

Cultural heritage online

VIRTUAL MUSEUMS: Online, immersive, panoramic and 3-D environments to draw the young

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WHEN was the last time you visited a museum?

For many Malaysians, it was when they went on a school trip with a busload of friends. Many are not keen on museums which are often viewed as mausoleums that contain boring, old objects and materials of cultural, religious and historical significance but which are no longer relevant today. On top of that, the architecture of some museums may present a somewhat exclusive image which discourages visits.

This perception mars the fact that the museum as an institution — through its artefacts and displays — tells the story of man the world over and how humanity has survived in its environment over the years. It houses creations by nature and man that reflect the dynamics and change in society — creations which are critical resources that could assist future generations to understand and appreciate their history and culture, and take pride in the achievements of their forefathers and take all that knowledge in striving forward.

But what would draw the public — especially the younger genera-

tions — to museums to appreciate the immense diversity of our cultural heritage?

For Dr Tengku Siti Meriam Tengku Wook, a senior lecturer at the Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia (UKM), the answer lies in technology.

"We live in a time where there is rapid advancement in technology. New tools and technologies have exponentially broadened our access worldwide and this gives the possibility for the museum to deliver information in new ways to those who cannot visit in person," she said.

"Digitising the collections and making them accessible online will speak to digital natives who expect to be reached online. And this will hopefully help pique an interest in heritage which is severely low in our country."

Working together with UKM's Multimedia & Usability Research Group and in collaboration with the Terengganu State Museum Board, Tengku Siti Meriam is the project lead that implemented the Terengganu Virtual Museum — which was launched last month.

A first for Malaysia, the virtual museum (www.fram.ukm.my/museummaya) allows a panoramic virtual walk-through of the Terengganu State Museum — the largest in Southeast Asia and home to Batu Berarut



Tengku Siti Meriam (left) and research assistant Mardiah Ibrahim discuss ways to enhance the website.

Terengganu (Terengganu Inscription Stone), the oldest artefact with ancient Jawi script — with three-dimensional 360-degree manipulation and viewing of digitised images copied with detailed information of scanned artefacts.

The virtual museum showcases eight out of nine galleries — Natural History, Textile, Royal, Craft, Islamic, Natural Resources and Economy, Seafaring and Trade, and Fisheries and Marine. It also currently features 207 of the museum's 33,000 artefacts.

The term 'virtual museum' has many definitions. Our definition is a museum we can immerse in using non-immersive methods without the need for special equipment or com-

plex hardware. By just using a mouse or touchscreen, we can be in an environment that is like the actual situation and have an experience similar to a real-life visit. It is more economic in terms of cost compared to using high-tech equipment. And the virtual museum can be accessed from anywhere and anytime as long as there is an Internet connection."

THE PROJECT

The idea of the Terengganu Virtual Museum originated from a master's thesis paper by the then UKM student Normala Rahim in 2010. Her research discussed the development of a conceptual model of a Virtual Museum Environment using the

Terengganu State Museum as a case study. It looked at user requirements and proposed that appropriate virtual reality techniques be applied in this environment.

A native of Besut, Terengganu, Tengku Siti Meriam felt that it was an opportunity to assist museums in the country — particularly the Terengganu State Museum — to be more forward thinking.

With the endorsement of the museum director, the faculty enhanced Normala's model and Tengku Siti Meriam presented the prototype to the museum board of directors.

"Through our analysis of virtual museums around the world — in particular The Virtual Smithsonian and The Virtual National Museum of the American Indian — we found that the virtual reality panorama technique, which can be manipulated, can increase interest in the public to visit the museum. As the young likes gadgets, we use them as the medium for them to step into the virtual museum," added Tengku Siti Meriam.

She applied for a RM210,000 grant under UKM's Economic Transformation Programme Research Fund Scheme to carry out the project. The grant covers the preservation of the cultural heritage and artefacts which can be displayed digitally while kept in storage of the nation in a sustainable manner.

