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MAKING THE TRANSITION FROM DOCUMENTATION TO EXPERIENCE: THE ETERNAL EGYPT PROJECT

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Abstract

Museum exhibit designers have long known that using modularized storytelling to link together museum holdings can enable a richer visitor experience than other organizational techniques. Virtual experiences of cultural heritage also benefit from a modular, narrative approach, though this path can be impeded by the very technologies that make it possible. Databases and digital archives are powerful, indispensable tools, but often their power can unintentionally shape the way the data is encountered by visitors and users. This challenge, moving from an archival notion of cultural data to one that privileges the experience of that data, requires a significant conceptual leap and non-trivial technical innovation.

This paper addresses a possible solution to this challenge as exemplified in a project called Eternal Egypt. Specifically we outline the ways in which the Eternal Egypt content strategy attempted to synthesize the diverse stakeholder definitions of Egyptian culture and demonstrate how this led directly to a narrative-based content management system. In addition, using various components of Eternal Egypt, especially the handheld application known as the Digital Guide, we will explore the implications of treating an entire country as a single museum to be explored whenever and however the visitor chooses. We will demonstrate aspects of Eternal Egypt that illustrate the overriding design point of multimodal storytelling, bringing cultural heritage to the widest audience in the most flexible way possible.

Keywords: modular, pervasive, multimodal, multichannel, virtual museum, narrative, storytelling, personalization, digital guide

Zusammenfassung

Austellungsdesigner wissen es seit längerem: Eine modular aufgebaute Erzählung (Story) ist eine ideale Präsentationsform um einzelne Objekte eines Museums in einen gemeinsamen Kontext zu bringen und dem Besucher so einen besseren Einblick in die Ausstellungsthematik zu geben. Genauso können virtuelle Ausstellungen, z. B. auf einer Website, von einem modularen erzählerischen Ansatz profitieren. Die hier eingesetzten Technologien können allerdings sowohl Problem als auch Lösung sein: Datenbanken und digitale Archive sind mächtige, unentbehrliche Werkzeuge, aber ihre Macht kann die Art und Weise wie Besucher und Benutzer die Daten aufnehmen unbeabsichtigt beeinflussen. Die Aufbereitung der kulturellen Daten – weg von einem rein archivierenden Ansatz, hin zu einer echten

Benutzer/Besucher-Erfahrung – erfordert einen konzeptionellen Quantensprung und technische Innovation.
Dieser Beitrag beschreibt eine mögliche Lösung des Problems am Beispiel des Projekts Eternal Egypt. Besonders hervorgehoben wird, wie die Content-Strategie von Eternal Egypt versucht die sehr unterschiedlichen Definitionen von ägyptischer Kultur der Auftraggeber und Interessenvertreter zusammen zu fassen und wie dies direkt zu einem Erzählungsbasierten Content Management System geführt hat. Darüber hinaus wird anhand von verschiedenen Komponenten des Projektes, besonders anhand einer Applikation für tragbare Minicomputer (PDAs), dem „Digital Guide“, beleuchtet, wie ein ganzes Land zu einem Museum werden kann, welches die Besucher erforschen können wann immer sie wollen. Wir werden auf jene Aspekte von Eternal Egypt eingehen, die das wichtigste Gestaltungsmerkmal von Eternal Egypt veranschaulichen, die multi-modale Erzählweise. Diese erlaubt es kulturelle Geschichte einem breiten Publikum möglichst flexibel nahe zu bringen.

Schlüsselwörter: modular, durchdringend, multimodal, Multikanal, virtuelles Museum, Personalisierung, digitale Führer, Content Management, Storytelling.

Résumé

Les concepteurs d’expositions de musée savent depuis longtemps que de proposer des récits modulaires reliant les diverses collections entre elles permet de rendre la visite bien plus enrichissante que toute autre technique organisationnelle. Les expériences virtuelles relatives au patrimoine culturel bénéficient également d’une approche narrative modulaire, et ce bien que cette voie puisse être entravée par ces mêmes technologies qui la rendent possible. Les bases de données et les archives numériques sont des outils à la fois puissants et indispensables, cependant leur potentiel peut, souvent, et de manière involontaire, influer la façon dont les visiteurs et les utilisateurs se heurtent aux diverses données. Le défi consistant à passer d’une notion archivistique des données culturelles à un concept qui privilégie l’expérience de ces données nécessite un véritable saut conceptuel, et des innovations techniques non négligeables.
Cette communication offre une solution possible à ce défi comme en atteste le projet Egypte Eternelle. Nous expliquons précisément de quelle manière la stratégie éditoriale d’Egypte Eternelle a tenté de synthétiser les définitions de la culture égyptienne fournies par les divers intervenants et de démontrer comment cela a mené à la mise en place d’un système de gestion

du contenu basé sur le récit. De plus, en utilisant plusieurs composants d'Egypte Eternelle, en particulier l'application portative connue sous le nom de Guide Electronique, nous envisagerons les conséquences qu'implique le fait de traiter un pays entier en tant que musée unique pouvant être fréquenté quand et comme le souhaitent les visiteurs. Nous démontrerons aussi certains aspects d'Egypte Eternelle qui illustrent le principal point de conception des récits multimodaux, mettant de la sorte le patrimoine culturel à la portée du plus grand nombre d'individus de la manière la plus flexible qui soit.

Mots clés: Récit modulaire, Omniprésence, Multimodalité, Multivoie, Musée virtuel, Narration, Contes, Personnalisation, Guide électronique portatif

I. Challenges in Enabling the Virtual Visitor Experience

In *The Museum in Transition*, Hilde S. Hein (2000) charts the forces that have transformed museums from places where objects are put "on view" to places that focus on the enablement of a visitor's experience of objects. She notes that the museum's goal still encompasses "assembling collectibles" but that the collection is now only a means to the end of fostering a positive visitor experience. This way of framing the purpose of a museum – no longer as a repository of objects but rather as a platform for the staging of an experience as the visitor interacts with the collection – parallels the ways in which cultural heritage computing has evolved from the assembly of basic collection information to the development of complex applications intended to make the data more interactive, malleable, and adaptive to the needs of the visitor. Put another way, technological advances in the cultural heritage space seem to be following (indeed, embodying) larger trends in the field. For example, the introduction of virtualized and portable information sources into the physical museum space is emblematic of the overall evolution of the cultural space into a locus of interaction where visitors in part construct their own experience. To be sure, the degree of interaction afforded by these information sources varies widely and serves a spectrum of visitor needs. Figure 1 plots various types of enhancements to the museum visitor experience based on the degree of interactivity/functionality and the information density/variety. Depending on information density needs and the desired degree of interactivity, various solutions exist to deliver a successful visitor experience.

