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Beyond Theme Parks and Digitized Data: What Can Cultural Heritage Technologies Contribute to the Public Understanding of the Past?

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Our legacy, our patrimony, and our professional responsibility as cultural heritage technologists, lie not only in gigabytes and pixels – but also in the dramatically evolving social significance of heritage itself. In the interactive touch screens of national museums and local visitor centres, in the interpretive applications at archaeological sites and monuments visited by school groups and tourists in their millions, and in countless websites and on-line archaeological databases, the past has become an ever-present virtual reality that is simultaneously more real and more virtual than ever before. No longer the exclusive domain of specialised scholars trained in arcane lore of ancient languages, ceramic chronology, and architectural history, the past is now seen as a resource for the economic development of local communities and regions, a medium for cultural identity and cross cultural communication, an edifying destination for cultural tourists, and a focus for educational enrichment. Never before have so many people, in so many walks of life, been offered so many avenues to the past. But do these avenues all lead in the same direction? Should they? And what role can technology most profitably play in enhancing the value of these increasingly frequent virtual journeys through time?

As in so many facets of our increasingly PowerPointed era, we are doing some things – certain things – with unprecedented power and efficiency. As we can see in the papers presented in this conference, the digital technologies of Cultural Heritage informatics are utterly transforming two main activities central to the process of re-creating and understanding the past. One is enthusiastically esoteric. The digital recording and analysis of scientific data have now become powerful automated operations, developing and utilizing the most advanced techniques of image processing and state-of-the-art statistical and database applications, designed with and for specialised scholars with their highly specific professional needs. The other is at least superficially democratic: the communication of new insights and understandings about the past to the widest possible audience through interactive applications, personalized presentations and breathtakingly realistic virtual reality environments. In fact, we now see these two operations – the esoteric and the democratic – as the opposite ends of a cultural heritage informatics production pipeline. At the start is the data collection and analysis – and at the very end – after the scientific work has been concluded and the scientific judgments formulated, come authoritative, accessible, and

complexly hyperlinked academic publications, closely followed by popularized presentations for the general public – in the form of effectively crafted CDs, DVDs, websites, and multimedia applications for use in education, community edification, and sustainable valorisation of museums, historical monuments, and archaeological sites.

Yet even as we refine and raise the efficiency of the so-called Cultural Heritage pipeline, we need also be aware that it is only one way of looking at the past. For the Past is one of the most virtual of the realities we have to contend with. It's an untouchable phantom: a once-lived reality that comes to us in pieces and can be experienced only in retrospect. We can never re-create the past as it actually was, with its sense of uncompleted present-ness and uncertain expectation: not knowing whether a particular city would be conquered by its enemies, whether this year's crops would be abundant or fail and leave the people cold and hungry, or whether a certain empire or village would weather all its social and environmental challenges to bequeath a bright future to generations still unborn. We may be able to measure precisely the dimensions of the excavated rooms of an ancient structure, count and map the artefacts found within it. We can accurately chart settlement patterns on the landscape, and perhaps even approximate the outward physical appearance of ancient communities. But we can only guess at the human dimension of past civilisations by piecing their surviving fragments together with the glue of our own ideas of logic and cause-and-effect. And that glue, unlike the ancient shards that it holds together, comes from the hopes, fears, dreams and ideologies of the era in which we live.

David Lowenthal (1985) put it best – and with characteristic frankness – when he wrote that “the more realistic a reconstruction of the past seems, the more it is a part of the present.” Just compare an artist's rendering of a pharaonic temple from the massive 18th century *Description de l’Egypte*, with an early 20th century Egyptologist's reconstruction, with the latest creation of virtual reality. The differences are not merely due to the progressive accumulation of scientific data or techniques of reconstruction. Each of them also embodies the deepest cultural sensibilities of the time in which they were made. That cannot be avoided; we can only see the past from the perspective of the present and that inevitably time bound perspective is what makes every generation's vision of the past so unique.

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All too often, I am afraid, we are so preoccupied by the challenge of processing the sheer quantity of data that flows through this pipeline that we do not often have the time or the inclination to question the overall design. Who built it? Who decides what raw materials it should be fed with? Who benefits from its final products? Whose interests does it serve? The very idea of a cultural heritage production pipeline to channel and analyse historical and archaeological data is itself a time-bound conception. For as the archaeological historians Kenneth Hudson (1981), Bruce Trigger (1990), and Thomas Patterson (1995) have all noted, the modern techniques of archaeology and material culture study matured in an age of industry and industrialized extraction – and they all share some important aspects of a common consciousness. Certain raw materials are identified as valuable and their sources are protected. The perception of their economic value or social utility determines the kinds of industrial processes they will undergo no less than the shape of the products into which they will be formed. And once those products are refined or manufactured, their quality is checked, their supply is monitored, and they are delivered to consumers through established market mechanisms.

