SAVE THE SYRIAN HERITAGE:

TECHNOLOGIES TO DOCUMENT PALMYRA

AND ENDANGERED WORLD HERITAGE

INTERVIEW TO YVES UBELMANN, ICONEM'S CEO

By Redazione Archeomatica

Fig. 1 - Yves Ubelmann and Philippe Barthélémy

Iconem is a French start-up created in 2013 by Yves Ubelmann, an architect specialized in archaeology, and Philippe Barthélémy, an aeroplane and helicopter pilot. The company is involved into the documentation of major archaeological sites in the middle-east. The Iconem's team is composed by architects, engineers and graphic artists which are specialized in 3D production.

The french start-up has made a name for itself by taking on unprecedented technological challenges, including the complete modelling of Pompeii as well as scanning archaeological sites in Syria, Afghanistan, Iraq and Haiti. All of these plans will soon be available for the general public online on a special platform which will constitute a unique virtual archaeological encyclopaedia.

Using the latest technologies and procedures, drone photography and photogrammetry, Iconem works to preserve unique archaeological heritage sites worldwide, with the aim of keeping their memory alive for future generations. Recently, Iconem has been working with the DGAM (Direction Générale des Antiquités et des Musées – the Syrian Directorate- General of Antiquities and Museums) to digitally reconstruct Palmyra as part of "Syrian Heritage"

Fig. 2 - Theater of Palmyra_IconemDGAM.

project. The project intended to create an extensive database of 3D archaeological information on threatened Syrian heritage sites. Just a few days after the liberation of Palmyra, Iconem visited the devastated ancient city to carry out the first 3D survey of the damages.

Iconem realized survey to produce 3D models of the site in order to help scientists from all over the world to study and understand the ancient city damages. Iconem has already produced an initial 3D model of the temple of Bel which shows the damage suffered by the building, available online on Sketchfab.com.

We asked Yves Ubelmann, Iconem's CEO, few questions about the Palmyra project.

A -   How did the project come about? Why did you choose to focus on that region?

When the conflict in Syria started, foreign archaeological missions had to leave the country. I was really sad to see syrian archaeologists left behind. They operate with very limited resources, trying to protect heritage sites from destruction. As an architect specialized in archaeology,

I have been working in the Middle East for quite a long time and I tightened close relationships with the Syrian Directorate-General of Antiquities & Museums (DGAM). Thus I really felt the necessity to bring all the support and expertise I could. Iconem proposes a very efficient tool to save the memory of archaeological sites through 3D scanning. We use a process called photogrammetry, where thousands of pictures are taken and then processed by computers to create 3D model of an archaeological site.

Y.U. - It was simply natural for us to share this technology with syrian archaeologists. In 2014, we launched a first project with the DGAM, helping archaeologists to digitalize the "Krak des Chevaliers" (a massive citadel on the UNESCO World Heritage list) which had been damaged by war. Since fights were ongoing, we helped DGAM from Paris, and provided them with instructions about the photo shooting protocol. DGAM members sent us the pictures through web servers and we start to process them using our algorithms. After this first step, Iconem's team went to Syria in December 2015 to extend the project. The
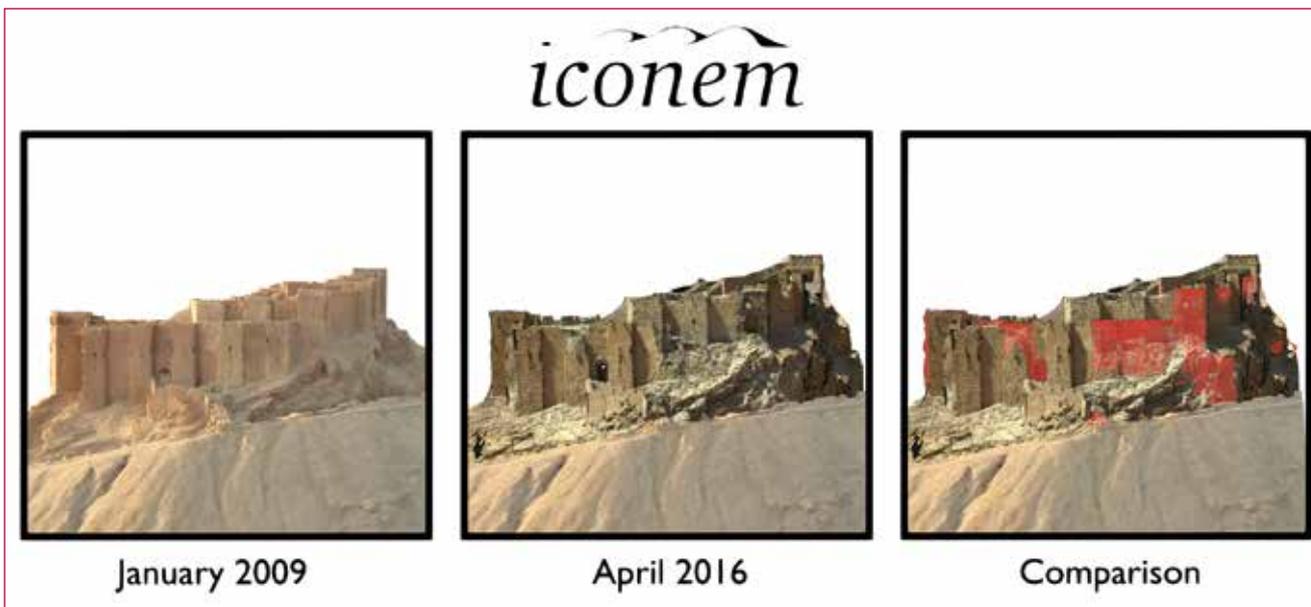
Fig. 5 - 3D Model of the Citadel of Palmyra on Sketchfab.

