Themata 5 E-learning Archaeology, the Heritage Handbook

E-learning Archaeology

the Heritage Handbook

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Digital public outreach

by Francois Bertemes & Peter F. Biehl

MSCO Abstract

Our traditional understanding of producing and communicating archaeological knowledge, on-line or off-line, assumes either a direct correspondence with the world or a systematic semantic correspondence with concepts. Even Web 2.0 (see below) largely ignores the past 70 years of sociological and philosophical arguments for an understanding of knowledge as situated skillful practice. Although the past 10 years have witnessed a dramatic increase in archaeological digital projects around the world, we have to acknowledge that there are major shortcomings in transmitting of this knowledge to the public as well as the specialist communities.

This module explores, through several on-going projects, how both Web 2.0 and Web 3.0 fail to recognise the vital aspect of disciplinary knowledge, and public understanding of knowledge, and how many of the tools of Web 2.0 could be used to enable a diversity of perspectives and consequently appeal to a wider audience within the framework of the public outreach.

MSCO Introduction

This module discusses the knowledge production ranging from digital field archaeology, visual representation, knowledge management, and the sociology of knowledge. At the core of each of these areas is a concern with the processes by which knowledge is produced, represented and communicated. The module presents several projects that are concerned with the ways such processes operate in the context of archaeological information as a means of sharing diverse forms of knowledge with diverse communities.

Here we will discuss conceptions of knowledge as performance and the potential of the web as a contact zone, in which environments can be constructed that support the generation and representation of knowledge in, by, and for diverse communities. We will also evaluate the potential for the narratives, values, and interests of diverse knowledge communities to be appropriately represented with archaeological information that is created using the technologies and practices of Web 2.0.

→ **LU** Public outreach in the digital age: Knowledge production *by Francois Bertemes & Peter F. Biehl*

SCO The basics

> *Animation*

Practice

Our assertion is that knowledge is a practice; it is knowing how to adjust to a specific social-material setting (Smith 1996; Brown and Duguid 2000).

Theory

Knowledge is also performance: it is embodied in practice, not something we have, nor even something we can name consistently, but something we do (Boast and Biehl, in press). Moreover, a necessary condition for the generation of knowledge is engagement with other agents, other people and other things. However, engagement involves more than perception and cognition. It involves purposiveness and interpretation - intentionality.

Methods

Traditionally, the performance of archaeological knowledge tends to use two modes of representation, the interpretative and the classificatory, and there is a conflict between these two approaches. The systematic classificatory approach denies, fundamentally, the role of an object as citation. It gives fundamental primacy to the definitive account upon which all other secondary accounts are placed.

Analysis Interpretation

While the interpretive engages with the classificatory only as a mode of access to objects as illustrations, and while archaeology has become increasingly open to grassroots access and the ability of social computing to provide for greater audience participation, an important step of re-considering object citation and representation still has yet to be fully taken.

Knowledge production: some advanced theory

Representation must involve a consideration of the diverse ontological frameworks associated with different expert communities who have an informed experience and interaction with the object. Archaeologists, heritage managers, cultural preservationists, curators, and, critically, the local and regional public must all interact around the object, and

influence its selection, acquisition, classification, and presentation. This allows for online information systems to perform as 'contact zones', spaces which foster incommensurability and dialogues that emerge from the different traditions within which the object has travelled (Pratt 1992; Clifford 1997).

Artefacts and sites, as pieces of tangible cultural heritage, are gateways to a number of intangible, yet critically connected, practices: the telling of a story, a prayer, a song, a fairy tale, the process of research, the history of the exhibition, its relation to other objects, and so on. Therefore, we wish to re-expose these intangible processes around the object, through the consideration of 'multiple ontologies'. We find this goal for the module particularly pertinent and possible in the context of digital spaces – and that the possibilities of Web 2.0 create new models for re-thinking representation.

