

Project outputs

The Ganesha Digital Library (GDL) Version 3 software which is distributed free of cost with its source code. GDL has been acquired by about 1,500 institutional and individual users.

A fully functional Indonesia Digital Library Network with 60 registered institutional and individual members, 26 of which have digital library systems running on GDL and connected to the network. The network has about 4,300 Indonesian library users and another 200 users from around the world.

Project basics

Grant from PAN/IDRC:
\$60,000CAD

Grant used for:

- Purchase of two servers, four PCs, printer, scanner, networking equipment, blank CD-ROMs.
- Salaries of staff.
- Cost of convening a national seminar on digital libraries.
- International travel for project staff to attend conferences and demonstrate GDL software.

Supplementary grants from other sources:

- Knowledge Management Research Group: \$5,000CAD
- Indonesian Foundation of Research and Development for Telecommunication and Information Technology (YITI): 150 million Rupiah.
- Partner institutions comprising Eastern Indonesian Universities Development Project, Institut Teknologi Bandung, University of Brawijaya Malang, University of Muhammadiyah Malang, and Institute of Islamic Religion (IAIN): \$16,500CAD

Indonesian Digital Library Network



The vast information resources of Indonesian libraries has been unlocked. The “key” was provided by the Indonesian Digital Libraries Network (IndonesiaDLN) initiative and the Ganesha Digital Library software developed by it. The rich information resources of 25 major libraries in the country are now plugged into the network. The number is expected to rise rapidly during 2002.

IndonesiaDLN offers users instant access to a bibliographic database of current research papers, theses, and dissertations written or published by academic staff, researchers and students of participating member libraries. The database may be searched on-line by anyone with an Internet connection. The number of electronic versions of the original documents of titles and abstracts listed in the database which are instantly available on-line from the network is increasing by the day.

The network has emerged as an important national center for the exchange of research results and scholarly work. Prior to the establishment of the IndonesiaDLN website in August 2000, Indonesia did not have a reliable inter-library loan mechanism to cover the numerous academic libraries spread across the vast archipelago of about 3,000 Indonesian islands. Researchers and scholars had to rely entirely, in the past, on conventional, manual methods of tracking down scientific information, and post office mail to deliver photocopies of the documents requested.

Attracting international interest

The digital library has attracted much interest outside Indonesia during the short time it has been in operation. The American Society for Information Sciences and Technology (ASIST) awarded its First Prize for 2001 to a paper submitted by Ismail Fahmi, Project Leader of IndonesiaDLN about the initiative. In the same year the Penang Library Network in Malaysia reviewed the Ganesha Digital Library (GDL) software, which lies at the heart of the operations of

The project team

The Knowledge Management Research Group (KMRG) based at the Central Library of the Institut Teknologi Bandung (ITB) were the implementors of this project. The team comprises ten young information technologists. Five of the members are recent graduates of ITB, the other five are registered students with the institute.



“ We decided to use only free software to make sure that developing countries will be able to use our system. ”

Ismail Fahmi, Project Leader

The team is headed by Ismail Fahmi, 27 years old, who graduated from the Electrical Engineering Department of ITB in 1997. He started working on the institute's digital library while still a student at ITB. Apart from managing KMRG, Ismail is also a researcher with the Computer Network Research Group and the Asian Internet Interconnection Initiative (AI3) based at ITB. He is the Secretary General of IndonesiaDLN and the creator of the Ganesha Digital Library software.

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The KMRG team of software specialists at work on GDL Version 4.

IndonesiaDLN, as a possible model of its work in Penang. GDL is named after Ganesha, the symbol of Institut Teknologi Bandung (ITB). Also in the same year, collaborative work began with the Networked Digital Library for Theses and Dissertations (NDLTD) at Virginia University, USA in developing an Open Archive Protocol module at IndonesiaDLN to enable the sharing of information resources amongst the two networks.

The initiative began modestly in 1999 as an effort to develop a digital library for ITB. The initial objective was to put on-line, within the ITB campus, the institute's bibliographic database of research papers by its staff, and theses and dissertations by the students. The positive results of this initial effort encouraged the team to consider networking libraries across the country so as to provide students and staff with a superior research and referencing tool. The concept for IndonesiaDLN was thus born. Versions 1 and 2 of GDL were written for the ITB library network. The software was rewritten to launch the national network. Ismail Fahmi, who turned down an offer of a scholarship for a Master's degree in Japan to work on the project, completed rewriting the code from scratch during two intense months, when he worked 16 hour days.

