

## CULTIVATING KNOWLEDGE DIVERSITY

*Reflections on Cognitive Justice, ICT and Development*<sup>1</sup>

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**Abstract.** The unique capabilities of the Internet seem to offer new ways to solve problems and make decisions. But this approach presents the Internet as a neutral technology, 'empty' of any bias that shapes the ways it homogenises or diversifies. Yet the bias of the Internet is inscribed in its technology. Can a biased technology cultivate the diversity of our knowledge? This paper proposes *cognitive justice* as a framework to investigate issues of knowledge and diversity. The Open Knowledge Network is presented as an example of an alternative approach to ICT for social and economic development.

### 1. Introduction

In Biology, diversity is defined as a characteristic of living systems that is maintained via autonomous self-organisation. A free, self-organising system is able to adapt, respond and evolve, without losing its autonomy. In social and cultural studies, the concept of diversity is used to refer to the conditions, expressions and experiences of multiple cultural groups as they interact and relate to one another within a social organisation.

Recent insights into the importance of diversity come from new understandings of ecological systems, in particular the role of autopoiesis and autonomy (Varela, F., H. Maturana, and R. Uribe, 1974). Diversity is increasingly understood as an important factor in the capacity of systems to adapt to change and to solve complex problems. A diverse system facilitates self-organisation by providing spaces for 'give and take', symbiosis and reciprocity. Self-organisation supports diversity through self-regulation, decentralisation and local control (Shiva, 1993, 1997).

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Mahatma Gandhi saw the capacity to self-organise as the basis for communication between different cultures. He referred to autonomous self-organisation and diversity when he said:

“I do not want my house to be walled in on all sides and my windows to be stuffed. I want the cultures of all lands to be blown about my house as freely as possible. But I refuse to be blown off my feet by any. I refuse to live in other people's houses as an interloper, a beggar or a slave.” (Gandhi, 1958)

Gandhi's 'house' can be understood as a metaphor for a free self-organised system within a locally controlled, decentralised network of 'houses', and with spaces for 'give and take' where communication between equally valid cultures can take place and diversity can be cultivated. Visvanathan (see Kraak, 1998) uses the concept of cognitive justice to refer to the equal validity of the different knowledges of these cultures and the dialogic relationship in which these knowledges should co-exist.

The concept of cognitive justice, the equality of knowledges assumes that knowledge is embodied and embedded. Our knowledge cannot be separated from our bodies, language, and social and cultural history (Varela, Thompson and Rosch, 1991; Maturana and Varela, 1992). Knowledge is situated, it is always located, offering a partial perspective (Haraway, 1995):

“Knowledge is understood as relative, representing the powers and interests of a certain group. Knowledge is expressed in the act of knowing and thus involves a knower. In contrast, most knowledge and development literature treats knowledge as an object that can be expressed and represented independently from the knower. This knowledge is undone from its context and ideology, its 'embodiedness' and 'situatedness', and presented as neutral and universally good.” (van der Velden, 2004).

Is there a role for the new information and communication technology (ICT) in cultivating the diversity of human knowledge? Can ICT further cognitive justice by providing spaces for dialogues between different knowledges? This paper will investigate diversity in the context of ICT for local and global knowledge sharing for social and economic development. The Open Knowledge Network will be presented as an alternative approach to knowledge sharing for development.

## **2. From Seed to Network**

In biology we can identify three important levels of diversity: the levels of genes, species and systems. In the context of the diversity of human knowledge, diversity is often discussed in terms of knowledge systems, or the different types of knowledge within one knowledge system. The following two stories explore these understandings of the diversity of human knowledge.

## 2.1 THE SYMBIOTIC INTELLIGENCE OF THE NET

At the Los Alamos National Laboratories in the US, Dr. Norman Johnson and his team analyse the symbiotic intelligence of the Internet. They study how the Internet can facilitate problem solving when traditional methods fail. Traditional problem solving is a linear, premeditative approach in a controlled environment. Problems arise when the environment or system is not under centralised control or so complex that it can't be fully understood.

According to Johnson, distributed systems such as global economics, immune systems, and human societies, have been able to evolve because their problem solving capacity is based on diversity and self-organisation. Diversity, according to Johnson (1998), is the degree of unique information in a group of agents with a common worldview. The combination of diversity in experience, preference and performance brings the group to a higher level of performance.