> *Animation*

Archaeological practice
Archaeological practice has been experiencing many changes over the past three decades, not least in the reorientation of recording and interpretation from a singular and authoritative account to multiple conflicting accounts (Boast and Biehl in press). However, no matter how much argument there has been for a pluralistic approach to interpretation and presentation, the intellectual control over the informational core of the recording, and its catalogue of objects and relations, has largely remained in the hands of the elite experts. The maintenance of the archaeologist as academic gatekeeper has been replaced by the archaeologist as educational gatekeeper. This change is clearly represented in the dichotomy between the diversity of archaeological performances in on site and (through talks, guides, school tours, and exhibitions) off site presentations and the actual record. While the archaeology allows many voices to be expressed from different experts, authorities and even the public, rarely do these voices pass beyond a local and temporary performance, and rarely are they recorded in an enduring way in the site record or monument description. Despite the numerous recent technological innovations, which encourage contributions from a wide variety of distributed groups of users, traditional archaeological recording practices persist, with narrowly descriptive structures written by a small, select group of 'expert' contributors.

'The digital advantage'
Alternatives exist... While the projects discussed below demonstrate the potential of recent technological innovations to engage stakeholder groups to participate in digital recording and managing projects, what is still unclear

about the implementation of Web 2.0 technologies into archaeological recording and heritage managing is whether these efforts are sufficiently balancing the primary accounts with the input from the diverse set of users in a way that yields a useful system for experts and non-experts alike. In the following we will look at two basic design errors that limit the usefulness of most existing online collaborations: (1) the requirement that users search using concept labels drawn from a single, predefined sets of vocabularies, usually following the traditional standards and vocabulary of the museum, and (2) the more general failure to provide users with opportunities to truly engage with and manipulate the content of the record, let alone with the data objects and monuments themselves. These design errors are the likely result of misunderstandings of the nature and roles not just of online records, but also of programmes of recording and their removal from the consideration of practices of knowledge production (Bowker and Star 1999).

sco Visual Representation
> *Animation*

Multimedia technologies
Virtual representation for producing and communicating archaeological knowledge has become increasingly important in the field of archaeology and heritage management in the past few decades. But it is a given fact that there are great potentials and serious dangers when using multimedia technologies such as virtual reconstructions, 3D-animations etc. to popularise archaeology (Biehl 2005; Biehl, Bertemes and Northe, in press), and we will discuss two case studies to illustrate this.

Visual representations
Visual representations reproduce knowledge whether by reproducing likenesses of objects, places or people. Recorded data, is organised in a more communicable - form (i.e. visualisation) or by reproducing the various interpretations of archaeologists and heritage managers. Van Dyke stresses that 'visual representations are integral to the production of knowledge and scholarly authority' (Van Dyke 2006). Visual representations are often used by archaeologists and heritage managers to not only communicate information to one another, but to also make their interpretations available to the public. In recent years, one way this is being done is through outreach programmes using digital media. It's true that computers have been used by archaeologists for a long time (see Boast 2002), but highly sophisticated and fast computer graphics have

been available to archaeologists only in the past two decades. The 1980s marked the beginning of its use, starting with the digital production of site plans, illustrations of artefacts and the results of the analysis of archaeological data.

Virtual Archaeology
Computer graphics are a valuable tool allowing for the representation and manipulation of large amounts of complex data and this tool has been labelled 'virtual archaeology' (Lehtonen 2005; Virtual archaeology applications 2008, Virtual archaeological methods 2008) and includes everything from reconstructions of sites and artifacts that can be created graphically from this amassed data to virtual reality reconstructions and 3D animations. Virtual (or digital) archaeology is a powerful tool in visualising and understanding archaeological data as well as producing and communicating it to the public (Evans and Daly 2006: 253). It is also an educational source for the general public and students in archaeology and heritage management. Many re-creations from greatly detailed archaeological sites have been created with standard modelling, rendering, and animation techniques. Digital archaeology allows for increased rates of publication of archaeological materials through the use of the internet. Its 'open-source-knowledge' allows to quickly and at a low cost (or cost-free) to produce and communicate archaeological knowledge to an international specialist community, schools and the interested public alike and even get them interactively involved in this process.

