ITB Central Library Contribution: Concept, Strategy, and Technology for Future Indonesian Libraries

IITELMIT, JCC 30 June 2000

This paper presents the development of concept, strategy, and technology for future Indonesian libraries that have been being developed by Knowledge Management Research Group of ITB Central Library.

The concept is based on Digital Library and Knowledge Management. The aim is to leverage the Intellectual Capital of an organization (education and research institution).

By:

Ismail Fahmi (<u>ismail@itb.ac.id</u>) Knowledge Management Research Group (KMRG) ITB Central Library

Agenda:

[1] Knowledge Management Project, ITB Central Library

[2] Knowledge Management at a Glance

[3] Ganesha Digital Library, Managing Intellectual Capital of ITB Community

[4] Digital Library Network For Research Reports, Theses, and Dissertations

[5] ISISNetwork, One Stop Shop for Libraries Services

[6] GNU-Lib, Free-Software for Library Automation

[1]Knowledge ManagementProjectITB Central Library

Vision:

Toward the development of a knowledgebased society, through an effective management of our local Intellectual Capital, and using any low cost and appropriate information technology.

Knowledge-based society

is an environment where its communities share their knowledge each other for a better life.

Strategies:

- Using low cost information technology, such as utilization of Free-Software or Open-Sources (Unix FreeBSD, Linux, etc).
- Develop a low cost and useful Digital Library software, and make it Free.

- Capture ITB's Intellectual Capital (Final Project, Theses, Dissertations, Research Reports, etc) and provide presentation and access in digital format via Internet to the communities.
- Share the technology to other educational and research institutions, and develop a Digital Library Network with them.
- Promote the idea and invite communities to join the knowledgesharing society.

[2] Knowledge Management at a Glance

From "The Knowledge Management Year Book 1999-2000"

The explicit knowledge as we find everyday is like a top of an iceberg where the tacit knowledge reside under the surface. Managing the tacit knowledge becomes very important and strategic for organizations.

What is Knowledge Management?

Knowledge Management can be defined as:

- Identification
- Optimization
- Active management,

of intellectual assets, either in the form of:

- explicit knowledge held in artifacts or
- tacit knowledge possessed by individuals or communities.

Explicit Knowledge

The optimization of explicit knowledge is achieved by the consolidation and making available of artifacts.

Tacit Knowledge

The optimization of tacit knowledge is achieved through the creation of

communities to hold, share, and grow the tacit knowledge.

Knowledge Management

The active management of intellectual assets is the creation of management processes and infrastructure to bring together artifacts and communities in a common ecology that will sustain the creation, utilization, and retention of intellectual capital.

These activities to intellectual capital are important for organizations that wish to survive and prosper into the next decade and beyond.

What are the objectives of a Knowledge Management Project?

<u>Create knowledge repositories</u> Three basic types of repositories:

- 1. external knowledge, such as competitive intelligent
- structured internal knowledge, such as research reports, product-oriented marketing materials, techniques and methods
- informal internal knowledge, like discussion databases full of knowhow.
- <u>Improve knowledge access</u>
 Provide access to knowledge or facilitating its transfer among individuals. "Get at the knowledge we know we have" and "share our knowledge".
- <u>Enhance knowledge environment</u>
 <u>Establish an environment conducive to mo re</u> effective knowledge creation, transfer, and use.
 Build awareness and cultural receptivity to knowledge, initiatives attempting to change behavior relating to knowledge, and improve the knowledge management process.
- <u>Manage knowledge as an assets</u> Thread knowledge like any other asset on organization's balance sheet to improve return.

What are indicators of a successful Knowledge Management project?

- Growth in the resources attached to the project, including people, money, and so on.
- Growth in the volume of knowledge content and usage.

- The project would still survive without the support of a particular individual. It means that the project is an organizational initiative, not depend on individual.
- Some evidence of financial return either for the knowledge management activity itself (e.g. become profit center) or for the larger organization.

How to success in a Knowledge Management projects?

