

# ICOA789: PROJECT ANQA: DIGITALLY DOCUMENTING AT-RISK HERITAGE SITES IN SYRIA AND IRAQ

## Subtheme 03: Protecting and Interpreting Cultural Heritage in the Age of Digital Empowerment

**Session 1:** Relevance of Digital Tools & Technology in Documentation, Conservation and Safeguarding of Heritage & Community Engagement

**Location:** Silver Oak 2, India Habitat Centre

**Time:** December 13, 2017, 10:25 – 10:40

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**Abstract:** The practice of recording and digitizing cultural heritage sites is gaining ground among conservation scientists and scholars in architecture, computer science, and related fields. Recently, the location of sites in areas of conflict has highlighted the urgent need for documenting heritage sites for preservation and posterity. This process is not limited to digitization, however, but also includes the meaningful interpretation of sites with respect to their intangible values. This practice necessitates new tools, which goes a step beyond simple digitization.

Project Anqa counters the devastating loss of cultural heritage throughout the Middle East, most notably in Syria and Iraq. The project is funded by the Arcadia Fund (London, UK), and works through the partnership of CyArk, ICOMOS, and the Yale Institute for the Preservation of Cultural Heritage to train local professionals in documenting at-risk sites in 3D before they are destroyed or altered. Through an interdisciplinary process, Anqa aims to assemble the recorded documentation, historically contextualize it, and make data accessible and useful for scholars, peers, and the public with state-of-the-art tools.

A primary goal of Project Anqa is to work through a process that includes capacity building on the ground so that local partners are included in the data collection, ownership, preservation, and the story-telling process. Our partnership with CyArk, who are specialized in photogrammetric and laser scanning technologies, helps to train professionals to collect RAW and ethnographic data. Together, we emphasize the importance of documentation using what we call the “subjective eye,” which is based not only on tangible but also on a list of intangible categories in accordance with CIDOC-CRM and ICOMOS CIPA standards.

It is our hope that Project Anqa will serve as an example of ‘people-centred’ cultural heritage documentation in a digital age through an open-access web platform hosted by Yale University. The site will make graphic and textual information available to scholars crossing a variety of departmental

borders and the general public. Through this effort, we offer a foundational, democratic and participatory platform for the study and documentation of tangible and intangible cultural heritage, not only for at-risk regions in the Middle East, but more generally around the world.

***Key words:*** *project anqa, at-risk heritage, open access, middle east*

## Introduction

Anqa, taken from the Arabic word for phoenix, is funded by Arcadia Fund – UK, and works through the partnership of CyArk, ICOMOS, and Yale University<sup>1</sup>. We work together to train local professionals in documenting at-risk sites in 3D, conduct scholarly research, and create a web platform to educate the public on the importance of cultural heritage preservation. What sets Anqa apart from other related projects is our effort to build capacity on the ground in Syria through in-person and online technical and ethnographic trainings, as well as an emphasis on interpreting data for the dissemination of knowledge, raising awareness around sites located in conflict zones, and storytelling.

Bridging the digital and humanities gap in the practice of cultural heritage documentation is important as data move from the hands of technologists to domain experts, such as archaeologists or architects<sup>2</sup>. The web platform to be designed in shared ownership is geared towards scholarly inquiries, and will make RAW and academic data available to researchers on request.

The data that we analyze and process for Project Anqa comes through Yale's partnership with CyArk, a Bay-Area based organization that specializes in photogrammetric and laser-light scanning technologies. We work together to train architects, engineers, and computer scientists on the ground, who then collect information that includes RAW and ethnographic data, including field notes, drawings, and sketches of site plans, building structures, and the location of scanners. CyArk works as an intermediary to collect and process RAW data and coordinate the on-site technical trainings, communicate regularly and directly with our documentation partners in Damascus, as well as with the team at Yale.

The documentation includes what we call the “subjective eye,” which is based on a list of intangible categories in accordance with CIDOC-CRM and ICOMOS CIPA standards<sup>3</sup>. Photographs, videos, and interviews of building caretakers/users, on-site observations of rituals and processes, and the recording of peculiarities of a building all help in the storytelling process and convey the importance of cultural heritage preservation.

Another important feature of Anqa is that it directly engages in capacity building in areas of high conflict through technical training and co-ownership of resulting data. The close collaboration with the local team on recording, interpreting, and contextualizing these sites is an invaluable contribution to the sustainability of the project (Fig.1).

