Edit This Page

http://itpedia.nyu.edu/wiki/Edit_this_page

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ABSTRACT

The Interactive Telecommunications program lacks accessible memory of its people and projects beyond any given 3 year period. Using the dormant data in administrative databases about the people, projects, and classes, ITPedia is a website that brings the last five years of our people and our work into a wiki that is viewable and editable by current students and alumni alike. Using the commonly repeated set of relationships between people and projects as a structure, ITPedia provides a space for free-form collaboration that increases the granularity of the community memory over time as well as persuading a higher level of engagement out of the community. 'Edit this page' is the story behind this effort.

Author Keywords
organizational memory, knowledge management, communities, mediawiki, wikis, semantic mediawiki

1. INTRODUCTION

In my father's village there's a stone wall made without cement, just flat rocks locked into place by friction. He grew up in a house a few hundred feet from this wall and remembers it being there his entire life. He says it was made by either his grandfather or his great uncle. This wall isn't particularly special; it's just a stone wall in a field on the mountainside of a small island in Greece. But it is special in it's modesty. It was built well over a 100 years ago to be a wall and has survived amongst other things a destructive earthquake. It was built using time tested skills passed on by oral tradition. When my father was a child in the 1940s, this community was 500 people strong, and everybody was involved in creating almost everything. By 2009, There were 3 families living in this village, and the skill-set to build that stone wall is long gone my father tells me. Unless I mentally archive where this wall is and the name of my ancestor who built it, that small piece of knowledge may very well be gone one day as well. There might be nothing wrong with this loss of knowledge, my father certainly doesn't spend any time lamenting it; walls are built using cement now. It's the lack of a good replacement for this kind of small scale community memory that I lament. On the largest scale, the internet itself acts as one large distributed database, retaining traces of a significant amount of our communications, itself a form of collective institutional memory. But what about smaller social groupings, anything ranging from a Fortune 500 company to a small church community? What kind of methods do they employ to retain institutional memory?

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As a graduate student at the ITP program of NYU, the challenges of institutional memory became readily apparent early on. With a student body of 220 that transforms totally every three years, it seemed amazing to me that there was any sense of history in regards to projects made, classes taught and the people that had passed through here. As a community, the ITP graduate program has a collaborative work culture developed over 30 years, encouraged by a mindful institution. This culture is well served by our propensity for experimentation with new tools and peer learning.

I start off this paper by examining the history of knowledge management and organizational memory as a discipline that has been applied to businesses throughout the 20th century. I then apply this area of thought to the ITP graduate program and seek out the most important areas of organizational memory that can be affected.

Finally I describe the proposed solution I built as my thesis project. ITPedia is a website that brings the last five years of our people and our work into a wiki that is viewable and editable by current students and alumni alike. It is my intention to show that by allowing community access to the administrative databases of an institution, organizational memory can be affected dramatically.

2. HISTORY

2.1 Knowledge Management

Knowledge Management as a discipline begins after WWII with post war college grads entering a business environment steeped in wartime scientific discovery. The U.S. business culture at the time was de-personalized and highly bureaucratic, a product of the 1950's culture of conformity and homogeneity. Peter Drucker coined the term "knowledge worker" in Landmarks of Tomorrow: a proposal that a new breed of highly educated workers would have the skill to aquire theoretical and analytical knowledge. in 1966, Michael Polanyi clarified the notion by separating tacit and implicit knowledge into separate domains. Explicit knowledge is knowledge that is articulated in formal language and easily transmitted among individuals both synchronously and asynchronously. (Frappaolo, 2006) To give a basic example, an instructional manual that accompanies a microwave oven is explicit knowledge that is transmitted asynchronously. An undergraduate lecture in Western Civilization is explicit knowledge transmitted synchronously. In the 1980's, the emerging opinion was that organizations could benefit in Knowledge Management by making sound investments in information technology that could capture implicit knowledge in an identifiable manner (Strassman 1985). In the early 90s, an organizational 're-engineering' movement begins to challenge the structures of operation that stood unchallenged a long time. The increasingly global competitive environment was the impetus behind this movement, and although structural, the challenge on process was essentially one on rigid knowledge management. However, the re-engineering movement didn't provide a long term solution that took into consideration constant change and flux, but instead replaced one set of procedures with another. By the mid and late 90s, Knowledge management had become a movement that included academia, business practices and media coverage. The fuel behind this growing movement was the huge advances in information technology. With accelerating change (e.g. Moore's law) taking place in networks and hardware, information technologies accessible to every level of an organization emerged. These first generation software tools were geared at creating better interfaces to explicit knowledge repositories, for example text retrieval and document management. When the networking technologies came into the picture, the initial impulse was to use them in extending the mining of those same explicit repositories. That's how we ended up with corporate intranets and portals, e-learning initiatives, and other solutions that underutilized networks within a paradigm that was compatible with a process oriented approach. When we speak of re-engineering not working, we mean that it replaced one process oriented approach with another, and this was re-engineering all over again. Dave Snowden in "Whence goeth Knowledge Management" (2006) criticizes this era for taking an approach that was centered around a linear workflow of document creation.

