Painting a Landscape onto TAPPED IN 2

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The Original TAPPED IN

From 1996-2002, we developed and hosted an online teacher community called the TAPPED IN Testbed project with NSF funding (http://www.tappedin.org; Schlager & Schank, 1997; Schlager, Fusco, & Schank, 1998 & 2000). Using this testbed, we and our partners have conducted research and development aimed at understanding the nature and affordances of online communities of practice in the service of teacher professional development and systemic reform projects. We have been quite successful at cultivating a thriving education community: through TAPPED IN, more than 15,000 members, including K-12 teachers, librarians, teacher education faculty, professional development staff, researchers, and other education professionals, attend activities hosted by education organizations, conduct their own activities, take online courses, bring their students online, experiment with new ways to teach, and expand their circle of colleagues by participating in community-wide events.

TAPPED IN Version 2 (TI2)

The TAPPED IN Testbed environment supports some of the key activities of an online community of practice, but the environment does not support other online structures and activities that we know are needed to move forward with our research (Schank, Fenton, Schlager, & Fusco, 1999). Starting in mid-2001, with new NSF funding, we began working with our partners and community to design a new TAPPED IN system that we call Tapped In Version 2 (TI2). TI2 is a complete rewrite of the original TAPPED IN and adds many new features and capabilities, including group creation and management, file sharing, threaded discussion boards, search, membership and place directories, instant messaging and chat, and (soon) calendaring and course management (see http://ti2.ctl.sri.com/tappedin).

The Place Metaphor in TAPPED IN

Our original TAPPED IN environment, shown in Figures 1 and 2, emphasized a place metaphor with views of rooms, views of a campus with buildings, and a campus map. We explicitly designed the original TAPPED IN to resemble a conference center to evoke the kind of professional atmosphere (and thereby encourage the kinds of discourse) one would find at a conference facility or institute. We built suites of rooms for our partner "tenants" and offered free offices to our members. The physical metaphor helped our members (especially teachers new to technology) navigate the environment and enabled us to attract small groups of education professionals (and scouting parties for larger organizations) looking for an on-line venue to hold group activities.

However, these physical cues (maps, room drawings) also took up a lot of space in our user interface. With TI2, we planned to make some sweeping changes that would make much more information and many more collaborative tools accessible in the environment. We conjectured that users nowadays would be much more web savvy, so we could devote more of the interface to information and let the place metaphor fade to the background. So, in our design for TI2, we kept the room metaphor, but replaced the functional room drawing with a small room thumbnail, and replaced the graphical campus map with directory listings (see Figures 3 and 4).

Testers' Reactions to TI2

TI2 was released for alpha testing on September 1, 2002. Thirty-two of our "old" TAPPED IN member volunteered to be alpha testers, which involves exploring the system and running through one

or more of five testing scripts (see http://ti2.ctl.sri.com/tappedin/beta_testing.jsp). During the first month of testing, 13 of these volunteers have submitted bug reports (8 volunteers) or general suggestions (8 volunteers). Feedback has been overwhelmingly positive. However, the most common complaint has been a lack of understanding of where you are, how to go to other rooms, or that there even are other rooms. A sample of these "place-related" comments from alpha testers are shown in Table 1.

Table 1. Sample comments from TI2 alpha testers related to the sense of place (or confusion about the lack thereof). All testers are former TAPPED IN users.