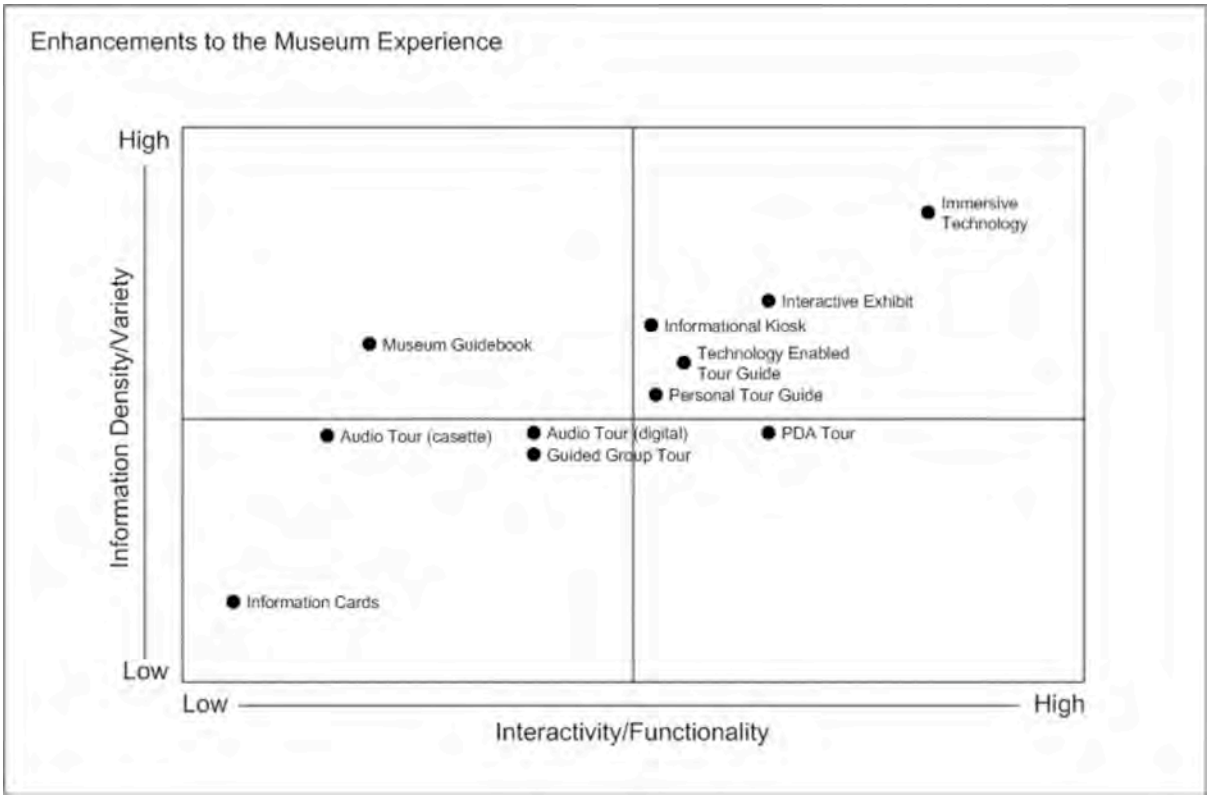

Figure 1: Scatter chart of various enhancements to the museum visitor experience

1. Frameworks for the Visitor Experience

Yet, setting the stage for a visitor's experience is a tricky task. Databases and digital archives are powerful, indispensable tools, but often they constrain the way the data is encountered by visitors and users. For example, museums frequently create data models based on curatorial departments which, though logical from an internal perspective, are often not easily understandable for the average museum-goer. For example, the Hermitage Museum web site (www.hermitagemuseum.org) organizes its digital collection first by collection and then by type. While this method does enable members of the general museum-going to drill down into a large number of stunning works of art, their only option is to jump from record to record. Another approach is when an institution's organizational hierarchy or physical layout, rather than the architecture of the database, is the organizing principle of the visitor's online experience. In these cases the online visitor experience is a by-product of a mental model for a different, offline experience. For example, Atlas – the French database of the Louvre Museum web site (www.louvre.fr) – primarily organizes works of art by room and by department, though this is supplemented by a very robust search capability. This approach assumes that the user is familiar with either the physical layout or the organizational structure of the museum.

2. Interaction Models and Sensory Overload

Overlapping the framework of one experience with another can also have positive effects; the virtual and physical experiences of cultural heritage can strengthen and enhance one another. Over the past few years, several museums have introduced handheld computing devices to augment the visitor experience of touring the museum. Peter Samis, an associate curator at the San Francisco Museum of Modern Art notes, "It's an opportunity to give visitors information they need in a compelling manner, just in time, right in the palm of their hand." (Kwan).

Using the example of a handheld computing device, we see that augmenting the visitor experience with technology presents considerable challenges to those institutions attempting to create a holistic visitor experience. Cultural heritage sites such as museums, archaeological parks, and historical locations, are naturally sensory-rich environments. Even in the absence of overt technology, visitors often complain of "museum overload", a fatigue caused by a surfeit of sensory input. If not well-planned, the introduction of technology into a cultural space can easily add to the cognitive din of the exhibits, signage, wayfinding, other museum-goers, purchasing opportunities, and personal needs that all compete for one's attention. When a cultural institution chooses to intersect the virtual and the real it must thus strike a balance between seeming opposites: the virtual experience must be compelling and seamless enough to sustain the visitor's interest, but it must also support interruption by and subordination to the other modes of input around the physical space of the museum. A balanced approach strives to engage the visitor but does not add to the visitor's cognitive overhead, enables a non-linear experience, and provides an integration with real world needs.

Focusing on the virtual cultural heritage experience, one notes recurrent problems in design or execution. For example, cultural heritage projects demonstrate the perennial computer design problem of building an interface that neither competes with the content it presents nor impedes the usability of the application. The complexity of the rich media (high-resolution images, animations, video, audio, etc.) that typifies a virtual cultural heritage experience requires an extremely simple interaction model not only because the content deserves the bulk of the visitor's attention but also because issues of accessibility are more acute with rich, multi-sensory media. Full accessibility can present a problem as an institution strives to balance a rich multimedia experience with technical limitations. Moreover, the "invisibility" of the interface – that is, the degree to which the functional elements of the interface do or do

not demand more attention of the user than the content area – is of paramount concern when presenting aesthetically beautiful cultural heritage artifacts. These interface design challenges are formidable and require close attention to address constraints and to produce a positive and effective visitor experience.

3. The Challenge of Content and Culture

Technological projects such as these tend to focus on technical implementation. Of equal, if not greater importance is the development and presentation of content. Because of the ways in which issues of culture and language can affect a visitor's subjective response to *any* experience, the challenges that they present in an explicitly cultural exhibit can be especially complex. The content needs not only to be engaging but also understandable to the visitors.
A further challenge to the goal of creating compelling content is the reality that large-scale online cultural heritage projects often require large, diverse teams of contributors.
This multi-author environment requires that the content be edited and synthesized into a single "voice" with standardized nomenclature (a "controlled vocabulary"), then translated into the languages selected for the target audiences, all the while maintaining the quality, varying perspectives, and accuracy of the original.

Toughest of all is the challenge presented by the goal of creating content for a global audience. In technically complex projects such as these, the task of creating content in multiple languages is often underestimated. For example, in addition to the translation resources required, the content development workflow (and supporting management applications) must be synchronized so that all languages are treated equally. Additionally, interface text, graphics, online help, and supporting documentation must be created and translated. Certain languages of course impose extra challenges in presentation such as right-to-left or top-to-bottom directionality, multiple alphabets, and non-standard orthography. Even more intractable are cultural issues relating to the design of the visitor experience itself. For example, the act of providing the exhibit with a universal brand identity – an inevitable if not always deliberate activity when designing any experience – can often seem at odds with the timeless, non-commercial content under development. Indeed, the means of presenting cultural heritage itself can be at odds with the culture in which the presentation takes place. Examples of this include politically charged or religiously significant content or technologies of presentation that offend the sensibility of local audiences. All these factors make imperative the task of testing the virtual exhibit across all the constituent target cultures.

