collection of Antiquities
Guided Tours Adults	X	X	X	X
Guided Tours Students	X	X	X	X
Museum Island Tour		X	X	X
Workshops		X		
Languages	German	German, English, Spanish	German, English	German, English



9.3.2 Case study Online Exhibitions

Interview	Gender	Mother language / foreign languages	Age	Industry	Hours on the internet, daily	Duration/h of accompanied exhibition visits	Number of visited exhibitions	Access	Exhibition (in order of interest)
Case1	male	German English French	65	IT	Professional: 8 hours Private: 0.5 to 2 hours	40 minutes	8	1 title list, 2 Europeana, 3 Oldportal / euscreen	An meine Völker Hungarian Music and Dance To my people Cake? Cake! The past but not as you know it Expeditions European Sport Heritage The velvet Revolution
Case 2	female	German, little English	50	Culture / museum	Professional: 15 minutes Private: 0.5 h	40 minutes	4	1 Europeana, 2 Title List	Leaving Europe Places of Utopia Anne Frank Centre—The Secret Annex Online Monet and the Birth of Impressionism
Case 3	female	German English	29	Culture / museum	Professional: 8 hours Private: 24/24	50 minutes	17	1 Europeana, 2 Title List	Recording and Playing To my people The past but not as you know it Poisonous nature A Roma Journey Napoleonic Wars Hungarian Music and Dance From Dada to Surrealism Wiki loves Glam Spices Yiddish Theatre in London Art Nouveau Monet and the Birth of Impressionism Jews in Argentina Anne Frank Centre—The Secret Annex Online An meine Völker Places of Utopia
Case 4	female	German Russian French	47	Educatio n / School	Professional 0.5 h Private: 10 minutes Overall rather sporadic	30 minutes	5	1 Title list, Europeana, oldportal/euscr een	Anne Frank Centre—The Secret Annex Online Napoleonic Wars Buildings Hungarian Music and Dance Ski jumping and Ski flying
Case 5	female	German English	17	Student / high school	Professional: 1 hour Private:	50 minutes	6	1 Europeana, 2 Oldportal / euscreen,	Ski jumping and Ski flying Food and Drink Buildings



Interview	Gender	Mother language / foreign languages	Age	Industry	Hours on the internet, daily	Duration/h of accompanied exhibition visits	Number of visited exhibitions	Access	Exhibition (in order of interest)
				graduation	5 hours			3 Title List	Pablo Picasso Expeditions Anne Frank Centre—The Secret Annex Online
Case 6	female	English German	24	Doctoral candidate of German Studies	Professional and private: 24/24	60 minutes	4	1 Title List, 2 Europeana	Places of Utopia Poissonous nature 1514.Book.2014 From Dada to Surrealism
Case 7	male	Turkish English German	19	Student / mathematics, economics	Professional: at least 4 hours Private: 5 hours	30 minutes	6	1 Europeana	Untold stories of the First World War Darwinism: Reception in Spain and Catalonia The Euro Science and machines Poissonous nature Napoleonic Wars
Case 8	female	German	51	Service sector in healthcare	Professional: 1 hour Private: 10 minutes a day, only what's up, and that 24/24	45 minutes	9	1 Title List, 2 Europeana, 3 oldportal / euscreen, 4 Europeana	Anne Frank Centre—The Secret Annex Online Places of Utopia An meine Völker Napoleonic Wars Jews in Argentina Monet and the Birth of Impressionism Roma in Festa Poissonous nature Buildings
Case 9	male	German English	22	Student / Museum	Professional: 2 hours Private: 2 hours	40 minutes	7	1 Europeana, 2 Oldportal / euscreen	Napoleonic Wars Buildings Weddings in Eastern Europe EUScreen Science and machines Buildings Art Nouveau
Case 10	male	German English	58	Science / Museum	Professional: 6 hours Private: 15 minutes	150 minutes	7	1 Europeana	Poissonous nature Photography on a Silver Plate Darwinism: Reception in Spain and Catalonia To my people Pablo Picasso Expeditions
Case 11	female	German English	26	Media / Mediation /	Professional: 3 hours	60 minutes	3	1 Title List	Places of Utopia Anne Frank Centre—The Secret Annex Online



Interview	Gender	Mother language / foreign languages	Age	Industry	Hours on the internet, daily	Duration/h of accompanied exhibition visits	Number of visited exhibitions	Access	Exhibition (in order of interest)
				Museum	Private: 30 minutes				Monet and the Birth of Impressionism
Case 12	female	German English	35	Culture / Media / Museum	Professional: 3 hours depending on task Private: 0.5 h	60 minutes	9	1 Europeana, 2 Title List	Napoleonic Wars Spices 1514.Book.2014 Leaving Europe Pablo Picasso Roma in Festa Places of Utopia Anne Frank Centre—The Secret Annex Online Monet and the Birth of Impressionism



9.4 LIST OF EXPERTS INTERVIEWED

Expert	Name	Institution
1	Museum Professional	Museo della Grafica
2	Museum Professional	Museo Galileo
3	Museum Professional	European Museum Academy Foundation, The Hague
4	Museum Professional	Mine, Museum of the Mine and Territory of Caviglia
5	Museum Professional	Museo Vetulonia
6	Museum Professional	Fondazione Musil – Museo dell’Industria e del Lavoro
7	Museum Professional	National Institute for Museums and Public Collections (NIMOZ)
8	Museum & Libraries Professional	Bibliotheksservice-Zentrum Baden-Wuerttemberg (BSZ)
9	Museum Educator	Johns Hopkins University
10	Interaction Designer & Consultant	Design & Consulting Company
11	Museum Professional	Museum of Modern Art, MoMA
12	Museum Educator	Teylers Museum in Haarlem
13	Museum Educator	Van Gogh Museum
14	Digital Learning Manager	The British Museum
15	Independent Consultant	Digital Strategy & Consultancy for Museums & the Cultural Heritage Sector
16	Museum Professional	Museum of Cambridge
17	Digital Learning Expert	Knowledge Media Research Center, Tuebingen
18	Museum Professional & Digital Media Expert	School of Creative Media, City University of Hong Kong
19	Museum Professional	HATII, School of Humanities & Hunterian Museum, University of Glasgow
20	Museum Professional, Digital Curation Expert	Faculty of Information, University of Toronto

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