

Ethics of Digital Representation in Egyptology

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Ancient Egypt, New Technology

*The Present and Future of Computer Visualization,
Virtual Reality and Other Digital Humanities
in Egyptology*



Edited by
RITA LUCARELLI, JOSHUA A. ROBERSON
and
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Ancient Egypt, New Technology

Harvard Egyptological Studies

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Looking Back, Looking Forward: Ancient Egypt—New Technology

Rita Lucarelli, Joshua Aaron Roberson and Steve Vinson

During the summer of 2015 and summer 2016, Rita Lucarelli was awarded two Collaborative Research Grants from the Mellon Foundation and the Digital Humanities Department of the University of California, Berkeley, to study the “materiality of the ancient Egyptian Book of the Dead,” by realizing 3D models of decorated coffins in the Phoebe A. Hearst Museum of Anthropology of the University of California in Berkeley. During this same period, Lucarelli began co-operative efforts with the Computer Cluster of UC Berkeley, concerning issues of sustainability and data sharing, and the Institute of Digital Humanities at UCLA, concerning the annotation of 3D models with Hieroglyphic metadata, et al.¹ During the summer of 2016, Joshua Roberson was awarded a Faculty Research Grant from the University of Memphis, for the purpose of creating 3D models of Egyptian artifacts in the Art Museum of the University of Memphis. From late Summer 2016, Roberson and Lucarelli began to discuss the possibility of collaboration between Berkeley and Memphis, concerning digitization and annotation of Egyptian mortuary objects. These conversations underscored the lack of interconnection among disparate projects in digital Egyptology and the benefits that might result from increased collaboration. In response to this perceived deficit, Roberson and Lucarelli developed a proposal for a large conference and workshop featuring a roster of leading scholars working actively in the digital realm, for the purpose of assessing the current “state of the art” in Egyptology,² as well as the directions that the field might be headed. In April of 2017, as the proposal was being finalized for submission, Lucarelli and Roberson met with Steve Vinson at the sixty-eighth annual meeting of ARCE in Kansas City, Missouri. Vinson expressed his interest in the proposed conference and workshop, insofar as he had also recognized the need for assessing the state of digital research in our field. Unfortunately, however, Roberson and Lucarelli’s

1 <http://digitalhumanities.berkeley.edu/blog/15/10/22/dh-fellow-prof-rita-lucarelli-developing-book-dead-3d>, accessed 04-04-2022.

2 For which, see now Zamacona and Ortiz-García, eds. 2021.

proposal went unfunded at that time and the conference and workshop project was stalled.

In the meantime, Vinson had, in the spring of 2016 and 2017, obtained internal funding from Indiana University (New Frontiers program of the Indiana University Office of the Vice President for Research; the Hamilton Lugar School of Global and International Affairs; IU Institute for Advanced Studies; Office of the Vice Provost for Research) to launch a pilot project to produce three-dimensional digital models of the small Egyptian collection in the Indiana University Eskenazi Museum of Art (known then as the Indiana University Art Museum). However, later in 2017, the IU Art Museum received a major gift from the Eskenazi family, a happy development that nevertheless resulted in a two-year closure of the museum for renovation and reinstallation of its collection. When it became clear that the Eskenazi project was going to be delayed until at least 2020, Vinson inquired with contacts at the Brooklyn Museum of Art as to whether the Brooklyn Museum would be interested in a photogrammetry and modeling project in Brooklyn's Egyptian collection. With their agreement, Vinson undertook short, exploratory photogrammetry campaigns in Brooklyn in 2017 and 2018.

Late in 2018, this preliminary work culminated in major additional funding from Indiana University to move the Brooklyn project forward, courtesy of the Indiana University Vice President for Research, and the Ostrom Grant program of the Indiana University College of Arts and Sciences. In 2019, with these resources, Vinson was able to undertake a three-week photogrammetry campaign in Brooklyn, hire a research associate (Mohamed Abdelaziz) to process the resulting models, and to organize and host what was hoped to be the first of a continuing series of international conferences on "Ancient Egypt—New Technology." In the process of organizing this conference, Vinson re-connected with Lucarelli and Roberson, who were invited to serve as advisors and panel moderators. The conference, held March 29–31 2019 in Bloomington, Indiana, was attended by 80 registered participants, including presenters from 14 countries including the U.S., who contributed 34 public presentations and 10 posters, as well as live displays of Virtual Reality technology.

The present volume, co-edited by Lucarelli, Roberson, and Vinson, presents the results of this conference. It offers a snapshot of the sorts of digital projects operating within the field of Egyptology at that time. Chapter 1, by Wendrich, considers both philosophical and practical questions surrounding the ethics of Egyptological research and publication in the digital realm. As such, it was selected to serve as both an introductory essay for the volume and as a backdrop for the studies that follow. Many of those chapters focus on digital techniques, such as photogrammetry, as applied to answer questions that have arisen in

specific archaeological contexts (Abdelaziz and Elsayed; Janzen and Nichols; Lang et al.), or to work with specific sorts of artifacts in museum collections (Manieri; Lucarelli and Nederhof). Other contributors consider innovations in online interfaces and digitization of collections (Tomorad and Zlodi; Wilbrink and Roberson). Novel, computer assisted approaches to traditional philological investigation are well represented (Amin et al.; Harel et al.; Martin; Stauder-Porchet; Puglisi and Dakota). The possibilities and pitfalls of the virtual reconstruction of ancient landscapes—a perennial favorite for its obvious pedagogical value, among other reasons—are explored from various perspectives, in chapters by Danelon and Zielinski; Noc; Picardo; and Sykora et al. Along similar lines, Troche and Weston discuss the creation of an Egyptian-themed computer game as a tool for the instruction of schoolchildren. Navratilova examines the case for a robust research infrastructure in the study and analysis of the under-appreciated text genre of so-called “secondary epigraphy,” known more traditionally as graffiti, while Moroney discusses the use of computer-assisted topographical analysis, to calculate the most efficient travel routes (“least cost paths”) to ancient building sites. On top of all that, we even have a robot (Li et al.). As a snapshot of current work in digital and computer-enhanced Egyptological projects from the US and abroad, the present volume helps to fill a significant lacuna. While these techniques have been employed in our field for the better part of a decade (longer, in some cases; for a helpful summary, see discussion by Navratilova, in Chapter 14), the field itself has yet to pause and reflect on where the technology has taken us and where we are headed for the future. It is the editors’ hope that this work, along with similar projects being developed in Europe and elsewhere (see most recently Zamacon and Ortiz-García eds. 2021), will help to lead the field into the next phase of its evolution and to provide something of a signpost and guide for those who are preparing to begin their work on ancient Egypt, as viewed through the lens of new technology.

Works Cited

- Zamacona, C.G. and J. Ortiz-García, eds. 2021. *Handbook of Digital Egyptology: Texts*. Monografías de Oriente Antiguo 1. Alcalá de Henares: University of Alcalá.