Where are the other offices?
Although the new interface has a crisp look, and is undoubtedly useful for moobies, I must admit that I'm a bit at a loss regarding the overall architecture. I really liked the way the 'old' Tapped In had a virtual '3D' presence. 30+ floors with wings, the ability to walk around, browse directories, go up the elevator, walk over to the Pepperdine building, etc. This interface feels much too flat (apologies to Monty Python). Although you can build passageways (a good idea), it doesn't make sense to me to not have a virtual layout. The feel is very two dimensional so far.
Site map? Would like it back - Without the site map the sense of navigating around (entering, exiting, teleporting, etc.) is lost. The vital feeling that you are in a community, moving around and interacting is lost in this interface as I feel like I am simply on an internet site, entering into my web page. - It is hard to get a grasp on where you are. In an online community, that place in space is important I think. - I do really miss my office where I had tables, whiteboard, etc, that I could split groups of students into, other rooms for breakouts discussions and just the cozy inviting look. Students felt like they were inside my office and the different the classrooms I had created. The little photo on the left becomes an icon instead of a feeling of where you are.
3) Is it my imagination, or is there just one room currently implimented? OTOH... 4) I really like the isometric view of the scrap of reception area that's visible. I'm not sure that it is more effective than the top-down map view currently in place, but it looks neat and kinda gamelike (Sim City, etc).
I am hoping that there will be a simple way to put the office graphics back.

Based on such comments, we decided to reassess the issue of place in TI2 to determine how we could provide more helpful cues about location and geography in a minimally invasive way (i.e., not have the cues take over the interface as they did in the original TAPPED IN) and within our small remaining budget. Could we paint a geographical landscape onto TI2 in a meaningful and cost-effective way?

Assessment of the Problem

Both the original TAPPED IN and TI2 are based on place-based models in which (1) you are always in a room, (2) rooms are grouped in collections, and (3) rooms are connected to each other. In the original TAPPED IN, the collections are buildings and floors, and the connections are room exits depicted on graphical maps. In TI2, the room collections are by type (e.g., tenant rooms, group rooms, personal offices, course rooms, reception rooms) and connections between rooms are implemented as virtual "passageways" from one room to another. The word "passageway" was chosen precisely because it doesn't imply a shape or geographical location, as do "street", "hall", "road", etc. Much like

many other chat environments, there is no visual or structural sense of place or an overarching geography to the TI2 community beyond the look and name of each individual room, aside from the addition of the passageways. We imagined all the rooms of TI2 as not existing in a particular location, but just floating in space, connected by dynamic passageways which could be created and deleted on the fly.

There are many ways to move between rooms in TI2, but many of them rely on accessing the directory or choosing from a list of favorite places rather than navigating by means of the room interface itself. The only significant navigational component in the room interface is the Passageways menu item, which lists passageways out of (and sometimes into) the room. Also, "featured" passageways are listed on the "Featured Items" note on the welcome page.

We think that TI2 users were most confused by (1) the conceptual loss of the campus geography, buildings, floors, elevators, with only rooms remaining as a spatial unit, and (2) the absence of visual navigational cues and functions in the room interface itself. Without immediate maps and other cues, users lost their sense of place and were at a loss for how to move from one room to another. The textual cue of the room name (which appears twice in the interface) and the images and colors associated with the room seemed to be inadequate in giving users' a sense of location. It is interesting to note that most of "feeling lost" comments came from members of the original TAPPED IN; they seemed to a feel a more keen sense of loss and disorientation than did users that were completely new to the TI2 community.

Finding Solutions

Our TI2 team spent about 3 weeks considering these place issues and implementing a solution. We wanted to help our users, but careful planning and design was required so that we didn't compromise the design of our interface by awkwardly retrofitting a place model onto TI2. A number of needs had to simultaneously balanced in addition to orienting the user, including managing the limited screen real estate, designing for easy expansion, and meeting the needs and requirements of invested tenant partners. For example, our users wanted some kind of graphical campus map, which would need to change whenever a new tenant joined TI2 or an old tenant left. However, as we found with the original TAPPED IN, it is harder maintain, scale, and license a system that requires ongoing maintenance of often-changing graphics such as room and campus maps. This was one of many motivations to provide directory listings in place of maps in our original design of TI2. Where possible, we needed to design automated, scalable revisions.

Our easiest decision was to highlight the passageways, our primary existing navigational component. We moved the featured passageways into a separate note on the welcome page of each room. In the future, we may also try to give the passageways note a more distinctive look (see Figure 5 item a).