Self-organisation, as a manifestation of a distributed system, occurs when spontaneous global order arises out of local interactions. Johnson uses the metaphor of a path in the forest. Such a path is the result of the contributions of many people and animals with very different means and goals. A solution – a way through the forest - was found without someone defining the problem and without centralised organisation of problem solving. The self-organising knowledge generated by this process differs from traditional knowledge because there are no pre-meditative actions involved. Johnson argues that the Internet presents unique qualities to support the generation of self-organising knowledge. The 'Net', the human-technological system, is able to facilitate a higher level of performance as a result of the diversity found in the system.

## 2.2 BIJA SATYAGRAHA – SEED OF TRUTH MOVEMENT

In Gandhi's teachings, writings, and social practices, three concepts are of central importance. *Swaraj*, or sovereignty, *swadeshi*, or creative reconstruction, and *satyagraha*, or the force or firmness of truth. *Swaraj* implies local self-governance by communities and is founded on self-respect, self-realisation and self-reliance. The quest for *swaraj* is *swadeshi*. *Swadeshi* means first of all locality and refers to the local community as "the node in a network of oceanic circles that over-lapped and spread out in its ever widening embrace." (Parekh, 1995:56). The local community represented for Gandhi a set of values, not a category, and is the place where self-respect, self-realisation and self-reliance are reached through creative self-construction. This self-construction is based on the material and moral

resources people already possess and helps people to free themselves of oppressive structures.

*Bija Satyagraha*, a social movement in India, uses these Gandhian concepts to recover community rights, in particular the rights to their biological and intellectual heritage. Bija, the seed, embodies this struggle:

“It embodies diversity and the freedom to stay alive. And seed is still the common property of small farmers in India. In the seed, cultural diversity converges with biological diversity. Ecological issues combine with social justice, peace, and democracy.” (Shiva, 1997:126).

Dr. Vandana Shiva (1997), a physicist and Bija Satyagraha activist, describes international development and globalisation - which are both founded on ideas of centralised control, monocultures, and coerced homogenisation - as a “war against diversity”. She argues, however, that the homogenising processes of development and globalisation do not reach the stage of true monocultures. Diversity is mutated into competing negative dualities, fighting over the scarce economic and political resources. Difference, writes Shiva, thus becomes the basis for division and an ideology of separation instead of the basis for the richness of diversity.

Shiva sees high-tech agriculture, the Green Revolution, as the final break in the symbiotic relationship between seed and its environment, while genetic engineering represents the break in the symbiotic relationship between genes and the organism as a whole. Biotechnology thus targets an organism’s ability to self-organise. Both situations mark the transformation of processes of self-regeneration and self-production, or autopoiesis, in which seeds are food as well as means of production, to processes of commodification of seeds and genes.

### **3. THE POLITICS OF KNOWLEDGE**

The stories of the Bija Satyagraha and the research at the Los Alamos National Laboratories may seem like worlds apart. Los Alamos is the birthplace of the first atomic bomb and a symbol of ‘western’ science and technology. Bija Satyagraha is a story of science and technology that supports and protects life and is based on what is often called traditional or indigenous knowledge. On the other hand, both stories use the same discourse to formulate a way forward in dealing with complex problems and situations: diversity, self-organisation, decentralisation, and local control. Shiva comes to this conclusion on the basis of an analysis of the different waves of globalisation – colonisation, development, ‘free’ trade – in which positive diversity has mutated into negative duality. Johnson comes to this

conclusion on the basis of an analysis of the growing complexity of our world and particular perspectives on knowledge and technology.

Despite apparent similarities in the two discourses, the stories of Bija Satyagraha and the research at the Los Alamos Labs are examples of different conceptualisations of diversity and knowledge. Bija Satyagraha is based on an understanding of diversity *as a worldview* (Shiva, 1997), a world in which the interdependence of the natural and the human, and the cultivation of their biological and cultural diversities, form the basis of freedom, survival, and prosperity. Johnson defines diversity as the degree of unique combinations *within a worldview*.

Johnson distinguishes between traditional knowledge and self-organising knowledge. The knowledge of the rural communities participating in the Bija Satyagraha would probably fit Johnson's notion of self-organising knowledge. In 'western' science, however, this community knowledge is perceived as indigenous or local knowledge and not on a par with the objective, scientific, and global knowledge created in 'western' universities, labs, and think-tanks<sup>2</sup>. But it is definitely the latter for which Johnson perceives a role for ICT such as Internet in the production of self-organising knowledge.

The digital divide, the divide that prevents access to or effective use of ICT, is understood in socio-economic development discourse as the lack of access to information and knowledge for development and the consequences of that lack. With ICT playing a fundamental role in the transformation of knowledge and the transfer of knowledge for development (van der Velden, 2004), a discussion of the politics of knowledge in social and economic development becomes a necessity in order to insure the inclusion of non-'networked' people and communities and non-digitalised knowledge, such as the knowledge of Bija Satyagraha, in the problem-solving and decision-making processes of development.