2.2 Organizational Memory

Organizational Memory is the body of data, information and knowledge relevant to an individual organization's existence. If knowledge management is a set of tools, Organizational memory is what it intends to manage. How is information about the past actually stored in an institution? Early theorists postulated that standard operating procedures are the embodiment of the memory within an institution (March and Simon 1958). A more nuanced approach developed later in which organizational memory is viewed in terms of structural artifacts that over time lose their efficacy and become obstacles of change (Starbuck and Hedberg 1977). Research suggests that the cognitive memory functions of an individual (information aquisition, short term memory) actually apply to supraindividual collectives as well (Loftus and Loftus 1976). The anthropomorphism involved in trying to apply this line of thought to institutions on a large scale is subject to ambiguity when the metaphor is extended. In a strictly functional sense, Institutions resemble information processing systems analogous to an individual's cognitive functions. "Sensors act to receive information, information is processed with defined symbols in some processing capacity, and information is retrieved from memory." In order to understand how an institution processes information, we must also see it as an interpretive system, that parses information subjectively in terms of an existing ontology within the institution.

Since an organization is ultimately comprised of individuals, it's memory as a model of processed information involves interpretation by individuals. Since individuals vary in their interpretations of information, the organizational memory system has to be seen through a paradigm of shared interpretations amongst individuals, as well as the construction of a collective interpretation through bargaining and decision making. Interpretations of the past take the form of embedded artifacts within an institution. Those artifacts can be seen as administrative structures, a shared culture, and oral narratives carried by individuals within the institution.

There are potentially five different storage bins for these artifacts that we can consider as the retention facilities of an institution: individuals, culture, transformations, structures, and ecology (Walsh and Ungson, 1991)

Information acquired by individuals through experience can be stored as their own belief structures, cause maps, assumptions, values and articulated beliefs. Insofar as an

individual is able to relay an experience to a person, they are the organizational memory. More so, every individually maintained technological storage serves as a detached part of the larger picture.

Organizational memory is also embedded into the culture, as knowledge learned and transmitted from person to person. The memories as culture are stored as language artifacts through stories, symbols, shared frameworks, and transmitted from person to person over and over. As a result, a version of the events and knowledge shared are stored with the people who make-up an institution at any given moment.

The transformations that an institution undergoes naturally are the result of decisions that take into account past experiences. New recruits are the result of an older employee retiring, the replacement process is informed by previous replacements, and necessitates a protocol of information about how the institution handles change. A standard operating procedure is the result of multiple transformations codified into a schema made available to people within an institution for further use and modification (Weick 1979). The organizational holding place for the resulting knowledge falls under the umbrella of Administrative databases and related systems. (Jelinek 1979).

Structures within an institution have to be considered from the perspective that individuals act within the expected social parameters assigned to them by the institution. Inso far as organizational memory is transmitted culturally, the people doing all the transmitting and learning act within the social constraints of their respective positions within an institution. As a result, the structure reflects how the different groups within it collectively perceive their environment. (Walsh and Ungson, 1991)

The physical environment of an institution also has a role to play as a reflection of itself. The aforementioned structures are often physically on display in the form of corner offices, executive bathrooms, dark areas vs. well lit areas. This ecology reinforces behaviors and roles, shaping the character of how it's inhabitants share information with each other.