- Build a Knowledge-Friendly Culture, where:
 - People have a positive orientation to knowledge
 - People are not inhibited in sharing knowledge
 - The knowledge management project fits with the existing culture
- State your Clear Purpose and Language. The term – "knowledge," "information," "organizational learning," "data" – are subject to varied use and interpretation. Pay attention to this factor for your organization.
- Use Multiple Channels for Knowledge Transfer.
 - Give Senior Management Support, in the form of:
 - Sending messages that knowledge management and organizational learning are critical to the organization's success.
 - Providing funding and other resources for infrastructure.
 - Clarifying what types of knowledge are most important to the organization.

[3] Ganesha Digital Library, Managing Intellectual Capital of ITB Community



Vision:

Toward an Intellectual Capital information center of ITB, by effectively managing the tacit and explicit knowledge of individuals in ITB community, using low cost and appropriate information technology, and open access to our nation for knowledge sharing through the Internet.

Strategies:

- Mapping the Intellectual Capital of ITB.
- Capturing the explicit knowledge and manage them in digital format.
- Provide Expertise Directory for tacit knowledge to enable direct knowledge transfer with the individuals.
- Setup policy, rule and procedure for individuals to submit their explicit structured knowledge.
- Open online access for ITB community, our nation, and globally via the Internet.



Knowledge Map of ITB's Intellectual Capital:

Explicit:

- Course material: courses information, exam materials, course references in digital format.
- Individual or groups knowledge: Final project reports, Theses, Dissertations, Research Reports, and papers.
- Publication: internal journals, bulletin, etc.
- Proceeding from seminar, workshop, studium general within ITB.
- Multimedia, converted into digital format:
 - audio and video cassettes collection of ITB Central Library (events, history, language learning, etc)
 - speech cassettes collection of Salman Mosque

Tacit:

- Directory of expertise: individual, groups, and departments profiles.
- Mailing list archives.



External Knowledge

- Web portal to other science and technology related sites.
- International Journal for Intranet online access (full text).

URL

http://digital.lib.itb.ac.id

Network Topology



Server Configuration

Current configuration of Ganesha Digital Library server is as follow:

Server	Pentium 100
Hardware	64 MB Memory
	8 GB HD
Operating	Unix FreeBSD
System	
Application	Web server:
servers	Apache+PHP
	Database: MySQL
	Index server/search
	engine: ISIS-FreeWAIS
	and FTPSearch
	Multimedia server: Real
	server
	Mail server: Qmail

[4] Digital Library Network For Research Reports, Theses, and Dissertations

Improving Graduate Education and Upgrading the Utilization of Research Results

Objectives

This project focuses on two segments of communities:

- The students as a critical community in the world of higher education and the researchers as the most creative and innovative community.
- The libraries as a knowledge archive, organizer, and distributor to serve the first community.

Accordingly, the general objectives of this project will be:

- Information about research results will be more easily and widely (national and international) available.
- Publishing the research results will be faster, easier, and cost effective.
- The quality of graduated students and their research results will be upgraded.
- The utilization of research results by students and researchers also by business, industry, and public will be increased.
- The tacit knowledge sharing and processing will be facilitated so that scholarly discussion among students and researchers will upgrade their knowledge.
 - At the next phases: Linkage between education-research institutions and community of business, industry and public will be increased and will produce many new beneficial impacts for national development.

Project Beneficiaries

Community of Producers: higher education students and researchers

The benefits they will obtain from this project are:

- Easy of searching and finding other research results related to their concern, whether online or off-line (using CD-ROM).
- Increase their information literacy.
- Easy of publishing their research results electronically (including metadata and full text).
- Eam royalties from any utilization of their research reports.
- Possibilities of further collaboration between the author and business, industry, or public segments that interested on their research results.

Community of Users: Libraries

This community acts as the knowledge archive, organizer, and distributor produced by the first community and in turn will serve the needs of the community to upgrade their information literacy and to support further knowledge construction.

The benefits libraries will obtain from this project are:

- Have a technology (GPL license) to serve their communities.
- Get a technical support to maintain and operate the system.
- Have a network (community of libraries) to exchange knowledge.

