

This work is licensed under the Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 Unported License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/3.0/> or send a letter to Creative Commons, 171 Second Street, Suite 300, San Francisco, California, 94105, USA.

SITUATED CLASSIFICATION WORK ON THE WEB

Maja van der Velden
Institute for Information Science and Media Studies
University of Bergen, Norway
maja@xs4all.nl

Abstract: This paper investigates the interactions between information and communication technologies and the diversity of knowledge in a study of classification work on the Web. The author starts with a mapping of a marginalised knowledge domain in eleven web directories and web portals, focussing on the politics of categories. In the analysis of the results the technical frame of the Web moves to the foreground. The Yahoo!-way of organising things on the Web may have become an ‘hegemonic brandscape’. The Open Knowledge Network (OKN), one of the portals under consideration, is built on a very different technical platform, enabling non-hierarchical classification work. Data from participant observation in the OKN India and Kenya makes, however, also here the disciplining agency of technology visible. Examples of classification systems of other marginalised knowledge domains are sought, such as the TAMI Aboriginal database in Northern Australia and John Deer’s First Nations library classification systems in Canada. They show the importance of a focus on the situated-ness of knowing and provide inspiration for situated classification work. The off-line TAMI database has its web-based variation in collective, non- hierarchical tagging sites such as del.icio.us and Flickr. Non-hierarchical tagging in combination with a decentralised, low-bandwidth web technology such as the Open Knowledge Network may support classification work that is not pre-empted by the categories of international development and the default settings of technologies.

[H]ow to collect or classify things if you think the world through connections.
(Bruno Latour paraphrased in Gane and Haraway, 2006)

1. INTRODUCTION

A conflict over the categories of knowledge in social and economic development erupted in the late 90s, when World Bank president James Wolfensohn presented the idea of the World Bank as *Knowledge Bank*. The Bank’s new approach was based on the relationship between economic growth and knowledge[1] and the Bank as a neutral broker of this knowledge (Wolfensohn, 1996; World Bank, 1998). Joseph Stiglitz, at the time CEO of the World Bank, pointed to the particular role of the Bank:

[The World Bank] can perform another role: certifying the quality of the messengers and messages; in a noisy world, with many alternative theories vying for centre stage, there needs to be some way of sorting through the cacophony, establishing credibility (Stiglitz, 2000).

One of the Bank's new knowledge initiatives was a global Development Gateway, a web-based portal for development knowledge. According to David Ellerman (2000), Stiglitz' advisor and critic of the Gateway, the World Bank had its mind set on establishing a "global one-stop-shopping [...] mega-portal" for development knowledge. Such a project was very much in line with the "90s E-commerce 'portal' phenomenon" (Gurstein, 2001). The Bank started widespread consultations on the project but the Gateway's technical platform and editorial structures were already in place before consultations with civil society organisations and indigenous leaders were completed (van der Velden, 2002). One of the responses to the establishment of the Gateway was a boycott. A group of 'knowledge workers', academics, activists, and non-governmental organisations, signed a public declaration to avoid any dealings with the World Bank's Global Development Gateway. This pledge, published on the internet as *Development Gateway: A Declaration from Concerned Knowledge Workers*[2], gave three "fundamental objections" to association with the Gateway:

- The Gateway privileges certain voices over others
- The Gateway makes an untenable claim of independence
- The Gateway undermines alternatives

As a critique of the dominant knowledge discourse of the World Bank, the Declaration can be understood as an expression of a marginalised knowledge domain. In the perspective of the Declaration's signatories, the Gateway is another attempt to control the categories of development knowledge:

[Y]ou will not find topics on "political economy" or "inequality" or "discrimination", just concepts like "governance" and "human development". Moreover the Gateway's 130-issue taxonomy ghettoises cross-cutting issues such as gender and climate change (Turtle, 2001).

Nick Harrison, the Gateway's Head of Content, when confronted with the issue of the Gateway using a "donor taxonomy", confirmed those concerns:

[D]evelopment is a mature subject, I think we do know the classifications (Harrison quoted in Wilks, 2002) [3].

The Declaration criticises the idea that the world is a knowable body of information with clear categories that can be orderly organised. It calls for a boycott of the Gateway and support for "diverse, independent internet schemes" and "alternative knowledge sources". In this paper I explore this conflict over categories of knowledge in web-based classifications such as web portals and web directories. Mapping these resources brings to the foreground some of the political, ethical, social, and technical choices, decisions, and dilemmas that have been made to design, produce, maintain, or resist them (Star and Ruhleder, 1996; Bowker and Star, 1999).

I will use the critique as expressed in the Declaration as the basis for an exploration of development knowledge classification in the Development Gateway and other web-based initiatives for organising and sharing development knowledge. Three issues will be explored: 1) Is there a standard for classifying development knowledge? 2) What is an alternative way of organising development knowledge on the web? And 3) How can classification on the web be inclusive of other ways of knowing?

2. MAPPING CLASSIFICATIONS

The *Declaration from Concerned Knowledge Workers* describes the Development Gateway as a political tool to establish the hegemony of a particular version of knowledge, not as a neutral tool to efficiently manage knowledge for development. It read its “130-issue taxonomy” as a vocabulary that controls the categories of knowledge for development. A taxonomy is used to organise categories of knowledge in a subject tree. As a classification it brings together related concepts and helps users to search and browse a body of information (Kwasnik, 1999; Batley, 2005). A good classification functions as a theory, it connects concepts in a useful structure, and how an entity is categorised creates a conceptual frame that provides information about the item as well as shapes the user's interaction with it (Jacob, 2004). The success of a classification thus depends on its design (ibid.)

Geoff Bowker and Susan Leigh Star define a classification as: “anything consistently called a classification *and treated as such* can be included in the term” (1999). They describe a classification system as “a set of boxes (metaphorical or literal) into which things can be put to then do some work – bureaucratic or knowledge production” (ibid., p.10). Bowker and Star see classification systems as integral to any working information infrastructure. They use the metaphor of a thick forest with lots of underbrush and complex ecology: “Now imagine that the forest is a huge information space and each of the trees and bushes are classification systems. Those who make them up and use them are the animals and plants, and the soil is a mix of the Internet, the paper world, and other communication infrastructures” (p.31).