Satyagraha, Gandhi's notion of truth, provides an alternative for the 'western' concept of *possessing the truth*. His concept of truth is not based on a negative duality, one truth in opposition to other truths, but on a dialogue of truths, a dialogue of knowledges. As Lal (2002: 178) writes, Gandhi's own life shows that "our concept of truth must remain

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<sup>2</sup> This view is reflected in Intellectual Property Right (IPR) definitions in Trade Related IPRs (TRIPS) and the World Intellectual Property Rights Organisation (WIPO) in which an innovation, the creation of new knowledge, is only recognised as a private right, not a community or public right; when it creates wealth, not when it fulfils social needs; and when it can be industrially applied (Shiva, 1997). Knowledge is thus perceived as the product of a linear, premeditative process. Self-organising knowledge produced by a community is not considered an innovation.

hermeneutic, dialectical, and dialogical.” This concept of truth lies at the basis of works by critics of socio-economic development such as Shiva (1993, 1997), Escobar (1995), Visvanathan (1998), Apffel-Marglin and Marglin (1996), and Vinay Lal (2002).

Gandhi’s politics of knowledge contrasts with the absence of a critical investigation in the concept of knowledge as a particular category in social and economic development, in particular in dominant discourses on information and knowledge societies. In an era in which knowledge has been acclaimed as a key economic commodity, one would expect a varied and politicised knowledge debate. Instead, there is a broad consensus on the use of knowledge as a particular category in social and economic development despite the lack of clear definitions or debates over knowledge. Discussions on knowledge management (KM), knowledge for development, and knowledge societies inspire discussions of knowledge but they stay above and beyond power and politics (Nustad and Sending, 2000; van der Velden, 2004). Thus when the World Bank founded the Global Development Network<sup>3</sup> and the Development Gateway<sup>4</sup>, Joseph Stiglitz (2000:35), in his capacity as chief economist of the World Bank was able to write that the Bank, as a Knowledge Bank, was in the proper position as an information and knowledge broker,

“certifying the quality of the messengers and messages; in a noisy world, with many alternative theories vying for center stage, there needs to be some ways of sorting through the cacophony, establishing credibility”.

Behind this presentation of an impartial selection of neutral, credible knowledge for development lays a highly politicised production process. For example Goldman (2001) describes the production of environmental and social knowledge for development by the World Bank in a study of the Nam Theun 2 hydrological dam project in the Lao People’s Democratic Republic (Laos). He describes a production process that is based on selective information gathering, the adaptation of knowledge, the use of particular categories, and the suppression of knowledge.

In his research on the symbolic intelligence of the Internet, Johnson can avoid the politics of knowledge by defining diversity as a number of variables within a common construct of the world. He mentions that the differences in worldviews, rather than the diversity within one worldview, may be the source of conflicts (Johnson, 1999), a view similar to that of Huntington (1993). When variables such as the knowledge of the peoples to be displaced by dams and of the Bija Satygraha are not considered part of the problem or the solution, conflicts definitely do arise (Udayagiri and Walton,

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<sup>3</sup> See <http://www.gdnet.org>

<sup>4</sup> See <http://www.developmentgateway.org>

2002; World Commission on Dams, 2000). There is a growing body of literature that suggests that it is the exclusion of knowledges that has led to conflict and failing development (Apffel-Marglin and Marglin, 1996; Lal, 2002; Roy, 2001; Shiva, 1993).

Important insights in the bias of knowledge construction came from feminist writers such as Donna Haraway (1995) and Sandra Harding (1991), who showed how the dominance or inferiority of knowledge is decided by its relationship to gender and power: knowledge legitimises power and power legitimises knowledge. Thus the knowledge of the peoples displaced by the Nam Theun 2 dam may be considered valuable, and may even be 'museumised' by anthropologists and biologists, but the powers-that-be have determined that these indigenous cultures are ecologically destructive and backward (Goldman, 2001). Power decides that these cultures don't possess knowledge but traditions that obstruct development. In this case they hinder the 'resettlement' of the local communities and their adoption of a more sedentary lifestyle as farmers and entrepreneurs.

