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# THE ETHICS OF DIGITAL INCLUSION

## Reflections on FLOSS and Diversity

**Maja van der Velden**

Research Fellow

Institute for Information and Media Studies

University of Bergen, Norway

maja@xs4all.nl

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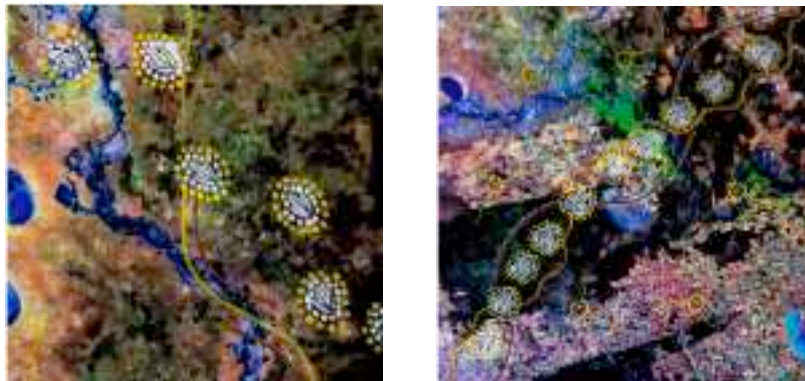


Fig. 1. Art work by Lyn Moore and Tracey Andrews (2001)

**Abstract:** A preoccupation with content and connectivity in bridging the digital divide obscures the role of information and communication technology in making different ways of knowing and other logics and experiences visible or invisible. How to deal with this diversity in information systems and what is the role of Free/Libre Open Source Software (FLOSS)? In a discussion of the Development Gateway, the Open Knowledge Network, the Indymedia Network, and the TAMI Aboriginal database, this paper shows that this is done in different ways. The examples propose that FLOSS is not only supporting diversity through localisation work facilitated by its technical efficiency. The analysis draws attention to FLOSS as enabling political and ethical positions that result in dealing with diversity in the source code.

**Keywords:** free libre open source software, knowledge, diversity, code, ethics, digital divide

## 1. Introduction

Digital inclusion suggests that information and communication technologies are solutions, bridges across the digital divide which enable the flows of knowledge and information to reach new territories. Furthermore, the digital divide metaphor implies a conceptualisation of knowledge as object (Walsham, 2005), a commodity which can be extracted and transported from one place to another (van der Velden, 2002, 2005). Accordingly, efforts to overcome the digital divide are closely connected with ideas about a global knowledge society in which everyone has the right of access to information and knowledge.<sup>1</sup>

If we understand knowledge not as an object and commodity but as a way of knowing, something produced socially, we must ask about the nature of digitalisation itself. As the Aboriginal elders say, "Things are not real without their story" (IKRMNA, 2005). The technology that produces visibility through digital connectivity also produces the invisibility of people and their stories, the fabric of the social nature of knowledge. When confronted with the social embeddedness of knowledge, the digital divide becomes a divide, not between the information and knowledge haves and have-nots, but between what can be digitalised (commodities) and what cannot be digitalised (social processes).

The perception that technology has no intrinsic value, that it gets its meaning through use (e.g. UNDP, 2001:27), has obscured the social and political processes that led to the design or selection of a particular technology through which information and knowledge is shared. How to deal with difference in a world where credible alternatives are rendered invisible by the technologies which claim to offer digital inclusion? The bias of technology and the social embeddedness of knowledge imply the need to go beyond a rights-based approach in search of an ethics of digitalisation itself.

Elsewhere I have proposed a framework for how to deal with knowledge diversity in designing information technology (see van der Velden, 2005). I argued that the cultivation of diversity in information technology is mainly enabled through technical flexibility, providing a variety of language modules and content management modules. Free/libre open source software (FLOSS) is perceived as particularly well-positioned to enable this technical flexibility. But what role can FLOSS play in an ethics of digitalisation? What are the political and ethical positions that FLOSS can support? Can it strengthen the role of people and organisations as designers and owners of technology, in their effort to democratise technology and its institutions? Can FLOSS support them as agents of change by enabling autonomous self-organisation?

