Indonesian Traditional Knowledge Management
A Case Study: Cashew Nut Shell Liquid (CNSL) *)

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Abstract

*Indonesian traditional: **Cashew Nut Shell Liquid** (CNSL) knowledge and research reports, is it very difficult to find traditional CNSL knowledge such research reports and grey literature in Internasional and National publication written by Indonesian people. Cashew Nut Shell Liquid (CNSL) is the one of the largest, readily available, renewable resources of phenolic liquids in the world. Natural CNSL contains anacardic acid (60%), cardol(20-25%) and cardanol(6%) depend on resource.CNSL can be used in polymer applications and has been identified for its pharmacological activity. According to available statistics, only a small amount of CNSL enters the world market most likely due to difficulties in removing the oil from the shell and CNSL. In this case, we present CNSL model of computer systems design with the CNSL functional life – cycle model, the user interface model, and the usability engineering model are discussed as models of computer systems design. Consideration of the preference of potential end-users is strongly adhered to in this model through the use of CNSL knowledge management prototyping.*

It is a general condition of Indonesia libraries within Centre and Research Institutions that they haven't acted as primary resources of knowledge for researchers and learning. Their collections are very limited and many of them are absolete because of very limited fund to get the up to date books and periodicals. Researchers can't rely on the libraries collection to support their researchers. Their researchers quality won't be satisfactory, if they didn't seek other reference resources.

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*) Submitted for " International Conference on Digital Libraries " New Delhi, February 24-27, 2004.

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Introduction

The economic crisis in Indonesia makes the libraries condition to be more acute. It is nearly impossible for libraries to add their books and periodicals (international journals, magazines, grey literature, etc) collection. The recent knowledge resources become more difficult to find out.

Currently there is no national effort to organize their information in order that people from public, academic, researchers, and small and medium enterprises sectors industry can easily search, find and take advantage from their result. Most of them are finished in the libraries cabinet of each institution, without any appropriate information exchange within and/or among them.

General internet infrastructure condition of Indonesian academic and research institution, which some institutions in Java island have dedicated internet connection at more than 64 kbps and even several universities have more than 1 Mbps. Most of Indonesia universities and research institution have to be satisfied with 28, 8 Kbps dial-up connection. Online digital library network only will work for some institutions. This condition will effect the dissemination method of research result information in digital format for the whole country.

Research objectives : researchers as a critical community and as the most creative and innovative to the develop traditional knowledge community, also the Indonesian libraries as a knowledge center for Indonesian traditional knowledge, such as CNSL.

- the researchers as a critical community and the researchers as the most creative and innovative community to produce Indonesian traditional CNSL knowledge.
- the Indonesian libraries as a knowledge archive, organizer, and distributor to serve the researchers.
- information about research results will be faster, easier, and cost-effective, if they will use digital library based on Information and Communications Technology (ICT).
- publishing the research results will be faster, easier, and cost-effective so that will be more easily and widely available.
- the quality of researchers and their research result will be upgraded the utilization of research results by researchers will be increased the **traditional CNSL tacit knowledge sharing** and processing will be facilitated so that researchers will upgrade their knowledge.

For the next phases : linkage between research centers/institutions and community of business, industry and public will be increased and will produce many new beneficial impacts for national development.

The following table is a description of outcomes that will be reached :

- standarization – the standard of metadata and classification, submission and dissemination process;
- servers – several servers will be installed and operated;
- organization – PDII-LIPI to organize the operational and administration of digital library network, with other research center at Indonesian Institute of Sciences (LIPI) will be established in each partner that install and operate, the coordination of all agencies/research centers, especially for knowledge exchange and library network in Indonesia will be operated by PDII-LIPI.

At the end of the project, we estimate the participation from researchers will be at least 5% of fulltext of final reports, and grey literature of researchers in Indonesia during the project will be submitted into central server, at least 5% of fulltext research report on Indonesian traditional knowledge will be managed by PDII-LIPI and also will be up loaded into central server.