After going back and forth several times, we finally decided to reinstitute a geographical hierarchy of Building, Floor, Room where each tenant has its own building. Each room is on a particular floor of a particular building. Other options—such as buildings having wings in addition to floors or all of TI2 being one building—were discarded since they either didn't scale well or were overly difficult to visualize or conceptualize. For simplicity, each room appears in only one floor, and never exists in more than one place, even though having a room appear in multiple places was technically possible and arguabley even desirable for convenience. Floors serve as both a spatial unit to add geographical richness as well as a container to spatially group related rooms. At all times, a user is in one particular room; that is, you can never be in a building or on a floor without also being in an actual room in that building or on that floor.

For example, any user who joins TI2 can create a personal office. If that user is affiliated with a tenant, such as "Pepperdine," the user's office appears only on the Personal Offices floor in the

Pepperdine Building. If the user is not affiliated with a particular tenant, his or her room appears in the Personal Offices floor of the Tapped In Center Building. Technically, if a user is affiliated with a tenant, it would be easy to have his or her office appear in the Personal Offices floor in the Tapped In Center Building *in addition* to appearing in the tenant building. Indeed, some users may want the convenience of being able to access any personal office from the Tapped In Center Building. However, this violation of the rules of physical space could confuse other users. Since we have other, redundant "convenience" alternatives for fast teleportation to any place in TI2—such the Favorite Places menus, Passageways, and the "Tapped In: Places" and "Search: Places" tabs—we chose the simplified model in which a room exists in one and only one floor of one and only one building.

Armed with a consistent physical metaphor, we were able to proceed with designing how the interface would reflect that geography. Specific interface changes made include:

1. Adding to each floor a special "lobby" room where a listing of the rooms on that floor is available in the room interface (see Figure 6).
2. Making the tenant's main reception room the "entry room" on the first floor of their building. This room provides a listing of the floors in the building and the rooms on the first floor inside of the room Welcome note (see Figure 7).
3. Adding an "out" link the interface of a room, just below the room image. Clicking out in a room takes you to the lobby of the floor you are on; out in a lobby takes you to the reception room of the building you are in; out in a reception room takes you to the TI2 reception (see Figure 5 item b).
4. Changing the building icon to always reflect the building that the room is in, instead of being tied to the particular room look and feel that is customizable by the user. Clicking on the building icon transports the user to the reception room of that building (see Figure 5 item c)
5. Adding a campus map with graphical representations of all the buildings in TI2. The map appears in the "Tapped In: About" tab and as a link from on the welcome page of reception rooms (see Figure 8).

We were able to implement all of these changes in an automated fashion that requires little ongoing maintenance by TI2 engineers. We believe that these changes will improve the navigability of TI2 and give users a better mental model of the community structure, but it remains to be seen whether these changes will be enough to negate the "two-dimensional" feeling that some testers comment on. At the workshop, we will report on reactions by our testers and users to our attempt to paint a landscape onto TI2, and additional modifications we may make based on their reactions.

Referemces

Schlager, M., Fusco, J. & Schank, P (2002). Evolution of an on-line education community of practice. In K. A. Renninger and W. Shumar (Eds.), *Building virtual communities: Learning and change in cyberspace*. NY: Cambridge University Press, 129-158.