Inspired by the artwork of Lyn Moore and Tracey Andrews (2001)<sup>2</sup>, I look at information technologies as palimpsests. Moore and Andrews use the figuration of the palimpsest

<sup>1</sup> For example, the Heinrich Böll Foundation initiated in preparation for the World Summit on the Information Society a Charter of civil rights for a sustainable knowledge society, calling for the "unhampered and non-discriminatory use of knowledge and keeping access to information resources open" (see [http://reddot.xima-redaktion.de/download\\_en/Charta3-0-en.pdf](http://reddot.xima-redaktion.de/download_en/Charta3-0-en.pdf))

<sup>2</sup> I was introduced to the art (see p.1 of this essay) of Moore and Andrews through an article by Bowker (n.d.).

to engage with the “record of history” (Haraway, 2000) of Lake Mundo region in Australia. In its original meaning, a palimpsest is a manuscript, usually papyrus or parchment, on which an earlier text has been removed – literally “scraped again” - in order to make place for a new text. The original text is often not completely erased and is still, or can be made, legible. Moore and Andrews researched the many ways in which the Lake Mundo region has been mapped. Andrews, a Barkindji woman, drew (her) Ancestor tracks across satellite images of the region. In an art installation, these images were juxtaposed with a colonial map of 1835, showing the colonial discovery of the land (Moore and Andrews, 2001).

I understand Moore and Andrews' palimpsest as a political and ethical metaphor for the relation between knowledge and technology. Information and communication technologies, such as satellite technology, superimpose a way of knowing and ways of owning knowledge and sharing information on a community or society. The existing way of knowing and of owing and sharing knowledge can be scraped away – the literal meaning of palimpsest – by technology. But the artwork of Moore and Andrews also shows us how knowledge that has been scraped away can be made visible again.

Looking at technologies as palimpsests enables us to see how the different ways of knowing, owing, and sharing knowledge are made visible or invisible by technology. How we deal with these differences, with the diversity of knowledge, is reflected in our moral choices about technology (Hamelink, 2000). Who decides which way of knowing is visible or invisible and why? The understanding that information and communication technology can make other ways of knowing visible or invisible brings us into the realm of ethics. In this essay I will look at information systems in which different ways of knowing are interpreted and negotiated. Understanding these information systems as palimpsests enables looking at a design as the result of a struggle over knowledge and over whose knowledge counts in the technological design.

## **2. 'Hardwiring' Diversity**

Discussions of free and open source software versus proprietary software are often about technical flexibility and the costs of producing software or buying user licenses. In this paper the focus will be on the motivations for selecting the design of these systems, the motivations for selecting FLOSS or proprietary software, and how these motivations are related to the organisation's mission statement and goals. Looking at these motivations will enable better understanding the politics and ethics of designing or selecting technology.

In this section I will analyse four information and knowledge sharing projects - the Development Gateway, the Open Knowledge Network, Indymedia, and TAMI, an Aboriginal database – based on the documents related to their development and design. This analysis is further informed by the use of two of the projects, the Development Gateway and Indymedia. The Open Knowledge Network and TAMI are not ‘live’ on the internet but demonstrations of the two systems can be accessed via the internet (OKN, 2005a; TAMI, 2005a). These four projects are selected because each, in their own way, proposes to deal with knowledge diversity through technology. They have tried to

“hardwire” certain ideas about knowledge and its diversity in the code of the information systems.

### 2.1 Global Development Gateway

The Development Gateway ([www.developmentgateway.org](http://www.developmentgateway.org)) is founded and developed by the World Bank. While it is still operated by the World Bank, it is now governed by the Development Gateway Foundation. The design of the Gateway is based on a centralised content management system.

The negotiations over what is knowledge for development and how this knowledge can be shared was an important issue during consultation meetings between the World Bank and civil society representatives.

Table 1. Issues of discontent

<b>Issues of discontent</b>	<b>World Bank</b>	<b>Critics</b>
Design	Centralised system	Distributed system
Ownership	Owned by World Bank	Owned by participating organisations
	Proprietary software	Free / Open Source software
Architecture	New portal working side-by-side / in competition with other portals and networks	New peer-to-peer network overlaying / connecting existing networks
What is knowledge	Knowledge is causal, linear, credible, and a public good	Knowledge is power-related, tacit, situated, embodied, gendered. The credibility of knowledge is established through the people/organisations who convey the knowledge

During the design phase of the Development Gateway, the discussions focused on issues of design, ownership, organisational structure, and knowledge (see table 1). Civil society representatives argued that the diversity of understandings of what knowledge is and how it is shared should inform the design of the Gateway (van der Velden, 2002). It was during this phase that Oneworld International (see section 3.2) proposed a design for a distributed gateway. The World Bank addressed some of the critique (van der Velden, 2002). An important result was that the Gateway was built with free/open source software and open standards.

