

**NATIONAL ENDOWMENT
FOR THE HUMANITIES**

SAMPLE APPLICATION NARRATIVE



Preservation and Access Humanities Collections and Reference Resources

Institution: Walters Art Museum

I. Significance

The Walters Art Museum seeks \$350,000 from the National Endowment for the Humanities for *Parchment to Pixel: Creating a Digital Resource of Medieval Manuscripts*, a two-and-a-half-year project to digitize, catalog, and make available 105 of the extraordinary illuminated medieval manuscripts in its collection representing diverse Christian cultures—Byzantine, Greek, Armenian, Ethiopian, and Latin Western. This amounts to some 38,000 pages of ancient text and 3,500 pages full of sumptuous illumination. *Parchment to Pixel* will continue the museum’s ambitious initiative to create, preserve, and make accessible fully cataloged digital surrogates of its world-famous medieval illuminated manuscripts, an initiative that began in 2008 with an NEH grant-funded project to digitize its Islamic codices that has enjoyed successful outcomes. The resulting digital catalog and library of images will conform to internationally accepted standards (as will be articulated in this proposal), and it will be distributed to diverse audiences through scholarly and public databases worldwide under a Creative Commons 3.0 license. This unparalleled access to little-seen treasures will enable close collaborative study of the materials from locations around the world and across disciplinary boundaries, reduce wear and tear on the codices, and further aid in the fulfillment of museum’s mission to “bring art and people together.” The aim of this project is to allow access to the museum’s digital collections free of charge, mirroring in the virtual world what the Walters has already achieved in its physical presence through its commitment to free admission.

Medieval manuscripts are unique historic documents and often consummate works of art of the utmost significance to humanities research. They are the sole sources for all texts, for all music, for the vast majority of works of art, and for all narrative histories before 1456. They are the raw material for historians of the philosophy, literature, politics, and culture of the Middle Ages and early Renaissance. They are keys to the past for scholars, witnesses to history for students, and objects of beauty for those who love art. In the western hemisphere, The Walters Art Museum’s holdings of illuminated manuscripts are second in number only to the Morgan Library and Museum and are of a level of quality only matched by that institution and the smaller collection at the J. Paul Getty Museum. As they exist now, the bulk of the Walters manuscripts (barring the already digitized Islamic codices) are largely a local resource, occasionally visible in the museum’s galleries and in special exhibitions. *Parchment to Pixel* aims to transform this situation and make digital versions of these treasures global in their reach, permanently on display, easy to use, and readily adaptable to external online databases.

Collection Description

At the time of his death in 1931, the museum’s founder, Henry Walters, left to the city of Baltimore his entire collection of art, including a legendary collection of illuminated medieval manuscripts that is a major national treasure of the United States. Between 1895 and 1931, Walters collected around 730 codices. Since the museum opened in 1934, additions have been made by the Board of Trustees on the recommendation of the Curator and the Director. Today, the collection includes some 850 illuminated and illustrated manuscripts and 150 single leaves, ranging in date from the ninth to the nineteenth century and constituting one of the most significant collections of its kind in the country. The manuscripts are widely consulted by scholars and frequently travel on loan to exhibitions throughout the world. All of these works of art have been individually selected for the collection. *Parchment to Pixel* proposes to digitize the Walters’ holdings of Armenian, Byzantine, Ethiopian, Dutch, English, and Central European manuscripts. Highlights from this selection are illustrated in Appendix 1.

Armenian Manuscripts

The collection of Armenian manuscripts at the Walters Art Museum is distinguished by its concentration of illuminated Gospel Books of particular historic value. The 11 Armenian manuscripts assembled by Henry Walters compare in importance to those housed in such internationally acclaimed repositories as the Mashtots Institute of Ancient Manuscripts in Yerevan and the Mekhitarist monastery of San Lazzaro in Venice. Through the choice holdings at

the Walters, ranging in date from the tenth to the seventeenth century, the history of the Armenians, both in their homeland and in Diaspora, is narrated as the highpoints of Armenian manuscript art unfold. The earliest Armenian manuscript at the Walters, dated 966 AD (MS W.537), is the second-oldest Armenian illuminated Gospel Book and is recognized as the most important example in North America. Another highly significant manuscript in the collection is dated 1262 and signed by the celebrated Armenian painter T'oros Roslin (MS W.539). This codex offers the most richly illustrated and iconographical folios of Roslin's oeuvre. Comparable to Byzantine and Western compositions, Roslin's paintings exemplify intersections between Armenian art and other visual traditions. Henry Walters also assembled later Gospel Books and Hymnals produced by Armenian communities living under Georgian and Islamic rule. These include a fifteenth-century illuminated Gospels (MS W.543) from the Lake Van region, which is considered to be the masterpiece of the illuminator Khachatur of Khizan, as well as seventeenth-century manuscripts attesting to the reconfiguration of western iconography as found in the European printed book. The Walters has maintained a commitment to preserving and publishing its choice collection of Armenian codices. Sirarpie Der Nersessian (1896-1989), renowned specialist of Armenian art, was later commissioned to produce the indispensable but now out-of-print catalog *Armenian Manuscripts in the Walters Art Gallery* (Baltimore, 1973). Then, in 1994, the Walters served as the second venue for and major lender to the acclaimed exhibition *Treasures in Heaven: Armenian Illuminated Manuscripts*, funded in part by the National Endowment for the Humanities.

Byzantine Manuscripts

Like no other collection in North America, the holdings of the Walters present a survey of virtually the entire history of Byzantine and post-Byzantine miniature painting in 18 codices. A series of illustrated Gospel Books and lectionaries ranging in date from the tenth to the sixteenth century allows for comparing evangelist portraits painted in widely different period styles. Four Walters Greek volumes contain extensive and sometime unique illustration cycles. In terms of its decoration, the fifteenth-century Book of Hours MS W.534 (still very little known, even among specialists) is one-of-a-kind. Its miniatures are an extremely interesting example of Gothic painting on Byzantine soil. The eleventh-century Imperial Menologion (MS W.521) was made personally for Emperor Michael V and is certainly the most important Byzantine illuminated manuscript in the United States. Equally famous, but as yet unpublished in full, are the marginal illustrations of the fourteenth-century Psalter MS W.733. The late sixteenth-century miniatures of the Gospel lectionary MS W.535 have also not been published in full. Although written in Greek, this book was illustrated in Moscow and is exceptionally important for the history of Russian painting and religious iconography. The Walters' Greek manuscripts are also of considerable interest to paleographers, since they display a large variety of calligraphic Greek handwriting. Most of them contain New Testament texts and thus form witnesses to the textual history of Greek Scripture.

Ethiopian Manuscripts

The Walters boasts the largest collection of Ethiopian art outside of Addis Ababa, and illuminated manuscripts make up a small but important part of the collection. These eight manuscripts, five scrolls, and three leaves represent an excellent overview of the artistic traditions of the Christian faith in Ethiopia from the Middle Ages through the nineteenth century. The holdings include MS W.836, a fourteenth-century Gospel Book from the monastic scriptorium at Tegray; decorated canon tables and a sequence of three prefatory miniatures accompany the text and can be linked stylistically to other books produced at the same scriptorium. MS W.850, a mid-sixteenth-century Gospel Book made at the important monastic center of Gunda Gunda, is in a nearly perfect state of preservation and features four evangelist portraits, seven full-page narrative miniatures, and ornamental designs throughout the text. MS W.835, a Homiliary with stories of the Archangel

Michael, is even more richly illuminated, boasting nearly 50 full-page illuminations. This book is a pristine example of luxury book production in the seventeenth-century imperial center at Gondar, and its illuminations and their accompanying inscriptions present a fascinating view into the conception of pictorial narrative at the time. A final highlight of the collection is a late-fifteenth-century folding processional icon in the shape of a fan (Walters object 36.9), an extremely rare object of which only two other examples are known to exist, both in Ethiopia. Though not exactly a book, the icon is painted on parchment in a style very similar to that of MS W.850, and when not in use would have been folded away between wood covers like an accordion-fold book.