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Ethics of Digital Representation in Egyptology

Willeke Wendrich

Abstract

Interest in digital approaches to Egyptology started in the second half of the 20th century, for instance with the establishment of the *Manuel de codage* at the 1984 international round table “Informatique appliquée à l’Égyptologie.” Since that time, many large textual, visual, and spatial digital projects have been developed by teams from several countries for a variety of audiences. The developments of practical and theoretical approaches of digital Egyptology have subsequently grown within the broader context of the Digital Humanities. Although digital scholarly projects are in the first place content driven, ethical questions on, among other aspects, representation, access and sustainability should always be included and can only be an effective part of the project design when considered and integrated right from the start.

Keywords

Egyptology – Digital Humanities – ethics – access – sustainability – environment – collaboration

Egyptology, similar to many other scholarly endeavors, increasingly makes use of digital tools for recording, studying and presenting original materials and research results. This volume gives an overview of several instances, but the list of digital projects is long and the variety large. In our efforts to explore the capabilities of digital Egyptology and mediate the drawbacks, it is important to explicitly address ethical concerns. With the recent emphasis on decolonizing museums and scholarship, with the attention for diversity, equity and inclusion in the field, ethics are an inherent part of Egyptological scholarship.¹

1 Daly 2007; Abdel Maguid 2014; Tully 2015; Stevenson 2016; Carruthers and Van Damme 2017.

Digital Egyptology, however, deals with additional sets of ethical questions related specifically to the particularities of digital authorship, access, representation and sustainability (Figure 1.1). The interplay of ethical questions around digital applications and methods, as well as Egyptological questions, makes for a complicated and many-sided set of concerns that I will lay out in this chapter. In many ways this is a thought experiment and an effort to be aware of ethical consequences of our work, every step of the way.

1 Introduction

Many digital Egyptological projects collect and build upon prior scholarship: publications such as dictionaries and excavation reports, often dating to the 19th and early 20th century. Much of this information is valuable, but we should recognize that the research context has changed. Data are no longer considered value free, while research questions and concerns have found different foci. Moreover, digital publication differs from traditional print publication not only in form, but especially in character. Not just the research interests, methods, and theory—in short, the contents—have changed, but publication has become a continuous process reflecting knowledge in flux.

Digital Humanities has developed from “computer-based humanities” to a critical approach of research and representation. As Egyptologists we should use the insights of what I call *data critique* in the work done in the fields of digital humanities, digital archaeology, and digital cultural heritage.² I will consider important aspects of “digital Egyptology” and then outline how these principles have been incorporated in existing projects. There are many forms of digital publication of Egyptological content, and a critical approach to these helps to formulate the principles of ethical digital representation. In the course of this discussion, I consider successes, problems and best practices, outlining several principles that are rarely considered within Egyptology, but are part of an ongoing debate in Digital Humanities.

A thoughtful, yet admirably concisely formulated outline of best practices is the *London Charter for the Computer-Based Visualization of Cultural Heritage*,³ that defines six principles, outlined in Table 1.1

The Charter explicitly does not limit itself to academia but has a broad focus and is concerned with the research and dissemination of cultural heritage

2 Bentkowska and Denard 2012; Burdick et al. 2012; Watrall 2016; Bonacchi 2017; I.W.N. Jones and Levy 2018; Richardson 2018; Lercari et al. 2021.

3 EPOCH 2009.

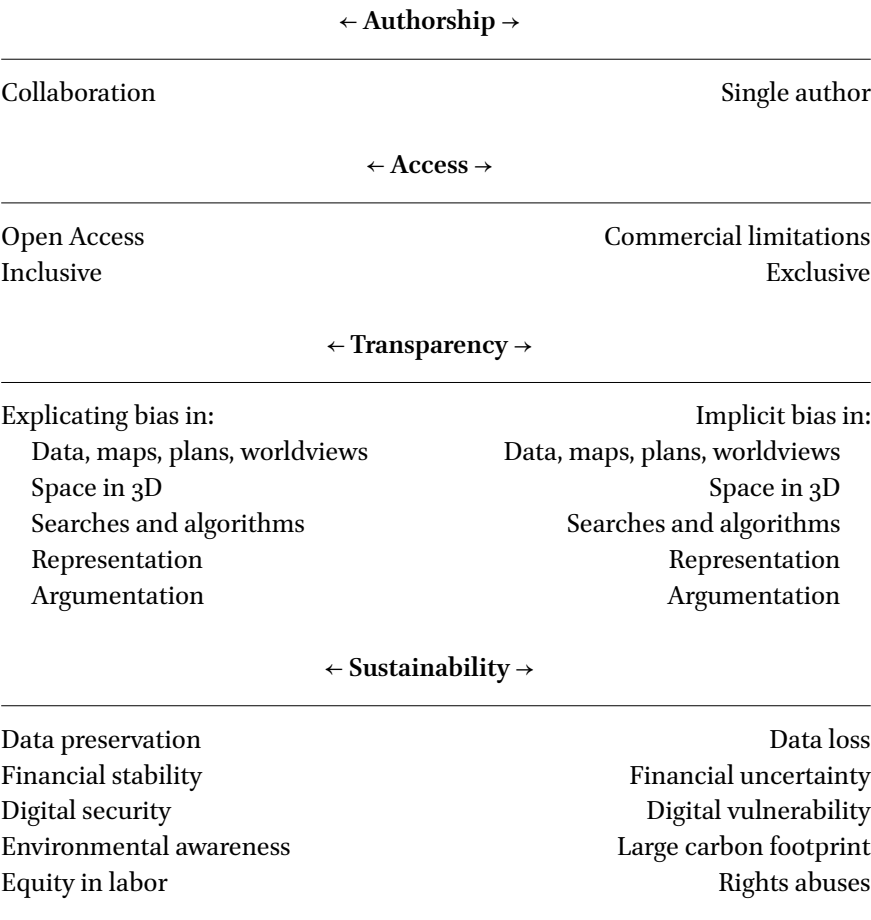


FIGURE 1.1 Scales on which to balance an ethical approach of digital research, publication and representation. The chapter structure (sections 2. through 5.) follows the aspects listed under the four principles of authorship, access, transparency, and sustainability.

across academic, educational, curatorial, and commercial domains. Although the London Charter focuses on computer-based visualization, most of these principles are valid for digital research projects in a broad sense and even to a certain extent for traditionally published research in the humanities and interpretative social sciences. This is illustrated by Figure 1.1 which outlines several spectra that may serve to illustrate and concretize the charter's principles. They are not meant to necessarily present positive or negative features of digital Egyptology or of one particular type of project or product. There are indeed very few inherent pros or cons of a digital approach. The quality of information, and ease of access depend on the choices made in the process of building

TABLE 1.1 The London Charter for the Computer-based Visualization of Cultural Heritage

Principle 1 Implementation	The principles of the London Charter are valid wherever computer-based visualization is applied to the research or dissemination of cultural heritage.	p. 3
Principle 2 Aims and Methods	A computer-based visualization method should normally be used only when it is the most appropriate available method for that purpose.	p. 6
Principle 3 Research Sources	In order to ensure the intellectual integrity of computer-based visualization methods and outcomes, relevant research sources should be identified and evaluated in a structured and documented way.	p. 7
Principle 4 Documentation	Sufficient information should be documented and disseminated to allow computer-based visualization methods and outcomes to be understood and evaluated in relation to the contexts and purposes for which they are deployed.	p. 8
Principle 5 Sustainability	Strategies should be planned and implemented to ensure the long-term sustainability of cultural heritage-related computer-based visualization outcomes and documentation, in order to avoid loss of this growing part of human intellectual, social, economic and cultural heritage.	p. 10
Principle 6 Access	The creation and dissemination of computer-based visualization should be planned in such a way as to ensure that maximum possible benefits are achieved for the study, understanding, interpretation, preservation and management of cultural heritage.	p. 11

EPOCH 2009

a digital research project. What Figure 1.1 represents are the scales on which we need to balance an ethical approach to digital publication and representation in Egyptology.