Functions

This section describes a set of objectives and functions proposed at Centre for Scientific Documentation and Information – Indonesian Institute of Sciences (PDII-LIPI), and suggests an organizational form and structure for the organization. PDII-LIPI is considered here to be a networked consortium of Science and Technology information services in Indonesia that their roof significant traditional information or knowledge resources (such as local resources in the field of S&T traditional information and knowledge) and make them available to the public.

In addition to the server organizations, PDII-LIPI concept also includes a larger number of S&T traditional CNSL information or knowledge extension agents such as Warintek (S&T cyber café), SIBM (Centre for Society Business Information), etc.The latter are “remote access points” to PDII-LIPI, located in selected organizations throughout Indonesia, the function of these extention agents is to access PDII on behalf of these organizations, their workers as well as the immediate public. They are to be trained by PDII-LIPI and provided with the necessary equipment and tools to access PDII-LIPI server organizations.

The concept of PDII-LIPI extension agents is considered to provide scienttfic and technological traditional information/knowledge services for the public, especially Indonesia’s S&T communities whose members depend on having timely, reliable and economical access to problem solving.

In the context of PDII-LIPI " scientific traditional information services" facilitate access by the professional public to such information – to scientific, technical, business, and other data, information, expertise and knowledge.

Constituting an important resource of society, "problem-solving information" exists in two basic form: as knowledge and expertise possessed by a humans, and as contents of publications or document. The latter may be in printed form (in PDII-LIPI library collections) or in electronic form (such as full-text databases, abstract databases, bibliografhic databases, etc) both full text and non-textual (numeric, tabular) databases are called source databases.

Locating particular data, information, or knowledge requires the use of directories, indexes and similar access tools electronic form access tools. Called referral data bases or meta databases. Constitute a major product of the global information service industry.

By providing high quality information services PDII-LIPI serves the larger objective of supporting Indonesia. socio-economic development, it also contributes to such development by fostering the growth of an emerging economic sector toward the information service industry.

Purpose

To meet its purpose, it is proposed that PDII-LIPI perform initially three distinct functions, as follows:

1. Operate a public S &T information services consisting of two components: searching of electronic referral databases, amd delivery of full-text such as :CD-ROM and textual document copies (from PDII library and source databases at least: 500.000 records) The two functions constitute the core of the model information service sector, the first information exists on a particular subject or topic, and it allows them to select specific document, or contact particular institutions or individuals, the second service delivers to user a physical copy of the documents containing the data or information of interest. PDII-LIPI aims at making these services accessible nationally, publicly, economically, and efficiently.
2. Operate a referral service

   PDII-LIPI is planned in such a way that information service which may not process locally the information resources needed to answer a specific request is able to forward the reques-electronically-to another information service organization capable to answering it. This referral functions PDII-LIPI as a cooperative information service network.
3. Carry out a set of support functions includes:
   - Development or participation in the development of information policies, standards and other activities conductive to the compatibility and transparency of PDII-LIPI's user services;

- Generation and maitenance of intellectual tools needed to perform the public sevices, such as various electronic products;
- Maintenance of essential domestic (Indonesian) databases, both bibliographics and factual/full-text;
- Development of a network of PDII-LIPI extension agents (such as:Warintek, SIBM,etc) ;
- S&T information service marketing;
- User education and training of service operators;
- Development of managerial, professional and paraprofessional manpower to operate PDII-LIPI; and
- Professional activities having the potential of enhancing the impact of PDII-LIPI.

PDII – LIPI Services

Each PDII-LIPI node is a WARINTEK designated to perform specific public information services, the latter are : a) databases search service, and b) document delivery, any given Warintek may be assigned to perform one or both of these services, provided it possesses the appropriate information resources (databases or local document collections).

As a matter of policy PDII-LIPI intends to produce, systematically, these resources in electronic form, and allocate them to selected Warintek for network wide access and use. To extent possible, at least some WARINTEK nodes should be sector-specific, and possess specialized information resources and staff expertise (e.g. social sciences, physical sciences, environment sciences, energy, industry, and the like). Other WARINTEK will tend to be more general, in keeping with the character of their clientele.