Dutch Manuscripts

The Golden Age of Dutch manuscript painting was comparatively short—it lasted from the late fourteenth to the early sixteenth century. It was shaped by the religious movement known as the *Devotio Moderna*, which sought a broadly based and personal brand of spirituality. This resulted in a rich vernacular literary corpus and inventive image making, some of which was of outstanding quality. The Walters' 18 illuminated Dutch manuscripts not only cover many of the diverse regional styles of Dutch manuscript production in this period but also include seminal works of literature and monuments of world art. An example of this literature is a copy of Dirc van Delf's *Tafel van den Kersten Ghelove*, or *Table of Christian Faith*, made between 1400 and 1404 for Duke Albrecht of Bavaria, Count of Holland, Zeeland, and Hainault (MS W.171). It is a much-acclaimed compendium of Christian knowledge and is considered to be one of the best prose texts in medieval Dutch. It has been called a "Cathedral in prose" and a "monument of the art of thinking and writing." The book contains 35 large historiated initials of astonishing originality in their iconography and of the very finest quality. An example of an artistic monument of the first importance is MS W.174, the Missal of Eberhard von Grieffenklau, made in Utrecht c. 1430. It was illuminated in part by the Master of Catherine of Cleves, the greatest of all Dutch artists of the fifteenth century, and, with one full-page miniature, 52 column miniatures, and 68 historiated initials, it is one of the most extensively illustrated missals surviving from the Middle Ages.

English Manuscripts

The 15 English manuscripts at the Walters span the twelfth, thirteenth, and fourteenth centuries. Several of them figure in the monumental multi-volume series that discusses the highlights of English manuscript illumination, *The Survey of Manuscripts Illuminated in the British Isles*, edited by Jonathan Alexander. They include a masterpiece of English Romanesque art, the twelfth-century Rochester New Testament (MS W.18), the companion volumes of which are in the British Library, and 27 miniatures by W. De Brailes (MS W.106), one of only two artists of the thirteenth century whose name we can associate with surviving works. These miniatures are the remains of the longest series of miniatures of biblical subjects to have ever been attached as a prefatory cycle to an illustrated Psalter. Some of these manuscripts are also of outstanding textual importance, including a copy of Henry of Huntington's *Historia Anglorum* (MS W.793), which was used for the critical edition of that text, and Giles of Rome's *On the Government of Princes* (MS W.144).

Central European Manuscripts

Henry Walters collected 30 Central European manuscripts, which illustrate the history of German, Austrian, and Bohemian manuscript illumination from the Carolingian Empire to the Reformation. They include a Carolingian Gospel Book of c.870 executed in the Rheims style (MS W.4), a glorious fragment from a Franco-Saxon Gospel Book from the mid-tenth century (MS W.751), an Ottonian Gospel Book from the Reichenau monastery of about 1060 (MS W.7), and the only example of an Ottonian treasure binding in an American collection from a Gospel

lectionary (MS W.8). Between them, they cover the major styles of continental illumination in the early medieval period. The German manuscripts are particularly noteworthy for the examples of fully finished drawing that they contain, including an illustrated Missal from the Abbey of Melk (MS W.33) from c.1200 which was recently exhibited in a landmark exhibition at the Metropolitan Museum of Art, illustrated copies of such seminal medieval texts as Honorius of Autun's *Commentary on the Song of Songs* (MS W.29), and Gilbert of Auxerre's *Commentary on the Lamentations of Jeremiah* (MS W.30). Later manuscripts in the collection include splendid illuminated prayer books, reflecting the personal piety of the later Middle Ages in the hundred years before the Reformation. These include MS W.163, the Prayer Book of Leonhard von Laymingen, bishop of Passau (who is depicted 19 times in the manuscript!) and a beautiful Book of Hours made in Cologne in 1512, which illustrates, among other subjects, the Mass of St Gregory (MS W.437).

Collection Condition

The majority of the illuminated manuscripts at the Walters Art Museum are in good condition. In part this is due to the selective nature of the collection; Henry Walters and subsequent curators and trustees only accepted works of the highest standard in good condition. The manuscripts are also stored properly. The vast bulk of the collection is housed in custom-made cases, and all of the collection is stored in controlled conditions. Since 1984, at least one conservator at the museum has been dedicated full-time to the conservation of manuscripts and rare books.

The condition of the Walters' manuscripts is regularly monitored. At any given time as many as 50 manuscripts can be on view at the museum, subject to a rigorous preservation and exhibition policy. No manuscript is exhibited for more than three months at a time, no manuscript is exhibited more than once a year, and no page opening is exhibited more than once every five years. As a result of these strict rotation policies, most of the manuscripts have been on view at least once in the last 10 years. Each time a manuscript is exhibited, it is appraised by the Conservation Department, remedial work is undertaken on the book as a whole, and the ink and paint on the 20 folios in the book nearest the folio on display are consolidated if necessary.

Of the 115 manuscripts that fall into the cultures that are the subjects of the *Parchment to Pixel* project, approximately 10 have particularly serious structural problems. These will not be digitized as part of this project, but rather will be the subject of a separate conservation-centered initiative over the next several years. The remaining 105 manuscripts that will be digitized do not need extensive conservation treatment. However, in keeping with the Walters' protocols for any extremely fragile, valuable, and unique artifact that is subject to movement or possible stress, conservation monitoring and care is built into the project workflow. The conservation work in *Parchment to Pixel* will commence with a detailed condition survey of the manuscripts to be digitized and will subsequently entail the repair and stabilization of bindings as necessary, the mending of tears and losses in supports, and the consolidation of flaking text ink and miniatures with unstable media. Manuscripts will also be inspected after digitization for changes in condition. This is reflected in the budget and the workflow of the project; more details can be found in Appendix 2.

Collection Documentation

The goal of *Parchment to Pixel* is to build on the success of the digitization of the Walters' Islamic manuscripts, a project that was made possible by an NEH grant awarded in 2008 and that is already bearing fruit, making these holdings available to a worldwide audience as never before. *Parchment to Pixel* will continue this endeavor into important and frequently unpublished areas of the collection. The manuscripts at the Walters have been intensively studied since the museum opened in 1934, although not all areas of the collection have been formally cataloged. Each one of the manuscripts has an unpublished curatorial file associated with it, containing notes by visiting scholars, provenance information, exhibition

label copy, and offprints of relevant scholarly literature. The upkeep of these files is an integral part of the stewardship of the collection. The Walters has also published print catalogs of its Armenian manuscripts (Sirarpie Der Nersessian, *Armenian Manuscripts in the Walters Art Gallery*, Baltimore 1973) and Byzantine manuscripts (Georgi Parpulov, "A Catalog of the Greek Manuscripts at The Walters Art Museum," *The Journal of the Walters Art Museum* 62, 2004, pp.71-187). There are therefore many resources to draw on for the digital cataloging of the manuscripts in this project. *Parchment to Pixel's* digital catalog, however, will, once complete, contain the first comprehensive catalogs of the Walters' English, Dutch, and Central European manuscripts and will be an essential resource for scholars of medieval art and culture. Since most of the manuscripts in this project have been collected for their artistic quality, the possibility of cataloging and publishing entire manuscripts in digital format is particularly exciting.

Audiences

Through *Parchment to Pixel*, the Walters Art Museum intends to give greater access to the Armenian, Byzantine, Ethiopian, Dutch, English, and Central European manuscripts to the following audiences:

A Worldwide Public

The Walters will distribute the digital manuscript surrogates created through *Parchment to Pixels* via a number of online publication applications. These applications allow for the dissemination of unique handwritten manuscripts with exactly the same profile as a digital version of a printed book, removing the advantages of dissemination and replication that made the printed book the medium of choice over the manuscript for more than 500 years. They make the dissemination of books as easy as YouTube makes the publication of video. Digital resources can also be disseminated on Facebook, blogs, Web sites, etc. Each instance of such online publication allows the user to download a readily usable version of the manuscript, such as a PDF, which can be saved and viewed on the desktop, even offline, at the user's discretion. That same PDF can then be attached to an e-mail or saved to a CD or thumb drive and disseminated further. Through the use of appropriate metadata, the Walters will ensure that its digital manuscripts contain enough information about their source to allow readers to learn more, contact the museum, etc. This has already been accomplished with some digitized Islamic manuscripts (see <http://issuu.com/the-walters-art-museum>). One of the advantages of publishing through such portals is that entirely new audiences can be reached through the organic nature of links that such portals support. Worldwide readers of online Islamic materials are now being exposed to the Walters' Islamic manuscripts through such means. The Walters is also in the process of signing an agreement with the Library of Congress in order to partner in the World Digital Library Project (<http://wdl.org/en>). The World Digital Library has agreed to host 20 Islamic manuscripts from the Walters; in the attached letter, John Van Oudenaren, director of the project, expresses his interest in hosting many of the manuscripts to be digitized in *Parchment to Pixel*.