And so it has become with cultural heritage, undergoing processes no less systematic than coal, gold, petroleum, or bauxite. Certain classes of artefacts and structures are deemed significant and the sites that contain them distinguished by scholarly classification and protected by law. Increasingly rigorous and standardized methods of excavation and stratigraphic analysis have been developed. And even though the range of relevant data has continually expanded from precious artistic objects to everyday implements to environmental evidence – and new tools such as Carbon 14, trace-elements analysis, and remote sensing have been added – the basic disciplines of the production pipeline have remained largely the same.

The product of this process is knowledge, but it comes out of the pipeline in quite standardized forms: excavation reports, typological studies, scholarly monographs, visual reconstructions, museum collections, officially protected and demarcated historical sites. If we extend the pipeline to encompass communication with the general public, we will see how scientific conclusions are simplified and popularized through a wide range of picture books, children's books, textbooks, magazine articles, CDs, websites, and various on-site interpretive installations, ranging from simple informational panels to immersive Virtual Reality.

The output of the pipeline, however, is historical knowledge of a very particular kind. For since at least the 19th century, the systematic excavation and physical examination of ancient material culture through accepted scientific methods has largely superseded ancient folk beliefs and the study of the biblical stories of creation as the definitive, authoritative manner for studying the material remains of the past. Modern conceptions of time as a straight-shot arrow moving relentlessly forward (in contrast to the mythic cycles or grand apocalyptic scenarios), have given rise to new chronological narratives that reshape the way we understand

human history. From the aesthetic concerns of Renaissance scholars in defining the progressive evolution of artistic styles by the Greeks and the Romans, to Enlightenment visions of ancient peoples marching onward from barbarism to civilization, to the industrial metaphors of man's steadily increasing technological sophistication through the Stone, Bronze, and Iron Ages, to modern archaeological narratives of environmental balance and fluctuating social tensions, archaeology's stories have always reflected contemporary sensibilities and concerns. And no less important, they continue to provide modern nation-states with scientifically documented national biographies.

And so every modern nation has created its own production pipeline, in which its universities, government antiquities services, ministries of culture, and education systems play their appropriate role. National museums are maintained as prestigious state institutions. Specially selected heritage sites are recognised as national monuments, administered and interpreted by officials of heritage bureaucracies. Famous ruins and discovered artefacts serve as ideological symbols, diffused into the popular consciousness as national icons, themes for theatrical epics, motifs for postage stamps and banknotes, all referring – directly or indirectly – to the national narrative. And the designated heritage sites themselves become places of pilgrimage and leisure-time diversion, venues for school visits, community commemorations, and potentially lucrative tourist trade.

The word “lucrative” is significant, for it provides the cultural heritage pipeline with a motivation for marketing that brings it dangerously close to being a state-sponsored commercial enterprise. From the very beginning, there have always been gawkers, gapers, and holiday-makers at the iconic monuments of Europe – Stonehenge, the Roman Coliseum, the Parthenon, the Leaning Tower of Pisa, just to mention a few. But with the rise of mass tourism, new amenities were needed. At first they were quite simple: licensed guides and informational panels. As the competition for visitors mounted, public presentations expanded to include historic re-enactments, reconstructed buildings, special events, and celebrations. In the late 20th-century, theme-park techniques of promotion and marketing were added. And in our day, the Information Age “edutainment” tools of touch screen interactivity and Virtual Reality are gradually becoming prerequisites for every major heritage site.

The phenomenon is spreading. All across Europe, in recent years, heritage sites by the hundreds if not thousands have been valorised, glamorized, and relentlessly merchandised by regions, municipalities, local communities, and now even private management companies seeking to attract visitors and the prospects for economic development that they bring. What emerges at the very end of the pipeline is therefore carefully processed leisure time entertainment, edifying perhaps, but still structured in the same way in terms of booking, entrance fees, and overnight accommodations as the other packaged visits of the tourist industry. For in this age of increasingly self-supported culture, attendance figure and account books are the real tyrants. If the main objective

of heritage presentations is to attract heritage consumers, interpretation can rarely afford to offer the kinds of serious and troubling historical reflections that are likely to drive holiday visitors away. All too often, the past has indeed been presented as a theme park. While some holiday makers might choose to escape the daily grind in the mountains or the seashore, the cultural heritage tourist has learned to seek another destination: exchanging the uncertainties and worries of the present for the comforting stability of a scientifically imagined past.