When a given database exists in Indonesia, either on CD-ROM or in computer mass storage, the entire service process in electronic : a user having access to PDII website, fill out (on the computer sreen) an appropriate service – requesting form, the requests is executed by PDII-LIPI webmaster, and its output stored in the user's electronic mail (or, in case of document photocopies, transmitted by facsimile, etc).

The PDII-LIPI systems may thus be viewed as standard arrangement for transmitting electronic documents (requests, database outputs, journals, articles,etc). A highly appropriate model for PDII-LIPI is the electronic document delivery technology, a computer – to – computer exchange of intercompany business documents in a public standard format.

Preparatory Phase

During the last year, we have learned to CNSL knowledge management systems that are easier for many people to learn and to use as to improve their performance at work.

Although some progress has been made in developing usable systems for such explicit databases software as ES and AI, less progress has been made in the CNSL knowledge management design of more complex KM systems such as a digital library. The CNSL KM systems need to be created which are easy to learn and to use in order to prevent the insidious problem of underused systems.

Usability issues should be considered during the design of CNSL KM services in order to build sytems which people with limited technological skills and readily use.

In this paper, we discuss two key forms of CNSL KM usability, interface usability and **the human – computer – interaction** has helped designer CNSL KM principles to improve interface usability.

CNSL KM is a networked information discovery, retrieval and collaboration tool and WWW browser. WWW mergers information discovery and hypertext techniques for linkage to text, files,etc.

We hope that CNSL knowledge systems usability dimensions include :

- accessibility – ease with which user can locate spesific computer systems and electronic access to our systems;
- compability – level of compability of file transfers from system to system;
- integratibility into work practices – how smoothly the system fits into a person or groups work practices.

The preparatory phase of traditional (CNSL) knowledge includes the establishment of a communication network and a program to enhance people understanding of the benefits of the traditional CNSL knowledge for supporting their learning. This will be conducted through the following procedures:

- special and uniform format for traditional CNSL knowledge use in digital library facilities for users;
- establishment of internet access in areas where there are concentrations of users;
- development of users awareness of DL services within their areas;
- provision of training to users on basic computer and internet usage;
- provision of email accounts for users; and
- provision of users course homepage icon on the DL outlets desktop.

Enhancing users understanding of the potential benefits of the internet and traditional CNSL knowledge for their learning , which will include the following activities :

- development and distribution of printed materials; and
- conducting seminars and short training courses for representatives of users on the utilization of traditional CNSL knowledge through digital library online services.

CNSL knowledge of digital library

A great deal of users satisfaction is influenced by the size and content of the DL services. The incentive for using a traditional DL services is highly dependent on the CNSL content of traditional knowledge, which may be useful to one person and not useful to another. Usefulness is the capability of the system to be used to achieve a predetermined goal. A systems usefulness to an individual is influenced by the extent to which that person knows that they will find something usefull. Usefulness is different from usability in that it is germane to individual preferences towards a DL services.

Design for usability is a new term that refers to the design of computer CNSL knowledge systems so that they can be effectively integrated into the work practices of PDII-LIPI organizations. It goes beyond the focus on user interfaces. Design for usability includes designing the infrastructure of CNSL computing resources that are necessary for supporting and helping user learn to traditional knowledge effectively use systems.

A traditional CNSL knowledge encourages system designers either to accommodate to users mix of skills, work practices, and resources or try to systematically alter them. A traditional CNSL knowledge design for usability can be applied to the selection and integration of diverse computer systems or to the design of new systems to improve the likehood that users will use them.

A traditional CNSL knowledge computer systems should be a prime target for design for usability. Their effective value depends upon their practical usability by users in organization and communities. The emerging traditional CNSL DLs have come to include publicly available information and private information shared by collaborators: reference volumes, books, journals, newpapers, images, scientific raw data.

