The Future of Open Systems Solutions, Now.

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(Executive Summary v.2.4, Berlin, 26 January, 2013)

'I WANT AN ACCESS TO THE WORLD OF KNOWLEDGE.'[1]

Malala Yousafzai, Swat District, Pakistan

This simple plea, penned by Pakistani schoolgirl and human rights activist Malala Yousafzai, a few days before she was shot by militant civil society opponents, sums up one of the greatest challenges faced by today's globalized media and communications society. She pleads not for the fundamental right to be able to go to school, not for the institution, but for the right to *access* the world of *knowledge* that lies just beyond her grasp. The statement graphically illustrates both the basic problem of access to learning for many children worldwide. It points to the potentials of the vast resources for education, scientific research as well as social and economic development lying behind firewalls of fear and ignorance. It also signals the urgency attached to WSIS Action Line C3 '*Access to Information and Knowledge*' in which governments are committed to provide freedom of access to public information and facilitate the technical accessibility to ICTs and the internet, especially for disadvantaged, marginalized and vulnerable groups.

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[1]http://thelede.blogs.nytimes.com/2012/10/09/my-small-video-star-fights-for-her-life/

Creating sustainability and independence through the sharing of knowledge

The report takes the position that such unhindered access to information and the sharing of knowledge are fundamental human rights. Through the technical possibilities made available by the increased sophistication of ICTs and user oriented social media the traditional FOSS models of effective collaboration and innovative sustainability have now been expanded into much more comprehensive Open Systems Solutions that include highly diverse realms of public domain activity ranging from Open Data and crowdsourcing platforms, Open Educational Resources (OER), data mobility and device journalism to open hardware, collaborative design and the advent of internationally networked *iHubs*, *Fablabs* and open culture '*maker*' spaces.

It explores contexts, real results, degrees of implementation as well as the successes and hindrances in the development of diverse Open ICT-led knowledge creation and dissemination scenarios inherent to four of UNESCO's key global challenge areas:

- Climate Change and Environmental Responsibility

- Access to Quality Education and Knowledge

- Post-Conflict and Post-Disaster Response

- Gender and Minority Empowerment

Due to their inherently cross-disciplinary nature, the applications of Open Systems Solutions do not occur in isolated environments. The interactions between these diverse forms of open technologies create solutions that link the effective mitigation of the four global challenges themselves. They create tangible connections between self-determination, sustainability, and accountability by empowering both governments and their citizens to take control of their data, technological systems and resources. In doing so Open Systems Solutions help to break down the lingering digital divides that still create marginalization, and with many of the world's leading Open Systems Solutions coming from developing or transformation regions, the increase in the flow of knowledge from South to North is also significantly strengthened.

Open Systems Solutions in practice

Case studies from Africa, Latin America, Central and South East Asia are used to illustrate the way in which emergent forms of open, user defined technologies and methodologies are linking to FOSS in creating innovative Open Systems Solutions that are being implemented and practiced in ever increasing and complex realms of

social enterprise.

Selected innovative or best practice examples of these include:

• **Crowd Sourcing and User Participation in post-crisis scenarios:** FOSS platforms such as *Sahana*, used to coordinate rapid response and relief in mitigating the effects of the 2010 Pakistan floods, or *Ushahidi* (meaning "testimony" in Swahili), which began in 2008 as a website to map reports of post-election violence in Kenya and now has well over 24 000 deployments world-wide, leading the world in citizen determined Open Systems Solutions for information collection, data visualization and interactive mapping.

◦ **Benefits?** Empowerment and critical response. Enabling eyewitness reporting of events using the simplest of globally ubiquitous technologies (text, image, voice messaging), deployable almost anywhere i.e. post-disaster and conflict scenarios, to create rapid response for, with and by relief authorities.

• **Quality education and enhancing environmental awareness:** *Eco-Literacy Project for School Systems* initiative in Pakistan, a radical climate and environmental awareness program for the pro-active greening of 700 Karachi schools (over 700,000 students) through hands-on sustainable urban farming practice, IT and media development, access to open environmental data, and environmental auditing aimed at linking education with real ecological capacity building.[2]

◦ **Benefits?** Introducing traditional urban sustainability methodologies into curriculum, linking learning with family and community development. Contextualized alongside tangible gains of environmental awareness, the program invigorates a decrepit school system increasing the value of learning.

