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knowledge geography and the fourth place; some lessons for km from urban mediascapes

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Introduction

The value of information and telecommunications technology lies to some extent in its disrespect for geography. Whereas geography was, in former times, a factor in telecommunications, today information moves around fast and cheaply enough that only the respective time zones of sender and receiver remain relevant. Whereas this means cheaper communications, it also impoverishes those communications in subtle ways. This impoverishment is relevant in knowledge management because knowledge is supposed to be rich.

Problems and responses

ITC is a young industry that in many instances still relies on primitive data types such as 8 bit ASCII codes to move and store information. Whereas simplification has resulted in the taming of the geography of communication, it has the side-effect of destroying context – a net loss of information.

Digital information is 'thin.'

As a rule, richer information types such as XML or MPG (that convey more context) can be encoded in simpler data types, but whatever the complexity of the format, the act of digitizing is an act of editing, where the signal is abstracted from a set of possibilities, and the data are separated irretrievably from the context in which they were digitized. This process is unidirectional in that that context cannot be reconstructed from the resulting data. Metadata, because they must be searchable by character strings and timestamps alone, are a pale shadow of the world in which data originate.

To be retrievable, data must be stored in databases. Database designers have to design dimensions along which seekers of data are likely to be able to locate it. In databases, time, weather, contentiousness, price, colour, quality, place, and any other dimension must be represented by the designer, then captured reliably, or be lost. Representation and capture are both simplifications. One effect among many is therefore to denude information of its geographic context. There are two responses to this.

Geographic Information Systems are an attempt to encode geographic information in primitive data formats susceptible to storage in relational databases. GIS was developed mainly by geographers (natural and human) and geologists. Although it is now used in business, take-up has been limited outside the United States. Geographic representations are themselves described by textual metadata; this is more important than for text-like data types because geographic data sets are not readily searchable with text strings – although they are searchable spatially. They are moreover of no use until corresponding tabular data has been georeferenced to their unique record identifier or to a common co-ordinate system. This process then allows facts to be associated with places. Georeferencing is far more expensive if undertaken in retrospect rather than at capture (hence design) time.

In contrast, geographically aware systems are an attempt to encode geographic context at the time of digitizing. The systems we will be considering are exemplified by Urban Tapestries, developed by SoMa (Social Matrices) and Proboscis in conjunction with the LSE's media department. I was involved in the first live trial of this system in London during December 2003. There are other such projects, notably Mobile Bristol. Related projects like One Block Radius do not use automated georeferencing, but imply it.

We will consider what implications for corporate knowledge management can be drawn from geographically-aware information generated by the casual user. But not yet.

Urban mediascapes

Mediascapes are context- and or geography-sensitive digital media that refer to other landscapes. Typically, as they have been used so far, they are overlaid on an urban landscape such that multimedia database entries (text, sound, video) can be associated with a precise point on the

earth's surface, for example Bloomsbury Square, London (Urban Tapestries) St Augustine's Parade, Bristol (Mobile Bristol) or Rivington and Bowery, New York (One Block Radius).

These landscapes are held on a server. Local wireless traffic (usually IEEE 802.11x, GPRS or both) is routed to the server via a conventional internet connection. Users have wireless handheld devices with web browsers and some form of global positioning capability (Mobile Bristol uses GPS, Urban Tapestries relies on 802.11b and GPRS). When the client requests a page from the server it passes its location with the request so that the server can return a view of the virtual landscape that corresponds to the client's real position. Items that are not part of the landscape, that have been uploaded by other users in that location, are visible to users in the vicinity as symbols. Clients can then upload their own annotations, like sticky notes attached to the map.

Urban Tapestries in use

In the first trial, Urban Tapestries did not yet have any automatic location sensing, so it used an Ordnance Survey 1:10,000 map of Bloomsbury containing every local Royal Mail address. Users tapped the screen to indicate their position. This is less than satisfactory given that one's position may not be obvious with respect to the part of the map one is looking at – in other words, people get lost. But a user-entered location needs to remain an option because of concerns about malign surveillance and because users may want to see parts of the map without going there themselves.

Entries in the vicinity, created by other users, appear as geometric shapes overlaid on the map (one shape per 'thread'), with threads joined by lines to create an itinerary users can follow by actually walking from place to place. Tapping a shape brings up the content – in the first trial, this is text only.

In December 2003 Urban Tapestries used a Macromedia Flash client on an HP WiFi PDA. In use, especially towards the end of the trial when there were hundreds of entries all over Bloomsbury, Flash proved too much for a PDA, and frequent resets were needed.

Unfortunately, because of Ordnance Survey's restrictive copyright conditions, reproduction here is illegal.

Ethnography or technology?

Urban Tapestries was primarily an ethnographic study, concerned with studying the way people might respond to being able to upload data to places, and to read other people's contributions. The project nevertheless has software development at its heart, because it aims to create an open source platform for capturing and serving geographically aware data *in vivo*. The aim is to remain platform and network agnostic.