"Syrian Heritage" project was born. We could provide a more thorough training to our DGAM counterparts. We were able to digitalize 11 sites. Their memories are now saved forever. If they are damaged or destroyed, our tool will make restorations easier, and will make sure their knowledge is not reduced to ashes.

A - We all know about the Million Images Database, for example, as well as New Palmyra, and a few more digital archaeological projects. Could you tell us why Syrian Heritage is such a unique project?

Y.U. - It is great to see all these initiatives, people working hard to preserve sites under threat of disappearance. To protect archaeology in this part of the world, there must be as many organizations as possible working towards this common goal. It is also important to see a wide array of different approaches, all characterized by their own features. Now, if we have to differentiate "Syrian Heritage" from other initiatives, I would say that "New Palmyra" and "Million Images Database" are "remotely supervised" programs, while we are present on the spot, in Syria. Besides asking general public to collaborate and provide images, we are present on the ground among archaeologists. Our experience taught us that results are often better when the mission is achieved by a small number of very well trained and equipped professionals, rather than by a large number of contributors, who may not have the same level of equipment and expertise. One single person during the fieldwork can accomplish true miracles – capturing a wide area in a record time - when equipped with the right tools. We are also blessed with our own proprietary technology, which is a result of a partnership with a large French research center INRIA. This strategic partnership provides us a technological advance in the field of "image based modeling".

A - Nowadays, in this threatening climate for cultural heritage and world monuments, which is the role of digital archaeology? And which are the limit of these technologies?

Y.U. The unquestionable strength of digital archaeology is its capability to save the knowledge and memory of an ar-

chaeological site. This ensure an unvaluable tool for researchers, historians and archeologists, and beyond them, for the general public. It is also a great way to make sure that their memory will be passed on from generation to generation. Modern tools such as drones dramatically reduces the time allowed to fieldwork and make us capable to capture various scales of a site simultaneously, while our brand new computer provide incredibly precise resolutions, often accurate to the millimeter. Digital archaeology has recently made light-year jumps and is about to make new ones in the coming years. However, digital archaeology cant accomplish miracles. If a scanned monument that is reduced to, its digitalization may not be enough to reconstruct it. Indeed, a digitalization only captures the "outer envelope" of the monument, and not the inner materials' composition. Again, technologies are continuously improving, and I am sure groundbreaking and disruptive advances await us!

For further information about ICONEM visit: www.iconem.com

Abstract
An interview to ICONEM on the role of digital technologies used to preserve endangered cultural heritage, with a particular eye on syrian cultural heritage. Still at the moment the French start-up is working directly on the field to preserve monuments from destructive madness of the war. In order to pursue its goals, ICONEM has gained profitable relations with Directorate General of Antiquities Museum (DGAM), which provide them all the necessary support on the territory.

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