Testing too presents problems, for finding the resources and time to test multiple applications and diverse content across countries or peoples can easily overwhelm the capabilities of the development team.

In describing the evolution from expository to experiential exhibition design, Hein (2000) notes that the experience "might be triggered by a multitude of devices, not all of which are real, or genuine, or material." This is certainly true and easily verified from the pervasiveness (in full production or pilot form) of audio tours, personal digital assistants, media displays and projection, "hands-on" exhibits, and even first-person role playing in cultural institutions today. Yet, it is not enough to merely web-enable a collection management system or to enhance the in-museum experience with technology. Neither alone yields the desired result of transcending cultural documentation by creating an engaging visitor experience of that culture. While technology certainly plays a major role, the total user experience is the holistic amalgam of *all* the factors – some easily quantifiable, some not – that produce a human response to a given cultural heritage. No doubt there are many solutions to the aforementioned challenges, but it is to a particular case study of one way to which we now turn.

II. The Eternal Egypt Project

In late 2000 IBM had recently completed its work with the Hermitage Museum in St. Petersburg, Russia and on the virtual reconstruction of Michelangelo's Florence Pietà project. It was at this time that Dr. Ahmed Tantawy, Director of the IBM Cairo Technology Development Center, and Dr. Fathi Saleh, Director of the Egyptian Center for the Documentation of Cultural and Natural Heritage (CultNat), began discussing the possibility of a partnership between IBM and the Egyptian government on a large-scale cultural computing project. Together with the Egyptian Supreme Council of Antiquities and with the help of a $2.5 million grant of technology and expertise from IBM, the project team embarked on a quest to use innovative technologies and services to create an interactive, multimedia experience of Egyptian cultural artifacts, places and history for a global audience. Three years in development, the Eternal Egypt Project is the fruit of this collaboration, bringing to light over five thousand years of Egyptian civilization.

While documenting the entirety of Egyptian cultural heritage was a formidable challenge, the Eternal Egypt Project aimed to go one step further: from documentation to experience. The following six core principles were crucial in establishing and refining the visitor experience.

1. A Country as a Single Museum

Rather than document the collection of a single museum or cultural institution, the Eternal Egypt Project aimed to transcend the boundaries of museum walls and document all of Egyptian culture. In their paper "Information Resources on Cultural Heritage: Some Problems on Integration," Nadezhda Brakker and Leonid Kujbyshev (1999) assert that because an artifact's physical storage location (whether in a library, museum, or archive) is irrelevant to the user, we should not subject the user to this artificial classification scheme. For example, a user trying to find information about the Throne of Tutankhamun, or a Mosque Lamp of Sultan Hassan, should not have to know where that artifact is physically located. Expanding on this idea, related contextual data such as information about the original owner or information about the place where the artifact was discovered should be readily available.

Because the data from the various museums and archaeological sites is so interrelated, an approach evolved to treat the country of Egypt as a single virtual museum. Its virtual walls could thus include both tangible items such as artifacts from the collections of dozens of museums as well as information about historical characters, locations, and events. The idea was to enable visitors to experience traditionally disparate content holistically rather than sorting through database entries.

2. The Adaptive Experience

One of the primary goals of the Eternal Egypt Project was to provide worldwide access to Egypt's cultural heritage. Early in the project, it was agreed that all aspects of the project would be provided in three languages – English, French, and Arabic – but making the site multilingual was just the beginning. The content had to be delivered in such a way that it adapted to meet the varying needs of the visitors. The experience had to be consistent – whether accessing the web site using a traditional computer, visiting a museum, or taking a cell-phone based tour of popular location – yet scaleable enough to meet the unique needs of each interaction.

For example, a visitor accessing the site over a broadband connection has different needs than a visitor using an Internet-capable mobile phone to take a tour at the Giza Plateau. Rather than design for the lowest common denominator, the Eternal Egypt Project strategy sought to accommodate the lowest common denominator, by adapting to provide a richer experience as needed and/or requested. Figure 2 plots the various versions of Eternal Egypt and specific functionality of each based on the degree of interactivity/functionality and the information density/variety. Depending on information density needs and the desired degree of interactivity, the experience flexes to deliver a successful visitor experience.

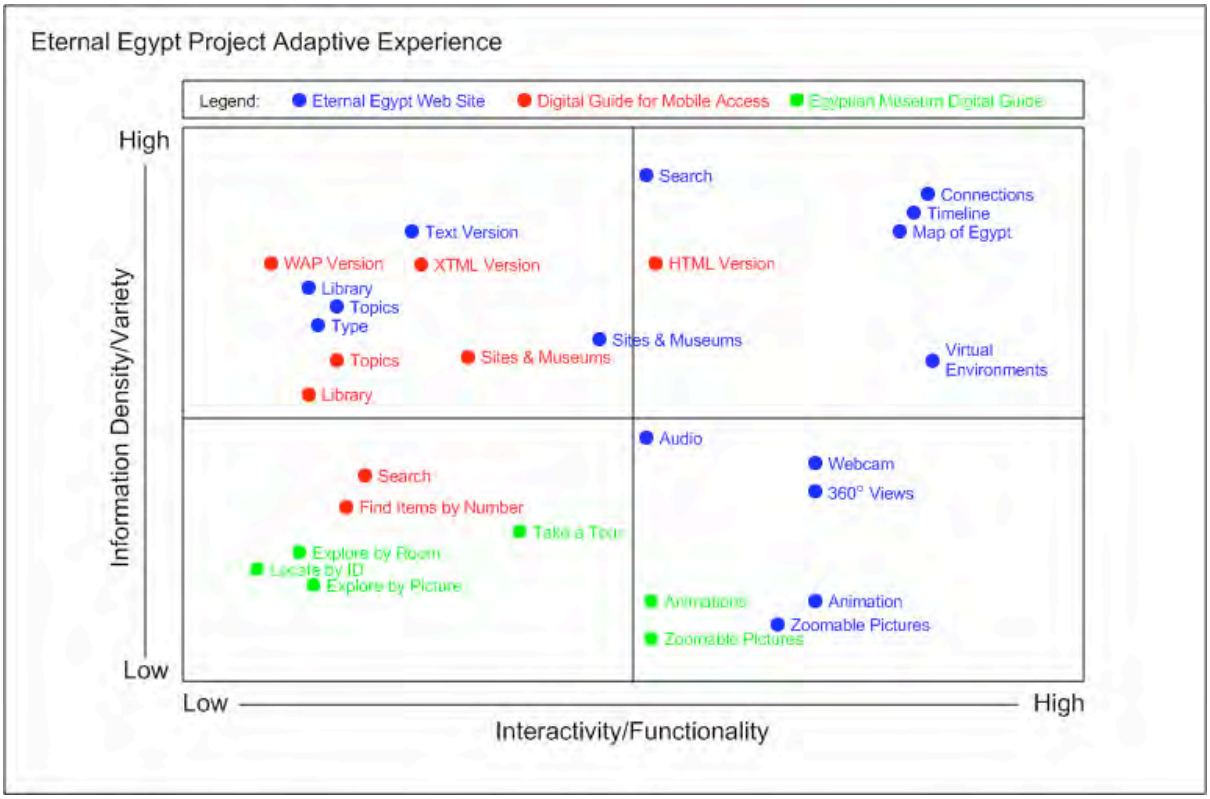

Figure 2: Scatter chart of the adaptive experience of Eternal Egypt

As noted in Figure 2, the Eternal Egypt experience is not limited to the web site eternalegypt.org. The Digital Guide is a handheld device that is available at the Egyptian Museum and features content from the Eternal Egypt Project that is relevant to the artifacts at that location. Similarly, the Digital Guide for Mobile Access (dg.eternalegypt.org) is an alternate version of the Eternal Egypt web site that has been streamlined to provide mobile users with access to tours and other relevant information. This multichannel approach illustrates how the experience adapts to meet visitors' needs.

