Digital Heritage Applications and its Impact on Cultural Tourism

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ARTICLE INFO	Abstract
Keywords: Digitalization; Digital Heritage; Cultural Heritage Tourism; Sustainable Development; ICT's. **(JAAUTH) Vol. 17, No. 1, (2019), pp. 37-50**	Cultural Heritage is inherently unlimited by time, geography, culture or format. It is culture specific, but potentially accessible to every person in the world. The Constitution of UNESCO provides that the organization will maintain, increase and diffuse knowledge, by assuring the conservation and protection of the world's inheritance of books, works of art and monuments of history and science, that its "Information for All" Program provides a platform for discussions and action on information policies and the safeguarding of recorded knowledge, and that its "Memory of the World" Program aims to ensure the preservation and universal accessibility of the world's documentary heritage. Digitalization contributes to the conservation and preservation of heritage and scientific resources; it can be used to encourage tourism; and it provides ways of improving access by citizen to their patrimony. Intangible tourism services cannot be physically displayed or inspected at the point of sale before purchasing, and so tourism product is dependent upon information in printed and audio-visual form. The unique tourism product will depend on extensive and targeted marketing, leading to the growth of new distribution channels, such as using 'virtual reality' technology. By World Tourist Organization one of the most important niche market is the market of cultural heritage tourism.

▪ **Research Importance:**

Digitization contributes to the conservation of heritage; it can be used to encourage tourism. Intangible tourism services cannot be physically displayed at the point of sales before purchasing, so the tourism product is dependent upon information in printed and audio-visual form.

▪ **Research Objectives:**

1- Presenting different definitions for digital heritage preservation.
2- Providing information regarding the relation between sustainability and heritage preservation.
3- Reviewing some of the information & communication Technology (ICT) applications and its role in developing digital heritage conservation.

Introduction:

Digitalization contributes to the conservation of heritage and scientific resources; it can be used to encourage tourism, and it provides ways of improving access by citizens to their patrimony. Intangible tourism services cannot be physically displayed or inspected at the point of sale before purchasing, and so the tourism product is dependent upon information in printed and audio-visual form. As it is difficult that a tourist form a clear image of a destination without the actual experience, the multimedia interactive nature of the Web can add a new dimension to destination marketing. Virtual travel experience is very important to the decision making process. Hence, each tourist destination must have a major digital

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application rather than a fragmented number of individual Websites put online by independent stakeholders (tourist agencies, tour operators, hotels, restaurants, services).

Defining "Digital Heritage Preservation":

According to the UNESCO's (UNESCO, 1972), Charter: "Digital heritage is made up of computer-based materials of enduring value that should be kept for future generations. Digital heritage emanates from different communities, industries, sectors, regions. Not all digital materials are of enduring value, but only those that require active preservation approaches if continuity of digital heritage is to be maintained". According to Merriam-Webster Dictionary the first known use of the verb digitize dates from 1953. Nowadays meaning of digitization is "conversion of analogue information in any form (text, photographs, voice, etc.) to digital form with electronic devices (scanners, cameras, etc.) so that the information can be processed, stored, and transmitted through digital circuits, equipment, and networks". Other meaning is: "integration of digital technologies into everyday life by the digitization of everything that can be digitized".

Digital preservation (DP) is defined by the Digital Preservation Europe project as "a set of activities required to make sure digital objects can be located, rendered, used and understood in the future".

In 2006, the Online Computer Library Centre developed a four-point strategy for the long-term preservation of digital objects that consisted of:
1- Assessing the risks for loss of content posed by technology variables such as commonly used proprietary file formats and software applications;
2- Evaluating the digital content objects to determine what type and degree of format conversion or other preservation actions should be applied;
3- Determining the appropriate metadata needed for each object type and how it is associated with the objects;
4. Providing access to the content (Online Computer Library Center, 2006).

Digital Applications in Cultural Heritage Tourism (CHT):

Heritage is a very important motivating factor for tourism. In the past decade, the vast amounts of new media information made available to heritage tourists via the World Wide Web have provided a convenient access to the intended destination image of marketers and the actual destination image of travellers.

The economic benefits that heritage tourism brings are manifold. Take for example, a study conducted by Oxford Economics recently on the economic impacts of heritage tourism in the United Kingdom. According to Oxford Economics, heritage tourism (including museums and green spaces) is an industry worth £20.6b annually with visitors amounting to 164.7m. The contribution to gross domestic product is more than the car manufacturing industry, advertising, and entertainment. Spill over benefits suggests a link between the visitor economy and other areas of economy such as retail, manufacturing, health and life sciences. Heritage tourism also employs 270,000 people in the UK excluding green spaces, and 466,000 including green spaces. It is estimated that the tourism economy will grow by 2.6% a year from 2009 to 2018, higher than the forecast for manufacturing and similar to retailing and construction (Deloitte, 2008).