#### **4. Cognitive Justice**

Visvanathan (see Kraak, 1999) proposes the concept of cognitive justice as a positive heuristic for dialogues of equally valid knowledges and knowledge systems. Visvanathan frames cognitive justice within a discussion of traditional/indigenous knowledges and 'western'/scientific knowledges but his motivation is to overcome the dichotomy in which these knowledge systems are situated, cultivating diversity instead of duality. In a critique of socio-economic development, Visvanathan (1998) argues that our problems have become too complicated to be solved by a retreat in the original village life. New options are to be found in a dialogue of the local and the global.

Only with diversity as the basis of our worldview can we overcome the dichotomies of human/nature, local/global, and 'western'/indigenous and unleash the problem-solving capacity needed to deal with complex problems in truly sustainable ways. But can a technology that comes forth out of a particular worldview cultivate a diversity of equally valid knowledges? Would the Internet look very different if was based on the principle that all knowledges are equally valid?

##### **4.1 FROM HETEROGENEITY TO DIVERSITY**

Johnson (1998) shows how a diverse, noncompetitive system is more successful in problem-solving than a competitive, 'survival of the fittest' system. In "A Thousand Years of Nonlinear History", De Landa (1997) describes how a meshwork, a diverse and self-organising system, can create

the same economies of scale as a hierarchy of uniform elements. Nevertheless, as De Landa mentions, diversity is viewed as a problem that needs to be eliminated or what Shiva (1997) calls the war on diversity. The problem, as Johnson shows in his experiments, is not the functionality of a diverse system. The issue is that of control. Diversity can only be cultivated in systems based on collaboration and decentralised control. In the case of knowledge for development, however, the 'credibility' of knowledge seems valued higher than the diversity of knowledge. The control over what is knowledge and whose knowledge counts is a key issue in international development (van der Velden, 2004). Thus instead of using a diverse, distributed system, as Johnson proposed, the World Bank founds the Development Gateway, a global 'knowledge for development' web portal based on a centrally controlled database (van der Velden, 2003).

An important characteristic of the Internet is, according to Johnson, the ability to quickly integrate heterogeneous systems. The Net may as well facilitate connections and analysis but does a web site with links to similar web pages in ten different designs and languages cultivate diversity? De Landa (1997:68) argues that heterogeneity can lead to a deeper level of diversity if the heterogeneous elements are interweaved. He quotes Maruyama (1978) arguing that heterogeneity can cut both ways. It can increase the heterogeneity between the entities that themselves remain or become more of the same, or it interweaves the entities, making the differences between the entities smaller but increasing the heterogeneity of each entity.

Gandhi argued for a communication between cultures that would make his 'house' more diverse, bringing it closer to other 'houses', without losing its particular difference. In other words, diversity needs to be articulated in each of the entities or 'houses' in order to make diversity a characteristic of the system as a whole. Interweaving the 'houses' will also lower the chances for conflict, as each 'house' thus becomes an intrinsic part of the system, making its survival interdependent with the survival of the system as a whole. In the same way we can argue that diversity as a worldview is based on an understanding of the world as a meshwork of diverse knowledge systems. The diversity of human knowledge is based on the diversity of knowledge systems as well as the diversity of knowledge in each system. The question is thus not only whether the Internet can facilitate symbiotic intelligence. The basic question is how Internet technology should be designed in order to facilitate the meshworking of equally valid, diverse knowledges? What are the characteristics of ICT that cultivates diversity?



## 4.2 DEMOCRATIC RATIONALISATIONS

Johnson's symbiotic intelligence of the Net, the human-technological system, is based on the assumption that the technical structure of the Internet will largely decide the symbiotic intelligence of the Net. He mentions for example the high-level accuracy of the system: miscommunication is not the result of technical weakness but the failure of people. The technology itself is presented as ethically neutral. This technological rationality, as Feenberg (2002:4) argues, embodies a universal truth: "technical feasibility will transform prevailing practice, overriding the cultural ethos handed down from the past."

The majority of Internet users doesn't question the existing configurations of Internet technology, primarily because they assume that technology is neutral. Technology determinists believe that a challenge of the hegemony embedded in this technology is impossible. Feenberg (1999) argues in his critical theory of technology that technology is neither neutral nor determinist. Building forth on constructivist approaches to technology, he discusses the fact that each technology is the result of certain choices. The configuration of a technology can thus be changed. Users can intervene with tactical resistances to established designs. Through democratic rationalisations<sup>5</sup>, undermining the technological bias from within, alternative and dissident uses become possible and technology can be (re-)constructed to serve humanity (Feenberg, 1999).