## Methodology

Following the successful preliminary training on laser scanning, photogrammetric and panoramic image capture of Syria's Directorate General of Antiquities and Museums (DGAM) staff in Beirut in January 2016, a second full training was focused on refining data capture techniques and provided additional

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<sup>1</sup>Arcadia Fund – UK, [www.arcadiahfund.org.uk](http://www.arcadiahfund.org.uk); CyArk, [www.cyark.org](http://www.cyark.org); DGAM, <http://dgam.gov.sy> ; Yale Institute for the Preservation of Cultural Heritage (IPCH), <http://ipch.yale.edu> .

<sup>2</sup> Alliez et al., 2017

<sup>3</sup> Silver, et al., 2016

guidance to the DGAM on the site recording forms and pertinent information. CyArk conducted the training from 16-26 January 2017 at the UNESCO offices in Beirut and on site at the Temple of Echmoun, a Phoenician archaeological site located approximately 40 km south of Beirut. The training was complimented by online sessions with interventions by the project team.



*Fig.1– With Anqa project team in Damascus, December 2016.*

The training was used to review completed site recording forms and exchange any of the data collected in Damascus. Some preliminary data was shared via summary electronic correspondence, but file size and connectivity challenges necessitated an exchange of physical hard drives and memory cards. Despite the constant contact with the DGAM team in Syria, data capture and transfer was slower than expected and came to completion only by the end of August 2017. With the help and support of the UNESCO Beirut Office, the data was shipped to CyArk and, after review and assessment in September 2017 to Yale.

During the CyArk training, we agreed upon a method of collecting data by using forms that the DGAM team members print out and take with them into the field also came up with a list of tangible and intangible categories that work in accordance with CIDOC-CRM<sup>4</sup> and ICOMOS CIPA standards<sup>5</sup>. Fig. 2 shows a meta-data form, which includes basic information about the site (site name, year built, architect/patron, location, etc), along with width and dimension of rooms and partitions, description of overall site condition, and a brief history. The additional categories work in tandem with the technical data collected through laser-light scanning and photogrammetry. Some fall under a general category called the “subjective eye”. This includes general observations of the site, including sketches or notes about unusual markings or inscriptions, contemporary use, interviews with caretakers or visitors, short

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<sup>4</sup>CIDOC, 2017

<sup>5</sup>ICOMOS, 1996

videos of the sites, or remarks about archival documents or plans that exist in nearby libraries or municipalities.

بيانات تعريف المخطط		
مخطط لتوثيق ثلاث أبنية مدينتي دمشق القديمة يتشكون مع منظمة اليونسكو و شركة سوارك وجامعة بابل		
اسم الموقع: البوغازستان النوري		
المؤسسة:	تاريخ التوثيق:	المديرة العامة للأثار والمتاحف
د. محمد علي	8/7/2014	
د. رقية محسن		
د. زكي		
د. حنا كافي		
صورة الموقع:		مكان الموقع على الخريطة
عناصر الموقع		
حالة الموقع	مواد الموقع	وصف الموقع
حالة تامة	1- الجدران المخارطة - القرن 2- الأعمدة المخارطة - القرن 3- السقف القديم - القرن	<p>- البوغازستان النوري يقع في قلب مدينة دمشق ، ويعد واحداً من ثلاثة بيمارستانات اشتهرت بها المدينة.</p> <p>- بناء الملك العادل نور الدين زنكي عام 1154/هـ، وخصصه كمشفى للمساكين والفقراء.</p> <p>- ثم تحول ليصبح واحداً من أشهر المشافي ومراكز الطب والصيدلة في البلاد الإسلامية، وقد تعلم فيه كثير الأطباء مثل ابن سينا والزهراني.</p> <p>- في سنة 795 هـ، قام الصاحب شمس الدين البهنسي بتجديد إحدى أجناعه.</p> <p>- في سنة 803 هـ، تعرض للدمار على يد تيمورلنك، وبعد زحولة عاد لاستقبال المرضى، ولكن على نطاق ضيق.</p>

مكان وفئات الجغرافيا
معالجة البيانات
النتائج

Fig.2– Screen capture of sample DGAM meta-data form

Currently, we are finalizing the documentation of six sites in the old city of Damascus, which were selected based on discussions with the DGAM. A pilot, developed around the data from the Al Azem Palace<sup>6</sup>, is supposed to become the expandable base for a scholarly resource around the six sites, including general historical information and further meta-data.

