(Re)birth And Resurrection - Digitizing Antiquity: Preparing Ancient Egyptian Collections for the Digital World at The Grand Egyptian Museum and The Egyptian Museum in Cairo

Kenaya N. Camacho

Johns Hopkins University, Museum Studies Digital Curation Certificate Program

Kcamach1@jhu.edu

April 21, 2017

Research Semester: Spring 2017
Abstract:

Protector of thousands of years of ancient Egyptian history, the Egyptian Museum in Cairo (EMC) is home to the greatest collection of ancient Egyptian antiquities in the world. Unfortunately, the EMC has not incorporated many digital technologies nor initiated a comprehensive digitization program. As a result, the world is missing vital information regarding the ancient Egyptian civilization and will continue to do so until action is taken. In the next two years, the new Grand Egyptian Museum (GEM) is set to open near the Giza Plateau with hopes that it will embrace more technological advancements.

This paper is based on published sources as well as three interviews with people in Egypt who are knowledgeable about the EMC and GEM all providing insight about how digital technologies could impact the future of these institutions. With the founding of the GEM, a focus on the possibilities of using digital technology tools to bring the treasures of the GEM and EMC to the world is timely. A new tool is also proposed in this paper tentatively titled “Kemet ib” meaning “Heart of Egypt” in ancient Egyptian hieroglyphs, a five-year plan/living document to establish the groundwork of technological and digital programs at both the GEM and EMC.

Integrating new technological programs at the GEM will be a “(re)birth” in the sense that the museum will be able to establish a digital presence and learn from how the minimal inclusion of technology at the EMC has hindered the institution. Implementing new technologies in the EMC will be a “resurrection” in the sense that since little digital technology and media programing has been adapted thus far, the ability to reinvigorate and revitalize the museum will renew its sense of purpose and respect for its dedication to preserving its collections in spite of limited resources, and sharing its collections with all Egyptians and the world.

Keywords: Egypt, Egyptian Museum in Cairo (EMC), Grand Egyptian Museum (GEM), Digital Preservation, Ancient Egyptian Civilization
# Table of Contents

**Introduction and Problem Statement** ........................................................................................................... 4  
**Research Questions** ......................................................................................................................................... 6  
**Research Design & Methodologies** .................................................................................................................. 7  
  - Case Study .................................................................................................................................................... 7  
  - Model Programs ........................................................................................................................................... 8  
  - Open-Ended Interviews ................................................................................................................................. 8  
  - Data to Be Collected ................................................................................................................................... 9  
  - Target Audiences ......................................................................................................................................... 9  
**Literature Review/Case Study** ....................................................................................................................... 10  
  - The Egyptian Museum in Cairo (EMC) ....................................................................................................... 11  
    - The Egyptian Museum Registrar Training Project (EMRTP) & Collections Management Process ........................................................................................................... 15  
  - The Grand Egyptian Museum (GEM) .......................................................................................................... 17  
**Model Programs** ............................................................................................................................................ 19  
  - Musée du Louvre ......................................................................................................................................... 19  
  - Bibliotheca Alexandrina .............................................................................................................................. 21  
  - Providing Cultural Heritage Resources Online ............................................................................................ 22  
  - What the EMC and GEM Can Consider for The Future .......................................................................... 22  
**Findings** .......................................................................................................................................................... 23  
  - Interview with Interviewee #1 .................................................................................................................. 23  
  - Interview with Interviewee #2 .................................................................................................................. 25  
  - Interview with Interviewee #3 .................................................................................................................. 27  
**Recommendations For The Future – Planning, Proposal & Strategies For The Implementation of Kemet ib (Digital Preservation Plan)** .................................................................................................................. 29  
**Goals** ............................................................................................................................................................... 31  
**Measurement of Success** .................................................................................................................................. 34  
**Conclusion** ..................................................................................................................................................... 36  
**References** ...................................................................................................................................................... 38  
**Appendix 1: 12 Objectives of the GEM** ........................................................................................................ 41  
**Appendix 2: Digital Preservation Plan for the EMC and GEM** ..................................................................... 42  
**Appendix 3: The Extended Collaboration Continuum** .................................................................................. 48
Introduction and Problem Statement:

The Egyptian Museum in Cairo is home to the greatest collection of ancient Egyptian antiquities in the world. One thing it lacks is the incorporation of technology throughout the museum as well as a digital media presence - including a website, digital catalogue of its collections, and activity on social media sites such as Facebook and Twitter. In the next year or two, the Grand Egyptian Museum will open near the Giza Plateau and become the new home to numerous antiquities including collections currently residing in the Egyptian Museum in Cairo. Although many antiquities will be moving, the Egyptian Museum in Cairo will not be left completely bare as it will still house collections of ancient Egyptian art.

As global guardians of the ancient Egyptian civilization and its antiquities, the Grand Egyptian Museum (GEM) and Egyptian Museum in Cairo (EMC) have an opportunity to transform the scholarship of Egyptology, encourage tourism and revive worldwide interest in the subject matter, by commencing and embracing the importance that technology and science have globally today. By acknowledging this, the EMC and GEM can adapt and adopt newer technologies, protocols, and digital media programs to help them serve the needs of teachers and students, in Egypt and around the world.

However, the EMC and GEM need to work towards advancing further into the digital world that is the 21st Century. Due to the minimal advancement and investment in digital technologies at the EMC, the GEM can take that example as a learning opportunity to embrace digital technologies in their museum early on. By retaining the same protocols and not completely advancing into the digital world, the EMC will stay behind; it is crucial for EMC to continue implementing new technologies as well and take initiative to increase awareness about
its collections and its accessibility. Additionally, a shared system that integrates digital technology and serves both the EMC and GEM would be helpful to increase the economies of scale. These first steps are important because if neither the EMC nor the GEM embraces the idea of digitizing their collections, these invaluable resources will be restricted for everyone. Not only is the investment in digital technologies and digital collections at the GEM and the EMC valuable for preservation and scholarship, but also for educational purposes in Egypt and increased tourism. For example, completely digitizing the collections could help preserve the authenticity and existence of the objects if they were ever damaged or stolen, as the digital images would provide documentation of what the original looked like. Since minimal technology has been incorporated into the EMC and no technology at the GEM, there are a variety of projects both museums can implement.

This paper proposes implementing a technology advancement project called *Kemet ib* (or *km.t ib* in ancient Egyptian hieroglyphs, which stands for “Heart of Egypt”), a five-year program, to help establish the foundation of technological and digital programs, which constitutes a reinvigorated role to incorporate these new additions into each museum respectively. This proposal is by no means final; it is a living document that is intended as a guide that will help both museums focus on incorporating technology in order to better serve the needs of individuals in the 21st Century.

The strategic framework of *Kemet ib* is a dramatic shift from prior operations and thinking: it means that both the GEM and EMC will incorporate new technologies for different results to shape each museum’s role in the community and beyond. This approach represents the (re)birth (GEM) and resurrection (EMC) of each museum.
respectively, as it moves into the technological age of the 21st Century Museum everyone has been waiting for. A strategic framework will provide a “step pyramid” in which a variety of constituents will help to build and shape two of the leading museums in the world that house Egyptology collections. It is assumed that a project like this has not yet been proposed for either institution previously. This proposal is relevant as it will build the foundations for technological inclusivity and advancements, allowing both the GEM and EMC to further expand upon these incorporations in each institution as technology changes over time. After five years, the project should be re-visited to determine what would need to be changed in the future, followed by the creation of a new proposal to continue implementing and advancing the plan.

This paper begins with an historical overview to establish the background of each museum and discusses the goals for implementing a digital technology plan to ensure the establishment of a solid foundation. Implementing these programs into the GEM will be a “(re)birth” in the sense that the museum will be able to establish a digital presence. The GEM will also learn from how the minimal amount of technology at the EMC has hindered the institution and not follow in its footsteps, as it will be able to open with these programs in place once the institution opens to the public. Integrating newer technology in the EMC will be a “resurrection” in the sense that since neither a technological nor digital media program is currently present, the ability to incorporate these programs in the museum will renew its sense of purpose and bring life back to the original museum all have come to admire.

Research Questions:

This paper will answer the following questions to better contextualize and understand what needs to be done at both the EMC and GEM in order to determine what digital technology implementations are best to incorporate for each museum in both the present and future.
With the completion of some digitization projects at the EMC, what can the GEM learn from this and what types of technologies can they adapt that the EMC has in order to have both museums’ assets be available and accessible to each other?