Museum Visitors

Until now, public access to the Walters' manuscripts has largely been in a museum context, with the primary use of the collection being in exhibitions and rotating displays in the permanent collection galleries. Since the Walters opened in 1934, illuminated codices and single leaves have been a part of the museum's offerings to the public. Their rotation instills a sense of dynamism into the permanent collection, while four thematic manuscript shows a year offer deeper insight into their history. While display of original artifacts will always be central to the Walters' mission, digital presentation can enhance the visitor's experience in ways impossible in a traditional museum setting. Through the use of computer kiosks, the Walters has already presented some folios in manuscripts in greater detail and in better light than is possible in the galleries. The experience of paging through a complete digital surrogate, as the *Parchment to Pixel* project will make possible, allows an additional level of personal engagement, restoring

some of the intimacy with which many of the manuscripts were designed to be discovered and enjoyed and enabling more detailed guided study of these books than is possible in an exhibition label.

Researchers

The creation of full digital surrogates of the Walters' manuscripts, coupled with rich catalog information, will transform the experience of scholars wishing to learn more about these invaluable documents. The goal of *Parchment to Pixel* is to provide researchers with access to high-quality reproductions of manuscripts in the collection, along with authoritative and trustworthy descriptions of those manuscripts created by leaders in the field. Before researchers travel to consult a manuscript, they will have been able to study it in depth from their desktops at high resolution and with detailed metadata. Trips to Baltimore will only be made when necessary and will be rendered more fruitful simply because the researcher will be better informed than ever before possible through conventional publications. Scholarly publication of images for non-commercial purposes of Walters manuscripts will be free of charge and will not require application to the Walters. The free and aided distribution of Walters' material on such sites as The Index of Christian Art, The World Digital Library, and Digital Scriptorium will create added value to the crucial assets hosted by other institutions and render these repositories more powerful search tools for students and scholars. *Parchment to Pixel* will create a digital resource that will open hitherto unexplored avenues of research on medieval documents, from text criticism to book history, not to mention quantitative palaeographical and codicological analysis.

Students: Professional, Graduate, and Undergraduate

The creation of digital surrogates of the illuminated manuscripts in the Walters' collection will allow for detailed and offsite study of the manuscripts as never before experienced. The Walters' Department of Manuscripts and Rare Books holds several classes annually for the University of Virginia's Rare Book School. These are one-week master-classes in which distinguished scholars use the collections as the basis for intensive courses, which have ranged in subject matter from The History of Bookbinding (taught by Jan Storm van Leuwen, retired Keeper of the Binding Collection at the Koninklijke Bibliotheek in the Hague) to The Fifteenth-Century Book in Script and Print (taught by Paul Needham, Scheide Librarian at Princeton University Library, and William Noel, Curator of Manuscripts and Rare Books at the Walters Art Museum). Several additional courses are held in conjunction with Johns Hopkins University each year, including graduate seminars in the Department of German and Romance Languages and Literatures and continuing education courses through the division of Advanced Academic Programs in the Krieger School of Arts and Sciences. In addition, the department frequently hosts class visits from universities and liberal arts colleges in the region (e.g. Georgetown University, Hood College, University of Pennsylvania, University of Pittsburgh, University of Maryland Baltimore County, and University of Maryland College Park). Reproductions that can be studied digitally will allow students to engage on a deeper level with the material, in advance of departmental visits, when viewing the manuscripts in person, and in subsequent study. Advance viewing of digitized manuscripts will also reduce wear and tear on the physical objects, since students will have a clearer idea of what aspects they should most closely observe when viewing the manuscripts firsthand.

Students: K-12

Parchment to Pixel will enable teachers to incorporate medieval texts and images in their online curriculum materials. The texts and the approximately 3,500 works of art in these manuscripts will provide source material relevant specifically to the visual arts, language arts, world language, and social studies areas of the Maryland state curriculum.

The Walters' Art Museum is an important resource for teachers in Maryland. Because it is the only major source of medieval art between Philadelphia and Richmond, the collection of objects and manuscripts is well attended for field trips and studio visits by school groups from northern Virginia to southern Pennsylvania. More than 28,000 students visit the Walters each year, and 6,000 of these students select tours that include objects from the museum's medieval collection. *Parchment to Pixel* will provide online access to the medieval manuscripts, allowing students to bring their museum visit to their work in the classroom and to use the online images and information as a point of departure for learning about the history, languages, dress, music, and religions of other cultures. Although many students come to the Walters to see actual works of art, logistical and/or economic constraints make it impossible for some to engage with the collection. School budgets have been significantly reduced throughout the state, leading to a decrease in the number of field trips. An online presence is a way of surmounting that barrier and providing all school children with access to the Walters' world-class collection.

For many years, the development of resources for schoolteachers and their students has been at the forefront of the Walters' mission. The Walters' Teacher Advisory Council was established to explore and implement links between the school curriculum and the Walters' holdings. The results of this partnership are most readily manifest in the online resource *Integrating the Arts*, an interdisciplinary educational Web site designed specifically for use by K-12 students and teachers (<http://thewalters.org/teachers/resources/multimedia.aspx>). The Walters offers teacher-training workshops throughout the year to guide interdisciplinary teachers through the Web site and teach them how to use it to write arts integration lesson plans using the Walters' resources. The workshops have been instrumental in encouraging teachers to incorporate the site's information and lesson plans into their specific curriculum. The Walters Art Museum's digital manuscripts will be used in these workshops and presented to teachers as a trustworthy source for primary material to employ in their teaching.

II. History, Scope, and Duration

History

The Walters Art Museum is fully committed to leveraging modern technology to fulfill its mission to bring art and people together for enjoyment, discovery, and learning. Technology is changing the museum's interaction with the public and its stewardship of the permanent collection on many fronts. In support of this goal, the museum as a whole has converted from an Argus Management System to The Museum System (TMS) for the care, organization, and cataloging of art objects in the collection. This collection management database presently houses extensive data for 33,000 works of art and associated images for approximately 20 percent of the collection. A monumental, phased plan is now underway for digitizing the entire permanent collection. Over time, the Walters will make this data available through its Web site and provide free and open access to the digital collections in as many ways as possible. Phase I, completed in March 2009, marked the launch of an upgraded online collections site that displays images and data for the more than 5,000 works of art on view in the galleries. Phases II and III, currently underway, aim to both further fortify the digital asset holdings of the museum and clean up problematic data issues and cataloging gaps within the database. To achieve this goal, two full-time contract data entry assistants catalog object data, streamline database records, clean up vestiges of the Argus database conversion, and process the linkage of images to associated data. It is in the context of this initiative, fully supported by the museum leadership and Board of Trustees, that *Parchment to Pixel* takes place.

In addition, the Department of Manuscripts and Rare Books at the Walters has been at the forefront of efforts to make illuminated manuscripts available to the public. Since 1934, rotating displays of illuminated manuscripts have been a feature of the permanent installations of the museum. Since 2001, The Walters has been committed to complementary digital presentation of its material. With the reinstallation of the galleries in 2001, a manuscript technology center featuring an interactive kiosk has

been a permanent offering to museum visitors. Kiosk users can page through 10 of the greatest codices in the collection, including the Beupré Antiphonal (which visitors can also hear sung) and watch two videos—one introducing the collection and the other showing how illuminated manuscripts were made. Recognizing the demand for medieval content tied to the Maryland secondary school curriculum and the strength of this collection area, museum staff elected to devote the first module of the Walters Web site's educational resource *Integrating the Arts to the Middle Ages*. Visitors to the Web module can interact with digitized images of two medieval manuscripts and design their own manuscript pages using Walters' images as their guides.