Looking at the Gateway as a palimpsest shows how the powerful World Bank’s way of knowing, with its orientations towards economic development and information technology (Bretton Woods Project, 2004; Walker, 2003), superimposes other ways of knowing. The Gateway is the product of two ideas about knowledge: that knowledge can be treated as a commodity and that there is universal knowledge. These ideas were first introduced in the 1996 Annual Meeting Address of the then President of the World Bank, James D. Wolfensohn (1996). Wolfensohn’s idea of a Knowledge Bank was

informed and inspired by corporate sector knowledge management approaches of capturing available knowledge and sharing credible knowledge among partners. This idea became further developed in the 1998/1999 World Development Report (World Bank, 1998). The role of the World Bank in this initiative becomes clear in the words of the World Bank's then Chief Economic Officer Joseph Stiglitz: "[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 ways of sorting through the cacophony, establishing credibility." (Stiglitz, 2000). The Development Gateways first Draft Business Plan (World Bank, 2001) puts it in more commercial language. It states that the success of the Gateway will depend in part on the capacity to complement or "replace existing sources of information on the Web".

#### *FLOSS and the Development Gateway*

In the Frequently Asked Questions (FAQ) of the Development Gateway (2005), the following information on the Gateway's technical platform can be found:

The Development Gateway portal uses an open-source approach to technology and information standards, which enables greater accessibility, scalability, reliability, collaboration, and innovation. The portal is currently deployed on a J2EE based portal framework known as Digi which was developed by the Development Gateway. Digi uses open-source standards, systems, and tools developed by the Apache Foundation, IBM, JBoss, Sun Microsystems, the W3 Consortium, and others. Some parts of our site are still running on our former technology platform, the open-source AOL web server platform using the open-source ArsDigita Community System.

By using open-source technology, we are able to make our service platforms available to developing countries economically, while facilitating the ability to localize applications.

In the Gateway's technical assessment (Quigley, 2000), hardware and software options are discussed in an instrumental and managerial framework. The selection of the technical platform for the Gateway is based on the discussion of knowledge as digitalised content, files and links to files, and how to best access and manage them. Differentiations in user needs are made in terms of speed of access and the diversity of signs, that is, the language and cultural implications of web interface design. In line with the understanding of knowledge as neutral, the technology is perceived as neutral, providing non-gendered and non-political tools for knowledge sharing.

The Development Gateway can use its centralised design to keep a control over what is included in the centralised database. Also the Gateway choice of topics to organise and classifies documents and links on the website reflects clear biases in terms of what is considered knowledge for development (Jha, Seymour, and Sims, 2004).

The Gateway states that its rationale for using FLOSS as follows: "[By] using open-source technology, we are able to make our service platforms available to developing countries economically, while facilitating the ability to localize applications" (Development Gateway, 2005). The Gateway's open source platform is now being used by tens of so-called Country Gateways and Regional Gateways.

## 2.2 Open Knowledge Network

The development of the Development Gateway is intertwined with that of the Open Knowledge Network ([www.openknowledge.net](http://www.openknowledge.net)), an initiative of Oneworld International. Oneworld is a coalition of non-governmental organisations from more than 90 countries. It introduced the idea of a distributed gateway, based on peer-to-peer file sharing technology, in a consultation with the World Bank (Armstrong, 2003). The World Bank did not discuss this proposal and opted for its original plan, a centralised database system. Oneworld developed its idea for a decentralised gateway into the Open Knowledge Network, which was first presented to the public during the World Summit on the Information Society in December 2003.