- How will the incorporation of a digital preservation plan/curation plan at the EMC and GEM help each museum preserve its assets ensuring that the ancient Egyptian collections it has will be usable by multiple audiences (locally and around the world)?
- How will digitization of the ancient Egyptian collections be beneficial to the museum and how will it determine the needs of its audience in order to build a digital preservation plan?
- What are recommendations for the future? What factors will account for the implementation of new technologies?

**Research Design & Methodology:**

The research design and methodologies that will be utilized to answer the research questions proposed in this paper are historical research and case studies supplemented by open-ended interviews. Each of these qualitative research methods have been chosen because they have provided connections and insight that will address the questions asked in this paper.

**Case Study:**

Utilizing case studies will allow for the reconstruction of the EMC’s history, while subsequently identifying what digital technologies the EMC has implemented. This analysis will also highlight the current trends and practices at the museum and their effect on the materials that are and are not accessible. Historical analysis of digital technologies that have and have not been incorporated into the EMC will also be useful, providing a foundation and guide, which will help determine what should be implemented at the GEM. Additionally, a digital preservation plan will
be discussed as a tool both the EMC and GEM can employ in their future plans to bring each museum forward and incorporate new digital technologies to aid in the preservation of their priceless objects.

**Model Programs:**

Model programs research will allow for the assessment and analysis of what other institutions (e.g. The Louvre and Bibliotheca Alexandrina) have done in regards to incorporating digital technologies. These examples provide information about how various digital technologies are used, which can be evaluated by the EMC and GEM to determine if they would like to implement similar technologies at their institutions.

**Open-Ended Interviews:**

Open-ended interviews provide unique perspectives offering an in-depth look into what has and is going on at the EMC as well as with the development of the GEM. Three experts in the field in Egypt were interviewed: Interviewee #1, Director of a Rare Books and Special Collections Library Located in Cairo, Egypt, who has worked with both the EMC and GEM, provides a unique perspective in regards to having a better understanding about what each museum is doing and what is to come in the future. Interviewee #2, Professor of Egyptology in Cairo, Egypt and Member of the Scientific Committee at the GEM, has been in the field of Egyptology for over 25 years and knows the ins and outs of the EMC and what the GEM is becoming. Her interview gives an understanding of the GEM’s future, and why both museums need to “wake up” and embrace the incorporation of digital technologies. Interviewee #3, Curator and Artifact Storage Director at the GEM, provides an insiders perspective on how the incorporation of digital technologies at the GEM would help the staff and museum improve their accessibility by allowing more than just staff access to the museums catalogue.
Data to Be Collected:

Data includes the historical background and case study on the EMC. This information is drawn from primary and secondary source materials on the history of the museum giving a holistic overview of the evolution of the EMC as well as interviews. In turn, this information is analyzed to formulate general principles that can be suggested for use at the GEM in regards to the incorporation of digital technologies and its benefits. The data collected will also provide foundational steps that will assist each museum respectively in determining what technologies are most beneficial for them. These steps largely depend on the target audience trying to be reached, budgeted funding, promotion of mission, as well as other factors that can be applied towards creating the ultimate plan for the EMC and GEM. Each interview is important and has been synthesized, as it will help identify areas for improvement at the EMC, provide new considerations for the GEM and give an overall view of digital technologies and its effects on multiple audiences both inside and outside the museums.

Target Audience:

The intended target audiences for this proposal are those who work with Egyptology collections (i.e. The Egyptian Museum in Cairo and the Grand Egyptian Museum), those members of the digital classics and digital humanities communities, and those who want to determine the best ways in which ancient artifacts can be digitally preserved and continued to be used for future generations. For this paper, I have also identified a number of important target audiences at the specific museums I am looking at including:

- **The Supreme Council of Antiquities / Board of Trustees** (They are the first set of people that would approve anything new to occur at either museum and the ultimate decision makers in regards to what technological advancements will and will not be incorporated at each museum).
- **Funding Organizations** (Determining who/which groups will help to ensure enough funds are being raised and allocated to each museums’ projects).
• **Museum Directors** (Would make sure things are running smoothly for the EMC and GEM respectively and that the incorporations that are occurring are suitable for each museum as well as integrated amongst both).

• **IT Staff** (Would ensure all of the technology needed in each museum is available, works properly and everyone is trained).

• **Archivists** (Will be making the digital archives available, and understands who the target audiences are both physically inside the museum and outside of the museum to reach as many people as possible).

**Literature Review & Case Studies:**

“Discussions of technology must start with who we are and who we want to be as museums and as museum professionals within the context of our disciplines, communities, cultures, and countries” (Morrissey & Worts 1998, pp. 148).

Literature available in regards to digitizing ancient collections is minimal but has two seminal works including, *Rome Wasn’t Digitized in a Day*: *Building a Cyberinfrastructure for Digital Classics* by Alison Babeu (2011) and *Ancient Worlds in Digital Culture* by Claire Cilvaz, Paul Dilley & David Hamidović, eds. (2016). Both publications have come to demonstrate the importance of digitizing ancient collections and why taking these steps are useful for future generations. Despite the fact that most of these studies have focused on Greco/Roman antiquities and Biblical Studies, many of these same concepts can be applied to ancient Egyptian collections.

An abundance of literature has been written regarding the Digital Classics and Digital Humanities, two areas that have come to recognize the importance of digitizing collections that relate to ancient artifacts and the humanities in general. For instance, Alan Liu (2012) in his article, *The State of the digital humanities A report and critique*, discusses how the incorporation of digital technologies in the humanities is changing the way we come to understand works in this field, how it is changing the way we teach about particular topics and how digitization is useful for saving our history.
Over the past century, museums have tremendously evolved in regards to the collections they maintain, the exhibits that have been placed on display, and the methods in which information is disseminated to visitors of the institution. Within the last decade of the 21st Century alone, technological advancements in the museum have not only allowed visitors to learn more information about exhibitions they are seeing through the use of computer kiosks and audio guides, but technology has also assisted museum staff in their everyday duties. “Technology is more than a tool; it is an extension of the staff, it serves a key component in the larger organizational mission...” (Spinazze 2007, pp. 131) demonstrating the importance and impact of technologies in our everyday lives. In order to have a better understanding of the minimal role technology has had at the EMC and the impact it could have at the GEM and the EMC if both museums were to incorporate new(er) technologies, one must first understand the histories of the EMC and GEM.

The Egyptian Museum in Cairo (EMC):

The Egyptian Museum Cairo has been around for more than one hundred years, and is one of the most famous landmarks in the heart of Cairo’s Tahrir Square. Home to the world’s largest Egyptology collection of Pharonic art, the museum was built to showcase its cultural heritage and attract visitors from all over the world.

Early in Egypt’s history, the ability to keep ancient Egyptian antiquities safe from danger was a problem, like it is today. The history that leads up to the creation of the Egyptian Museum in Cairo, begins in 1826 when Mohamed Ali Pasha (ruler of Egypt at the time), recognized that there were many dangers facing Egyptian antiquities (Hawass 2015, n.d.), including looting and removal of antiquities from the country itself. In 1835, Mohamed Ali established the first government department to protect and serve antiquities (including laws governing their
ownership), created a plan to get a museum started and developed a program to preserve ancient monuments (Hawass 2015, n.d.). Unfortunately, at the end of Mohamed Ali’s reign in 1848 the project to get the museum started also ended. The project was not revived until 1858 under the reign of Khedive Said Pasha who renewed and re-envisioned Ali’s project to establish the museum. Initially the Egyptian Museum was placed in an old mosque that was restored by Auguste Mariette in the area of Bulaq (Hawass 2015, n.d.). Although this was the first incarnation of the museum, it was not a suitable place to house thousands of antiquities as the museum had little room for objects. Khedive Tawfiq Pasha (Hawass 2015, n.d.), decided that a proper establishment / museum needed to be created in order to take care of all these objects and during his reign, construction of the museum began in 1897, and in 1901 the building was complete (Hawass 2015, n.d.). On November 15, 1902, under the reign of Khedive Abbas Helmi II, the Egyptian Museum was inaugurated and opened in Tahrir Square with 36,000 objects (Hawass 2015, n.d.). The arrangement of artifacts and collections in the Egyptian Museum are displayed in chronological historical sequence (i.e. Pre-Dynastic Egypt to Graeco-Roman Egypt) and include everything from papyri, statues, coffins, jewelry, to scarabs.

One interesting thing to note about the EMC is that neither a mission statement nor vision statement has been developed for the institution. Despite the fact that the museum has been very successful, the lack of these statements can greatly impact the connection a visitor might have with the museum since it does not know what it officially stands for.