Popularisation
Since funding is increasingly limited for both universities and heritage management, the internet becomes more and more pivotal for communicating archaeology (Biehl 2005). It is therefore necessary to produce and perform archaeological knowledge efficiently with multimedia applications so that it can be easily accessed by the public – one of the greatest resources for archaeology. Tourism is one of the world's most powerful revenue sources. Visits to archaeological sites are often greatly educational. Unfortunately, the nature of tourism is at the same time economically beneficial to not only the funding of archaeology and heritage management and the local economy, but sometimes also threatens the archaeological remains (Renfrew and Bahn 2008, 545-74). One way to outreach to the public to keep its interest as well as preserve the fragile nature of many archaeological remains is through digital archaeology and the internet. The internet has greatly expanded

communication networks and the distribution of educational materials. The rate at which archaeological information is available on the internet is ever-increasing. Site reports, virtual museums, digital reconstructions, and ideas are available almost instantaneously. Some even argue that the internet is increasingly becoming the most important way to publish archaeological sites because of the wide distribution of knowledge and frequency and ease of updates and new editions.

Open Source and Open Access
The open-source quality of the archaeological knowledge on the internet provides the possibility to interactively modify, improve and redistribute knowledge. 'The speed, range, and low cost of the internet have created new possibilities for dissemenation and participation in knowledge construction and acquisition' (Hodder 1997). It allows for the opportunity of access to raw data and the ability to form one's own conclusions about archaeological materials. This has been seen as a move from a hierarchical structure of interpretation to a more networked or multivocal approach. These innovations bring with them the great potentials described above as well as serious dangers. Unfortunately, many online publications and site data are restricted in some form or another. Articles may require subscriptions to their online publications. Many of the journals that are only online are relatively small and not well-known, and well known journals of the same type, offered in print and digitally, may offer almost no free information.

Potentials and Dangers
Though it is a powerful tool for visualization, understanding, and communicating to the public, visual representations are biased, they encourage one particular interpretation over another (Van Dyke 2006). Levy points out that 'it is impossible to decide objectively between 'good' and 'bad' uses of the past; furthermore, there has been so much human movement, cultural mixing, and culture change in Europe that continuity from the past is a fiction' (Levy 2006). And there is a final danger with digital archaeology: its Eurocentric perspective. Not all countries offer speedy broadband connections to their universities, museums or heritage management services, not too speak from school or private households.

However, we would like to discuss two case studies in order to illustrate 'public outreach in the digital age'. First, we will briefly discuss the digital components of the Çatalhöyük

excavation project in Turkey, and second, we will use the project 'Blobgects' at the Museum of Archaeology and Anthropology (MAA) in Cambridge to discuss how archaeological knowledge is produced and communicated about via online-museum collections.

> SCO Exercise

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→ **LU** Multimedia applications at Çatalhöyük
by Francois Bertemes & Peter F. Biehl

SCO Digital places
An important and influential website is that of Çatalhöyük, Turkey; a significant Neolithic site discovered in 1958 in Central Anatolia and excavated 1959-1963 by James Mellaart and continued by Ian Hodder from 1992 (*www.catalhoyuk.com*).
> *Animation*
  The website features...
  archive reports
  databases
  site management plans
  illustrations, reconstructions, photographs,
  video documentations etc.
  This allows for analysis of the archaeological materials by interested parties. The video documentation not only tracks the excavation processes but also the views of the excavators. These videos are put on the website to assure some sort of multi-vocality and have proven to be a good means to popularise the site and its archaeology on the one hand, and to make it create a better understanding of it in the public on the other hand (Biehl/Gramsch 2002). Also included are lists of researchers and excavators, contact information, visitor instructions, forums and blogs, to encourage open communication networks.

SCO Methods
Çatalhöyük is a good example of the methodological turn virtual archaeology offers for producing and communicating archaeological knowledge. The application of multimedia equipment such as video recording (Brill 2000, Stevanovic 2000, Wolle and Tringham 2000) enable a reflexive and fluid methodology at a large-scale excavation project and promote a reflexive, pluralistic and 'open' access to archaeological knowledge, and can disentangle 'the dichotomies between past and present, theory and method, interpreter and interpreted, subject and object, specialist and public, which are so troubling today' (Biehl 2002:151). The latest trends in public outreach can also be studied at the Çatalhöyük project:

These cutting-edge and innovative projects are directed by Ruth Tringham and range from 'remixing' (*http://okapi. dreamhosters.com/remixing/mainpage.html*) to 'remediating' (see remediated places project: 'Senses of Places, the digital mediation of Cultural Heritage' *http://chimeraspider.wordpress. com/*) and 'Second Life' (h*ttp://slurl.com/secondlife/Oka-pi/128/128/0*).

