

Tips for Building Knowledge Infrastructures

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Note #11: Introducing the Knowledge City: A Proposed Metaphor for a Knowledge Interface

About Knowledge Management (KM)

The reality: too much information, not enough knowledge. The challenge of any Standard Knowledge Infrastructure (SKI) is generally to connect the *right users* with the *right knowledge* at the *right time*. True – but let me add two critical parameters: the *right amount of knowledge* that must be conveyed, and – perhaps critically – *at the right cost*.

The purpose of this note is to propose one user interface, an interface that is designed to optimally control floods of knowledge and allow their conversion into meaningful working knowledge. This interface serves as an organizer of knowledge for the users, the knowledge leaders, the IT personnel that need to support them, and the managers who must fund and evaluate the overall value of the Standard Knowledge Infrastructure.

The users' first encounter with a knowledge infrastructure is with the interface. The interface is a set of signs that convey meaning, much like words, pictures, road signs, or gestures are signs. The signs of the interface, be they verbal or graphic, bridge between the user and the functioning program. The interface is the visual unit that presents on the users' screen and through which they perform all knowledge-related activities, and hence is crucial to the success of the knowledge management system.

—Yesha

Theoretically, a knowledge infrastructure has three principal components (Figure 1). The switchboard is the invisible mechanism that connects knowledge users to knowledge services. Like the telephone switchboard, the purpose of a knowledge switchboard is to “do the job” quickly and efficiently, over and over, and behind the scenes. However, because it connects the users with the services, the switchboard must assume some façade so that it is represented to users; this representation, which becomes the users' ticket to command and direct infrastructure functions, is the knowledge user interface.

The willingness of organizational users to access and use their knowledge infrastructure depends

on the success of the user interface. If the interface is too complicated or cumbersome, many users will not proceed further and will choose alternative methods for essential tasks, even if less efficient or comprehensive (Tiwana, 2000). Die-hard computer buffs may brave any interface; for many, however, “the apparel oft proclaims the man” (*Hamlet*, I.iii.72), and a first impression gels to a permanent judgment. Indeed, assessing a program by way of its interface is more than the case of a book being judged by its cover, since the interface needs to be actively engaged to allow for entry into the program.

KNOWLEDGE GEOGRAPHY

One of the most common metaphors for knowledge location and arrangement within an organization is known as “knowledge cartography,”

