Wistfully Waiting No More: An Open Source, Exhibition Building Case Study

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ABSTRACT

The promise of virtual exhibitions has been attractive to faculty and staff at the University of Virginia (UVa[1]) for well over a decade.The use of Virtual Exhibitions is threefold: (i) 'Exhibitions' is a useful metaphor for publishing; (ii) 'Exhibitions' suggests curated collections and mixed media; and (iii) 'Virtual' suggests that this new form of publication is accomplished online. This case explores the current ways faculty and graduate students at UVa are meeting their needs as well as an earlier development effort of the Virtual Exhibition Tool (VET). Development on the VET continued for more than a year as part of UVa's response to the appeal of virtual exhibitions. At UVa, a large part of this need is now met using Omeka VisualEyes and WordPress.Several other solutions are also in use currently at UVa. All these solutions are being recommended by SHANTI (Sciences, Humanities and Arts Network of Technological Initiatives), a faculty-led center at UVa. Omeka is an open source tool for building online exhibitions. At UVa, Omeka is chosen to meet this need for online virtual exhibitions rather than to continue development of the VET. There are at least two other solutions being used for online exhibitions building at UVa that are also briefly analysed here. This paper explores these current solutions in use at UVa and outlines the lessons learned from them and from the earlier development effort on the VET.

Keywords: Virtual online exhibitions, virtual exhibition tools, omeka, WordPress

1. INTRODUCTION

Virtual exhibitions have been proven to be appealing to university of verginia (UVa) faculty and staff with a desire to build and publish virtual archives of their research often integrating a variety of media into their presentations.

1.1 Publishing

The metaphor of publishing is, of course, a central one in higher education. Several related and unrelated pressures are making conventional publishing difficult for scholars. As Dan Cohen, Director of the Center for History and New Media, notes, new alternatives to traditional publishing and peer review allow a number of things that are attractive to traditional scholars and are actually hampered under the more conventional publishing and peer review system[1]. Thus, scholars have begun to explore alternative online venues that meet these needs and allow them for some of the things that conventional publishing supported: exploring ideas, inviting feedback, engaging with colleagues, debating, and focusing expert and academic conversation, etc.

1.2 Curation

Curation is at the heart of a scholar's work. It encapsulates all of Unsworth's 'scholarly primitives'[2] discovering, annotating, comparing, referring, sampling, illustrating,a nd representing. Those scholarly primitives describe the essential activities of scholars. Unsworth's analysis sought to identify those essential elements of scholarly activity to assess the power and usefulness of web-based and digital approaches[2]. Curation, then, is an essential metaphor that invokes those most fundamental activities[3]. Many scholars are now finding web and digital tools are useful as a complement or an alternative to conventional scholarly work. If nothing else, the ability to curate a virtual exhibition, whether as a part of a class presentation or a presentation to colleagues or to the general public can free the individual scholar to make arguments and support them effectively without the cumbersome delays and roadblocks of actually having to make a physical display. The virtual exhibition can be a quicker and more effective alternative. In addition, the virtual exhibition can last longer than a physical one as well as having greater reach.

1.3 Mixed Media

Many scholars are exploring the ways that digital media enrich their scholarly work. Text-based and traditional scholars find that adding images, sound files,maps, etc., to their publications and presentations greatly enhances their work. Not only new questions can be asked and new arguments can be made, but also even traditional scholarly analysis and presentation can be made more compelling by integrating other media. Ben Ray, for example, has published work making new arguments about the 'Salem Witchcraft Trials' by interrogating and displaying maps of the localities that include rich layers of data about the subjects involved[4].

1.4 Digital Revolution

It is a commonplace to note that much of what happens in the academy is unchanged by the digital revolution. Academicians frequently joke that Socrates himself would feel much at home in most of the classes currently underway in higher education. At the same time, though, digital technologies have been a vital part of the work of a select group of scholars. The recent change, however, is that digital technologies have become both ubiquitous and easier to use so that increasing numbers of scholars want to integrate them into their ongoing research, teaching and outreach activities.