Although neither a mission statement nor vision statement has been established, the EMC has strived to be its best despite multiple hindrances that have arisen throughout its history. For instance, over multiple decades, the façade of the museum has deteriorated significantly due to inadequate maintenance of the building. In addition to this, the city’s pollution and traffic
problems have also contributed to the museum’s exterior decline. The January 25, 2011 Revolution sent shock waves through the museum on January 28, 2011, when local citizens formed a human chain to protect the EMC from being looted, only to find out that ten small artifacts and two mummies were damaged (Glock 2012, n.d.). This is the first time in the history of the EMC that there was a breach of security (ARCE 2011/2012, n.d.).

So, what is the current state of the EMC today? Some work still needs to be done to fully bring the EMC into the digital world, but despite all that has happened, there are a few instances of museum revival that were initiated pre-revolution to bring the museum farther into current best practice.

Prior to 2007 (and pre-revolution), the EMC did not have a Registration Department, a vital and crucial department to any museum. Because of this, Dr. Scott Getty, the American Research Center in Egypt’s (ARCE) director established The Egyptian Museum Registrar Training Project (EMRTP) which would “hire and train registrars to keep track of and care for the Museum’s vast collection” was made possible with funding from “ARCE’s Egyptian Antiquities Conservation Project (EAC) which was possible through a grant from the United States Agency for International Development (USAID)” (ARCE 2011/2012, n.d.). Goals of the Egyptian Museum Registrar Training Project were twofold and were worked on in conjunction with Egypt’s Supreme Council of Antiquities:

“1. To teach a select group of newly hired registrars the policies, practices and skills needed to manage the Museum’s collections including day-to-day activities of acquisition, cataloging, tracking object movement and location, condition reporting, object handling, inventory, preventive care, loans, and appropriate documentation” (ARCE 2011/2012, n.d.).
“2. To develop and maintain a computerized collections management system in order to effectively track the Museum’s collection” (ARCE 2011/2012, n.d.)

An important part of the EMRTP was the creation of the Egyptian Museum database, which predates the EMRTP – known as the Egyptian Museum Database Project, initially began in 2005 (ARCE 2011/2012, n.d.). In its first iteration, the new database was established using Filemaker Pro, to replace an older database at the museum (ARCE 2011/2012, n.d.). The new database was meant to record “basic object information and collections management data, such as object location and object movement” (ARCE 2011/2012, n.d.). The volunteer database team at the time had no access to the museum’s register books and could only input data from the museum’s published catalogues (ARCE 2011/2012, n.d.) into Filemaker Pro. Eventually in 2009, the EMC database was migrated to the collections management system KE EMu (ARCE 2011/2012, n.d.; Kamrin 2015, pg. 432).

As part of the Egyptian Museum Database Project, two digitization projects were initiated and supported by ARCE’s Antiquities Endowment Fund (AEF) (ARCE 2011/2012, n.d.). The first project took place from July 2005 through August 2006, which “digitized all of the museum’s Journal d’entrée and Temporary Register books, a total of thirty-six volumes” (Kamrin 2015, pg. 432). What is so special about the Journal d’entrée books is that they are all handwritten, and there is only one of each volume making them unique and irreplaceable (Kamrin 2007; ARCE 2011/2012, n.d.). These books are essentially every Egyptologist’s bible and first step toward finding out information about an object in the EMC’s collection, making it

---

1 A more detailed discussion on the EMRTP will be presented later in this literature review.
an invaluable resource to be digitized. Many of these books show heavy signs of wear and tear as a result of being frequently used by scholars and curatorial staff (not to mention that some of the volumes are over a century old) (Kamrin 2015, pg. 432). Because the books are in a constant state of deterioration, and fear if there was ever a disaster such as a fire or flood, the EMC decided it was best to get these materials digitized so their contents would not be lost forever.

“After each page had been digitized (at full-size, 300 dpi) and processed in Adobe Photoshop (an image processing program), it was saved as a TIFF file and also laid out for printing in an Adobe InDesign file” and in addition to this “a lower resolution (150 dpi) copy of each spread was saved as a JPEG file and linked to the database for ease of reference” (Kamrin 2015, pg. 432).

The second project ran from July 2007 through December 2008, focusing on the digitization of the EMC’s 98 Special Registers. These registers were created in the 1950s in which a majority of objects on the upper floors of the EMC were assigned to one of seven “sections” that correspond more or less to chronological periods or categories of objects which are also tied to the galleries in which the objects are displayed or stored (ARCE 2011/2012, n.d.; Kamrin 2015, pg. 392). In addition to the registers, multiple Catalogue général des antiquités égyptiennes du Musée du Caire (CG) manuscripts and printed volumes were digitized. These manuscripts are important as they also “group and number objects according to category (e.g. statuary, obelisks, canopic jars, etc.) or assemblages” (ARCE 2011/2012, n.d.) which is another reference guide for Egyptologists and scholars who are looking for more information on particular objects.

The Egyptian Museum Registrar Training Project (EMRTP) & Collections Management Process:

The EMRTP trained nine registrars who “oversee all aspects of the centralized collections management and documentation systems within the museum” (Kamrin 2015, pg. 433) who also
work with the senior curators (also known as section heads) who are responsible for all of the objects in their jurisdiction and maintain their own section records (Kamrin 2015, pg. 433). As a result of this project, the first registration and collections management department at the EMC was formed – The Registration, Collections Management, and Documentation Department of the Egyptian Museum Cairo (RCMDD) (ARCE 2011/2012, n.d.; Kamrin 2015, pg. 433).

In 2009, the RCMDD began to create procedures for inputting metadata for each object record into the KE EMu collection management system. Each object record is “begun by the transcription of information from one register series (usually the Journal d’entrée or the CG) into the EMC database” (Kamrin 2015, pg. 433).

Regarding the Collection Management Process at the EMC, the following principle duties are overseen and managed by the RCMDD: accessioning, inventory, movement tracking, in-house exhibitions, travelling loans and outside requests (Kamrin 2015, pg. 434). All of these duties ensure the database stays up-to-date and contains pertinent information that can be useful for both staff and scholars.

Another result from the projects is the creation of intranet and internet portals. The intranet portal is only available to museum staff. It includes all of the objects and collections management information in the database that has been published along with images and facsimiles, while the internet site which would accessible to the public (containing selected materials approved by Egypt’s Supreme Council of Antiquities), has not been published due to the fact that the “internet connection at the museum is still not able to carry the expected load, so the site has not yet been launched” (Kamrin 2015, pg. 435).
Grand Egyptian Museum

A new museum called the Grand Egyptian Museum (GEM), which will be located near the Giza Plateau, is proposed to take over many of the collections currently housed in the EMC, leaving the EMC “with just a collection of ancient art” (Kingsley 2015, n.d.). Since the opening of the EMC, the amount of artifacts has grown from 35,000 to over 140,000 objects, many of which are not on display (GEM Historical Background 2015, n.d.). As a result, the EMC also saw an increase in the number of visitors it receives each day due to the popularity of its collections. Due to overcrowding, the Egyptian government has allocated a piece of land, with the great pyramids of Giza as its backdrop, on which the Grand Egyptian Museum will be built (GEM Historical Background 2015, n.d.). On February 4, 2002, the foundation stone of the museum was laid to announce that Egypt is committed to building a significant cultural monument (housing over 100,000 artifacts) to show that the Egyptian civilization will always be a source of enlightenment (GEM Historical Background 2015, n.d.). The collections it will house will be those currently located in the EMC, including some collections currently in storage, which will be transported to the new museum.

The GEM’s vision statement states that it is “a place that allows its visitors a unique experience of going back in time and navigating through the story of Ancient Egypt over the past 7000 years, and enjoying a voyage through one of the richest cultural heritages ever created” (GEM Vision & Mission 2015, n.d.).

The mission statement of GEM “is to preserve, document, conserve, research, exhibit its collections and educate and entertain its visitors, whether adults or children. The major concern of the museum is to satisfy visitors through serving as a world-class, hospitable and dynamic institute in order to engineer new experiences capable of raising the visitors’ curiosity and
including the pleasure of discovery and enjoyment of culture” (GEM Vision & Mission 2015, n.d.).

The Grand Egyptian Museum also has twelve objectives that it strives to implement when the museum is opened to the public including, “allowing a worldwide audience to participate in the museums programmes through electronic means of communication,” and “building a people- and-artifact-friendly museum, the design of which caters for the safety, pleasure and comfort of visitors while enhancing their learning experiences” (GEM Vision & Mission – Objectives 2015, n.d.) (Appendix 1).

