

## Mapping the information landscape of the academic library

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**Abstract:** This paper originates from a project entitled *Bibliotek i Endring*, or “Changing Libraries”, funded by the Norwegian National Library, which ran from June 2013 to March 2015. The project studied two academic libraries in Norway undergoing significant organisational changes: a merger of four campuses into one in one location, and a change of director in the other. Over this period of change, a variety of qualitative and quantitative methods were used to create maps of the information landscape (Lloyd 2010) in these two libraries.

The methodology provided summary data on the changing information landscapes for the project team, and also ‘on-the-spot’ data for project participants. Group concept mapping sessions using the Ketso tool ([www.ketso.com](http://www.ketso.com)), held at regular intervals over the duration of the project, raised awareness in the librarians of issues like information sources, blockages, priorities, and necessary actions. Through giving the librarians a shared conceptual space in which to exchange information on tasks, values and actions, “operational proximity” (Tagliaventi and Mattarelli 2006) came into being and boundaries between operational areas of the library could be crossed. The project illustrated how different groups could come together and make collective judgments about the relevance of informational resources in their landscape, a problem with which information science has long struggled (Saracevic 2007).

**Keywords:** information landscape, academic libraries, concept mapping, social network analysis, relevance, operational proximity, communities of practice

### 1. Introduction

This paper discusses the methods of a project, *Bibliotek i endring* (in Norwegian, ‘Changing Libraries’). The project took place at two academic libraries undergoing significant change, and studied this change and related

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organizational learning processes as collective, dialogic (Linell 2009) and social processes “that underlie knowledge sharing between the different subunits of a single organisation” (Tagliaventi, Bertolotti and Macri 2010, 332). Project methods were an innovative mix of *mapping* techniques to generate data about the “information landscape” (Lloyd 2010) of the libraries and how it was managed, both by individuals, and collectively. This methodology provided summative data about the changing information landscapes for the researchers, and ‘on-the-spot’, formative data for project participants. The project thus illustrated how different professional groups could make ongoing, collective judgments about the relevance of informational resources in their landscape, a problem with which information science has long struggled (Saracevic 2007).

## 2. Methodology: Why mapping?

Lloyd’s metaphor (2010) of the “information landscape” is a productive one. Geographical landscapes are all built of the same basic ingredients, but these come together in a near-infinity of configurations, shaped by activity at the micro-scale, continually iterated over long periods. The landscape acts as a record of these activities, revealing its history to observers. For example, in Norway’s fjords one can read evidence of prior glaciation. And in the study of landscapes, maps are valuable tools. They are representations of information derived from a study of a given landscape, representations that are *selective*: maps created for hikers look rather different from maps created for geologists. One can look at a map of a landscape one has never seen, but still acquire a good impression of what is there and what it looks like. A map can also reveal new paths of exploration through a landscape with which one is familiar. Thus, maps are, at one level, tools for learning – and their creation is also a learning process.

The same things are true of information landscapes. Information landscapes are formed of a wide variety of different resources, including texts, documents, reports, people, procedures, systems and more, and while the landscape of one library (say) may resemble another, it will still be essentially unique. In each landscape one can read the record of prior informational activities. The landscape is something one *experiences* and *explores*, an engagement which “allows [one]... to map the landscape, constructing an understanding of how it is shaped” (Lloyd 2010, 2). Exploring, and mapping, an information landscape “requires the act of becoming informed” (*ibid*); that is, to form an idea about the relevant resources within the landscape and “to understand and make judgments about these activities in the context of what is considered acceptable practice by others who share the same contextual space” (*ibid*; see also Whitworth 2014, 14).