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Schlager, M., & Schank, P. (1997). TAPPED IN: A New On-line Teacher Community Concept for the Next Generation of Internet Technology. *Proceedings of the Second International Conference on Computer Support for Collaborative Learning*, R. Hall, N. Miyake & N. Enyedy (Eds.), pp. 231-240, Hillsdale, NJ: Erlbaum.
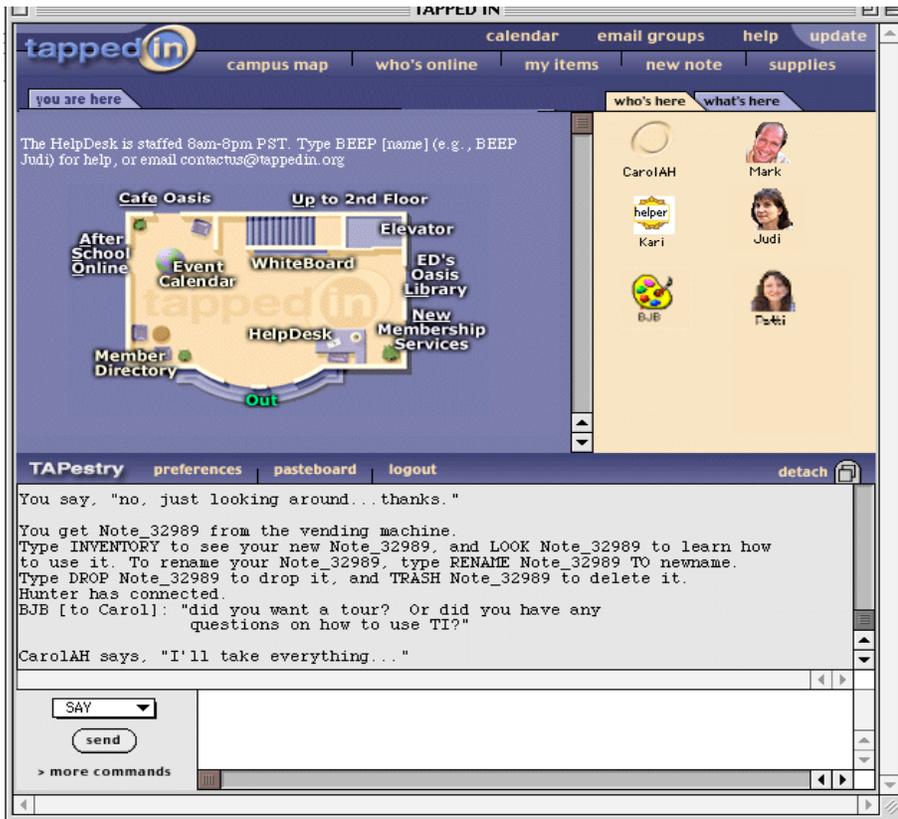
Figure 1. The user interface to the original TAPPED IN testbed system.
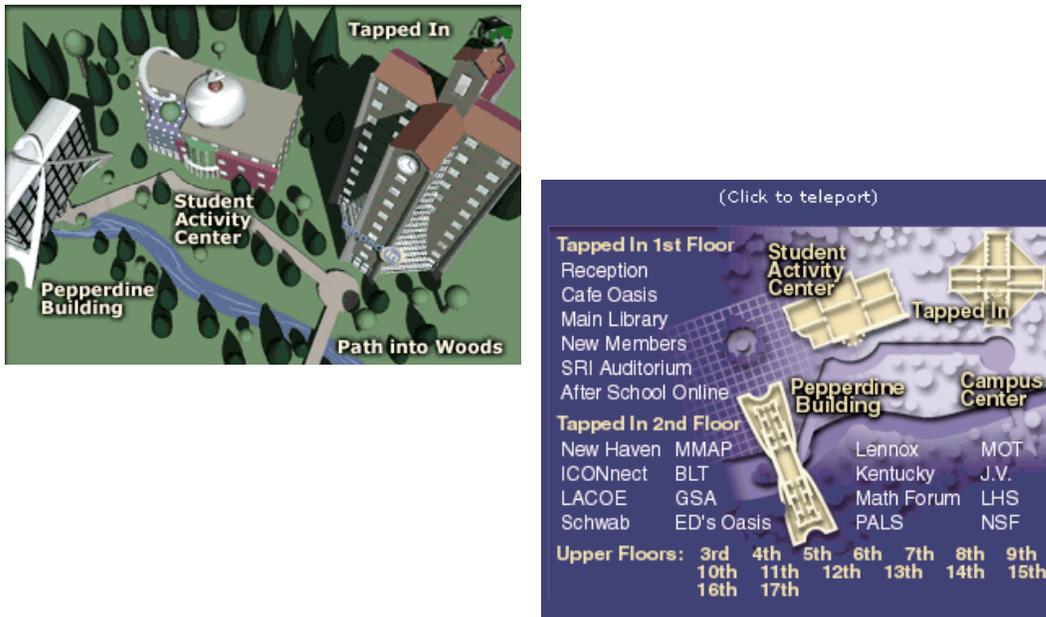