With the GEM being built during a time where technology is recognized as critical to a museum’s mission, it will be imperative to incorporate appropriate technology into the museum as a whole for physical visitors, online visitors and staff. The discussion of technological advancements must start now in order to determine what kind of museum the GEM will be and how the use of technology will be incorporated into its overall vision in order for it to be a successful institution. The GEM can learn a lot from what the EMC has done and it would be beneficial if the museums ensure that their collections management systems are interoperable giving way to an intranet portal of all objects across both institutions.

Of course, using technology in a museum setting can sometimes be seen as a catch-22; at times the technologies implemented in an exhibit can really enhance one’s experiences and on other occasions it can detract from one’s experience if the technological additions do not work even though its presence is vital to understanding what a particular exhibit might be about. Technological investments made by the museum such as having a functioning website with a digital catalogue of objects is an invaluable source for those who cannot get to the museum in person, but on the other hand sometimes the costs of maintaining such a site is not in a museums
budget. This incorporation will also benefit the staff in carrying out their responsibilities and researchers all leading to increased visibility. Despite these paradoxes, various technologies should be used in the museum to enhance, inspire, and engage visitors in their collections while further promoting learning and exploration of knowledge outside the museums walls.

**Model Programs:**

Many institutions have started on their journey towards incorporating digital technologies because “new technologies continue to reshape our approaches” (Daigle 2012, pg. 245) in regards to audience outreach and the amount of information that can be disseminated worldwide. “Digital technology provides an amazing opportunity for museums by allowing them to be ubiquitous, exist in a variety of forms that correspond to the needs of different visitors, engage with new audiences, and, above all, forge relationships that are far more meaningful than traditional museum visits” (Alfandari 2014, para. 1). Two institutions that have embraced the digital journey are the Musée du Louvre (Louvre Museum), Paris, France and the Bibliotheca Alexandrina (Library of Alexandria), Alexandria, Egypt. A discussion on the digital technologies implemented at both institutions will serve as a guide providing insight on technologies the EMC and GEM can consider as they embark on their journey of incorporating new technologies into their institutions, respectively.

*Musée du Louvre*

With the development of the internet and the creation of websites, museums were able to take steps and develop methods in regards to how they wanted to reach new audiences by taking their collections outside of their physical walls. Alfandari in her article, *How digital can help museums to reach new audiences* (2014) raises a good point when she states:

“Although websites are wonderful tools for meeting visitors and amateur’s needs, they are of relatively little help in reaching new audiences… [So] how can [a museum] reach people who
are not yet interested in museums or who know of us but feel uncomfortable with the institutional site?"

In the case of the Louvre, they decided that “rather than having them [i.e. the visitors] coming to the Louvre, the Louvre goes to them” (Alfandari 2014, para. 6).

In order to reach out to the audiences they wanted, the Louvre decided to go two routes with digital technology: they created a Louvre app and an audio guide on the Nintendo 3DS XL. The Louvre app content focuses on “discovering the palace and the collections rather than preparing a visit…[which] is geared to mobile or home use, rather than principally aimed at on-site users” (Alfandari 2014, para. 9). While the app focuses on visitors who are not at the Louvre, the audio guide was created for those on-site in the museum. The Nintendo 3DS XL audio guide, is more than an audio guide – it provides “features such as indoor location, three-dimensional (3D) reconstructions, 3D photos of the galleries, and high-definition of the artworks” (Alfandari 2014, para. 12). The Nintendo was chosen because it was in alignment with the Louvre’s outreach strategy and they also believed that it would help them develop better relationships with their visitors (Alfandari 2014, para. 13).

Alfandari, the Louvre’s digital development chief believes that “A museum today that doesn’t answer the question of how it will integrate new technologies at every level of its functioning will, in my opinion, be seriously missing the boat” (Iverson 2012, para. 1). Alfandari also believes that even though many museums are skeptical about jumping on the high-tech bandwagon, digital technology is just another educational tool for museums, “which when used intelligently can enrich the visitor’s experience and perhaps even attract a new generation” (Iverson 2012, para. 6).
“Digital technology offers cultural institutions new ways of reaching an important goal: to make artworks and artefacts available and understandable, and to share and build knowledge with as many people as possible for mutual exchange and enrichment” (Alfandari 2014, para. 1).

The Bibliotheca Alexandrina (BA) mission is to be “A center of excellence in the production and dissemination of knowledge and to be a place of dialogue, learning and understanding between cultures and peoples” (BA Mission, 2017). As a “leading institution of the digital age” (BA Mission, 2017), the BA has completely embraced the addition of digital technologies making the institution a prime example of how technology can be used to enhance visitor experiences and reach world-wide audiences.

Digital technologies have really shaped the way the BA reaches its audiences. For instance, one digital technology asset they implemented is The Digital Assets Repository (DAR), “an eco-system of components developed to create an institutional repository maintaining the Library’s digital collections…. [and] provides public access to digitized collections through a web-based search and browsing facility” (DAR, 2017). The DAR was built to “support the creation, use and preservation of a variety of digital resources. It provides management tools which facilitate the process of creating, managing and sharing of the Library’s digital assets” (DAR, 2017). In addition to this the DAR “provides different viewing options, searching for a keyword or expression, tagging, sharing books on other social networks, rating books, and interacting with other users through submitting comments” (DAR, 2017). Having the ability to share so many assets, the BA uses the DAR as a means to engage its audience and provide access to many of its assets.
Providing Cultural Heritage Resources Online

The inexorable loss of Egypt’s cultural heritage is not only a concern of those who deal with the issues every day, but a concern of the world. Priceless ancient Egyptian artifacts are disintegrating at an alarming rate, and it is up to us to help prevent this. Both the Louvre and BA have taken steps towards preserving objects and digitizing their collections so that scholars and scientists can consult in perpetuity.

“Establishing history websites, digital libraries, or a historical memory for each country on the Internet is a new method with various positive advantages. It copes with [people’s] attempts to form their culture and knowledge through digital media, and not the previously used forms of transmitting knowledge and science. The variety of historical sources and materials also makes the Internet a perfect method to connect materials together” (Azab 2016, pg. 8).

Ensuring that cultural heritage resources are available online, can increase tourism and contribute to the economy. These resources are significant forces in shaping societal development in Egypt. Making historical memory that can be accessible to all and by promoting cultural experiences, appreciation and understanding, the value of the preservation of the culture, both ancient and modern can be appreciated by all.

What The EMC and GEM Can Consider for The Future

What the EMC and GEM can learn from model programs like the Louvre and the BA is that there are a multitude of ways that digital technologies can be incorporated in their institutions. Depending on how they want to reach their audiences, the EMC and GEM can use their assets to their advantage to promote the ancient Egyptian cultural heritage in ways that are fitting to them. That could be through a digital asset repository like the BA or through more on-site means by incorporating an interactive audio guide like the Louvre.
Findings:

With an understanding of the history of the EMC and the possibilities of what the GEM could be become, interviews were conducted with three individuals to learn more about the ins and outs of each museum and their status on approaching the inclusion of digital technologies for the first time (GEM) or incorporating newer technologies (EMC).

Interviewee #1 – Director of a Rare Books and Special Collections Library (RBSCL) Located in Cairo, Egypt

Interviewee #1, was interviewed to learn more about what is currently going on at the EMC and GEM as he works with multiple individuals at both museums. While talking to Interviewee #1, his perspectives provide great insight into understanding how effective the technologies at the EMC are working and gaining a better understanding of what will come in the future.

When I first started discussing the EMC Database Project that began in 2004, I asked Interviewee #1 what he knew about the project and why it was decided at that time to begin a project of that nature. “The procedures for getting the collections into an official online database at the EMC were very behind (and still are behind to till this day unfortunately) and it wasn’t until Janice Kamrin came around and was able to assist the museum in making this a reality. If it wasn’t for her initial push, the museum still might be going off handwritten museum records (some of which they still are)” (Personal communication with Interviewee #1 March 13, 2017). When I asked Interviewee #1 about the involvement of the SCA and the American University in Cairo (AUC) had in the project he stated that “The SCA was involved since day one when the proposal was presented by ARCE. They had to approve it and also felt that this was a need of the museum and that something should be done. AUC had a handful of volunteers come in assist with getting documents scanned. Now keep in mind, that these were the handwritten museum
records documents to start off with” (Personal communication with Interviewee #1 March 13, 2017). With this in mind, I then asked about how well the collections management system that is in place at the EMC (KE EMu) is working for them. Interviewee #1 stated that the “collections management database is not completely up-to-date because there are not a lot of people dedicated to working on it full time. The software was developed in the UK but not a lot of individuals that work at the museum were trained on it, which is a problem. Plus, a majority of the time, the way that the database is updated is when a request is received for an image. The image is provided to the scholar under the pretense that they provide us with any bibliographic information they have on the object” (Personal communication with Interviewee #1 March 13, 2017). It is unfortunate to hear that the museum does not have enough staff to get all of the records updated in a timely fashion, and that it is only done so when there is a request. Going off the previous question, I asked Interviewee #1 to discuss what the GEM is going to be doing in terms of the incorporation of digital technologies. He stated that the “GEM will incorporate similar technologies that the EMC has because everyone wants both museums to have databases that can be used together. I hope this can be done, but I do not know if it will be done anytime soon. The main focus right now, is to get the GEM open and think about the exhibitions and what will be on display. The unfortunate truth is that digital preservation is not on the top of the list at the moment (Personal communication with Interviewee #1 March 13, 2017). To hear this statement, is quite unfortunate as expressed by Interviewee #1; all more of a reason to present to each museum why digital preservation is something that should be at the forefront of their mind. Based on this question, I also asked Interviewee #1 whether or not he thought either the EMC’s or GEM’s collections would ever be online. He stated that “we hope to have them online one
day, but again this is something that will not happen for quite some time. We do have an internal intranet, but nothing for the public.”