Traditional CNSL Life Cycle Model

The traditional functional life-cycle approach to computer systems design includes six stages performed sequentially : project definition, system study, design, programming, installation and

post – implementation. Each stage includes a set of activities which must be completed before advancing to the next stage.

Typically, communication between the developer CNSL knowledge and end-user is frequent during the requirement specification period, but once requirements are set, the level of communication diminishes and is mostly concerned with budgetary matters. For example, the project definition step might entail assessing the end-user profile in preparing a project proposal report. One possibility is for a designer to involve the end-user which includes interviewing prospective end-users. In contrast, a different designer might decide not to involve the end-user, and choose to determine the profiles of the people who will use our systems by individual assumptions. For example, the motivations for choosing not to involve the end-user might include :

- Conform to traditional CNSL knowledge standards, it may be a standard practice in an organization to exclude the end-user in requirements planning.
- Expectations that end-users will view the traditional CNSL knowledge system as the designer does.
- We are developing a new technique with the attitude that we are the expert in this area and the future end-users might not understand what they want.
- We are may have had training in a current or previous organization, where it was learned that requirements documents are written without consulting with the end-user.

Typically, this model does not involve the end-user in very many steps during traditional CNSL knowledge system development. Consequently, computer design systems developed using this model often have serious drawbacks when implemented and become underused system by users for whom the system was designed. The user interface approach to computer design includes more concern for the potential people who will use the traditional CNSL knowledge system than the traditional approach.

We present several models of computer systems design. The traditional CNSL knowledge functional life – cycle model, the user interface model, and the usability engineering model are discussed as models of computer systems design. The highly automated model seems to be a cultural model for the DL design and the artificial intelligence (AI) model of Cashew Nut Shell Liquit (CNSL) design represents the cultural model of (AI) expert systems design. The last model – the organizationally sensitive “design for Cashew Nut knowledge model – represents a new approach to ways that software developers can design their systems to ensure usability. These models become cultural models when they are taken for granted within an organization or professional community as the way that all systems should be designed.

In this model, a hightened awareness of user preferences and needs more so than in the user interface model is proposed such as:

- know the user – study intended users and use of cashew nut product;
- competitive analysis – analyze existing cashew nut product according to usability guidelines and perform user tests with cashew nut product;
- setting goals – establish minimal acceptable level of usability;
- parallel design to explore different design alternatives before deciding on one final design;
- participatory design, include end-users troughout design phase;
- coordinated design of the total interface – maintain consistency across screen layouts, documentation, on-line help systems, and tutorials;
- apply guidelines and heuristic analysis – select user interface guideline appropriate for situation;
- prototyping "cashew nut shell liquid knowledge " to pretest on end-users;
- empirical testing – test end-users on specific usability attributes;
- iterative design – capture design rationale through iterative testing and design;
- collect feed back from the users for future design.

As in the user interface model, the motivation to involve the end-user is used by developers throughout the application of this model. Consideration of the preference of potential end-user is strongly adhered to in this model through the use of **cashew nut shell liquid (CNSL) knowledge management prototyping** and iterative usability testing in which end-users are repeatedly measured on their effective use of revisions of the systems until a satisfactory.

Summary

The purpose of PDII-LIPI to provide public information services in the field of science and technology information and knowledge, also facilitate access by the professional user. This an article addresses CNSL knowledge design of the PDII-LIPI system, the first part provides a schematic description of the CNSL knowledge management.

The design of CNSL- KM is motivated by several key principles such as:

- a standard, simple interface CNSL design to PDII-LIPI information services from user perspectives;
- the CNSL knowledge management design to provide knowledge services at the lowest possible end-user cost;
- maintaining as much of the global and local resources as possible to support an Indonesian society;

- development of a network of extension agents to provide access to PDII digital library services;
- the principle is reflected in common policies, use of compatible technologies, use of standard forms, procedures, and application of digital network – wide performance measures.

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