On the next phase, benefits also will be obtained by communities such as business and industries. The benefits they will obtain from the further phases of this project are:

- Easy access on the research results from academic and research institutions.
- Possibilities of finding solution from academic and research institutions' point of view for their needs.
- Easy access on the expertise information among academic and research institutions toward the further mutual collaboration.

Project Methodology

The methodology for this project will consist of the following activities:

- Evaluate the existing technology that freely available on internet.
- Involve the library community by bringing together the participants to construct the required standards and rules of the networked digital library, such as developing standard of metadata, submission process, copyright, royalty, file naming, etc.
- Develop a new appropriate application of networked digital library of research reports, theses, and dissertations based on the existing technology.
- Construct an agency to manage the operational and administration of the system.
- Hold a test bed and then operate the central server of the system.
- Socialize the system amongst higher education students, lecturers, and researchers, and train them on how to use the system (searching, retrieving, make submission, take advantage).
- Disseminate the research information collected in the central server whether in the form of on line digital library or offline CD-ROM.
- Construct a course material of training and distance learning for user and administrator of the system.
- Disseminate the system to be implemented by partner organizations.
- Hold a test bed that performs information exchange between the central server and other servers.
- Provide technical support and coordination during the growth of the system nationally.
- Evaluate and monitor the progress of the system.

Project Outputs

The following is a table of this project's outputs.

No	Output	Туре	Dissemination
	Description		
1	Tools or	Software	Make it freely
	application of		available on
	the networked		internet, using
	digital library		GNU/GPL

2	 with the following functions: submission, search, browse, and retrieve the stored research reports information exchange between servers in the networked digital library additional facilities to manage the tacit knowledge Standards, for example: metadata, file naming, submission process, file format, etc. 	Standard	license. Need coordination with the agency for the implementation and joint to the network. Available on web site.	 University of Brawijaya Malang Central Library University of Muhammadiyah Malang Library IAIN (Institute of Islamic Religion, supported by McGill University Canada): IAIN Sunan Ampel Surabaya IAIN Sunan Kalijaga Yogyakarta Supporting Organizations Asian Internet Interconnection Initiatives (AI3) ITB Computer Network Research Group (CNRG) ITB Funding Organizations Institute of Technology Bandung International Development Research Centre (IDRC), waiting confirmation. Indonesian Foundation of R&D for Telecommunication and Information Technology (YLTI). Computer Network Research Group (CNRG) Contribution from each partners.
3	Rules of the agency for the management of operation and administration of the system.	Standard	Available on web site.	Users socials biodi distatisses where ful loci server 2 Users access biodi servers and 2 Users access biodi servers and 2 Users access where ful loci server 2 Users access biodi servers biodi se
4	Database of research results including full text.	Database and full text	Online digital library web site and CD-ROM.	Provide mediata liton Provide mediata liton

Partner Organizations

- Eastern Indonesia Universities Development • Project (EIUDP, the CIDA's project):
 - University of Cendrawasih (UNCEN) 0
 - 0 University of Samratulangi (UNSRAT)
 - University of Pattimura (UNPATTI) 0
 - University of Haluouleo (UNHALU) 0
- Pasca Sarjana ITB •
- Research Institute of ITB (LP ITB) •
- ITB Central Library (Digital Library)
- PDII LIPI Jakarta

[5]ISISNetwork,One Stop Shop for LibrariesServices

Enable online communication and transaction between individuals and librarians for libraries services

What is CDS/ISIS?

CDS/ISIS is a software of library's catalogues database that is developed and maintained by UNESCO for libraries in developing countries. Most of libraries in Indonesia use this software to manage their bibliographic information and other collections.

A low cost but great software for library automation has been developed by Institute of Agricultural Bogor (IPB) Library and based on this CDS/ISIS platform. It is called SIPISIS. Contact: <u>mus@ipb.ac.id</u>

What is WAIS/ISIS?



WAIS/ISIS is a Free-Software that running on Unix box (FreeBSD or Linux) that able to search the indexed CDS/ISIS database directly, without any conversion, so that the database can be accessed from the Internet. The advantage of WAIS/ISIS compared to other CDS/ISIS-to-Web-Gateway software is its capability to communicate between WAIS/ISIS servers, so that we can develop a network of CDS/ISIS database servers.

