Heritage Information Management Package (HIMP) - Technology and experience driven approach towards efficiently managing India’s built heritage sites

Krupa Rajangam and Pankaj Modi, Conservation Architects
Vishweshwariah Technological University and Saythu...linking people and heritage

1. Introduction
Heritage Information and Management Package (HIMP) is a personal initiative of the authors. It is a customizable information and management package particularly developed to cater to the requirements of heritage site conservation and management by the Archaeological Survey of India (ASI) - India’s premier national organization in protecting, conserving and managing the nation’s built heritage.

Based on their experience of working with such national heritage management organizations, the authors observed certain endemic challenges towards efficient and effective site management and conservation. They considered these challenges as opportunities and developed HIMP with the aid of technology in the hope that it would help rationalize the conservation process.

2. Aim
The authors worked towards developing HIMP as a conservation tool rather than a pure data management tool and successfully demonstrated it to ASI using one of their sites, the Boganandeeshwara Temple complex in Nandi village.

3. Description
3.1. The site
This central government protected site consists of a significant Dravidian style temple complex built between the 9th and 15th century AD in an enclosure of
about 30,000 sqm or 7.4 acres. Within it the principal temple block forms the western boundary with a prakaara (circumambulatory pillared passage) on the other 3 sides and main entrance to the east. The entrance pathway leads to two mahadwaaras (main gateway) and the temple proper (a twin temple) with a couple of kalyanis (ritualistic temple tanks), choultries (communal halls) and mantapas (pillared pavilions) enroute, including a sabha mantapa (royal audience hall).

Each of the twin temples has a garbhagriha (sanctum), sukhanasi (ante chamber) and navaranga (pillared hall) with Nandi mantapas (pillared halls) in front. Kalyana (marriage) and vasanta (spring) mantapas are associated with the large kalyani.

Few of the mantapas have been dismantled and material stacked for reconstruction. Structural repairs to outer prakaara are ongoing and it is proposed to restore the kalyanis. Recent works on site including stone cleaning and waterproofing wherein the authors involvement was Documentation and Condition Mapping of the outer prakaara, developing work phasing strategy and a maintenance manual for the complex.

### 3.2. HIMP

The authors compiled consultants’ written reports like those mentioned above and record of works for each site including periodic findings, conservation status, drawings, 3d models... into a comprehensive data set for HIMP. They then layered the conservation tools they developed over this data set. For the purpose of the demo the authors worked on Skyline’s Terragate and TEP (Terra Explorer Pro), a web-enabled 3D GIS software, which was specially developed / customized by the authors’ GIS developer to suit their requirements.

The authors understand from their developer that unlike other GIS softwares, Skyline provides a full Application Programming Interface (API) that enables one to both easily customize the user interface according to one’s requirements and build one’s own 3D web application. Below are largely self-expla-
The general web interface of HIMP with both map and text based view - query entered for Boganandeeshwara temple

Satellite view of Boganandeeshwara temple complex with overlay of geo-referenced photos and services (parking, ticketing, museum and so on…)

Logging in – user - Superintending Archaeologist / Regional Head and icons on view after log-in – past and ongoing works, reports and archival material, Instructions and Works Query
natory screen shots explaining some of the key features of HIMP.

4. Results
The demonstration was presented to State (Hindu Endowment Board), National (ASI) and International (WMF-World Monuments Fund) organisations working in the cultural heritage sector. Feedback was positive at all levels given the initiative taken i.e. tying experience with technology, having a single point source of information about a site giving one a comprehensive idea of its current state, closing the gap between site and office, the way HIMP layers information across hierarchies and its infinite scope for expansion to accommodate all types of data. However, reactions to actual implementation within these organisations were varied. Reservations were expressed mainly in terms of current staff’s capability to effectively and efficiently make use of HIMP.

