# ETHICS OF DIGITALISATION: DESIGNING SO AS NOT TO HURT OTHERS

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Abstract

The diversity of knowledge is crucial for finding credible and sustainable alternatives for living together. Yet, a preoccupation with content and connectivity obscures the role of information technology in making invisible different ways of knowing and other logics and experiences. How to deal with diversity and difference in information technology? In this paper two cases are explored in which dealing with difference is a particular political and ethical concern. The designs of Indymedia, an Internet-based alternative media network, and TAMI, an Aboriginal database, are informed by the confrontations over different ways of knowing. They translate difference without sacrificing diversity, providing clues for building credible and sustainable design alternatives that will not hurt others.

# Ethics Of Digitalisation: Designing So As Not To Hurt Others

> Now we are faced with a global conflict that is so nebulous, so ill-defined and ill-conceived, that it may never end. All we are told is that there is our side, and there is the other side. (…) But the horror of never ending war brings with it the chance for a truly global resistance. And so we will create a new side – the side that wants to understand, the side that seeks out the root causes of our struggle, the side that will triumph over conflict itself. (Adbusters, 2005)

Information technology is one of the pillars of the global war. It is also a technology of development, as information and communication technology for development (ICT4D). Behind both lurks the metaphor of the digital divide. For the Pentagon, the digital divide is manifested in technological superiority over enemies on the battlefield. In development, the digital divide is a metaphor for the barriers to the digitial flow of information and knowledge and the social and economic consequences thereof. In both, the digital divide metaphor suggests that information and communication technologies are solutions, bridges across the divide which enable the flows of knowledge and information to reach new territories…and new targets.

The digital divide metaphor implies a conceptualisation of knowledge as commodity, something which can be extracted and transported from one place to another. 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.[1] But 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 that information and knowledge is transmitted.

If we understand knowledge not as a commodity but as a process 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 digital connectivity also produces the non-existence 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).

Whose knowledge and experiences, or what forms of knowledge and logic, have become invisible in the categories (see Bowker & Star, 1999) and technological designs chosen to organise information and knowledge? How can we promote difference in a world where credible alternatives are rendered invisible by the very solutions which claim to “bridge the divide”?

The Portuguese sociologist Boaventura de Sousa Santos (2004) argues that the

richness of human knowledge and experience is actively rendered invisible. In a sociology of absences, Santos (2004, p.165-166) presents five modes in which this richness is produced as non-existence, as non-credible alternatives to what exists:

- *The monoculture of knowledge and the rigor of knowledge*: the way in which modern science and high culture are the sole producers of truth and aesthetic quality. This monoculture produces nonexistence in the form of ignorance and lack of culture.

- *The monoculture of linear time*: the way in which history has a unique and known direction and meaning, e.g. In the form of progress, development, globalisation. This monoculture produces nonexistence in the form of describing as backward whatever is not declared forward.

- *The monoculture of the naturalisation of differences*: the way in which the distribution of people according to categories such as race and sexe naturalise hierarchies. This monoculture produces nonexistence in the form of insurmountable inferiority.

- *The logic of the dominant scale*: the way in which the dominant scales of the West, the universal and the global, prevail and ignore contexts. This logic produces nonexistence in the form of non-credible alternatives such as the local and the particular.

- *The logic of the productivity*: the way in which productive nature and productive labour maximise fertility and profitability in a given production cycle. This logic produces nonexistence as non-productiveness: in nature in the form of sterility and nonexistence; in labour in the form of laziness.

How we deal with different ways of knowing is reflected in our moral choices about technology (Hamelink, 2000). In *The Companion Species Manifesto,* Harroway (2003, p.61) describes “caring about and for other concatenated, emergent worlds”. Haraway´s new manifesto is her “political act of hope in a world on the edge of global war” (p.3). In a similar vein Latour (2002, p.16) echoes Santos by warning against a “false peace”, a peace in which the right to construct remains in the hand of the “culture-free scientists, engineers, economists, and democrats”.