External archives act as an important repository of knowledge about an institution, with the most common sources being retired or otherwise former members. in addition, other prominent sources are competitive intelligence and media coverage.

3. ORGANIZATIONAL MEMORY APPLIED TO ITP

The two memory storage bins I examined in depth at ITP are cultural and transformations Although it became apparent that the two are intertwined, I did my best to separate them.

3.1 Transformations

The greatest impact on memory at ITP is the fact that the student body completely changes every three years. Since the program takes two years to complete, any single graduating year has direct knowledge of the year ahead of it and the year following it. In addition, the courses offered change drastically every semester, with only a portion offered repeatedly and even those changing in scope and instructors over time. The third major transformation occurs in the physical realm, with the end of semester show. During the end of semester show, the entire floor changes from classrooms and common areas to a venue that displays finished projects by the students to outside visitors.

In order to accommodate these three transformations and provide continuity of every-day affairs, the administrative structure has codified the process using information technology tools, in the form of internal databases. In order to maintain a changing roster of individuals, the administration maintains a persons database. In the same vein of necessity, there is a courses database, and a projects database. The actual implementation is an assortment of custom PHP + mySQL applications that track these transformations as necessary, but are not always linked to each other. The codification extends beyond the maintenance by the staff to include input as necessary in a workflow manner by the individual owners of items in the databases. Individuals are requested to fill in their information (name, email address, bio), Instructors fill in their class descriptions, and students participating in the end of semester show must fill in their project information. Much of this information is made public; The ITP website has a person section with publicly viewable sections for each person. Individuals can set privacy parameters for their own information, so that for example their telephone number is only viewable by the administration, their email by the ITP community, and their website is available to the public. The courses currently offered are made available for browsing, and the projects database is viewable behind a wall to students. The history of transformational memory is perceivable in how the privileges of editing and viewing are parsed out by the administration structure over time.

In the knowledge management paradigm, all the transformation systems maintained by the administration represent a collection of explicit knowledge. There's a relative ease in making this kind of information explicit, since it's codified down to a set of semantic relationships. 'What is your city of origin' is a readily available piece of information about a person that can be stored in a database within a clear taxonomy.

This readily available taxonomy that allows for databases to

be filled up with shallow explicit knowledge, is also the weakness of this administrative storage bin. If we start digging into the semantic relationships between the different items in these databases, we start to see the ontology falling apart. In the classic example used in semantic studies, "Berlin belongs to Germany", is a many to one relationship, since Germany can have many cities but Berlin can only belong to one Country. At ITP, a project belongs to many creators, and was made for many classes, which over time are taught by more than one instructor (each with individual syllabi.)

Take for example the Botanicalls project. It was created by a group of 4 students, for four different classes according to the projects database. The database manages to capture that information, since it's a common situation for a project specific to the institution.

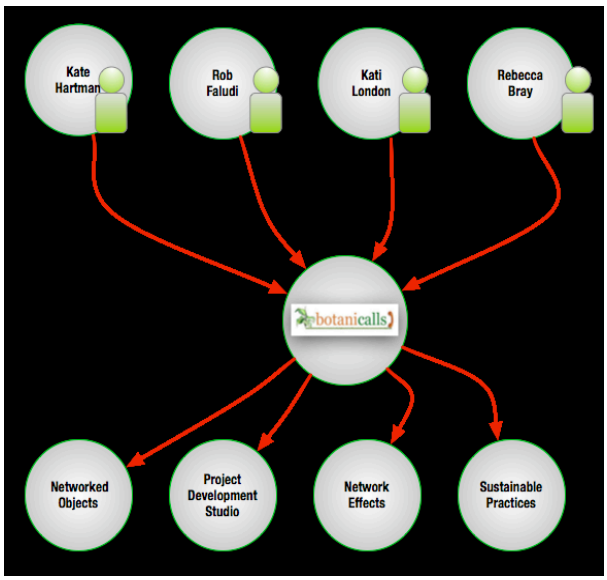

Figure 1. Ownership of the Botanicalls Project

The administrative databases however fail in two other regards. The first is in capturing and offering relationships that already exist in it's databases but lack an explicit connection. Rob Faludi officially offered this project as his Networked Objects final, and then two years later is teaching the same class at ITP. This information resides in the courses database, but isn't explicitly connected to the project via the person. Once again, the role of this database is to ensure the transformation of the ITP floor into a venue displaying projects for a show. In that regard, knowing who made it and for what class is sufficient, easily captured, and maintained.