1.5 Virtual Exhibition Tool (VET)

In 2007, a collaborative group representing the library, faculty projects and the organisation responsible for computer support at UVa (ITC—Information Technology and Communication) came together to leverage their common interests in making virtual exhibitions easier at UVa. At the same time, they wanted to leverage their respective expertise and resources.

1.6 Statement of the Problem

Faculty members need to:
- Support lectures and new kinds of publications that they can use when collaborating or conferring with colleagues. This tool should be usable in two ways:
  (i) A linear 'ballistic' presentation for making an argument; and
  (ii) A more free-flowing presentation that providers responses to questions from the audience and spontaneous explorations of the complexities of the issue;
- Assemble, repurpose and store digital materials;
- Actively collaborate with colleagues;
- Create research environments for their students; and
- Maintain version control as they publish their evolving thoughts and discoveries.

2. CURRENT DELIVERABLES FOR VIRTUAL EXHIBITIONS AT UVa

As the VET project was being suspended, a new faculty led center was being established. That center is called as SHANTI[5] (Sciences, Humanities and Arts Network of Technological Initiatives) which has taken leadership (still in close coordination with the library and ITC) in delivering tools to meet this ongoing needs.

2.1 SHANTI and Digital Ecology

SHANTI was created in 2008, growing in part from a groundswell of support from faculty who wanted better support for digital work at UVa. The Vice President and CIO along with the Provost then made a strategic short-term investment to support this experiment, empowering this faculty center to see whether it is guided by faculties' inputs and priorities could find ways to grow the technical infrastructure more quickly and thereby free up the creative energies of faculty members. The metaphor that has emerged from this experiment is a 'digital ecology of tools'. This metaphor is meant to invoke a variety of things, among them dynamic change, tools that are both scalable and sustainable as well as invoking a new model, an alternative to conventional service provider/client relationships. As part of the work that SHANTI has undertaken, it has collaborated closely with the library and ITC in delivering several good and well-supported solutions for virtual exhibitions at UVa. These solutions are introduced in the SHANTI portal at www.shanti.virginia.edu. Examples can also be found in Appendix 1.

The tools for online exhibitions include: Omeka[6]; VisualEyes; and WordPress, which is branded at UVa as 'SHANTI Pages'. In addition, UVa continues to explore related solutions that would complement this need:
- ArtStor, in particular the 'Shared Shelf' initiative.
- An externally hosted server was necessary to make these tools available quickly, while UVa worked out the challenges of integrating the open source tools into its primary content management system, UVaCollab[7].
- UVa's use of Sakai[8] as CMS branded as UVaCollab. This tool meets much of the needs for storage and authentication.
- Kaltura for projects that need audio/video as part of their virtual exhibition.

Support needs are handled by a combination of:
- UVa knowledge-base and forum (wiki-based community-driven documentation)
- Traditional documentation by library and ITC

- Workshops offered by SHANTI, as well as by the library, ITC and schools
- SHANTI cohorts. Seminar-style groupings of faculty, staff and graduate students working collaboratively to both advance their skills and complete their individual projects while exploiting appropriate digital tools
- Web-based resources maintained by the sites themselves and their user communities

3. ECOLOGY OF TOOLS—SHANTI

The tools mentioned in Section 2 are part of an ecology of tools that SHANTI is integrating into the technical infrastructure at UVa. This effort, focused around the OM (Omniscient Metaframework) initiative as described here.

This project led by SHANTI and in close partnership with ITC and UVa library. The OM initiative aims to open up our university's digital ecology to the vitality of the world wide web.

Playfully invoking OM and the most sacred of Indian syllables, the OM Initiative signifies intent to think holistically about our smaller community as embedded within the broader social, intellectual, and digital universe (Fig. 1).

Figure 1. OM initiative flyer, November 2010.