The heritage tourists however, are motivated by their eagerness to learn the heritage and culture associated with a particular site. Tilden (2007) observed that a visitor is exposed "to a kind of elective education that is superior in some respects to that of the classroom, for here he meets the thing itself-whether it be a wonder of nature's work, or the act or work of man"

and suggests that "to pay a personal visit to a historic shrine is to receive a concept such as no book can supply" (Barab and Roth, 2006).

Virtual Reality (VR) Technology in Heritage Sites:

The first virtual tour using digital technology was presented at a conference hosted by the British Museum (Boland and Johnson, 1997). Since then, many natural and cultural heritage sites have been digitally reconstructed, where physical reconstructions were impossible before, Virtual Reality (VR) and games technology allows a complete reconstruction of present ruins to its former glory thousands of years ago. The technology allows remote access to heritage sites at any given space and time without the site damaged by visitor pressure. Animals, human agents (Chˑng, 2011), and vegetation as agent-based models populate landscapes and react to environmental parameters. Virtual users could be tracked to an extremely high resolution and any objects that they looked at the location and orientation of their gaze are stored for data analysis by site managers. Virtual Reality facilitates the exploration of heritage sites in fully computer generated environment (Chˑng, 2009). Augmented Reality blends the real and the virtual by overlaying computer generated information onto the real world via digital displays, trends in Ubiquitous Computing sees networked devices pervading objects, activities and contexts with digital information where the user interface recedes into the ambient environment.

Sustainability in Cultural Heritage Conservation:

Cultural heritage, like natural capital, raises sustainability issues because once destroyed, it is lost forever. As Rizzo-Throsby (2006) outline, a peculiar feature of cultural capital is that the deterioration or destruction of heritage is not compensated by the creation of new cultural capital, such as contemporary artistic items; therefore, conservation is needed so that present needs can be met without compromising the satisfaction of future needs Rizzo and Throsby, 2006). However, as Bonnet (2003) outlines, caution should be taken in evaluating the economic role of cultural tourism. Data are usually unclear so that it is difficult to distinguish between 'solely cultural-motivated' visitors (or tourists) and those who are 'combined motivated'; the complementary expenses related to the consumption of the cultural goods. For instance, a much debated issue is the use of historical or archaeological sites or buildings for cultural events such as concerts or theatrical performances or even fashion shows: these uses of heritage are, in some cases, prohibited by the public decision makers because they are perceived as not being compatible with the heritage (state of conservation, prestige, etc.) regardless of their important economic benefits. Thus, how conservation is carried out, and who is involved is an open and crucial question to assess the overall benefits of cultural heritage conservation (Bonnet, 2003).

Cultural Heritage Conservation Efforts:

5.1. 'National' Efforts: National efforts are the main concern of the local governments, that's why they have many levels to work on, such as the following:

The Governments' tools:

In all the industrialized countries the public sector plays an important role in the conservation of cultural heritage, even if with different quantitative and qualitative characteristics. The analysis of the normative rationale for government intervention is outside the scope of this paper and the related efficiency and equity arguments are taken for granted; in what follows the attention will be concentrated on the features of public action and on its effects.

Monetary tools:

Direct public expenditure ranges from the purchasing of goods and services as well as of buildings of artistic interest to the subsidies and/or loans to cultural public or private

institutions as well to private owners of historic buildings. Public spending is financed through the tax revenue but in most countries lottery funds are becoming an important source of financing.

Government support is also provided indirectly, through tax-expenditures, in the form of tax allowances, incentive private financing, such as, donations/ sponsorships aimed at supporting heritage conservation. In most Western countries there is a great interest in indirect support because it is believed that it increases the amount of resources devoted to cultural heritage; however, as Rizzo– Throsby (2006) point out, such a tool has not the same effects everywhere because private decisions are affected by many factors of social norms, such as the public recognition of the relevance to the arts, which are specific to each country (Ch'ng, 2009).

Regulations:
Regulation is a flexible tool, which satisfies the need for quick decisions characterizing the heritage field, and at the same time leaves many degrees of freedom to the decision maker. (Rizzo, 2003). Reported that such an issue has been dealt with in more detail; here, it is enough to stress that the identification of the scope and the range of regulation is highly discretional, especially when minor heritage is involved; therefore, the features of the decision making process and of the actors involved are important in determining the stock of cultural heritage, both in quantitative and qualitative terms, and its capability of becoming a 'resource' for local development. In fact, as Montemagno (2002) outlines the allocation of resources in heritage conservation is likely to be biased by the scholastic and academic training of managers and civil servants involved in the decision making process.