3. The Narrative User Experience

In formulating a strategy for bringing such a wide variety of material to a global audience, storytelling emerged as a solution to a variety of problems. We knew from anecdotal and observational evidence with prior projects that people naturally assimilate stories more readily than discrete, undifferentiated chunks of data. Stories entertain, compel, and involve visitors. Moreover, it is human nature to construct a story from the barest of raw materials. That is, we read stories *into* content that is presented as a whole. Mark Bernstein (2001) calls this personal story-making a "primitive urge." Storytelling, a form of personalization, is one of the strongest methods of organizing online resources: narrative enables macroscopic (and sometimes abstract) themes to be brought down to the level of the individual. Bernstein's exhortation thus provided a conceptual underpinning for the design of the site from the very beginning: "The point is not that we should *add* stories to our sites to ensnare narrative-starved readers. The point is that the reader's journey through our site is *a narrative experience*. Our job is to make the narrative satisfying."

Thus storytelling offered a convenient human-centered organizational structure for the site's vast content and for the technical development of the content management system, an application that became a kind of story-making machine. But creating content that suited this structure and this tool proved more difficult to effect than we had envisioned. This was primarily due to the realization that starting with broad topics and making them progressively more specific until ultimately they are illustrated with representative media was, in reality, not always possible. Often the ease or difficulty in obtaining the permission to scan an element or in creating descriptive text for it was the determining factor in adding it to the project, irrespective of where it might fit in an overall narrative thread. So, often elements begat the stories, rather than the other way. Even so, despite not encompassing every one of the several thousand elements, stories and groupings of story modules form a strong backbone to the site experience, providing the inter-connective tissue between artifacts, people, and places and paralleling the focus that museum exhibit developers nowadays place on designing exhibits as end-to-end experiences with real dramatic arc.

Storytelling served as a vehicle for more than just the visitor experience. In designing the overall project framework we created fictionalized scenarios informed by knowledge of user behavior, best practices, prior project lessons learned, and stakeholder requirements. These scenarios were useful tools for explaining and discussing the project's broad concepts and

technologies with team members from various disciplines (and levels of technical sophistication) around the world. As the scenarios became more specific we were able to visualize them using rudimentary animation and storyboarding (Figure 3), eventually linking them into very early-stage functional templates. While none of the scenarios exactly matches the user experience that came to be in the final design, the ability to begin the discussions of functionality and usage with easy-to-understand human stories was indispensable.

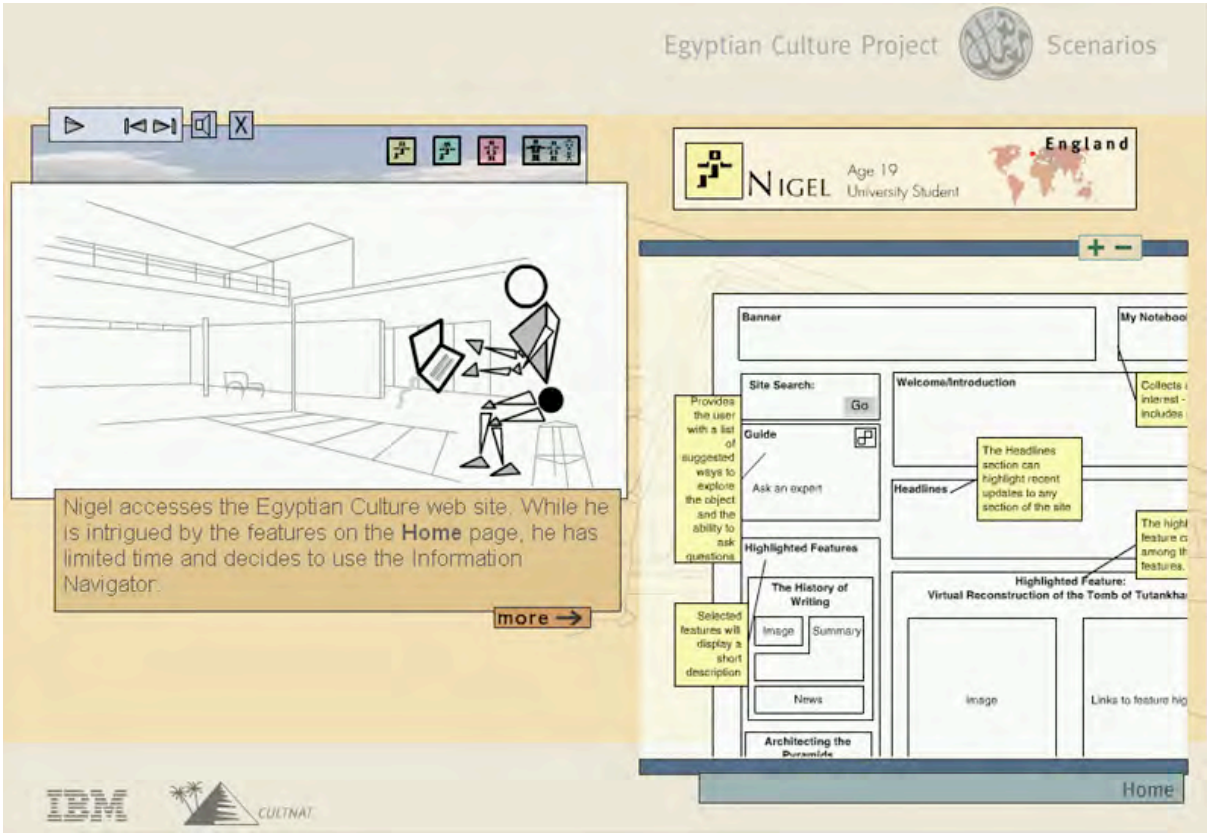

Figure 3: Early usage scenario visualization tool

4. Content Strategy

The task of documenting the entirety of Egyptian culture is almost too large to grasp. In order to adequately represent all aspects of Egyptian culture, it was determined that the content for Eternal Egypt would be roughly 60% Pharaonic, 20% Greco-Roman, 10% Coptic, and 10% Islamic. Another challenge was that all content for the Eternal Egypt Project would be created, rather than repurposed from existing data. It was immediately clear that this monumental task required dozens of cultural experts, curators, photographers, writers, editors, translators, and data entry personnel. But where do you begin with a culture that spans over five millennia?