• **Open Data vs. Climate Change:** *Sauti ya wakulima* *('Voice of the farmers')*[3], a collaborative knowledge base and FOSS communications system developed by farmers in Tanzania for monitoring, sharing and discussing the tangible effects of climate change. Using shared smart phones as tools for observation and non-text based audiovisual evidence gathering[4], the farmers, who are often in remote locations, actively participate in the design of new strategies for the adaptation and sustainability of their crops.

◦ **Benefits?** Enhanced sustainability, control of data, mitigation of the tangible effects of climate change. Better crop yields and new forms of effective rural collaboration using an easy to use FOSS interface independent of the level of literacy of its users.

• **DIY Access to Knowledge:** *HONFablab* *Yogyakarta* is part of the growing international network of local, open access and peer-to-peer *Fablabs* enabling innovation and hands-on training "to create (almost) anything"[5]. Its project to create an "open fabrication methodology for low-cost below-knee prostheses"[6] complements the organization's interdisciplinary, scientific, cultural and academic focus on complex societal transformation issues.

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[2]information on the program is not available online (http://greenschools.pk/), however the Greener Karachi Trust has a number of informative vignettes outlining their modus operandi, i.e. http://vimeo.com/22569998
[3]http://sautiyawakulima.net
[4]http://newswatch.nationalgeographic.com/2011/11/30/smart-phones-meet-smart-farming-indigenous-knowledge-sharing-in-tanzania/
[5]http://ix.natural-fiber.com/
[6]http://www.lowcostprosthesis.org/

These include FOSS and open data projects aimed at alternative forms of energy and the support of biodiversity such as **MICRONATION/MACRONATION - Democratizing Energy** which addresses the relationships between climate change, fossil fuel dependency and increasingly erratic food production.

◦ **Benefits?** Empowerment, enhanced access to knowledge and strategically mitigating longer term effects of climate change. Opening scientific and technological processes to user input, directly providing sharable and scalable solutions to address identified community needs.

• **Open Hardware and Empowerment: *MetaReciclagem*[7]** is a Brazilian network developing decentralized, hands-on, user and community oriented actions using *Appropriate Technology* (AT). One of the first organizations to openly and demonstrably address the recycling of computer equipment for social and educational[8] use, as well as increasing the access to technology for marginalized groups *MetaReciclagem's* AT methods require 'fewer resources, are easier to maintain, and have less of an impact on the environment compared to techniques from mainstream technology.'[9]

◦ **Benefits?** Effective, sustainable resource management used to enable access to knowledge, information and education.

Recommendations

Today the potentials for **Open Systems Solutions** to address UNESCO's principal challenge areas based on free, publicly available resources and collaborative practices are readily at hand. The report makes the cross-disciplinary connections, linking innovation to need, context and challenge to illustrate how **Open Systems Solutions** can have their greatest impact where people have simple access to them. These questions are also not entirely ones of technology or access to the Internet. The creation of secure spaces and places that in themselves are free, open and conducive to an open exchange of ideas, experience and opinion is one of the key overarching challenges linking almost all the scenarios of development, education, and empowerment which are aimed at by the WSIS Action Line C3 on 'Access to Information and Knowledge'.

As such, key recommendations to strengthen the application of Open Systems Solutions in the creation and support of Knowledge Societies include:

1. Fostering '**Access to Open Access**' by creating public use access spaces and lowering barriers for access to technology.

2. Developing universal criteria and vocabulary for more rapid implementation and better understanding of

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[7]http://rede.metareciclagem.org/livro/english
[8]MetaReciclagem co-founder Felipe Fonseca in his 2011 book Laboratórios do pós-digital (Post-digital Laboratories)
       http://efeefe.no-ip.org/livro/laboratorios-pos-digital
[9]http://www.appropedia.org/Portal:Appropriate_technology

FOSS and Open Systems Solutions.

3.   Fostering the use of Open Systems Solutions as effective long-term sustainability priorities to address UNESCO's four key challenge areas.

4.   Fostering professional training ('*education of the educators*') as well as children's elementary education into and through Open Systems.

5.   Acknowledging, supporting and promoting small scale, independent or user defined FOSS incubators, highlighting the interconnectivity between individual tools and methodologies to create thoroughly comprehensive Open Systems Solutions.

6.   Linking the economic and long-term sustainability advantages of Open Systems Solutions in the allocation of public funds and procurement processes.

7.   Securing and enhancing the creation of accessible *Open Knowledge Commons* that enable access to the growing range of Open Systems Solutions, including FOSS, Open Data, Open Hardware and their related processes, methodologies and experiences.