What are the implications of Bowker and Star’s understanding of classifications for my exploration of web-based classifications of development knowledge? How to focus on categories of knowledge without losing sight of the complete classification system, and the infrastructural technology of the internet, the web, and the databases that host and connect the classifications? Bowker and Star (1999) propose “infrastructural inversion” to make an infrastructure’s complex relationships visible, “recognising the depths of interdependence of technical networks and standards, on the one hand, and the real work of politics and knowledge production on the other” (ibid., p.34). As a kind of “reverse engineering” such inversion reveals the convergence (Bowker and Star, 1999) or “grooving effect” (O’Hara quoted in Bowker, 2000) that took place. A subsequent process of reverse bootstrapping can occur, where the structures of data in the database become the lens through which we make assumptions about the world (Bowker, 2000; Christie, 2004). Lev Manovich calls the translation between these different levels transcoding, “the project of the ontology of a computer on culture itself” (Manovich, 2001).

The signatories of the Declaration feared that their colleagues would not see these processes in the Development Gateway. Over the years the conflict surrounding the Development Gateway would be forgotten and the convergence that had taken place would have become invisible. By revisiting the controversy, through qualitative research both on the web and in India and Kenya, I want to revive this controversy and make the different ways in which knowledge is constructed visible (Bowker and Star, 1999; Star, 2002). The method I propose is to look for the boundaries of classification: which concepts are marginalised or excluded. Hope Olson (1998) uses the metaphor of the *map* to try to redress the limits of the Dewey Decimal Classification (DDC). By mapping *A Women’s Thesaurus* (Capek, 1987), a marginalised knowledge domain, in the DDC, Olson finds that some concepts fit better than other; the DDC seem to further marginalise some of the concepts in its classification scheme (Olson, 1998; n.d.).

I will use Olson’s approach in my *mapping* of the categories of the Declaration in web-based classifications of development knowledge. I will relate the results of these mappings with

explorations of web technologies and observations during fieldwork in India and Kenya. This will enable a *drawing of tracks* of development knowledge in the technologies that sustain and regulate classifications on the web (Lessig, 1999). A track is a rough path beaten by use. My *drawing of tracks* is inspired by Australian artists Lyn Moore and Tracey Andrews who draw *Aboriginal Ancestor tracks* in satellite images of the Lake Mungo region, connecting the latest satellite technology with the earliest known human presence on the continent (Andrews and Moore, 2001; Moore and Andrews, 2001; van der Velden, 2006). Donna Haraway referred to such knotting of human and non-human actors, which she calls her game of cat's cradle, as an actor network theory: "Tracing networks and configuring agencies/actors/actants in antiracist feminist multicultural studies of technoscience might lead us to places different from those reached by tracing actors and actants through networks in yet another war game" (1994). The art work by the Australian artists inspires my movements on the web and in India and Kenya. By tracing a path in the 'forest' of information infrastructure and following the actor of knowledge (Hanseth, 2004), I knot together some of the actors that make up my game of cat's cradle.

The classifications that I will explore are selected on the basis of a literature review and web analysis of the Development Gateway as an *issue* (Gateway, 2001; Wilks, 2002; Walker, 2003; Jha; Seymour et al., 2004; Marres, 2004; Rogers, 2004; Muth and Gerlach, 2005). The following sites were selected[4]:

- The *Development Gateway* (www.developmentgateway.org)
[<http://web.archive.org/web/20060424054744/home.developmentgateway.org/>]
- The *World Bank* (www.worldbank.org)
[<http://web.archive.org/web/20060428024319/http://www.worldbank.org/html/extdr/thematic.htm>]
- *Choike* (www.choike.org)
[<http://web.archive.org/web/20060424103951/http://www.choike.org/>]
- *Dev-zone* (www.dev-zone.org)
[<http://web.archive.org/web/20060428011600/http://www.dev-zone.org/knowledge/>]
- *ELDIS* (www.eldis.org) [<http://web.archive.org/web/20060428011600/http://www.dev-zone.org/knowledge/>]
- *SciDev* (www.scidev.org)
[<http://web.archive.org/web/20051110120844/http://www.scidev.org/>]
- *Oneworld International* (www.oneworld.net)
[<http://web.archive.org/web/20060520184145/uk.oneworld.net/guides/topics>]
- The *Open Knowledge Network*
(<http://220.226.204.240:8080/eNRICH/viewPortalPage.do?PPID=300>)

The Development Gateway was founded by the World Bank and is now governed by the Development Gateway Foundation. Choike (Uruguay) and Dev-Zone (New Zealand) are established by non-governmental organisations. They both have a strong regional as well as a global focus. Eldis is established by the Institute of Development Studies and is funded by the British, Swedish, Norwegian, and Swiss governmental agencies for development assistance. SciDev is a network focusing on "authoritative information on science and technology for the developing world". OneWorld International is a global network of independent media organisations and activists. The Open Knowledge Network is a hybrid peer-to-peer network for the sharing of local knowledge for local development, connecting local access points and hubs in

ten countries[5]. It has a presence on the Web but the main point of the OKN is to make all content also available for off-line browsing and editing.

As a kind of ‘control group’ and to add contrast, I added three popular general resource web classifications to this list:

- Google Directory (dir.google.com)
[http://web.archive.org/web/20060424105010/http://dir.google.com/]
- Yahoo! Directory (dir.yahoo.com)
[http://web.archive.org/web/20060423104736/http://dir.yahoo.com/]
- Open Directory (www.dmoz.org)
[http://web.archive.org/web/20060424124006/http://www.dmoz.org/]

Yahoo! was the first web directory on the internet. Yahoo! Directory and Google Directory are part of large commercial web portals offering a variety of services. The Open Directory is a non-profit web directory, entirely based on the work of volunteers.

3. MAPPING CATEGORIES

The Declaration mentions seven categories of development knowledge in particular: political economy, inequality, discrimination, human development, governance, gender, and climate change. I mapped these categories in each of the eleven web-based classifications (see table 1). It becomes immediately clear that the OKN has none of these categories and that Google, Yahoo!, and OD have the same six categories, while the others are somewhere in between.

Table 1. Presence of categories (√ = present / - = not present)

	Gender	Climate change	Governance	Inequality	Discrimination	Political economy	Human development
Google	√	√	√	√	√	√	-
Yahoo	√	√	√	√	√	√	-
Open Directory	√	√	√	√	√	√	-
Eldis	√	√	√	√	√	-	-
Development Gateway	√	√	√	-	-	-	√
DevZone	√	√	√	-	√	-	-
World Bank	√	√	√	√	-	-	-
OneWorld	√	√	-	-	-	-	-
Choike	√	√	-	-	-	-	-
SciDev	√	√	-	-	-	-	-
Open Knowledge Network	-	-	-	-	-	-	-

I looked at the validity of the claims in the Declaration by mapping the values of each of the seven categories in the eleven classifications. The Declaration argues that gender and climate change are ghettoised in the Gateway; that governance and human development should not be Gateway categories; but that on the other hand inequality, discrimination, and political economy

should be part of a classification of development knowledge. Table 2 shows that the Declaration’s claims about the Development Gateway are valid, except the claim of the ghettoisation of the crosscutting issue of gender. In fact, compared with the other classifications, the category of gender is well connected in the Development Gateway. However, none of the other development knowledge resources offer what the Development Gateway, according to the Declaration, fails to do. Only the three general web directories, Yahoo!, Google, and Open Directory, do what the Declaration claims the Gateway is not doing. They have categories such as political economy, inequality and discrimination; they don’t have the concept human development (but they do have governance); and they don’t ghettoise crosscutting issues such as gender and climate change.