The Open Knowledge Network (OKN) is a distributed system of independent hubs—intermediaries with Internet access, local communities, organisations, grassroots, and individuals with or without Internet access, in which relevant development information can be shared. Users can publish or access information via the Internet but also by telephone, wireless, radio, loudspeakers, notice boards, etc. The OKN does not repackage knowledge but provides local knowledge owners, producers, and seekers a decentralised, global structure to share information via their existing, locally owned organisations and networks. Local knowledge is shared in the OKN through community intermediaries who work as community reporters. Sharing local knowledge as news is part of the OKN's strategy to protect local ownership over local knowledge, as well as to protect the OKN from possible liability for the dissemination of copyrighted materials. The OKN is now looking into using Creative Commons Licenses ([www.creativecommons.org](http://www.creativecommons.org)).

The OKN connects a network of independent organisations, which are using a variety of technologies and media to communicate. For example, satellite images of weather systems enter the OKN via one of its hubs and travels to India where the images are analysed. Weather information relevant for fishermen in Pondicherry is sent to another hub where the information is translated in a local language, put up on a local noticeboard, and transmitted through loudspeakers on the beaches. Which text is legible in the OKN palimpsest - whose knowing is visible - depends on your position in the network.

### *The Open Knowledge Network and FLOSS*

The OKN (2005b) website provides the following information about the design of the network and the use of free/open source software:

The OKN software is a tool designed to facilitate the creation, display and exchange of locally relevant content in the communities where our partners work.

Key principles that have therefore informed the software design are:

- Support for content in local languages and scripts;
- Ability to work in areas of poor or expensive connectivity;
- Screens that make it easy for people who are unfamiliar with computers to enter and view content;

- Content displays tailored to the interests and needs of each community we serve;
- Exchange of content at local, national, regional and global levels.
- High Reliability and ease of maintenance (we have not always achieved this!);
- Use of Open Source Tools, open protocols and a commitment to offering the OKN software to the Open Source community;
- Common metadata framework for describing OKN content that works across different media - web pages, documents, images and audio and across languages.

The requirement to work in areas with weak or expensive connectivity has had a strong influence on the software design. In particular, the OKN software is able to work as a peer-to-peer content exchange network where OKN systems need only come on-line to exchange content with the rest of OKN.

The OKN's technical assessment (West, 2002) is based on the objective of facilitating knowledge sharing that is relevant to neighbourhoods and villages in so-called developing countries. The OKN's approach is based on a peer-to-peer (p2p) file sharing system. There is no central database or 'centre' that can control or monitor the flow of information between the users of the system. Because control is decentralised, the system is highly flexible.

The project's focus is how people share knowledge and how they access knowledge. The OKN thus enables people to share their local knowledge in different kinds of formats and connections (Internet, radio, mobile, as well as offline access to users with expensive or slow Internet connectivity). The focus is on the diversity of the users and their knowledge. Hubs do need to install OKN software on their computers in order to be able the exchange files.

Recently, OKN hubs in Northern India, Nepal, and Sri Lanka have started to work with Open eNRICH, a FLOSS package developed by the National Informatics Centre of the Government of India, UNESCO, and the OKN. The first release of Open eNRICH is currently being field-tested and should be ready at the end of October 2005 (National Informatics Centre, 2005). Open eNRICH will provide the computer users of the OKN with a web interface for accessing files. OKN's local knowledge will thus become accessible via the internet too.

### 2.3 Indymedia

Indymedia ([www.indymedia.org](http://www.indymedia.org)) is a collective of independent media centres (IMCs) and hundreds of journalists. IMCs can be found in more than hundred countries and cities and in more than twenty different languages.

The mission statement of Indymedia states (Indymedia Document Project, 2005a):

The specific purpose of the Confederated Network of Independent Media Centers (CNIMC) is to facilitate the use of media production and distribution as a tool for promoting social, environmental and economic justice, and to develop a global decentralized communications network to provide a voice for the voiceless. It is also

the purpose of this network to give expression to a wide diversity of social movements in order to assist the distribution of intellectual, scientific, literary, social, artistic, creative, human rights, and cultural expressions not covered by the commercial press.

Each Indymedia Media Centre is asked to subscribe to the membership criteria (Indymedia Document Project, 2005b) and the Principles of Unity (Indymedia Document Project, 2005c). The Principles of Unity is a work in progress. It contains ten principles, among others the principle of Open Publishing which is still in draft format: "All IMC's, based upon the trust of their contributors and readers, shall utilize open web based publishing, allowing individuals, groups and organizations to express their views, anonymously if desired."