Based on this information, it is clear that the EMC and GEM have some time to go before digital technologies will be fully implemented and brought up to speed. It is good to know that these things want to be implemented, but that it will take some time for it to be fully initiated and completed.

**Interviewee # 2, Professor of Egyptology in Cairo, Egypt and Member of the Scientific Committee at the GEM**

As a leading scholar in the field of Egyptology, Interviewee #2, was interviewed to learn more about the future of the GEM in regards to digital technologies. While speaking with Interviewee #2, her perspective gave insight into why there is a need for a “wake-up” call to embrace digital technologies not only at the GEM but at the EMC as well.

At the GEM, Interviewee #2 is associated with the International Tutankhamun GEM Conference and Scientific Committee at the GEM. “The Scientific Committee at the GEM is responsible for ensuring all of the objects are being properly taken care of and that they are slated for conservation when necessary. Also, the scientific committee ensures that the GEM meets ICOM standards” (Personal communication with Interviewee #2 April 3, 2017). It is great to hear that the GEM is maintaining ICOM standards as it shows that the museum shares similar values along with others in the international community.

Considering that the GEM can learn from what the EMC has done, I asked Interviewee #2 about her thoughts on the EMC Database Project (2004), “This was a great start for the EMC because nothing like it had been implemented before. As the program was evolving and gaining momentum, things were going well. Unfortunately, once the funding started to disappear is when many Egyptologists saw it as a sign of misfortune especially if things could not keep going and
get digitized” (Personal communication with Interviewee #2 April 3, 2017). When I asked Interviewee #2 if she thought something similar could happen at the GEM, in terms of them not being able to have enough funding to digitize the entirety of their collections she stated “Funding is a problem for every museum, not just the GEM. Inshallah, the GEM will be able to procure funding to complete the digitization of their collections. But we must remember, the country is still in unrest, so the funding may come and go. Just as long as we keep trying, we will eventually get everything digitized” (Personal communication with Interviewee #2 April 5, 2017).

Wanting to learn more about the role digital technologies might play at the GEM in the future, I asked Interviewee #2 to speak on what some of the museum’s main focuses are regarding this topic. Interviewee #2 stated, “One of the main focuses of the GEM is to figure out what type of digital technologies they want to implement and what would be best for their audiences. The GEM knows who they want to target, but it is a means of doing so in the right way” (Personal communication with Interviewee #2 April 3, 2017). When I asked about who the target audience was, Interviewee #2 responded with “Everyone!” (Personal communication with Interviewee #2 April 3, 2017).

I also wanted to learn more about how the GEM and the EMC might collaborate with one another in terms of whether or not they would decide to adapt similar technologies. When I asked Interviewee #2 about this, she stated “the EMC and the GEM need to have a wake-up call when it comes to digital technologies. In my opinion, the best thing for them to do would be to have an interoperable system. Something to be approved by the SCA (Supreme Council of Antiquities). When you think about it the collections are essentially the same, just moving from one museum to another. The wake-up call to incorporating digital technologies has to happen
sooner than later, and they need to choose technologies that are best for their needs. We don’t want to risk losing objects. I know it can be a challenge to get on board, but it needs to be done” (Personal communication with Interviewee #2 April 5, 2017). I agree with Interviewee #2 – the EMC and GEM do need to embrace digital technologies at their institutions so it can help them achieve their goals. In an article written by Adrian Murphy (2015), he interviewed Eric Longo, the executive director for the Museums Computer Network, stated something that applies to both the EMC and GEM:

“Digital projects require iterative and nimble workflows and processes that challenge traditional hierarchies, forcing staff to collaborate across departments, and digital forces museums to have a certain appetite for risk...Museums must also be vigilant not to fall for the latest digital innovation but to really focus on how they can leverage the right technology tools that best support their mission.”

What Longo said supports what Interviewee #2 mentioned in her interview- choosing technologies that are best for their needs is what the GEM and EMC need to do, and by doing so will achieve their goals.

**Interviewee #3, Curator and Artifact Storage Director at the GEM**

Interviewee #3 provides perspective on how the incorporation of digital technologies could help the GEM’s staff and the museum as a whole, create more accessibility to their object catalogue.

At the GEM, Interviewee #3 works daily with ancient Egyptian objects. As a curator and storage director, Interviewee #3 believes that the implementation of digital technologies would help the staff not only keep better track of the objects, but would also assist them in making the collections available to the community and beyond. When I asked Interviewee #3 to explain more about how the technologies would help, he stated “Having worked with museums in Egypt for many years, I’ve seen the need for digital technologies to be incorporated. We are dealing
with so many objects, and the first step would be to implement a digital preservation plan and a collections management system (CMS) that is easy and intuitive to use. I think by starting with those two things, would reshape the way the museum functions – and I mean this in a good way. Creating a digital preservation plan would allow us to prioritize what objects need to be considered first. This plan would help us start somewhere so we can go somewhere.” (Personal communication with Interviewee #3 March 16, 2017). Hearing from a staff member that there is a need for a digital preservation plan, is encouraging because it demonstrates that staff members are thinking about this and want to move forward with embracing technology. When I asked Interviewee #3 about his thoughts on integrating an interoperable CMS between the EMC and the GEM he stated, “This would be great! I think something like this needs to be done because the museums are almost one in the same. The EMC and GEM represent all of the collections even though they are two different institutions. People want to know what we have, and I think it is time that we show them” (Personal communication with Interviewee #3 April 4, 2017). I asked Interviewee #3 to explain more by what he meant in regards to the people wanting more, “The people of Egypt and the people of the world have wanted access to our collections, but we haven’t been able to give it to them. This is sad because we have so much and there are people who want to study it. Not everyone can come to Egypt, especially with the unrest, but still need to see things in our collections! I feel that if we could allow everyone to see what we have, our connections would grow and we could learn more about the ancient Egyptians that we haven’t before!” (Personal communication with Interviewee #3 April 4, 2017).

When I asked Interviewee #3 to talk more about accessibility and what this would mean for the GEM and its audiences, he stated “Everyone wants to have access to our collections. The ancient Egyptian civilization is fascinating to so many people and they want to learn more. Why
can’t we give them more? We can! We as a museum just need to figure out how we want to make this happen and what kinds of technologies we want to use. Once we figure this out, we can fulfill more of our mission and continue to embrace the digital age and provide our audience with what they want. I know that we are limited in technology infrastructure, but we can make it happen. The benefits of digitization not only helps the museum but our audiences as well because they want to see the objects!” (Personal communication with Interviewee #3 April 4, 2017).

I agree with Interviewee #3, that the GEM has the potential to make its collections accessible and so does the EMC. By utilizing the technologies each institution has and considering what can be incorporated in the future, both institutions have the ability to meet their visitors where they are and revitalize the access to their collections.

**Recommendations For The Future – Planning, Proposal & Strategies For The Implementation of Kemet ib (Digital Preservation Plan):**

“Technology is considered broadly as any type of electronic communication tool including audio, video, computers, networks, and virtual realities, among others. These technologies are by no means a definitive list…. but promote dialogue and creative meaning making…. that encourage visitors to leave a museum experience feeling more engaged, thoughtful, in-touch, and responsible and with better sense of who they are and how they are connected to and contribute to their culture and their natural environment” (Morrissey & Worts 1998, pp. 156-157).

