

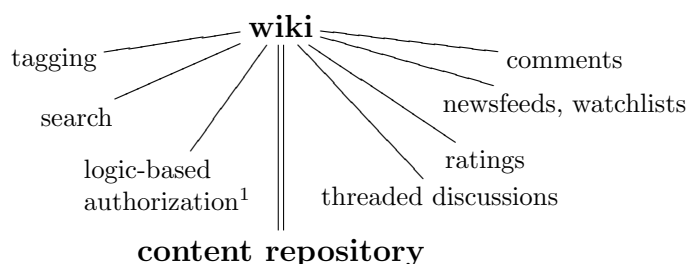
Briefly contrast the Shaker Hymn:

‘Tis the gift to be **simple**,
‘Tis the gift to be **free**,
‘Tis the gift to come down **where we ought to be...**

with most of Swarthmore’s digital space and you’ll see that most Swarthmore websites come up short: they’re neither simple to use nor free to improve and they rarely take us where we want to go. Yet Swarthmore has a tightly unified community in spite of this fragmentation of its digital space. What’s missing online are the opportunities for interaction created by the network of pathways that lead you from one place to another on campus. For example, the pathways host chalked messages, taped or pinned-up advertising, posters, interesting crowds or gatherings, friendly faces, and plenty of random strangers with whom you might want to speak. Relatedly, Swarthmore’s campus helps people get to around by assigning places simple, memorable names which you can use to direct others or to be directed.

Compare this to the digital situation, where read-only websites with complicated addresses prohibit opportunities to publicly communicate with other travelers of the digital space. What popular web space is available through which to advertise, to direct people, to meet strangers, or to provoke discussion? Where online in Swarthmore’s digital space can you comment on, rate, or parody a work and have your voice heard? Are you able to follow foot-traffic, join gatherings, or to improve an existing site when the desire strikes you?

In light of these deficiencies, there’s a conceptually simple improvement we can and should make to Swarthmore’s digital space; namely, we should remake its underlying architecture to look like this:



Where does the diagram come from?

Recent experience online suggests to me that people use a fairly small number of techniques for finding things online. Notably, they search, guess the name of what they want, are directed by someone with similar aims, follow a friend, author, editor, community, or crowd, participate in a matchmaking service, or are directed to their destination by private or non-digital communication. When discriminating between several options, they use comment, discussion, and rating systems to direct their attention and frequently help direct others by providing their own rating or comment or by advertising the resource and their interest in it in a communal or personal space.

I infer from these observations that to unify a diverse, fragmented digital space, we should change the space to allow users to improve the space’s link structure and resource naming, to direct each other, to follow one another, and to rate and comment on the space and its contents. In other words, users should be able to publicly communicate with one another much as we do in the analog world¹.

Below are some concrete examples of these ideas in action. Consider how:

- 1) *Google* both searches for and names resources since we use it to find large result-sets and to easily direct others number-one hits.
- 2) *Wikipedia* relies on easily guessable names and on individuals directing one another by creating and improving the site’s link structure.

¹ Managing trust relationships to prevent both pragmatic and legal misuse of the system and using good version control as a safety net are important technical details which have different solutions in the digital world than in the analog world. Good solutions for both issues now exist but are beyond the scope of the present paper. Please ask for details.

- 3) *Slashdot* supplies crowds of techie-readers with recent technology news and regularly gleans insight from the chaff of thousands of comments with an effective comment rating system.
- 4) The *New York Times* keeps many people up to date on a broad array of subject matter by publishing reporting and insightful commentary and humor from a community of well-known columnists.
- 5) *Youtube*, *Flickr*, and *SourceForge* each provide large communities with highly usable tools for publishing, rating, and exploring streams and databases of video, photo, and software content.
- 6) The *Facebook*, *LiveJournal*, *MySpace*, and *DeviantArt* help their users share contact information, life events, personal stories, and artwork through powerful friends-watching aggregation systems.
- 7) Online sales and auction services like *eBay* and *Amazon* help buyers find products they want and sellers they can trust with rating, comment, recommendation, and reputation systems.
- 8) Social bookmarking and tagging sites like *del.icio.us*, the *LibraryThing*, and *CiteULike* help their users follow one another around the internet, keep up with reading lists, and record and share research bibliographies.
- 9) The *Trac* project helps many geographically far-flung software development communities work efficiently by using a customized wiki to tightly unify information about software revisions, bugs, and plans for producing new revisions of the software by fixing bugs.