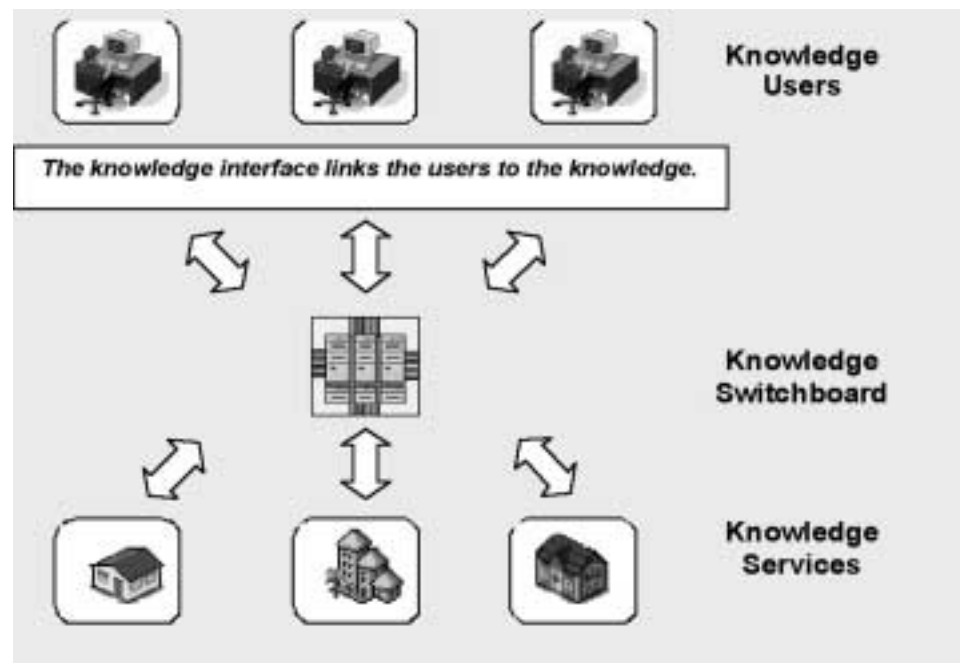


Figure 1. Knowledge Users - Knowledge Services Connection

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or “knowledge mapping,” or as we call it, knowledge geography. There are many definitions of a knowledge map; one representative definition is: *“The knowledge map is a navigation aid to explicit (codified) information and tacit knowledge, showing the importance and the relationships between knowledge stores and dynamics. The knowledge map, an outcome of synthesis, portrays the sources, flows, constraints and sinks (losses or stopping points) of knowledge within an organization”* (Grey, 1999). The idea is a simple one: take knowledge points, be they origins, conduits, passageways, references, or destinations, and plot them. In other words, visually designate knowledge sources.

A knowledge map is designed “to guide people to knowledge resources” (Allee, 1997, page 216). This notion of guiding is important, for positioning, locating, directing, orienting, and navigating are as much a part of knowledge management as they are of cartography. Maps can be spatial, pictorial, or hierarchical, as is common with Internet sites.

Yet even more inviting than a hierarchical map representation is a geographical map representation. It is a familiar, easily-adapted, graphic tool. Once the user learns how to read one geographical map, which for most people is a skill acquired in elementary school, one essentially knows how to read any other, be it of a neighborhood, a city, or a country. The map’s components are easily recognized houses, highways, streets, parks, bodies of water; likewise its set of relevant symbols, be they for rest rooms, picnic areas, or filling stations. Finally, one of the particular assets of a map is its adaptability: just as towns add new streets or re-route highways without destroying the integrity of the map, so a map as a graphic representation of data, information, knowledge, or any material can adapt to changing needs and contents, all the while retaining its basic structure.

A KNOWLEDGE GEOGRAPHY INTERFACE

The discussion that follows explores some of the components of a proposed knowledge map interface and July-September 2001 • WebNet Journal

their function as knowledge management tools. The map referred to is the interface of ATO (A Typical Organization), Inc., an organization we have examined on previous occasions (Sivan, 2001a-b).

The “House” as a Knowledge Service

We have previously defined a knowledge service as “a collection of knowledge views about a particular subject matter” (Sivan, 2000). That is, a service is comprised of arrangements of knowledge about a certain subject for certain sets of users.

With this concept of a service, let’s translate it to the metaphor of a geographical map. We can think of a knowledge service as a “house,” whose contributing knowledge units become the “rooms.” A knowledge house thus includes knowledge rooms, which in turn contain binders that are made up of pages. Pages can be static or dynamic. A static page, such as a Word document, an HTML file, or a PowerPoint presentation, is a fixed unit unless specifically changed by an editor. A dynamic page changes automatically based on data that it draws from a certain source – for example, from a

database that lists all new prospective clients or from an Internet list of all news items about the organization’s competitors.

Let me illustrate a house, its rooms, and their binders and pages by way of two examples. Displayed below are the hierarchically arranged contents of two knowledge houses from the ATO map interface, one of ATO’s General Library and the second on the Management of Information Systems (MIS) at ATO.

Figure 2 demonstrates a generic structure for a knowledge house. Background information about the house – its description, contents, leader, relevant news – can be accessed by clicking on the House icon and name. Each House displays its own set of rooms, divided thematically and furnished with relevant material, binders and pages alike. Notice that the Library includes its own “Museum,” namely, a room that stores old material no longer in active use but which people may still wish to view. For its part, the MIS house is still partially in the planning stage, with some rooms, binders, and pages designed but yet to be realized; hence their status of “TBD”: To Be Determined.