The spectra of Figure 1.1 can be mapped onto several of the principles as defined in the London Charter, albeit not at a one-to-one coverage. Some of these aspects of digital publication and representation are organizational, oth-

ers are intellectual, while most have aspects of both. This is quite common for digital projects, which usually combine practice, method, and theory. Best practices in digital publication and representation should, therefore, not just focus on the practicalities of digital projects (ease of use, cost, sustainability), but on the scholarly and societal values of transparency, explicating bias, and environmental sustainability. Design and user experience are important for usability, but also for access to the underlying information. A user should be able to understand the information that visualizations are based on and how much is reconstruction or conjecture. These issues will be explored in the next pages, based on a discussion of digital Egyptological projects, including lessons learned from the work that my collaborators and I have done in the past 15 years.

2 Authorship

2.1 *Collaboration—Single Author*

Digital Humanities has defined itself as different from “traditional” humanities, because of its collaborative nature, its networked environment, which changes both the culture of knowledge creation and the types of questions that can be asked of cultural heritage.⁴ Egyptology as a humanistic endeavor has long been and still is characterized by single authorship, even in publications of teamwork such as archaeology. The excavation director used to be responsible for the publication of data and interpretation, while specialists authored their own reports and team members were perhaps mentioned. Sometimes a surveyor or architect, who created maps, plans and elevations of the excavation, was credited, but often not. Local excavators usually remained anonymous.

In digital Egyptology the technical contributions are even greater than on excavations. Digital projects are by definition teamwork and this goes much further than a “tech team” lending “support.” Every step in the development, from the construction of a database to user experience, requires experience, knowledge, insights and creativity of content creators, designers, and programmers responsible for search, maintenance, and security structure. It is surprising, therefore, that the London Charter does not address credit for contributions to digital visualization. Even if part of the team is delivering “work for hire,” credit is due. Working in teams in which each person contributes specific knowledge, skill and ideas means that the traditional authoritative relations are less impor-

4 Burdick et al. 2012, 3.

tant and preferably are done away with. The roles of faculty, staff and students in a digital project depends on every individual's particular input in the process and ranges from disciplinary to technical contributions. The strength of interdisciplinary projects, of which digital projects are an excellent example, is the fact that everybody learns. With the new ways of communicating, design and user experience testing have become more important than ever to enhance writing.⁵ Tasks of digitizing, curating digital data, classifying, and describing digital assets, adding metadata and providing documentation for each step of the process are fundamental tasks in digital scholarship, often done by different team members. Students involved in the complexity of the project gain experience in producing scholarly products but are also challenged to consider how digital representation differs from traditional publication.

There are excellent examples of giving credit to various participants in a project. The most obvious is the "about" page of a web-based project, where all contributors can be recognized for their contributions past and present. Excavation data are increasingly presented with full authorship recognition for original notes, drawings, photographs and recording forms. This not only gives credit where credit is due, but also stimulates a sense of responsibility and a possibility to check the quality and consistency of work by several people. It, furthermore, demonstrates scholarly contributions that are traditionally expressed as class credit, performance evaluations, promotion, and tenure.

3 Access

Access to Egyptological knowledge traditionally depended on well-equipped libraries. "The "holdings" of the library were just that: holdings held for the initiated who had the privilege of access and use."⁶ Access to digital Egyptological content seemingly has enlarged access, by making materials available online. Still, that access is not equitable: differences in financial capability (subscriptions or payments for access), ownership of a powerful computer, availability of stable and fast internet, suitability for people with disabilities to negotiate the functionality of a website are all aspects that can help or hinder inclusion in the broadest sense. It may be clear, therefore that statements on access (London Charter principle 6) are closely related to the aim of a digital project but go far beyond.

⁵ Burdick et al. 2012, 12.

⁶ Burdick et al. 2012, 45.

3.1 *Open Access—Commercial Limitations*

The term Open Access (OA) originally was defined as access to scholarly or scientific literature that is “digital, online, free of charge, and free of most copyright and licensing restrictions.”⁷ Over the past decade the term has gradually expanded to comprise not only literature, but archival information, original research results, photographs, video, audio, in short data in the broadest sense. Large scale digitization has provided almost instant access to what used to be the purview of researchers who were able to spend considerable time in archives. The “discovery” of an archived gem that changes our insights has been enhanced by the capability of combining and contrasting large amounts of information from multiple sources. Originally defined and defended by academic librarians, OA is one of the principles of FAIR, which stands for findability, accessibility, interoperability, and reusability.⁸ For digital projects beyond articles or books, this means access to the full web functionality, without the hurdle of a pay wall. In most cases it also means that the data underlying the online presentation should be accessible and downloadable. An excellent example is Open Context, which makes granular archaeological information available for online searches, as well as download for re-use. Egyptological examples of online open archives are the Giza archives of Reisner,⁹ the archive of the Griffith Institute,¹⁰ and the publicly available photographs and documentation of the Metropolitan Museum¹¹ and the British Museum.¹² Although many good arguments have been made in favor of open access, there are financial aspects that need to be taken into account: creating and maintaining a digital resource requires considerable funds (see below).

3.2 *Inclusive—Exclusive*

A different side of access to digital resources is that of accessibility: is a web resource inclusive or exclusive? Accessibility includes accommodations for physical and cognitive disabilities, such as low vision, blindness; hearing loss and deafness; limited movement, speech disabilities, photosensitivity, and learning disabilities. Website functionality that has become standard, such as a mouse-over to provide additional information, is inaccessible to someone who is not able to use a mouse. This aspect of access goes further than ensuring that

7 Suber 2004; Holley 2018.

8 FAIR 2018.

9 Digital Giza 2017.

10 Griffith Institute 2021.

11 The Met 2021.

12 BM 2021.

every functionality is made available through different methods, so that there is an alternative way of accessing information. Several initiatives inform website creators on good practices and allows developers to test the accessibility and usability of their site. The Web Accessibility Initiative, which studies how people with a disability use the web, is linked to the World Wide Web Consortium, an international community that develops open standards to ensure the long-term growth of the Web.¹³ The standards developed under the title Web Content Accessibility Guidelines¹⁴ have become leading principles for various national governmental regulations such as the U.S. General Services Administration Government-wide IT Accessibility Program¹⁵ and legal requirements in Italy and Germany.¹⁶