Providing voice to the voiceless and the principle of open publishing form the basis of the Indymedia network. The principle of open publishing is at the same time the most problematic as it is in conflict with the legislation on restricting freedom of speech as well as with the values and local politics in some of the countries where Indymedia centres are established. Indymedia centres in these countries have implemented their own editorial policies to deal with these local realities. Aspects of these policies are inscribed in the code base.

#### *Indymedia and FLOSS*

The use of free/open source software is one of the membership criteria for participating as a Indymedia Media Centre in the Indymedia network (Indymedia Documentation Project, 2005b):

9. All IMC's shall be committed to the use of free source code, whenever possible, in order to develop the digital infrastructure, and to increase the independence of the network by not relying on proprietary software.

There are at the moment about fourteen different code-bases in use in the Indymedia network (Indymedia Document Project, 2005d). The first code base, a software package named Active, was developed by activists in Australia to run a small activist media centre. In the same year, the software was adapted and used for the independent media centre in Seattle during the activities surrounding the World Trade Organisation (WTO) meeting in 1999. The success of the media centre in Seattle led to the establishment of many more Independent Media Centres. Coleman (2004) and Hill (2003) describes how soon after discussions started on how to improve Active. What was initially dubbed Active2, resulted in many more source codes with names such as SF-Active, Mir, FreeForm and DadaIMC.

As Hill (2003) discusses, each of the Active spin-offs reflects the different evaluations and approaches to the problems of the first Active software. For example, a code base called Mir was developed for the German IMC site, reflecting "a legal environment which prohibits racist, hateful, and revisionist speech in ways that necessitates prior restraint story moderation in a way that many IMCs are uncomfortable with." (Hill, 2003, p.5). Other spin-offs dealt with the authentication process. Active had no authentication process, allowing anonymous postings. This is still possible with IMC software such as



DadaIMC. Other IMC softwares now require a name, while some also allow you to post under a nick name.

Another points of contention were the way feature articles were implemented, the system's user-friendliness, and the internationalisation and localisation of the systems (Hill, 2003). Each of the Active spin-offs dealt with these issues in a particular way. Hill (2003) points to an interesting issue: the Indymedia Technical Collective never developed Active2. The politicisation of each design choice made it impossible to rewrite the original code base into one that would satisfy every Indymedia centre in the world. The result was that many different code bases, reflecting the diversity of ways of knowing and sharing knowledge, in the Indymedia network.

The ongoing negotiations in the Indymedia network in order to balance unity, diversity, and autonomy show that part of these negotiations need to be expressed on the level of the code base, the software programmes on which the individual IMCs run. New participants in the Indymedia network can choose which code base serves their values best or develop a new one.

As a palimpsest, the Indymedia network looks similar to the OKN. The main difference is that this diversity is 'hardwired' in fourteen different code bases. Each of the Indymedia Media Centres uses a code base that allows it to express local politics, local ethics, and local experiences, and to participate in the global network in its own way. Each of these local code bases can be read as an inscription of the Indymedia palimpsest, the palimpsest in which all fourteen inscriptions are interconnected to form the Indymedia network.

#### 2.4 TAMI: An Aboriginal database

Indigenous Knowledge and Resource Management in Northern Australia (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. The project is a cooperation between Charles Darwin University and indigenous groups in Northern Australia. Two of the academics involved in the project, Helen Verran (2005) and Michael Christie (2004), proposed a design process in which users are designing their technology by using it. They discuss a database emptied "as far as possible of its ontological presumptions" (Christie (2004:9), starting with a minimal metadata structure and a limited dataset. A focus on the use of this database will then inform the design of the interface, search engine, and data structures.