What could you do with such a system?

1) **Better locate existing writings, performances, and artworks.**

Many people (and groups) in this community have devoted considerable time and effort to making and publishing interesting things in digital form (namely photographs, paintings, recordings, podcasts, humor, cartoons, essays, grand schemes, papers, and so on). Many other analog community products (discussions, arguments, meeting minutes) disappear from the community lexicon or exist only in the memories of a few witnesses but could be readily digitized.

In a system like that proposed, it would be straightforward to publish, advertise, locate, and appraise these artifacts - thereby helping to find, spread, and preserve the valuable ones from the vagaries of time and memory.

The reason for combining all kinds of digital content together is that, unlike the situation in most communities, we have the time and resources to develop our interests in several fields at once (i.e. we are photographers, singers, and engineers simultaneously) but we relate to one another first because of our shared environment and only second because of shared interests.

2) **Mark, fix, or route around obsolete content.**

There are lots of old guides and handbooks floating around our websites, cluttering up searches. This would be easy to fix if the link structure of the digital space were mutable or if comments could be left on any page to direct viewers to newer versions of a document but in the present system, there's little that can be done because it's so hard to find the person responsible for replacing the obsolete document on the web site.

3) **Fix Blackboard.**

Blackboard imposes far too much useless structure on course websites and frequently obstructs its users from seeing resources in other classes for no good reason. By placing a wiki at the center of the new architecture, we would remove the extraneous structure, we would make it much easier to get from place to place online, and we would generally produce higher quality work faster as a result of using a system designed for finding and recording information online as opposed to a system that primarily models the bureaucracy that produced it.

4) **Improve collaboration and discussions.**

Currently, the only collaborative digital environments available are based on email or Unix or are external to the school. There's not even a world-writable folder on a file server, let alone a decent version control system or snapshotting filesystem.

Unlike the present, in the proposed system, it would be easy to create space just for your lab group, your campus-wide discussion, or your secret cabal without requiring the intervention of anyone else

in the system. Also, for discussions, you'd have good tools to use to separate helpful comments from unhelpful ones and to record who said what when and where, both online and in real life.

5) Appraise and publish new artistic output.

The lack of centralization of digital artifacts means that it's nearly impossible to get a global view of the institution. For example: which were the ten most popular photographs taken of Swarthmore's campus this year? Currently, no one knows and there's no economic way to find out; however, many people would like to know, the Publications Office not the least of them. In a system with a centralized index of photographs (or songs, paintings, ...) it's entirely feasible to find the best and most popular items in a collection of items by holding competitions or juries, or simply by asking large numbers of people to supply ratings.

Lack of submissions to artistic publications or galleries like the student-run Kitao Gallery and the student publications magazine Alchemy could also be alleviated in the proposed system simply by making it easier to be notified of new works that should be considered for the next publication or show.

6) Connect the alumni community to current students.

Current students experience the alumni community through irregular, short-duration, scripted events like conferences, dinners, and externships. It would be valuable for current students to be brought closer to the college's alumni not just through lists of names, careers and email addresses but also through on-going interactions that naturally arise out of common interests, desires, and needs. From an alumnus' or alumna's perspective, a system like this one would offer a compelling way to continue to enjoy the fruits of the Swarthmore community (people, discussion, music, ...) as far as time and desire permit.

The Big Picture

If nothing fundamental changes then ten years from now the Swarthmore digital space will be just as lackluster as it is now. On the other hand, if we make the changes proposed in this paper, then in just five years, we'd have a really neat record of what was (publicly) important in people's lives here. In ten years, with 500 other universities using the same system in a federation with us, we'd have a truly amazing system.