Reflected in the following six aspects, the OM Initiative seeks to maintain the advantages of current computing environment-security, consistency, ease of maintenance, common space-while opening the gates to the most powerful and exciting tools available to scholars on the web for new levels of innovation and efficiency. The UVa OM initiative: 6 aspects of a transformative digital ecology for higher education are:

3.1 Welcome to New Collab

Go to www.uvamist.org. It's simple and powerful:
- One web address for UVa digital tools and worksites.
- One ID and one password to use for digital technology and online site access.
- One login to access multiple tools and sites
- One way for forming groups who work on sites with shared tools.
- Endless possibilities.

3.2 SHANTI Consultations and Presentations

One-time consultations with or presentations to UVa faculty, staff, graduate students, or undergraduate student groups will help users explore the advantages of the digital revolution in their work.

3.3 UVa Community Knowledge Base

If one is stuck or want to share new insights, go to the Knowledge Base (www.uvakb.org). The Knowledge Base is intended to be a user-driven community-based reflection of local tools and situations. Just sign in using UVa computing ID to solve problems and contribute solutions.

3.4 Community Tools and Platforms

Whether the work requires audio-video, online collaboration, mapping, blogging, language learning, or website creation, the OM initiative provides digital tools that are at the same time powerful, reliable and easy to use-at your fingertips. The following tools/facilities are available for users to exploit the authoring tool optimally:

- Audio-Video: (Kaltura and the forthcoming Drupal Media Base)
- Online discussion and commentary: (NowComment)
- Bibliography maintenance: (Zotero)
- E-Conferencing, online communication, and Online teaching: (Elluminate)
- Group social networking: (Drupal Commons Project)
- Interactive syllabus: (iSyllabus)
- Interactive visualisations: (VisualEyes)
- Ontologies: Creating structured, hierarchical, multilingual and annotated 'maps'of areas of knowledge for their own sake, and to index other resources (Knowledge Map)
- Place documentation: Dynamic mapping (GIS), map catalogs, gazetteer, essays on places, rich structured descriptions of places.
- Textual editions comparison: (Juxta)
- UVA language learning platform: (A combination of tools within the new Collab)
- UVa profiling system: (Fathom)
- Website creation: Three powerful systems with different virtues for creating and maintaining websites, from the simple to the complex (WordPress, Omeka, Drupal).
- Wiki Collaborative Text Production: (Confluence)

3.5 SHANTI Workshops

It offer beginners and advanced workshops in how to use digital technologies in academic work. One may work into the schedule, or make a special request.

3.6 SHANTI Cohorts

Groups of faculty, staff and students engage in ongoing exploration of specific digital technologies for their work. www.uvashanti.org covers a full list of Cohorts.

3.6.1 SHANTI Partners

SHANTI partners are organisational units and sectors of the university community (including ITC, the UVa library and technology groups in schools such as the Engineering School, faculty centres like NINES and the Tibetan Himalayan Library, ASCIT, and many individuals).

3.6.2 Options to Participate

• Going to www.uvamist.org to explore the new tools.

• Contributing to the ever-expanding UVa Knowledge Base.

• If you are a technologist, contacting us with your interests and ideas.

Although the OM initiative is obviously designed to meet a much larger set of needs than just virtual online exhibitions, it nevertheless meets that need with several others. First and foremost in meeting this need for virtual online exhibitions is Omeka. The case for the uses of Omeka was made by Trevor Owens when he articulated the hard budget choices that higher educational institutions are being forced to make and the appeal of open source tools like Omeka in that environment[9] (Fig. 2).
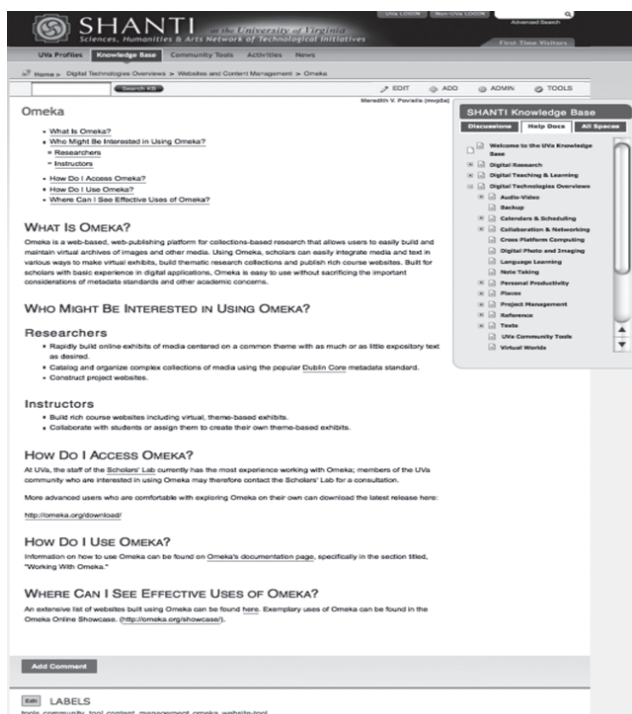