In short, we must confront the threat of invisibility by technology design. The social embeddedness of knowledge, and the problem of invisibility, implies the need to go beyond a rights-based approach in search of an ethics of digitalisation itself. Elsewhere I have proposed an ethical framework for how to deal with social difference in designing information technology (see van der Velden, 2004, 2005). This framework deals with issues of democratisation, representation, cultivation of diversity, and self-organisation. Below, I examine the problem of the invisibility of other forms of knowledge, logic, and experience as a particular ethical challenge for people designing and selecting information and communication technology. I will examine information technology as a site where invisibility is produced by looking at Indymedia

and TAMI, two information systems in which different ways of knowing are interpretated and negotiated. Indymedia is a collective of independent media centres and hundreds of journalists and has a global reach (Indymedia, 2005). TAMI is part of the Indigenous Knowledge and Resource Management in Northern Australia (IKRMNA) project. TAMI is a database constructed for and by Aboriginal people (IKRMNA, 2005a).

## Figurations

One place where choices about technology are made are design processes. Design processes can be understood as translation processes: stories, concepts, values, and facts are translated into material representations (Mörtberg, 2003). When information technologies become available to us as users, we have no clue about the experiences and concepts that played a role in the design process. Seldom do we realise what our technologies make invisible and that they could have been designed differently.

In this section I discuss figurations as a lens to look at how information systems deal with difference. A figuration is a metaphoric framing (Braidotti, 1994). It is both a mode of differentiation, to provide different ways of looking at one account, as well as a mode of production of alternative accounts. Rosi Braidotti (1994) considers a figuration as political fiction: it allows one to move across established categories, to think them through and to establish alternative ones. For example, she uses the *nomad* as a figuration of a post-colonial feminist subject, a conceptual form of self-reflexivity to think through and to move across established categories and connections. The *nomadic subject* is inspired by nomadic people but refers more to a nomadic state than nomadic traveling (Braidotti, 1994). A nomadic state presents a particular politics of location: “A location is an embedded and embodied memory. It is a set of counter-memories which are activated by the resistant thinker against the grain of the dominant representations of subjectivity” (2004:3). The nomadic subject results in a call for a new kind of ethics, which Braidotti (1994) presents as the ethics of sustainable nomadic shifts. Nomadic shifts are creative ways of becoming through otherwise unlikely encounters of experience and knowledge.

The figurations discussed below have in common that they establish alternative categories and accounts by bringing in a more ecological perspective, making already existing but invisible connections and agencies visible and different outcomes possible. Figurations imply a discursive ethics: “that one cannot know properly, or even begin to understand, that towards which one has no affinity” (Braidotti, 2002:241). Figurations provide us with a language to describe and map difference.

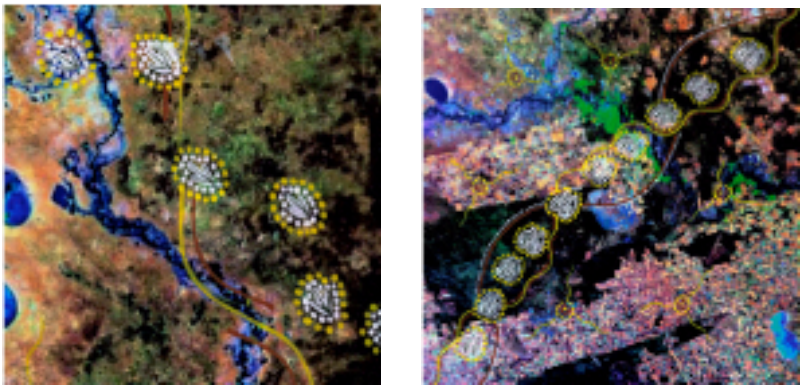

Fig. 1. Art works by Lyn Moore and Tracey Andrews (2001)

*Palimpsest: Reworking the linear*

Lyn Moore and Tracey Andrews (2001)[2], whose artwork is presented in the two images above, use the figuration of the *palimpsest* to make the history of the Lake Mundo region in Australia visible. 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).

Moore and Andrews call their artworks *palimpsests*. In its original meaning, a palimpsest is a manuscript, usually papyrus or parchment, on which an earlier text has been removed - literally scraped away - 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. The palimpsests of Moore and Andrews re-arrange the seemingly linear order of the different texts by scraping the Ancestor history in the image, revealing the deceptiveness of satellite technology as a reflection of a reality. They show that what is not visible on the satellite image, a nonexistence, is actively produced as such by the technology.

