

## Chapter 2.5

# Bridging the Digital Divide by Open Source: A Theoretical Model of Best Practice

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### ABSTRACT

*In this article the authors show how open source software can be used as an instrument to tackle certain issues of the digital divide. This article elaborates the relationship between the digital divide, appropriate technology and open source. The authors present some aspects and possible building blocks that are to be taken into account for the successful and sustainable development and implementation of open source systems in institutions of higher learning in developing countries.*

*The study is motivated by the context encountered in a development aid project with the aim to develop and implement an academic registration and information system (ARIS) for Mozambican universities. The ideas and findings presented here are based on a theoretical literature review in order to build a theoretical model of best practice in the context of North-South collaborations.*

### INTRODUCTION

The World Summit of the Information Society took place in two phases in 2003 and 2005. Representatives of 175 countries declared their political will to establish the foundations of an information society for all. The common vision for this information

society was formulated as the “desire and commitment to build a people-centered, inclusive and development-oriented Information Society..., so that people everywhere can create, access, utilize and share information and knowledge, to achieve their full potential and to attain the internationally agreed development goals and objectives, including the Millennium Development Goals” (WSIS, 2005, p. 1). Furthermore, the importance

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is underlined of removing barriers to bridging the digital divide, particularly those that hinder the full achievement of the economic, social and cultural development of countries and the welfare of their people, in particular in developing countries.

The digital divide has been defined various times by different entities. Many definitions distinguish those who have access to modern information technology and those who have not. Some definitions take into account not only the access but also the capability to use the technology (see for example the definition at WhatIs, 2009). The WSIS follow up report enforces the actual use of information technology (WSIS, 2008); it is argued that since it is already within reach that more than half the world's inhabitants have access to ICTs, at some point in the medium-term the digital divide will no longer be related to basic ICT access, but will be measured in levels of ICT use.

In his analysis of the digital divide Gurstein (2003) proposed "effective use" as the goal to be achieved rather than simply access to ICTs and the information society. Access ensures opportunities to "consume" Internet enabled services. Provision of access to infrastructure and end user terminals may bridge the "hardware divide", but access on its own is a passive mechanism. It needs to be extended with or embedded in a greater context. What is significant is both having access as well as the knowledge, skills, and supportive organizational and social structures in order to achieve social and community objectives. For development to occur access is a precondition. But the focus has to be on the whole development process including infrastructure, hardware, software, and social organizational elements. In an information society ICTs are an essential means of production, and their effective and productive use increasingly distinguish the haves from the have not's. Local communities need to train their capabilities so that they can produce, not only consume, and that end users can do locally significant things with technology tools to which they have access.

Effective use occurs in social settings including the family, work groups and communities and is therefore context dependent. What is appropriate in one context may not be in a different context. A Community Informatics approach to support local effective use would be a participatory design, where application design is done with full participation of the end users and the local community. In this way, an application is directly linked to local needs and creates local ownership and local champions who can provide feedback on its development and evolution.

Community Informatics (CI) is an interdisciplinary approach utilizing ICTs to enable and empower community processes. According to Gurstein (2007) the objective of CI is to use ICT to enable the achievement of community objectives including overcoming "digital divides" both within and between communities. CI can be used to examine how and under what conditions ICT access can be made useful to the range of excluded populations and communities and particularly to support local economic development, social justice, and political empowerment using the Internet.

Open source software removes barriers to participation. At a minimum it offers access to source code. To become productive and make effective use, potential participants need skills in software development and communication. CI practices can enable local participants if embedded in an appropriate fashion that takes into account the local context. In this paper we want to present options how development cooperation projects between North and South can support developing countries in creating these skills, and thereby respond to the challenges of the digital divide.

We will outline the potential of open source software as a methodology to involve local stakeholders, to facilitate local ownership and achieve effective use. We will use the concepts of Appropriate Technology and the Appropriate ICT framework, which in turn is based on CI concepts. Furthermore, we will review literature in order to help determine how to select and design technolo-

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