Focus on conservation:
Different types of conservation may have a relevant impact on the economic benefits stemming from conservation, namely those related to use value. For instance, preservation is an intervention which does not allow for compatible uses. If heritage is simply preserved, in order to guarantee its conditions at its original state, though its non-use value is preserved, a considerable amount of benefits might be lost. Alternatively, adaptation implies that an historical place is modified for compatible uses, to meet modern standards of comfort and safety without harming its physical structure or its architectural character. In such a case, the benefits related to its use value can be generated because of its utilization for consumption and/or for production purposes but, at the same time, the cultural value might be harmed if the proposed change is not balanced (Rizzo, 2004).

The costs of regulations:
As Rizzo (2002) outlines, restrictions on the use of buildings, their appearance and the way in which restoration and reuse is carried out might undermine the possibility of restoring and revitalizing historical center which is usually one objective on the political agenda of local authorities (Rizzo,2002).

Public participation:
Peacock's analysis (2004) of economic advice in culture offers illuminating hints in this respect. The introduction in decision making of a systematic assessment of the economic impact of regulation could help to reduce asymmetrical information and offer evidence to improve public scrutiny of public decisions. This might make it easier, for instance, to adopt at local level Codes of Practice or guidelines agreed between the regulator and those involved in conservation activities (architects, building firms, engineers, cultural associations, etc) in order to make prior commitments and reduce the uncertainty related to investments in heritage conservation (Peacock, 2004).

Professionals as well as the general public are invited to contribute and respond to the consultation questions contained in the conservation principles feedback form. It might not be by chance, however, that such a consultation takes place within a system based on the arms' length approach – where government influence on the cultural sector is lower – and not within a bureaucratic system. Moreover, devolution is usually indicated as another means of increasing the accountability of government; because of the very close links between regional/local communities and heritage, the positive effects of devolution seem to be even stronger in such a field than it is usually claimed (Montemagno, 2002).

'Global' efforts:
The Constitution of UNESCO provides that the Organization will maintain, increase and diffuse knowledge, by assuring the conservation and protection of the world's inheritance of books, works of art and monuments of history and science, that its "Information for All" program provides a platform for discussions and action on information policies and the safeguarding of recorded knowledge, and that its "Memory of the World" Program aims to ensure the preservation and universal accessibility of the world's documentary heritage.

The General Conference of UNESCO adopted at its 31st session in 1999 resolution 34, drawing attention to the ever-growing digital heritage in the world and the need for an international campaign to safeguard endangered digital memory. The General Conference also invited the Director-General to prepare a discussion paper for the 164th session of the Executive Board containing elements of a draft charter on the preservation of born-digital documents, to be submitted for adoption to the General Conference at its 32nd session in 2003, as well as to encourage the governmental and non-governmental organizations and international, national and private institutions to ensure that preservation of the digital heritage be given high priority at the national policy level.

In addition to the previous UNESCO heritage conservation efforts, there is the 'WDL' (World Digital Library) project, which was launched in April (2009), which aims to:
- Promoting cross-cultural understanding and intercultural cooperation
- Increasing quality and variety of cultural content on the Internet
- Providing a global teaching resource for educators, scholars and general audiences
- Narrowing the digital divide within and between countries
- Encouraging both students and the general public to learn more about the cultural heritage of all countries (UNESCO, 2005).

The Role of Information Technology (IT) in Conserving Heritage:
The physical conservation of material heritage resources is perhaps the central task of the CH sector. It represents the material basis on which all scholarly and public understandings of heritage lie. Ever since the adoption of the Venice Charter (ICOMOS, 2001), the overriding concern for the conservation of authentic physical fabric has been the foundation of all accepted international heritage standards and policies. And in the past two decades enormous strides have been made within the CH sector by such international institutions as the Getty Conservation Institute, the Institute for Conservation, and ICCROM to address specific problems in the physical conservation of various types of ancient materials, monuments, and artefacts (GCI, 2007). Indeed, the initial surveys of EPOCH's Sector Watch have highlighted CH stakeholders' concern with more effective Information and Communication Technology (ICT) tools for:1) detailed, and in some cases, three-dimensional documentation of the physical state of objects and structures, 2) accurate monitoring of progressive change or deterioration, 3) Visualization and modelling of original, anticipated, or desired future states.