Because the Eternal Egypt Project involved many channels (web site, Egyptian Museum Digital Guide, and the Digital Guide for Mobile Access), the first step was to create a modular content strategy. Creating the content in smaller, manageable pieces facilitated content creation and allowed the content to be assembled in multiple ways to meet the needs of different channels (including an audio channel generated automatically using text-to-speech synthesis technology). Figure 4 shows the building blocks used in the modular content strategy.

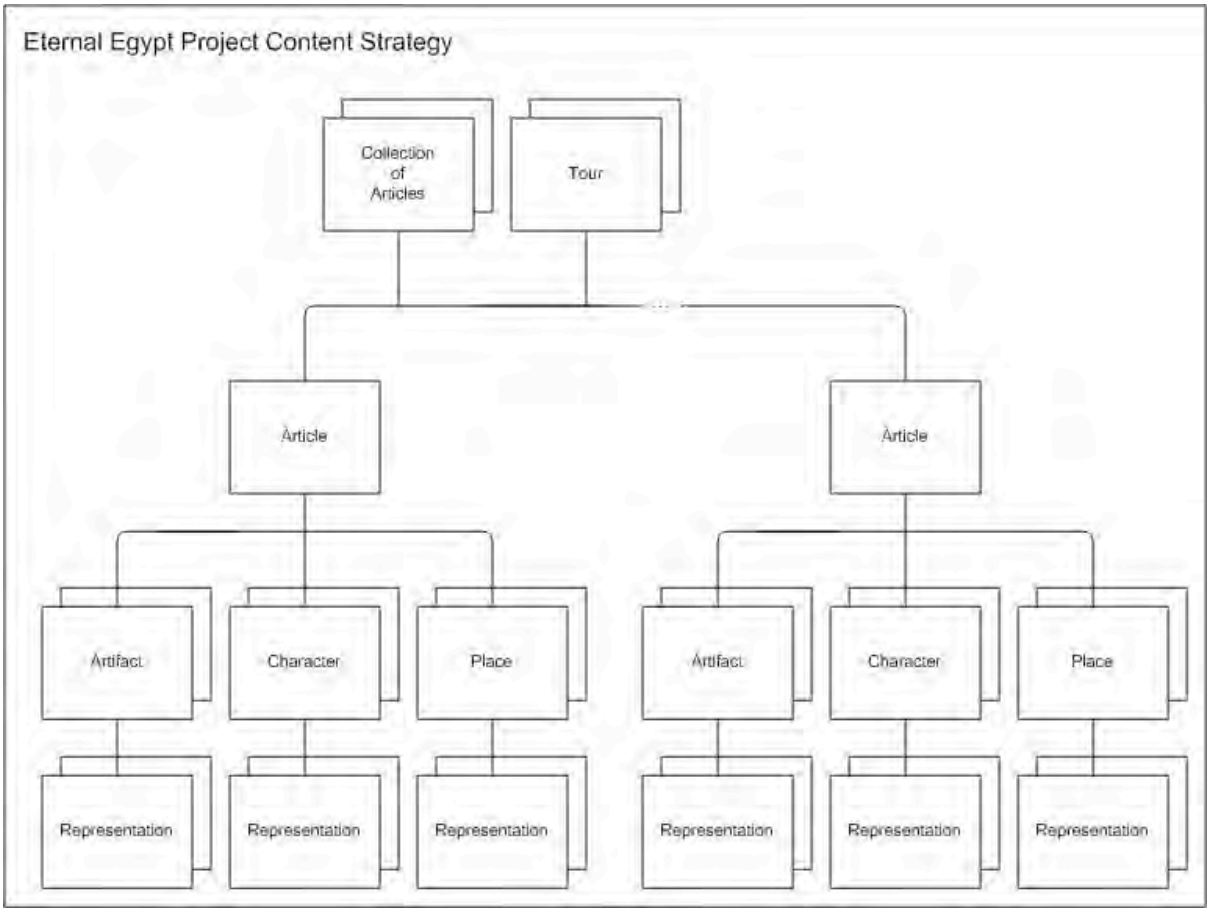

Figure 4: Modular content strategy created for Eternal Egypt

- A collection of articles is simply a group of articles linked together to create a story. This structure is also used for tours on the Digital Guide for Mobile Access, or the Egyptian Museum Digital Guide. Approximately 30 collections of articles and tours were created for the launch of the Eternal Egypt Project.
- An article is a succinct, focused story about a single topic. Articles can contain elements, make sense when read independently, and can be grouped together into collections of articles. Approximately 225 articles were created for the launch of the Eternal Egypt Project.

- Elements are the smallest unit of content and can be artifacts, characters, or places. All elements have a short and long description that documents not only the physical characteristics of the element, but also explains the element's purpose and describes what makes the element unique and interesting. Approximately 2,000 elements were created for the launch of the Eternal Egypt Project.

  In addition to the description, numerous attributes were documented for each element. These attributes allow programmatic relationships to be derived from the data, which makes possible features such as Connections, the Map of Egypt, and the Timeline. In addition to these system-generated relationships, the data model supported manual relationships, for example, to specify that an artifact was created for a particular character, or that a character is depicted by a particular artifact.

  The last important component of elements is the visual representations that accompany them. All elements must have at least one visual representation, but can also have many representations such as virtual environments, 3-dimensional views, 360° views, animations, webcams, and high-resolution zoomable pictures.

Once the content strategy was defined, a distributed workflow was created to ensure that content manipulated by dozens of participants maintained a consistent style, voice, and tone. Figure 5 shows the content development workflow used for the Eternal Egypt Project.