The second failing is in offering information about the people and the project that isn't captured in any of the administrative databases. It turns out, Rob Faludi offered a student wide tutorial on wireless networking while still a student that was the basis of both how this project worked, but also the basis of how the networked objects class syllabus evolved over the next two years. In addition, Kate Hartman worked on a crucial part of the communications technology in this project as an individual internship. If they weren't in the databases, how did I find out about these two details?

3.2 Cultural memory

The other great force of organizational memory at ITP is purely cultural, and is the likeliest place for tacit knowledge transfer. There are 3 different ways to examine cultural memory at ITP, through the physical person to person exchange, the digital tools used for communication (both synchronous and asynchronous) and structural composition of the community.

On a person to person level, I started by examining the diversity of the student body. Since the program is decidedly interdisciplinary, it is comprised by students from diverse academic and professional backgrounds. With no sense of a standard student background at ITP, there is also no way to establish a common body of knowledge across individuals. In this vein, the only way to survive academically and produce work at ITP is to approach students with experience in a certain realm and ask them a direct question such as "how did you do that part of your project" or "what component did you use for that project". Direct questions from person to person result in a multi-part transaction that pulls out tacit knowledge in the form of a conversation. This conversation plays out as a story, "First I connected this two parts" or "Then I tried this camera and it didn't work". The most fascinating exchanges involve answers that transcend the current student body and pull in second-hand stories from past years. It is not uncommon for a second year student to reference a project made the previous year by someone who has already graduated, or a story they heard when they were a first year student. (Again, the program is two years – as a first year student, you don't have direct knowledge of the work and people that graduated before you arrived.) These exchanges absolutely define the character of the community as they are the only ones guaranteed to include participation from the entire community to varying degrees. The importance is such that it is emphasized and preached in a codified manner by the faculty and staff as part of the recognized learning methods at ITP. This codification itself can be viewed as a toolset within the transformational memory bin that recognizes the weaknesses of the administrative databases pinpointed in the previous section. As we shall see later on in the structural section, the student body codified this process on their own as well.

ITP also utilizes digital tools for communication within the community itself and between community and institution. In a cursory pass over the variety of tools used I identified the following:

Wordpress mu installation for multiple student and class blogs

General student list-serv mailing list archived across hundreds of individual email accounts

Individual area mailing lists, physical computing, programming, telephony

An ITP server with languished directories from old ITP eras

A collection of class wikis, current and past

A collection of staff and faculty maintained resource wikis

The most salient characteristic of all these tools is the varied degree of participation amongst the community members. Although every student automatically receives a Wordpress blog installation for their use, many students decide not to use it or use it on occasion. There is an interesting intersection with institutional requirements when instructors for individual classes require participation on a per class or per assignment basis. To speak a bit more on that intersection, the staff and faculty maintained resource wikis have a more clearly defined agenda of displaying explicit knowledge in a time sensitive manner for use by the community. The largest of the community tools and a subject of fascination for myself and other students over the years is the student list-serv.

Technologically speaking, the list itself is nothing more than a mailing list that current students sign up for voluntarily. That fact alone means that not all currently enrolled students participate on the list, just those who sign up. Since there is no defined agenda or rules of participation for the student list, it generally reflects the current needs for asynchronous communication of the student body with varying degrees of signal to noise ratio over the years, and with the definitions of what signal is and what noise is changing as well. Although archived across hundreds of email boxes, the only relevant conversation on the list is whatever is current, despite the ability for individuals to search within their own archives. As a result, questions get repeated often, and over the years conversation repeat with different participants and different answers. The tragedy from the point of view of knowledge management is there almost never any sense of memory in these conversations: at best, it can go back 3 years if an enterprising individual manages to revive a particular point from the archives.