Table 2. Validity of the claims in the Declaration (diagonal shading confirms claims)

	Gender	Climate change	Governance	Inequality	Discrimination	Political economy	Human development
Google	√	√		√	√	√	-
Yahoo	√	√		√	√	√	-
Open Directory	√	√		√	√	√	-
Eldis	√	√		√	√		-
Development Gateway	√						
DevZone	√				√		-
World Bank	√			√			-
OneWorld	√	√	-				-
Choike	√	√	-				-
SciDev	√	√	-				-
Open Knowledge Network	-	-	-				-

I also mapped web classifications by looking at their top-level categories[6]. The purpose of this mapping was to see if over the years a convergence had taken place in terms of the categories of development knowledge (see Table 3). Could some of the classifications be grouped together on the basis of similar categories? At first glance, the group of eleven classifications can be divided in three groups. The top-level categories of the first group, Google, Open Directory, and Yahoo! are almost identical. Google and the Open Directory work with identical schemes with 16 top-level categories. The main difference is that the Yahoo! scheme has 14 in stead of 16 top-level categories. The second group is the Open Knowledge Network. Tables 1 and 2 show that the OKN contains none of the seven categories mentioned in the Declaration. Looking at the top-level categories of the OKN, it becomes clear that its top-level categories are not subjects but content types organised in folders such as ‘Events’, ‘Knowledge’, and ‘Messages’. The OKN’s classification scheme can be understood as a kind of *faceted classification* (Ranganathan, 1931) in which the facet of ‘content type’ is the main entrance point to the information resource[7]. The third group consists of seven web portals that work with very different sets of top levels categories. In terms of numbers, they range from 5 (Choike) to 35 (Eldis) and 37 (World Bank) (see Table 3). Not one top-level category is shared by all seven portals. In Table 3 I also present some of the other outcomes of the mapping of the 11 classifications, such as the names of the classification as a whole and the name of the top-level categories. I have also looked at the

number of top-level categories, the number of languages in which the classification is available, and finally the overall editorial policy that governs the classification. What becomes clear through this mapping is that all classification schemes, except the Open Knowledge Network, do classification work similarly:

- The knowledge domain is organised in a specific set of top-level categories
- Categories are organised in a tree-like classification structure
- Each category contains links to information resources
- The classification is maintained in a centralised, top-down manner
- There is often one logical place for each link in the web directory
- The inclusion of a link is based on a centralised editorial policy

Table 3. Meaningful differences

	Name of classification	Name of top-level categories	Number of top-level categories	Number of Languages	Editorial policy
Google	Directory	Categories	16	*	Centralised
Yahoo	Directory	Categories	14	*	Centralised
Open Directory	Directory	Categories	16	*	Centralised
Eldis	Gateway	Resource guides	35	2	Centralised
Development Gateway	Gateway/ Portal	dgCommunities	8	3	Centralised
DevZone	Knowledge Centre	Categories	20	2	Centralised
World Bank	Web site	Topics in development	37	4 (23)	Centralised
OneWorld	Network	Topic guides	10	8	Centralised
Choike	Portal	Thematic fields	5	2	Centralised
SciDev	Network	Dossiers	10	5	Centralised
Open Knowledge Network	Network	Folders	13	14	Decentralised

The mapping of top-level categories also makes clear that nine of the eleven classification schemes mix “classification models” (Zins, 2002). Within each of the 9 schemes there are categories that refer to subjects (e.g. communication), concepts (e.g. gender), prospective users (e.g. Kids and Teens), location (e.g. Pacific Focus; Norwegian research), and media of resources (e.g. manuals and toolkits) are all found at the same top-level. The most consistent classifications are Choike (5 subjects) and the OKN (13 types of resources). This mapping exercise shows that there is no standard for the categories of development knowledge and that most classifications lack consistency in classification criteria.

When the results of the mappings are taken together, it becomes clear that the three general web classifications, Yahoo!, Google, and Open Directory, are almost identically. The situation is somewhat different for the development knowledge classifications. Each organisation organises its resources in an unique set of top-level categories. This is not surprising as they differ in content, but also in history, ownership, budget, sponsorship, and audience. For example, the sponsorship of a category, financially or in terms of volunteer services, can have a direct effect on the availability and position of a category, contributing to inconsistencies and bias in a

classification scheme[8]. The classifications also differ in the ways in which they present or market themselves. They all have unique logos and site designs and use different terms for their classifications and categories. For example, the top-level categories in Eldis are ‘Resource guides’ and the Development Gateway calls them dgCommunities (see Table 3). But both open in a set of clickable sub-categories that organise links to other resources on the web. In sum, the mappings show that there is no standard for the categories of development knowledge.

4. TECHNICAL CODES AND THE BOUNDARIES OF DIVERSITY

The Development Gateway Draft Business Plan (Gateway, 2001) mentions the need for considerable amounts of funding and resources to establish a portal for development knowledge, an investment which was expected to result in at least 5 million page views per month in 2003. One observer perceived this as a “very real danger (likelihood) of this having the result of crowding out/unfairly competing/defunding all the other "realities" - many of which may be closer to the interests and activities of folks on the ground or in the trenches - the NGO's, the implementers, the communities, the development activists” (Gurstein, 2001). But this scenario didn’t materialise (Muth and Gerlach, 2005). In 2005, Mike Pereira, Content Manager of the Development Gateway reported 1.4 million page views per month (Pereira, 2005) while other initiatives, such as Eldis, Choike, and OneWorld, did not seem to lose their market segment (Jha; Seymour et al., 2004).

The mappings show that the Development Gateway is not very different from the other initiatives. The seven development knowledge portals, Choike, Development Gateway, Dev-Zone, Eldis, OneWorld, World Bank, and SciDev, offer similar services: a subject-tree-like web directory; search; email alerts; news feeds (rss); some kind of reference materials such as FAQ, manuals, maps, and statistics; and a choice in languages. The *Law of Merging Models* (O’Leary, 1998) explains (see below) this resemblance as the result of borrowing popular features from each other until they become similar: It is the market that “jerks them into compliance”. After that it is marketing and partnerships that fuels competition. This model is well-captured in the Development Gateway’s Draft Business proposal (Gateway, 2001; Muth and Gerlach, 2005).