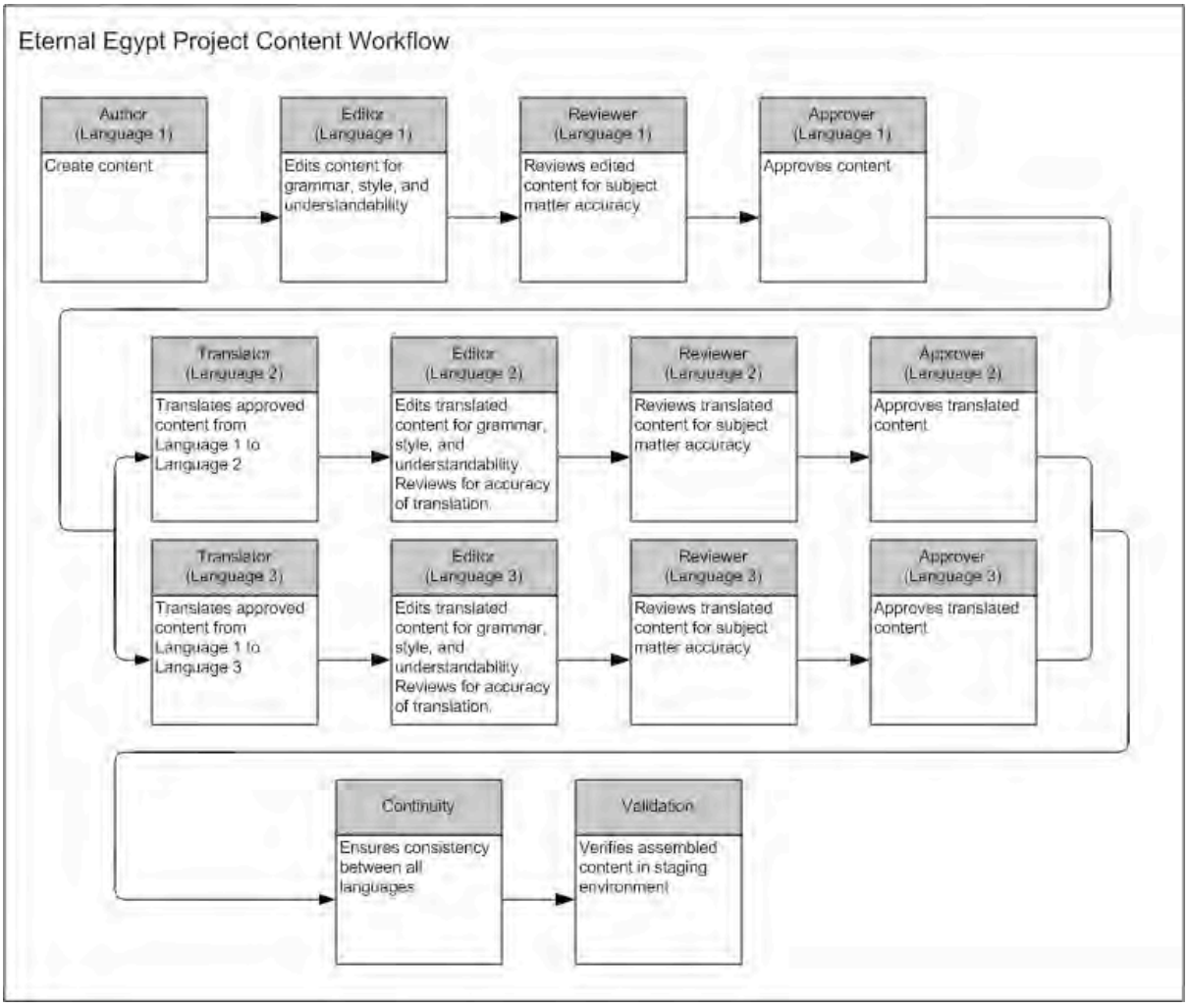

Figure 5: Eternal Egypt content development workflow for authors, editors, translators, and reviewers

The amount of textual content created for the Eternal Egypt Project is simply astounding: 1.3 million words. But while this modular content strategy made the task of documenting Egyptian culture approachable and facilitated future work, it also introduced some challenges.

- Because there were so many parties involved, it was initially difficult to reach consensus on what data would be captured and what terminology would be used. The purpose of the Eternal Egypt Project was not to replace existing museum collection databases, but rather to create a new repository for a subset of information deemed appropriate for the project. Because curators and cultural experts are used to scientifically documenting information, it was challenging to convince these experts that some existing data, while important for a collection database, was not needed in the Eternal Egypt Project. Furthermore, because Egyptian culture is a very scholarly topic, it became clear that a glossary of terms was required on the web site and that the editors would have to be vigilant about simplifying language and terminology.

- Though modularity made the task of documenting the entirety of Egyptian culture approachable and though the diversity of article content benefited from this approach, collections of articles often lacked the dramatic arc usually present in stories due to a lack of strong transitions from article to article.
- The use of text-to-speech technology was required in order to address the need to frequently update content. Without using a text-to-speech application to generate audio, any change to text would require an actor to re-record the affected sections. Because the content required so many proper names and Egyptological terms, special pronunciations had to be created in all languages. The Arabic language introduced its own unique challenges, specifically that the Arabic text-to-speech engine was under development and the first application of its kind. Furthermore, since written Arabic contains no vowels, Arabic content had to first be "vowelized" to work with the text-to-speech application. While text-to-speech provided ease of update, the amount of effort required to prepare content for this application has to be weighed against the value-add of text-to-speech audio to the experience.

5. Exploration and Discovery

The Eternal Egypt Project was faced with the challenging task of designing a taxonomy for content that spans five millennia. (A comparative survey of the main modes of exploration for major museum and cultural heritage web sites is included in the Appendix.) For museums, the most commonly used organizational scheme is based on departmental or thematic category. Cultural heritage web sites tend to emphasize geography as an organizing principle, or like larger museums with multiple branches, act as a portal to the various organizations that they oversee.

Early on in the project it became clear that a single taxonomy was problematic for a variety of reasons. Selecting a known classification scheme unintentionally favored certain time periods over others and creating a new classification scheme put the burden on the visitor to learn the new, quite arbitrary scheme. In their paper "Interface for Cultural Heritage - Cultural Dimensions of Interspaces," Kim Veltman and Heiner Benking (1998) note interface design challenges inherent in cultural heritage projects. Of particular relevance was their assertion that cultural heritage interfaces must adjust to meet the needs of a diverse visitor population, for example, different cognitive models, levels of education, and computer experience. One way of establishing a framework that avoided rigid hierarchy and was flexible enough to

support diverse visitor needs was to emphasize the interrelationships of the element data rather than a superimposed taxonomy as a path for navigation. In this scheme relationships between objects, people, places were treated as important as the elements themselves. A simple example of this framework is the ability to quickly view all elements in the database that are made of the same material as the current object under inspection. The flexibility comes from the fact that this is not a predefined pathway but rather one that is created only when two or more elements are entered that share the same attribute. Obviously controlled data vocabularies are critical to enable such interrelationships, but the benefits are considerable. "Data-as-navigation," the term employed to describe this strategy, enabled a variety of useful modes of exploration

Rather than have the visitor drill down through a hierarchy of data, the Eternal Egypt Project provides the visitor with eight ways to explore in addition to a very robust search.

- **Connections** - Connections is a visual tool that allows the visitor to explore the web of relationships among the artifacts, characters, and places that together comprise Egyptian culture. As shown in Figure 6, there are 17 possible paths from the Gold Mask of Tutankhamun. For example, we see that one of the materials is obsidian, and can explore down that path to reveal other artifacts made of that material. Connections also shows that the mask was found in the Valley of the Kings, and selecting it would reveal all artifacts found at the location.