One of the projects is TAMI ([www.cdu.edu.au/centres/ik/db\\_TAMI.html](http://www.cdu.edu.au/centres/ik/db_TAMI.html)), which stands for Text, Audio, Movies and Images<sup>3</sup>. The specific design of the system allows the users to take up the position as designers. They group and order resources by simple drag and drop and they can print out or save their collection on DVDs. An important feature of the database is that it is designed to be ontologically flat, so indigenous knowledge traditions are not pre-empted by western assumptions. The user encodes the structure in the database, for example:

<sup>3</sup> See [http://www.cdu.edu.au/centres/ik/db\\_TAMI.html#](http://www.cdu.edu.au/centres/ik/db_TAMI.html#)

- Objects can be uploaded and searched without metadata
- No pre-existing categories
- Users can give metadata to their own collections
- One way of searching objects in the database is by browsing through the full set of thumbnail resources

An ontologically flat database offers the possibility of adding different interfaces to it. Besides the interface configuration used by TAMI, it is possible to imagine another configuration, one which embeds the way of knowing of western science (Verran, 2005). Such a database may even help to negotiate what Verran (2005) has called ontic differences, the different ways in which people give meaning to things.

The development of the TAMI database shows that an information system is a socio-technical space where different ontologies, knowledges, and experiences “meet, clash and grapple with each other” (Pratt, 1999). The TAMI project shows how a database becomes the contact zone (Pratt, 1999) where Aboriginal and western scientists create dialogues on resource management. The Aboriginal database will be read differently by people with different ways of knowing. Its ontological flatness will allow for different user interfaces and different readings. For non-Aboriginal database designers, an ontological flat database with its lack of schemas<sup>4</sup> and other structures that make connections between the data in a database possible, may seem illogical. Understanding the TAMI database as a palimpsest makes clear that such a database doesn’t lack anything: it inscribed a different way of making connections between the data in the database. The database was structured according to the Aboriginal way of knowing and producing knowledge. The specific design of the database makes it possible to re-order the different readings of the information in the database. An Aboriginal designer of the database inscribes a different way of knowing in the database as the academic involved in the project.

### *TAMI and FLOSS*

On the issue of software requirements for the TAMI database (TAMI, 2005) the following is mentioned:

While the ARC Linkage Research project has employed funds to research user requirements and develop conceptual frameworks for TAMI we will be seeking to develop TAMI through securing specific software development funding. Charles Darwin University holds the IP which comes out of this research. (The IP over the indigenous content of any of our software systems is retained by the original owners). Initially we envisage developing a proof of concept animation of TAMI as well as a supporting functional specification document and budget. We are seeking funding to continue the development to the point of usability testing and deployment of an initial version.

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<sup>4</sup> A schema describes the objects that are represented in the database and the relationships that exist between these objects.

The prototype of TAMI available on the internet uses proprietary software (iLife) but the final software programme will be owned by the developer of the system, Charles Darwin University.

### **3. Political and Ethical Positioning with FLOSS**

Information systems are not neutral technologies. In the presentations of the Development Gateway, the Open Knowledge Network, Indymedia, and TAMI, I have briefly sketched how the design of these systems reflect the values of the people, organisations, and communities involved. What values can be read in the motivations for using FLOSS or proprietary software in these projects?

In the case of the Development Gateway, the rationale to select FLOSS is technical, economical, and it facilitates localisation. The technical assessment for the Gateway (Quigley, 2000) does not mention free/open source software. The use of FLOSS seems not a principle for the Gateway. The World Bank's motivation for selecting FLOSS can also be read as political positioning in a situation in which there was strong opposition against its proposal for a centralised development portal. FLOSS was promoted by other organisations during consultations on the Gateway. The FLOSS solution provides the Bank the same technical functionalities and efficiencies, such as centralised content management, as proprietary software solutions. The World Bank's choice for FLOSS reflects also an instrumentalist approach: FLOSS allows the Bank to share its software platform with the tens of Country Gateways that have been established with World Bank and InfoDev funding. As a result, the independent Country Gateways have incorporated the same centralised approach to sharing knowledge-for-development as the global Development Gateway.

Oneworld International, one of the founders of the Open Knowledge Network, mentions in its Mission Statement that it "recognise that rights of access to internet technology should be balanced by responsibilities in its application" (Oneworld, 2005). This ethical position is reflected in the software solution that was specifically developed for the OKN. Both the choice for a peer-to-peer solution and its principle to contribute with this software to the FLOSS community reflect a commitment to diversity enabled by decentralised networking, local ownership, and local control. The organisations and communities participating in the OKN network use a variety of technologies for organising and sharing their knowledge: from loudspeakers on a beach to a web-based content management system and satellite technology. The second FLOSS solution for OKN, Open eNRICH, is based on proprietary software (eNRICH) developed by the National Informatics Centre (NIC). A partnership between NIC, OKN, and UNESCO has resulted in a FLOSS version, Open eNRICH.