The Open Knowledge Network is the only resource that doesn’t compare with any of the other initiatives. An important difference between the OKN and the other initiatives is the technological platform (van der Velden, 2005). The OKN is built on a hybrid peer-to-peer network in which all classification work is decentralised. The information resources published in this distributed network are produced, created, and stored at the local access points and hub, where also the selection, editing, and categorisation of resources take place. This suggests that it is the OKN’s technological platform contributes to a way of organising and classifying knowledge that is different than the one supported by the centralised databases of the development knowledge portals.

4.1 The Hegemonic Web

The mappings show a dominant way of organising and sharing development knowledge on the Web, which is similar to other web-based classifications, as the mappings of general resource classifications as Google, Yahoo!, and Open Directory show. These web portals developed out of a search engine (Google) or out of a plain web directory (Yahoo!). In the late nineties there was an “explosion of ‘portal’ sites” (Miller, 2004). Miller argues that the development from search engine and web directory into web portal was based on the adoption of a ‘consumer service model’. The provision of free consumer services such as email, news, shopping, and chat attracts more internet traffic to the portal, which increases income from advertisements or, in the case of

development knowledge portals, funding from donors. Portals started to look very much the same. As Yahoo! Founder David Filo mentions:

“Early on we looked at AOL and thought that the net, in order to be successful needed something like AOL... Once they get the user, they kind of own the user, and they can provide any service they want to the user, and they really control all that the user does” (quoted in Miller, 2004, 175-6).

Yahoo! became the first directory on the web. It was established in 1994 and soon became the standard for how a web directory functions. Its classification structure is the subject tree, which is based on the concept of the family tree, which organises the relationship between the members of a family, e.g. into parents and siblings. Mick O’Leary (1998) wrote about the “‘Portal’ Services Spring Up” (p.80) and explains this phenomenon with his *Law of Merging Models*. In his comparison of the four popular web directories in 1998, Excite, Lycos, Infoseek, and Yahoo!, he argues that their classification systems look much alike: “Despite the diverse content on the Web, the same topic headings in each service lead to many of the same Web sites” (ibid., p.80). The subject tree became the dominant way of organising categories and links on the Web, even if research has shown the cultural specificity of such logical structures (Walton and Vukovic, 2003) and the influence of visual literacy and cognitive style on how people are able to access and navigate such tree successfully (Chen; Magoulas et al., 2004; Lee and Olson, 2005). In other words, it is not only the content of the web directory but in also its form, the manner in which it organises content on the Web, that seems to play an important role in how the world becomes ‘knowable’. Mapping the development knowledge classifications shows the influence of Yahoo! on the form and shape of these classifications, even if their categories are different. Yahoo! has become an “hegemonic brandscape” (Thompson and Arsel, 2004)[9], creating a global expectation of how knowledge is organised on the web. Such an hegemonic technical code establishes the boundaries for diversity: what variations can be expressed within the frame and what variations are marginalised or made invisible by the frame.

The ‘hegemonic brandscape’ framework is based on the concept of *hegemonic global structure*, which anthropologist Richard Wilk uses to describe how a form and content interact (Wilk, 1995; 2004). Wilk’s case study is a local Miss Universe Contest in Belize within the global frame of beauty pageants. Wilk concludes that the global frame does not promote homogeneity but controls diversity:

[A] hegemony of form not content, which celebrates particular kinds of diversity while submerging, deflating, or suppressing others. The global system is a common code, but its purpose is not common identification; it is the expression of distinctions, boundaries and disjunctures (Wilk 1995, p. 118).

Similarly, Yahoo! has become a global code for organising knowledge on the web. The mapping of the categories of development knowledge showed that the differences between the Development Gateway and similar initiatives remain within the boundaries of their mutual technical frame. Only a different technical frame, such as that of the OKN, can offer the possibility of an alternative way of knowing. This is not to say that there is no significance in the fact that there are differences within the classifications of, for example, the Development Gateway and Choike or Eldis. For example, one of Eldis’ top-level categories is ‘Questioning Development’. An advanced search of the Development Gateway on phrases such as ‘questioning development’, ‘post-development’ or ‘anti-development’ (a category found in Google) did not yield any results. But this diversity found among categories is restricted by the common code that

makes up the web portals and web, making alternative accounts of knowing the world and being of the world invisible.

4.2 Interface Observations at the Open Knowledge Network

The Declaration called for the support for alternative sources of knowledge without specifying where such schemes could be found and what would make them alternative. The mapping exercises show that the only different classification, in terms of a different way of organising and categorising development knowledge, is the Open Knowledge Network (OKN). The mappings visualise what an *alternative knowledge resource* on the web could mean in the context of web-based organisation of development knowledge. For example, none of the Declaration's seven categories of knowledge can be found in the OKN (see Table 1). The OKN uses a kind of faceted classification and its opening page shows one such facet, that of 'content type'. A drop-down box allows the organisation of resources by language. The OKN supports the highest number of languages (14), such as Swahili, Tamil, Wolof and Shona (see Table 3). The other facets, however, are not available on the opening page. Only a click on 'advanced search' shows the other facets by which information resources are organised:

- Subject (45 categories)
- Content type (16 categories)
- Audience (17 categories)

An important difference between the OKN and the other 10 classification schemes is its editorial policy. There is no centralised editorial policy that governs the whole collection; editorial decisions are made by the organisation that contributes resources to the OKN. Each participating organisation works with its own implicit or explicit editorial policy. New information resources are added to the collection through the work of volunteers who write short pieces that are based on particular knowledge practices found in the local community [10]. The volunteers categorise each resource in each of the five facets and upload the item to a knowledge worker based at a local or national organisation. The knowledge worker checks, and sometimes changes, the categorisation work of the resource, edits the text if necessary, and decides on the distribution. Some resources are only distributed within a local network of an OKN hub with its community or village *knowledge centres*, while others are distributed over all OKN hubs. The OKN thus enables a global network with multiple local editorial policies. Each of those local editorial policies can be supported by local categories of development knowledge and localised organisation of knowledge, which are both features in *OpenEnrich*, the software on which the OKN is built [11]. However, none of the hubs and access points that I visited in India and Kenya [12] changed the default lay-out and knowledge organisation provided by the *OpenEnrich* software, nor did they add local categories to the OKN's default classification system.