In this meaning of palimpsest, the dominant text is not scraped away but the still legible older texts are made visible. This scraping makes visible what is produced as nonexistence by the satellite technology. With the figuration of the palimpsest the artists are able to create an alternative account of the history of the region. Through writing Ancestor history back into the satellite image, connections are created between past and present.

*Friction: Creative power of diversity*

Another figurative approach is that of *friction*. In *The Global Situation*, Anna Tsing (1999, p.337) describes globalisation as pre-occupied with "the *ur* object of flow - instead of the social conditions that allow or encourage the flow". Tsing suggests that if we imagine the flow as a creek, we would notice not only what flows but also the channel which makes the flow possible. She points to the importance of looking at the process of channel-making.

Tsing (2005) reminds us that we need to look at the political and social processes that build the channels that enable or restrict flows. By prompting us to think of the friction in channels, Tsing focuses attention on the false dichotomies of flow and non-flow such as immobile and mobile, local and global, particular and universal, connected and unconnected. The figuration of friction enables us to see the diversity in speeds, change, place, scale, and connectedness and see how people and places become disconnected and re-connected, how flows slow down or take a different course.

Tsing (2005, p.5) describes how “knowledge of the globe” and “globally traveling knowledge” depends on friction: “[F]riction reminds us that heterogeneous and unequal encounters can lead to new arrangements of culture and power”. Friction is a figuration of emergent accounts, of fragments of global connections. Sometimes one account gathers enough power to seem global, argues Tsing (2005), but investigating the friction surrounding it will reveal its connectedness with other accounts. Friction is a figuration for the creative power of diversity.

*Diffractions: Making a difference*

Donna Haraway´s (2000) figuration of *diffraction* refers to the broken-up light rays on a screen. It is not a reflection, the displacement of the same somewhere else. “Diffraction patterns record the history of the passage of light rays through slits, the history of interaction, interference, reinforcement, difference” (Haraway, 1997:273).

With the figuration of diffraction, history, not representation, is used as a tool to foreground something, to make a difference. Haraway´s *Companion Species Manifesto* can be read as the record of history of the companionship of people and dogs. Diffracting is showing something in all its contexts and meanings, mapping the effects of difference. Diffraction is above all a figuration for the commitment of making a difference in the world.

Figurations are materialist mappings, drawing a network of connections in which otherwise disconnected experiences and knowledges meet. Moore and Andrews´ artwork shows how the vision of a satellite produces a non-existence of other ways of seeing and knowing. They use the palimpsest to make the layers of the past visible in the present. In the same way diffractions draw a record of history in order to make difference visible and “to make a difference in the world”. Frictions draw an image of the flow of information and knowledge in information systems and networks as a creek (Tsing, 2005) with obstacles, diversions, transformations, branches, and dead ends. Braidotti´s nomadic subject incorporates a non-unitary vision, a freedom of thinking in the flow of connections, imagining new becomings.

Christina Mörtberg (2003) discusses the use of figurations as interventions in system design. Using the examples of diffractions and the nomadic subject, she compares them with techniques used in the design of information systems such as prototyping and development of scenarios. Mörtberg proposes to use figurations as a way to foreground the significance of materiality, the techniques, technologies and methods

we use to produce a technical solution. Figurations thus contribute to making the materiality in system design visible in order to open up the design processes towards using different models, techniques and technologies, as well as to making interconnections between use and design and to create new techniques and methodologies and new solutions.

In the next section, I will present two information system designs. Both designs are the result of a struggle over knowledge and over whose knowledge counts in the technological design. I will use figurations to describe the confrontations and negotiations over difference in the design process.

## Translating Diversity Into Technology

The technological design of an information system controls for a large part how information is produced, categorised, archived, and shared in the system. This design reflects the politics, culture, and even race, gender, class, and ethnicity of the people involved. The technological design is often perceived as the result of a set of neutral technical choices. For example, decisions about the information architecture of a database are supposedly based on neutral considerations of efficiency and effectiveness as the structuring of data and metadata is deemed crucial for the location and retrieval of the data as well as the interoperability with other systems.