5. Discussion
The authors consider that the above could be because efforts to utilize technology to assist site management are generally unknown. State and national organizations tend towards basic database packages and focus continues to be on solutions to aid and enhance visitor experience of built heritage. Utilization of technology towards recording and documentation itself is minimal and HIMP takes it a step further to include conservation. Here it is noted that the authors consider recording and documentation to be the first step of site management and conservation. Some challenges and opportunities in the development of HIMP as a customizable conservation tool are noted below,

• A need to clearly understand the organisational structure. For example, in the case of ASI, the organizational hierarchy is centralized and bureaucratic; decision making takes place at a number of levels. Real time transfer of information and decisions are thus both time-consuming and laborious. As a result, conservation planning and resource allocation tend to suffer. There are practical difficulties in monitoring sites on a regular basis due to limited staff and remote location of many sites.
Hence HIMP as a package, which integrates all types of trans-disciplinary data on a particular site and help speed up the decision making process. Further the hierarchy of log-ins and type of information available to view and edit at each of these hierarchies is based on the decision making powers at that level. Thus the SA (Superintending Archaeologist) is able to send instructions to his subordinates through HIMP (the system sends an email as a backup). The subordinates are able to view instructions on logging in and respond to them.

- Knowledge and understanding of the nature and phasing of works generally carried out by the organization.

Thus, in this case, the creation and development of appropriate tags for nature of works i.e. urgent, necessary, desirable and type of works like flagging, waterproofing and so on, i.e. works generally carried out by the ASI, to help rationalize conservation decision making. For example the SA can either query urgent works / waterproofing works / urgent waterproofing works across all sites under his jurisdiction or within one site from the desk. HIMP also shows geo-referenced work tags and images on plan for each query. This would assist resource allocation while biannual work updates would help the SA monitor works progress more effectively. Further HIMP enables the user to read measurements (L, B, H and Area). This aids development of Bill of Quantities for different items of works.

- General awareness of the organisation’s current technological needs.

Thus, awareness of recent developments in all ASI Circles to reach out to more to public, make information available online resulted in opting for a web-based public interface for HIMP.

The authors conducted an online survey of cultural database systems when they first conceptualized HIMP. Internationally, English Heritage’s Pastscape and Cyark were notable examples, Pastscape for gathering all types of data and Cyark for its 3d modeling. However, most systems generally appear to focus on data integration and presentation rather than site management. Nationally, HWAMA (Hampi World Heritage Area Management Authority) uses GIS but just to manage data within the Hampi World Heritage boundary (core and buffer zones). Baig A. (pers. comm. June 2013) Representative India for WMF made the authors aware of a system called ARCHES being developed by Getty in collaboration with WMF. Comparing the two, Baig felt HIMP could

Unique features include, 3d modeling over the footprint, overlay of IP camera live feed from site, CAD drawing overlay over image
be considered a rung higher since it attempted to integrate conservation and site management with data management.

6. Conclusion
The authors could successfully demonstrate HIMP as a conservation tool rather than a pure data management tool. Consequently, the database became a component of the package rather than the result. Further, as demonstrated, they were able to develop a completely customizable package, one which can be easily adapted to the needs of a particular cultural management agency’s organizational, jurisdictional and site management structure. The use of GIS technology makes it practical to collaborate within and across cultural management agencies.

7. Significance
The authors firmly believe that technology is the way forward as it is useful in efficient and effective data management and informed decision making. They hope that one of the organizations, to whom HIMP was demonstrated, will take it to the level of actual implementation. In view of the mixed response to implementation the authors have suggested suitable capacity building workshops at different levels to train agencies to maintain and update HIMP internally.

Anticipated results as demonstrated were reduction in existing gaps in site management and aiding cross-disciplinary use of data. Since the tools assist concerned authorities to make informed decisions towards resource optimization, material and manpower disbursement and financial allocations across sites, it would simplify the task of the country’s premier agency in management and thus conservation of cultural sites. In due course it would improve accountability and transparency in site management, making it more sustainable.

Acknowledgements
The authors would like to thank RSI Softech India Pvt Ltd’s Anil B and Adiga S for their complete technical support and the Superintending Archaeologist, ASI Bangalore Circle for encouraging them to develop a working model of HIMP.

Notes
1 www.pastscape.org.uk/
2 www.cyark.org/