Still, documentation is one of the most important aspects of archaeology, including the listing of artefacts, the mapping locations of sites, and positions and contexts of the artefacts within the strata. In order to create a detailed representation of an archaeological site or artefact, detailed measurements, observations, and collections of data need to be accumulated (Lehtonen 2005). The Total Station increases the speed at which finds and features can be recorded, allowing for a much greater number of finds to be recorded in a smaller amount of time. This speed increases the accuracy and thoroughness of excavations.

SCO Database Standards
> *Animation*
  Databases
  Archaeology often depends on archival data obtained by other archaeologists, or by researchers in other fields. This can cause differences in the way things are documented, including measurement units and the language of the data. Often databases are selective, and even when they are assessable, they may differ in size, format, or structure. Databases that have been compiled separately and are controlled by museums, government agencies, as well as individuals and universities, may have been created on different computer platforms (Snow et al. 2006). There is a voluminous array of unpublished literature consisting of limited distribution reports and so-called grey literature that has been mainly produced by commercial excavation firms and government agencies. Also, images, maps, and photographs embedded in museum catalogues and archaeological reports both published and unpublished. Protocols are needed because of the confusion caused by modern political boundaries, which,nevertheless, are irrelevant when talking about prehistoric, early historic or environmental contexts.

  Virtual Museums
  With the advancement of computer technology, virtual reality renderings have brought data to life. The Minnesota State University's E-Museum describes VRML or Virtual Reality Modelling Language, as allowing archaeologists to convert 2D digital elevation models of sites using GIS data

into 3D 'full color, photorealistic models that can be interactively explored' (Virtual archaeological methods 2008). 'GIS is a computer based set of procedures for storing, manipulating, analyzing, creating, and displaying spatially referenced data' (Davis 2005). Modelling allows for easily viewed and distinguishable stratigraphic layers and the relationships of those objects found within the strata (Uehara et al. 2001).

Digital Fieldwork
Virtual excavations use a computer tablet along with a GPS unit. It allows visitors to the site to see what the site would have looked like in the past, connecting far greater a level of understanding of a site with barely any visible signs of the past with its human presence. People can see a site in its original state, they can change their perspective, view the site without degradation by natural or human proc-esses, and it can be viewed by a much larger number of people through the use of the internet (Uehara et al. 2001).

Digital Theories
Computer programmes aid in artefact assemblage by 'finding adjoining pieces in a large collection of irregular fragments by comparing their shapes' (Da Gama Leitao 2001). Documentaries are also very important tools utilised in communicating archaeology to the public. They can be viewed on TV as well as through the internet (Van Dyke 2006). 'As an excavation progresses, the archaeologist never sees more than a single reference frame. As portions of a site are uncovered, they are recorded as data and a new reference frame is revealed while the first is forever destroyed by virtue of the second being revealed. By modelling the data, both artefacts and the matrix of associated soils, rocks, floral, faunal and other documented finds, the researcher can essentially paint a motion picture of the excavation' and the past (Applications 2008).

> SCO Exercise

→ LU Cambridge Blobgects project
by Francois Bertemes & Peter F. Biehl

SCO Digital Objects

Blobgects (*http://museum.archanth.cam.ac.uk/blobgects/*) was created by Robin Boast at the Museum of Archaeology and Anthropology (MAA) in Cambridge to explore how people access and make sense, or not, of museum catalogue entries on-line (see Boast and Biehl in press). The name 'Blobgects' is

a mash-up of the words 'Blog' and 'Object,' just as the system itself is a mash-up of the functionality of a blog as applied to a catalogue of museum objects. To this end, the study was focused on exploring how people would engage with cata-logue entries, in their relatively pure form, in a format that was familiar to most, but that was unfamiliar to the catalogue. The study focused on how certain features of access, tagging and commenting, might impact the means by which users engaged with catalogue entries as digital objects and is a good example to illustrate how to better produce and communicate archaeological knowledge.