If we take equity, diversity, and inclusion seriously, however, then we should assess all elements of our research, from the fundamental basis, the type of questions we ask, to the reception of our research output. Many aspects are obvious: the language in which a site is written determines who can access it. The projects of the *Center for Documentation of Cultural and Natural Heritage*, in collaboration with the *Bibliotheca Alexandria* are presented on a website that is accessible in both Arabic and English¹⁷ Some German Egyptological websites are bilingual German/English, e.g., TLA 2004. The UCLA Encyclopedia of Egyptology has abstracts in Arabic and keywords in four languages: English, Arabic, French and German,¹⁸ while the digitally born *Rivista del Museo Egizio*¹⁹ is published in multiple languages and has abstracts in English and Arabic. Ancient Egyptian Architecture Online, a temporarily defunct online resource, set out to develop a tri-lingual illustrated resource for architectural terminology, in English, German and Arabic. While the *Getty Online Thesaurus of Art & Architecture* provides terminology in most European languages.²⁰ A herculean effort to provide a multilingual resource specifically for Egyptology, the *Multilingual Egyptian Thesaurus*, was published online originally with European languages only, to which more recently Arabic was added.²¹

Even though language access has somewhat improved with browser translation capabilities, machine translations of discipline-specific texts can be con-

13 W3C 2020.

14 WCAG 1.0 1999; WCAG 2.1 2018.

15 Section 508 2018.

16 BITV 2019; AgID 2020.

17 CultNat Arabic 2021; CultNat English 2021.

18 UEE, PDF Only 2008; UEE 2010.

19 RIME 2017.

20 AAT 2017.

21 MET 2007.

fusing or misleading. With the importance of community archaeology gaining ground, archaeological projects increasingly involve local excavators in the development of research questions, interpretation, and output. Making reports available in Arabic is just one step towards increasing access to Egyptian cultural heritage in Egypt. Publication online in formats that can be understood by a broad part of the population, in Egypt or elsewhere provides immediate access to research activities that otherwise remain invisible. Incorporating videos and photographs, including those produced not by professional archaeologists, but by local participants, further increases inclusion.

Fundamental in the ethics of access is the implicit (dis)incentive of using a website based on the perception whether a visitor is actually welcome, whether she is part of the target group or not. In Egyptology this is not just linked to modern languages, but also to whether and to what extent one reads the ancient Egyptian language, knows the technical terminology, or understands how an archaeological excavation is documented.

Sometimes access is explicitly restricted. There are excellent reasons to make certain data available to researchers only. One example is the restriction that is put on geographic coordinates of antiquities sites, which cannot be made public because advertising locations enables the exact position of vulnerable sites to become known. This can be highly problematic because of potential damage caused by larger number of visitors. In the worst, but not uncommon, case publishing site locations results in targeted looting. Although most archaeologists are aware that it is often necessary to restrict access to geographic data, very little has been published about it. It is, for instance, not emphasized in the “guides to good practice,” developed through a collaboration of several national repositories of archaeological digital data.²² In Egypt, many sites are officially under protection of the Ministry of Tourism and Antiquities, but only a limited number are under permanent watch.

Research output has various objectives and audiences. Different criteria are required for information that is geared towards specialists, versus the presentation of results in an interpretative environment for a general audience. The aim of a digital project is thus not just defined by the content, but also by the targeted audience. The *UCLA Encyclopedia of Egyptology*,²³ for instance, is geared to colleagues, but also to an advanced undergraduate level general audience and the editors discuss the content and terminology that authors use in order to ensure that specialized jargon is avoided as much as possible. In addition, in

22 *Archaeological Data Service* 2009.

23 UEE, PDF Only 2008; UEE 2010.

the full version of the work the terms that cannot be found in a regular dictionary are clarified in the side bar, activated by clickable links (Figure 1.2). This version of the UEE differs in lay-out from the (also freely available) PDF version that is published through eScholarship, the online publication platform of the University of California. The printable form of the article is designed in two columns, a format that is unsuitable for online reading, especially on tablets and telephones.

A project that is accessible to an English-speaking general audience is the *Theban Mapping Project*, which focuses on the tombs in the Valley of the Kings.²⁴ The project of mapping, measuring, and photographing all tombs in this famous area started in 1979, under direction of Kent Weeks, American University in Cairo. In 1989 the results were published online as an interactive site which allowed the user to access the location, configuration, and decoration of the tombs. The site also provided references. This compilation of information was made available in a very intuitive way and widely used by a general audience. The website remained online for 21 years, a remarkable feat considering the many changes in browser configurations which results in most online resources needing an overhaul approximately every five years. From 2010 to 2020 the website remained inaccessible, but at present it is live again thanks to a grant from the American Research Center in Egypt. A map-based interface allows a very intuitive way of accessing materials and the clustering of information at different scales, from overview to detail.

A similarly long running project is *Digital Giza*, directed by Peter Der Manuelian.²⁵ This project combines three-dimensional reconstructions of the architecture of the Giza Plateau with a vast archive of archaeological research materials, based on a wide variety of American, European, and Egyptian expeditions, starting with the Harvard University—Boston Museum of Fine Arts Expedition from about 1903 to 1947. The online presentation of interlinked archival materials draws upon the Giza Consolidated Archaeological Reference Database. The open access of literature, made available for download on the website, is an example of the collaborative effort of this project.

An even longer history underlies the *Thesaurus Linguae Aegyptiae*, developed in Germany and incorporating a large number of German and Belgian initiatives,²⁶ but was based on and inspired by a standard work in Egyptology: the *Wörterbuch der ägyptischen Sprache*, published between 1926 and 1950,

24 TMP 2020.

25 Digital Giza 2017.

26 TLA 2004.

but for which the work started in 1897.²⁷ The TLA is enhanced with the results of several in-depth research projects. The English introduction of the website states that “All texts come with running translations to assist particularly non-specialists and scholars of neighboring disciplines in their work” (TLA Introduction). Nevertheless, a person with an interest in ancient Egypt, and even Egyptologists who are not very familiar with the site will have difficulty negotiating this important source of information.

Non-Egyptologists will have an easier time with another standard work in Egyptology, that has transferred from a book series to an online version: The *Online Egyptological Bibliography*²⁸ provides titles and in many cases abstracts of books, articles, and reviews of Egyptological publications from 1822 to the present. It combines the Annual Egyptological Bibliography,²⁹ with the *Bibliographie Altägypten*,³⁰ and the *Aigyptos* database, with keywords, and more than 40,000 further items. This important resource is subscription-based and that is a hindrance for independent scholars, or students and faculty from smaller universities that do not have institutional subscriptions. It also excludes members of the audience with a casual interest in ancient Egypt.

Most of the entries in the *Ancient World Online* (AWOL), which started as a blog by librarian Charles E. Jones to highlight open access digital content, point to traditional journals and articles that are made available as PDF.³¹ Although extremely useful, such forms of online journal publication do not benefit from the possibilities that the medium potentially offers, which includes enhanced searching, analysis, imbedding of different data formats and full data availability. The format of the AWOL site itself is very basic, and in terms of access, is relatively easy to maintain, but runs the risk of linking to online projects that are no longer available. That is the final aspect of access that needs to be mentioned and has been referred to above: online presentation of digital information that are well-designed with complicated functionality are very difficult and costly to maintain. The website of the UCLA projects of *Digital Karnak* and *Ancient Egyptian Architecture Online*³² are good examples. Digital Karnak is now only available through the internet archive,³³ while AEGARON is seeking funding for restoration of functionality.