The EPOCH Research Agenda has, in turn, underlined the importance of this realm of activity and has identified a wide range of applications with direct relevance for physical conservation activities (Arnold and Geser, 2007), Yet even the briefest glance at the World Monument Fund's "Watch List" (WMF 2007) or the ICOMOS "Heritage @ Risk" reports (ICOMOS, 2006), indicates the enormous scale of conservation threats to all types of material heritage (Gheyle, 2006).

It is increasingly obvious that a new, regional and worldwide approach to heritage conservation is needed that can grasp the true dimensions of the problem we now face. ICT can play a crucial role in analyzing particular types of conservation problems, prioritizing their importance, and providing networked data that can assist in the formulation of overall policies in the CH sector. In addition to monitoring specific processes of decay and deterioration, interlinked ICT networks can offer detailed and regularly updated "snapshots" and trend forecasts about the physical state of the entire range of material remains in a particular state, region or locality. As in the case of environmental planning, the goal cannot only be to preserve a particular kind of monument or object as an "endangered species" without taking into consideration the changes occurring in the wider "eco-system" to which it belongs (Lozny, 2006).

For heritage, in its physical aspects, must be considered to be more than our society's attic of antiques. The material remains of the past are a part of our living present; in their omnipresence and visibility they offer individuals and communities alike a sense of who they are and where they are in the history of humanity (Lowenthal, 1985).

The Europeana cultural platform (www.europeana.eu) now provides access to some 30 million cultural objects from more than 2,500 organisations: the resources of Europe's cultural institutions are now more internet-friendly and more widely re-usable. European helps develop and implement standards and interoperability in this area and provides a space where culture professionals share digital expertise. It allows Europeans to engage with their cultural heritage and contribute their own personal experiences, e.g. in relation to landmark historical events such as World War I. There are another several tourism apps and services using digital cultural heritage via European are already available, such as:

➢ **The Europeana Beacon (eBe) IOS** app is a new way of thinking about tourist guides. The app determines the user's position in a town square, museum room or exhibition, always displaying the correct information about the work of art they're facing. Tourists can discover new facts, engage in fun puzzles and quizzes to explore their surroundings, while museum curators or the local tourism bureau gain a deeper insight about what people really visited.

➢ **TueMuseo.it** is an app for the whole visitor experience – from pre-visit online planning and discovery, to on-site experiences and then post-visit personal storytelling. Digitized points of interest and real-world exhibits are brought together through gamification, allowing cities and museum managers to guide and analyze visitor flow in real time. Missions, quizzes, badges, points, rankings, awards and a newsfeed encourage positive tourist behavior, driving people to discover places in new ways.

➢ The **Field Trip** app includes curated European content to do with archaeological sites, historical buildings and monuments. This mobile app recognizes where people are and allows them to explore and discover more about their surroundings. The app has been developed by Google Niantic Labs and is available for IOS, Android and Google Glass in more than 30 languages. For this pilot, we are working with the Swedish National Heritage Board, National Heritage Board of Estonia, National Heritage Board of Poland and Austrian National Library.

7. Digital Heritage and Cultural Tourism:

There is a wide range of learning not only on open spaces but especially in a museum, where information is structured. Hooper-Greenhill stated that "A museum is not a book, or an encyclopaedia, although it has been compared with both; a museum is a complex cultural organization, which is made up of a site that is frequently spectacular, a body of people with rare and fascinating expertise, a collection of objects that in its totality is unique, and a range of values that are currently under intense scrutiny from within the institution, from the academy and from government. All of these elements are susceptible to study, and therefore present learning opportunities. The level of learning can range from early childhood education to postgraduate research." (Hooper, 1999).

As tourist behaviours and preferences are being learned across different domains, software agents are making sense of scattered data. The tourist experience in making arrangements for a trip becomes easy. The tourist need only to indicate in natural language (perhaps still via keyboard input, or voice input) a place of interest and the tourist's virtual butler (the intelligent agents or shop bots as a collective entity) negotiated and coordinated all the services on market overview 'menu' awaiting confirmation. The travel information will include not only the best choice across all services in terms of pricing and value, but also with an added personal touch – based on the user's history from across his digital device domain. For example, the user may wish to visit Georgetown in Penang, Malaysia, a UNESCO World Heritage Site. Based on his previous spending in another destination a list of exclusive beach resorts at Batu Ferringhi appears on the user's Smartphone. This together with nearby restaurants of the user's favourite food menus and prices are provided. Information is multifaceted through social sharing, and is deep and rich with textual, video and image contents embedded within each item. Automatic scheduling of day trips places travel times and schedule on the tourist's digital calendar, including a "must have" favourite local dessert "Ice Kacang" for 30 minutes at the town centre after lunch and prior to the shopping trip for hand-crafted souvenirs at the heart of the culturally rich world heritage site. During the trip and before lunch, the mobile phone notifies the user of a local friend in the social network having the same dessert just 10 minutes after the tourist leaves, a swipe of a finger on the mobile phone reschedules the event and all events during the day just so that they could be together. Shopping for the best deals becomes easy as all objects are digitally connected (Hein, 1998).