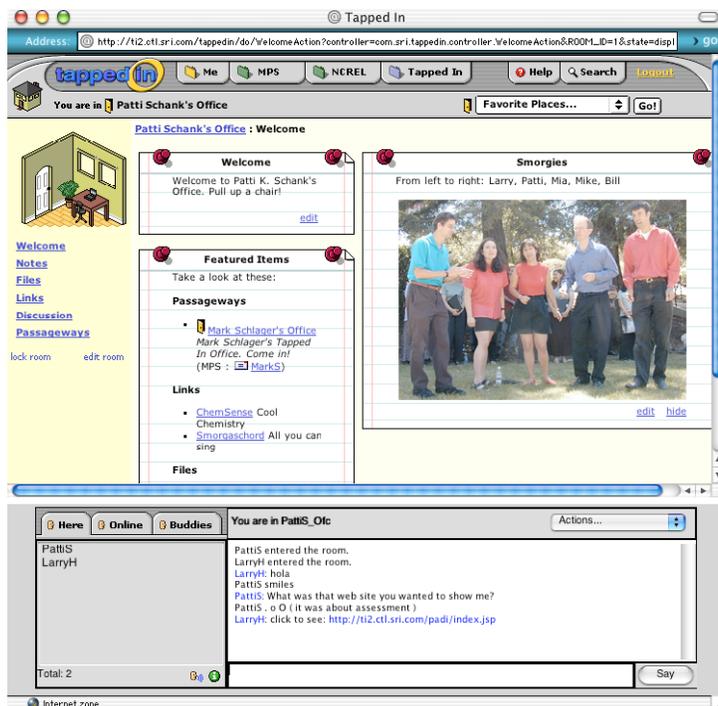**Figure 2**. Original TAPPED IN Campus view and campus map.

Figure 3. Initial TAPPED IN Version 2 (TI2) interface view of a room, analogous to Figure 1 in the original TAPPED IN. TI2 also uses the metaphor of place, but puts more emphasis on (new) tools and information.
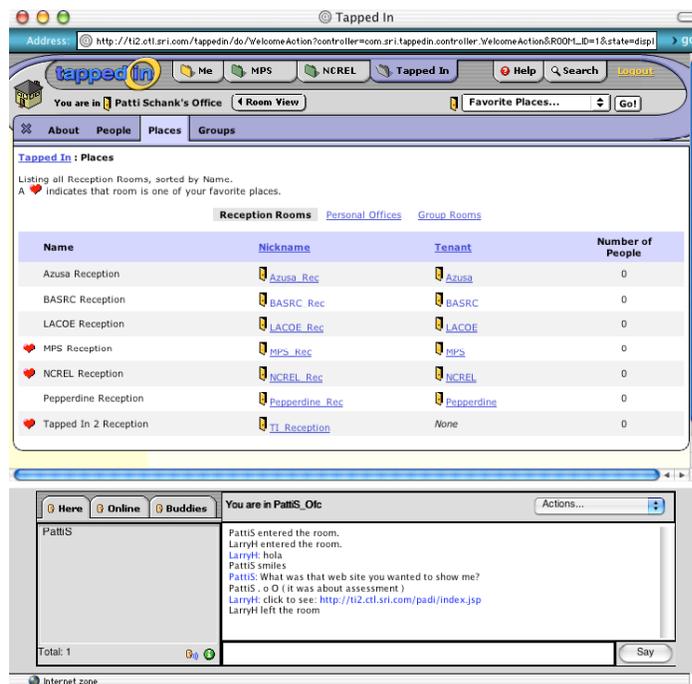