## Results

We have made significant progress on conceptualizing and preparing a web platform for the dissemination of open-access data for Project Anqa, with support from the Yale Digital Humanities Laboratory.

The homepage gives a general overview of the Project Anqa mission and locates the six sites on an interactive map (Fig.3). There will also be a feature that gives an historical and geographic overview of the Middle East region with a special focus on the urban history of Damascus, which situates the sites in relation to one another (Fig.4).

<sup>6</sup>Azem Palace (Museum of Popular Arts and Traditions): Palace, built in 1749-52 by Assad Pasha al Azem, the Ottoman governor of Damascus.



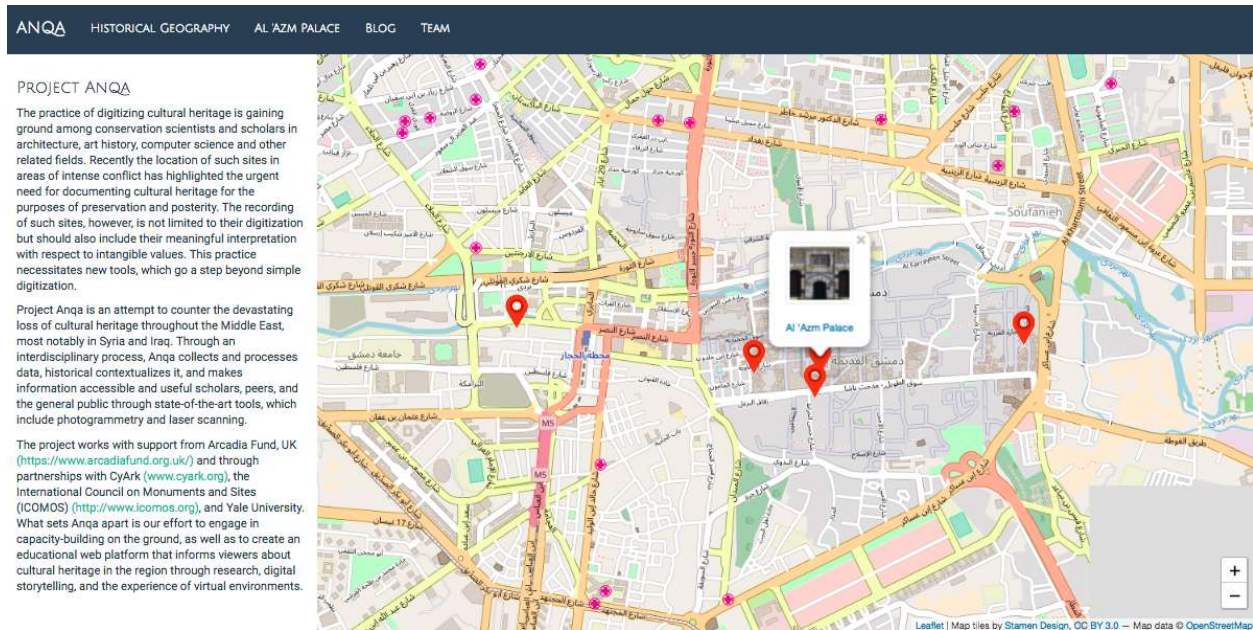


Fig.3– Screen shot of interactive map for Project Anqa

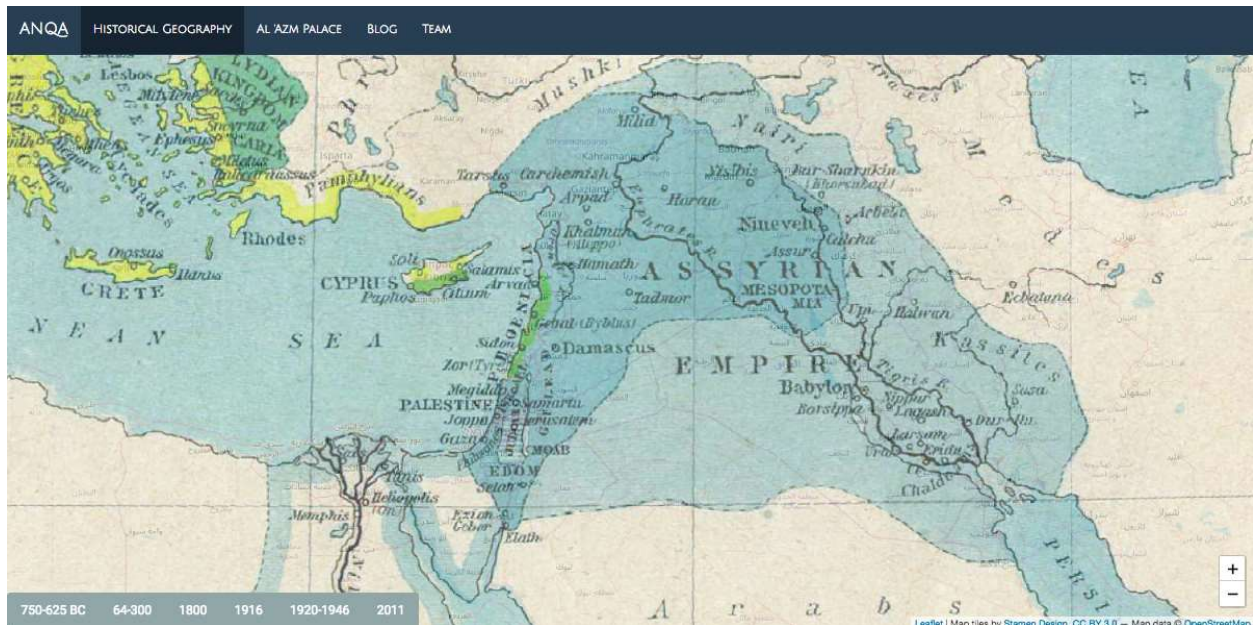
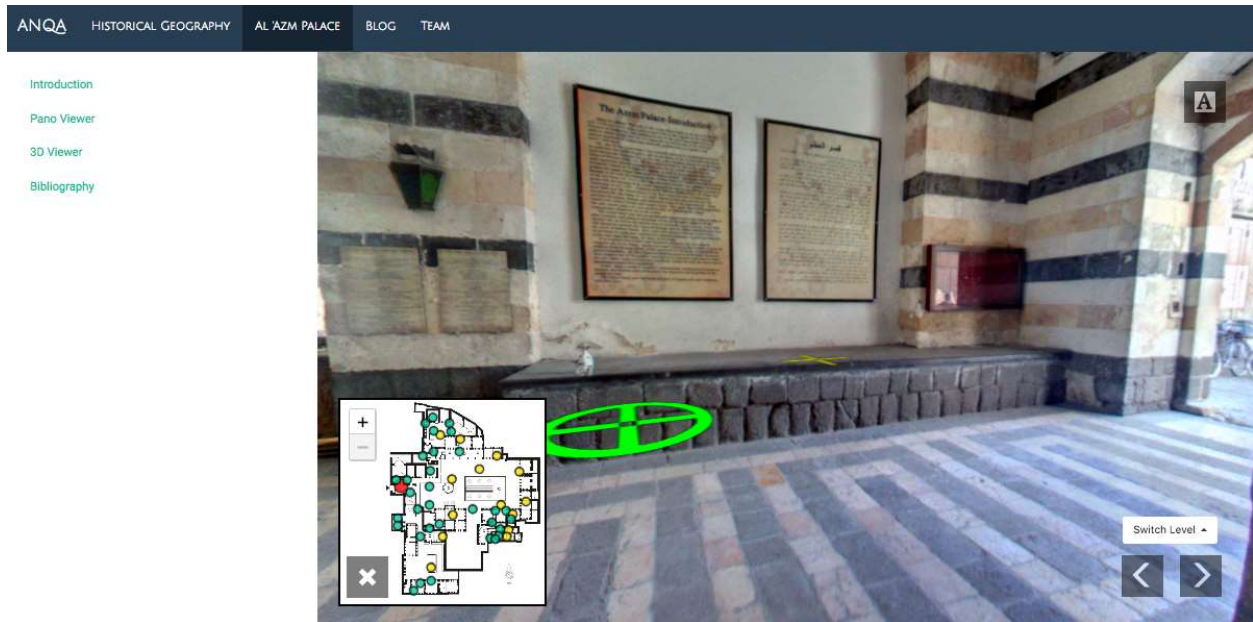
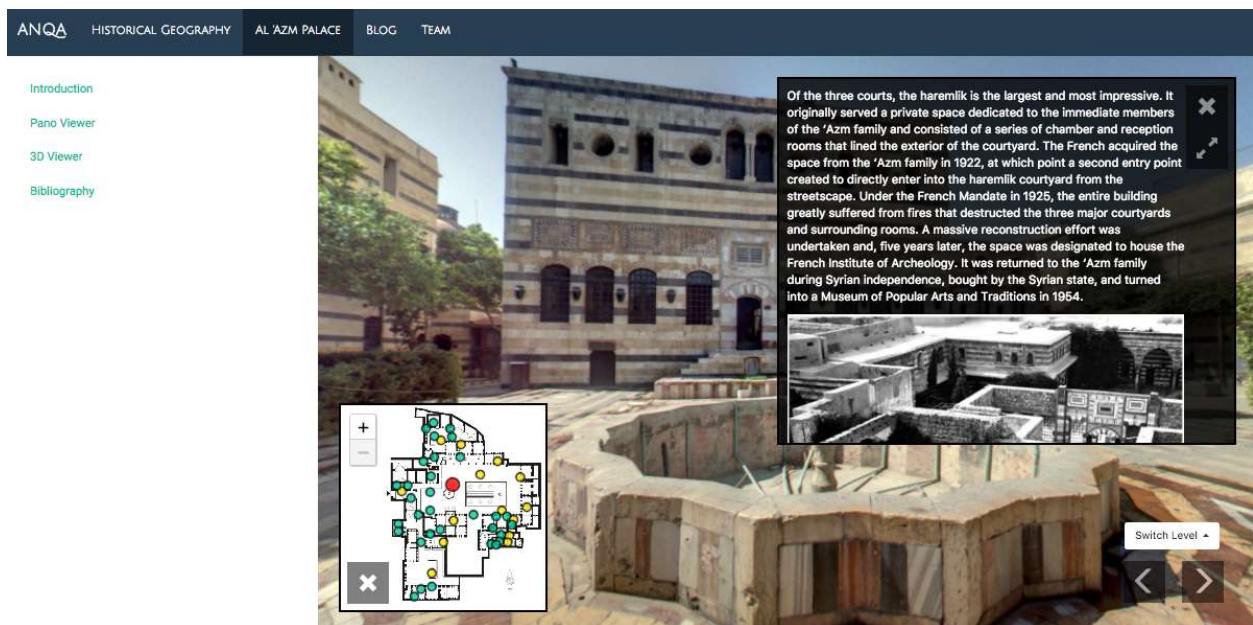