The directors of Urban Tapestries are eager to convey the non-commercial nature of their endeavour. This is far from saying that it is anti-commercial; rather, it positions itself upstream of the product development process in the sense that it is concerned with the design of standards rather than of products.

The emphasis on the observation of human behaviour is interesting to knowledge managers in as much as many of the challenges under study are about how people use systems to support real activities, whether they be commercial, domestic, recreational, or creative. As in many commercial organizations, whether those systems generate revenue directly (an interventionist product-driven approach) is secondary to the question of how they affect behaviour. Furthermore, an exploratory approach acknowledges the dialectical relationship between behaviours and tools, allowing for the fact that what users do with technology, imagined as static in reductive product development exercises, may evolve in the light of new possibilities. This is obviously relevant where new technological applications such as georeferenced mark-up are involved.

Knowledge managers may have something to learn from ethnographers.

The knowledge management problem

There are two broad strands to Knowledge Management, summarized broadly by Stewart (2001)

as *collecting* versus *connecting*. I would add a third.

Collecting is the librarian's prerogative: the idea is common in many organizations that if everything collectable and categorizable is collected and categorized, then users will appear, search for lost nuggets and deep insights, and return to their work gratefully empowered. In practice, linear hierarchical taxonomies are a means of hiding information, which *ipso facto* occupies many categories in proportion to its usefulness. Moreover, these systems are often driven by supply and constrained by the technologies available: data warehouses house only tabular data, knowledge repositories only textual, and there are no links from one to the other. Often, how data are retrieved and reconfigured is the fount of value: systems that rely on exhaustive, exclusive deterministic categorizations are therefore, at best, value-neutral. Even where there is demand, the notion that raw data are useful remains remarkably persistent.

Connecting people is cheaper and richer, but no collective 'knowledge' is saved. The best example of this is the corporate yellow pages, searchable not only by name and job title, but by proclivity and place.

Both collecting and connecting suffer from the thinness of digitally stored media mentioned in the introduction.

An insight from economics may be instructive here in providing a fresh view of what collecting, connecting and creating mean in wider terms. In *The New Division of Labor: How Computers are Changing the Job Market*, Levy and Murnane describe how computer-aided design and manufacturing have eliminated a whole class of assembly skills to do with correcting for wide manufacturing tolerances (Warsh, 2004). Warsh uses the analogy of the shim, which has disappeared from aerospace. Instead, a new highly skilled class of worker has emerged who render the shim redundant by designing to closer tolerances and co-ordinating the assembly of parts that can now be made in different countries with the knowledge that they will fit when assembled. This new class are connectors. People are the new shims.

Knowledge management is presumably trying to facilitate the work of these human shims with systems that collect knowledge about the gap to be filled and identify processes to fill it, then remember the result for the benefit of future generations. The knowledge question is whether what human shims do can be reduced to a system. I would argue not, since the job of shims is to connect partially known systems that don't otherwise fit. This process is not necessarily reducible, since the number of partially known systems is potentially infinite.

The third strand of knowledge management is, to my mind, *creating*. If reducing knowledge to a platonic taxonomy is inadvertently to create a new and naïve model of the world rather than to remove worldly uncertainty, it is as well to recognize the value of the memorable artefact in the search for the springs of knowledge.

The crafted artefact is most obvious in those 'collecting' systems that have evolved into libraries of well-maintained best practice manuals, just as it is in a good encyclopaedia. It is no accident that both are labour-intensive products of writers, illustrators and editors. In short, they are books.

Books are creating for collection, but their use is not reductive: it leads to other possibilities. But there is also creating for connection: the transitory artefacts groups create and annotate in the course of a discussion or project are the result. Beyond discussion groups, there has been less progress in getting these artefacts into distributable persistent forms. They survive in people's heads or are forgotten.

Geography in knowledge management

Much dissent arises from the poor adaptations of 19th century work spaces to knowledge work (Sharpe, 2002). The geography and ethnography of knowledge is best illustrated by attempts to reimagine those workspaces, whether by radical redesign of the office, by the introduction of 'information affordances', or by the disposition of work spaces with respect to the accidental or manufactured 'third spaces' in which we really learn what goes on in our organizations.

There is also a sense in which the microgeography of work prevails over attempts to systematize

and regulate creative and collaborative endeavour. The clean desk policy, and its cousin, hot desking, are an attempt to strip context from the last redoubt of tactile creative disorder. The implication is that the PC and telephone are the only props necessary for solving problems, and that the anorexic data they convey must be the currency of all knowledge.

Sharpe (2002) identifies three capabilities that will best enhance knowledge work beyond what current office political geography allows. They are intended to be general so as not to anticipate specific solutions. The three are shared surfaces, persistent information, and extended presence. All three have geographic and temporal elements, and all three are addressed in intriguing ways by urban mediascapes. Urban mediascapes are themselves shared spaces, on a scale far beyond what information appliance designers have so far imagined. They provide a protocol for handling, classifying and storing persistent information in ways not imagined even by users of GIS. And as communication tools, they extend the presence of knowledge authors in both time and space.