The use of FLOSS is also one of the guiding principles of the Indymedia Collective. Besides technical considerations, Indymedia sees the use of FLOSS as contributing to the independence of the network. Indymedia's motivation to enable diversity in and through its code bases show is that there are different interpretations of open publishing possible within the Principles of Unity. These interpretations are politically

and ethically motivated and “grant us a meaningful form of freedom, the independence to choose the socio-technical terms on which we communicate” (Hill, 2003, p.8).

TAMI will not be built with FLOSS. The rights to the final software solution will be with the Charles Darwin University. Compared with the other three systems, local ownership of the information in TAMI is a not only a political and ethical issue. Aboriginal ownership of Aboriginal knowledge is perceived crucial for the protection of Aboriginal life. The TAMI project is based on the understanding that all the information in the system is owned by the Aboriginal family involved in the project. However, this ownership can only be executed fully if the hardware and the software needed to access the information are owned by the same family who owns the information. The same is true for the design of the database. The Aboriginal users create the information infrastructure, the connections between the different pieces of information, while using the database. The Aboriginal ways of doing knowledge is based on these connections. A situation in which the Aboriginal family is not owning the software that allows them to make the connections seems ethically untenable. It is the political position of the university, to declare ownership of the rights to the intellectual property produced in the project, that may prevent the Aboriginal family from fully securing its ownership over its digitalised knowledge.

### 3.1 The Contestation of Code

The examples of the Gateway, OKN, and Indymedia confirm that FLOSS is as much about politics and ethics as it is about technical and economic efficiency. The organisations are motivated to select FLOSS because:

- it allows them to control diversity and deal with critics (Development Gateway)
- to cultivate diversity (OKN)
- to assert diversity (Indymedia)

This political and ethical positioning contradicts Eric Raymond, one of the founders of the Open Source Software movement (OSM), who argues that “*OSS is not about politics, it’s about software*” (as cited in Berry, 2004). Raymond’s seemingly rational and objective approach appeals to the common sense of many engineers and designers: efficiency and effectiveness, rather than politics and values.

In *The Contestation of Code*, David Berry (2004) analyses the discourses of the Free Software Foundation (FSF) and the Open Source Movement (OSM), two of the main proponents of FLOSS. Berry’s analysis points out that the OSM uses a technocratic discourse, while the FSM takes a more ethical position as it sees software design and development as a value-laden activity. For the FSF, *free* refers to the freedom to use, copy, and modify software: software as collective ownership. This seems very much the position promoted by Indymedia. Collective ownership of the Indymedia network is established through a variety of locally owned code bases. This was possible because the first Activ source code was released as free software. New code bases built forth on or 'forked' the Activ code. Indymedia’s variety in codes facilitate the “meshworking” (Escobar, 2003) of a diversity of knowledges and experiences in a flexible, decentralised, and user-controlled network. In particular in the case of Indymedia, but

also in the Open Knowledge Network, FLOSS enables autonomous self-organisation. There was no conscious effort to organise Indymedia in the way it functions now, the order emerged spontaneously. FLOSS enabled the participating people and organisations to determine their own rules, via their own local code base, for local and global networking.

Indymedia's principle of Open Publishing is closely related to the principle of Free Software. Open Publishing is about creating content (news, texts, art, code) in a transparent<sup>5</sup>, non-hierarchical, and participatory manner with minimal editorial interference. It seems that only by accepting the principles of Open Publishing and FLOSS together, was the Indymedia collective able to position itself politically and ethically in dealing with diversity in its technology. Together these principles facilitate democratic, collective, and local ownership over both the technology and the content created with the technology.

The experience of Indymedia may be of importance for the people and organisations involved in TAMI, which will not use FLOSS. In a paper on Australian law, Aboriginal law, and digital technology, Christie (2004:3) states:

"There is a further problem. If someone designs a database, and I put my digital resources into it, and then I use the database software to bring those resources together in a particular way for a particular purpose, the logic of that configuration may in fact be understood as part of the copyright of the programmer, and therefore the arrangement doesn't necessarily belong to me. The court might find that it's not my IP."