Figure 4. In the initial implementation of TI2, the graphical campus map views (shown in Figure 2) were replaced with directory lists that "overlay" the room view.
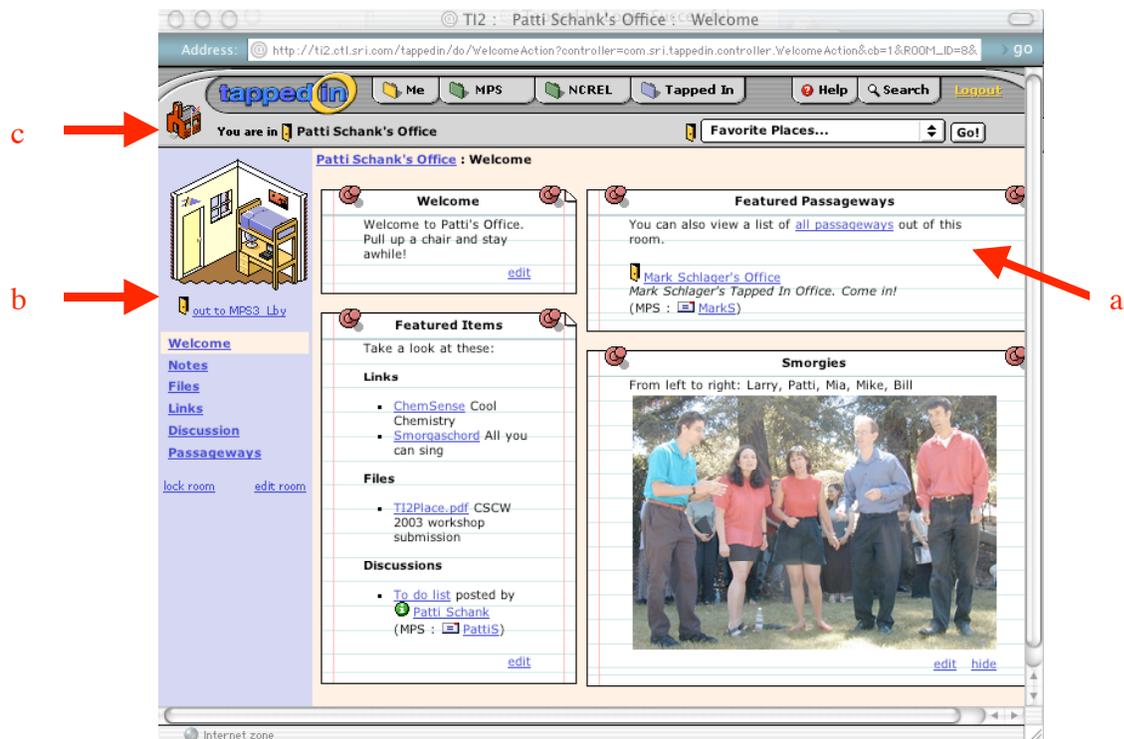
Figure 5. Redesigned TI2 Office with (a) separated Passageways note, (b) new "out" link to the new lobby of the 3rd floor on which it resides, and (c) icon corresponding to current building (previously, this icon was tied to the customizable room look and feel). (Chat disabled to highlight changes.)
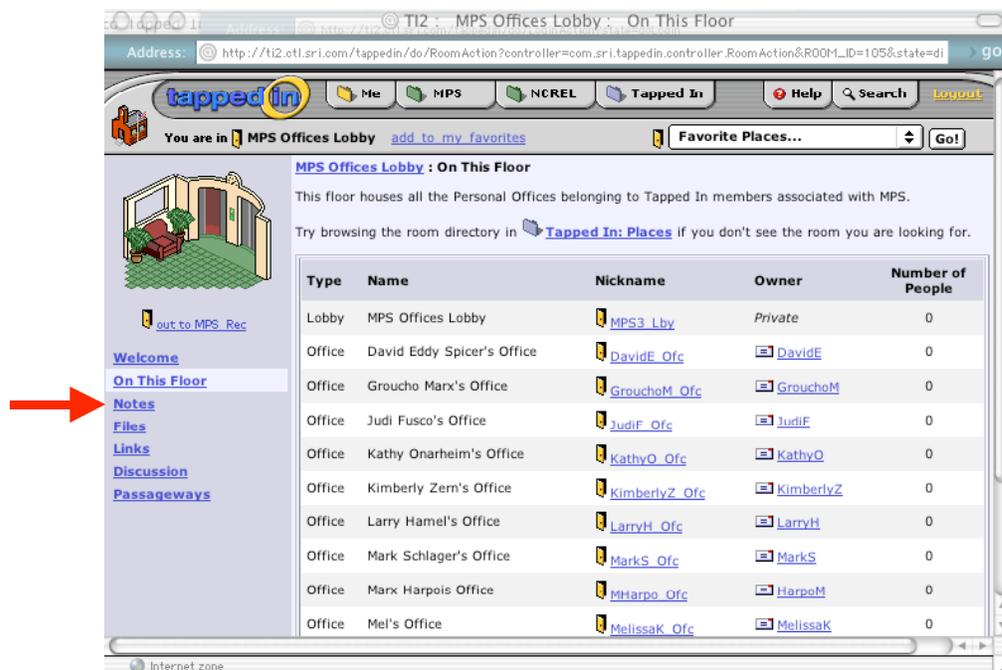