The department has also learned much in regard to the rigors required to perform a digitization project through the conservation, digital imaging, and study of the Archimedes Palimpsest, a project directed by the Curator of Manuscripts and Rare Books, William Noel. The Archimedes Palimpsest is a much degraded parchment codex of the tenth century that has been revealed not only to be the unique source for two treatises by the ancient Greek mathematician, but also for two speeches by the Athenian orator Hyperides and for Alexander of Aphrodisias' lost commentary on Aristotle's *Categories* (<http://archimedespalimpsest.org>). The results of this project are presented free of charge and distributed to servers around the world.

The success of the Walters' model of unparalleled public access married to state-of-the-art technological achievement provides a strong philosophical and practical foundation on which the NEH-funded project to digitize the Islamic manuscripts at the Walters has been based. At the time of the submission of this grant request, the project to digitize the Walters' 128 Islamic codices and 60 single leaves is on schedule. Imaging has been completed for 40 manuscripts in nine months. Of these 40, 30 have been fully cataloged by the Project Cataloger, Dr. Adam Gacek, lecturer at the Institute of Islamic Studies at McGill University. The results of this project can be accessed through a number of portals and in a variety of ways:

1. The data generated by the project is being hosted by the Internet Systems Consortium (<http://thedigitalwalters.org>). Raw data will be hosted for open access via HTTP, FTP, and remote synchronization on server.
2. Images from Islamic manuscripts are also available to visitors to the Walters' Web site (<http://art.thewalters.org/viewgallery.aspx?id=1227>).
3. Complete digital surrogates of Islamic manuscripts are available through the online publication database ISSUU (<http://issuu.com/the-walters-art-museum>). ISSUU has a freely available online PDF publication capability.
4. Twenty Islamic manuscripts from the Walters' holdings will be available shortly on the World Digital Library (<http://wdl.org/en>).

The digital surrogates of the Walters' Islamic manuscripts have been secured as long-term persistent digital objects, and they have been made accessible in a variety of ways for diverse users. The data has been presented in its raw form on <http://thedigitalwalters.org> to be as interoperable as possible. Users have the images and metadata they need to incorporate the Islamic manuscripts in databases of their choice and to present the information as they like. The data is provided for free and published under a Creative Commons Noncommercial Attribution Share Alike license.

The Walters, therefore, has the digital presentation of its assets at the core of its strategic plan. The Department of Manuscripts and Rare Books has successfully digitized many of the illuminated folios from the Islamic manuscript collection and presented them in the galleries and through TMS and on the Web. Dynamic user interfaces have also been created for audiences of different levels. The Walters has demonstrated competence in directing advanced digital imaging projects. *Parchment to Pixel* has at its heart the aim to continue the digitizing campaign of the Walters' great manuscript holdings.

Scope

The Walters' holdings of medieval manuscripts number over 1,000 and come from all over the world. Ultimately, the long-term goal is to digitize them all. However, the Department of Manuscripts and Rare Books has prioritized this work and plans to digitize discrete areas of the collection in sequence. The Islamic codices were chosen first because they were the least known manuscripts in the collection; infrequently visited and not yet cataloged, there was also little in-house expertise to research and advocate for them. Thanks to the NEH grant of 2008, this situation is now being transformed. Now, in *Parchment to Pixel*, the department aims to digitize manuscripts from other areas, representing diverse Christian cultures: Armenian, Ethiopian, Byzantine, and Catholic. The most numerous parts of the Walters collection are the French, Flemish, and Italian illuminated manuscripts (numbering over 400). However, the published catalogs of the French and Flemish manuscripts at the Walters already provide a certain level of access to these holdings, and they are generally better known than the books that have been selected for digitization as part of this project. *Parchment to Pixel* entails the imaging of 105 medieval illuminated manuscripts, containing 19,325 folios (the equivalent of 38,650 pages). Together with complete visual documentation of bindings and flyleaves, the project is estimated to capture around 39,254 images.

Duration

Conservation for *Parchment to Pixel* will commence in July 2010 and continue through the digitization period. Imaging will commence in January 2011 and continue through December 2012. Every estimate indicates that the required work rate to complete the project on time can be achieved, based on current production rates being logged for the Islamic manuscript digitization project. Upon completion, the digital images will be available in perpetuity. The Walters will continue its policy of full digital surrogacy and the development of interfaces to make these surrogates appealing and accessible for the rest of the manuscript collection.

III. Methodology and Standards

Parchment to Pixel will build upon the digitization methodology and standards that were developed for the digitization of the Walters' Islamic manuscripts. The goal of the imaging program is to store Dublin Core identification information in the header of each image, create complete XML manuscript descriptions according to Text Encoding Initiative Public Release 5 (TEI P5) guidelines, and provide the technical metadata required to preserve and curate the digital objects in a PREMIS archive.

The project will utilize an integrated architecture with four primary components to support the production of an authoritative digital data set in a standardized format that meets the needs of libraries, institutions, and other users:

1. **Digital Imaging and Collection:** Images of the manuscripts will be digitally captured and collected in digital files with the associated Dublin Core metadata elements embedded at the time of image capture.
2. **Cataloging:** Important information about the manuscripts will be collected in a custom-built Walters Electronic Cataloging Tool (WECT), which is designed to display the digitized manuscripts and to allow the Project Catalogers to enter data in fields. The collected data can then be exported as XML files
3. **Management and Storage:** Image derivatives and associated structural, descriptive, imaging, and preservation metadata will be integrated and stored by the Walters Art Museum and by the Internet Systems Consortium at <http://thedigitalwalters.org>. Johns Hopkins University will store the image master files, associated structural, descriptive, imaging and preservation metadata include the metadata necessary to regenerate the image derivatives.
4. **Access:** Image derivatives and associated metadata will be integrated and stored through the Internet Systems Consortium at <http://thedigitalwalters.org>. From these host sites users are able

to download and exploit the data as they like within the parameters of the Creative Commons 3.0 license.

Digital Imaging and Collection

Digital imaging will be conducted with the latest generation of imaging technology, building on the processes and techniques developed during the Archimedes Palimpsest Project and refined over the past year during the Walters' digitization of its Islamic manuscripts. This system uses proven hardware and software to capture high-quality raw images, from which both archival TIFFs and a variety of access copies are created (image derivatives). The Walters has been successfully using this system to capture images from its Islamic manuscript collection since September 2008 and has trained a two-person team of Digitization Specialists to use a system specifically designed for two people, in order to achieve a combination of exceptional image quality and a high rate of productivity. The budget in this grant proposal includes expenses for software and hardware support and maintenance throughout the grant period.

Before images are captured, essential data that will accompany each image as a header is entered into the Walters Electronic Cataloging Tool, a multi-tiered web application (Ruby on Rails backed by a PostgreSQL database—see Appendix 3). This data conforms to the Dublin Core (DC) Metadata Element Set (International Standards Organization Standard Number 15836 -- ISO 15836), which describes resources with a set of core elements for effective discovery and retrieval. With the aid of the Project Cataloger, the Digitization Specialists inspect the manuscript leaf by leaf and create a record for each image of the manuscript to be taken, as well as for the manuscript as a whole. For each manuscript, Dublin Core information includes shelfmark, title, copyright information, support material, author(s), scribe(s), languages, date, genre, and keywords (mainly cultural and geographic designations).

For each folio, the folio number is given, together with any procedural notes for the imaging (resolution or special handling needs, for example). The WECT ensures the integrity and accuracy of this data and forms the basis of later cataloging information. From this data a load file is generated that populates a database in the imaging system software with the list of all images to be shot and the Dublin Core metadata. A record is therefore ready for an image before that image is even captured.