Based on the findings and research that has been conducted, it is fitting to propose a technology project (*Kemet ib*) that would not only enhance the GEM which can be seen as a (re)birth of the EMC since it will be taking over a majority of its collections, but to also use the same project to enhance, invigorate and resurrect the EMC as it will still be used to house collections of ancient Egyptian art. “It can be and typically is a very daunting task to integrate any type of technology into a traditional museum environment” (Sayre 1998, pp. 129) but well worth both museums time, as it would bring them forward into a thriving digital world.
A proposed framework for a digital preservation plan (Appendix 2) has been created for use by both museums. Each museum will need to think about their digital preservation and curation plans for the future as both play a vital role in determining the future of the assets and their accessibility. Although it will not be fully discussed in this paper, digital curation goes in hand with digital preservation as digital curation involves the active planning and ongoing management of digital objects over their lifetime that ensures their long-term preservation in a repository for future use by all generations. In the 21st Century, “digital curation is retrospective; [but] tomorrow’s must be prospective” and the primary focus of digital curation practices have been retrospectively addressing digital assets in regards to stabilizing and protecting existing assets and digital content, but eventually there will need to be a shift in the field of digital curation towards something more prospective (Zorich 2015, pg.14). This prospective shift will need to focus on the front-end workflows of capturing data at the initial stages in order to work with a digital asset in its entirety from the beginning. By developing a more universal institutional strategy for managing their digital assets, the EMC and GEM would open and allow themselves to be effective in its digital curation efforts. In the data curation lifecycle, a core component of digital curation is digital preservation, which combines policies, strategies and actions to ensure access to content that is born digital or converted to digital form regardless of the technological changes that have occurred, and renders the most authenticated content over time (ALCTS 2016).

The incorporation of a digital preservation/curation plan at the GEM and EMC is vital to ensuring the longevity of the collections and propelling both museums into the digital future. Incorporating this plan will help each museum have a better understanding of their collections and learn more about what is in dire need of preservation. As an Egyptologist, digitization of
ancient Egyptian collections is extremely valuable and beneficial to scholars, visitors and everyone else in the world. Due to the fact that much of ancient Egyptian history is at risk of being lost, the faster we digitize the materials, the faster we are to preserving that knowledge, which also allows for the opportunity for us to gain more knowledge. Preserving the objects, will allow for new studies to commence and new discoveries to be made. Digitization will also be beneficial to the museum because it will help them determine a priority list and identify items in need of physical conservation and preservation, so that treatment could be incorporated into the digitization workflow. Applying for external funding could help make this a reality and continue the insured longevity of the objects in the collection. Furthermore, it helps the museum ensure that it knows everything it has in its collections.

Additionally, each museum will need to determine who their audiences are. This could be done via a survey or even by observation by seeing who comes into the museum. Lessons learned from the Louvre and Bibliotheca Alexandrina could serve as a guide to help the EMC and GEM think about the multiple audiences they need to consider including: tourists, scholars, researchers, visitors to the physical museum, visitors to the museums website, who wants to access their collections, languages materials should be offered in, learning types, etc.

Goals

To ensure that all of GEM’s and EMC’s efforts focus on its most important priorities and goals over the course of five years, clearly defined strategic initiatives and outcome measurements support Kemet ib, which sets out to achieve four key goals:

- **Goal 1 - Connecting Through Experiences: To engage audiences where they are – either within the museum or through online communities.**
  - This goal is proposed because the main initiative of Kemet ib is to incorporate technology in both the EMC and GEM. It is proposed that technology will be used inside the museum as well as outside the museum (i.e. through a website) in order to engage audiences from all over the world to make them feel like they are part of the museum.
Goal 2 - Bringing the Collection to Life: To research, interpret, preserve and display the Egyptology collection for all visitors and digital audiences.
- This goal is proposed because the goal of any museum is to bring to life the collections that are on display, which can be done through the use of technology to help ensure everyone has access to information about the collections both onsite and digitally.

Goal 3 - Aligning Digital Strategy With Institutional Priorities: To improve the technological infrastructure of the museum with a strong IT Team.
- This goal is proposed because a strong IT Team will need to be created in order to ensure all the technology in the museum works as well as keep up with the latest trends in technology.

Goal 4 - Fiscal Stability and Sustainability: Build long-term sustainability so the museum can stay up-to-date with technological advancements.
- This goal is proposed because without a steady stream of funds to support this project, the technology that’s incorporated into each museum might not survive. By establishing secure funds, the museum can ensure that the technology it decides to use is consistently maintained.

Strategies Defined for Each Goal

To better understand how each goal will be achieved at both museums, the strategies that will be implemented for each goal will be further discussed as well as how the success of each goal can be measured.

Defined Strategies for Goal 1 - Connecting Through Experiences: To engage audiences where they are – either within the museum or through online communities.

- Create a website, social media sites and mobile apps that allow visitors to get the most out of their experience on site and beyond the walls of the museum
  - These digital media sites are important because they are valuable and will allow visitors to get the most out of their museum experience whether it be at home or in person. It also shows that the museums are dedicated to being accessible for all people including scholars or visitors who are curious about the collections. In addition, each museum can enrich and enhance the visitor’s experiences through these interactive online technologies allowing for more self-exploration and pursuit of knowledge based on individual interests.

- Add computer kiosks, audio guides and other interactive technologies (e.g. QR Codes) on-site so visitors do not feel “lost” when looking at the collections
  - This is important for both museums to incorporate because these technological advancements will greatly improve the quality and experiences museum visitors have
as they browse the collections and allow them to learn more about what they are viewing. Technologies that will be incorporated in each museum will be used to enhance the visitors experience, not hinder it; this will allow the visitor to be engaged in the moment and expand upon the knowledge they are receiving, and think about how they relate in context to what they see on display. This strategy will also help work on increasing visitor attendance at the museum by having technological additions that make visitors feel engaged and want to come back to the institution.

- **Create new opportunities for learning (within the museum and the classroom)**
  - This strategy will transcend disciplinary boundaries by connecting communities all over the world through conversations and initiatives. By creating new opportunities for learning (inside the museum and virtually), the museum demonstrates that it is a leader in education as well as emphasizes the importance of connecting people to the information they need that can only be supplied by their institution.

- **Creating a friend’s program**
  - Establishing a friend’s program would allow individuals to feel that they are part of the museum, and based on their positive experiences, can lead to them encouraging others to join as well. Through the use of internet and other technologies, informative programs can be developed to foster public awareness about exhibitions and engagements with the museum that can be sent to members first as a “perk” before non-members.

*Defined Strategies for Goal 2* - Bringing the Collection to Life: To research, interpret, preserve and display the Egyptology collection for all visitors and digital audiences.

- **Establish a digitally archived collection of all artifacts in the collection that will be published online and to create an Egyptology library that fulfills the needs of researchers around the world**
  - This is a very important step for each museum to take. By having ones’ collection published online not only does it attract visitors to its website, but also inspires them to come to the museum and do research onsite. Each museum owns their own collection of books regarding Egyptology and establishing a library is essential because not only do the curators and registrars benefit from it when doing research for exhibitions, but scholars from all across the world can also come work and do research with rare books and collections that are not easily accessible. This would also increase the amount educational resources in each museum.

- **Open access to data, research and collections and support researchers through collaborative structures and platforms**
  - By being transparent both the GEM and EMC can allow other museums around the world with Egyptology collections to add information to artifacts. For example, if there is a coffin lid in one museum (e.g. the Louvre) while the coffin base is in the GEM then both museums could collaborate on the website to provide the most accurate information about the artifact as if it were complete in one museum.
**Defined Strategies for Goal 3** - Aligning Digital Strategy with Institutional Priorities: To improve the technological infrastructure of the museum with a strong IT Team.

- Make technological improvements in infrastructure, software, and digital projects
  - With the help of the IT team, each museum will determine the best method to make sure the technological infrastructure within the museum is up-to-date and fulfills the needs of the staff members allowing them to complete their work at ease.

- Determine the long-term IT needs, figure out types of equipment needed for various exhibitions (permanent and temporary), strategize web development and content, as well as determine what software system should be used to document the collections
  - This will be vital for each museum to do because of the fact that technology is forever changing and the incorporations of technology in the museum will need to satisfy the needs of everyone. Also, because technological problems always arise it is crucial to ensure the IT staff is well versed in the software being used at the museum (if this is a job that is outsourced, it will be good to know which companies can be counted on to provide quality service when needed, especially in the case of emergencies).

**Defined Strategies for Goal 4** - Fiscal Stability and Sustainability: Build long-term sustainability so the museum can stay up-to-date with technological advancements.