How to understand the lack of localisation of the organisation and categorisation of knowledge in the OKN? Conversations with OKN community volunteers and OKN knowledge workers in India and Kenya point to two explanations. First, while almost all the other organisations work with dedicated or paid indexers, the OKN's indexers or knowledge workers did their classification work in addition to their usual daily tasks in the organisations where they worked and that hosted an OKN hub. The result was often a delay, sometimes up to a week, between the moment an item was submitted for publication and the moment it was distributed in the network [13].

Classification work in the OKN includes checking and editing the resources sent in by the volunteers. In India, this classification work was complicated by the fact that the Community Knowledge Centres and their hubs used local Tamil and Hindi text editing software based on local character encoding software and not the universal Unicode character encoding standard supported in the OKN software. Many people worked with older computers based on a Windows-

platform that does not support Unicode. As the OKN also promotes knowledge sharing in a variety of other formats, articles were often published both in the OKN and in local newsletters and magazines. However, the local print shops also used the local Tamil and Hindi text editing software so the preferred language fonts were those used locally, not those provided by the OKN. A lack of technical support and understanding of the issue thus resulted in a lot of extra work, including the retyping of articles[14].

A second explanation may be connected with the limits of technological literacy I observed among the volunteers and knowledge workers. None had experience in installing the software themselves or in tinkering with the default settings of a software package, be it OKN software or a web-browser. Information technology was used the way it was delivered, with its default settings and standard options. The language font issue described above, or the OKN's complicated numerical and case-sensitive internet addresses (URLs), such as <http://220.226.204.240:8080/eNRICH/>[15] were understood as problems for which there was no solution. As one knowledge worker told me, if there was a solution, the 'software people' would have dealt with it.

5. SITUATED CLASSIFICATION WORK

During my fieldwork at the Open Knowledge Network in India and Kenya in 2006 and 2007 I observed volunteers and knowledge workers searching for information in the OKN's body of knowledge[16]. The OKN's faceted classification enables navigation and browsing through the OKN's information resources in different ways. For example, one can choose to see all information resources that have 'fishermen' as their 'audience'. I asked volunteers at OKN-ALIN in Kenya to show me how they locate an information resource in the OKN. Searching and navigating the system was not simple. For example, the sub-categories in each top-level category are not ordered and they become only visible by scrolling down a list. Second, the 'findability' of an information item was influenced by how it was categorised by the volunteer and/or knowledge worker[17]. Some items in the OKN refer to very situated practices. For example, many items in OKN-ALIN refer to the knowledge and livelihoods of pastoral people but there is no category 'pastoralists' in the facet for 'audience'. Analysing the categorisation work of one community volunteer, a member of one of Kenya's pastoralist communities, shows that the category 'farmers' was not a satisfactory alternative for information resources for pastoralists. Alternative categories that were used are 'citizens', 'development workers' or 'householders'. Even though the OKN has decentralised classification work, this work was restricted by a default classification scheme that was not adapted to the local situation. None of the volunteers and knowledge workers, neither technical support, had considered adding locally appropriate categories. The OKN provided an alternative way of classifying and organising development knowledge, but the volunteers and knowledge workers using the system never got past the default settings of the software. The default classification system thus became the OKN's own *hegemonic global structure* (Wilk, 1995), limiting the ways in which knowers could organise and classify their way of knowing their world.

While the Open Knowledge Network offers an alternative way of organising development knowledge on the web, the practice of classification work in the OKN shows the limitations of the classification scheme in terms of its inclusiveness of other ways of knowing. Classification work is *disciplined* (Berg; Mörtberg et al., 2005) by the technology through, in the case of the OKN, default settings and character set standards. I therefore propose to look for clues (Santos, 2004)[18] for more inclusive classification work outside the technical frame of the Web.

The first example is the *Brian Deer Classification*, a classification scheme developed by Kahnawake librarian Brian Deer to counter the marginalisation of First Nations knowledge in Canada by library classification schemes such as the Library of Congress (LC) and the Dewey Decimal Classification (DDC). Brian Deer worked at several First Nations libraries and each time he developed a classification scheme from the ground up, based on the particular collection and the community that produced it (MacDonell; Tagami et al., 2003). Deer did not try to design an universal system nor did he modify an existing system. His classification scheme is very different from the Euro-American worldview underlying classification systems such as DDC or LC. Ann Doyle, librarian at the Xwi7xwa Library[19], a library affiliated with First Nations House of Learning in Canada, “feels that the key concept in the Brian Deer classification system is that it tries to acknowledge and represent indigenous ways of knowing” (MacDonell; Tagami et al., 2003). The library collection is not to serve research but action, reflecting the ways First Nations may use the collection:

As such, the subject areas represented in the Brian Deer classification system used at Xwi7xwa are classified to reflect and support the actual activities of the users. Examples of such subject areas are "land claims" or "economic development." An action-based collection reflects the social action within a community (MacDonell; Tagami et al., 2003).

Brian Deer did not try to map the categories of First Nations knowledges in the dominant classification schemes such as the DDC and LC, but created a new classification scheme for each First Nation community he worked with. Instead of tactical interventions in the existing library classification, Deer opted for making the excluded and marginalised knowledge visible in its own right.

The second example is from the *Indigenous Knowledge and Resource Management in Northern Australia (IKRMNA)* project[20]. IKRMNA is a project to support and develop Indigenous databases that maintain and enhance the strength of local languages, cultures and environments in Northern Australia. One of the database projects is TAMI, which stands for Text, Audio, Movies and Images[21] and is designed to be useful for people with little or no literacy skills. The database was designed to be ontologically flat, so indigenous knowledge traditions were not pre-empted by western assumptions, i.e. there was a minimal metadata structure and no pre-existing categories (Christie, 2004; Verran, 2005b). The users became designers while grouping and ordering information resources. They could enter and search items in the database without metadata, give metadata to their own collections of items, and create different organisations of digital objects for different contexts. Helen Verran, one of the researcher in the IKRMNA project, speaks in this context about performances and choreography of bringing “into ‘presence’ (in the design process) that which has been systematically ‘absenced’ and ‘Othered’ in database design generally (Verran, 2005a; 2006). The users do map digital resources into a classification but create the classification in the act of mapping. Helen Verran describes such work as “doing ontics”, which is “emergent, partial and performative” making something visible that was not there before (Verran, 2005a; 2007).

The two examples show that classification work is always *situated* (Haraway, 1995), offering a particular perspective. A classification scheme and its categories emerge out of doing knowledge work, they are not pre-existing. Such situated classification work, done by the knowledge workers themselves, can prioritise poor and marginalised knowers. Returning to the Web, a similar approach can be found in collective tagging systems on the Web, e.g. del.icio.us[22] and Flickr[23]. These user-generated classifications are created by adding metadata in the form of tags to an information resource, creators and users of an item create categories and connections between different items[24]. Such *folksonomies* allow one resource to be categorised in diverse,

even contrasting, ways. So-called *tag clouds* (Wikipedia, 2007) visualise how minority and majority opinions of how to categorise or tag an item can exist next to each other (Golder and Huberman, 2006) The classifications and relationships that emerge from such work are situated and performative, similar to the classification work in the TAMI project.