The Walters uses a Stokes Imaging system for its manuscript digitization efforts, a system that is comprised of both hardware and software components and provides the quality of image capture, care for the original artifact, and productivity rate that make this enterprise possible. Stokes Imaging systems have been used to capture more than 2 million images for the Library of Congress, the New York Public Library, the National Library of Medicine, and others. The custom-built, 33-megapixel Stokes camera captures its raw images in 48-bit RGB color (16 bits per channel) and uses a large-format camera body (4x5) and a 120mm lens for outstanding optics. Computer-controlled stepping motors that move the camera bellows for autofocus and automatically position the camera relative to the manuscript, along with computer control of the camera operation, increase productivity and free the operator to focus on the care of fragile originals.

One of the greatest strengths of this imaging system is that it uses a modified Buchanan conservation book cradle to safely position the manuscript for imaging and to provide constant support to the structure of the codex. The cradle apparatus is highly adjustable to the handling needs of each manuscript; rotation, spine width, and wedge position are all controlled by computer. Once the manuscript is in the cradle, imaging can take place from a constant focal plane, moving through the manuscript from start to finish without stressing or straining the binding. A vacuum wedge descends into the gutter of the manuscript and the folio to be photographed is carefully laid over it. Gentle vacuum pressure holds the leaf in place for the shot. All recto folios are captured during the first pass of imaging the manuscript, then all versos, allowing for a maintained rate of productivity and a minimum of handling for the manuscript. Images of

the exteriors (boards, spine, fore-edge, head, and tail) are also captured for the benefit of bookbinding scholars.

Stokes Imaging software provides complete control of the capture process, including calibration routines, settings, online controls, and focus. It also includes routines for viewing files, setting viewing parameters, generating a color matrix, analyzing resolution data, tonal correction, and image modification. The software works with an SQL database to both systematically control and record all data associated with the digitization process. One record is created in the software for each folio; this record seamlessly follows the resulting image through each stage of the imaging process: capture, color correction, verification, automation, and inspection (see Workflow section below). Utilizing the same software to control all phases of the imaging process avoids problems of information transfer between platforms and ensures data integrity as the images move along in the production process (see Appendix 4).

At the time of image capture, the Stokes software adds to the imaging record any technical metadata essential for the long-term preservation of the digital images. This technical information includes, for example, exposure time, aperture setting, image resolution, image size, number of shots per scan, color information, cropping information, capture date, inspection date, bit depth, MD5 checksum, scale, file name, and file size.

The Stokes Imaging system captures digital images in a Device Independent Bitmap (DIB) raw file (which is scaled down to an evaluation image for purposes of working within the software). From these raw images four 24-bit color image derivatives are created:

1. Archival master—TIFF file taken at 600PPI for text folios and 1200PPI for illuminated folios. (In the case of oversized manuscripts, the illuminated folios are taken at as high a resolution as possible).
2. Mid-sized TIFF—300PPI, suitable for reproducing in print publications
3. Standard all-purpose access file—1800-pixel line file JPEG
4. Thumbnail—190-pixel line file JPEG

The descriptive and technical metadata travels with and is modified for each derivative. With this accompanying information, the images can be maintained and preserved over time. Those who curate these digital objects in the future will have the information they need to test data integrity, migrate the data to new formats, and preserve knowledge of what the bitstreams represent.

Workflow

The following outlines the steps taken to image each manuscript:

1. Imaging metadata entry—The process begins with performing an initial review of the manuscript. This serves two purposes: to note any handling issues that may arise during image capture and to enter preliminary Dublin Core metadata into the Walters Electronic Cataloging Tool. The Dublin Core metadata elements created during this stage accompany each image in a digital header.
2. Image capture—Following its initial review and preliminary metadata entry, the manuscript is positioned in the cradle and photographed, controlled by Stokes Imaging software.
3. Color correction—After the capture phase is complete, each image is individually corrected for color, using daylight-balanced lighting and a calibrated LaCie monitor. The image is corrected by trained eye to match the physical object. A Macbeth color chart is used for color reference; it is included in the archival TIFF and cropped out of access copies. Deskewing and cropping also take place during this stage. Color correction is accomplished using Stokes Imaging software.
4. Verification—Once each image is color corrected, it undergoes the first of two quality-control steps mandated by the Stokes Imaging software. Images are reviewed in sequence at this time and any final adjustments to the raw images are made.

5. Automation—The Stokes Imaging system then creates the desired derivatives after the verification phase via an automated process. An MD5 checksum is created at this stage and run by the system at delivery to ensure data integrity.
6. Inspection—Upon completion of the automation stage, the final quality-control check takes place through the Stokes Imaging software. The derivatives are reviewed at this time, and any unsatisfactory images are reprocessed.

With set up, calibration, and occasional administrative duties, five to six hours per day are spent by the Digitization Specialists charged with the technical operation of the system in actual image collection. They will average 100 images per day, depending on the fragility and size of the manuscript. The two-person set-up has been extremely advantageous. While one Digitization Specialist captures images, the other performs metadata entry, color correction, or quality control. This process results in an optimum level of productivity and efficiency. Calculating 225 working days per year, the team is capable of capturing 22, 500 images per year.

Cataloging

Accurate cataloging, beyond Dublin Core identification information, is critical to effective searches and retrieval of the images and data, whether by museum visitors, manuscript scholars, or the general public. It is the information that makes the digital asset accessible by and relevant to any potential audience. A team of trained professionals familiar with cataloging standards and the manuscript collection will catalog all the manuscripts to be imaged as part of *Parchment to Pixel*.

Once a manuscript has been digitized, the JPEG derivatives are uploaded to the Walters Electronic Cataloging Tool (WECT) for review by the Project Catalogers, who undertake the detailed cataloging metadata. The WECT presents users with an easy-to-use interface with which to view images of manuscripts at a sufficient resolution. They can therefore complete the vast majority of their cataloging work from their desktops. At present, it is geared to the remote cataloging of Islamic manuscripts and the requirements of that project's cataloger, Dr. Adam Gacek. A period of three months prior to image capture for *Parchment to Pixel* will be used to clearly define and implement the requirements for the cataloging of the manuscripts currently under consideration, which are different in character. Only occasional on-site visits by the Project Catalogers will be necessary. The full catalog descriptions will build on the identification information already entered into the WECT for the process of image capture (See Appendix 3).

Using the fields in the WECT, catalogers will fill in fields, supplementing the Dublin Core information already entered (shelfmark, title, copyright information, support material, author(s), scribes, languages, date, genre, keywords). On the manuscript level, these fields are: abstract (a summary of the content and importance of the book); artists (authors and scribes are already entered from the Dublin Core information); text note (describing the importance of the text); support description (more detailed information on the support material); extent information (number of pages, height, width, and comments fields); collation information (collation formula, catchwords, signatures, and comments); layout information (number of columns, lines, and a description); binding description; date of origin; place of origin; provenance episodes; and bibliography.

For individual folios, in addition to the identification information already entered, there are optional fields, including text identifier, e.g. Matins of the Hours of the Virgin; text comment, e.g. Rubrication in French; decoration type, e.g. Initial; decoration title, e.g. Annunciation; decoration form, e.g. pen drawing; decoration label, e.g. "This is an excellent example of an unfinished picture: The image has been drawn and the gold has been laid down, but the paint has not been added."; and hand notes, e.g. illumination by the Matser of the Dresden Prayerbook.

Wherever possible, references will be made to identification numbers of authority files, including the Union List of Artist Names®, Getty Thesaurus of Geographic Names®, and Library of Congress National Authority Files. Specific cataloging guidelines for *Parchment to Pixel* will be documented to ensure consistency across personnel and over time, and curatorial staff will validate catalog entries. The finished catalog descriptions will then be extracted from the WECT in Extensible Markup Language (XML) format files. The WECT has been designed to produce valid TEI P5 XML. TEI (Text Encoding Initiative) is now an accepted (and usually preferred) standard to which detailed descriptions of medieval manuscripts conform.

