



PROJECT
bamboo

Demonstrator Report

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Project Bamboo Demonstrator Report

Summary

The Bamboo Demonstrators are a series of small to medium-sized projects that serve as a mechanism to explore and test ideas, structures, and technologies related to the core Bamboo challenge – *how can we advance the cause of arts & humanities research through shared technology services?* As the community came together to begin to address this challenge via the Bamboo Planning Process, the notion of demonstrators changed and developed alongside our shared understanding of the project. Initially conceived of as a mechanism for illustrating various technical capabilities, the demonstrators evolved into scholar-technologist partnerships. The results of these partnerships were tangible examples of the rewards, challenges, and open questions in the conversations supported by the Bamboo Planning Project.

In general, the UC Berkeley office coordinated projects which explored the impact of Bamboo ideas (modular design, interoperability, workspaces) on specific scholarly projects. The University of Chicago office coordinated projects which explored and illustrated how the same ideas (modular design, interoperability, workspaces) might be implemented, supported, and sustained. Once begun, the ongoing relationship between the demonstrator projects and the core planning process varied – some investigators were deeply engaged at workshops, while others found it more practical to communicate with touchpoints within the program staff. Many themes emerged in common between the projects and Bamboo as a whole, and these practical experiences brought particular clarity and specificity to the difficult and sometimes theoretical work of designing scholastic infrastructure.

The foundations of the major deliverables of the Bamboo Technology Proposal, as well as the founding principles of the community, are evidenced in the demonstrators, which are described in greater detail below.

Prosopography Services

<https://wikihub.berkeley.edu/x/2YAAQ>

The Prosopography Services demonstrator project initially planned to develop a prosopographic tool that would parse a corpus of cuneiform text transliterations for information such as personal names, activity and role markers and use this information in a graph-builder program to generate visualizations of the social networks preserved in the documents. The direction of the project shifted as a result of user feedback, when it became apparent that users wanted individual workspaces that allowed for permanent citation of data and data analysis. A preliminary architecture was built around this new concept.

The data in this project provided a number of challenges. The disparity in the kinds and quantity of prosopographical data contained in texts from different time periods underscored the need to accommodate/include corpus-specific data-fields and parameters. This, combined with scholars' concerns about maintaining the integrity of each data set associated with a particular authority in a given sub-speciality, were among the motivating factors that led to the reconceptualization of the project around the notion of workspaces.

PAIR/PhiloLine

<http://code.google.com/p/text-pair/>

PAIR and PhiloLine are two sequence analyzers for text, with the goal of identifying similar passages. The identification of similar passages is a common need for humanists working with texts, and the algorithms involved are related to those used in bioinformatics to identify related segments in representations of genetic data in very large databases.

PAIR and PhiloLine take slightly different approaches to sequence analysis. PhiloLine can perform alignments on all of the documents in a single PhiloLogic database or all of the documents in two or more PhiloLogic databases. The system generates either static result documents for each document, compared to all of the other documents in the collection or a structured database for further search and analysis. PAIR is a one-to-many aligner, designed to support identification of similar passages in an unseen document, typically submitted by an end user, to an existing document collection. The first versions of PAIR and PhiloLine have been made freely available for download, and can be used either in conjunction with the PhiloLogic analysis tools or re-used independently of PhiloLogic.

Spectral Imaging with a Single Picture

This demonstrator project was aimed at developing simple, inexpensive methods for recording high-dynamic-range spectrum images using standard consumer grade photographic equipment. The developers successfully modified a camera by putting a spatially varying filter in front of the camera lens and calibrating the spectral response of the camera.

The project demonstrated the viability of spectral imaging using modified consumer-grade equipment, but early results suggest that developing the filter in such a way as to minimize noise is a larger challenge.

Center for New Music Inter-arts Projects Library

http://cnmat.berkeley.edu/new_music

The Center for New Music Inter-arts Projects Library makes more than 20 years of audio and video material accessible on-line. This digital library allows users to navigate the site using rich metadata that has been added manually to each item. The site enables curators to present the facets of a composition piece (including score, audio, video, performances and instruments) together on a single webpage. A set of software tools were also developed as part of this project that apply statistical analysis to music, with the goal of enabling music scholars to retrieve and display information concerning large corpora of material.

The PI noted that audio and video conversion from a wide range of media (including DAT, ADAT, CD, audio cassette, Hi-8, DV, VHS, and DVD), and tagging that material appropriately with regard to related media, projects, people, subjects, techniques and software, was a major undertaking. The choice of what taxonomies and organizing principles to use was a challenge as significant as the technical issues surrounding media conversion.