Figure 2. Omeka splash page in UVa knowledge base.

SHANTI, in close consultation with our colleagues in the library, is recommending Omeka to meet the faculty member's needs for online virtual exhibitions. Here is an example of the splash page in the UVa Knowledge Base regarding Omeka.

Many faculty members are interested in alternatives to Omeka, especially when those alternatives give greater flexibility or greater speed in developing an online exhibition. One of the more popular alternatives has been WordPress, with its ability to support quick, nicely formatted web pages and blogs. Faculty members have found that with over 400 new faculties and graduate student pages were created in the last two years at UVa since this new alternative has been available as a supported solution there. Faculty and graduate students are also using other tools in the SHANTI ecology of community tools as they mount virtual online exhibitions.

4. LESSONS LEARNED

4.1 Community

When SHANTI was first being formed, a conference call was set-up with the Center for New Media and History from George Mason University that was developing Zotero and Omeka. It was learned that over 20 coders were contributing to the core application, Zotero. In contrast, it was learned that Pachyderm[10], one of the key components of our approach to the VET, had only one developer contributing to the core code. Furthermore, that developer was not working on it full-time. The result was that Omeka was both making more substantial progress and attracting more contributions from others who had begun extending the usefulness of the applications by writing plugins. Omeka, therefore, became a much more compelling choice to meet this need.

4.2 Open Source

Not all open source coding projects are equal. In this particular case, the sheer fact of so many more coders working on Omeka meant that crowd-sourcing factors emerged. In contrast, our primary coder working on Pachyderm was several times hampered by having to wait for the only person who could help her, the principle coder, who, in turn, was being distracted by others who also needed his undivided attention as well as by other tasks that could give him more immediate financial return.

4.3 80/20

Since UVa had defined the use-case and had the resources to allocate a coder full-time to supporting exactly the use-case we had defined, we were enthused about realising our vision, which would have met 100 % of the use-case. Instead, we now have incremental parts of the solution that meet less

than 100 % of the use-case. By embracing Omeka, we had to abandon one of the more visionary parts of the use-case, ubiquitous working storage. This compromise, though frustrating and even painful, provides a concrete example of the 80/20 rule, generally stated as supporting a solution that meets 80 % of the use-case. In practice, it is hard to be precise about percentages, but nevertheless clear that compromises are good when they advance good solutions in ways that are sustainable and scalable.

5. WHAT IS MISSING?

Although the solutions mentioned above are elegant and in many ways very effective, but they have not delivered on all the necessary elements that were planned for in the VET. The main things that are missing include:

5.1 Simple Workflow

Figure 3 shows an elegantly simple workflow. This planned workflow included the unlimited and ubiquitous storage that would have been built on the Fedora infrastructure. Instead, we have delivered an interim solution while we make incremental progress towards improvements and simplifications in workflow.

5.2 Unlimited Storage

One of the more innovative aspects of the VET project plan was unlimited storage: Institutional repository (IR). Generally, IR is sought of as an archival storage space. In the VET, it was considered as active and ongoing workspace.

5.3 Leveraging Sakai and Fedora[11]

A related innovative idea of the VET was to use the IR to couple and leverage Sakai (branded at UVa as UVaCollab) and Fedora (an open source infrastructure for the digital library that was developed in part at UVa).