Fig.4– Historical geography – embedded in website

Based almost entirely on the panoramic photographs, a few of the RAW images that CyArk and Yale each used to derive photogrammetric models, but none of the LIDAR models a pilot website for the Azm Palace has been developed. Yale Computer Graphics team developed a viewer that deploys familiar technology (cf. Google maps “street view”), but which also demonstrates how three-dimensional “pop-ups” can be incorporated into the viewer (Fig 5). It furthermore allows for annotations and for example the integration of historic photography for comparative purposes (Fig.6).



*Fig.5– Interactive virtual visit to the Azm Palace, based on Google Streetview*



*Fig.6– Interactive virtual visit to the Azm Palace, map, annotations and integration of historic photography*

The website incorporates a state-of-the-art software designed by the Yale Computer Graphics and IPCH called CHER-Ob<sup>7, 8</sup>, an open source platform for cultural heritage research, which provides annotations that appear on or besides 3D models and/or photographs. The CHER-Ob program will also feature a

<sup>7</sup>Shi et al, 2014

<sup>8</sup>Kotoula et al, 2017



video component, which creates short animations of a site or object that highlights material or historical aspects of a site or object and provides annotated explanations.

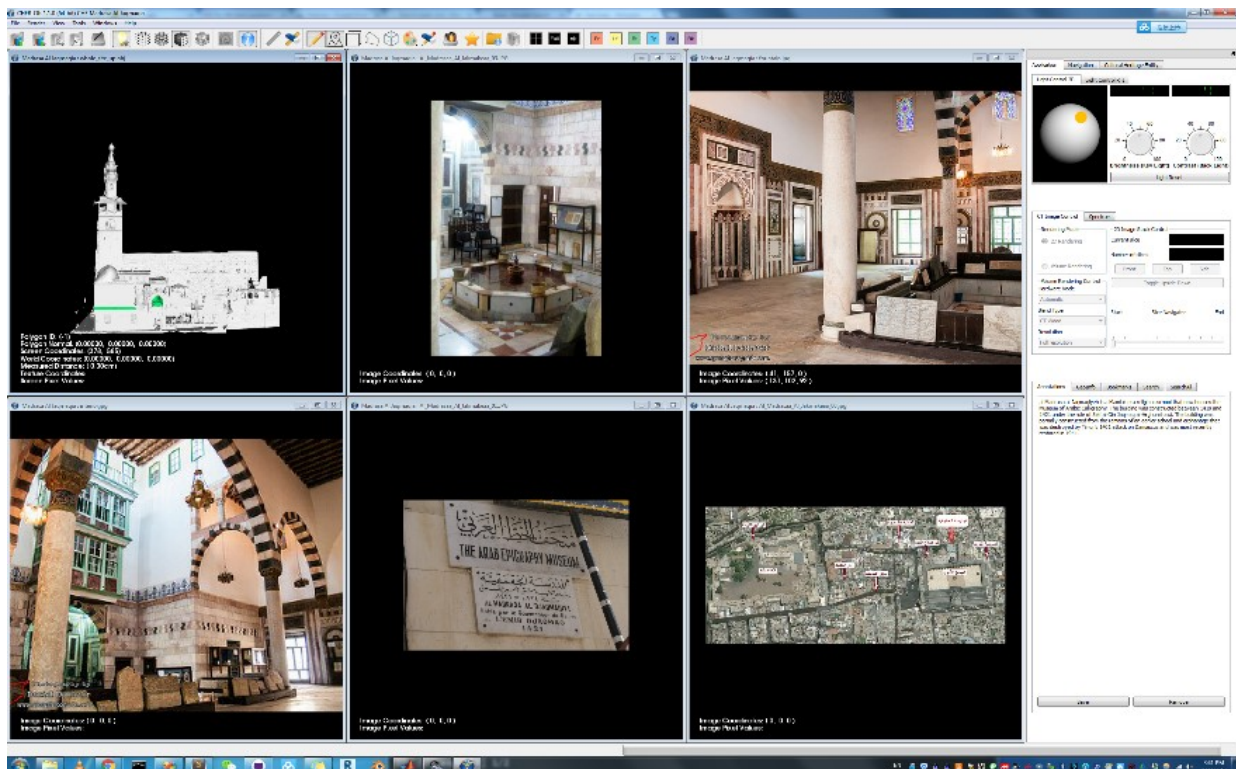


Fig.7– Screenshot from CHER-Ob showing Al-Jakmakiyah Madrasa

We also envision a portal through which users can register and request RAW data files for deeper scholarly inquiries. The website will initially be published in English, and hopefully be available in Arabic at a later stage. Our intended audience ranges from a general public, to educational institutes (including K-12 schools, colleges, and advanced graduate programs), to scholars who can further their studies based on our data scans and research.

CHER-Ob analyzes and annotates heterogeneous data files about cultural heritage entities, such as 2D images, 3D models, RTI and CT images in addition to their archival/textual data. The main features of the software are the Cultural Heritage Entity (CHE) – which are user defined sets of data, and the Project – which are types of studies that are focused on answering specific research questions about a single or plural CHE. CHE's are the main source of data to be studied in CHER-Ob. They consist of a set of information uploaded into the software by the user, including image files and annotated data classified according to the Getty Classification of Works of Art, or GCWA<sup>9</sup>. All of the images can be annotated, and point, surface, and polygonal annotations are available for 2D, RTI, CT images, including frustum (volumetric) for 3D models. Ultimately, the contribution of this platform is that it facilitates and enables the sharing of a diverse nature of documents for experts from different disciplines in their collaborative research.

<sup>9</sup> Baca, 2014



During the development of a Project, users can explore visualizations and their metadata, add bookmarks, annotations, and new files. They can also search, sort, and filter the data by making use of functions provided in CHER-Ob and generate new knowledge. The progress can be tracked by using the navigation tool. The program tracks users' names and timestamps, in addition to evidenced-based statements, which are important features that protect the intellectual rights of each contributor and preserve data provenance information. The content of projects and CHE(s) can be exported via the report generation function in .pdf and/or video formats, which encourages the distribution of information to non-CHER-Ob users for research, publication and archival purposes.