What is ISISNetwork?



ISISNetwork is a service that is developed by KMRG ITB within ITB Central Library. It provides CDS/ISIS databases publication to Internet for Indonesian Libraries that are facilitated with online Shopping (online-order).

Currently, there are 11 libraries host their CDS/ISIS database at ISISNetwork server of ITB Central Library, and more than 40 databases can be accessed from the Internet.

The Internet address of ISISNetwork is <u>http://isisnetwork.lib.itb.ac.id</u>.

What services provided by ISISNetwork?

There are two types of services provided for Indonesian libraries:

<u>Free CDS/ISIS Hosting</u>

Your library's CDS/ISIS databases could be freely hosted at ISISNetwork server with unlimited space. People from the Internet will be able to search your CDS/ISIS databases.

This service has no online order feature.

Full Hosting

With full hosting service, your library page will be created including contact address, payment information, and connected to our membership database. The advantage of this service is your library will be able to give online service to users for example information finding and photocopying parts of collection.

fice -		a Factor Hous	2 2 2
	Plantation (Contraction)		1
CONSIGNATION OF CONSIGNATIA OF CONSIGNATIA OF CONSIGNATIA OF CONSIGNATIA OF CONSIGNATIA OF CON	Cleaning Clanters Channel		
-	010		The states it
CDS/I			
Netwo			and Meaning Tell 15
The local day	THE BEST OWN TO EXTEND TO	IN LODING VERY BURNESS	A DEALERS THE
IE Network	Select libraries that you want I	to year	
It for work			
Select Ibrary	No 3.Reary Home	Email Cav	
Databases lists	t (*** 199 Swani Laney	mide has being	till tilt ac at - Phatocopy - Referal- Training
TROOMS VIEW	21" Peputakan D-326	trui .	No strike astrona (blief)
In 1973	10" Perpentakoan Donton ITE	Fread	No mine some a hall
			the state state of the set
ek ave	at" Perputakan UNCER	Enal	No states assiste \$14
nikacen Animichicog Dill	and the second sec	Contraction of the State of the	
	af" Perguatakase (MCSH of English Language Center of	Contraction of the State of the	No strate annines (File)
	 #" Perputation UNCER Displain Language Tenter of indexees (ELCP) 	Ervive Emvil	No scient atomicto (Find) No scient services (Find)
	 g/* Perputation UNCER 5/* Explicit Language Tenter of indenesis (ELEP) 6/* Perputation UNERXW 	Evolum Emol Emol Emol	No union annione (Final No unione services (Final No unione screeces (Final
	 Perpatriane UNISH Digital Language Tenter of Inducess (SEEP) Perpatriane UNISHW Perpatriane DESPL Perpatriane Desertion IN 	Enviren Envil Envil Envil Envil	No state exercise (5 m) No state survive (5 m) No state survive (5 m) No state survive (5 m)
	 41^a Perputation UNCR 50(4) Language Device of Indexes of SLOP 61^a Perputations (SLOP) 61^a Perputations PhOPL 61^b Perputations Uncertainty In 100 61^a Perputations Uncertainty In 	Enviren Envil Envil Envil Envil	No states sensors (Fis) No states surveys (Fis) No states surveys (Fis) No states surveys (Fis) No states surveys (Fis)
	gr ^{ac} Perpathikan UNCEN South Language Center of monose 4 5459 Gr ^{ac} Perpathikan UNERAW Proposition UNERAW Proposition UNERAW Proposition Unerstand IN Proposition	Cardon Email Email Email experibilation Email Educentation Encod	No unite sensors () and No unite sensors () and

How libraries visiting and databases searching works?

1. First, user will select libraries that s/he wants to visit. Then the list of databases owned by the libraries selected will appear.

