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 dis-
tinguish those who have access to modern infor-
mation 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 organi-
sational and social structures in order to achieve
social and community objectives. For develop-
ment 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 interdis-
ciplinary 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 objec-
tives 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 jus-
tice, and political empowerment using the Internet.

Open source software removes barriers to par-
ticipation. 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 ap-
propriate 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-