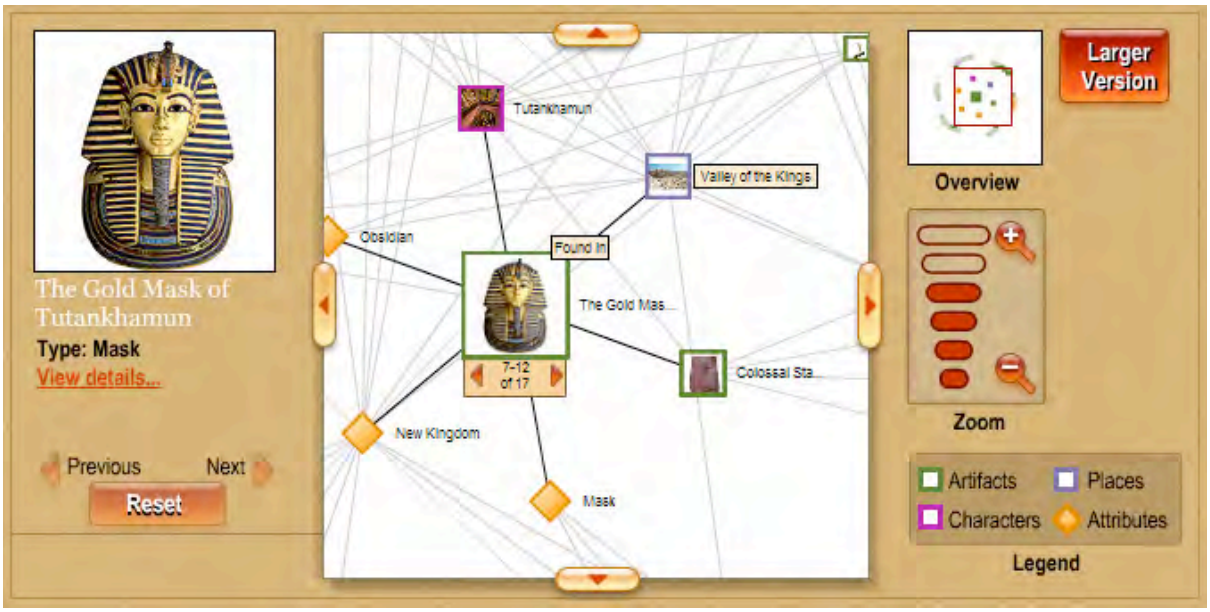

Figure 6: The Connections feature of Eternal Egypt

At any time, the visitor can click the View details link to access the element detail page.

- **Map of Egypt** - The Map of Egypt provides a way for the visitor to explore the collection geographically. The map features important locations in the country of Egypt, some of which have additional information such as the number of items from their collection included in Eternal Egypt. As shown in Figure 7, the Greco-Roman Museum is located in the Governorate of Alexandria which is in Lower Egypt.

Figure 7: The Map feature of Eternal Egypt

In addition to information about places, the map can also be used to learn about where artifacts were created, discovered, and where they are currently on display or where characters were worshipped, where rulers were born, and where they died. The visitor can click the View details link to access the element detail page.

- **Timeline** - The Timeline provides a way for the visitor to explore the content of Eternal Egypt in the context of time. For example, Figure 8 shows that the Uraeus of King Senusert the Second was created in 1991 BC. The timeline also shows that there are 28 other important associations with this year, including the construction of Karnak Temple.

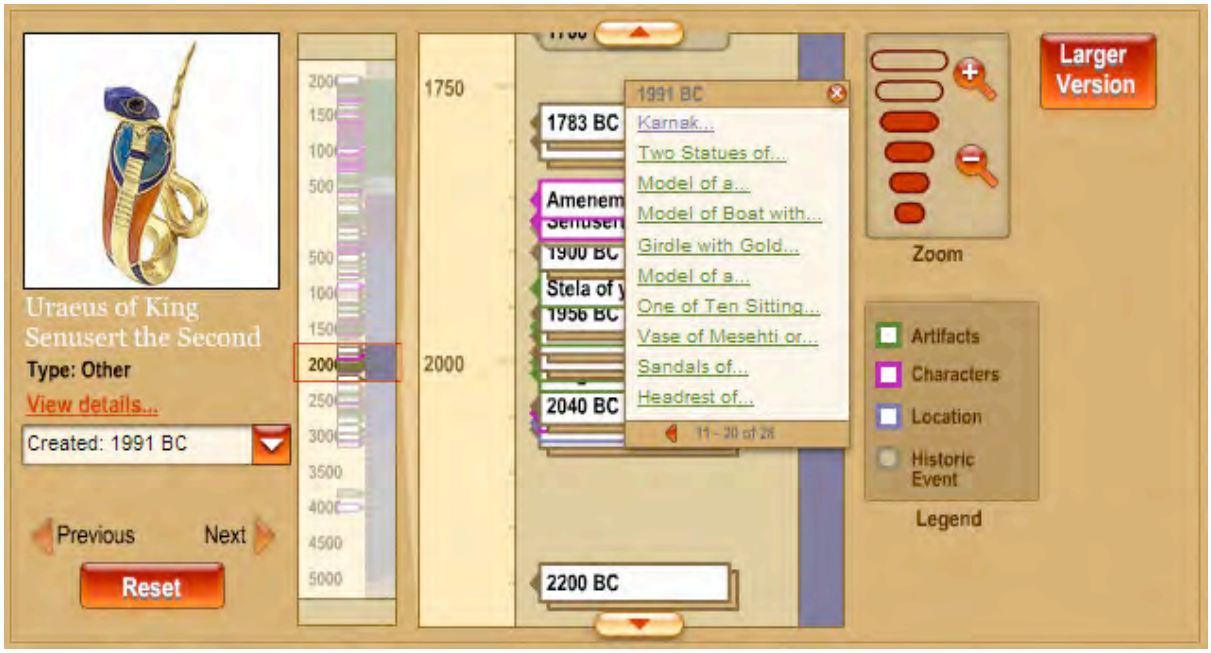

Figure 8: The Timeline feature of Eternal Egypt

At any time, the visitor can click the View details link to access the element detail page.

- **Multimedia** – The Multimedia page enables visitors to explore elements on Eternal Egypt based on the type of visual representations that accompany them. The page provides streamlined access to the virtual environments, 3-dimensional views, 360° views, animations, webcams, and zoomable pictures.
- **Library** - Rather than focus on the elements themselves, the Library groups elements into articles about Egyptian culture. Similar to Connections, the Map of Egypt, and the Timeline, the Library can be used as a way to access elements. Unlike those three modes of exploration, the Library is unique in that it starts higher in the content hierarchy, providing the visitor with a better sense of the big picture.
- **Topics** – Like the Library, Topics is another way of grouping elements in the bigger picture that is Egyptian culture. All content can be associated with one or more hierarchical topics, and each topic features a very detailed description of why that topic is important in Egyptian culture.
- **Type** – The Type page sorts the artifacts, characters, and places based on their type. For example, clicking the link for the artifact type textile displays all artifacts that are textiles, or any other type hierarchically beneath this type.

- **Sites and Museums** – The Sites and Museums page lists locations that house the majority of the artifacts on Eternal Egypt. Rather than linking to each museums web site, which is a common approach in cultural heritage sites, this page links to a description of the site or museum and a link to view all artifacts from that site or museum as contained in Eternal Egypt.

All eight modes of exploration provide a means to access element detail pages. Each element detail page reinforces this exploration by providing information from each mode of exploration in the context of the element. Figure 9 shows an element detail page for an artifact. Note the sections in the right column that both provide links to and present the data from the various modes of exploration, data-as-navigation.