The project kicked off in February 2014 with the aim of sharing the rich heritage of Terengganu and making the Terengganu State Museum a pioneer in online museums in the country while generating income. Twenty to 30 per cent of the artefacts are planned for virtual viewing. A nominal fee is charged for a more detailed view of an artefact.

"UKM is the developer, consultant and service provider of the project. A team of 12 from the Multimedia and Usability Research Group works on the project."

The team first analysed user requirements in terms of human-computer interaction. Next, the design process took place. Then data was compiled, a database/repository was set up and coding was written.

"We did a cognitive walk through with eight experts — curators and academicians — to look at content, delivery, layout and presentation of the system. With their feedback, we redesigned the system. We did a test run of an exhibition with the public and looked out for efficiency, satisfaction and effectiveness."

The website of the virtual museum is currently hosted on a server located in UKM but will be ported over to a server housed in the museum soon.

"We plan to digitise the images of 400 artefacts that will be put into the expandable repository. We will teach the museum staff to process the images of the other artefacts and operate the system."

Apart from the virtual museum, the team also had other deliverables such as workshops. "We produced a six-chapter book titled *Kelestarian Warisan Budaya* published by UKM. Seven papers were published in the *Asia Pacific Journal of Information Technology and Multimedia*. We plan to present our findings at conferences."

UKM owns the copyright on the virtual museum model and system and is in the process of getting a patent for the process of the activities carried out by the team.

"The technique we used for the manipulation of the artefacts is not new in virtual reality — the patent is



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Tengku Siti Meriam Tengku Wook, senior lecturer at the Faculty of Information Science and Technology, UKM



Research assistants Mardiah Ibrahim (right) and Tengku Nurfarisya Tengku Seharuddin preparing equipment for 360-degree photography.



A digital display of an exhibit.



Tengku Zaihan Che Ku Abdul Rahman at the launch of the Terengganu Virtual Museum.

LIST OF ACADEMIC OUTCOMES

PUBLICATIONS

(Index proceeding)
Norazma Khamis, Tengku Siti Meriam Tengku Wook, Nor Azan Mat Zin, 2013, Developing Conceptual Model of Virtual Museum Environment Based on User Interaction Issues, *IMC 02: Lecture Notes in Computer Science*, Springer, 95. Science Citation Expanded, pages 253-260

INNOVATION/INVENTION

IP: Copyright: Persekitarian Museum Maya, Tengku Siti Meriam Tengku Wook, Nor Azan Mat Zin and Norazma Khamis, Multimedia and Usability Research Group, Centre for Software Technology and Management, Fakulti Teknologi dan Sains Maklumat, Universiti Kebangsaan Malaysia (UKM). Apply through application for Technology Opportunity funded by Innovation Unit, UKM. File number: UKM13.29/108/2/536. Submitted on Sept. 18, 2012

GRANTS THAT ARE CURRENTLY ACTIVE

ETP-2013-057, Project Leader: Tengku Siti Meriam Tengku Wook, Sesi Kutub dalam Persekitarian Museum Maya. (RM210,000). March 2, 2014-Feb 2, 2016

SEMINAR/WORKSHOPS

Symposium on ICT in Cultural Heritage 2016, Lembaga Museum Negeri Terengganu, Feb 1-3, 2016

for context of use. It is a mixed technique of virtual reality and visualisation of information."

MOVING FORWARD

At the launch of the Terengganu Virtual Museum, the State Tourism and Culture Committee deputy chairman Tengku Zaihan Che Ku Abdul Rahman (who represented Terengganu Menteri Besar Datuk Ahmad Razif Abdul Rahman) expressed appreciation for the creativity of all parties in the realisation of the 3-D imaging of artefacts.

He said the virtual museum is beneficial to all segments of society in appreciating the history of civilisations and is the catalyst for smart partnerships in the country.

"I am confident that this system will bring a transformation in access to information in this state in particular and the country in general," he added.

Tengku Siti Meriam has more plans for the museum. She and her team are developing an English version of the site which is currently in Bahasa Malaysia only.

"We are also planning a mobile version so that it will be truly accessible from any gadget. On the cards is gamification based on the contents of the museum. Users can enjoy our cultural heritage without realising they are learning."