5.4 Integrated Tools

Because the VET project would couple and leverage Sakai and Fedora, the tools that would be offered to support virtual exhibitions would, by definition, have been integrated into those two enterprise-wide systems, and would in fact, have been the mechanism for that integration.

6. VET CASE STUDY

It was a multi-year, Open Source Software Development Project at the University of Virginia. This is a simplified version of a paper presented at the Universitas 21 (U21) Conference in Glasgow, Scotland in October 2008. It was delivered with two goals:

(i) Inform colleagues about our development goals; and

(ii) Invite collaborative partners to contribute to development[12].

While the response was warm and knowing regarding the first goal, no collaborative partners stepped forward from the U21 community.
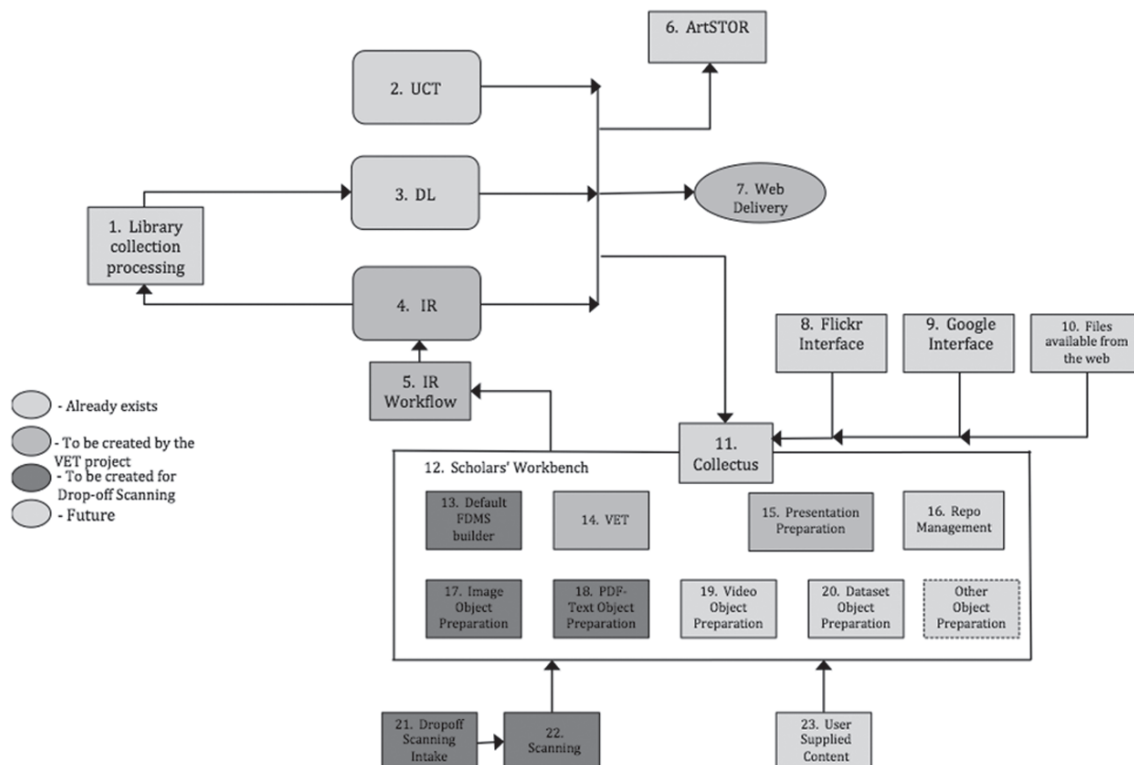

Figure 3. Flow chart for the VET.

6.1 Background

A small group at the University of Virginia worked for two years on an open source tool that leverages three other open source tools: Fedora, Sakai, and Pachyderm. This new tool, the VET was designed to make it easy for faculty to do more sophisticated presentations in either web pages or slide show formats (Fig. 4).

with Sakai, these were capabilities that we wanted to leverage. In initial investigations, it was discovered Pachyderm, which did many of the things we wanted our new tool to do, so we began to explore its capabilities, in hopes of speeding our development time. Our early flow chart captures what we had hoped to accomplish with this tool.

| **Fedora Commons** | **Sakai** | **Pachyderm** |
| **(http://www.fedora-commons.org/)** | **(http://sakaiproject.org/)** | **(http://www.pachyderm.org/)** |

Figure 4. Logos of the three open source tools (used in the VET development project).