 The World Tourism Organization reports that 37% of all international trips include a cultural component. "Greatly motivated" cultural tourist represents the core of cultural tourism, but most cultural heritage tourism activities are complement to other travel activities "accidental cultural heritage tourist". Clearly, the tourist awareness, prior knowledge and experience, cultural identity and perception of quality and value are factors that affect motivation to visit a destination. This implies the necessity of education in the field of cultural heritage, which can be more successful by using digitized cultural heritage. The cultural heritage tourism industry is now in the process of systematic use of information, communication and multimedia technologies, in order to achieve competitive advantage by developing tourism destinations.

A good example of the European cooperation in culture is a European Union supported portal of cultural heritage, which organized attractions into 45 categories. The portal offers an enormous range of choices in cultural tourism and can help the tourist in the decision making process. European visions of the possible applications of the Internet in tourism assume a multilingual context, with a far greater emphasis on culture and history.

▪ **Case Study: "London Charter":**

The London Charter for the use of 3-dimensional visualisation in the research and communication of cultural heritage seeks to establish what is required for 3D visualisation to be, and to be seen to be, as intellectually rigorous and robust as any other research method.

The initiative has to be seen in the context of what has become a constant burning issue in 3D visualisation applications to cultural heritage: "transparency".

Transparency is crucial if such applications are to mature as a research method and acquire widespread acceptance within subject communities. In particular, it must be possible for those communities to evaluate the choice of a given visualisation method, and how it has been applied in a particular case without having to rely exclusively on the "authority claims" of the author. This applies not only to Cultural Heritage, but to all those disciplines where 3D visualisation rightfully belongs as a methodology (https://www,london.gov.uk/).

▪ **The Scope of the London Charter**

The London Charter is not discipline specific; it aims to serve the whole range of Arts, Humanities and Cultural Heritage disciplines using 3D visualisation for research and dissemination.

The Charter adopts a wide definition of the term "cultural heritage", encompassing all domains of human activity that are concerned with the understanding and communication of the material and intellectual culture. Such domains include, but are not limited to, museums, art galleries, heritage sites, interpretative centres, cultural heritage research institutes, arts and humanities subjects within higher education institutions, the broader educational sector, and tourism.

It is hoped that the Charter will acquire sufficient standing to be adopted as an EU and international benchmark and guideline.

The Charter initiative does not aim to propose radical new proposals, but rather to consolidate major principles that have been published by numerous authors, but not yet fully taken up by the community. This is why the idea of a "Charter", rather than another article, seems appropriate, and why it is important that it should emerge out of, and evolve through, discussions within its target communities.

The term "Charter" is usually reserved for documents enouncing principles of very wide generality, as the well-known Venice Charter on conservation and restoration and the Florence Charter on historic gardens and landscape [CHART] (https://www,londoncharter..org)or to documents less well-known than the above, and not yet adopted as Charters by international institutions as ICOMOS, ((https://www,international.icomos..gov/charters.htm)but nonetheless of comparable relevance and importance to the Ename Charter on interpretation [ENAME]The London Charter by contrast, which concerns a research and communication method, may as yet appear rather limited and circumscribed, and is presently perceived as having less impact on cultural heritage than the ones quoted above. However, it is our opinion that what we presently propose as methodological principles will acquire an increasingly greater importance in a future in which digital communication and visualisation technologies will pervade every aspect of culture (https://www.enamecharter.org).

The most important aspects of the London Charter [LC] will be summarized as the following:

Principles of the Charter

More fundamental issues underlie what is frequently the presenting problem of transparency; tackling these at the level of principles, as opposed to on a purely pragmatic level, requires us to think through disciplinary contexts, and how we formulate and assess the aims, methods

and sources of 3D visualisation-inclusive research and communication operations. Consequently, these form the subject of the first three principles in the first draft of the Charter (http//cidoc.ics.forth.gr).