Collective tagging decentralises and democratises classification work but does not necessarily prioritise “the poor as site contributors, editors, and viewers”, as the *Declaration from Concerned Knowledge Workers* insists. Sites such as de.icio.us do not offer off-line browsing, as is available in the OKN, but require a continuous good internet connection and certain levels of technological and informational literacy and English language skills. A combination of collective tagging with a decentralised, low-bandwidth peer-to-peer network technology such as offered by the OKN, however, could be one way to support and democratise classification work. If tagging was offered as an additional function in the OKN, it could support such classification work through:

- Tagging of photos, maps, audio and other media (since they cannot be found in keyword search)
- Use of tags in keyword search
- Analysis of tags to improve an existing classification scheme, e.g. adding situated categories
- Provide connections between items not captured by the existing classification scheme by grouping tags

This situated classification work is not pre-empted by the assumptions of experts and technologists or the default settings of technology. In such classification work metadata and categories emerge from people’s knowing and being of the world.

6. CONCLUSIONS

In this paper I have mapped and tracked the interactions between information and communication technology (ICT) and the diversity of knowledge. Mapping and tracking are metaphors for my explorations in technoscience, which led me to the classifications that organise categories of knowledge. I have presented some of my tracks in ‘the thick forest of information infrastructures’ that grow and maintain classifications of development knowledge. My original ‘map’ was the *Development Gateway: A Declaration from Concerned Knowledge Workers* — one expression of the conflict over the categories of knowledge. Mapping the Declaration’s categories of development knowledge in the classifications of the Development Gateway and other web-based portals and directories showed that the concerns expressed in the Declaration did not come true after all. The Development Gateway’s grand plan to become the ‘one-stop-shop’ for development knowledge on the web failed. The Gateway did not create a standard for the categories of development knowledge. The centralised portal proved to be a 90s idea as the web expanded to include second generation web services such as tagging sites, wikis, blogs, and peer-to-peer file sharing.

In order to address the issue of web-based classification that is inclusive of other ways of knowing, I needed to step outside the technological frame of the web. The examples of the Brian Deer classifications and the TAMI Aboriginal database are examples of decentralised classification work that is situated in the lives and histories of the people who will use those classifications to sustain their communities and families. I found similar approaches on the Web in the new collaborative tagging sites. It is here where we can begin to address Latour’s (and Donna Haraway’s) question about collecting and classifying things, as quoted in the beginning of this paper.

While collective tagging democratises classification work, it remains within a technical frame that is outside of the control of the classifiers. There is no guarantee that this work will prioritise poor or marginalised knowers. In contrast, the people working on the TAMI project were able to limit the disciplining agency of the technical frame by starting with a design with minimal ontological assumptions. They were able to minimise the design-reality gap (Heeks, 2002) by developing a collective design process and designing a database on the basis of their knowledge and technical literacy.

Mike O'Leary explained what he saw as the growing similarities between web portals and directories as the *Law of Merging Models*. But commercial sites on the web, such as Yahoo! and Google, merge differently than the donor-funded development knowledge sites. The latter merge in terms of the technological frame or common code that establishes the boundaries for their differences. They comply with the technical code but within this frame are the differences that allow them to establish their niche in the world of web-based knowledge sharing for development and to obtain donor funding accordingly. The hegemony of this common code may be one of the contributing factors to the disappearance of the OKN and TAMI. These initiatives tried something different, did not comply, and 'lost'. The OKN never fully developed according to its potential and funding stopped in 2006. The network has ceased to exist as a global network but some hubs, such as ALIN in Kenya, are still active in a more regional setting. The TAMI project ended in 2007 and it is unclear if there will be a follow-up. As ideas, experiences, and memories, however, these projects are still alive and may provide inspiration for new maps to track the diversity of categories of knowledge.

References

- Andrews, Tracy and Lyn Moore (2001). "Satellite imagery as art." *Acres Update*(24): 8-9.
- Bank, World (1998). *Knowledge for development*. New York, Oxford University Press.
- Batley, Sue (2005). *Classification in Theory and Practice*. Oxford, Chandos Publishing.
- Berg, Elisabeth, Christina Mörtberg, et al. (2005). "Emphasizing technology: socio-technical implications." *Information Technology & People* **18**(4): 343-358.
- Bowker, Geoffrey C. (2000, 30 September 2005). "Biodiversity: Datadiversity." from <http://epl.scu.edu:16080/~gbowker/biodivdatadiv.pdf>
- Bowker, Geoffrey C. and Susan Leigh Star (1999). *Sorting Things Out: Classification and its Consequences*. Cambridge, The MIT Press.
- Capek, Mary Ellen S., Ed. (1987). *A Women's Thesaurus: An index of language used to describe and locate information by and about women*. New York, Harper & Row.

Chen, Sherry Y., George D. Magoulas, et al. (2004). "A flexible interface design for Web directories to accommodate different cognitive styles." Journal of the American Society for Information Science and technology **56**(1): 70-83.

Christie, Michael. (2004). "Words, Ontologies and Aboriginal Databases." Retrieved 23 April 2007, from <http://www.cdu.edu.au/centres/ik/pdf/WordsOntologiesAbDB.pdf>

Ellerman, David. (2000, 10 October 2007). "The Bank as a Global "Coordinator" and "Integrator" of Bottom-up Initiatives." Retrieved 10 October 2007, from <http://ces.iisc.ernet.in/hpg/envis/doc98html/infovb201104.html>.

Gane, Nicolas and Donna Haraway (2006). "When we have never been human, what is to be done? Interview with Donna Haraway." Theory, Culture & Society **23**(7-8): 135-158.

Gateway, Development (2001). The Development Gateway Portal: Draft Business Plan 37.

Golder, Scott A. and Bernardo A. Huberman (2006). "Usage patterns of collaborative tagging systems." Journal of Information Science **32**(2): 198-208.

Gurstein, Michael. (2001). "The Global Development Gateway." from <http://www.mail-archive.com/gkd@phoenix.edc.org/msg00494.html>.

Hanseth, Ole (2004). Knowledge as infrastructure. The Social Study of Information and Communication Technology. Chrisanthi Avgerou, Claudio Ciborra and Frank Land. Oxford, Oxford University Press.

Haraway, Donna (1994). "A game of cat's cradle: Science Studies, Feminist Theory, Cultural Studies." Configurations(1): 59-71.