The case study will analyse the progress to date and the ways that UVa is addressing the impediments that have arisen. This presentation will be designed to invite collaborations with other universities that might like to take advantage of and contribute to this project[12].

6.2 Project Details

This project grew from 12 years of successful course development projects through UVa's Teaching + Technology Initiative (TTI)[13] grants to faculty. Despite the fact that the vast majority of those projects had depended on common solutions to enable a web/database to enrich a particular course, the individual projects remained prototypical,stand-alone because UVa had been unable with limited resources to grow its infrastructure and to create scalable tools to support these approaches. At the same time the Vice Presidents who made these awards wanted to see newer and more innovative approaches supported. So they gave charge to a small group of professionals with the task of creating an open source tool, dubbed the VET, to make this tried and true approach to enriching the learning environment more scalable.

The small group of professionals began as a group of four, two from faculty support roles, and two with more technical backgrounds. They hired a programmer who began immediately to code the solutions they planned.

6.3 Growing and Leveraging Infrastructure

Because UVa was a leader in developing Fedora and was a collaborative partner actively experimenting

6.4 Feedback Loops and Reviews

Nine faculty members (selected because they would both understand what we were up to and stand for the more rank and file faculty) were asked to actively give us feedback on our development process and tools. All of them readily accepted and we also have added a number of colleagues to this advisory group. We have leveraged the Sakai tool itself to support our communications both for the development group and for the advisory group.

6.5 Clarifying Objectives

The first feedback that was got from that group of faculty caused to reprioritise our tasks and to be clearer about goals for the tools in development.

Some early accomplishments included a tool for scraping URLs that could then be included in collections of media object.

These scraped URLs are then handed off to an application that was written at UVa called 'Collectus'. Collectus is a 'shopping cart' application that allows the faculty member to not only collect media objects from various sources but also to do simple slide shows with those objects[15]. The slide show capabilities will be enhanced in the VET as that development progresses.

An early win in the project was the realisation that these saved objects could be saved in the 'My Workspace' portal of UVaCollab that each user was automatically granted. Thus, IR could be quickly enabled (Fig. 3).

At the same time, the testing for the first drafts of the tools has caused us to realise the inadequacies of our processes about moving from development to production. We are now trying to

Figure 5. Logo for pagecomber[14]

rapidly articulate a more clear and concrete plan for testing and for how the testing results will be captured and addressed even as we move ahead with development.

6.6 Larger Ambitions

As we were reprioritising initial design specifications, we discovered that this tool lead logically to a much larger vision that we refer to as the 'Academic Information Space'. We have begun to pursue larger funding so that we can speedup this project's development.

7. CONCLUSIONS

"The only thing that makes life possible is permanent, intolerable uncertainty: Not knowing what comes next"[16].

SHANTI will continue to develop and refine its ecology of tools and to improve the ways that those tools interoperate even as we keep in mind the items that are missing from our original use case. In the mean time, faculty and students will continue to exploit the evolving options for mounting virtual exhibitions at the University of Virginia.

Given the uncertainty of the future, it can be noted that SHANTI itself is a three-year experiment at UVa. As of this writing, we are currently in our third and last year of that initial funding. Among the uncertainties is the fact that the Provost at UVa is leaving for a new position even as he must carry the case for ongoing funding for this effort to the board of visitors. Although early indications are that SHANTI and its sister effort focused on the Computational Sciences and Engineering, UVACSE, have far exceeded goals and expectations, when the future depends on allocations of limited resources, the future is always uncertain. Despite that, we continue to be positive about the future both of SHANTI and of the virtual digital exhibitions that are so promising to our faculty and graduate students at UVa.