One of the effects of such “neutral” design processes is what O´Hara (quoted in Bowker, 2000) calls the grooving effect. Grooving is a process of convergence (Bowker, 2000, p.17): “A set of data structures and retrieval models are set up so that a particular, skewed view of the world can be easily represented. [...] Thus the world that is explored scientifically becomes more and more closely tied to the world that can be represented by one´s theories and in one´s databases [...].”

After the process of grooving, a subsequent process of reverse bootstrapping can take place, where the structures of data in the database become the lens through which we make assumptions about the world (Bowker, 2000; Christie, 2004).

As we will see in the examples of the Indymedia network and the TAMI database below, it is possible to work the other way around. The technology underlying these two projects was designed to accommodate the way people produce and share information and knowledge, the way they “do knowledge” (Bowker & Star, 1999; Christie, 2004; Verran, 2005).

*Doing* knowledge refers to an understanding of human knowing as a continuous, dynamic social process, rather than a commodity. In an autopoetic perspective (Maturana and Varela, 1987; Graham and Rooney, 2001) knowing is understood as effective action. In the context of designing information technology, it is crucial to look at how people know and how people represent that knowing. Can the design process be located where the users *do* knowledge, where they live and produce knowledge?

The examples of Indymedia and TAMI are selected because their explicit mission is to provide voice to the voiceless, to design a technology that does not exclude other ways of knowing and experience. In this essay I have analysed the documents produced in and around the design processes of these two systems. I was able to access Indymedia as it is freely accessible on the internet.

*Doing information and knowledge*
Indymedia (www.indymedia.org) is a collective of independent media organisations and hundreds of journalists, forming a diverse network of Independent Media Centres. They can be found in more than one 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 its proposal phase: “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 were 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.

There are at the moment about fourteen different code-bases in use in the Indymedia network (Indymedia Document Project, 2005d). The first code base, *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) describe how

soon after discussions started on how to improve *Active.* What was initially dubbed *Active2*, resulted in many more code bases 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, 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.

Other 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. The result was that 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 (Hill, 2003).

What the variety of IMC code bases show is that there are different interpretations of open publishing possible within the Principles of Unity. These interpretations are politically motivated and "grant [s] us a meaningful form of freedom, the independence to choose the socio-technical terms on which we communicate" (Hill, 2003, p.8).

The ongoing negotiations in the Indymedia network in order to balance unity, difference, 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.

Another example of doing knowledge is the Indigenous Knowledge and Resource Management in Northern Australia (IKRMNA). 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. Verran (2005) and Christie (2004) present a design process in which users are designing their technology by using it. Christie (2004, p.9) proposes to rid the database "as far as possible of its ontological presumptions" and to start 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, which stands for Text, Audio, Movies and Images[3] and is designed to be useful for people with little or no literacy skills. The users become designers when 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:

- 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.

*Programming for diversity*
The Indymedia network and the TAMI database were selected because dealing with difference and giving voice to the voiceless were clear objectives in both projects. I was particularly interested in how their dealing with difference worked out on the level of computer code of the software programmes underlying the two projects. This computer code functions as law (Lessig, 1999). Code regulates for an important part how we can use a database, a content management system or an internet service. As code regulates the production and communication of our expressions, it can interfere with our own values.

I used the figurations presented in the section above as guides and lenses while exploring Indymedia and TAMI. Using these figurations helped me focus on the history of the systems. In these histories, moments and places of friction became visible where confrontation, negotiation, and translation take place. In the case of the Indymedia, using figurations helps to understand that the network is very different from other distributed content management systems on the Internet. The diversity in the code base of the Indymedia network enables the expression of the diversity found within the participating communities, countries, and peoples. The disagreements over the values inscribed in Active, the first Indymedia code base, can be read as creative friction (Tsing, 2005), resulting in the development of several new code bases.