27 Erman and Grapow 1926.

28 OEB n.d.


29 AEB 1947–2001.

30 BA 1822–1946.

31 Jones and Elliott 2015.

32 AEGARON 2010.

33 Digital Karnak 2008.



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Dimitri Laboury

فن العمارنة

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Keywords: evolution, pharaoh-centrism, talatat, Atenism

Abstract

The art that developed in the reign of Amenhotep IV/Akhenaten, known as "Amarna art," has largely been considered revolutionary in the history of ancient Egyptian art. As such, it has been the subject of much debate and has generated numerous theories, often contradictory or controversial, and, in fact, deeply influenced by the history of its modern reception. Nevertheless, the remaining evidence still permits us to investigate Amenhotep IV/Akhenaten's conception of images and art, as well as the artistic evolution under his reign. From a hermeneutic point of view, Amarna art can be interpreted as a multi-causal phenomenon, involving an internal evolution of 18th Dynasty society and art, pharaoh-centrism, and purely aesthetic factors.

Abstract in Arabic

« فن العمارنة » يعتبر الفن الذي تطور خلال عهد امنحتب الرابع/أخناتون والمعروف باسم يعتبر الى حد كبير تطور ثوري في تاريخ الفن المصري القديم فيمثل هذا التطور محور الكثير من النقاشات وبنى عليه العديد من النظريات التي غالبا تكون متناقضة أو مثيرة للجدل وعلى أي حال فإن هذه النقاشات والنظريات متأثرة بشدة بتاريخ استقباله الحديث، مع ذلك فإن الأدلة المتبقية لا تزال تسمح بفحص مفهوم امنحتب الرابع/أخناتون للفن والتصوير، فضلا عن التطور الفني في ظل حكمه. يمكن تفسير فن العمارنة باعتباره ظاهرة متعددة الاسباب والتي تشمل تطور الذاتية للمجتمع والفن خلال الاسرة الثامنة عشر، دور الفرعون والعوامل الجمالية البحتة.

Aten

Deity representing the actual sun disc, raised to the position of sole state god under the rule of Amenhotep IV/Akhenaten (1349 - 1332 BCE). Cult center: Akhetaten.

It traditionally used to refer to the unconventional art developed in the reign of Amenhotep IV/Akhenaten (1349 - 1332 BCE). It was coined after the modern Arabic name for the site of el-Amarna, where the king Akhenaten, in the first third of his year five. So-called Amarna art had nevertheless been initiated earlier, in the reign of Amenhotep III. It was officially launched at Karnak, a period that is usually called the "proto-Amarna stage" (Verguieu 1976; 1999: 201 - 202; Verguieu and Gondran 2004). The link between the art instituted by Amenhotep IV/Akhenaten and the new ideology of the Aten cult, the designation "Atenist art" thus appears more appropriate.

FIGURE 1.2 A page from the UCLA Encyclopedia of Egyptology with multilingual main words, a dual abstract in English and Arabic and clarifications of discipline-specific terms in the margin. The text is rendered in one column and the table of contents links to various sections of the article.

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4 Transparency

Transparency in digital Egyptology starts with the basic questions of who did the research, who built it, who paid for it, what is the purpose, who is the audience. These are usually addressed in the footer or the “about” section of the webpage. Beyond that there are a many other aspects that determine whether a digital Egyptological project is constructed in a transparent way or not.

Perhaps the main contribution to transparency is whether the purpose and research questions have been made explicit. This is not just a matter of presentation but lies at the heart of the development of the project. The London Charter principles that are central here are aims and methods (principle 2), research sources (principle 3) and documentation (principle 4). Sub principle 3, the charter states: “Particular attention should be given to the way in which visual sources may be affected by ideological, historical, social, religious and aesthetic and other such factors.”³⁴

In Figure 1.1, I proposed that the two extremes of the transparency scale are implicit bias and explicating bias. Humans are inherently biased,³⁵ and even though bias in itself is not unethical, it definitely is highly problematic to consider biased perceptions as “objective,” or to use inherently biased considerations as the basis for social, economic or other forms of inequality. Small steps to understanding our own biases are based on listening and self-reflexivity. We should at least aim to be as explicit as possible in defining our goals, building our methods, and formulating our arguments. Some of the tools we have for this are data and critical thinking. In technical terms transparency is effectuated through the documentation of data, meta-data, and para-data.³⁶

The line between these three types of data is unclear at best and depends on the research question. Data makes up the information that we seek or develop to address our research. Meta-data comprise information about the data, for instance the name of the photographer who took an image we are using as a source, and the date on which the photo was taken. Para-data describe the process of information gathering. While co-teaching a workshop on meta-data at UCLA, I found it quite liberating to realize that this distinction is not fixed, perhaps not that relevant, and can change at a moment’s notice. When a researcher is focused on the contribution of photographer Harry Burton to the discovery and registration of the tomb of Tutankhamun, the photographer’s name is part of the data, rather than the meta-data.

34 EPOCH 2009.

35 Eberhardt 2020.

36 Bentkowska and Denard 2012.

The relationship between different data formats (texts, numbers, maps, plans, 3D models, still images, moving images, sound) and different types of knowing (visual, aural, tactile) is complex. Still, the digital format enables connections between most of these, perhaps with exception, for now, of the tactile aspects of perception. Recording through these data formats results in, for instance, measurements, locations, descriptions, illustrations, photographs, videos, references, or oral histories. What is important at every step, is to define what the status of knowledge is: what is the degree of certainty in an observation. I would argue that digital representation requires an even more rigorous explication to ensure intellectual integrity, with clear indications whether the information is uncertain, ambiguous, or hypothetical. If a complex combination of data and datatypes is presented as evidence, it should be explicated how these contribute to addressing the underlying questions.

Each type of data presentation has its own forms of inherent bias and manners to explicate these. In the following sections we will consider those of spatial data, in two and three dimensions, quantitative data, search structures, representation and argumentation.

4.1 *Data, Maps, Plans and Worldviews*

Ancient Egyptian Architecture online was started with the express purpose to provide transparency in the sources used to produce architectural plans, following defined drawing standards. In Egyptological publications plans of temples, tombs or settlements are often copied without specifying whether the plan represents a reconstruction or the actual state of a monument. In addition, the “actual state” in 1909 is not the same as that in 2021.³⁷ A further consideration of mapping should address the fundamental basis of how space is understood. Spatial orientation is not universal and cultural as well as intra-cultural differences in perception of maps and mapping have been recognized in geographic and anthropological communities, but not so much within Egyptology.³⁸

Archaeologists’ use of maps to indicate the geographical context of the site where they work and detailed plans of excavations. Maps are, by definition an abstraction or manipulation from the situation on the ground. The projection of the globe on a two-dimensional surface (paper or screen) results in a distortion of spatial relations. The equal earth map projection,³⁹ is a recent attempt to solve a number of projection problems, for instance that of the Mercator

37 Fauerbach et al. 2010.

38 Chang and Antes 1987; Perkins 2008; Miller 2012.

39 Šavrič, Patterson, and Jenny 2019.

projection, which is maligned, because of its distortion of the landmasses. In this map projection Europe is looming large over Africa, while this is a gross misrepresentation of the actual size of the two continents. The purpose of the Mercator projection was, however, not to represent landmasses correctly, but to provide the most economic (“straight”) sea routes for navigation before the time that ships had the availability of using the Global Positioning System (GPS). It may seem that the globe (as represented, for instance by Google Earth) is, therefore, the most “neutral” spatial representation, but looking from space towards earth is a very particular way of thinking about human lived space.⁴⁰ This approach to spatial context is fundamentally different than the experience of being in the world. Especially if our goal is to understand or represent an ancient world view, the birds-eye view as exemplified by mapping is incongruous.