Subject Communities

While the London Charter aspires to be "valid across all domains in which 3D visualisation can be applied to cultural heritage", nevertheless, different subject areas differ in their understandings of what research is, and therefore what research methods such as 3D visualisation ought to achieve. This imposes strict limits upon the level of detail a cross-subject document can entertain.

Ensure Cohesion between Aims and Methods

The draft recognises that "3D visualisation methods and outcomes can be used to address a wide range of research and communication aims". It appeared also necessary to establish that it is only one method among many; that "it should not be assumed that 3D visualisation is the most appropriate method of addressing all research or communication aims." This is to ensure that, in serious contexts, it is not used simply because it is available or to impress; the draft therefore proposes that "3D visualisation should not normally be used when other methods would be more appropriate or effective."

The nature and integrity of Research Sources

This arose, in particular, out of a presentation at the London Symposium by Daniel Pletinckx, in which he demonstrated how important and complex is the task of rigorously assessing the research sources we use, in particular of paying attention to the kinds of aesthetic and ideological factors that may condition our visual sources.

Transparency Requirements

This section on "transparency requirements" goes on to propose that "it should be made clear what kind and status of information the 3D visualisation represents. The nature and degree of factual uncertainty of an hypothetical reconstruction, for instance, should be communicated."
The transparency requirements of 3D visualisation projects may differ from those of other projects because of "the high occurrence of dependency relations within 3D models" which means that, if the process and its outcomes are to be evaluated by those outside the project, "it may be necessary to disseminate documentation of the interpretative decisions made in the course of a 3D visualisation process."

Documentation

The process and outcomes of 3D visualisation creation should be sufficiently documented to enable the creation of accurate transparency records, potential reuse of the research conducted and its outcomes in new contexts, enhanced resource discovery and accessibility, and to promote understanding beyond the original subject community. Indeed, while the provision of adequate documentation about research sources, methods and interpretative decisions is at the core of solving the "transparency" problem, it is also, in practice, among the most intractable challenges.

Standards

Work on standards needs still to be done and although we acknowledge their importance this is still a less developed part of the Charter. Relations with existing standards need to be fully explored when declining the charter in individual domains. For instance, when developing Charter implementation guides for Cultural Heritage domains, it will be necessary to explore how the goals of the Charter may benefit from the adoption of documentation standards as CIDOC-CRM [CRM] (http//cidoc.ics.forth.gr).

Sustainability

The draft notes that "3D visualisation outcomes pertaining to cultural heritage…constitute, in themselves, a growing part of our intellectual, social, economic and cultural heritage" and that "if this heritage is not to be squandered, strategies to ensure its long-term sustainability should be planned and implemented."

In the next draft of the Charter it has been proposed to lay more emphasis digital preservation, with the understanding that preservation of digital content is included in many specialized research agendas; research in this field will determine optimal strategies for preserving 3D digital content as well. In other words, the importance of adopting preservation strategies for 3D content is acknowledged, by monitoring the results obtained from elsewhere, and without committing now to any one in particular.

Access

During the London Symposium, David Robey, Director of the AHRC's ICT Programme, underlined the importance of continuing to make the case for technologically expensive work in the Arts and Humanities – to explain its value, and value for money – and also to consider that work in cultural heritage (broadly defined) is, for the most part, publicly funded, and many 3D visualisation outputs have a high re-purposability, as it is incumbent upon us to consider whether our work might have a value beyond our own immediate uses.
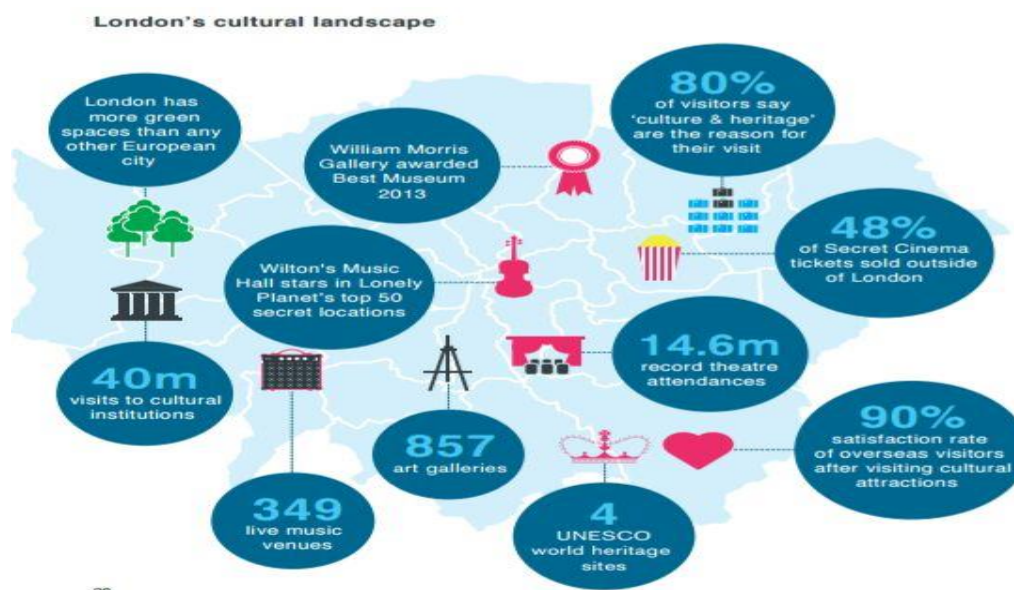
Charter Implementation