At the same time, the Indymedia network shows that confrontations and negotiations are ongoing. Someone who doesn´t agree with the policies of the local centre, for example the option to post anonymously is disabled, can still use other centres with different policies. The *laws* of Indymedia, the network´s code bases as well as its membership criteria and Principles of Unity, are sites of translations of the differences found in the network. These differences are not negotiated and translated into one code base nor into a set of principles accepted by all. Translations takes only place

where the Indymedia centres connect to share information.

Translations are one common way of dealing with difference in information technology. Translation in this context normally refers to the *localisation* and *internationalisation* in software design. Localisation refers to the customisation of software and documentation for a particular country or people, including the translation of menus and messages into the native spoken language as well as changes in the user interface to accommodate different alphabets and culture. Internationalisation refers to the process of designing an application so that it can be adapted to various languages, time zones and monetary values without the need for changes in the design.

The examples of Indymedia and TAMI suggest a new dimension in processes of translation in information technology. In different ways, their designs reflect a commitment to diversity in the code base. In the case of Indymedia, diversity is expressed in the variety of local code bases in one global network. In the case of TAMI, diversity is expressed through one local code base, which is able to negotiate its visibility globally.

Translation, as a way of dealing with difference, was a more conscious process in the example of the TAMI database. Helen Verran (2005), one of the scholars involved in the IKRMNA project, proposed to negotiate ontic differences by looking for the inside connection, a third translating domain at the overlap of the two ontologies. This overlap can be understood as what Tsing (2005) would call this the site of creative friction or what Mary Louise Pratt (1999) has called *contact zones*: “social spaces where cultures meet, clash, and grapple with each other, often in contexts of highly asymetrical relations of power, such as colonialism, slavery or their aftermaths as they are lived out in many parts of the world today”. Pratt describes an almost 400 years old heterogeneous text deploying European and Andean systems of meaning making as a contact zone. She argues that the position of a person in the contact zone will decide how the text is read.

The development of the TAMI database shows that an information system is a contact zone, a sociotechnical space where different ontologies, knowledges, and experiences “meet, clash and grapple with each other”. The TAMI project shows how a database becomes the contact zone where Aboriginal and western scientists create dialogues on resource management. As was the case with Pratt´s text, the Aboriginal database will be read differently by people from different ontologies. Its ontological flatness will allow for different user interfaces and different readings.

For non-Aboriginal database designers, an ontologically flat database with its lack of schemas[4] 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 the database doesn’t lack anything: it inscribed a different way of making connections in the database. The database was built according to the Aboriginal way of knowing, making Aboriginal ways of doing

knowledge visible.

## Conclusions

"Beyond what there is now, there is what you know"
(Construction site graffiti in East-Oslo, Norway, 28 September, 2005)

In this essay I have explored an analytical approach to the problem of difference in a world in which credible alternatives are made invisible by technology. In his sociology of emergences, Santos (2004, p.176) shows how diversity becomes visible through "the symbolic amplification of clues". Clues are signals and traces of the future in the present. As the examples of Indymedia and TAMI show, figurations help us to find clues for an ethics of digitalisation.

In the case of Indymedia, difference was negotiated not into one one but several different code bases. The wide variety of media organisations is able to work together in one global networked collective because of this diversity. Each of the versions contains confrontation and negotiation. The negotiations were about the way to work together and share information. The confrontations over issues of privacy and control resulted in different ways of organising access and information management. The different software versions each have a common component for the collective networking and a different component for networking at the level of the individual centre. In the case of the TAMI, negotiations resulted in a database that does knowledge the Aboriginal way. The databases of the researchers and their institutions need to adapt to the Aboriginal way of doing knowledge by constructing open and flexible databases. The adaptation is from the bottom up, from the smaller or weaker to the bigger or more powerful. This design makes it possible to imagine institutional databases that do not "hurt" Aboriginal people and their knowledge.

António Sousa Ribeiro (2003) describes translation as a metaphor of our times, providing "mutual intelligibility without sacrificing difference in the interest of blind assimilation". The design processes of Indymedia and TAMI can be understood as translation work. The work in Indymedia and TAMI is very different from what is called localisation or internationalisation in software design. Nor is this form of translation based on a dialogue between different ways of knowing, in which assimilation or consensus is being sought between two or more clearly defined cultures. This understanding of translation is based on the idea that no culture or knowledge system is complete. Thus the designs of Indymedia and TAMI are the result of people negotiating as equals, with "equal rights to construct" (Latour, 2002), building together as companions, sharing bread (Haraway, 2003). This kind of translation work is based on an epistemological imagination that makes it possible to create credible and sustainable alternatives and to live so as not to hurt others.