The benefit of this shallow memory, which should be made clear, is that the process of converting tacit knowledge to explicit knowledge for current participants in the conversation maintains a sense of urgency that any sense of a canonical conversation would diminish.

The individual area mailing lists also serve a more modest role of providing an asynchronous forum for communicating answers to students asking direct questions. The most interesting mailing list at ITP in this regard is the physical computing mailing list, which is open to community outsiders with an active interest in physical computing. Many of these active participants are actually ITP alumni who are members of the community at large, but are not active parts of the other available tools by cultural design. An example of cultural design is that although there are many alumni who lurk on the student list, they rarely participate for lack of the context that comes with being an enrolled student with a physical presence on the floor. The salient fact here though is the active participation of the extended community given an appropriate forum.

This fact serves us well into the next topic, the structural composition of ITP and how it affects organizational memory. The first aspect to consider is that the ITP community is inherently intertwined with the institution itself. All but three of the fulltime faculty members are ITP alumni, and all but 2 staff members are alumni or currently enrolled students. The majority of adjunct faculty at ITP at any given moment are alumni themselves. Again, the model of cultural person to person exchange is augmented with an extra dimension. The conversion of tacit knowledge into explicit knowledge happens in the hallways as the members of the institution casually relate to students stories about their own experiences as students or projects and work they remember by other people from their years as students. The instructional and mentoring services provided by the institution extend beyond the traditional means of classes assignments and syllabi, by being liaisons into the past of the community. Although from a knowledge management point of view this is a highly inefficient and wasteful way to carry over explicit knowledge, the evolution of the program into a mutualistic relationship between community and institution has elevated the practice to a high form of knowledge exchange. The establishment of this practice within ITP is better understood by examining the drive-by tradition.

The Drive-by is a weekly peer-to-peer education event fully coordinated by the students. The student written description:

“students can sign up for classes they wanted to teach and classes they wanted to take, and since everyone is a peer, students have to volunteer to teach a class if they signed up to learn from someone else. The idea behind the seminars is

that every ITP student has something they are brilliant at and something they haven't tried yet."

This tradition was established at ITP in 2005, and has carried on strongly for 4 years, with weekly attendance at around 12-20 people and a range of topics. In it's essence, the drive-by codifies into a community tradition an amplified version of the recognized cultural memory mechanism. The other aspect worth examining is the use of wikis as a tool to coordinate the drive-by. The organizational aspects inherent in coordinating this kind of weekly event, meant that at least this regard, the community would have to act more like an institution and codify some of the process. The administration may have it's databases, but the community found a freeform tool in wiki software.

4. WIKIS AT ITP

Wiki software is a completely free-form web publishing platform that has proven successful in encouraging informal and unstructured collaboration on a large scale. Although the premise of it's strength is a lack of formal structure, in the absence of user continuity it becomes a noticeable weakness. Wikipedia is obviously the most successful example of a community wiki, but it's defining characteristic is a purely voluntary and virtual nature. Although there are many lessons to be learned in terms of collaboration from Wikipedia, it can also be deceiving as a model for a physical community.

The first instance of a student wiki at ITP is 2005, alongside the creation of the drive-by. As discussed earlier, the application necessitated the software. Beyond the scope of the drive-by the wiki was used enthusiastically by students in 2005 and 2006 but started languishing in 2007. Because part of the student body in 2007-2008 were some of the later wiki participants as it began to languish there was still a directed sense of activities better suited for collaboration on the wiki (Rather than say, a discussion on the student list).

These activities and topics are generally the ones that need a persistence over time, wether that's 24 hours or an entire academic year. An example of 24 hour persistence is a list of students who are going to a museum together on the weekend. An example of year long persistence is a list of radio channels reserved by individual students for wireless projects to avoid radio interference. A discussion on the student list would become stale and hard to reference for either of these topics within a few hours, whereas a static website page is easily referenced later on.

The actual archive of the wiki and it's pages was still present within the digital tools available to the students after the languising began. By the academic year 2007-2008, one of the very few drivers of use for the wiki remained the drive-by: the application driving the technology.

4.1 ITPedia version 1.0

As part of a group of three first year students, Corey Menscher, Jonathan Swerdloff and myself began examining how to re-establish the wiki as a form of collaboration and memory at ITP.

