Facilitating national cultural research into historically-significant textile-based heritage artefacts through the application of high-end photogrammetry techniques to create a transformative digital collection of three-dimensional datasets.

Professor Gavin Sade, Associate Dean (Teaching and Learning) QUT Creative Industries Faculty
Dr David Pyle, QUT Creative Lab Fellow, Maria Cleary, Curator Qld Performing Arts Centre Museum

Queensland University of Technology, Brisbane, Australia, g.sade@qut.edu.au
Queensland Performing Arts Centre Museum, Brisbane, Australia

BACKGROUND

The science and technology for obtaining accurate information about physical objects by interpreting photographic images and scanned data (LIDAR) has well-known applications in geology, forestry, archaeology, engineering, construction, computer games and movie-making. But Photogrammetry also has potential to revolutionise collection, analysis and dissemination of research data across the Galleries, Libraries, Archives and Museums (GLAM) sector.

Collecting institutions face compounding challenges in their ongoing role as caretaker/archivists of ageing fragile and environmentally-sensitive artefacts. Textiles and artefacts based on organic materials are the most sensitive and have the shortest life spans. Be this a garment from the 1930's or a woven basket - such artefacts are far more prone to damage by their environment and human handling than objects of stone, steel and wood. Exposure to light and human interaction places these collections at increased risk, and compromises the ability of institutions to provide researchers and the public with access to important artefacts from the national heritage. The delicate nature of these items makes it difficult to capture and experience them digitally.

QUT has recently established Australia's highest resolution photogrammetry, 3D scanning facility. This facility deploys over 80 Digital SLR cameras and powerful computational resources to create extremely high-resolution textured digital models of human scale artefacts and preserve their unique characteristics. Images are taken instantaneously so the system is ideally suited to "flowing" artefacts i.e. ones which are not solid and immovable. This applies particularly to garments but equally, there are many other artefacts in Australian collections that also have these properties.

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QUT is using this new facility as the catalyst for a national conversation which sets out to:

− Identify creditable leaders and key stakeholders to oversee development of the proposed new digital cultural heritage collection;

− Devise technical and governance frameworks to support this collection;

− Establish content strategy and workflows required to support extensive digitisation of textile-based and fragile collection artefacts;

− Develop technical designs and specifications for a mobile, flexible photogrammetry system that can be assembled at stakeholder institutions to enable digitisation without the need for transporting valuable collection items to a dedicated facility;

− Explore options for online access to digital artefacts that accommodate technical, intellectual property and FAIR issues to ensure researchers, the public and school students retain access to the cultural heritage knowledge embedded in fragile objects; and,

− Develop models and associated legal and contractual instruments to enable institutional participation.

PROJECT APPROACH

A part of the ARDC Data and Services Discovery Activity program, this project conducted a small-scale pilot project to digitise, archive and re-present a selection of artefacts from prestigious local institutional stakeholders. The team explored challenges related to establishment of a transformative collection ranging from technical workflows to governance structures that enable institutional participation. Activities included:

− Small-scale pilot project to digitise selected artefacts from project partners;

− A series of workshops with national stakeholders;

− Collaboration between QUT and other experts in eResearch to develop a framework for management and wide-spread dissemination of collection data according to FAIR principles; and,

− Piloting a new interface for access to collections that meets the requirements of national stakeholders.

STAKEHOLDERS

The project consulted with a range of collecting institutions that face the same challenge – archiving sensitive textile/organic materials and providing public/researchers with access to important artefacts.

The pilot project includes garments from the Queensland Performing Arts Centre Museum (QPACM) whose collection holds numerous significant stage costumes, including several created for opera legend Dame Joan Sutherland.

Further, a wide range of institutions across Australia collect similar artefacts. QUT's photogrammetry unit worked with the Museum of Brisbane (MoB) on a preliminary trial to document elements of the Eastern-

Pearson fashion collection in 3D. Collecting institutions consulted during the project include:

National Gallery of Victoria (Fashion collection)   Arts Centre Melbourne (Performing Arts collection)

Australian Museum of Clothing and Textiles (Regional)   Australian War Memorial (Military Uniforms)

Australian National Maritime Museum (Naval Uniforms)   Powerhouse Museum (Dinnigan Collection)

QUT also engaged with key university partners that have synergies in respect to research – either in terms of digital collections, or studies that involve use of such collections. Lead academic and technical direction came from QUT's Creative industries Faculty and eResearch team.

PROJECT OUTPUTS

Key outputs of the pilot include:

- Digital models of selected artefacts from key stakeholders (QPACM);
- A technical white paper detailing the digitisation approach and technical designs that enable institutions to establish their own capabilities;
- Paper describing content strategy and governance framework required for institutional participation, covering issues ranging from IP to provenance; and,
- A series of workshops with potential stakeholders to develop the above frameworks.