In particular, the project was interested to see the role of the unmediated catalogue descriptions. In other words, it was interested in the nature of the catalogue description as an accurate and accessible description of the object. Therefore, all images were intentionally omitted from the catalogue entries. The purpose of this omission was to ensure that the catalogue descriptions were used without other mediating descriptions to test their validity, and to see how responses to these descriptions might perform in a Web 2.0 setting.

SCO Cataloguing

The catalogue entries used in Blobgects were drawn directly from the MAA's Collections Management System using the approximately 11,000 accessions (objects and photographs) available from the Arctic. The vast majority of the material is from collections made during the Wordie Arctic Expeditions of the 1930s to Greenland and Baffin Island. The material is not particularly contentious as it was largely openly traded for during the expedition. However, there is a small proportion of the material which was excavated from sites during the expeditions. The data presented from the MAA catalogue, which conforms with the SPECTRUM documentation standard (*http://www.mda.org.uk/stand*), included the usual public information (see example below). This information was not rewritten nor modified for the Blobgects system, such as witnessed by the inclusion of the original use of 'Eskimo' throughout the records, as it was envisioned to prompt discussions of the nature of existing museum records.

> *Animation*
  Cataloguing
  IDNO: Z 45064 G
  DEPT: Anth/Arch
  name: Bone; Carving
  Keyboard: Tools; ?Art
  Material: Bone
  description: Worked
  'Note with the objects reads: 'These seven specimens were part of the priests collection from Abverdjar but from their

appearance are obviously different from the rest of the collection and are probably either surface finds or mixed in by mistake by the Eskimo or at the priests house' This record originally said this was a slate point. The slate point is marked A. The object marked G is bone. It has a dot pattern on the curved upper surface. The under side is flat. This object resembles a broken carving of a figure.
S-J Harknett 23/1/2001'
Local name:
Maker:
Culture group:
Source: Rowley.Graham.W (collector and donor)
Source date: ? 1938; ? 1939
Place: Americas; North America; Arctic; Canada; Northwest Territories; Fox Basin; Abverdjar
Period: Eskimo
Context Date: ?Recent -; Collected by: Rowley.Graham.W

sco Blogging

Web 2.0
The system has been inspired by the idea of creating a blog that would allow museum objects to be commented upon and tagged online. The Blobgects 'experimental' system version simply made the same metadata possible as the MAA's standard catalogue, the key difference being its allowance of users to modify, tag, comment, and so on. The results of the study confirm that it is not simply the presence of Web 2.0 technologies that matter, but the nature of the voices that use those technologies, allowing users to encounter multiple perspectives around the object. In this regard, the initial prototype of Blobgects was a very successful failure – while it is dissatisfactory as a standalone system, the reactions gathered from users indicate a clear path forward to further developing digital museums that focus on making Web 2.0 capacities present while concurrently working actively to include tags and comments by relevant voices to provide context to the object in the form of a set of diverse perspectives.

The experiment
The study was designed to compare results between two different user populations: a group of masters-level students in the Department of Information Studies at the University of California, Los Angeles (US), and a group of Inuit high school students at the Inukshuk High School in Iqaluit, Nunavut Territory (Canada). Both these groups are representative of the types of 'expert communities' inter-ested in museum objects and their representation in catalogues, in that each maintains a distinct but important

connection to the objects presented online, whether as part of the cultural education of traditional objects from one's community (Inukshuk) or as an object that must be shared with the public, and in particular museum studies with professionals, via a cultural institution (UCLA museum studies students).

Each of the two user(s) populations was divided into an experimental group and a control group. The experimental groups interacted with the fully-functioning Blobgects system, which displays a tag cloud, or a set of hyperlinked descriptive terms which are used for navigation and access to groups of objects (e.g. clicking on 'ivory' would bring up all objects with the term 'ivory' in their catalogue entry). This group could also search the system via a 'simple' search from the home-page, or from a separate 'full search' page. The experimental group was also allowed to add comments to entries if they wished. Importantly, the Blobgects tag cloud, rather than being user-generated as is the case for many Web 2.0 tagging sites like Flickr and del. icio.us, was instead derived from terms found in the actual museum catalogue records – by doing this, it was hoped to examine whether a system identical to the CUMAA's standard catalogue system, in terms of the basic metadata provided, would prove superior if it allowed for Web 2.0 capabilities (in this case, navigating the Blobgects system via tags).