Whitworth (2014, 160-5) explores the conceptual link between information practice, mapping and phenomenographic research, which seeks to build a picture of a phenomenon through methods designed to elicit the maximum variation in perception among those connected with the phenomenon (Marton

1981, Bruce 1997). The ideal result of this process – an outcome space, in phenomenographic parlance; a tool for exploring and revealing variation (Andretta 2007, 156) – can be viewed as a map drawn by a wide range of stakeholders: a collective *mental model of an information landscape*. This can be seen as lying at one end of a continuum. At the other would be a map that represented only one dominant interest in a given setting, thus, would be a dominant and constraining definition of practices within that setting. Authority over such practices would be singular, monologic (Linell 2009) and not open to scrutiny through methods designed to raise awareness of alternative perspectives (Edwards 2006). Thus, mapping generally is a way of representing the complexity of an information landscape, but will innately be selective. If the maps are created through a participatory and inclusive process, and open to continual review, then authority over the practices embodied in the maps (mental models of information landscapes) would be more distributed and open to scrutiny, and driven by collective rather than individual judgments. Thus, the project methodology was intended to facilitate knowledge sharing, learning and development, change management and information management across a wide range of stakeholders in the participating libraries.

Mapping techniques for information landscapes are diverse, and based on a range of different assumptions about what should be depicted, and how it will be represented. A standard organization chart shows relationships between units of an organization, and is based around conventions such as the fact that the CEO is usually depicted at the top and the existence of discrete organizational subunits with clear lines of command and control. Social network analysis, on the other hand (see Scott 2000) will depict relationships within an organization quite differently. Timelines (e.g. for project planning), dashboards and art therapy are diverse ways of representing information and ideas. This project adopted *concept mapping* as its principal method, facilitated by a specific tool, which is discussed in detail below.

Stewarding is another key concept in the project. Wenger et al. (2009) use this concept to describe the tasks undertaken by members of a *community of practice* that are oriented to maintaining a technological environment that all members of a community can use to learn. We widen this idea beyond its focus on the purely technological elements of the work environment, instead considering how staff members collectively manage the information landscape: the broad configuration of informational resources that are drawn on in the course of work. Wenger et al. (2009) note that the stewarding role often falls on a limited number of people, often only one, and that a community will be stronger if the steward role is more widely distributed, with community members checking and balancing each other in this regard. Thus, our methodology had a two-fold intention:

- To record, over the period of change, how library staff collectively stewarded their information landscape and, through analysis of these data, identify key issues in library change management procedures;
- To raise awareness of issues such as information management, task allocation, prioritisation, blockages and other problems among staff, so that they could develop a more active and distributed stewarding role as the project unfolded.

In other words, we did not just gather data for analysis at the end, but the data were revealed to participants as they proceeded, to help them collectively steward the information landscape.

### 3. Ketso: a method for facilitating group concept mapping

Participation in the project was voluntary. A total of 28 library staff members participated in the project, 13 from library A and 15 from library B, representing around 50% of staff at each location. Participants represented a wide variety of library staff profiles:

clerical staff, librarians  
Not all participants gathered session, with because of pressure of but most participants throughout the project final interviews and the One participant at each in the course of the the employment of the dropped out for personal



library management, and academic librarians. attended every data some being missed other work or illness, were retained and participated in the majority of the sessions. institution dropped out project because they left libraries, and one other reasons.

Library staff at the two locations used Ketso ([www.ketso.com](http://www.ketso.com); Tippet et al 2007) to map their information landscapes over 6 sessions, held at each location at approximate two-monthly intervals for one year (early October 2013 - late September 2014). The six group concept mapping sessions spanned considerable changes at each library: library A's merger and move to the new campus took place in summer 2014; library B's new director arrived in January 2014. All sessions lasted around 90 minutes. The sessions were audiorecorded. At each location, two separate maps were created; the physical size of each Ketso map means that around 6-7 people per group is optimum, and creating two maps at each location doubled the amount of data available, and offered more variation in perspective.

Ketso is a participatory concept mapping tool designed to allow as many members of a group as possible to contribute to the mapping of a problem space, and the resources existing within the information landscape to address problems (Tippet et al 2007). The image below shows a fragment of a Ketso map. The colours and shapes of the tool are deliberately 'natural'. Each 'leaf' can be

written on and then wiped clean, and repositioned on the map if necessary. The durable nature of the material means that it is easy to store maps from one session to another, and then revise the previous map.