Storage

It is envisioned that there will be several repositories for the data generated by *Parchment to Pixel*:

1. Curated data storage will be managed by the Digital Research and Curation Center at the Johns Hopkins University's Sheridan Libraries. For each manuscript the following are delivered to Johns Hopkins: (1) all the master TIFF images of the manuscript, (2) a TEI file with complete cataloging data for the manuscript and links to its images, and (3) an XML manifest file that completely documents the digital objects for the manuscript, including technical metadata, Dublin Core data (for content identification), and MD5 checksums of each image and other data file belonging to the manuscript's "information package." The creation of these attendant files, the TEI manuscript description and the file manifest will be generated and validated by the WECT using user-input data and technical metadata exported from the Stokes Imaging system. Each set of data will be validated and verified before delivery to Johns Hopkins. This system is already employed to store the data generated by the Islamic manuscript digitization project (Appendix 5). The Sheridan Libraries has the technical infrastructure to support the long-term preservation of the digital asset in a preservation archive. Using the technical metadata that accompanies the digital objects, Fedora can track relationships between digital objects, duplicate information, and if necessary, the repository can be entirely rebuilt just from the contents of its file system. Fedora also offers useful utility in the form of "disseminators" that automatically support rendering of content through different views or applications. The Sheridan Libraries also have the large-scale storage capacity and networking facilities necessary to handle the data. The storage system is based on Sun Microsystems SAM-QFS. Together, these systems provide an immediate storage capacity of nearly 500TB with the flexibility for further expansion. The Sheridan Libraries have also joined the Sun Microsystems–sponsored Preservation and Archiving Special Interest Group (PASIG), a multi-institution academic consortium of peers. The PASIG has already offered significant utility through the development of programming that integrates their STK 5800 systems with Fedora. The Johns Hopkins University, a member of the Internet2 consortium, offers robust, reliable, high-speed networking that supports significant data transfer needs to a range of institutions. As an example, Johns Hopkins is able to access massive datasets from the Sloan Digital Sky Survey headquarters in Chicago. The security of the digital asset housed within the Sheridan Libraries at Johns Hopkins will be subject to appropriate Johns Hopkins' IT policies, which include consideration of network security, backup and recovery, data encryption, and data center security. The University policies are described at <http://it.jhu.edu/policies/indes.html>. Sayeed Choudhury, Hodson Director of the Digital Research and Curation Center of the Sheridan Libraries, whose letter of support is attached, has worked with the Johns Hopkins Information Security Institute (<http://jhuisi.jhu.edu>). JHUISI represents the University's "focal point for research and education in information security, assurance and privacy."
2. All of the raw material from *Parchment to Pixel*—the archival images, derivatives, and associated descriptive and technical metadata—will also be stored by the Internet Systems Consortium at <http://thedigitalwalters.org> (Appendix 6). The Internet Systems Consortium (ISC) (<http://isc.org>) is a nonprofit 501(c)(3) public benefit corporation dedicated to supporting the Internet community with software essential to its infrastructure. The ISC has extensive experience

in the security requirements for digital assets, and it already hosts such datasets as the Internet Archive (<http://archive.org>) and the Archimedes Palimpsest (<http://isc.archimedespalimpsest.net>). This allows the data to piggyback on the same robust security, accessibility, and technical support provided for core Internet data. The presentation and availability of the raw data is designed to ensure maximum interoperability with external applications and databases, for users who want to make full use of the Creative Commons 3.0 license under which it is published.

3. Derived images of all the folios will be stored on the Walters' digital asset management system (DAMS). After an extensive review process, the museum has acquired Media Beacon by Brighttech as its DAMS. Implementation of the system has begun. It will become the focal point for file organization and distribution, as well as the centerpiece for other applications that will use images and the Dublin Core metadata that is associated with these images within the museum. The system will allow access to both original files and on-demand derivatives of those files based on technical requirements and user security privileges. A dynamic connection will be established with The Museum System (TMS)—the Walters' collection management database—to ensure that collections data is presented as images and with associated descriptive text fields. The open architecture of TMS allows integration with other applications and a strong capability for automating data workflows in addition to the import and export of data. Using PHP scripting, the museum has implemented an automated process for batch upload of images into the database, which includes moving images across the network, creating thumbnails, linking images to the associated data records, inserting appropriate media data into the data record, and producing an error log for instances where manual intervention is required. A robust server houses TMS' SQL Server database. This server will be upgraded in FY2010 to ensure that the capacity for ongoing digitization is in place.

TMS will serve as the primary vehicle for access to the digital catalog of manuscripts at the Walters Art Museum. All of the images in all of the digitized illuminated manuscripts, together with metadata, will be imported into the TMS system, leveraging both automated data transformations and manual data entry and review. Once logged in, users can access fully cataloged manuscript folios.

The museum uses two levels of security to protect its digital holdings from malicious code and corrupted data. The first level is a robust firewall between the Walters' public server and the Internet. The second level is the lack of direct access to TMS and the DAMS, with regular one-way transfer of data to the public server. *Parchment to Pixel* will benefit from an additional level of security with the offline storage of the digital data in separate hard drives. Replication of this data for hosting internally at other institutions will also provide disaster recovery and access.

Access

It is central to the conception of *Parchment to Pixel* that there will be various portals through which the images and the associated metadata can be viewed. These are as follows:

1. All images generated by the project, and all associated metadata, will be available to the public through the Internet Software Consortium at <http://thedigitalwalters.org>. Anyone around the world can access the data in its raw and/or derived form, on this Web site. Published as it is under a noncommercial Creative Commons license, users simply must cite the source of the data. For all identified critical files we will establish a DOI (Digital Object Identity) that will guarantee the access to each resource through a permanent URL. (Appendix 6)
2. A dynamic connection has been established between TMS and the collections Web site at <http://art.thewalters.org>, which displays more than 6,500 objects, including 5,000 currently on view in the galleries. This allows for regular updates of object data and images and the continual expansion of content. Several of the Islamic manuscripts are already available through the site at <http://art.thewalters.org/viewgallery.aspx?id=1227>. (Appendix 8)

3. The Walters will use the digital assets generated by *Parchment to Pixel* to create online exhibitions of its illuminated manuscripts. Currently, the Walters presents four traditional exhibitions of its illuminated manuscripts each year and has done so for the past 20 years. The creation of digital assets will allow curators to virtually recreate exhibitions from times past, as well as create an online presence for their exhibitions in real time. Each Walters exhibition of manuscripts will now have an online complement at <http://thewalters.org>.
4. The Walters will collaborate with the Index of Christian Art at Princeton University (<http://ica.princeton.edu>). Founded by Professor Charles Rufus Morey in 1917, the Index of Christian Art is the most important and largest archive of medieval images anywhere in the world. Its Internet database presently contains nearly 80,000 work-of-art records and more than 100,000 images. Because the index already includes the illuminations from the manuscripts of the Pierpont Morgan Library and Museum, users will be able to search, in one database, the two most important collections of illuminated manuscripts in the United States. The Index of Christian Art has agreed to host the approximately 3,500 digital images of the illuminated folios of Walters Christian manuscripts on the Index of Christian Art. Please find attached to this application a letter of support from Dr. Colum Hourihane, Director of the Index of Christian Art and an adviser on this project.
5. The Walters will also collaborate with Digital Scriptorium (<http://scriptorium.columbia.edu>). Digital Scriptorium is currently hosted by Columbia University Libraries and is directed by Consuelo W. Dutschke, who is a consultant on this project, and whose letter of support is attached. This database currently has records for 5,300 manuscripts and 24,000 images. It contains records from 35 institutions with medieval manuscript holdings and acts as a virtual library for integrating the holdings of these libraries. Selected images from all of the manuscripts digitized through *Parchment to Pixel* will be hosted on Digital Scriptorium, enabling the Walters to become part of a virtual library of medieval manuscripts supported by metadata of interest to a wide range of medievalists, including historians, philologists, musicologists, paleographers, art historians, and codicologists. Digital Scriptorium has itself received two grants from the NEH since 1999.
6. The Walters will also collaborate with the World Digital Library (WDL) (<http://wdl.org/en>). The WDL was developed by a team at the U.S. Library of Congress with contributions by partner institutions in many countries, the support of the United Nations Education, Scientific, and Cultural Organization (UNESCO), and the financial support of a number of companies and private foundations. It makes available on the Internet, free of charge and in multilingual formats, significant primary materials from countries and cultures around the world. It is a resource for educators, scholars, and general audiences, and it aims to narrow the digital divide within and between cultures. The WDL recognizes that the Walters Art Museum can play a valuable role as a partner by providing the WDL with digital illuminated manuscripts of the highest quality from diverse cultures worldwide. The World Digital Library will host 24 digital manuscripts from *Parchment to Pixel* to supplement the 20 Islamic manuscripts it has agreed to host from the Walters' Islamic manuscript digitization project—four from each of the collection areas: Armenia, Byzantium, Ethiopia, The Netherlands, England, and Central Europe. Please see the attached letter of support from John van Oudenaren, director of the World Digital Library
7. Additional output from *Parchment to Pixel* will be in the form of human-readable PDFs to ensure the long-term instant availability of the all the cataloged information, independent of any database that ingests it. These PDFs will be published on such free Internet applications and repositories as ISSUU (see <http://issuu.com/the-walters-art-museum>) and the Internet Archive (<http://archive.org>). This has already been done for several Islamic manuscripts (Appendix 7)
8. Metadata collected for each manuscript will be used to generate data required for loading manuscripts into other databases and applications and for exposing descriptive metadata for each manuscript in other data delivery and data harvesting formats. Dublin Core and supplemental metadata will be generated for select images for import of images and metadata in the Walters'