Linguistic Mapping Project

The Linguistic Mapping Project aimed to combine the computational and analytic capabilities of GIS platforms with a browser-based data entry system for adding linguistic and spatial data, and an on-line interface for viewing the resulting visualizations. The developers successfully implemented this system, using data from Caucasian and Amazonian languages. Already, the tool has yielded new insights into language contact in the Amazon basin, and these discoveries have led to the formation of a multi-institutional research team that includes scholars from Europe and Australia that plan to pursue the topic further.

While the outcome of the project was successful, there were both legal and technical hurdles in the process. The developers discovered that their plan for publishing the SIL World Language Mapping System dataset ran afoul of the terms of use. While the open source Quantum GIS tools were chosen for the project, the limitations of independently developed plug-ins and bugs in the core system code made the developers reflect on the trade-offs involved in using open source software versus more mature commercial options.

Portable Durable Tele-immersion

<http://tele-immersion.citris-uc.org/>

This demonstrator funded a robust, portable Tele-Immersion system – which utilizes real-time 3D renderings of users – for use in a dedicated dance studio space. The creation of this space has inspired other University of California (UC) dance departments to implement similar setups, and tests have taken place between the systems at UC Berkeley, UC Merced and UC Davis to ensure compatibility. UC Santa Cruz and UC Irvine will be working with Berkeley in the near future to roll out systems of their own.

The project has expanded to include three main collaborators: UC Berkeley (Lisa Wymore and the Integrated Distance Lab and Ruzena Bajcsy and the 3D Tele-Immersion Lab), UC Irvine (John Crawford and the Embodied Media + Performance and Technology Lab at <http://embodied.uci.edu>), and Concordia University (Sha Xin Wei and the Topological Media Lab at <http://topologicalmedialab.net/joomla/main/index.php>). Affiliates to the project include: UC Santa Cruz, UC San Diego, UC Merced, and UC Davis.

The team is working with tele-presence technology (3D Tele-Immersion technology and real time streaming video technology built on a MaxMSP and Jitter platform) focusing on multi-location interaction for digital media performance and for more traditional research based applications. Utilizing pre-existing digital media labs and established Internet connections, a robust, codified, and easy to operate network of labs is enabling an entirely new way for campus researchers, artists, and scholars to connect. Participants are able to engage with one another through shared, real-time, streaming video data that is merged and projected into each participant's laboratory to create a sense of tele-presence. The system utilizes video, sound, motion capture, motion tracking, and body sensor technology to create a shared multi-user experience.

A primary motivation of the project is to contribute to the development of new paradigms for multidisciplinary applied research shared across the network. The project is sparked by the multidisciplinary nature of the performing arts and conducted by the collaborative team which is

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focused on cultural applications that inspire theoretical inquiry, increase collaborative potential across numerous fields, and change educational methodologies.

The primary objectives are: (1) to connect faculty and students from multiple campuses using a distributed “collaboratory” model, informed by existing expertise and experience; (2) to research and implement new systems and processes intended to establish an unprecedented level of inter-campus collaborative activity; (3) to demonstrate and disseminate these capabilities throughout the University of California system and with international collaborators. The core collaborators have been meeting regularly over the past year, building connections, sharing technology and hardware/software protocols, and testing networked performance. There will be a large-scale public demonstration of the team’s efforts shared in April 2011.

It is noteworthy that the primary objective is not simply to connect performers and audiences over computer networks. Rather, the research focus involves creating a new networked *infrastructure* that exists as a shared tool from which new artistic/research practices are facilitated. As with any innovation, existing institutional histories and protocols and training play a key role, but the focus of the team is on creating a truly collaborative tool that is based on dialogue with emerging digital technologies, from which we hope to discover new expressive forms, new ways of creating and sharing performances, new ways of engaging with other humanities-based researchers and artists.

As part of the process, the PI identified the need for weekly, in-person meetings between all parties involved to allow for the frequent exchange of ideas and ensure that the project is headed in the right direction. While there was initially a “language barrier” between the artists and technologists involved in the project (which echoes sentiments expressed elsewhere by faculty collaborating with technologists), goodwill and a shared vision helped break down that barrier over time.

Barlach Dynamic Bibliography

<http://barlach-biblio.org/>

This demonstrator project took a TEI-encoded bibliography of secondary literature about the German impressionist Ernst Barlach compiled by Professor Kent Hooper at the University of Puget Sound, and applied XSLT stylesheets in order to present the information using dynamically-generated sublistings on a cloud-hosted website. The development of the XSLT was a collaboration between Rick Peterson of Washington & Lee University, Quinn Dombrowski of the University of Chicago, and Jacob Jett of the University of Illinois at Urbana-Champaign. The website was initially launched using static HTML generated from the XML, and proved to be immensely popular with Barlach scholars in the United States and Europe. To enable Professor Hooper to revise the website himself, “Barlach 2.0” was launched on a server capable of dynamically processing XSLT.