Version 3 of GDL adopted the Dublin Core Metadata Standard to provide a crucial capability for linking the national digital library to international networks in the near future. It was written in PHP scripting language that runs on free software to ensure that users will not be required to purchase expensive commercial software in order to run GDL. This new, third version was successfully tested on servers running Apache web server software, MySQL database software, and Swish-e search engine: all of which are also software freely available without cost to users. The latest version of GDL may also be



“ Problems of mis-shelving are gone. We can now always find the documents. ”

**Studiati Suwandi, Librarian
Member of IndonesiaDLN**

installed on Windows 9x/NT/2000, Linux and Unix servers.

The completion of GDL Version 3 was followed by the training of 10 librarians at the ITB Central Library to operate the system. A hands-on approach was used in the training exercise during which the librarians uploaded research reports, theses, dissertations, audio and video files on to the server to create the first elements of IndonesiaDLN.

Forming an effective national network

With the prototype of the digital library and system up and running, the project team could now redirect their efforts towards promoting the concept of IndonesiaDLN to other librarians in the country. ITB hosted a national seminar on digital librarianship for 250 participants from across the country. The gathering of Indonesian information specialists provided the project team with an opportunity to promote the concept of IndonesiaDLN and to demonstrate the package of free software which could be used to operate such a digital library.

The seminar was followed-up by a meeting of 40 representatives from 23 research and educational institutions in Indonesia. The meeting took the important decision to formally establish IndonesiaDLN. It adopted a couple of important technical standards: Dublin Core Metadata Element Sets Version 1.1 as the basis of the IndonesiaDLN Metadata Standard, and XML format for data exchange among the libraries. At the same time the meeting adopted GDL Version 3 as the core software to run the network. The meeting also decided to base IndonesiaDLN at ITB and elected Ismail Fahmi as its first Secretary-General.



“ Our library users from all over the world can now contact us easily. ”

Nanan Hasanah, Librarian Member of IndonesiaDLN

A decision was also taken at the sidelines of the meeting by the Eastern Indonesian Universities Development Project funded by the Canadian International Development Agency, to collaborate with IndonesiaDLN in establishing the Eastern Indonesian Universities Digital Library Network (EIUDLN). This sub-network would adopt the system developed at ITB, and draw upon the technical expertise of the project team to set-up EIUDLN in such a way as to integrate with IndonesiaDLN. This sub-network has now been successfully established.

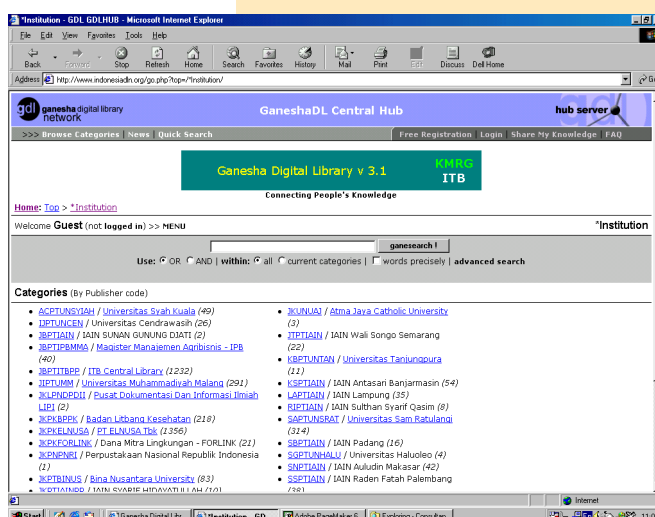
Within the first year of operation, the IndonesiaDLN project team had connected 25 partner servers to the network and 60 other institutions and individuals had registered as network partners. About 4,500 individuals had signed-up as users, of this total, about 4,300 are Indonesians with the other users originating from all regions of the world. During the second half of 2001, users had requested about 21,500 downloads of documents from the network, and read about 140,000 web-pages. The libraries, on their part, have uploaded about 3,500 electronic documents to IndonesiaDLN. Most of these items are “grey literature”, or unpublished and usually difficult to obtain material. The IndonesiaDLN team is now advocating to policy-makers in

About Indonesia

Approximately 3,000 islands make up Indonesia. The country covers a vast geographical area of about 1.9 million sq. km. The population now stands at approximately 207 million people. About 40 percent of the population live in urban areas. GDP per head is \$690USD. The adult literacy rate is high at 85 percent.