May received the	th at shipsedwala finds, that "An cost binant Lighter - Shinking Office)	
10. 10 (m. 10-		
Bat	57757777 577577 57757 5775 5775 5775 5	
	at & East Street and Astronomy Andrews	2.50
	Construction Construction	
CDS	ISIS 🕺 🕷 🕷	ar 100
Nitw		9.0
-		All and a state
BIS Vehicle's	Select database	
Select litrate		
Canabase Arts	Please salved at local and detailoan to user spice, that their the Salmit techni-	
International Content	[harst] have	
interne .	T NORS IN CONVENTION AND INCOMESING AND	
internation Di	C metric cooks, 4 (1) beautions per discrimina cooks, proposit	
and the second se	P. DERETT, et M. Course Course (MERTER AND INCOME IN DURING MERTER) Control (MERTER) of The Course Course (MERTER) SOFTWARE INSTITUT SEctions)	
	F BOLHSINRISH SHORE A #12 Carty Link WEB/IS BOLHSILSHIPS, SER, RUN/SSLAND	
	C LINEARY OF RESIDER PLANEING IS AND COMPACTING AND RESIDENCE AND DAMAGED PERSONNAL AND INTERNAL AND ADDRESS AND DAMAGED PERSONNAL AND INTERNAL AND ADDRESS AND	inesi.
	C. MORANCH HERMAN CO. (1) Control Lineary MERCIPARIES INTERACT STREAM (2) AND	
	P. BORK of Preparative Intel (MER. BRAIN BRAIN BRAIN, NEEDeal)	
	SUPERATIVE TAX SUPERATIVE	
line .	i i i i i i i i i i i i i i i i i i i	

2. User selects databases that s/he wants to search. Then a search form will appear against the selected databases.



3. User inputs their question. Then the server will search the query against the selected databases, and display the result to user web browser.



4. User clicks one of the results to see the detail of catalog information.



How online order works?

1. After user found information item from your CDS/ISIS database, s/he can send order via web browser. S/he also can type additional

information such as number of pages to be copied or other keyword to be searched by the librarian.



2. The ISISNetwork server will automatically send the orders to your librarian via email.



- 3. Your librarian will check the email, process the order, and send feedback to user via email to give information for example whether the requested order can be processed, found, etc.
- 4. If needed, your library can ask user to pay some money for the services (finding or photocopy). All of this activities will be done using email.
- 5. Eureka... your library is now have an online services and business that create fund.

How to publish your CDS/ISIS databases?

It is very simple:

 Register your library: <u>online:</u> visit <u>http://isisnetwork.lib.itb.ac.id</u> <u>or contact us via phone/fax to:</u> Mr. Mahmudin Email: <u>mahmudin@www.lib.itb.ac.id</u> Phone/Fax: 022-2500089 Address: Perpustakaan Pusat ITB, JI. Ganesha 10 Bandung

- Send your CDS/ISIS database file (compress in a zip file) to <u>mahmudin@www.lib.itb.ac.id</u> or send the disket to above address.
- 3. Our administrator will configure the server for your library, and
- 4. Go live to Internet for your CDS/ISIS database.

Online registration:

http://isisnetwork.lib.itb.ac.id/lib/libreg.html

Lill New forestes lad		
🜒 Mgo Weterskynsk, Rolfs ac i	348. Revig Fried	1
IDSTING TYPE		
the lype elimited in par	mar 17	
 Trailworkey for a		
a run hauset tea		
DRIVES INFORMATION		
All and pull And has to to		
Library Namo		a g. If B Cornel Linety
Address	2	a a .d Gannta M
		Backarg, 40132 Jama Batal
		1
Phone		4 6 022-2900099
Exe		a g 072-2900089
Cantact gamon nome		us Do Manuta
		Thes as reportant address
Empil address		th offers define will be a
URL DA	₽ð	· s. Max Owwell Mark
SERVICES INFORMATION		
the light of services do you		
		Fill the box if you provide
		Fill the box Fiyos provide
ſ	or place a type hore	F 8 the loss if you provide then type your addition a services. It the left be to service and sharty
	previde the procellar por unit for each service when	4
PAYMENT INFORMATION	va emai when they contact yea:	
a second s		
We Bank Account	1	Type your Many's One's
		occeant information o a market, hand starter, acc.
	-	randas
Vis Draft (versit)	-	TUSES WATER EXCLUSION
	2	1 outlined).
PUBLISHING AGREEMENT		
Name and the Oddawing In-	A LOOP AND DESCRIPTION	
	est responsible for the context of year databases - est responsible for user avoidong doest your	
the above an		
	Contral Library for any problems a social air seams and orders externation (renembers)	
	yes agree with this representation	
a start we are the second	Accept Reject	
	Billion and Billion Balance	

[6] GNU-Lib, Free-Software for Library Automation

Low cost, powerful, integrated with Internet, solution for Indonesian Libraries

What is Free-Software?