- Develop a financial plan
  - Each museum will need to adhere to the best practices to ensure appropriate fiduciary responsibility. A financial plan needs to be developed in order to ensure that the museum can continue to afford all of the technology that has been incorporated. If there are insufficient funds, the technology used throughout the museum would become pointless once it’s outdated and unable to be upgraded. This would severely impact and hinder museum visitors’ experiences especially if the technology is needed to understand a majority of the exhibition.

- Grow an endowment fund
  - An endowment needs to be created because technology is not cheap and is one of the most expensive “necessities” to maintain. Lack of funds would also impact the maintenance of the technological and digital media additions and if these are not working not only impact visitors, staff, and international audiences (via the web) but could also harm the reputation of the museum.

**Measurement of Success**

The success of *Kemet ib* can be measured for each goal can be done in a variety of ways.

For Goal 1, the success and outcome of the implemented strategies can be measured at each
museum by tracking how many visitors click on to their website, how people use the kiosks and audio guides, for example. Another way to measure success is through the use of online surveys, visitor experience & membership surveys, and community conversations that appear on social media sites like Facebook and Twitter. Success of this goal should be measured at the end of year three of the proposal to ensure enough time has passed to actually gain and analyze substantial data. The success of Goal 2 can be measured by how much of the collection each museum is able to catalogue digitally. Success of this goal should be measured at the end of year three and four because it gives the museum a chance to see how well/fast they are able to get information in the digital catalogue for visitors to have access to and also look at the numbers of websites visits as those should increase with more objects in the database. For Goal 3, the success and outcomes of the strategies proposed can be measured by how well the IT staff responds to technical difficulties. In addition, success can also be measured by how well the technological software aids staff in completion of their duties. Success of this goal should be measured at the end of year four, to determine whether or not in year five, considerable technological changes need to be made. The success of Goal 4 can be measured by the amount of money the museum is putting towards the endowment each month. If they are not meeting their goals, they should look other fundraising options as well as potential donors. If that does not work, they should consider downsizing the amount of technology being used throughout the museum to ensure that it is always maintained and does not damper ones visit to the museum. Success of this goal should be measured at the end of year three, to ensure that the museum can keep up with the demand of all the technological additions made in each museum.
Conclusion:

“At its best, technology can facilitate experiences in which visitors can both transcend and live more fully in their daily lives, thoughts, and activities. It can challenge visitors to reconsider or create new meanings…. It can help museums realize their institutional potential. The final challenge then is no less than that of placing technology in the service of understanding and enhancing the human experience” (Morrissey & Worts 1998, pp. 170).

In conclusion, the proposed framework of Kemet ib has been designed as a model to allow the EMC and GEM to decide what is most valuable for them when considering the digital technologies they would like to implement at their institutions, respectively. The four goals/initiatives that could be implemented over five years are designed to demonstrate both museums’ commitments to their mission, visions and goals. As stated by Morrissey and Worts, technology is designed to enhance a visitor’s experience, help them create new meanings and enlighten them about the collections they observe. Although there is a lot to be done by the EMC and GEM in order to bring them forward in the digital age, I do applaud that the EMC saw the need to implement a collection management system (CMS) which is a huge step for any museum. It’s just unfortunate that there is not enough funding to keep the momentum going and that staff are dedicated to other, bigger projects, with digitization put aside for “the future.” Just like any other museum that is just starting out with digitization of their collections, both the EMC and GEM will need to determine what types of digital technologies would be best for them to incorporate in their museums.

My findings point to the importance of digitizing collections in a timely manner, and the implications of these findings are numerous, highlighting the importance of digitization for ancient collections. The EMC has taken the first step by implementing a CMS which demonstrates their acknowledgement of ensuring everything in the collection can be accounted for. Unfortunately, at this time, all of the information that needs to be entered into the CMS has
not been completed, and the information that has been added is not accessible to anyone outside the museum staff, unless requested. The GEM is still determining the type of CMS and digital preservation plan they’d like to implement. It is hoped that the GEM and EMC will collaborate in the future (i.e. once the GEM opens) to decide on whether or not they will implement the same CMS or use different systems. There are many benefits to adopting the same CMS as it would be interoperable between both museums as expressed through the interviews discussed in this paper, and it makes the range of accessibility wider as it will be for two museums instead of one, and allows for both museums to have access to the entirety of the collection as it was original the EMC’s collection.

I’d hope that the EMC and GEM would take the digital preservation plan I developed and add to or delete from what I provided. This way, they are in control of what they want to have implemented based on my suggestions, which leads to the next steps they want to take. Being able to have someone as myself who is an Egyptologist and understands how positively the incorporation of digital technologies and a digital preservation plan would be at each museum is crucial for the Egyptology community since one of their own is able to make such suggestions.

Next steps that I recommend for the GEM and EMC is that they think about a collaboration continuum between themselves. This would allow them to establish the 6 C’s that are part of the Extended Collaboration Continuum, proposed by Sarah Higgins – conversance, contact, cooperation, coordination, collaboration and convergence (Appendix 3). A few of these already occur, but focusing more on how each institution can be more symbiotic would allow for further advancement of each museum and their collections. “Collaboration brings increasing benefits in resource efficiencies and user uptake as participating organizations progress through the continuum. It is in the area of digital content creation and management that the synergies of the
disciplines are most often harnessed through cooperative exploration coordinated projects and collaborative services” (Higgins 2013, pg. 1). Digital curation could bring a “wide array of opportunities and challenges” (Lee, C. & H. Tibbo 2011, pg. 127), but through the implementation of technology and digital media programs, the “(re)birth” and “resurrection” of the Grand Egyptian Museum and Egyptian Museum in Cairo respectively, demonstrates their commitment to reinvigorating their institutions and creating key experiences for their visitors in the museum and beyond.

References:


Bibliotheca Alexandrina (BA).


### Appendix 1: 12 Objectives of the GEM

**Objectives**

<table>
<thead>
<tr>
<th>To create</th>
<th>To transform</th>
<th>To establish</th>
</tr>
</thead>
<tbody>
<tr>
<td>a world class complex of museums capable of demonstrating the development of Egyptian Pharaonic civilization.</td>
<td>the idea of the museum from an institute whose only function is to exhibit collections, to an institute of different functions that enable visitors to enjoy a full-day experience.</td>
<td>proper laboratories for scientific researches, conservation, restoration, and photography according for best standards.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To build</th>
<th>To contribute</th>
<th>To expand</th>
</tr>
</thead>
<tbody>
<tr>
<td>a people- and artifact-friendly museum, the design of which caters for the safety, pleasure and comfort of visitors while enhancing their learning experiences.</td>
<td>the development of tourism industry by providing facilities capable of attracting an additional four million tourists every year.</td>
<td>the knowledge of visitors and enrich the quality of their experience through the interactive use of relevant techniques and technologies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To use</th>
<th>To allow</th>
<th>To offer</th>
</tr>
</thead>
<tbody>
<tr>
<td>the information highway to create the first electronic museum in a manner designed explicitly to facilitate maximum visitor involvement and participation.</td>
<td>a worldwide audience to participate in the museum’s programmes through electronic means of communication.</td>
<td>educational and recreational opportunities to all its visitors</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To establish</th>
<th>To invest</th>
<th>To revive</th>
</tr>
</thead>
<tbody>
<tr>
<td>a data bank and Egyptology library for studying worldwide collections of Egyptian artifacts to fulfill the needs of researchers.</td>
<td>in Egypt’s future by establishing a Museum for Children fostering cultural awareness in future generations.</td>
<td>ancient and neglected arts and crafts by establishing a Craft Center.</td>
</tr>
</tbody>
</table>
Appendix 2:
Proposed Framework for a Digital Preservation Plan for the Egyptian Museum Cairo (EMC) and Grand Egyptian Museum (GEM)

Table of Contents:

Plan Identification ..................................................................................................................................................
Status and Triggers ...............................................................................................................................................
Reference to Digital Preservation Policy ........................................................................................................
Summary of Environment & Constraints ........................................................................................................
  Organizational Structure ...............................................................................................................................
  Current Practices and Obligations ..................................................................................................................
  Organizational Readiness ...............................................................................................................................-
  Financial Constraints .................................................................................................................................
  Human Resources .........................................................................................................................................
  Technical Constraints .................................................................................................................................
Description of the Collection .........................................................................................................................
Relevant Characteristics of Digital Objects ....................................................................................................
User Requirements ..............................................................................................................................................
Consideration of Potential Action Plans ......................................................................................................
  Proposed Workflow ......................................................................................................................................
  Proposed Technology .................................................................................................................................
  Required Human Resources .........................................................................................................................
  Summary of Cost ...........................................................................................................................................
  Results of Test ................................................................................................................................................
  Discussion of Proposed Solution ..................................................................................................................
Preservation Action Plan ..................................................................................................................................
Identification and Justification of Chosen Action Plan ..................................................................................
  Roles and Responsibilities ............................................................................................................................
Work Breakdown Structure ..........................................................................................................................
Discussion of How Resources are Ingested Managed and Accessed ............................................................
Detailed Costs and Funding Sources ............................................................................................................
Trigger for Action Plan Revision ......................................................................................................................