Agriculture employs about 43 percent of the population, services employs 40 percent, and industry about 17 percent. Principal exports include petroleum products, natural gas, garments and plywood.

Computers per 100 population: 1.0
Internet hosts per 100 population: 0.1
Mobile telephone subscribers per 100 population: 1.7
Telephone lines per 100 population: 3.1
Colour TVs per 100 households: 44.0



Homepage of IndonesiaDLN

Hardware

A server equipped with the following minimum components is recommended for each member of the digital library network:

Intel PentiumIII 933Mhz. processor
128 MB memory
SCSI 18GB hard drive
IDE 40 GB hard drive.

The server may be connected via a dial-up connection or leased line.

Software

The digital libraries run on free software or shareware which maybe legally used and installed without the need for making any payments to their originators. The following are the software recommended for each digital library:

Ganesha Digital Library
(GDL) software
Apache web server application
PHP
MySQL
Swish-e search engine

Version 3 of GDL has adopted the Dublin Core Metadata Standard which will facilitate the exchange of information between IndonesiaDLN and other international and national information networks running on this widely adhered to standard.

Useful links

IndonesiaDLN website:
<http://www.IndonesiaDLN.org>
Application to acquire the GDL source code: <http://gdl.itb.ac.id>
First Prize ASIST paper:
<http://idln.lib.itb.ac.id/Open.html?target=papers/asist-paper-contest-ismail.htm>

universities and research institutions to update their institutional policies to require staff and students to provide electronic copies of their works so as to speed-up the acquisition of new items for the network. Older documents, which are available only on paper, are scanned and converted to electronic formats upon request from users.

Customizing solutions to meet local needs

IndonesiaDLN and GDL are designed to cater to users with varying quality of connection to the Internet. As the speed of access is slow in many parts of the country, GDL offers a facility to participating libraries to download onto their local servers updated information from the central hub server so that users can then access the information via their respective intranets without the need to always log-on to the central server at Bandung. Using the same facility, participating libraries may also upload to the central hub server their latest contributions for sharing via IndonesiaDLN. Participating libraries without reliable on-line access may also request for new information and updates to be sent to them on a CD-ROM.

The project team has decided to make GDL available as an open source software. This means that GDL is not only available free of charge, but users are also provided with the technical means to make enhancements to the software to customize it to meet their particular needs. Such customized versions of the software are in turn made freely available to other users. In this way, GDL will evolve over time as a piece of software which is not only fine-tuned to meet the precise needs of users, but also at the same time enjoy robust technical maintenance and oversight by a large pool of software specialists who represent both the creators and users of the software.

Users interested in obtaining the source code for GDL, which is about 2 MB in size, need to make an application to the project team. The application form is available at <http://gdl.itb.ac.id>. Applicants are required to confirm in their application that they agree to share the information resources which will be managed using GDL, thereby effectively extending the wealth of information sources on offer via IndonesiaDLN. The source code has been acquired by about 1,500 institutions and individual users during the six months following the release of GDL Version 3.

Planning for the future

This is just the beginning. The project team led by Ismail Fahmi has exciting plans for the future. They have begun work on developing a number of additional digital libraries which will become members of IndonesiaDLN. The libraries under development will serve a host of non-academic institutions such as non-governmental organizations specializing in human rights and heritage issues, farmers' cooperatives, and small and medium size industries. All these specialized libraries will also have access to the other libraries participating in the network. This means that a user of a university library will be able to search and obtain information from the human rights digital library, and vice versa.

The project team is also working with the librarians to evolve a business model for sustaining participating members of IndonesiaDLN. Many of the libraries in the country operate on limited budgets which restrict the full potential of their work. The team will facilitate members of the network in devising a pricing scheme for subscription and document delivery services associated with IndonesiaDLN. It is hoped that this scheme will not only recover the costs of operating the network but also generate income for the participating libraries. A promising future awaits to be further unlocked by this multi-purpose key.