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Thus modern history, not ancient, has shaped the heritage pipeline's conceptual blueprint. And where precisely do we, as cultural heritage technologists, fit in? For the most part, we fulfil specialized functions in various stages of the comfortably tubular progression from field recording and data capture, through data organisation, reconstruction and visualisation, to heritage education and communication, in conjunction with the specialists and decision makers in all of those fields. Making the pipeline ever more integrated and efficient is certainly a major challenge and some significant achievements have already been made. Yet many important challenges for cultural heritage technology also lay outside the pipeline. Indeed, I might suggest that one of the greatest contributions we can make to the public understanding of the past would be to go beyond the idea of the pipeline itself.

We are confronted today with new kinds of heritage whose significance defies analysis by scientific methods alone. Our material legacy is no longer seen in only stately buildings or prehistoric settlements, but in an increasingly broad and sometimes unpleasant sampling of the achievements – and failings – of our own civilization. The World Heritage List now includes the grisly remains of World War I trench warfare, concentration camps, colonial prisons, and rusting, crumbling 19th century factories and mines where children worked, workers died, and the very idea of a production pipeline was born. Can statistical patterning of shell holes in No Man's Land at the Battle of Ypres, or a detailed database of the eyeglasses and shoes collected from the victims at Auschwitz, or a precise 3D reconstruction of the 18th-century slave terminal on the island of Gorée off the coast of Senegal help us better to understand and to productively reflect upon the unpleasant realities of the past still painfully embedded in the fabric of our society – that those heritage sites symbolize?

For better or worse we have inherited a marketing mechanism of cultural tourism that is eagerly adopted by communities in desperate search for economic resources. Too often the authorities have carefully shaped the message, avoiding the kinds of unpleasant subjects of hatred, injustice, and genocide that are likely to keep the holiday makers away. But the value of the past is precisely to teach us new things, to offer difficult themes for public discussion and reflection, a task hardly possible when the goal is to capture a market share of recreational activities. Planning for the sustainability of public presentations – one of the main objectives of the EPOCH Network – may never be

effective if results are counted in economic sustainability alone. Some sites, no matter how elaborately researched and interpreted, will never attract large numbers of visitors, for the routes of tourism are exceptionally inflexible, based less on content than the convenience of nearby highways and airports, the pressures of itinerary planning, and the most comfortable facilities.

That doesn't mean that these more modest heritage sites don't deserve valorisation, for they each represent a material resource, a constant reminder of the past's ever-presence. We must apply our technology to more closely monitoring current heritage practices and developing new forms of cultural communication programs – in which success lies not only in professional competence, technology and rational planning, but in the creation of lively local institutions, not static monuments – sustainable in the long run not because of how they look or what information they contain, but for how effectively they function as centers for common reflection, self-assertion, productive questioning, and historical awareness within every community.

And what of the cases where heritage is in conflict? The legacy of narratives of promised lands and chosen peoples can make one warring party's proudest heritage an object of resentment and target for destruction by its adversaries. In our world, heritage has in some places become the battle banner of demagogues of ethnic exclusiveness and cultural purity, seeking to erase from the landscape and from public consciousness the diversity and complexity of human culture. We have seen the destruction of the Mostar Bridge in the battle for Sarajevo, the detonation of the Buddhas of Bamiyan, and the continuing historical conflict between Israelis and Palestinians over their heritage in a twice-promised land. How can technology help to restore or preserve pasts that are slated for selective destruction, with or without the consent of the governments concerned? Interoperability, I would suggest, is more than just a technological slogan. If integration of information is indeed one of the great potentials of digital technology, it is our responsibility to construct an infrastructure in which the recognition of the diversity and wholeness of human heritage is no less important than the perfection of scientific techniques.