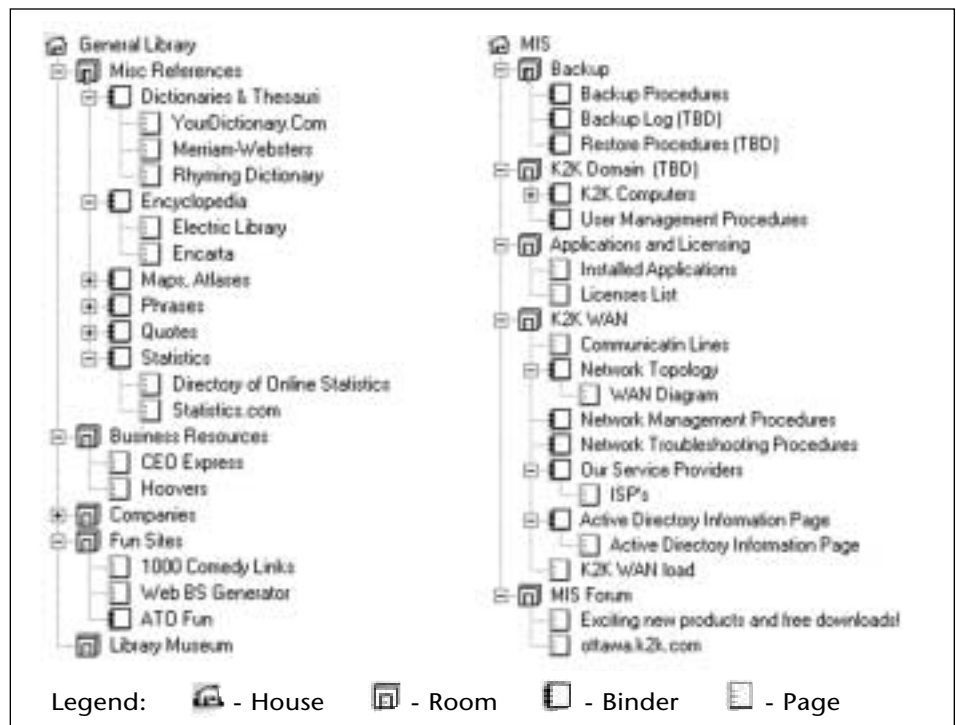


Figure 2. Sample Contents of Knowledge Houses

The purpose of this incomplete status is to inform the user that such material is intended for the house, available at some point in the future.

What value lies in the notion of a knowledge house? A house is a universally familiar object, enjoyed by many and desired by others: in other words, it has positive associations. Owning a house fosters a sense of pride and responsibility, and the way in which it is planned and furnished is a function of the owner's judgment. No two houses, albeit of the same façade, share identical interiors. Unlike a public park or a community center, a house is not open to all people at all times; rather, its owner determines entry and access. Furthermore, a house is a site both for storage and for activity. As sparse as any house or room may be, one of the functions of a house is its capacity to contain possessions – from the items used on a daily basis to family mementos boxed and unopened for generations. Yet in addition to the static nature of the contents, a house is a dynamic location – people come and go, interact, and change within its walls.

The analogy that a house offers to a knowledge service should already be clear. A knowledge house is “owned,” in effect, managed by a knowledge leader. Managing the knowledge house requires responsibility and creates an opportunity for renovation and innovation. Rooms, binders, and pages are selected, arranged, and even discarded at the discretion of the owner, who is also entitled to decide who may enter any room or view any binder or even any page. A knowledge house is a means of storage, but at the same time, may offer more dynamic activities, such as Chat rooms, video rooms, discussion groups, or even

places for completing and filing forms. Finally, a knowledge house will inherently be a familiar representation to veteran and new users alike, as well as a natural leap from the traditional hierarchy of folders familiar to people from Windows on the PC or X terminals, or even the equivalent from the Macintosh.

The “District” as a Departmental Collection of Houses

The role of a Standard Knowledge Infrastructure (SKI) is to include and manage many knowledge services, or according to the geographical metaphor, many houses. Houses within a defined geographical location are generally part of a neighborhood or a district; similarly, knowledge houses defined by their organizational role are grouped in districts. In other words, a district is the site for a collection of houses arranged on a map intended for a particular set of users. It is an organizing mechanism, so that houses are not randomly scattered across the map, with no logic to their placement.

Figure 3 offers an example of the Marketing district at ATO. It includes houses for specific Marketing needs, from CRM issues to Potential Sales Leads. Each icon, be it of a building or a house, or of another graphic, symbolizes the collection of rooms, binders, and pages – in short, the knowledge contained within that particular house, easily accessed by a click on the house. Within the district itself, there is an internal division of the area into three smaller areas. The area to the far left, left of the curved blue line, is “beyond the river.” It is the area designated for extra-departmental – often extra-organizational – knowledge houses that are important to

the workings of the department itself, such as the Competitors House and the Partners House in the figure. Moving across the map, to the immediate right of the river and dominating the central portion of the district, lies the area of core knowledge – for example, houses about products that can be marketed and about the sales force. Finally, to the far right of the district lie management houses that relate specifically to the district, such as “How to do it,” which outlines knowledge related to organizational methodology. There are many other potential houses for the district; the governing criterion for departmental district houses is their use as work tools for members of that department.