Free-Software is a philosophy. It states that software in this world should be "free". Free here means "<u>freedom</u>". Users of the software should have freedom to use it, install it, give it to



neighbor, modify it, cannibalize some parts of it to create a new software, etc. Please note, that "free" <u>doesn't mean</u> "gratis", "no charge", or "zero fee". It is a <u>freedom</u> that users get when using the software.

We may sell the software, but we also have license to copy, distribute, modify, etc. We may give it away without any charge. Examples of the software are FreeBSD, Linux and other applications within them.

What is GNU-Lib?

GNU-Lib is a name of project by KMRG, ITB Central Library. Objective of this project is to develop a Free-Software for Indonesian libraries that works as library automation.

This software will be freely distributed to Indonesian libraries.

Who Provides Funding for this Project?

The initial funding of GNU-Lib version 1.0 will be handle by ITB. In the future, maintenance of the software should be self-funded by KMRG, ITB Central Library, together with Indonesian libraries communities that take advantages from the software.

What features of GNU-Lib?

GNU-Lib will have the following features:

- Typical library automation workflow (circulation, OPAC, cataloguing, fine, etc)
- Integrated with Internet.
- Integrated with Barcode reader & printer.
- Online access via web browser for OPAC, reservation, renewal, fine, etc.
- Email alert for member that have email address.

(GNU-Lib)	
Selenzi datang, wikipeng sungang, noonggo rakhot, <u>Communu</u> datar balakang, tajaan, produk, darapak, ine software, fasafag) » Romana noverti dat seratus » The Trans (RAR Row & PF TER » <u>Contributor (Universitat & Kontak)</u> » <u>Work, Groups (Grangedan, Menilken, sek</u> » <u>Denken dan dolamentan</u> » <u>Standard dan danan</u> » <u>Envidend dan danan</u> » <u>Eventina entima</u>	News 03/25/00: Web (DATU-Lib project dabaat. 03/08/00: Mading tier onesk troor dan kontributor dibaat alani, opac]

Can I use the software for my library now?

Not yet. The first implementation will be tested at ITB Central Library on September 2000. After the test bed, software will be launched to public on October 2000. So, please be patient for now.

What requirements needed to run GNU-Lib?

The local area network topology needed in your library is as follow:



Hardware requirements

Server, minimum requirement:

- Pentium 100 MHz
- 32 MB Memory
- 4 GB HD
- Ethernet card

Client, minimum requirement:

- Processor 486
- 16 MB Memory
- No HD
- Ethernet card

Optional:

- Modem
- Internet connection to ISP

<u>Software</u>

Server:

- Operating system: Linux or Unix FreeBSD
- Database server: MySQL
- Scripting language: Perl
- Web server: Apache + PHP
- Mail server: Qmail

Client:

- DOS with TCP/IP application.
- Optional for barcode printing, using Windows 95.

[7] KMRG, Knowledge Management Research Group ITB

Dedicated for the development of webbased digital library and knowledge management.

Research on:

- Digital Library
- Digital Library Network
- Library Automation (Windows and Unix base)
- Managing Knowledge of Organization's Intellectual Capital
- Libraries Catalogues Online Network based on CDS/ISIS database

Services:

- CDS/ISIS Hosting for your online library services.
- Web design and web hosting.
- Installation of Wais/ISIS for your intranet online catalog.
- Designing and developing web-based digital library and knowledge management for your organization. Platform: Windows and/or Open Sources (Unix/Linux)

Contact:

Email: digilib@itb.ac.id Phone/Fax: 022-2500089 Location: ITB Central Library, Jl. Ganesha 10 Bandung