Our production pipeline presently has little provision for ethical considerations: it takes the value of its raw materials for granted and the processes performed upon them as the primary path to knowledge and public enlightenment. But today we can no longer flee into a world of soaring columns, impressive castles, or elegant châteaux that embody an impossibly homogenized idea of national character. Formerly coherent ethnic, national, and cultural identities are in the process of being shattered. The historic districts of many of our cities have become home to struggling immigrant communities for whom the official epics presented by antiquities services and national monument administrations – and even the concept of a distinctive European identity – have a sharply different interpretations and little practical relevance. "Heritage" can mean many things in the multi-ethnic landscapes of the 21st century. The growing acknowledgment of the claims

of non-academic, non-governmental heritage stakeholders such as community groups, religious bodies, indigenous peoples, and ethnic minorities implies an obligation not merely to homogenize their heritage perceptions into a master narrative but to offer respect and dignity to a wide variety of approaches and perspectives on past. When we speak as technologists of increasing public access to heritage, we should not think only of creating more cleverly packaged products, but instead create information avenues of two-way communication, in which, alongside traditional archaeological and historical investigation, alternative visions of the past can make themselves heard.

New data sources also have to be considered – beyond those functionally useful for academic research. Elements of intangible heritage such as folk traditions, music, dance, literature, foodways connected with heritage sites and historical cultures defy the standard organization or analysis of the production pipeline. And even standard data selection is often no longer a systematic process. The bulldozers and wrecking balls of rapid economic development all over the world uncover and endanger vast amounts of material heritage, in a quantity so great that no antiquities service in the world has the capacity to keep up. Technology can and has helped by creating quicker and more efficient methods of recording endangered data and more efficiently marshalling existing resources to deal with cultural heritage emergencies.

For at construction sites in busy cities, in wide ranging surveys of settlement patterns, and in new analyses of ancient foodways and trading connections, the European past has proved to be anything but static or pure. Waves of immigration, trading connections, and shifting networks of military alliances and commerce through the millennia have left a complex and multifaceted record of human interaction – and new understandings of what “European” identity might include. All these factors are relevant to the reshaping of the heritage pipeline from a one-way process of production into an ongoing, multi-channel public discussion – informed by reliable and meticulous scientific investigation but also enriched by the feedback of a wide range of contemporary perspectives about the value and significance of the past.

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Digital technologies hold great promise for improving and integrating the processes of cultural heritage, yet a voice from the past, Mark Twain, has offered us a grim vision of the fate that awaits a technology that fails to recognize its larger social context. In his comic and tragic 1889 novel, *A Connecticut Yankee in King Arthur's Court*, Twain tells the story of an ingenious inventor and factory manager who is miraculously transported through time from bustling 19th century America to Dark Age Britain, where he accomplishes some remarkable things. Defeating the wizard Merlin in a duel of superstitious magic versus scientific magic, the Yankee believes that that Science and Technology can utterly transform Camelot. As he gains the confidence and support of King Arthur, he trains a new generation of chamberlains and courtiers in the technologies of electricity, steam, printing, marketing, and

long-distance communication. He constructs an efficient production pipeline of technological innovation that utterly transforms Dark Age society. By the end of the story, we are treated to the spectacle of pacified knights riding through the countryside as moving billboards, monasteries and monks as tourist attractions, an efficient civil service replacing serfdom, steamships and railroads linking the kingdom with its neighbours, electric lights in all the castles, and telephones for even the humblest peasant in the land.

The Yankee's goal is unquestionably noble. He sees the people of the kingdom enslaved in an oppressive feudal system of fear and intimidation that he seeks to overturn with the tools of a modern market system – based on technological advancement of science and the diffusion of fair and impartial information to all. But his fatal mistake was to concentrate only on efficiency and the mechanics of the market, neglecting the powerful structures of intolerance and inequality that the Dark Age past had bequeathed. Eventually the old forces of privilege and exclusion recognize that they too can benefit from the institutions and innovations of the Yankee's production pipeline and Camelot becomes the scene of an apocalyptic battle between the forces of past and present. In desperation, the Yankee destroys all his technological advances lest they serve those who only seek to dominate their contemporaries.

Our challenge is to prevent a similar a disaster, for there are also forces in our world that seek a return to a Dark Age of fundamentalism, militarism, fear, and intolerance. If we are not careful we may just provide them with the digital tools to build efficient cultural heritage production pipelines themselves. Taliban TimeScopes? Virtual recreations of famous battles and idealised ethnic victories? Avatars of modern political ideologies clothed in scientifically verified simulations of ancient costume? Will our contribution finally be just the perfection of a machinery of historical illusion or will we begin to concern ourselves with heritage's social context and the way that our technologies are used? Our imaginings of the past – both scientific and creative – can serve a vital role in the shaping the future. And we can therefore make our greatest and most enduring contribution not only by improving the inner workings of a unidirectional production pipeline but by helping to construct an open and free flowing neural network of shared global memory that facilitates reflection – rather than dispassionately processes data – about the past's evocative, enigmatic, and always enlightening material remains.

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