These interventions seem to strengthen the meshwork aspect of technological systems as they increased the heterogeneity of the systems. Democratic rationalisations have led to more inclusive and more pluriform systems. For example, users transformed Minitel in France from a one-way information system into a multi-user communication technology (Feenberg, 1999). The same "creative appropriation" played a significant role in the transformation of the Internet from a network for the exchange of military information to a human communication network (Feenberg, 2002). These transformations do not automatically lead to more democratic meshworks. Deep democratisations, subjugated knowledges challenging and changing the dominant order so that social and political demands become embedded in the technical codes (Feenberg, 1999), are necessary to cultivate the meshwork characteristics of the Internet.

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<sup>5</sup> Feenberg (1999:75) recognises that democratic rationalisation is a contradiction in terms but with the term he proposes to reject the dichotomy between rational hierarchy and irrational protest implicit in Weber's theory of rationalisation.

### 4.3 INTERNET SATYAGRAHA

Gandhi's politics of knowledge, the refusal to be blown off his feet by the knowledge of India's colonisers, is based on cognitive justice. If we apply Gandhi's Satyagraha to the Internet, it is possible to see a connection between cognitive justice, Feenberg's democratic rationalisations and De Landa's meshworks. When people take charge of the technology and start designing technologies based on a more inclusive understanding of knowledge and culture, Feenberg's notion of the deep democratisation of technology can become an Internet Satyagraha, a resistance to Internet-based technologies that limit the free self-organisation of people and social groups on the Net.

One example of a deep democratisation of Internet-based technology could be the Open Knowledge Network<sup>6</sup> (OKN), an initiative by OneWorld International, a coalition of more than 4000 grassroots and non-governmental organisations and contributors from around the world. The OKN is based on peer-to-peer (P2P) file sharing technology. This technology allows people to share information in a global, distributed network of autonomous sub-systems or hubs without centralised control.

In 2000, when the World Bank started its consultations on a global development gateway for the sharing of development knowledge, civil society organisations objected to the idea of a centralised database system. They argued that this technology offers easy opportunity for 'gate keeping' such as user surveillance, editorial control, even censorship (van der Velden, 2003). In *A Distributed Global Gateway for Knowledge-Sharing in Civil Society*, Oneworld (2000) proposed a decentralised network of locally controlled gateways or hubs. The World Bank didn't consider the proposed technological platform a viable alternative. OneWorld developed its proposal and it is now being implemented as Open Knowledge Network (Oneworld, 2002).

The OKN can be understood as a network with more meshwork characteristics than the Development Gateway. Although both hybrids, each combining meshwork as well as hierarchical characteristics, the technology underlying the OKN allows users to strengthen these meshwork characteristics even further through self-organisation. The OKN's nonlinear network structure allows for an ongoing reconfiguration of hubs and connections. Users can connect with another hub, or even establish their own hub, when dissatisfied with the existing local organisation. The network can also easily connect with other network technologies such as wireless telephone and radio example.

The OKN resembles more the old Fido and UUCP networks that

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<sup>6</sup> See <http://www.openknowledge.net>

provided global digital communications before the Internet became accessible outside the military and the academia. Like Fido and UUCP, each of the local hubs is locally owned and operated. These hubs provide information and communication services in local languages and formats. OKN software allows people with slow or expensive Internet access with minimal connection times. Files are ‘unpacked’ on the user’s computer after the connection with the hub is closed. The technology underlying the OKN thus facilitates inclusiveness and diversity as it allows for a plurality of network configurations and modes of access and use.

## 5. Concluding Remarks

In this paper, cognitive justice is proposed as an ethical framework to investigate issues of knowledge and diversity. Johnson has shown that the Internet can support problem solving in the context of the growing complexity of our systems and problems. Shiva has argued, however, that many of our problems are the result of the loss of the diversity of knowledge, in part the result of biased technologies and the assumptions that underlie them.

Through democratic rationalisations such as creative appropriation and deep democratisation it is possible to rewrite the social and political code inscribed in the technology used for Internet-based communication. De Landa’s concept of meshwork can be used as a blueprint for the design of Internet technology that facilitates the cultivation of diversity. I have presented the Open Knowledge Network as a democratic rationalisation of the Development Gateway. Whether the OKN can be understood as part of an Internet Satyagraha, and gain more meshwork characteristics, depends on its success in the pursuit for cognitive justice.

Gandhi understood self-organisation as the basis for communication between different cultures. The capacity for autonomous self-organisation is interrelated with diversity. Communication technology that facilitates the cultivation of diversity and self-organisation can increase our capacity to solve complex problems. An Internet that facilitates the sharing of knowledge through biased technology will contribute to the loss of knowledge and its diversity.

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