digital heritage

Using 3D Reality Capture to Improve Heritage Site Status

The AEC industry understands the value of having good documentation, from construction through to long-term facilities management; this is partly why BIM is being rapidly adopted and LiDAR is used to inform it. Cultural heritage experts also recognize the importance of documentation for heritage site management; as Cleere, Trelogan, and Eve said in 2006[1]: "[The] recording of a site's current conditions is a fundamental first step … and widely accepted as a prerequisite for any conservation and management plan."

Tangentially, the operational guidelines for ICOMOS (UNESCO's primary heritage advisor) states, "Each [UNESCO World Heritage] nominated property should have an appropriate management plan". Thus, to be considered by UNESCO, sites need developed management plans, and good management plans come from good documentation. For those of us in the industry, we may expound: the best documentation is 3D scanning!

It seems heritage authorities are in agreement. It is a growing trend to supplement heritage management plans with 3D data, particularly to improve nominations for heritage listings (e.g., UNESCO's World Heritage List, US National Register of Historic Places, and other national/NGO heritage listings). The *Scottish Ten* (S10) initiative assisted the Archaeological Survey of India (ASI) in this fashion. In 2011 the S10 team digitally preserved Rani ki Vav in India. Rani ki Vav had been on UNESCO's tentative list since 1998. In 2012 ASI presented a dossier to UNESCO, including a management plan drawing from the new, precise 3D documentation data available to the conservators. In June 2014, UNESCO announced Rani ki Vav had moved from the tentative list and was *officially enlisted*.

3D mesh model of the intricate Hindu iconography found at Rani ki Vav in India, generated from 3D scan data. IMAGE BY SCOTTISH TEN AND THE CENTRE FOR DIGITAL DOCUMENTATION AND VISUALISATION.

In the US, University of South Florida's AIST has been helping nearly a dozen historic sites update their National Register status with new preservation and management plans, including *Fort Matanzas* and *Cape Canaveral*.

The *CyArk 500 Challenge* is also witnessing this trend. The University of Tehran has nominated five heritage sites in Iran for the Challenge. Of these five sites, three are on the tentative list for UNESCO World Heritage status. The University of Tehran wishes to include 3D laser scanning as part of the final dossier for enlistment, just as ASI did for Rani ki Vav.

It is exciting to see the value of 3D data capture being recognized by the heritage sector in such a significant way; not only to inform, but to improve, heritage listing status. This is the beginning of the paradigm shift for digital heritage preservation, but the metaphorical hill isn't surmounted yet. Dr. Nauriyal, Superintending Archaeologist of ASI's Shimla Circle district summarizes it well: "Digital archaeology is a successful technological revolution […] creating building blocks of the discipline for the present and future", yet, "the future challenge is to make these technologies widely available to all cultural sites, and store and share the information with students and research scholars." No small challenge, certainly, but the paradigm shift is happening and we must continue to push forward! ■

[1] Cleere, C. Trelogan, J., and Eve, S. 2006. Condition recording for the conservation and management of large, open-air sites. *Conservation and Management of Archaeological Sites*, 8(1): 3-16.

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