TMS collections management database. From the TEI manuscript description files, Open Archive Initiative (OAI) and Encoded Archival Description (EAD) XML descriptions will be created. Crosswalk information needed to generate alternate OAI and EAD files from the TEI manuscript descriptions will also be provided. As other repositories for storage of the digital manuscripts are identified, the metadata will be transformed or configured to comply with those systems' requirements.

IV. Work Plan

Parchment to Pixel will take approximately 32 months, with follow-on activities planned to expand upon this initiative with other manuscript collections at the Walters. Three additional personnel will be hired full time to support this effort, and one person will be hired to provide half-time support.

Project Objectives

To ensure that the final product meets the highest informational, visual, and preservation goals, the following have been outlined as project objectives:

- To provide worldwide access to digital images of illuminated medieval manuscripts from the Walters Art Museum on schedule, within budget, and to international standards
- To consult with advisors and outside experts in areas in which this project breaks new ground for the museum in order to develop appropriate standards and practices
- To communicate among the multiple parties involved in the project in order to guarantee that existing and developed standards are met as the workflow moves from the point of image capture and cataloging to the point of access
- To guide the entire project with a singular vision of maintaining the most enduring and highest-quality reproducible results from one manuscript to the next

The technical infrastructure to support the proposed workflow and to meet the project objectives is in place. The Walters will, however, work closely with the imaging equipment developers to ensure a consistent high level of productivity utilizing the best available technology.

Project Schedule

Months 1-6: Conservation Preparation and System Planning Phase

During the six months prior to the commencement of imaging, the Walters will conduct three primary activities beginning in July 2010:

1. Design and populate a database to record past treatment and present condition of the manuscripts as a prelude to conservation, create a conservation-based shoot-list for digitization, and begin required conservation treatment.
2. Conduct test imaging and cataloging on two relatively small western manuscripts, which will allow for the adaptation of the Walters Electronic Cataloging Tool to the requirements of Western rather than Islamic manuscripts.
3. Continue ongoing consultation and collaboration with parallel digital manuscript projects, including the Archimedes Palimpsest Program and the Maryland Institute for Technology in the Humanities (MITH) TILE (Text Image Linking Environment) initiatives, to continue to meet best current practice for the capture, storage, and presentation of digital data.

Months 7-30: Project Imaging Phase

During the 20 months of imaging and data capture from January 2011 to August 2012, the project's Digitization Specialists will image the manuscripts, the Project Catalogers will enter the metadata, and the Data Manager will integrate all data for a limited Alpha release of data for review by January 2012. The Data Manager and the Walters' Collections Database Administrator, supported by the Project Catalogers, will migrate initial records into The Museum System and finalize the TMS graphic user interface for the public Web site by March 2012. Throughout this phase, one Digitization

Specialist will conduct image capture while the other will perform data entry, color correction, quality control, and associated functions. (Both Digitization Specialists will be cross-trained in each function and switch off between functions).

Months 20-32: Data Release Phase

Throughout this 12-month phase from January 2012 to December 2012, data will be released in ever-larger groups with integrated metadata for review by users within the Walters and on the Internet to allow for continuous improvement cycles through each successive release and review. Imaging and metadata collection will continue in parallel to provide the additional images and metadata for each successive release. These include the following major releases:

- Alpha Release—A limited release of all digital images and metadata from 30 manuscripts in final form on TMS and the associated Web module in January 2012. Review documentation and recommendations will be solicited for a review in March 2012.
- Beta Release—A limited release of all digital images and metadata from 80 manuscripts in final form on TMS and the associated Web module in May 2012. Review documentation and recommendations will be solicited for a review in June 2012, incorporating changes identified in the Alpha Release.
- Candidate Release—A full release of digital images and metadata from all imaged manuscripts in final form on TMS and the associated Web module in August 2012. Review documentation and recommendations will be solicited for a review in September 2012, incorporating changes identified in the Beta Release.
- Final Data Release—A full release of all digital images and metadata from all manuscripts in final form on TMS and the associated Web module in December 2012, incorporating changes identified in the Candidate Release. This release will also be replicated at the ISC.

Months 32+: Post-Project Phase

Imaging and metadata collection will continue with additional manuscript collections at the Walters, capitalizing on the lessons learned during the *Parchment to Pixel* project and applying them to make images and metadata of thousands of unique manuscripts from the museum Web-accessible. The resource will continue to be maintained as a publicly available digital asset by the Walters.

V. Staff

Existing Staff

Across a number of divisions within the Walters Art Museum, existing staff will work collaboratively in order to attain the project objectives set out in the Methodology and Standards section. The following staff will be essential *Parchment to Pixel* personnel:

- Gary Vikan, Director of the Walters Art Museum, will provide vision and general direction for the project. He will spend approximately one percent of his time on the project.
- Kate Markert, Associate Director, overseeing the Technology Campaign and technology in general at the museum. She will provide guidance, strategic planning information, and, later, fundraising assistance. She will spend approximately one percent of her time on the project.
- Will Noel, Curator of Manuscripts and Rare Books, will serve as the Project Director and will have direct responsibility for scheduling, workflow, and outcomes. He will spend approximately 50 percent of his time on the project.
- Amy Landau, Assistant Curator of Manuscripts and Rare Books, will catalog the Armenian manuscripts. She will spend approximately 15 percent of her time on the project.
- Abigail Quandt, Head of Book and Paper Conservation, will provide conservation oversight of the project. She will train and aid in the oversight of the Digitization Specialists. She will also

supervise the Assistant Conservator in his/her work on the manuscripts. She will spend approximately 20 percent of her time on the project.

- Elissa O’Loughlin, Senior Paper Conservator, will assist in the oversight of the Digitization Specialists and their work, and in the supervision of the Assistant Conservator. She will spend approximately 20 percent of her time on the project.
- Jim Maza, Director of Information Technology, will manage museum access and security of the digital assets generated by *Parchment to Pixel*. He will spend approximately 10 percent of his time on the project.
- Jacqueline Copeland, Director of Education, will provide general oversight of the development of the education programs based on *Parchment to Pixel*. She will spend approximately two percent of her time on the project.
- Amanda Kodeck, Manager of School Programs, will develop educational resources in collaboration with teachers. She will spend approximately two percent of her time on the project.
- Kate Siplon, Collections Database Administrator, will oversee TMS input and aid in supervision of the Data Manager. She will spend approximately 15 percent of her time on the project.
- Dylan Kinnett, Manager of Web and Social Media, will advertise and release images and descriptions in a variety of forms and formats over the Web. He will spend approximately 20 percent of his time on the project.