Perhaps the supreme value of the district to the interface as a whole is the logical grouping of some knowledge houses together – and the exclusion of others. If we return to one of the parameters of our opening criteria of the SKI, we insisted that the infrastructure must make the right amount of knowledge available in a meaningful way. Organizing knowledge houses by department confirms that the “nuts and bolts” of HR, for example, do not clutter the desktops of the Marketing reps. In addition, it helps define for the user on what level s/he needs the knowledge of any one house: while Marketing Conferences may be of interest to the IT staff, that knowledge is not essential to their departmental tasks, and therefore the house would not appear in the IT district.

The “City” as a Collection of Districts on the Map

A typical complete map interface will portray the organization as a “city,” that is, a municipal unit that stands alone, albeit is connected to the outside world (over the bridge, beyond the river). As a city, it is composed of different areas or neighborhoods, or in the terminology of the interface, districts. Indeed, the complete interface generally presents different sets of three orga-



Figure 3. Sample Marketing District on the Map Interface

nizational districts to each user, as depicted in Figure 4.

The full map is the knowledge interface of ATO. Here, each ATO knowledge user enters the knowledge infrastructure with a similar – but significantly, not identical – map. The upper slice will generally be of the organization as a whole, and will include houses that are relevant throughout the organization, as shown in Figure 5.

Users may be frequent, self-motivated users of these houses, or the houses may be chosen for them – that is, management may decide that all users should have access to certain houses within the organization, even if they remain unvisited. What is important is that the knowledge user automatically identifies with the greater organizational whole on a daily basis, both visually (through the map) and as a result, conceptually. The district is also significant in that it provides a common, unifying portion to the interface across the organization.

The central district is the departmental district, which we examined above in our example of a Marketing district and our discussion of what constitutes a district. Finally, the lower third of the map is the personal district of the user, who, permissions permitting, can incorporate a variety of houses within his/her district. Take John, for example, who is an ATO salesperson in the west coast division. John's top two strata will be the ATO organizational and Marketing districts, respectively, and will mirror the maps of some of his colleagues. However, a look at the lower personal district reveals a district replete with houses different from his colleagues' choices, ranging from the QA house to a house reviewing restaurants in the Los Angeles area.

The city thus becomes a strong organizing tool for ATO's knowledge users, but its real value is far greater than that. It offers both a visual and logical principle for knowledge personalization within the greater organizational whole.

Organizational members of different departments share the upper level, while for colleagues within departments the two districts are similar. The lower personal district, however, ensures that no two maps will be identical, and performance encourages users to choose knowledge houses that particularly interest them. The result: a knowledge user is given access only to what s/he needs and what is of interest to him/her. Allowing houses from other departments to be placed on one's personal district, however, encourages the breakdown of unnecessary barriers. That is, if the Conferences House is not essential to IT, but it interests the head of the

department, why should it be closed to her? On the contrary, her interest is piqued and perhaps she may think along different organizational lines, an example of flexibility most welcome in large organizations. This in turn encourages knowledge generation and creativity, as well as the cultivation of the knowledge infrastructure itself by affording each user an area for personal design. Should this seem too much of a "free for all," however, the possibilities are easily curtailed by limiting access rights to houses.

Moreover, although we have presented the map as typically consisting of three districts, in actuality it allows for variations and adapta-