The liability of accidentally (or purposefully) using statistics, charts and graphs to misrepresent quantitative data has been described in a large body of literature.⁴¹ It outlines how both the design and the underlying data can be biased. Maps and charts always contain an argument. Whether they set out to be argumentative or are meant to provide a “value-free” image, their design and the conventions used are particular to a certain way of understanding and representing the information. Much has also been written about maps and mapping, mostly regarding their design, what information they contain, how they are used to make arguments and how they can mislead by accident or on purpose.⁴² Egyptian archaeology and history make extensive use of maps, often without the critical approach or explicit statements that clarify the purpose, or underlying data.⁴³ For digital mapping and geographic information systems, the selection of layers of information and the manner in which these are combined and displayed are even more influential.

The digital turn allows for interactive maps, where users can explore information, a development that has led to greater attention to representation, instead of communication.⁴⁴ It should be noted, however, that users’ agency in exploration, is bounded by the pre-defined content, layering and structure, as well as the underlying research questions and suppositions. In addition, there are cultural differences in how populations understand and interact with spatial information.⁴⁵

40 Oliver 2015.

41 e.g., Huff 1954; Tufte 1997; 2001.

42 Monmonier 1991; 2018; Tufte 1997; 2001; Wood 2010.

43 Gillings, Hacıgüzeller, and Lock 2020.

44 Perkins 2008, 151.

45 Alberti and Marshall 2009.

4.2 *Space in Three Dimensions*

The context for human domestic, social, and divine interaction is created, built, and shared three-dimensional space. The London Charter is specifically meant to define good practices for cultural heritage computer visualizations. It does not, however, explicitly separate the visualization of what exists from three-dimensional modeling of what does not or is only partly present. The first we will call three-dimensional recording, the second three-dimensional reconstruction. Critique of three-dimensional representation is not new, as expertly and concisely outlined by Paul Miller and Julien Richards,⁴⁶ but there are many good reasons that both three-dimensional recording and three-dimensional reconstructions are used in archaeology.

Archaeological hand-drawn plans and elevations have been the standard of recording length, width, and height/depth of excavated remains, or complete buildings or rock-cut tombs. These drawings are rapidly replaced by three-dimensional recording through 3D-scanning or photogrammetry.⁴⁷ The main reasons are speed and precision of recording, as well as the ease of three-dimensional representation, which provides an intuitive understanding of spatial relationships.⁴⁸ In Egyptology digital techniques are increasingly used for epigraphy, to locate inscribed spaces into their three-dimensional context and to record the three-dimensional nature of texts and imagery in relief. In addition, digital applications are used to enhance photographic recording.⁴⁹ The second edition of Krisztián Vértés' 2014 book *Digital Epigraphy*, is available in open access on a website dedicated to training digital epigraphers.⁵⁰ The site is a perfect example of collegial collaboration and the establishment of standards by the large epigraphic projects working in Egypt: the Oriental Institute of the University of Chicago, the Epigraphic Survey (Chicago House), the Giza Project at Harvard and the KU Leuven.

An argument against replacing hand drawing with digital registration is that epigraphy and field drawing are forms of visual interpretation and as such an integral part of analysis.⁵¹ The lengthy process of spending time and focus can be replaced by an intense process aided by digital enhancement. Here the processes of epigraphy and archaeological field drawing differ. The archaeologist cannot return to what has been excavated away.

46 Miller and Richards 1995.

47 Kamermans et al. 2016.

48 Schnabel and Kvan 2003.

49 Lima et al. 2018; Evans and Mourad 2018; Vértés 2020.

50 Digital Epigraphy 2021.

51 Morgan and Wright 2018.

The form of three-dimensional visualization that is usually comprised by that term is reconstruction, rather than recording. If recording includes interpretation, reconstruction does so exponentially. The role of para-data is to describe the process of reconstruction, including the source material, the level of interpretation, speculation, and uncertainty.⁵² The London Charter specifies that the choice of the type of visualization, whether a reconstruction is presented photorealistic or schematic, for instance, should be made deliberately. The influence of visualizations, especially in the Virtual Reality realm is persuasive, even seductive. It is very difficult to maintain a critical attitude, unless fuzziness and uncertainty are pointed out in no uncertain terms, within the reconstruction.⁵³ Although considered especially useful to inform a general audience, the process of creating a three-dimensional reconstruction is extremely helpful to generate additional research questions and formulate argumentations (see below).

4.3 *Searches and Algorithms*

Databases or spreadsheets can be used to organize information in a fully transparent manner. By making the data sources, objectives, and search criteria explicit, the user can trace search results to the source, including the underlying presuppositions. Unfortunately, as with maps and charts, databases are not designed to allow for ambiguity or uncertainty of information. This is problematic in all historical disciplines: a drop-down menu requires a clear, positive choice, which ancient sources hardly allow. Historical or archaeological data are generally uneven, with missing information. When relationships and search terms are organized in implicit hierarchies, the database becomes even more opaque.

Transparency requires that the sources are identified and evaluated, tested for level and kind of bias and search protocols. When these aspects are not in place, the search algorithm becomes a black box. It is what I call “the computer as connoisseur”: by an undefined, yet somehow measured combination of qualities, a result is produced. Connoisseurship is the result of years of experience-based building of knowledge, but simply “knowing” that an object is e.g., genuine, is based on a tacit, complex, weighing of attributes. It should, then, be possible to explicate what these are. Apart from requiring real effort, that would diminish the mysticism of connoisseurship. The digital equivalent of the connoisseur is the algorithm. Algorithms are part of proprietary business

⁵² Bentkowska and Denard 2012.

⁵³ Miller and Richards 1995.

secrets, and their lack of transparency is a given. Yet they are a source of bias that penetrates society, as well as scholarship.⁵⁴

4.4 Representation

The maps and charts discussed above are forms of visualization and representation. In this section we consider ethical considerations of representation *sensu stricto*: how do we represent persons, ages, genders, occupations, and cultures in a digital (re)construction. Before the digital age Egyptological studies have produced representations of knowledge mostly in the form of descriptions based on the study of texts, imagery, material culture and the archaeological context. Apart from textual representations can have many forms, including visualizations—image based interpretations. What these have in common is that they are based on a mental image, that is the result of tacit understandings of various aspects of ancient Egypt. Since the data are ambiguous, uncertain, and incomplete, historical information is open to interpretation. Digital representations often require unequivocal choices: drop down menus, points on a map, color spectra in Virtual Reality reconstructions. An ethical digital Egyptology will be aware of the inherent biases that are especially sensitive when concrete choices need to be made about ancient society, spaces, and people. Where an image says more than a thousand words, an interactive three-dimensional Virtual Reality model subconsciously determines our understanding in an underhanded manner. The responsibility of those who create Virtual Reality models, games, or Augmented Reality applications, especially when it includes people, is enormous.

