

# Experiences with the Greenstone Digital Library Software for International Development

David M. Nichols, John Rose, David Bainbridge and Ian H. Witten  
Department of Computer Science  
University of Waikato  
Hamilton 3240, New Zealand  
+64 7 858 5130

{dmn, davidb, ihw}@cs.waikato.ac.nz, john.rose1@free.fr

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## 1. INTRODUCTION

Greenstone is a versatile open source multilingual digital library environment [1], emerging from research on text compression within the New Zealand Digital Library Research Project in the Department of Computer Science at the University of Waikato. In 1997 we began to work with Human Info NGO to help them produce fully-searchable CD-ROM collections of humanitarian information. The software has since evolved to support a variety of application contexts. Rather than being simply a delivery mechanism, we have emphasised the empowerment of users to create and distribute their own digital collections [2,3].

## 2. EXPERIENCES

Greenstone is used around the world for a wide variety of purposes, including many linked to international development activities [3]. Here we list some of the key issues that have arisen over the previous 13 years:

*Computational infrastructure in developing countries.* Software developed in a Unix research culture had to be adapted to work on Windows and Mac, and on older operating systems (even Windows 3.1 and 3.11) which were prevalent in developing countries. When our research environment is upgraded with new software we must ensure that we retain the ability to cater for older configurations. Furthermore, Internet access is severely restricted in many developing countries, and early on we decided to ensure that any Greenstone collection could be distributed on removable media (e.g. CD/DVD) in exactly the same form as it is served on the Web.

*Commitment to software internationalisation.* Since 2000, the software has been improved and distributed as an international cooperative effort among the University of Waikato, the United Nations Educational, Scientific and Cultural Organisation (UNESCO) and the HumanInfo NGO in Antwerp, Belgium. As part of this effort, UNESCO distributes annually a CD-ROM with Greenstone fully translated in all six official UNESCO languages (Arabic, Chinese, English, French, Russian and Spanish). Furthermore, the Greenstone user interface has been translated into more than 50 languages (including Bengali, Amharic, Nepali and Thai). To support the various language interfaces we have developed software infrastructure to aid the maintainers of the translated interface text strings.

*Compatibility and international standards.* We have a policy of adhering to relevant international standards. Greenstone allows material to be ingested in many forms, from MARC records to the CDS/ISIS system that is prevalent in developing countries but almost unknown in the developed world; from DSpace to ContentDM. Greenstone collections can be served on the Web and over OAI/PMH, written to CD/DVD, and exported as METS or to DSpace.

*Partnership with international organisations.* The international development applications of Greenstone have been marked with fruitful and productive partnerships with UNESCO, Human Info NGO, FAO and eFL.net.

*Local workshops.* The physical presence of team members at workshops in developing countries (e.g. Tanzania, Thailand, Fiji, Cuba and Namibia) has helped to raise awareness of the power of digital libraries to aid in development activities [3]. Just as importantly, it has also alerted us to issues and problems with the practical use of Greenstone in diverse environments, and led to many modifications and enhancements to the software.

*Tutorial material.* An extensive suite of tutorial exercises has been developed for the workshops, and refined over the years. These are available from the Greenstone website, along with user-contributed guidelines on specific software features.

*Regional support networks* have been established in Latin America, southern Africa and South Asia with the support of international donors, and language-specific discussion groups have been developed for Spanish, French, Portuguese, and Arabic.

A constant challenge in the development of Greenstone has been to reconcile the demands of working in a research-centric University environment with the support and maintenance activities associated with global software distribution. As can be imagined, funding is a continuing serious problem, with no satisfactory solution in sight.

## 3. REFERENCES

- [1] Greenstone Digital Library Software, <http://greenstone.org>
- [2] Witten, I.H., Bainbridge, D. and Nichols, D.M. 2009. *How to Build a Digital Library*, Second Edition. Morgan Kaufmann.
- [3] Witten, I.H., Loots, M., Trujillo, M.F. and Bainbridge, D. 2002. The promise of digital libraries in developing countries. *The Electronic Library*, 20, 1, 7-13.