At the 6 Ketso sessions, each facilitated by two members of the project team, library staff were asked to map the following: the tasks they were working on; the information they needed to address them; the sources of this information; blocks on acquiring it; priorities; and actions to be taken by the next session. These factors cluster around topics, represented by the ovals. Small yellow circular markers indicate priorities. For example, around the topic “Teaching” on this map appear tasks (brown leaves) such as “Endnote” and “Bergen summer school”. Next to the last task are placed two information needs (yellow leaves) and an associated source (green leaf), but also a blockage (grey); that summer school course leaders do not have access to local systems. Actions are also marked with grey leaves plus a star (Ketso kits have only four colours, a minor hindrance to our use of it); here one is “Adapt course to needs of students”, which has also been prioritized (yellow tick symbol: white circles are comments).



Each session after the first one began with a review of actions placed on the map at the end of the previous session, recording which member(s) of staff were the agents of actions that were undertaken and/or completed. Maps from the previous session were then revised (though in the final session at one location we experimented with creating a fresh map: see the discussion below). Completed actions were removed, which might also have led to changes in needs and sources. Blockages and tasks were reviewed. Thus, throughout the study period, the maps served to record changes in resources and connections between them, revealing the evolution of the information landscape. Importantly, these data were also immediately available to project participants, helping reveal gaps in knowledge and areas of work which needed prioritising.



#### **4. Concept map data 1: volatility versus stagnation**

The mapping process revealed interesting details about the information landscapes at each location but there is little to generalise from this; every landscape is essentially unique. However, some trends and points of comparison can be noted.

There is a notable variation in volatility between regions of the map -- that is, the degree to which topics evolved over time, the number of tasks, needs,

actions, sources and blocks which were placed and then removed – without a clear correlation between this level of volatility and the placing of actions and priority markers. Some topics were designated as priority areas throughout, but changes were negligible. For example, the two images show a region of one map, above at session 3 (February 2014) and then at the final session (September 2014). The region just below the topic oval shows a task and associated information needs which were designated a priority area, but which more than six months later remains unchanged, despite it continuing to be designated a priority at each session. This does not necessarily mean no work activity is taking place, because the map is a representation of group perceptions and judgments: but it does indicate that the information landscape is not perceived as evolving.

Volatility varied over the series of sessions. Library A laid a total of 64 actions over the six sessions but the number varied from only three new ones in session 2 to 28 new ones in session 4. This was when work on that library's move and reorganization peaked. Library B had almost no activity in session 2 (November 2013), a 'limbo' period prior to the arrival of their new director.

Some areas had tasks defined, but very few or no other associated leaves, implying that no one connected these tasks with information needs, sources or actions or even blockages. On one map the topic 'External collaborations' appeared from the start, with several tasks, but virtually no other leaves were ever connected to it except, at session 3, an information need. Yet the topic and tasks remained in place through to session 6. The need for this work is in the consciousness of at least some participants – yet the associated region of the information landscape is not being stewarded. The mapping process revealed these neglected areas, and suggested that in certain places, blocks on action might be substantial, including the possibility (as raised by March, Olsen and Christensen (1976) in their study of the ambiguous nature of decision-making in higher education institutions) that there is no intrinsic connection between decision-making in HE and actual change.

## **5. Concept map data 2: 'territorialism' and scrutiny of practice**

The technique revealed interesting aspects of collective information stewarding. This has been an intransigent problem in information science (see Saracevic 2007): how do collectives make judgments about relevance? Or, in Wenger's terms — if stewarding can and should be distributed across a community of practice, what does this actually entail, operationally? How can the benefits of job specialisation be retained while still allowing for the work of a specialist to be checked by others?