Ancient Egypt has both been claimed as European and African. Petrie's theories that a dynastic race built the pyramids after colonizing primitive early Egypt was part of the racist ideas that African people would not have been capable to build the pyramids.⁵⁵ Pushing back against the whitening of ancient Egypt as part of Eurocentric claims are scholars that maintain that the ancient Egyptians were black.⁵⁶ Depicting the skin color of people in VR reconstructions directly brings up these ongoing debates. Similarly, the orientalist and male gaze that is at play in depictions of Cleopatra and other female historical figures is of influence on both the creation and reception of digital representations.⁵⁷ Independent of how people are represented in reconstructions,

54 Pariser 2012; Noble 2018; Christian 2020.

55 Petrie 1879; Challis 2016.

56 Diop 1989.

57 Godon 2018.

photographs or 3D scans of human remains (skeletons, skulls and mummies) can be a sensitive issue among particular audiences, although not among others.⁵⁸

Apart from the depiction of humans, whether a temple or village is represented in simple outlines, or “enhanced” with atmospheric details makes a difference in how the model as representation of the past will be experienced. Here the London Charter outlines most detail: in the Aims and Methods section it specifies that scholars should be explicit about the purpose of a model, as well as its execution. Should the model be schematic or photo realistic? Does the model represent a state of knowledge or a hypothesis? Lighting, colors, movement, and sound all contribute to the impression that a VR model conveys. What a digital model evokes, but does not actually contain are emotions, expectations, and relationships. What underlies a model is the ontology of the creators, their often-implicit world view. Ancient built environments are a complex material expression that is multi-layered: the same space might reflect shelter, safety, power, piety, posturing, negotiations, justice, or threat. Sharing space is a sign of social or ritual belonging. Location, orientation, context, building materials, decoration, re-use, and cleanliness all potentially inform us on what the space might be about. Is an ancient Egyptian village represented as grimy and the temple as pristine? Such choices should be made consciously and expressed in the documentation through the para-data.⁵⁹ For scholarly projects it is important that this documentation is available, for instance in the form of in-project annotations, such as exemplified by the digital publication of Elaine Sullivan and Lisa Snyder.⁶⁰

It may be clear that with the power that digital creators have on the perception of ancient Egypt, the question of who represents Egyptological knowledge is critical. The systematic exclusion of Egyptian scholars in the representation of ancient Egypt, has been outlined by Reid.⁶¹ The website of the Center for Documentation of Cultural and Natural Heritage features the work and archive of only one famous Egyptian Egyptologist,⁶² while the work of Egyptian scholars on ancient Egypt may present the opportunity to foreground alternative viewpoints.⁶³

⁵⁸ Colwell 2017.

⁵⁹ Bentkowska and Denard 2012.

⁶⁰ Sullivan and Snyder 2017; also Sullivan, Nieves, and Snyder 2017.

⁶¹ Reid 2003; 2015.

⁶² Selim Hassan 2019.

⁶³ Elgewely 2014; Elgewely and Wendrich 2015.

4.5 *Argumentation*

Above it was stated that maps and charts almost by definition contain an argument. Ethical considerations are important, especially when that argumentation is implicit, problematic, or both. An (in)famous example are the nationwide maps created in the USA between 1935 and 1940 by the federal government's Home Owners' Loan Corporation, known as "redlining."⁶⁴ In the third edition of Monmonier's *How to Lie with Maps*⁶⁵ he added a new chapter on animated, interactive, or mobile maps, in which he states "Possibilities abound when a viewer can explore the fuzziness of the data by changing a map's time frame or definitions, or question the reliability of a choropleth map by experimenting with cut points or number of categories."⁶⁶ Digital media allow for the creation of transmedia modes of argumentation:⁶⁷ an argument can be formed by or built into a digital representation other than text. An example is the Virtual Reality reconstruction of Karnak Temple, which shows the temple complex in multiple phases of development. The 3DVR model has been used in several publications, which I will briefly outline here. Two online publications use the model to discuss the construction phases of the Karnak complex. The first one is an encyclopedia article, that makes use of screenshots of the model,⁶⁸ the second is a video and PDF, part of the Digital Karnak website's educational materials.⁶⁹ In an online article, which includes the actual model Elaine Sullivan and Lisa Snyder discuss the process of authoring and peer-reviewing a three-dimensional model.⁷⁰ A multi-authored book chapter discusses how the production of 3DVR models is scholarly production, including the statement that "Models can offer new techniques to investigate questions of how gender, ethnicity, and power are conceptualized by a society and inscribed into the very space that structures such relationships."⁷¹ Additionally, the Karnak model was used in an argument on monumental architecture and cultural memory. The digital model can actually not only show the building phases but can clarify both the addition and the removal of architecture. This enables demonstrating the creation, as well as *damnatio memoriae* and usurpation of memory.⁷²

64 Mapping Inequality 2020.

65 Monmonier 2018.

66 Monmonier 2018, 201.

67 Burdick et al., 10.

68 Sullivan 2010.

69 Sullivan 2008.

70 Sullivan and Snyder 2017.

71 Sullivan, Nieves, and Snyder 2017, 301–302.

72 Wendrich 2014.

5 Sustainability

5.1 *Data Preservation—Data Loss*

Digital Egyptology has shown to enable the aggregation of information, by combining various formats (texts, photograph, videos) around a similar subject, such as the archives of excavations mentioned above. Amassing and analyzing information is known as the field of cultural analytics, which uses computational analysis and data visualization interpret cultural data on a large scale.⁷³ The counterpoint of amassing data is loss of information: we are all aware of the fickleness of digital preservation in a time when floppy discs are a distant memory. The London Charter's principles 2 (aims and methods) and 5 (sustainability) address concerns of preservation of data. Perhaps the best way to think about this is that the creation of digital Egyptological resources is conceptualizing prospective memory: thinking through how the reception of the present will be in the future.

Using standardized formats for the digital files that can be archived and updated is but one step in the process. Documentation of the relationships, processes and considerations is central to data sustainability. Initiatives such as the Digital Archaeological Record in the US,⁷⁴ the Archaeology Data Service in the UK,⁷⁵ and Ariadne in the European Union⁷⁶ provide the archival power and knowledge base to ensure long-term preservation of data and stimulate the FAIR principles (findable, accessible, interoperable and re-usable). An important ethical question in relation to this is: who has the power to decide what should be preserved, what can be deleted and who has access? The Indigenous Data Governance project⁷⁷ has been created to address traditional power inequalities. Apart from the FAIR principles this international alliance promotes the CARE principles (Collective benefit, Authority to control, Responsibility and Ethics).

Digital archiving is an increasingly specialized field, where the academic libraries have taken the forefront. The UCLA Encyclopedia of Egyptology has been designed from the very start for long-term preservation, by storing all assets, article texts, images and the data tables that drive the interactive maps and timelines with copious meta-data in the UCLA Digital Library. Whenever the front end of the website is outdated, on average once a decade, but often

73 Burdick et al. 2012, 40.

74 TDAR 2018.

75 ADS 2012.

76 Meghini et al. 2017; Ariadne 2020.

77 CARE 2021.

sooner, the information is safely stored and the relationships between all the different parts have been defined so that the functionality can be updated or rebuilt.