The control groups in both locations were presented with an identical version of Blobgects, with the key differences being that this version did not feature the tag cloud or commenting capability, but only displayed the three broad category terms as hyperlinks from the main page ('photo-graph', 'document', and 'object'), restricting users to directly interacting with the catalogue alone, and making searching the primary mode of accessing objects in the system. This 'control' system presents the same functionality and content as Cambridge's existing online catalogue, but via an interface that is designed to resemble the experimental version.

Further information and websites
Because part of the research study was meant to explore whether participants were interested enough in the items that they were engaging with to bookmark them for future exploration, participants were also encouraged to make use of the social bookmarking site del.icio.us during the study (*http://del.icio.us*). Del.icio.us is a web-based bookmarking utility that allows users to tag sites with one-word descrip-tors, and those tags can be shared with other users. Del.icio.us is one of several sites that Blobgects allows

users to directly tag or link to (others include digg.com, Technorati, StumbleUpon, and Bloglines). Tagging was not provided within Blobgects, though it could have been, as it was important to limit the test to see if the 'raw' catalogue entries would be sufficient to encourage further tagging within the Web 2.0 community. It could be argued that tagging within Blobgects would have better tested this premise, which may be a fair criticism. However, as a preliminary study, the intention was to minimise the possible variables.

sco Research Results

Blobgects was designed to explore how people access and make sense, or not, of museum catalogue entries on-line - catalogue entries from the now standardised catalogues that are required of museums. To this end, the study was focused on exploring how people would engage with catalogue entries, in their relatively pure form, in a format that was familiar to most, but that was unfamiliar to the catalogue – that of the Blog.

The experimental system intentionally did not include images as it was decided that this would complicate the understanding of how people engaged with the catalogue idiom. The study therefore focused on how certain features of access, tagging and commenting might impact the means by which users engaged with catalogue entries for digital objects. The most interesting outcome of this study was that the main feature of the Blobgects system, the ability to tag and to comment, had little to no effect – existing museum catalogue metadata are simply too specialised to engage diverse publics and 'expert' communities. However, the study also reveals the importance of issues around the roles of narrative, dialogue and image to contextualise the objects, independently of catalogue descriptions, and the potential in enabling users to move beyond definitive accounts. It also suggested that the many Web 2.0 and grassroots tools of personalisation and local description are not very useful without these complementary means of contextualisation.

More specifically, the following notable findings from this study can be summarised:
> *Animation*
  Tagging
  The power of narratological tags: In the rich, diverse, dynamic nature of cultural knowledge production, we continue to create systems that mediate our interactions and preserve our practices that are static, and still focused on retrieval questions that are displaced from practice and active engagement. Even though the presence of social web software (Web 2.0) has opened up positively our

categories from meta ontologies, within the domain of multicultural systems and publics these systems fall short of actually sharing knowledge according to the contexts in which it is produced. The systems, ad hoc, are dis-embedded, and we find in our study a possible solution to re-weave systems and cultures: that of narratological tags, and stories that integrate, with categorical social web indices-tags, around images.

Cataloguing
Diverse users with diverse inputs add meaning to the online catalogue: Diverse inputs are often ambiguous relative to a descriptive perspective. Diverse expert communities add to these objects with concepts, images, and contextual information that may not be easily explanatory of the object for a lay person. Yet this ambiguity represents the reality of diverse perspectives toward objects, and these ambiguities provide potential for inductive discoveries around the objects. As more diverse users add to the digital object, the context of these seemingly ambiguous perspectives begins to become clearer and stimulate further insight.

Communities
Tagging must fit within a discursive conversation: it was found that this process works within the online catalogue system when it is embedded within a discursive conversation, a conversation between different social contexts and actors who have a connection to the object being presented. Diverse tags can serve as a mechanism by which the objects can stimulate new interactions between expert communities, and between museum visitors and expert communities. The tag is therefore not the exhaustive representation of the object but the conduit for interaction between users and a deeper sharing of the context behind the object.

Images
The power of images: Digital objects and digital museums may stimulate this cross-cultural dialogue when images are presented. The experiment uncovered evidence that users are interested in interacting with, browsing, and retrieving objects via images and not just textual categories.