Data from both the Ketso maps and the interviews revealed several instances of where regions of the maps had been largely managed by specific individuals. For example, on certain maps this was quite apparent with each of the research

support; digital resources; and teaching topics. The impression is of a particular ‘territory’ being the responsibility of a particular individual. On more than one occasion where someone could not make one session for whatever reason, other staff members became reluctant to make any changes to ‘their’ region of the map in their absence.

At one level this seems self-evident — logically, the research support topic would be expected to be stewarded by the staff member with a responsibility for research support — yet also stands against the fact that Ketso was designed to elicit a group perspective (Tippett et al 2007) and was employed in this project to help distribute the stewarding role. We suggest that, in actuality, the technique allows for the ‘best of both worlds’. Expertise and responsibilities are recognised and other team members will, indeed, defer to the ‘expert’ when it comes to constructing that region of the map (that is, the representation of the area of the library’s information landscape which is relevant to tasks that cluster around the theme in question). But that does not mean the *authority* of that staff member cannot be scrutinised, and where deemed appropriate, their depiction of the region reviewed and altered (cf. Whitworth 2014). This insight calls for further research, but is, potentially, an original contribution of the project to the research literature in the area of how communities of practice collectively steward their informational environments and make judgments about relevance.

## **6. Role of facilitation**

All sessions were facilitated by at least one member of the project team and four of the six sessions were facilitated by two of them. Facilitation is very important to the group concept mapping technique, and therefore also to the project methodology. Ketso (see [www.ketso.com](http://www.ketso.com)) has a ‘hardware’ element, the physical kit, but there are parallel ‘thought-ware’ aspects: the guidance for the kit’s use, facilitation techniques developed from observations and prior experience. Library staff members could not simply have been provided with the Ketso kits, and a useful map of the information landscape emerged 90 minutes later without the need for facilitation. Wenger (1998, 234) points out that no community can effectively design its own learning without some kind of external perspective coming into play. Facilitators played a valuable role in prompting reflection; helping record observations on the leaves; organising the maps around topics; relating needs, sources, blockages, tasks and actions; resolving disagreements between participants (for example, over what to prioritise); and ensuring the sessions maximised their use of the available time. To some extent, facilitators influenced what was being placed on the maps, and on occasion contributed leaves; written summaries of points emerging in a discussion between other participants (the first of the three maps shown above has examples of a facilitator’s handwriting on it). But these were data elements more relevant to the internal, action research processes than the external ones. Facilitators helped represent discussions in Ketso form, but were not themselves contributors to the discussion.

### **7. Fresh maps or revised ones?**

Each Ketso session returned to the map created at the previous session and revised it. It is an unresolved question as to how things would have been different had a fresh map been created at each session. There are advantages and disadvantages both ways. Revising the old maps allows the ongoing evolution of the landscape to be recorded, but may also act as a constraint on new ideas coming in; that is, the form of the map itself shapes the future ability of the group to explore and engage with its information landscape. There was only one occasion (at library A in session 3) where a completely new topic was introduced by the participants, this being professional development.

In the final session at library A, post-merger, we experimented with creating a fresh map from scratch, and this provoked more ‘brainstorming’ than had been observed previously (that is, more contributors placing more leaves each). Yet it simultaneously made the data less useful in other ways; in particular, it made it much more difficult to record changes, both in terms of specific areas, and general patterns. This may be a situation where the ‘dual’ aspects of the methodology — generating data for external analysis, and generating data useful for participants — may have produced an opposition. A compromise might be to review the previous map at the beginning of each session, particularly actions, and remind participants of key themes, tasks, needs etc., but then to start afresh. This is for further investigation.