Data sustainability is closely related to continued access and the problem of dead links. The Multilingual Egyptological Thesaurus was created by the Center for Computer-aided Egyptological Research at Utrecht University, The Netherlands in the 1980s. In 2021 the acronym and the corresponding URL ccer.nl no longer refers to an Egyptological entity, but to computational economics research. The rights for the Thesaurus were transferred to the Center for Documentation of Cultural and Natural Heritage (CultNat), which licensed the web-access to a French initiative, *Projet Rosette*.⁷⁸ The difficulty of sustaining resources that were often built through the research and efforts of a large group of people over many years is illustrated by two projects that both focus on tomb reliefs. *MastaBase* is a database developed in 1998 at Leiden University, which enables searches through the decorative programs of Old Kingdom tombs. Originally appearing as a CD-ROM, the database was transferred to an open access website in 2014.⁷⁹ The database of the Oxford Expedition to Egypt likewise organizes and archives tomb reliefs from the Old Kingdom.⁸⁰ It is one of eight Egyptian data sets comprised in the Archaeology Data Service. Both initiatives partially cover the visual and intellectual information that has been generated during the lifetime of these research projects. Both have an enormous potential for growth, but they are stagnant, a situation that is related to the costs of both creating and sustaining digital projects.

5.2 *Financial Sustainability—Financial Uncertainty*

Creating a digital resource is expensive, and yet there is an unspoken expectation that everything that is online should be available for free. In the business world the real costs are, therefore, covered with advertisements or user data, by enticing users to continue their foray on the website. Presenting users more of what they are apparently interested in is a means of retention.⁸¹

Open Access stands in direct conflict with licensing of online publications or images. The copyright laws differ world-wide, but the common tendency is one of expansion of the time that resources stay under copyright.⁸² That in itself

78 MET 2007.

79 MastaBase 2014.

80 OEE 2006.

81 Kronic 2020.

82 Lessig 2000.

is an ethical question: what is more important: the rights of the author or the author's heirs or broad access to the public? Related to that is the question how far fair use can be stretched.⁸³

Many digital Egyptological resources have been created with grant money, in the US for instance from the Mellon Foundation or the National Endowment for the Humanities, which demands that projects created with public funds are publicly accessible. The conundrum is that there are funds available for new projects, but hardly for maintenance, refurbishment, or recreation of an existing resource. The expectations for digital resources adapt to the functionality that is developed by large companies with thousands of developers ("you may also like ..."). Commercial products that enable such functionality are not only expensive, but they do not guarantee longevity, or the capability to retrieve all data that were entered. A large community of developers that works on alternatives for commercial products, is supported by a non-profit organization, the Open Source Initiative.⁸⁴ Open Source does not necessarily mean that the software or product is free, but it indicates that the code is made available for others to build on. All digital resources require regular upkeep, a task which can be onerous, is quite thankless, and requires specialized knowledge.

Most Egyptological resources aim to provide open access and work on the basis of open-source software. As indicated above, that does not mean they are free to create. The term "sweat equity" indicates the many hours that are volunteered for the creation or upkeep of a resource. The UCLA Encyclopedia of Egyptology is fully dependent on the time donated by its editors, authors, reviewers. Technical staff and copyeditors are paid by the university through internal grants. In academia, where peer review is considered part of professional service, this is of course nothing new. As soon as an organization needs to hire staff to manage the project, however, it is no longer feasible to exist without a form of income. The Online Egyptological Bibliography has chosen for a subscription model, others are looking for private donors. One of the ethical considerations related to finances is where the money is originating and whether that origin is made public to the users.

5.3 *Digital Security—Digital Vulnerability*

Data security and data governance are ethical issues: even though humanities' research does usually not generate data as sensitive as medical or social science data, all work that includes humans should be treated with ethical

83 Aufderheide and Jaszi 2018.

84 OSI 2021.

considerations. Ethno-archaeological research directly involves human subjects (as research partners, they share sensitive information) and in the US requires permission from the Institutional Review Board of the researcher's university.

5.4 *Environmental Awareness—Large Carbon Footprint*

The ethics of digital Egyptology includes awareness that computers, datacenters, screens, all our instruments to create, use and archive important Egyptological resources, require large amounts of energy.⁸⁵ The carbon footprint of digital scholarship is large. Outsourcing to the cloud does not solve the problem, because large data centers are notorious energy consumers.

5.5 *Equity in Labor—Rights Abuses*

In a similar vein, much of the coding that is required to develop and maintain software is done in low-wage countries. Not only that, the machines on which we work, the laptops, computer chips, external hard drives, etc. are produced in low-wage countries and often involve child labor. These aspects of the digital turn in Egyptology often remains invisible and is rarely discussed.

6 Conclusion

In the above I stated that the continuum of Figure 1.1 is not an assessment, but that is actually not accurate. The ethics of digital Egyptology lean towards the left side of the chart: digital projects are inherently collaborative, rather than single authored works, and should be fully credited as such. Access to content should be as inclusive as possible, especially in countries where resources are lacking. This means that we should perhaps not design the latest and the greatest functionality but create something that provides a simple way of getting at important information, that downloads also at low bandwidth. Digital projects should be explicit about aims and purpose. While recognizing that it is impossible to exclude bias, we should give every effort to create an inclusive resource, based on sensitivity to different viewpoints. This requires a collaborative thoughtful process, in which aspects of inclusion and transparency are taken into serious consideration. The strongest and at the same time most difficult ethical requirements are the ones related to sustainability. We should strive to create sustainable projects that avoid data loss, and we should try to

85 Pendergrass et al. 2019.

make content available for free. Most importantly, an ethical approach to digital Egyptology should be aware of the costs to the environment and harm to human life and dignity. In the industrial systems of the global economy these detrimental and toxic realities are not easily addressed, but that does not mean they should be taken out of consideration. An ethical approach means that we should look at the system as a whole.⁸⁶

An ethical digital Egyptology promotes the democratization of knowledge and is explicit in how argumentation links to data. In the light of the Trump-era disinformation and lack of authority of scholarship, we should not give in to the temptation to simplify “truth” as something that is true and unambiguous. Ultimately, digital Egyptology is all about content, centered around data in the broadest sense of the word. Its form is transient and will change, with the development of new forms of digital communication and information access. Digital formats allow us to combine and search content in exciting new ways, allowing for serendipitous new insights. Then again, the main form of human communication has been focused on giving meaning to bits of information in the form of a narrative, and even if we agree on the particulars, the story might still spin out of ethical control.

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This volume of collected studies takes stock of most recent developments in Egyptology and the Digital Humanities, considering future directions for the application of new technologies in Egyptology. The book presents the results of an international conference held in 2019 at Indiana University – Bloomington, in which Egyptologists and digital humanists with interest in Egyptology gathered to present current projects in 3D modeling, virtual and augmented reality, game technology, digital pedagogy, database projects, computational and corpus linguistics and E-publications. Those projects, along with a selection of others that were not presented in Bloomington, are now described and discussed in this volume.

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