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Tools for Virtual Exhibitions at the University of Virginia

There are three principle ways that faculty staff and students are mounting virtual exhibitions currently at the University of Virginia. All these examples were accessed on 2/1/11.

Omeka

Omeka is an open source tool for mounting virtual exhibitions. The code was first developed by CHNM (Center for History and New Media). The University Library has had its coders contributing to the development of the Omeka Code.

Examples of Omeka at UVa include:
- Special Collections. http://explore.lib.virginia.edu/exhibits/.
- Several other projects are in development and almost finished as of this writing:
  o Louis Nelson's architectural exhibition about Falmouth, Jamaica.
  o A display of the plugins that the Library has been working on and contributing to Omeka.
  o Student exhibtions from Elizabeth Bollwerk's class on the representations of Native Americans in museum holdings.

VisualEyes

VisualEyes (http://www.viseyes.org/) is an open source tool for visualizing data easily and effectively. Developed by Bill Ferster of SHANTI, VisualEyes has been used in over a dozen projects at UVa including:

- Jefferson's Travels to England: http://www.viseyes.org/show/?base=jt
- Vinegar Hill: MemoryScape: http://www.viseyes.org/show/?base=vh
- Notes on the Future of Virginia: http://www.viseyes.org/show/?id=62287
- Visualizing the 1828 University of Virginia Library: http://www.viseyes.org/show/?base=library
- The Spaces of Khacloe Drubling (Noteworthy because it was developed in one semester by an undergraduate student, Kate Hartmann, as part of a thematic research collection of an undergraduate course): http://www.viseyes.org/show/?id=62047

  New Map of the Empire: http://www.viseyes.org/show/?id=58231
- The Life of Smithson (for the Smithsonian Institution): http://www.viseyes.org/show/?base=smithson

WordPress (SHANTI Pages)

WorldPress (branded at UVa as SHANTI Pages) is the easiest to use of the options listed here. Anyone at UVa can have a WordPress site on request to SHANTI. To date, hundreds of sites have been created by faculty, students and staff. Among them, some uses for virtual exhibitions include:

- MDST 3703. Introduction to the Digital Liberal Arts. In this ambitious course, the twenty students created Thematic Research Collections. Course homepage and the Student's Exhibitions are available at: http://pages.shanti.virginia.edu/mdst3703_2010_fall/
- Ed Berger and a group of colleagues use a course blog. Students in that course post exhibitions within that course that do a variety of things from editing and distilling the most salient parts of a professor's lectures to creating digital videos that capture a current instance of the impact of the course material in the real world. The course homepage are available at: http://pages.shanti.virginia.edu/statics2010/
- The McIntire School of Commerce uses a blog to give students a chance to present their respective experiences studying abroad. The blog is available at: http://pages.shanti.virginia.edu/mcintireabroad/
- The Bibliographic Society of the University of Virginia is using SHANTI Pages to present their organization and activities. Their site url is available at: http://pages.shanti.virginia.edu/bibsoc/
- The Graduate English program at UVa is organizing and conference and using SHANTI Pages as the site to exhibit the conference's presence. Their site url is: http://pages.shanti.virginia.edu/2011enggradconference/cfp/
- Paradosis is the site where an ambitious collaborative group displays the results of their work orthodox Christian theological texts. Their site address is: http://pages.shanti.virginia.edu/paradosis/

- UVa's School of Medicine has an online display of words, sounds and images contributed by faculty, staff and students. It is available at: http://pages.shanti.virginia.edu/hospitaldrive/

Other
- **Confluence (SHANTI Wiki)**

SHANTI has secured a site license for Confluence and is using it for a variety of purposes. SHANTI is promoting it for projects where collaborative text production is key. Probably the most noteworthy exemplar for this list is the Tibetan Himalayan Library available at: http://www.thlib.org/

- **Drupal**

Drupal is an open source package for easily delivering web accessible, content rich sites. SHANTI is crafting several generic instances of Drupal to meet common use cases that can easily be replicated for similar projects. A first instance that is currently being tested is the UVa communities site, available at: https://dev1.shanti.virginia.edu/commons/home