### **8. Feedback from participants**

Wenger et al (2009, 38) say that: “communities of practice need habitats to learn together. These habitats have to provide the places and support the ways in which members experience togetherness.” We suggest that the Ketso sessions served as such a “habitat” and supported “togetherness” in this way. In one-to-one interviews which took place after the final sessions in September 2014, participants at both locations noted that the sessions were valuable simply as a space to take time out from everyday work tasks, step back and reflect, both on ongoing operational issues (what tasks needed doing immediately, what were priorities, etc.) and on broader or more long-term plans. Insights and perspectives developed in the sessions were not necessarily recorded on the Ketso maps themselves, that is, the discussions that took place in the sessions had value for participants in their own right. In this respect the Ketso sessions served a similar function to strategic away days. They also offered a more free-form arena for planning and discussion than regular team meetings, being less constrained by pre-existing agendas, but still remaining focused on answering questions such as what to focus on over the next few weeks, where to seek needed information, etc. The maps then offered a record of these discussions that, because of the design of Ketso, was more dynamic, and because of the methodology of the project, open to more review and scrutiny than traditional meeting minutes. Thus, the team as a whole had authority over the information practice that was Ketso itself.



One interviewee at library B offered the specific example of where the sessions had helped him plan the introduction of the RFID technology into the library :

*“[the project] was useful for the new ORIA system which it was particularly important to find out about, and learn. People were sitting together and complaining about it. It was helpful to spend time sharing information about this.”*

In their study of knowledge-formation practices in a hospital (environments that, like academic institutions, are large and require the co-ordination of work between many different professional groups), Tagliaventi and Mattarelli (2006) observe the importance of *operational proximity* – the existence of particular spaces, rooms or pieces of equipment which served as “boundary objects” (Star 1989), catalyzing the emergence of joint perspectives between, in their case, nurses, doctors, technicians and managers. We suggest that Ketso acted as a boundary object in the same way. Representatives from library departments who have not otherwise obvious shared locations for communication, such as user services and digital resources, found operational proximity around Ketso, and thus, through the project methodology itself. Participants could envisage how their work fitted into the ‘bigger picture’, and also recognize when and how certain perspectives on the work of the library were not wholly aligned with those of colleagues. This was particularly significant at library A, which had to bring together practices that had, on occasion, developed at the different campuses in divergent ways but then had to be reconciled at the point of merger.

The visual and kinetic aspects of Ketso were considered valuable by many interviewees. The map was a recording of a conversation, but showed relationships between issues, and gaps in knowledge, more effectively than written minutes. Being able to move leaves around, rewrite them if necessary and remove them was also important. Several interviewees reported the sense of satisfaction that emerged when actions or (in the case of library A’s reorganization) entire topics could be removed from the map after completion.

## **9. Conclusions**

Saracevic (2007, 2141), in his review of the research literature into relevance, notes that information science has long struggled with the notion that these judgments are in large part collective and intersubjective. Thus, the paradigm that continues to inform the design of information and knowledge management systems is one based around individual requests and judgments about relevance. Yet communities of practice clearly make intersubjective judgments about the management of their information landscape. They do so with reference to a “collective matrix of interpretation” (Wellmer 1991, 197) that is shared and built by community members but may in large part be unconscious, and can be reified into habits, routines and procedures that are imposed on the community from outside (Wenger 1998). Saracevic concludes (via Dumais and Belkin 2005) that allowing for these factors in information management requires “new

mindsets, directions, approaches, measures and methods” (Saracevic 2007, 2141).

Or analyses of project data, and feedback from participants, suggest that these mapping methods could constitute one step on a journey towards an understanding of collective information stewarding practices within information landscapes. The methodology used in the *Bibliotek i endring* project raised awareness of tasks, sources, needs, blockages and priorities; helped with planning and reviewing specific actions and progress toward shared goals; and offered participants and external researchers alike a ‘big picture’ of the information landscapes at each location. At the time of writing, further funding is being sought to continue the work at more locations, including another academic library, but also outside the HE sector, with a cultural institution (a concert hall). The focus for this further work, in research terms, will be less on the maps’ content and more on the roles played by different individuals (including the facilitators) in constructing them, and how the work within the sessions may or may not impact on information and knowledge management between and after the sessions.

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