The work of projects such as Urban Tapestries and similar studies suggests that there is a way to afford to electronic information one small extra part of the context that accretes in the normal course of events to facts, exchanges, impressions and events – namely where it happened.

Learning

There is much evidence that learning and recall are interwoven in motor activities, especially in children (Davis, 1977). In associating information capture with actions and places, there is an opportunity to reinforce learning and reinvigorate the churn of ideas and chance encounters that make the 'third place' indispensable. Whereas reductive attempts to introduce good randomness may be doomed, representing information in new dimensions – notably space – may hold some answers, at least in exploratory (child-like) learning.

Searchability: even connection systems need to be searchable. Spatial dimensions provide new search criteria. This is already common in GIS.

Association: some recollection is by association only, and sometimes association is spatial. By extension, it is possible to imagine a search tool that is primarily and visually geographic, rather than a textual approximation of geography at a high level such as nonsensical pull-down lists that always list all countries alphabetically.

Serendipity: just as two memes can meet by chance on their way through a network or in a document, they can be associated by chance in space, creating new opportunities for associating what has not been associated before.

Related non-geographical systems

Urban Tapestries has applied resources to developing new standards, both by developing client/server protocols and by writing client software for Windows and Symbian PDAs, but it also uses a simple web log to allow its users to reflect on the project.

There are various other protocols that allow users to update online content at will, but a cursory examination suggests that they do not meet the rigidity requirement imposed by reference to a complex geographically aware database at the server, so they are limited to non-geographic applications. Nevertheless protocols like Wiki, best exemplified by the Wikipaedia, are finding their way into collaboration software and project management (*Business Week,* 2004). There is a possibility that these systems could be given rudimentary virtual geographies (see below) and thereby fulfil some of the functions of geographically-aware systems to the extent that those systems reflect human as much as physical geography. They will have succeeded if they make knowledge more navigable, but the approach taken to Urban Tapestries holds some lessons for how we go about building systems in general (see Lessons). In particular, it will tell us whether incidental geographic context at capture time is later used as much as artificially linked geographic context.

Going further

The abstraction inherent in digitizing information has an interesting side effect once geographically aware systems have been developed: the geography in question does not have to be real. Whereas all three projects examined here overlay contributions on real places, there is scope to invent landscapes that reflect the organization and its relationship with other entities; complex projects; complex problems; or landscapes designed to enhance recall, creativity, or problem solving. Less interestingly, mediascapes could be made to resemble the physical spaces in which people work, including the 'third space' in which informal networks are forged.

The possibility of anonymous contributions means that some of the advantages of electronic meetings could in principle be brought to the endeavour. The peculiar benefits of controlled anonymity are well understood and are already brought to bear in virtual landscapes online as chat rooms become ever more elaborate, indeed inventing geographies of their own.

The potential benefits for knowledge work are obvious, if the precise applications needed are not: geography, real or virtual, represents an opportunity to recapture or replace some of the context lost in the digitizing process, as well as the opportunity to create a 'fourth place' where people might connect in unexpected ways, just as they now do on discussion boards and wikis.

Lessons

The most striking thing about Urban Tapestries is that it is not primarily a technological experiment but an ethnographic one. In fact, it was prototyped without electronics, using a technique called bodystorming where participants walk around a room-sized map using sticky notes to add content. The lesson for systems developers and knowledge officers seems to be that because we are asking people to engage in and then alter behaviour, talking through specifications with users is no substitute for observing them using prototype systems, however rudimentary. One reason is simply that once you give people a space in which to create and collaborate, they will tend to make it their own, and not necessarily in expected ways. Our expectations about what users derive from information and knowledge organizing are often wide of the mark because we do not understand how what we think we know they do fits into what we don't know they do.

Prospects

Urban mediascapes and other geographically aware information offer intriguing possibilities for arranging information by providing something missing from textual and taxonomic information: spatial navigation. In so doing, they may succeed in alleviating some of the cognitive effort required to navigate what are currently very abstract information interrogation systems, hopefully making those systems less opaque, and removing one step in the strange journey from information to knowledge.

It is not hard to see how the motor and recall advantages of navigating real space can be translated completely into a usable knowledge management system; the question remains as to whether that system would be of any use other than leisure. On one hand, there will not be much enthusiasm for systems that require a walk outside to retrieve or add information, however salubrious this might be. Similarly, mapping the small spaces in which people already work is not likely to be interesting – although not everyone works in small spaces.

Whereas the prospect of navigating virtual geographies that represent the knowledge of the organization probably has merit, it is not currently within the gift of knowledge managers to predict how it may best be used. Existing ethnographic methods employed in trialling systems for usability – or even graspability – hold important lessons for how innovative systems are designed and deployed, both to reduce project risk and to remind us what knowledge systems are for.

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