Haraway, Donna (1995). Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective. Technology & the Politics of Knowledge. Andrew Feenberg and Alastair Hannay. Bloomington, Indiana University Press.

Heeks, Richard (2002). Failure, Success and Improvisation of Information Systems Projects in Developing Countries Development Informatics Working Papers. Manchester, Institute for Development Policy and Management, University of Manchester: 23.

Jacob, Elin K. (2004). "Classification and categorization: a difference that makes a difference." Library Trends **52**(3): 488-507.

Jha, Adithya, Vicky Seymour, et al. (2004). Evaluation of the Development Gateway, Development Studies Institute, London School of Economics: 46.

Kwasnik, Barbara H. (1999). "The role of classification in knowledge representation and discovery." Library Trends **48**(1): 22-48.

Lee, Hur-Li and Hope A. Olson (2005). "Hierarchical navigation: An exploration of Yahoo! directories." Knowledge Organization **32**(1): 10-24.

Lessig, Lawrence (1999). Code and Other Laws of Cyberspace. New York, Basic Books.

MacDonell, Paul, Reiko Tagami, et al. (2003). "Brian Deer Classification System." Retrieved 23 April 2007, from <http://www.slais.ubc.ca/courses/libr517/02-03-wt2/projects/deer/index.htm>.

Manovich, Lev (2001). The language of new media. Cambridge, MA, MIT Press.

Marres, Noortje (2004). "Tracing the Trajectory of Issues and their Democratic Deficits on the Web: The Case of the Development Gateway and its Doubles." Information, Technology and People, **17**(2): 124-149.

Miller, Vincent (2004). Stitching the web into global capitalism: Two stories. Web.Studies. David Gauntlett and Ross Horsley. London, Arnold.

Moore, Lyn and Tracy Andrews. (2001). "Ancestor tracks through art." Retrieved 30 September 2005, from <http://www.icomos.org/australia/Tracks/30a%20Moore%20&%20%20Andrews.%20Ancestor%20tracks.pdf>.

Muth, Hanns Peter and Frederick H. Gerlach (2005). Development Gateway Foundation: Independent Evaluation (Summary): 35.

O'Leary, Mick (1998). "Web directories demonstrate an enduring online law." Online **22**(4): 79-81.

Olson, Hope A. (1998). "Mapping Beyond Dewey's Boundaries: Constructing Classificatory Space for Marginalized Knowledge Domains." Library Trends 47(2): 233-254.

Olson, Hope A. (n.d.). "Linking *A Women's Thesaurus* and *DDC*: The Variables." Retrieved 24 May 2006, from <http://www.ualberta.ca/tildeholson/femclass/variables.htm>.

Pereira, Mike (2005). Introduction.

Ranganathan, S. R. (1931). The Five Laws of Library Science. Madras Library Association, Madras, India

.

Rogers, Richard (2004). Information Politics on the Web. Cambridge, The MIT Press.

Santos, Boaventura de Sousa (2004). A Critique of Lazy Reason: Against the Waste of Experience. Modern World-System in the Long-Durée. Immanuel Wallerstein. London, Paradigm Publishers: 157-197.

Star, Susan Leigh (2002). "Infrastructure and Ethnographic practice." Scandinavian Journal of Information Systems 14(2): 107-122.

Star, Susan Leigh and Karen Ruhleder (1996). "Steps Toward an Ecology of Infrastructure: Design and Access For Large Information Spaces." Information Systems Research 7(1): 111-134.

Stiglitz, Joseph (2000). Scan globally, reinvent locally: knowledge infrastructure and the localisation of knowledge. Banking on Knowledge: The Genesis of the Global Development Network. Diana Stone. New York, Routledge: 24-43.

Thompson, Craig and Zeynep Arsel (2004). "The Starbucks Brandscape and Consumers' Anticorporate) Experiences of Glocalization." Journal of Consumer Research 31(December 2004): 631-642.

Turtle, Voice of the. (2001, 6 July 2001). " The Development Gateway: A Declaration from Concerned Knowledge Workers." Retrieved 30 January 2006, from <http://web.archive.org/web/20010816115857/http://voiceoftheturtle.org/gateway/>
<http://www.voiceoftheturtle.org/gateway/>.

- van der Velden, Maja (2002). The End of Diversity? Knowledge, ICTs, and the Development Gateway. Third international conference on Cultural Attitudes Towards technology and Communication 2002, Montreal, Canada, Murdoch University.
- van der Velden, Maja (2005). "Programming for cognitive justice: Towards an ethical framework for democratic code." Interacting with Computers **17**: 105-120.
- van der Velden, Maja (2006). A license to know: Regulatory tactics of a global network. Cultural Attitudes Towards Communication and Technology, Tartu, Estonia, Murdoch University.
- Verran, Helen (2005a). Personal communication, 21 November 2005.
- Verran, Helen. (2006, 6 September 2006). "Software for Educating Aboriginal Children about Place." Retrieved 4 September 2007, from http://www.cdu.edu.au/ik/pdf/HRV_for_Kritt_WinegarFINAL4-06.pdf.
- Verran, Helen (2007). "Metaphysics and Learning." Learn Inq(1): 31-39.
- Verran, Helen (2005b). "Knowledge Traditions of Aboriginal Australians: Questions and Answers Arising in a Databasing Project." Retrieved 23 April 2007, from <http://www.cdu.edu.au/centres/ik/pdf/knowledgeanddatabasing.pdf>.
- Walker, Louise (2003). Startup of the Development Gateway. Washington, The World Bank Operations Evaluation Department: 53.
- Walton, Marion and Vera Vukovic (2003). "Cultures, literacy, and the web: dimensions of information "scent"." Interactions (Special Issue: HCI in the developing world) **10**(2): 64-71.
- Wikipedia. (2007). "Tag_cloud." Retrieved 4 December 2007, from http://en.wikipedia.org/wiki/Tag_cloud.
- Wilk, Richard (1995). Learning to be local in Belize: Global systems of common difference. Worlds apart: Modernity through the prism of the local. Daniel Miller, Routledge: 110-133.
- Wilk, Richard (2004). "Miss Universe, the Olmec and the Valley of Oaxaca." Journal of Social Archeology **4**(1): 81-98.

Wilks, Alex (2002). "Development through the Looking Glass: the Knowledge Bank in cyberspace." Information Development **18**(1): 41-.

Wolfensohn, James. (1996). "People and Development." Retrieved 10 October 2007, from <http://web.worldbank.org/WBSITE/EXTERNAL/WBI/0,,contentMDK:20212624~menuPK:575902~pagePK:209023~piPK:207535~theSitePK:213799,00.html> TinyURL: <http://tinyurl.com/yuxfe5>.