If we approach information systems as sites of translation, we can investigate how difference is negotiated into material representations. Santos proposes a sociology of translation based on a negative universalism, namely that there is no grand theory, no

universal theory of progress and development. Santos builds his sociology of translation on Raimon Panikkar´s (as cited in Hall, n.d.) thesis of the incompleteness of all religions and cultures: "*no culture, tradition, ideology or religion can today speak for the whole of human kind*". Panikkar argues for *diatopical hermeneutics*, a hermeneutics across radically different places (dia-topoi = across places). Diatopical hermeneutics is a proposal for dealing with the distance between a knower and the object to be known, when they belong to different cultures or ideologies. In a similar way does the Indian scholar Shiv Visvanathan (as cited in Kraak, 1999) propose dialogue as a positive heuristic for dealing with competing knowledges. This dialogue is based on cognitive justice: all forms of knowledge are valid and should co-exist in a dialogic relationship to each other. The examples of Indymedia and TAMI show that difference is also negotiated at the level of the code base. The designers of these systems are involved in creating meaningful technology: technology that enables giving voice to the voiceless; technology that helps to make credible alternatives visible.

In this, the translation work of Indymedia and TAMI confirm the importance of the four principles of this framework of the democratisation of knowledge and technology (van der Velden, 2005):

- The *Principle of the Democratisation of Technology* can be found in Indymedia´s multiple code bases and TAMI´s ontologically flat design.

- The *Principle of Democratic Representation* can be, for example, be found in Indymedia´s choice for free software and the family ownership of the TAMI database.

- The *Principle of the Cultivation of Diversity* can be found in Indymedia´s multiple code bases and the large number of languages supported in the Indymedia network. In the case of TAMI, diversity is cultivated by the particular design of the database, which supports an Aboriginal way of knowing without excluding access by databases designed to support other ways of knowing.

- The *Principle of Autonomous Self-organisation* can be found in the flexible design of the Indymedia network and organisation, which allows for ongoing expansion, even with the addition of new code bases, and again in the particular design of the TAMI database. The database is designed at the same time when it is used, allowing the users to determine the rules by which the database organises information.

The examples of Indymedia and TAMI add to this framework that in order to give voice to the voiceless, to make silence visible, local and global information systems need to be built from the ground up, starting with the small or weak, and to be inclusive of local code bases.

Indymedia and TAMI are both examples of information technologies that challenge the

idea of overpowering global flows and global media. The global flow of information in the Indymedia network is negotiated in each local Indymedia centre. The TAMI database is not yet connected with other databases, but other Aboriginal databases built on the same design principles will in the future negotiate the global flow of Aboriginal knowledge through their local code base. Non-Aboriginal databases can connect if they are built flexible enough to adapt to Aboriginal databases. The conflicts and negotiations in the design processes of Indymedia and TAMI reveal the power of local code. The global flows of information are channeled through local code bases.

The people involved in these projects recognised that they were all builders - founders, designers, users, beneficiaries - and equal participants in the construction of the systems. Crucially, there was no blueprint, there is no universal way to build. The standards by which we measure if they are good or bad builders emerge through the negotiations over the right ways to build (Latour, 2002). Indymedia and TAMI became spaces for negotiations and dialogues because they performed cognitive justice. In a description of the principles of cognitive justice, Visvanathan (as cited in Kraak, 1999) mentions among others that “Cognitive justice should strengthen the voice of the defeated and marginalized” and “Every citizen is a scientist. Every layperson is an expert”.

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## End Notes

[1] 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)

[2] I was introduced to the art of Moore and Andrews via an article by Bowker (n.d.).

[3] See http://www.cdu.edu.au/centres/ik/db_TAMI.html#

[4] A schema describes the objects that are represented in the database and the relationships that exist between these objects.