The initial plan for the Barlach demonstrator was to develop a generic processing engine for TEI bibliographies. An in-depth investigation of Professor Hooper’s TEI revealed the extent to which even a bibliography developed by a single scholar can use a variety of conventions to encode the same information. The need for standards stricter than “P5 compliance” for any generic TEI processing system quickly became apparent. While XSLT tailored specifically to Professor Hooper’s own conventions was written for this demonstrator, the stylesheets will serve as a starting point for developing more generalized XSLT for use with bibliographies made available through TAPAS, a TEI publishing project.

Townsend Humanities Lab

<http://townsendlab.berkeley.edu/about>

The Townsend Humanities Lab demonstrator project developed a suite of digital tools to support interdisciplinary research and collaboration among Berkeley scholars and their affiliates. These tools are driven by Drupal, an open-source content management system, and include project organization and communication tools (event listings, file sharing, news broadcasts, RSS and Twitter feeds), as well as newer collaborative tools for text annotation, image annotation, visualizations, mapping, and collaborative authoring. Images, documents, audio and video files can be uploaded, shared, and placed in circulation among designated project groups within the Lab.

While the Townsend Humanities Lab was initially intended as a limited pilot project, it was quickly adopted by 30 projects. It is currently open to all Berkeley scholars and to others they may invite.

Video Embedding

Part of the Townsend Humanities Lab project, this demonstrator developed a set of streamlined procedures for embedding video clips into Word and PDF documents using open source software. The developers felt that a set of “best practices” would be better than a single tool to do the conversion.

The project PI assessed that while the technical challenges of video embedding have been overcome, more work remains to be done in creating venues for the circulation of work that combines text and video.

Media Ecology

The Media Ecology demonstrator, led by Professor Mark Williams of Dartmouth, aimed to develop web-based workspaces where scholars could find and import video from a variety of sources, add annotations that can be shared, tag videos using folksonomies and taxonomies from a wide range of disciplines, and group videos thematically into playlists. The initial plan also served as a way to present the video content available on the WGBH/Boston website in an environment more amenable to scholarship.

A mockup for the Media Ecology site was developed using Drupal, including a rudimentary external search function that allowed the user to search and import videos from YouTube from within the Media Ecology website. It soon became apparent that much of the the anticipated work of the Media Ecology demonstrator was already being duplicated elsewhere. WGBH/Boston was on the brink of launching their own website that added much of the Media Ecology functionality to their video archive. Furthermore, Columbia University had recently finished Project Vietnam, a private workspace that successfully implemented the vast majority of the tools that the Media Ecology demonstrator planned to build. The Project Vietnam team used Django, rather than Drupal, and they planned to release much of their code under terms that would allow the Media Ecology team to build on their work. Further development of the Media Ecology project continues at Dartmouth.

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Strategic Impact of Demonstrator Projects

Project Title	Modular design and reuse	Interoperability, conversion, adaptation	Work Spaces	Community
Prosopography	Illustrated the speed of innovation possible with modular software engineering.	Quickly revealed the challenges in working with tools and formats that do not interoperate.	Exemplified the kinds of analytical activities which are made possible only in a work space context.	
PAIR/PhiloLine	Evaluated and implemented modular design via multiple competing techniques.	Emphasized adding new capabilities to an existing analysis package.	Highlighted the value of leveraging existing digital text corpus	
Spectral Imaging		Explored challenges around leveraging existing technology for new purposes.		
Center for New Music Inter-arts Projects Library		Explored conversion of analog materials.		Highlighted the need for shared best practices around taxonomies and conversion techniques.
Linguistic Mapping		Grappled with limitations in both commercial and open source software.		Created shareable dataset for use by colleagues.
Teleimmersion		Adapted commercial technologies to new purposes.		Required community-building to bridge gaps in mutual understanding and translate between technologists and scholars.

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Project Title	Modular design and reuse	Interoperability, conversion, adaptation	Work Spaces	Community
Barlach Dynamic Bibliography	Demonstrated the value of standards-based technologies to allow for reuse beyond the original scope of the project.			Created by a network of community resources drawn from four different institutions.
Townsend Humanities Lab	Used an existing modular platform to build quickly, leading to rapid results.	Implemented and tested early version of Work Space at Humanities Center		Supports interdisciplinary research and collaboration.
Video Embedding				Explored best practices around the dissemination of material that combines both video and text.
Media Ecology	Explored public-private partnership challenges.	Illustrated the need to begin workspace projects on pre-existing infrastructure rather than starting from scratch.		