The Charter is designed to establish principles that are sufficiently focussed that they have an impact, but sufficiently abstract that they remain current as methods and technologies evolve. While the Charter operates on the level of principles, therefore, more specific recommendations (e.g. about technologies, standards and methods), while they are needed, belong to a different kind of document: Charter Implementation Guides.
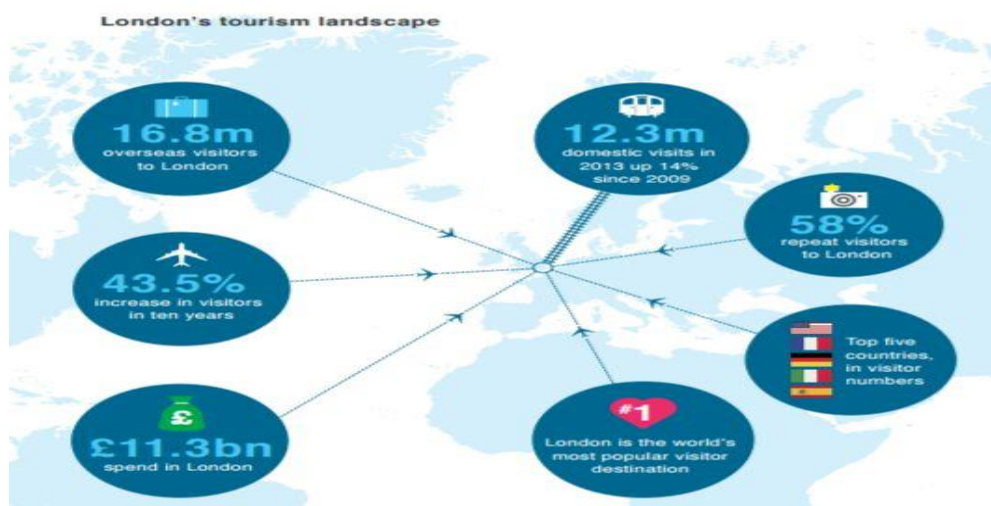
It has been suggested that, in order to do this, we may first need systematically to observe, how we reflect upon, choose, and communicate ('traditional') research methods. This would help us to build up a profile of what kinds of methodological information it is considered necessary to document for other research methods, and to base our recommendations on comparability with established academic standards. In addition to benefiting from their example, it could enable us to make persuasive arguments to 'traditional' scholars about the validity of 3D visualisation methods in terms that they would more readily understand.

Future work

As 3D Visualisation refers to a widely-used method, rather than a domain, there is at present no single organisation that can coordinate structured consultation and redrafting among key stakeholders. The Charter process will therefore be Chaired by Franco Niccolucci (VAST Lab PIN and EPOCH) and Richard Beacham (KVL), while Dr. Anna Bentkowska-Kafel and Julie Tolmie, Research Fellow and Network Development Officer (respectively) for the JISC 3D Visualisation in the Arts and Humanities Network (3D VISA) will act as "Secretariat" under the direction of Hugh Denard (Niccolucci et al,2004).