Our first step was to install mediawiki as the software, which was much more robust and user friendly than what was being used then, Pmwiki. After we transferred over much of the information from the old wiki, we installed an LDAP extension that allowed the students to use their NYU login information as identification for the system. The use of the NYU login proved to be an important step in realizing how ITPedia could become a better source of institutional memory. By providing a sense of identity on ITPedia, every action and contribution could be identified and traced back, binding the software closer to the physical community. In addition, an auxiliary effect became apparent. Since ITP alumni retained their NYU login identification credentials, we could solicit contributions from alumni and break the three year transformational barrier. We could rely on the cultural tradition of person to person knowledge transfer, and the mutualistic relationship of community and institution for a common area of exchange.

The other breakthrough we had as a group with the additional contribution by Matt Parker, was the concept of the fly-by. We came to the conclusion that there was a need for peer to peer education that was outside of the scope of the drive-by: short, single serving tutorials. Drive-bys are naturally a better fit for introductions to larger topics over the course of an hour supplemented by conversation. A fly-by, we reasoned, was this:

"...a bite-sized tutorial that can be mentally digested in under 10 minutes. The topic can be absolutely anything, and any ITP student, alumni, researcher, or faculty member can contribute.".

In the language of Organizational memory, we were seeking to codify the short repeated person to person exchanges that are the cultural norm but could benefit from a standardized repository. In the first 4 months, we only gathered 10 Fly-bys.

Overall, the experience of this version of Itpedia was underwhelming. but provided me with a chance to see it's greatest weaknesses and slowly develop a planned intervention. One of the important lessons was that all that

is necessary to effect change within our community is three people. You need more than that to make it successful, but to instigate you only need a quorum of three. The general open attitude towards transformation and a playfulness with new tools is definitely a factor in the implied permission, but one that we took advantage of, surely the same way the first ITP student wiki was setup. The greatest strength of wikis also turned out to be it's downfall. As great as the ITP community is at parsing out relevant knowledge from stories and person to person exchanges in an adhoc fashion, there was a failure to replicate it from scratch from ITPedia.

5. A SLIGHTLY SEMANTIC ITPEDIA

Considering the weaknesses displayed by the first version of ITPedia, this was the design challenge:

How do you design a community knowledge management system that structurally reflects how people work without becoming overbearing and rigid? How do you entice people to contribute the knowledge acquired through experience to into a system that reflects their process and culture? How do you get them to build that system themselves?

Going back to the notion of administrative databases at ITP reflecting transformational memory, what if we could provide the entire community access to all this stored information? Instead of having a workflow that took in the information and structured it for administrative purposes, what if all that information became globally editable by the community?

After gaining access to the databases, the idea took strength as I realized the full potential. The weak semantic links between projects and people identified earlier in the paper could be overcome by making the relationships transparent to the community. Using the example from earlier in the paper, there is no room in a strictly structured database for a entry describing a relevant drive-by by Rob Faludi on wireless networking as it relates to his project or the class he took and then taught. But if that relevant information was provided in the form of a structured wiki, as hoc changes could be made to individual pages.

The approach I took on the software side for this was a mediawiki installation with the semantic and forms extensions. The first extension allows definitions of relationships between data in the form of a triple. A triple is a statement about a resource in the form of subject-predicate-object. A simple example is The sky (subject) has the color (predicate) blue (object). I'll spare the painful details of the semantic web dreams and just say that a triple can be very useful if you don't pin all the hopes of human computer interaction on it. The specific reasons it is useful in our case is that triple relationships allow for the emergence of patterns and super categories, as long as the right kind of relationships have been defined and made accessible to users.

The right of kind of relationships are the ones that already exist between people, their work, and the resources they use. ITP is project oriented since so much of what we do (and don't do) is centered around our projects. The timeline, the url, the people who worked on it, the skill involved, the show it was in, the threads and links between different parts of the schema are the projects as much as the actual project itself. The more tangible of those links are the the people who make the projects: people cast longer semantic shadows than projects. The two primary views on ITPedia are individual people pages and project pages. Most other pages will act as glue between those two. Since most ITP projects are iterative across people and time, our ability to track our intellectual roots within our own community makes the work mindful and better informed. Reaching back to the cultural norm of person to person exchange, people draw on projects, people and classes as the semantic hooks in conversations when going through an explanation.