Blogs
Blogs versus Tags: Participants are largely uninterested in status quo tagging systems around digital objects, but the presence of the tagging system stimulates a reaction

amongst participants to share diverse reactions that are not merely categorical and descriptive around the object. Participants are interested in presenting social contexts, conversations, narratives, and images around the object, a process that may emerge more closely from a 'blogging' framework rather than a 'tagging' one.

SCO Standardisation

As the Blobgects study argued, traditional museum catalogues have explicitly omitted the multiplicity of accounts and contexts that can be shared. This has been the result of an uncritical and largely hidden application of technology to the representation of cultural materials resulting in an emphasis on information standardisation. The argument has been that this standardisation is necessary to facilitate access and interoperability (Bower and Roberts, 2001);
See also:

> METS (*http://www.loc.gov/standards/mets/*),
> EAD (*http://www.loc.gov/ead/*),
> Dublin Core (*http://dublincore.org/*),
> RDF (*http://www.w3.org/rdf/*),
> and CDWA (*http://www.getty.edu/research/ conducting_research/standards/cdwa/index.html*)

However, this standardisation comes at a high cost to the diverse local meanings of objects. Therefore, as part of the ongoing project 'Emergent Databases: Emergent Diversity (ED2)', the RDO project has explored ways that museums can develop access systems that are able to accommodate and develop multiple ways of engaging with and understanding digital objects.
Collaborative, participatory methodologies are gaining increasing acceptance in and across several social science disciplines, and the proliferation of participatory methodologies in social science research reflects a fundamental de-centering of the research paradigm. E.g. the structure and content of the MAA Catalogue conforms to the UK SPECTRUM Museum Documentation Standard (REF). What was most interesting about the preliminary results of the RDO study was the extreme disparity, even incommensurability, between the MAA Catalogue description and the many descriptions and accounts arising from specialists.

> SCO Exercises

MSCO Conclusion: Contextualising knowledge production and communication

At the end of the module we present not so much a conclusion or summary as a postscript. The case studies raise several issues that have always been present, but have been largely neglected. There is the need for information in narrative form and the power of diverse contextualisation of 'digital places' (excavation projects) and 'digital objects' (in museum catalogues). This suggests two major stages of access:

The first stage is the importance of understanding how to present digital places and objects to multiple publics, though this is not a study of semantics, as semantics are not, in themselves, a useful way forward for public outreach of archaeological knowledge. Semantics, and the Semantic Web (see below), start from the assumption that syntax is the bridge between ontology and epistemology. The module presented here suggests that understanding requires a consensus of and participation from those using the information; that the relevance of the digital places and objects arises not from the semantic designation of the place or object, nor from its role as an illustration of some definitive story, but from a context of use; that the context of these rich representations must be made apparent; and that through this dialogue with diverse images, accounts, and descriptions, others can begin to construct a meaningful understanding of these objects, sites and practices. It is, lastly, also through the process of meaningful use that others can begin to expand these understandings.

The usual response to this need has been to create interfaces for the information. Much of Web 2.0 operates on this assumption, with some real success. Simply provide users with a platform for interaction and use, and leave them to do it. However, this ignores the problem of context. Web 2.0 offers a space for exploring the power of appropriation and re-use of digital places and objects, but this must be extended to consider the ability to contextualise and engage local and vernacular accounts of digital places and objects from diverse communities. Future research shall continue to probe these critical issues and enable digital performance to serve as environments that support the generation and representation of archaeological knowledge in, by, and for diverse communities.

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→ **LU** Glossary *by Francois Bertemes & Peter F. Biehl*

SCO Glossary

Web 2 (and Web 3)

The term 'Web 2.0' refers to a perceived second generation of web development and design that aims to facilitate communication, secure information sharing, interoperability, and collaboration on the World Wide Web. Web 2.0 concepts have led to the development and evolution of web-based communities, hosted services, and applications; such as social-networking sites, video-sharing sites, wikis, blogs, and folksonomies.

Semantic web

The 'Semantic Web' is an evolving extension of the World Wide Web in which the semantics of information and services on the web is defined, making it possible for the web to understand and satisfy the requests of people and machines to use the web content.