London's cultural landscape

London has more green spaces than any other European city

William Morris Gallery awarded Best Museum 2013

80% of visitors say 'culture & heritage' are the reason for their visit

48% of Secret Cinema tickets sold outside of London

Wilton's Music Hall stars in Lonely Planet's top 50 secret locations

40m visits to cultural institutions

14.6m record theatre attendances

90% satisfaction rate of overseas visitors after visiting cultural attractions

857 art galleries

349 live music venues

4 UNESCO world heritage sites

20

(Source: https://www.london.gov.uk)

London's tourism landscape

16.8m overseas visitors to London

12.3m domestic visits in 2013 up 14% since 2009

58% repeat visitors to London

43.5% increase in visitors in ten years

Top five countries, in visitor numbers

£11.3bn spend in London

#1 London is the world's most popular visitor destination

(Source: https://www.london.gov.uk)

Conclusions
1. The digital era and the rise of intelligent agents are changing the tourist landscape. As digital natives and digital immigrants applaud and embrace connected technology, businesses will need to reconsider their strategy in order to survive in the highly competitive markets.
2. Heritage managers have the responsibility to make sure that their heritage assets are properly preserved through digitization.
3. Heritage managers will also need to make sure that their assets are digital resilient by making sure that they have the right means of dissemination either through interactive media or virtual worlds that suits the taste of a wide range of audiences.
4. The positive analysis of conservation has stressed that, far from being technical and 'neutral' decisions, conservation choices not only depend on the different types of heritage and on its features but are also affected by the institutional features of the decision making process and by the experts' identity.

5. The introduction of the opportunity cost concept, to drive the conservation decisions, is advisable to prevent experts from adopting 'conservationist' approaches which might lead to unsustainable conservation policies.
6. Cultural Heritage is inherently unlimited by time, geography, culture or format. It is culture specific, but potentially accessible to every person in the world. Resources of human knowledge are increasingly created digitally, or converted into digital form from existing analogue resources.
7. The digital heritage is at risk of being lost and that its preservation for the benefit of present and future generations is an urgent issue of worldwide concern.

Recommendations

1. More of the cultural heritage held in Europe's museums, galleries and archives needs to be digitized, especially 20th and 21st century material.
2. More cultural heritage institutions should be encouraged to open up their digital collections for re-use.
3. Quality should be seen as a priority when digitizing cultural heritage objects – creating high-quality reproductions with detailed and descriptive accompanying metadata.
4. High-quality, rights-cleared cultural heritage content should be easy to access and easy to use.
5. Awareness of the existence and benefits of the cultural collections available via Europeana should be raised within the target sectors.
6. Case studies demonstrating the benefit of using high-quality rights-cleared cultural heritage content should be used to encourage participation by cultural heritage institutions and organizations within the target sector
7. Tourism and cultural policy-makers should actively cross-promote the funding programs and activities for the development of cultural heritage tourism that are available both nationally and from Europe.
8. Tourism and cultural policy-makers should encourage the development of mobile applications at local, regional, national and European levels
9. Work with Europeana to record the impact of making cultural heritage content available for tourism, using case-studies and recording useful statistics on use and re-use

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التطبيقات الرقمية التراثية وأثرها في السياحة الثقافية

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معلومات المقالة	الملخص

التراث الثقافي الموروث غير محدد بوقت، أو ببعد جغرافي أو بثقافة معينه، ولكنه لابد وأن يكون متاحا لكل إنسان على سطح الأرض. إن منظمة الأمم المتحدة تدعم أنشطة صيانة التراث الثقافي والتاريخي، بالإضافة إلى زيادة ونشر المعرفة حول العالم، عن طريق حماية التراث الموثق بالكتب والمخطوطات الخاصة بالفنون والآثار والعلوم المختلفة، ويعتبر برنامج "المعلومات للجميع" أكبر قاعدة معلومات للمعلومات التاريخية والتراثية المحفوظة، بالإضافة إلى برنامج "ذاكرة العالم" الذي يهدف إلى تأكيد مفهوم الحفاظ وسهولة الوصول إلى التراث العالمي الموثق. التكنولوجيا الرقمية هي الحل الأمثل للحفاظ على التراث العالمي، واستخدام هذه التكنولوجيا يمكن أن ينشط ويحفز صناعة السياحة، حيث أنه يسهل طرق الوصول إلى التراث التاريخي أو الثقافي. إن الخدمات السياحية غير المرئية لا يمكن عرضها قبل عملية الشراء، وبالتالي يصبح المنتج السياحي معتمدا على المعلومات التي تعرض بشكل مرئي وسمعي. المنتج السياحي الناجح هو الذي يكون معتمدا عل التسويق الموجه، الذي يؤدى بدوره إلى تنمية منافذ البيع، مثل استخدام تكنولوجيا "الواقع الافتراضي". وطبقا لإحصائيات منظمة السياحة العالمية، فأن سوق السياحة التراثية هو من أهم الشرائح السوقية في المستقبل، وبالتالي سوف نشير في البحث إلى أهمية الحفاظ على التراث الثقافي بالتكنولوجيا الرقمية من أجل تنمية السياحة التراثية المستدامة.