In the CHE named 'Al-Jaqmaqiyyah Madrasa', for example, we have supplemented the models with general annotations, surface annotations and volumetric annotations. The general annotations contain historic information, stylistic analysis, and descriptions. The tabs on the right side of the screen provide enhanced access options. Annotations can also be accessed through the 'Navigation' tab, metadata can be viewed and edited through the 'Cultural Heritage Entity' tab, and other functions such as adding general annotations, search, filter, and bookmarks are located at the 'Application' tab (Fig. 7).

## **Conclusion**

The digital documentation of heritage sites, whether at risk of being destroyed or not, should go beyond simple digitization to include social, historic, and ethnographic information so that these sites can be understood within the contexts in which they are situated. Virtual, or immersive, experiences of the sites are important, as this data gives users an experience of places that they may have limited or restricted access to. However, presenting heritage sites apart from the experiences or stories of local communities and neighbourhoods risks disconnecting them from the culture and traditions in which they were created. Our hope is that, through this multi-partnered and interdisciplinary effort, Project Anqa may serve as a foundational platform for the study and documentation of tangible and intangible heritage sites, not only for conflicted regions in the Middle East, but more generally around the world.

We are working with teams and sites located in a high conflict zone, which comes with its own set of challenges and setbacks. A major challenge to Project Anqa was and has continued to be the transfer of large files out of Syria. Despite the circumstances and the delays in data capture and transfer, we nevertheless continue to make progress and have made considerable strides in the past months. Another challenge was to ensure that the DGAM continued the work for Project Anqa once the training was over and the team from CyArk had left. Collaborating with the major stakeholders in Syria on recording and preservation at risk heritage sites, being generous and creative in our support, will remain a challenge for the international conservation community in future decades.

## **Acknowledgments**

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## **Bibliography**

Pierre Alliez, Laurent Bergerot, Jean-François Bernard, Clotilde Boust, George Bruseker, et al., 2017. *Digital 3D Objects in Art and Humanities: Challenges of Creation, Interoperability and*

*Preservation*. White paper: PARTHENOS Workshop held in Bordeaux at Maison des Sciences de l'Homme d'Aquitaine and at Archeovision Lab. (France), November 30th - December 2nd, 2016,. pp. 71.

Baca, M., Harpring, P., 2014. *CDWA List of Categories and Definitions*. J. Paul Getty Trust. [www.getty.edu/research/publications/electronic\\_publications/cdwa/index.html](http://www.getty.edu/research/publications/electronic_publications/cdwa/index.html)

CIDOC, 2017 *Definition of the CIDOC Conceptual Reference Model*, ICOM/CIDOC Documentation Standards Group, continued by the CIDOC CRM Special Interest Group, Version 6.2.2, September 2017 [http://www.cidoc-crm.org/sites/default/files2/2017-09-30%23CIDOC%20CRM\\_v6.2.2\\_esIP.pdf](http://www.cidoc-crm.org/sites/default/files2/2017-09-30%23CIDOC%20CRM_v6.2.2_esIP.pdf), 314 pp.

ICOMOS, 1996. *PRINCIPLES FOR THE RECORDING OF MONUMENTS, GROUPS OF BUILDINGS AND SITES* (1996), Ratified by the 11th ICOMOS General Assembly in Sofia, October 1996, <http://www.icomos.org/charters/archives-e.pdf>

Eleni Kotoula, Kiraz Goze Akoglu, Weiqi Shi, Ying Yang, Stefan Simon, and Holly Rushmeier, 2017. *CHER-Ob for Cultural Heritage research: Unsleben Jewish cemetery case study*, Journal of Archaeological Science, (under review)

Shi, Weiqi, Eleni Kotoula, Kiraz Goze Akoglu, Ying Yang, Holly Rushmeier, 2016. *CHER-Ob: A Tool for Shared Analysis in Cultural Heritage*. EUROGRAPHICS Workshop on Graphics and Cultural Heritage, 10/2016. DOI = {10.2312/gch.20161404}

Silver, M., F. Rinaudo, E. Morezzi, F. Quenda, M.L. Moretti, 2016. *The CIPA Database for Saving the Heritage of Syria*. The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XLI-B5, 2016 XXIII ISPRS Congress, 12-19 July 2016, Prague, Czech Republic.

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