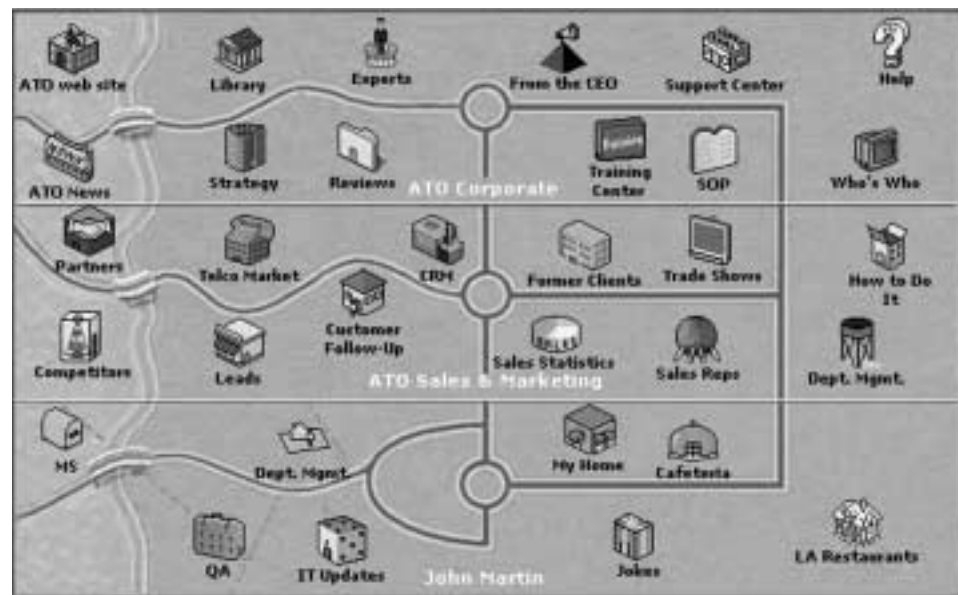


Figure 4. Sample Complete Map Interface

- ATO Web Site	- From the CEO
- ATO News	- Training Center
- Library	- Support Center
- Strategy	- Standard Operating Procedures
- Experts	- Help
- Reviews	- Who's Who

Figure 5. Knowledge Houses in the ATO Corporate District

tions. For example, if someone works within two departments or has recently moved from one department to another, the map allows for the possible inclusion of a fourth district. Or, a department head may decide that different houses within the district are more important for some people than for others, and place those houses accordingly. Just as approaches vary among urban planners, or urban planners themselves will utilize different styles and methods in the course of their work, so too the infrastructure maps have the inherent structural power to allow for flexibility and adaptation.

CONCLUSION

A New Knowledge Discourse

Gradually there is a new kind of discourse on knowledge within the organization. Instead of the more typical "who knows about..." or "how can I ever track down that report," other comments become the refrain. "How can I see this on my map?" indicates a desire to be more involved with the knowledge in question. Passing judgment on another's house, be it favorable or unfavorable, also displays a greater commitment to what the map looks like and how houses are built. Knowledge activities now make sense, and are almost required to sustain to sustain the logic of the interface. Finally, the map encourages knowledge generation, perhaps one of the most important

potential assets to an organization. Seeing and reacting to someone else's sales presentation, for example, motivates the creation of one's own new, improved presentation. This type of activity, renewal, and creativity assists the organization and the knowledge user alike - one of the underlying goals of the knowledge infrastructure.

The Value of the Metaphor

In particular, a geographical map as the user interface for a knowledge infrastructure allows all sorts of possibilities. Its immediate recognizability and set of familiar urban associations lend it a supreme advantage (Safdie, 1997). Divisions into districts, zones, and other geographical neighborhoods divide knowledge units, user groups, or structural organizational levels using a city metaphor that is grasped intuitively by any user. A bridge can suggest that another site, although within the greater scope, is less intricately connected. Similar geographical map associations abound. Perhaps most important, however, is the understanding of the dynamic nature of the interface. A neighborhood, representative of any geographical area, that does not evolve is not long for the lasting. New streets are added, street names change, stores come and go, and populations shift. In areas less populated, topographies change, landscapes evolve, and ecological systems develop. Thus, be it natural

evolutionary shifts or more artificial, industrial transformations, change is part of what defines a geographical area. Similarly, this dynamism mirrors the vital nature of a knowledge infrastructure.

There are of course many other metaphors eligible for effective user interfaces. The goal is to achieve a unique combination of meaning, ease, and aesthetic quality in one package; in this way, a user who works with a program will both see it physically and be able to grasp its value. As for the map interface proposed above: we are looking for your feedback - please explore the theory and the possibilities of the map at greater length (www.k2k.com - and follow the links to the map). Let us know what your impressions are of the map as a working knowledge interface, and share your comments and experiences. 🌐

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Links to Knowledge Management Sites

K2K: www.k2k.com - with links to the map

Applied Learning Labs: <http://www.learninglabs.org/>

WebMap: www.netzapper.com

Huge City of Huge Click: www.hugeclick.com