James Smithies, 'Federated Digital Archives and Disaster Recovery: The Role of the Digital Humanities in Post-earthquake Christchurch'

Long paper

The Canterbury region, in the South Island of New Zealand, experienced two major earthquakes during 2010 and 2011. On September 4 2010 a magnitude 7.1 quake struck at 4.35 am, causing widespread damage and two serious injuries. Significant aftershock sequences followed. On February 22 2011 a 6.3 magnitude quake hit at 12.51 pm. This earthquake caused severe damage and resulted in the loss of 181 lives, making it the second worst natural disaster in New Zealand history. Like the first, the second quake has been followed by thousands of aftershocks, including two significant earthquakes on June 13th 2011.

The University of Canterbury CEISMIC Canterbury Earthquake Digital Archive draws on the example of the Centre for History and New Media's (CHNM) September 11 Archive, which was used to collect digital artefacts after the bombing of the World Trade Centre buildings in 2001, but has gone significantly further than this project in its development as a federated digital archive. The new University of Canterbury Digital Humanities Programme – initiated to build the archive – has gathered together a Consortium of major national organizations to contribute content to a federated archive based on principles of openness and collaboration derived directly from the international digital humanities community. Two primary archive 'nodes' have been built by the Ministry of Culture and Heritage ('QuakeStories') and the University of Canterbury ('QuakeStudies') to collect content from the public and researchers respectively, and a 'front window (www.ceismic.org.nz) has been provided by the University of Canterbury to bond the Consortium, raise funds, and provide a platform for future aggregated search functions, which will be powered by New Zealand's bespoke cultural heritage schema maintained by Digital NZ. Other nodes in the federation include The Museum of New Zealand Te Papa Tongarewa, the National Library, Christchurch City Libraries, NZ On Screen, and the Canterbury Museum. The aim is to create a permanent record of digital objects for both present and future generations. To this end the technical requirements for QuakeStudies have been reviewed by the National Digital Heritage Archive with a view to ingesting significant subsets of content (if not creating a complete dark archive) for long-term preservation. Significant attention has been paid during the design process to multi-cultural and multi-lingual requirements, to ensure content from a broad range of New Zealand communities can be ingested and researched. Future development aims to create a bi-lingual interface in English and Māori.

The story behind the UC CEISMIC Canterbury Earthquake Digital Archive goes somewhat further than other similar digital archives. Not only is it being used to initiate New Zealand's first Digital Humanities programme, but it hopes to fulfil an important role in the cultural and intellectual recovery of the Canterbury region following the earthquakes of 2010 and 2011. New Zealand is a country with significant levels of technology uptake, and the vast majority of content produced following the earthquakes was created in digital form. As the central focus of the recovery efforts was, of necessity, focussed on the physical and spiritual well-being of the Canterbury public, it was quite possible that large amounts of valuable content would be lost to future generations. This altered somewhat after the initial phase of critical response ended, only to be replaced with new issues. Various institutions began gathering digital content into their separate repositories, but no co-ordinated approach was taken, creating a situation where disparate 'nodes' of content might be stored with little possibility of sharing and reuse. It was becoming possible that, although terabytes

of content would be captured, future generations of citizens and researchers would need to go to myriad different archives, each with their own metadata standards, in order to get a complete picture of events. Aside from the obvious inconvenience of this, such a situation would seriously constrain the possibility of sophisticated downstream data analysis and content reuse.

The digital humanities ethos of sharing and open collaboration has had a significant positive effect in this context. Consistent recourse to the digital humanities' message of collaboration has fostered a culture of trust that has in turn allowed an extremely broad Consortium to be initiated. Although there is little chance that the resulting federation will be technically seamless, this has allowed potential conflicts of interest to be put aside and technical discussions to start at a relatively early stage in proceedings, significantly enhancing the chances of developing a highly functional distributed archive. Additionally, the digital humanities' emphasis on open communication and community engagement has fostered a healthy culture across the federation, which has contributed significantly to the success of the project. This is represented most forcefully in the use of not only crowd-sourcing techniques, but a mobile recording studio fitted out with video and audio equipment, that has been taken to the suburbs of Christchurch to record public reaction to the earthquakes. This pro-active approach, coupled with robust attention to project structure, governance and human ethics, has created not only a digital archive, but a community of friends and partners, and a vibrant new digital humanities programme.

The project is also unusual for a digital humanities project in it becoming a flagship project for the broader university. Although the project and research teams are predominantly from the arts and humanities, close collaboration is also occurring with computer scientists, health researchers, social scientists and economists. As with the interest from New Zealand's national heritage agencies, digital humanities principles of collaboration and sharing, combined with well-considered metadata ontologies and system architecture, has prompted the project to occupy a central position in the post-earthquake recovery landscape. More than just an IT project, the CEISMIC Canterbury Earthquake Digital Archive is providing local, national and international public and researchers with a forum for discussion, organization and collaboration as well as a heritage asset in itself.

This paper will outline the project and present a model that will hopefully allow our approach to be reproduced in similar post-disaster recovery situations. Key to this model is the conscious use of digital humanities methodologies such as crowd-sourcing, community building and attention to open metadata ontologies and open access principles to create a robust and functional federated archive system. The model has several benefits, including the ability to develop a 'distributed nodal network' of archives and repositories independently, thus reducing the need for centralisation that would encumber development, but it requires a long-term vision and a strong governance framework to ensure the federation holds together and organizations feel comfortable sharing content. Similarly, while it offers excellent potential for teaching and research across the humanities as a whole, the relatively advanced nature of the project provides limited opportunity to involve students in system development. Instead, the project has created internships that will see students working as 'curators' on the research node in the federation, uploading content and taking responsibility for metadata quality and the integrity of manual procedures.

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