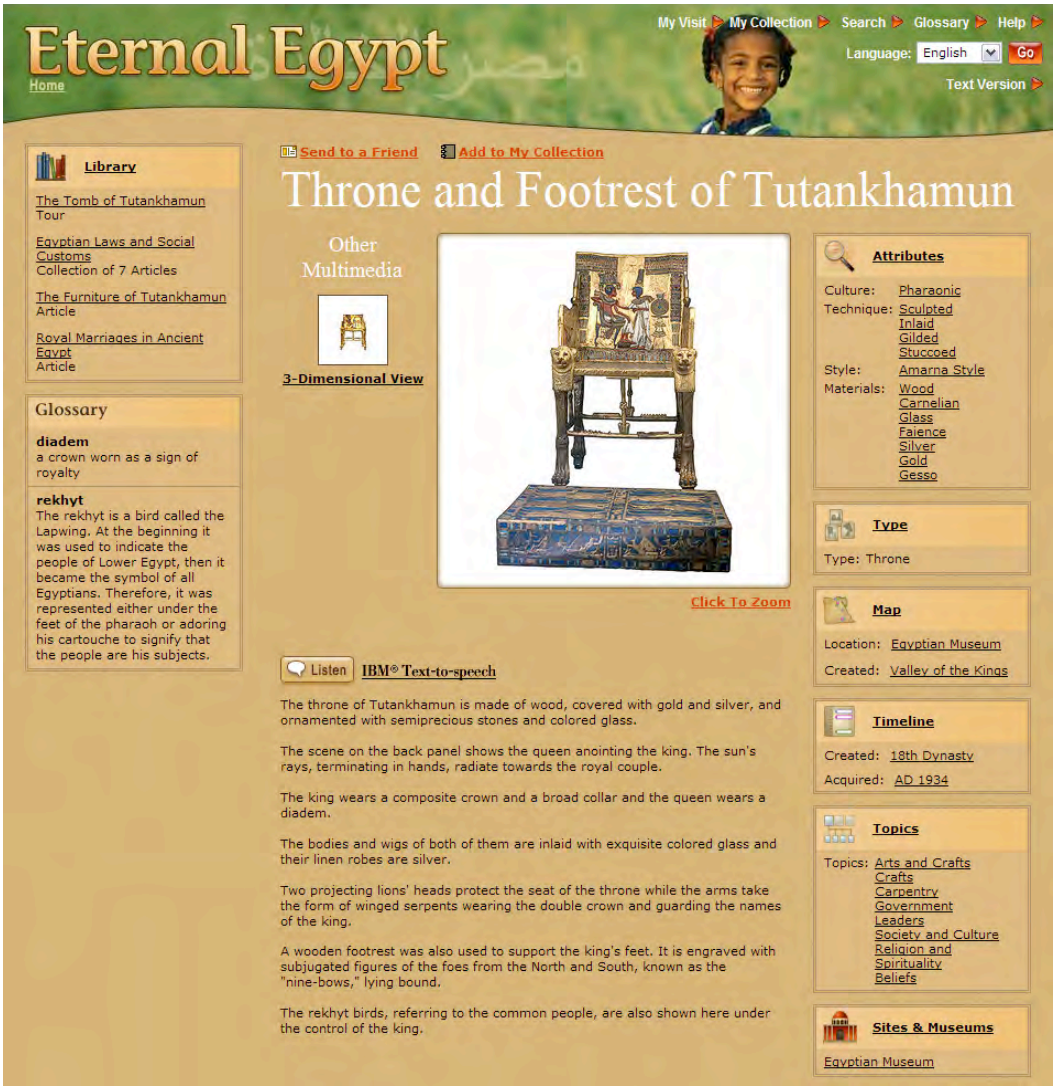

Figure 9: Element detail page for an Eternal Egypt artifact

Since different visitors have different backgrounds and mental models, these eight modes of exploration provide a flexible navigation model. They provides visitors with varying degrees of knowledge as well as varying degrees of experience with computers usable ways to navigate while also encouraging learning and exploration.

6. Global Design

Any web site can have a global audience. Designing for that audience is not necessarily "global design" but merely following established principles of good design. The Eternal Egypt Project did have some unique visual design issues. In order to avoid Egyptian stereotypes such as pyramids and camels, and to avoid an unintentional Western bias, an international network of visual designers each created their own design; the best parts of each design (Figure 10) were synthesized into the eventual look and feel. Since the content of the site spanned many time periods in Egyptian history, it was also important to avoid overuse of well-known Pharaonic imagery such as King Tutankhamun and the Sphinx. Additionally, since color can have strong cultural associations, it was important to choose palettes sensitively. Strong, vibrant colors were preferred over pastel or muted tones. Yellows, golds and greens have positive associations in Egypt as do the seasonably-variable hues of the Nile. A further challenge in developing the visual design and information architecture was the fact that the interface would have to flip horizontally to accommodate the right-to-left directionality of the Arabic language.

Figure 10: Early globally-submitted design treatments for Eternal Egypt

Early versions of the web site were tested with users in the US, France, and Egypt. This usability testing revealed, among other things, that visitors expected to see familiar images such as camels and the pyramids. Moreover, Egyptian visitors were concerned that non-Egyptians would not recognize images such as the water of the Nile as being uniquely Egyptian. The final design addressed this challenge by rotating the appearance of images deemed the most evocative of Egyptian culture: the natural heritage of Egypt – the people, animals, landscapes, and waterscapes.

III. Summary

Documentation is a critical component of cultural heritage preservation. Cataloging the attributes and historical relevance of an object is as important as documenting it visually. The Eternal Egypt project sought to extend the discipline of documentation and preservation into the realm of visitor experience, capitalizing on the rich data relationships between objects and their contextual information to permit the creation of a modular, adaptive, narrative-based visitor experience. Technology is a critical enabling tool and surely will continue to be used to establish a holistic approach to the experience of cultural heritage. Eternal Egypt serves as an example of technology working towards specific goals: meeting real visitor needs

(flexibility), attending to real visitor preferences (storytelling), and enabling real visitor goals (discovery).

Appendix

Modes of Exploration for Museum and Cultural Heritage Web Sites

			Primary Exploration Modes**							
		Available Languages	Geography	Department or Organization	Time	Theme	Type	Artist	Room or Location	Image
Museums	Art Institute of Chicago www.artic.edu	English		✓		✓				✓
	British Museum www.thebritishmuseum.ac.uk	English, French, Italian, Japanese, Spanish	✓	✓	✓					
	Fine Arts Museum (SF) www.famsf.org	English								
	Getty Museum www.getty.edu	English				✓	✓	✓		
	Guggenheim www.guggenheim.org/									
	Hermitage Museum www.hermitagemuseum.org	English, Russian		✓			✓			✓
	Louvre www.louvre.fr	English, French, Japanese, Spanish		✓					✓	
	Metropolitan Museum of Art www.metmuseum.org	English	✓	✓	✓	✓				
	Museum of Modern Art www.moma.org	English		✓						
	National Gallery (UK) www.nationalgallery.org.uk	English, French, Italian, German, Japanese, Russian, Spanish			✓	✓		✓		
	National Gallery (US) www.nga.gov	English			✓	✓				
	Smithsonian http://www.si.edu/	Arabic, Chinese, English, French, German, Japanese, Italian, Portugese, Russian, Spanish		✓		✓				
	Eternal Egypt www.eternalegypt.org	Arabic, English, French	✓		✓	✓	✓		✓	✓
Cultural Heritage	Canadian Culture www.culturecanada.gc.ca	English, French	✓	✓		✓				
	English Heritage www.english-heritage.org.uk	English	✓	✓						
	Hellenic Culture www.culture.gr	English, Greek	✓	✓			✓			
	Irish Culture www.heritageireland.ie	English, Gaelic, French, German, Italian, Spanish	✓	✓						✓
	Spanish Culture www.sispain.org	English, French, German, Spanish	✓		✓	✓				

** It is important to note the difference between Explore and Search because most sites feature at least a single text box search. *Search* requires that the user enter text. So to search by artist the visitor would need to enter the artist's name. *Explore* on the other hand is a more assistive search. To explore by artist the user might browse a list of artist names, for example.

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