This text reflects a close connection between technology and knowledge. A situation in which the intellectual property rights to the TAMI database software belongs to Charles Darwin University may pose a problem for Aboriginal ownership of Aboriginal knowledge. A possible solution would be to build TAMI with FLOSS. This would enable the academics to take a more ethical position concerning the software solution they have designed together with the Aboriginal participants. It will help to secure Aboriginal ownership of Aboriginal content.

The close connection between the technological design and Aboriginal knowledge, is acknowledged in a joint statement from the Indigenous World Association and Indigenous Media Network: „[S]haring of our knowledge must take place on our own terms and cannot put us at risk of losing our cultures and identities.“ (Commission on Human Rights, 2005:3). The statement stresses the need for indigenous peoples to develop alternatives to both IP regimes and public domain concepts, such as Indymedia's Open Publishing and the OKN's Open Content License<sup>6</sup>. These alternatives should take into consideration, among others, the collective status of Indigenous/Aboriginal knowledge; culturally diverse concepts of ownership; multi-generational coverage span; and the right to full ownership, control, and protection of cultural and intellectual property (Human Rights Commission, 2005).

<sup>5</sup> For example, Indymedia Norway, which allows anonymous publishing, publishes its editorial decisions on a special "story administration page" (Indymedia Norway, 2005).

<sup>6</sup> Liang (2004) presents a good overview of the different open content licenses available.

#### 4. Concluding remarks

The Development Gateway, Indymedia and the Open Knowledge Network selected FLOSS because non-proprietary software facilitates their local and global sharing of politically, culturally and linguistically diverse information and knowledge. This information and knowledge is discussed in terms of public goods, public domain, open content, and open publishing. There is a clear relationship between free/open source and open content. But open content is not necessarily free in terms of ownership. As we saw in the case of the Open Knowledge Network, knowledge is shared as news in order to protect local ownership of the knowledge. In the case of TAMI proprietary software will be used to share knowledge that is owned by the Aboriginal family and which can only be accessed by the family. This ownership may, however, be contested when proprietary software is used to organise the Aboriginal knowledge in the database.

The Development Gateway, Indymedia and the Open Knowledge Network are large, globally accessible information systems. Contrasting these systems with TAMI, a small, locally accessible information system built with proprietary software, made clear that the political and ethical positioning enabled by FLOSS is culturally specific and should not be perceived as universal. The licenses used in FLOSS and open content, such as GPL, Creative Commons, and Open Knowledge License, build forth on Western/liberal ways of understanding ownership. The World Bank's position on public domain knowledge is especially worrisome (Daes, 2004; Ruiz, 2002). The Bank argues that the sacred knowledge or knowledge with possible commercial value in the Gateways and indigenous knowledge databases is protected from piracy, patenting by third parties, because it is in the common domain, putting corporations on notice of so-called prior art.

Indigenous people demand the right to decide themselves what to share and how to share their knowledge. FLOSS should therefore not be understood as a principle that can be applied universally. Doing so may harm the diversity of knowledge. As Erica-Irene Daes (2004) suggests: "[F]or Indigenous peoples, the major problem of the future will not be gaining access to the internet, but keeping their most private and sacred knowledge out of the internet.

Looking at information systems as palimpsests enables a better understanding of the politics and ethics of the technological design and brought three issues to the foreground:

- One important reason why organisations develop or select Free/Libre Open Source Software for their projects is because it enables them to take up particular political and ethical positions towards knowledge: it enables them to deal with questions such as what is knowledge, who owns knowledge, and whose knowledge counts.
- The technocratic and liberal discourses of Free/Libre Open Source Software seem to suggest universal technological solutions for the cultivation of the diversity of knowledge. TAMI, the Aboriginal database exemplifies the limitations of such discourses.

- Three of the projects, the Development Gateway, the Open Knowledge Network, and the Indymedia network, seem to suggest – each in their own way - that information and communication technology enables the cultivation of the diversity of knowledge. The example of TAMI, the Aboriginal database, and discussions on indigenous knowledge databases in general, suggest that information and communication technology can harm the diversity of knowledge. The digitalisation of knowledge facilitates the access and sharing of knowledge, but current national and global property rights and alternative licensing regimes are not capable of fully protecting community-owned and indigenous knowledges from piracy and inappropriate use.

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