*Note: Because this would be a live working document and not all of the components are present, I have not included page numbers for each section. This is a proposed Table of Contents that I believe would be useful for the EMC and GEM in creating and establishing a digital preservation plan for its collections. This plan is based on the Canadian Heritage Information Network (CHIN) Digital Preservation Plan Toolkit and Digital Preservation Policy
Framework Development Guideline. In addition, this plan should be used for both physical objects that are fragile and need to be both conserved and digitized as well as those digital objects that need to be migrated to a new format.
Appendix 2:
Proposed Framework for a Digital Preservation Plan for the Egyptian Museum Cairo (EMC) and Grand Egyptian Museum (GEM)

Table of Contents – With Brief Notes

Plan Identification
- Name of the Plan: Egyptian Museum Cairo (EMC) and Grand Egyptian Museum (GEM) Digital Preservation Plan
- Date Modified: February 2017
- Version: 1.0 (First draft of proposed plan)

Status and Triggers
- The EMC’s and GEM’s preservation plan is in development
- Individual(s) Responsible for Creating Plan: The Supreme Council of Antiquities, Museum Directors at the EMC and GEM, IT Staff at both museums and Archivists at both museums
- Trigger: No digital preservation plan ever created for any of the collections at either the EMC or GEM

Reference to Digital Preservation Policy
- Official Digital Preservation Policy has not been created for the EMC or GEM and needs to be developed
- In the creation of the digital preservation policy, the EMC and GEM needs to establish “what must be done”

Summary of Environment & Constraints

Organizational Structure
- Supreme Council of Antiquities: Oversees all of the objects in museums in Egypt. They are the first set of individuals that would approve the digital preservation plan.
  - Would be considered the digital preservation officer
- Museum Directors: Would make sure that they are taking the orders from the Supreme Council of Antiquities to ensure that everything is being properly handled and incorporated.

Current Practices and Obligations
- Anything regarding digital preservation goes through the SCA first and then through the museum directors at the EMC and GEM

Organizational Readiness
- Organizations Awareness: The EMC and GEM knows that it needs to implement a digital preservation plan as soon as possible
- Organizations Attitude: The EMC and GEM have a good attitude and is willing to start to get the ball rolling on this preservation plan
Organizations Expectations: The EMC and GEM understands that at the onset of this project, it is going to take a lot of work to get everything organized and begin to write out a living document that can be continuously updated. It is the hoped that the EMC and GEM can implement a digital preservation plan in the next 3-5 years

Financial Constraints
- Since there is a variety of assets in the collection, the EMC and GEM needs to apply for grants to get money to preserve materials that are closer to obsolescence first as well as obtain monies to implement the digital preservation plan across all collections at the museum

Human Resources
- Cost of training individuals needs to be taken into account

Technical Constraints
- The EMC and GEM is aware that they do not have all of the necessary technologies needed to convert some of their fragile assets which is a problem because most of these assets are close to obsolescence
- Need to start incorporating more technologies that are of “the future” in order to preserve as much as they can without losing objects

Description of the Collection
- Inventory
  - Include an Inventory Template
    - Summary of Digital Asset Groups / Content Categories
    - Detailed Information for Each Digital Asset Group
      - Date of Acquisition
      - Ease of Replacement
      - Consequence/Impact of Loss
      - Estimated Years Required to Preserve
      - Frequency of Access
      - Access Permission
      - Physical Carriers / Physical Format
    - Location and Environmental Conditions
    - File / Format Type
    - Directory Structures
    - Security
    - Copyright Clearance
  - The Inventory Sections should be able to answer the following questions:
    - What digital content does the museum currently have?
    - What is already being preserved?
• What are we required to keep?
• What objects need to be reviewed and prioritized first?
• Which staff is needed to assist in this process?
  ▪ The Inventory Section can have a varying level of detail depending on what the EMC and GEM wants to include
  o Storage
    ▪ Requirements for digital content
    ▪ File type considerations
    ▪ Preservation of metadata
    ▪ Repository selection

Relevant Characteristics of Digital Objects

  o References to appearance of objects
    ▪ Color Depth
    ▪ Resolution of Images
    ▪ Fonts
  o Non-Static Objects
    ▪ Object’s behavior

User Requirements

  o This section will outline how contributing resources for preservation and those requiring access to the preserved resources must do so according to their own workflows

Consideration of Potential Action Plans

  Proposed Workflow

    ▪ Will give an overview of how the EMC and GEM will convert its assets, ongoing management of its assets and access

  Proposed Technology

    ▪ Discussion of what hardware and software will be used by the EMC and GEM
      ▪ Software: Discussion on using open source or not and the decisions approved by the Supreme Council of Antiquities, Museum Directors, Staff, and why

  Required Human Resources

    ▪ Description of staff that will help implement the project

Summary of Cost

    ▪ Will give a breakdown of various costs including ingestion, management of various resources (i.e. hardware, software, etc.), accessibility, etc.

Results of Test

    ▪ An assessment of the technology not evaluated
Discussion of Proposed Solution

- A detailed analysis of the EMC’s and GEM’s proposed solution that includes a discussion on the cost, benefits, impact, risks and opportunities of implementing the digital preservation plan
- Also discuss the requirements and any constraints at the time of implementation

Preservation Action Plan

- Give an overview of the action plan chosen by the EMC and GEM; why it was chosen and identify future trigger events

Identification and Justification of Chosen Action Plan

Roles and Responsibilities

- Description of each person’s responsibilities
- Roles of the content creators

Work Breakdown Structure

- Section outlines
  - Major tasks required
  - Responsible party for various tasks
  - Milestones
  - Deliverables

Discussion of How Resources are Ingested Managed and Accessed

- Discussion on
  - Technical characteristics (i.e. metadata included)
  - Process characteristics (i.e. how metadata will be provided)
  - Characteristics of preserved objects (i.e. what is preserved and what is not)
- Discussion on what technologies should be used to make sure resources are accessible in the long term
  - Migration
  - Replication
  - Emulation

Detailed Costs and Funding Sources

- Breakdown of costs of implementation
- Budget (with funding sources identified)
- Cost for maintenance

Trigger for Action Plan Revision

- Identify potential future events that might trigger a change in the action plan
  - E.g. newer technologies needed to preserve objects etc.
## Appendix 3: The Extended Collaboration Continuum

<table>
<thead>
<tr>
<th>Collaboration Continuum</th>
<th>Conversance</th>
<th>Contact</th>
<th>Cooperation</th>
<th>Coordination</th>
<th>Collaboration</th>
<th>Convergence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of Integration</td>
<td>None</td>
<td>Experimental</td>
<td>Minimal</td>
<td>Selective</td>
<td>Shared goal with a separable administrative framework</td>
<td>Shared vision with changed working practices and inter-depencies</td>
</tr>
<tr>
<td>Commitment</td>
<td>None</td>
<td>Casual networking</td>
<td>Trust building</td>
<td></td>
<td></td>
<td>Shared mission and service delivery</td>
</tr>
<tr>
<td>Activities</td>
<td>Keeping abreast of professional developments</td>
<td>Exploration of differences and commonalities</td>
<td>Information sharing</td>
<td>Joint projects</td>
<td>Joint projects leading to shared services</td>
<td>Shared infrastructure</td>
</tr>
<tr>
<td>Triggers for Moving Along the Continuum</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benefits</td>
<td>An understanding of the professional landscape</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Resources gap: skills, financial, infrastructure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Change agent: Management mandate, Staff incentives, Funding availability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Trust &gt; Vision &gt; Commitment &gt; Investment &gt; Confidence &gt; Ambition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Staff development &gt; Professional flexibility &gt; Best Practice Developed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Shared resources (human, financial and infrastructure &gt; Resource efficiencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Services, Outreach, Catalogues, Digital resources &gt; More users</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risks</td>
<td>Minimal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Differences not addressed prior to commitment</td>
</tr>
<tr>
<td>Measures for success</td>
<td>Knowledge of possible collaborators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Harmonization of:</td>
</tr>
<tr>
<td></td>
<td>- Trust develops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Organizational procedures</td>
</tr>
<tr>
<td></td>
<td>- Ideas for joint working emerge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Collection Management Framework</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>- Priorities</td>
</tr>
</tbody>
</table>