Grant Contract Staff

Digitization Specialists

The Walters intends to rehire the following skilled and experienced personnel, who are currently responsible for digitizing the Islamic manuscripts.

- Diane Bockrath, Digitization Specialist, will be responsible for carrying out preliminary metadata entry, image capture, color correction, and image processing, including quality control. She will spend 100 percent of her time on the project for two years.
- Ariel Tabritha, Digitization Specialist, will be responsible for carrying out preliminary metadata entry, image capture, color correction, and image processing, including quality control. She will spend 100 percent of her time on the project for two years.

Conservator

The Walters intends to hire an assistant-level book conservator will be responsible for the condition survey and preparation of the shoot list at the outset of the project and will carry out the examination and treatment of all manuscripts prior to imaging. This is a one-year appointment. See Appendix 9 for further details.

Consultants

Program Manager

Michael B. Toth of R.B. Toth Associates will plan, schedule, and integrate the key components of this project with stakeholders and service providers within and outside the Walters. He will support this project throughout the grant period by developing and monitoring the program master schedule, interfacing with access providers and other imaging programs, and planning and tracking resources. He will also be available for on-site meetings at least once every two months to monitor the project. The Walters has benefited from his expertise in facilitating the efficient execution of large-scale digitization initiatives during the Archimedes Palimpsest program and the Islamic manuscript digitization project; his support of *Parchment to Pixel* will ensure the smooth progress of the project and its ability to meet its schedule and budget requirements. His letter of commitment is attached.

Data Manager

Doug Emery of Emery IT will serve as IT systems architect for this project, designing and implementing software and processes to assure the delivery of images and accompanying metadata for multiple output formats. Emery will define the metadata collection to be done at the time of imaging and cataloging to comply with project requirements for data delivery. He will create tools and systems to process data from the Walters Electronic Cataloging Tool and extend that tool to produce data packets for delivery to data hosts, archives, and storage providers. Emery has provided key data support to the Walters as data manager and archive architect for the Archimedes Palimpsest project. He also designed metadata collection and data management systems for the Islamic digital repository, including design and development of the Walters Electronic Cataloging Tool. His letter of commitment is attached.

Catalogers

Dr. William Noel, Curator of Manuscripts and Rare Books at the Walters and Director of *Parchment to Pixel*, will assume overall editorial control for the cataloging of the manuscripts. One of the advantages of the Walters Electronic Cataloging Tool is that it allows for remote cataloging by world experts in their respective fields. The cataloging team is detailed below.

- The Central European manuscripts will be cataloged under the supervision of Dr. Jeffrey Hamburger, Kuno Francke Professor of German Art and Culture, Department of History of Art and Architecture, Harvard University (see letter of commitment attached).
- The English manuscripts will be cataloged by Dr. William Noel and Dr. Kathryn Smith, Professor of Medieval Art, Department of Art History, New York University (letter of commitment attached).
- The Dutch manuscripts will be cataloged by Dr. James Marrow, Emeritus Professor of Art History, Princeton University (see letter of commitment attached).
- The Ethiopian manuscripts will be cataloged by Dr. Getatchew Haile, MacArthur Fellow, Regents Professor of Medieval Studies, Curator of the Ethiopian Study Center, and cataloger of the Oriental manuscripts at the Hill Museum and Monastic Library, St John's University, Collegetown, Minnesota (see letter of commitment attached).
- The Byzantine manuscripts will be cataloged by Dr. Georgi Parpulov, Lecturer in Byzantine Archaeology and Art, Department of History, University of Oxford, who has already cataloged them in a print publication (see letter of commitment attached).
- The Armenian manuscripts will be cataloged by Dr. Amy Landau, recently appointed Assistant Curator of Manuscripts at the Walters, building on the Der Nersessian catalog.
- Dr. Consuelo Dutschke, Curator of Medieval and Renaissance Manuscripts, Rare Book and Manuscript Library, Columbia University, will be a consultant on paleographical descriptions of all the Western manuscripts to be digitized for *Parchment to Pixel*.

Project Catalogers will be available for consultation throughout the cataloging process, and they will visit the museum at least twice for weeklong on-site consultation during the grant period.

Advisors

Advisors will provide invaluable insight over the course of the entire project, and will keep the project's leadership abreast of new developments in the field. The following individuals, who are at the forefront of developments in special collections curation and digital information distribution, have agreed to assist in project development and implementation as needed.

- Mark Dimunation, as Chief of the Rare Book and Special Collections Division at the Library of Congress, has been a principal in planning and implementing the content and presentation of LC's digital library. Dimunation was responsible for the Library's relationship with Octavo, which produced the first American digitized copy of the Gutenberg Bible, among other titles. He has developed and overseen digital projects for the American Memory Project, Global Gateway, the International Children's Digital Library, and the World Digital Library. He has been involved

in all facets of digitization, from contractual protocols to content designation, to development and design.

- Carl Malamud is considered to be one of the leading experts on placing large databases of information on the Internet for public access. As the founder of the Internet Multicasting Service, he was responsible for placing the Security and Exchange Commission's EDGAR database and the U.S. Patent database on the Internet for free access by the public. Malamud is the President and CEO of Public Resource, a nonprofit firm based in California. The author of eight books, Malamud has been a visiting professor at MIT's Media Lab and at Keio University.

VI. Dissemination

All 105 digital manuscripts generated by *Parchment to Pixel* (approximately 39,250 high-resolution master images together with their lower-resolution access copies) will take their place alongside the 128 codices generated by the Walters Islamic digitization project on <http://thedigitalwalters.org>. There they will be available under a Creative Commons Noncommercial Attribution Share Alike 3.0 United States License for any noncommercial purpose. Associated with them will be XML files of technical and descriptive metadata in standard formats, available under the same license. Full digital surrogates of all the manuscripts, together with manuscript- and folio-level descriptive metadata, will be made available through the manuscript section of the museum's Web site at <http://art.thewalters.org/viewgallery.aspx?id=1227>. In addition, 3,500 images of the illuminated folios captured in *Parchment to Pixel* will be cataloged and made available through the Index of Christian Art at <http://ica.princeton.edu>. Descriptions of all the manuscripts and 1,000 representative images from them will be made available through Digital Scriptorium at <http://scriptorium.columbia.edu>. Twenty-four codices—masterpieces of medieval manuscript illumination—will be made available on the World Digital Library at <http://wdl.org/en>. PDF digital surrogates of all the manuscripts will be made available through free online presentation resources such as ISSUU (see <http://issuu.com/the-walters-art-museum>) and through the Internet Archive at <http://archive.org>.

Upon successful completion of the project, the Walters will make every effort to present its findings at conferences and ask to have it announced on the e-bulletins of the following organizations:

The Walters Art Museum: <http://thewalters.org>
 American Association of Museums: <http://aam-us.org>
 American Library Association: <http://ala.org>
 Digital Medievalist: <http://digitalmedievalist.org>
 College Art Association: <http://collegeart.org>
 International Center of Medieval Art: <http://medievalart.org>
 Medieval Academy of America: <http://medievalacademy.org>

It will be requested that links to the project's resources be posted on several sites, including:

The Labyrinth: Resources for Medieval Studies: <http://labyrinth.georgetown.edu>
 The UCLA Catalog of Digitized Manuscripts: <http://manuscripts.cmrs.ucla.edu>

Every effort will be made to promote the resource on Twitter, Facebook and Flickr. Other Web sites and blogs relevant to the promotion of *Parchment to Pixel* include: <http://theheroicage.blogspot.com>; <http://modernmedieval.blogspot.com>; <http://gotmedieval.blogspot.com>; <http://digital-librarian.com/medieval.html>; <http://larsdatter.com/wordpress>; <http://medievalnews.blogspot.com>; <http://mediaevum.de/haupt2.htm>; <http://medievalismo.org/fr/principal.htm>; <http://meliton.gimnazjum.com.pl/m1.html>; <http://capricorn.bc.edu/siepm>; <http://spolia.it/online/en/index.htm>; <http://archimedespalimpsest.org>.