5.1 Seeding the wiki

In order to properly seed the semantic mediawiki structure with the administrative databases, first I had to have access to the information that I could manipulate programmatically. A resident staff member, John Schimmel was in the process of developing an XML feed that gave access to publicly viewable information for the persons database the administration maintains. I took this as a sign of being on the right track, since the creation of a public XML feed meant the administration was seeking out ways to make that data more meaningful. Again, this is a characteristic of the mutualistic relationship between community and institution at ITP. Although a projects API is in the process of being created at ITP by resident researcher Adam Parrish, it wasn't available during this past semester. I created two additional xml feeds using php pulling from the administrative mySQL databases, one for courses offered (past and present) and one for projects. At this point I had access to structured data, and had to build out the structure.

There is a set of maintenance tools named *pywikipediabot* developed for wikipedia written in the Python programming language. Using these available libraries and an earnest desire to learn python, I eventually built over the course of twenty days the scripts that could populate ITPedia.

There was one particular semantic property in the databases that proved to be a conceptual boon to both the structure of ITPedia but also how the community can be understood. At some point, all the projects within ITP started using a keyword field, which allowed users to tag their own

projects. There turned out to be over 3000 keywords across 1293 projects. Although a folksonomical approach at first glance, the keyword feature had been built in to the administrative database interface without providing access to anyone but the original creator a a project to tag that project. In this sense, there was little that the community as a whole had provided to tagging projects – yet. The first thing I had to do was separate the keywords into a completely different namespace within the mediawiki installation. What this means is that in order for the keyword "physical computing" to have it's own page that could display all the projects tagged as such, it had to somehow live in parallel with a page named physical computing that provided a larger entry into the realm of physical computing at ITP, with definitions and a history. In essence, every word that could occupy a keyword and have it's own page, needed to be able to exist in parallel with the same word being a page with a bigger scope. At the end of this phase, ITPedia had 709 people pages, 1293 individual project pages, 459 different sections taught, and 3032 keyword pages, going back to 2004.

The next part of the seeding involved creating the first links for the relationships that have been hard to see through the administrative databases. These relationships are usually expressed culturally with questions like:

"What class was that project made for?"

"What other projects were made in that class?"

"What other projects has that person made?"

"What other courses has this person taught?"

And so, using the semantic structure built into ITPedia, I created templates that queried for this information dynamically. Semantically, every time a person page gets created on ITPedia, it asks direct questions from the users about this person:

Who is she?

Where does she come from?

What is her website?

But the page also asks questions to the rest of the wiki and displays what is relevant:

What projects has she made?

What classes has she taught?

The classes pages ask their own set of questions to the rest of the wiki:

"what projects were made for this class?"

"What sections of this class were taught in the past?"

These questions are all derived from the story driven cultural memory exchanges. As noted earlier, the potential for these relationships was always nascent in the administrative databases, but now become transparent and readily available for editing by all the interested parties, beginning with the individuals who created a project in ITPedia or teach a class at ITP.

The real potential however is really derived from being able to attach pages with content outside the domain of the structured ontology attributable to people within the ontology. Take for example the example of Rob Faludi teaching the wireless networking drive-by while still a student. Under the new wiki structure, signing up to teach a drive-by means attaching your name to a page with the materials you're providing during the drive-by. The only new thing here is the attachment of the name to the materials, within a semantic structure that knows what that means. So I added a question that ITPedia can ask te rest of the wiki for each person page: "what drive-bys has this person taught?"

5.2 Filling in the gaps

In the process of creating the semantic structure and seeding ITPedia, the idea of where exactly the flyby from the older version belonged became apparent. What we needed was a way to attach names to the stories that inform the work we do. The common question on the floor and in the mailing lists is

"How do I do _____?"

the blank field can be absolutely anything: a PHP conondrum, a video editing conundrum, a way to overcome a design challenge, where to get business cards. When the answer isn't a reference to another person or project, it very much can be an explicit explanation that fits the bill of the flyby. In order to make flybys more useful, I attached a semantic field to every project that allows users to indicate which tutorials were useful to that project. But the greatest feature of this field is it's ability to create references to empty pages. In practice, what this means is that if I put in the title of a flyby that doesn't exist in that field it creates a link to a page that doesn't exist, and adds itself to a list of "wanted pages". The creation of a link to non existent page, is essentially asking the implied question to the rest of the community. So in essence, by creating the field that requests the name of a tutorial, it allows the user to beg the question of himself and other people capable of creating that tutorial.