Zins, Chaim (2002). "Models for Classifying Internet Resources." Knowledge Organization **29**(1): 20-28.

Notes

1. In this paper the concept of knowledge covers different understandings. Terms such as 'knowledge for development' and 'development knowledge' refer to commodified knowledge. The World Bank (1998) understands such knowledge as 'knowledge about technology' (know-how) and 'knowledge about attributes' (i.e. information about market prices, credit, quality, etc.). The majority of the cases in this paper categorises such development knowledge according to sector (health, agriculture, etc.). In this understanding of knowledge it is possible to identify different ways of knowing, e.g. indigenous knowledge, but 'knowledge' (i.e. 'modern', scientific knowledge) and 'indigenous knowledge' are not treated equally. On the other hand, some of the authors quoted in this paper, understand knowledge as plural (Vinay Lal), situated (Donna Haraway), and emerging (Helen Verran). These knowledges are embedded and embodied; there is no separation of knower and known. My research in the diversity of knowledge is based on this understanding of knowledge and I proposed to treat such knowledges equally (see van der Velden, 2007).

2. The full text of the Declaration is available on the web at URL <http://www.voiceoftheturtle.org/gateway/> and in the Internet Archive at URL <http://web.archive.org/web/20010816115857/http://voiceoftheturtle.org/gateway/> The Declaration is a 544 word document and the initiators are Yash Tandon, International South Group Network, Zimbabwe, Patrick Bond, University of the Witwatersrand, South Africa; Phil McMichael, Cornell University, Ithaca, NY, USA; Chris Brooke, Magdalen College, Oxford, UK; and Rutendo Kambarami, Communications Officer, Mwelekeo waNGO, Zimbabwe.

3. This position is similar to that of the ontologist of Yahoo!, another web portal: "We are Yahoo We do not have biases. This is just how the world is. The world is organized into a dozen categories" (Unidentified Yahoo ontologist and her staff paraphrased in Shirky, 2006).

4. Web portals and directories regularly change their design and organisation. I have therefore used the versions of ten sites as archived in the Internet Archive (www.archive.org). The URLs for these sites are given with in parentheses. The Open Knowledge Network was never archived in the Internet Archive.

5. The OKN was first proposed as a possible design for the Gateway. The World Bank never discussed this proposal Armstrong, Peter (2003). Personal Communication. London. OneWorld continued developing the proposal and the result was a distributed gateway built on a network of civil society organisations and their local access points in ten countries. See van der Velden, Maja (2005). "Programming for cognitive justice: Towards an ethical framework for democratic code." Interacting with Computers **17**: 105-120, van der

Velden, Maja (2006). A license to know: Regulatory tactics of a global network. Cultural Attitudes Towards Communication and Technology, Tartu, Estonia, Murdoch University..

6. The top-level categories of each classification form the set of ‘clickable’ categories that open in new sets of categories and/or in a set of hypertext links to information resources.

7. This results in a rather unbalanced classification because the top-level category knowledge contains all the resources that other web directories organise in several top-level categories.

8. For example, one of Eldis’ top-level categories is ‘Norwegian Research’, a category edited by NorAgric (Norwegian Centre for International Environment and Development Studies). NORAD, The Norwegian Agency for Development Cooperation, is one of the donors of Eldis. The Development Gateway has as one of its top-level categories ‘glocalization’, which is edited by the Glocal Forum, a Swiss non-profit organisation. The ‘glocalisation’ topic is based on the Glocalization Manifest of the Global Forum, and the topic editors (indexers) are employed by Global Forum.

9. Craig Thompson and Zeynep Arsel Thompson, Craig and Zeynep Arsel (2004). "The Starbucks Brandscape and Consumers’ Anticorporate) Experiences of Glocalization." Journal of Consumer Research **31**(December 2004): 631-642. developed the theoretical framework of the “hegemonic brandscape” in their research on Starbucks, the global coffee shop brand. The authors argue that the hegemonic influence of the Starbuck brand is that it has been able to standardise, on a global level, the idea and meaning of a coffee shop. Its hegemony lies in the cultural influence on the non-Starbuck coffee shop, the way it has shaped expectations of how a coffee shop should be.

10. In India, the volunteers are selected from the community in which an OKN access point is active. In Kenya, volunteers are people from the community active in community development activities. In Kenya, ALIN hires young people, recently graduated in journalism or media studies, who work for one year at an OKN access point.

11. The Open Source software can be downloaded from <http://www.enrich.nic.in/>

12. In 2006 I twice visited the OKN project in India and in 2007 I twice travelled to Kenya in order to visit the OKN project in East-Africa.

13. One volunteer expressed frustration with this situation. People in the community were introduced to the computer network as an effective way of sharing knowledge. That message got lost when a local group contributed to the OKN and the item didn’t show up for a week.

14. Software programmes to automatically ‘translate’ from one language font into the other did exist but the people I met did not know about them.

15. The OKN never had an URL that was easy to remember. Even ALIN’s OKN network in East Africa works with such an URL. On top of that, the OKN web pages lack the metadata that are used by search engines. The result is that the OKN has no visibility on the internet.

16. The OKN hub in Kenya is based at the Arid Lands Information Network (ALIN) and covers a network of Community Knowledge Centres in Kenya, Tanzania, Uganda, and Ethiopia. This fieldwork took place in 2007 and by that time funding for the African section of the OKN had run out. Because the OKN is a distributed gateway, based on open source software, ALIN could continue its OKN activities within its own network without interruption.

17. How information resources are categorised is visible at the bottom of each item. It will give information about the author of the item, the person who added it to the OKN, date, place, content type, subject, and audience.

18. Sociologist Boaventura de Souza Santos (2004, p.175-176) describes a clue as an announcement of what is to come next and argues for the value and validity of clues as possibilities of the future that lie in concrete social experiences.

19. Xwi7xwa Library, URL <http://www.library.ubc.ca/xwi7xwa/>, accessed 23 April, 2007.

20. This section on IKRMNA is based on van der Velden (2007)

21. TAMI, URL http://www.edu.edu.au/centres/ik/db_TAMI.html#, accessed 23 April 2007.

22. URL <http://del.icio.us>

23. URL <http://www.flickr.com>

24. David Weinberger Weinberger, David. (2006, 10 October 2007). "Taxonomies and tags: From Trees to Piles of Leaves." from http://www.hyperorg.com/blogger/misc/taxonomies_and_tags.html. argues that our thinking about classifications should move away from taxonomies and trees to tags and ‘leaves’. The people who create or use an information resource can decide for themselves on which tree(s) to hang their leaves.