Figure 6. A new lobby room with listing of rooms on this floor. (Chat disabled to highlight changes.)
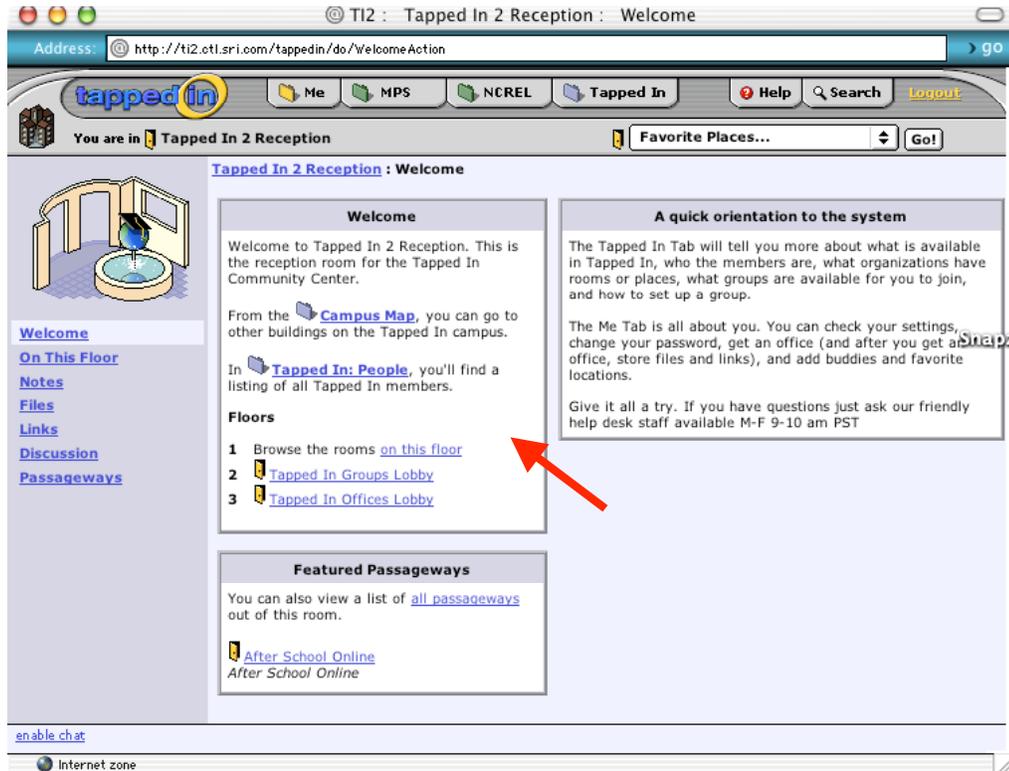
Figure 7. The TI2 Reception Room showing, in the Welcome note, rooms on this floor, floors of the TAPPED IN Center building, and a link to the campus map. (Chat disabled to highlight changes.)

Figure 8. A new, dynamically-generated campus map showing all tenant buildings on the campus. Click on a building to transport there. (Chat disabled to highlight changes.)