However, the utility of this reorganization of digital life extends beyond (rich American) higher education: consider the "One Laptop Per Child" initiative. The goal of the project is to jump-start a digital community among several million of the world's poorest children by distributing cheap mesh-networked laptops to them through their national governments. The 5,000,000-user question is "when these laptops are distributed, where will the children using them record their experiences?" Where will they publish their manifestos, upload their photographs and videos (the laptops contain cameras), and share their success stories? Furthermore, even assuming that space is available for them to record and publish these and other facets of their life, how will they find each other's work? Through Google, Wikipedia, or any of the existing services mentioned in this paper?

What this brief thought experiment reveals is that, like all education projects, Swarthmore and the OLPC project share a need for socially unified spaces in which to communicate. More precisely, their success is conditioned on the freedom, simplicity, and conceptual unity of the spaces that they provide to their communities. Thus if either project is to fulfill its highest potential, some system which addresses the issues raised in this paper will need to be constructed for it.

Ways to Build It

There are basically five ways to make this happen:

- 1) Take no responsibility. Write the concept paper, email it to Google, and Slashdot, sit back, and wait.
- 2) Take only financial responsibility. Commission someone else to build it.
- 3) Fund this as a research project. The Carnegie Foundation certainly funds related projects, as do DARPA and the NSF, among others.

To do this, it makes sense to find an established Principal Investigator in the field, make the proposal, and build it. The Stanford Infolab, the DSpace project, or the Sakai, Moodle, or OpenCourseWare projects are all reasonable places to start looking for such a partner.

- A different tack would be to approach the national law-enforcement and intelligence organizations on the basis of our mutual interest in finding good ways to direct authorized users to relevant information.
- 4) Found or join with an existing non-profit organization like the Internet Archive to build this system. Fund it with donations and grant-writing, hire the necessary people, and build it.
 - 5) Found a for-profit organization to build this system. Pursue venture capital, build the software, and market it.

The Scale of the Task

To give a sense of the scale of the undertaking, here's a brief outline of the kinds of work involved in building a software artifact like this one:

- 1) Management.

Any decent-sized project needs people do everything necessary for it to be possible to work. Examples tasks: hiring, contracting, accounting, public-relations, marketing, and management.

- 2) Intellectual Property.

Since we're working in a well-established field, patent, copyright, and trademark issues must be carefully handled from the start. Copyright law is significant for two other reasons: namely; we're going to be publishing lots of copyrighted works and we're going to be producing a rather large copyrighted work ourselves. To remain legal, the distribution of each of these works needs to be carefully controlled.

- 3) User-Interface Construction and Security Concerns.

Since the point of this project is to put a new interface on a novel combination of old ideas, there will be many tasks involving web design, graphic design, internationalization and localization, and digital archive construction. However, these tasks cannot be decoupled from the authorization, authentication, and error-handling concerns that are essential usability features. Therefore security audits and human-computer-interface testing will both be frequent activities.

- 4) Software Construction.

If the system is to be more than a pretty screen, it will have to reliably and effectively process large quantities of diversely typed information through a variety of interfaces. User-interface programming, database-middleware programming, interoperability and standards compliance verification, automated test construction, and issue tracking will therefore all require serious expenditures of effort. Finally, for these expenditures yield good results, it will be necessary to supply support in the form of good database administration, system administration, digital asset management, and software configuration management.

Conclusion

I have described a compelling vision of a project that would, word by word, mind by mind, and heart by heart, bring together people with visions for what they and Swarthmore can do and be in the world and people who can help make those visions into realities. This is clearly a hard project which cannot be undertaken lightly.

The true expenditures of time, personnel, dollars, and opportunity that would be required to build this system, while not yet precise, are certainly large in scale. However, they are not beyond the scope of other building construction projects that the college undertakes on a semi-regular basis. Indeed, I believe that a deep parallel underlies this comparison: we construct analog buildings in order to specialize an available space for a specific community or teaching need - labs for scientists, chalkboards for mathematicians, studios for artists, and gardens for the enjoyment of all. What environment would best serve our needs in our digital space?