The other part of ITPedia that was missing was the gear. The same way that projects are informed by tutorials, they are made using gear like cameras, software like Max/MSP or made of components such as the arduino microcontroller.

As it happens, Kate Hartman, alumnus, former resident researcher and current instructor, had been tasked to make dedicated gear and resources repository for physical computing by area head Tom Igoe. Through multiple discussions, we agreed that tailoring the gear section to her needs would be best. We designed it so that every piece of gear entered into ITPedia asks the user to associate it with a related class and a related area of focus. On the other side, every project in ITPedia can be re-edited to add the missing information that the administration didn't need for their databases:

"What did you use to make this project?"

A question that can be codified into ITPedia straight from the culture of the community.

And so we can finally add two more questions to the list that ITPedia asks of itself:

What gear has this person contributed to ITPedia?

What Fly-bys has this person contributed to ITPedia?

5.3 Awareness and participation

The future of ITPedia is geared towards increasing participation through interventions and awareness. Although no explicit efforts in this regard were implemented for the initial beta relaunch in April, the participation so far has been very positive with over 100 users logging in and viewing, 6 new ad hoc collaboration pages created in the span of a week, half a dozen alumni logging in and making edits to older projects, and 25 pages of gear being contributed by Kate Hartman and Michael Dory (Resident researcher).

The first proposed strategy for awareness is focused around creating hooks into other tools of communication and collaboration currently used in the community. The first that comes to mind is the student list. Automating emails from ITPedia to the student list on a weekly basis with items such as 'New Pages', 'Updated Pages', 'Most Active Users', 'New Categories' would serve to provide an constant reminder of how ITPedia is being used and by whom. Within that lies the potential for less then regular contributors to see the potential for how they can use ITPedia in ways they haven't previously. in addition, the 'Active User' list can invoke a sense of pride in a community that attaches a high level of recognition to members that tend to the cultural memory. The other tool in this category would be creating better ways of invoking emails for pages that people are interested in. This kind of email notification would be both for community pages users have created and have an interest in specifically, but also group collaboration pages that notify when a different member of the group makes changes. This is a very important point. If ITPedia is ever to become the kind of knowledge management system that truly transcends the linear pitfalls, it needs to give it's users the ability to use it from the first brainstorm session. This way a finished project from the ITP show could be traced all the way back to it's first unorganized document created in the second week of class. Currently this kind of work ends up living in google documents shared by a handful of people. The nature of this kind of work is of low importance to the maker in terms of final documentation, and as a result would never get posted to an ITPedia page if it wasn't already created there. The solution to this is a suite of better notification tools, 'link beachheads' in the class ITPedia page template for the creation of group projects, and more useable WYSIWYG interfaces for the collaboration pages. Since the competition is Google, the bar is set pretty high. However, considering the enticing hooks of syllabus and class pages, this is not an impossible challenge. The vast majority of this work can be done with mediawiki extensions and fine-tuning of templates. An easily overlooked aspect for the future of ITPedia rests on the ability to playfully hoodwink the incoming class just a little bit. If there is a quorum of wiki champions in September that have an explicit routine of use for ITPedia, there's no reason the incoming class won't accept the larger parts of ITPedia and how it works as part of the established cultural memory landscape.

6. CONCLUSION

An intervention into an institutional memory is not an easy task, and not one I necessarily think will carry on as I've envisioned it in my design. The greatest hope I have for ITPedia is that it transcends the designs I made for it, and that unintended uses come from the seeding and structure I built, but along the same lines of intent. In the very least, I can consider my role in the long term a success knowing that towards the road of building a broader view into the knowledge and history of the community I introduced the notion of connecting the questions we ask in the moment with the administrative artifacts that live on permanently.

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