Knowledge Storage

How do we store knowledge?
Menu

• A preview on Knowledge Management System
• Impact on Business
• Knowledge storage
• Tools
Preview on Knowledge Management System (KMS)
What is knowledge?

- Data
  - unstructured, fact
- Information
  - structured, fact
- Knowledge
  - structured, non fact

* engineering perspective
Data → Information → Knowledge

January

5

10

Car

February

2

12

Motor
<table>
<thead>
<tr>
<th></th>
<th>January</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Car</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

Data → Information → Knowledge
Data → Information → Knowledge

January  February  March

Motor  10  12  14

Car  5  2  1

*March is prediction
What is Knowledge?

Knowledge Management System

memory system

fact 1
fact 2
fact 3
fact 4

knowledge

knowledge acquisition

data

data acquisition

learn

retain

recall

thinking
Knowledge Creation

To tacit knowledge

From tacit knowledge

Socialization

Dissemination

Internalization

To explicit knowledge

Externalization

Combination

From explicit knowledge

Acquisition

Enrichment
Impact on Business
BIG Data aka. Data Mining aka. DSS

- **Purpose:** finding pattern in data to obtain information
- **Benefit:** provide recommendations to business
- **Loss:** so many buzz words, making it hard to focus
- **Tool:** Apache Hadoop, Pentaho, Weka

**Note:** It is not about the tool, it is about direction
Knowledge Management System

- **Purpose:** record knowledge for references
- **Benefit:** no second mistake
- **Loss:** unstructured, make it hard for knowledge internalization
- **Tool:** way too many tools

Note: It is not about the knowledge, it is about knowledge internalization (dissemination)
Knowledge Storage
Why do we need to care about storage?

- Average information worker spends over an hour and a half on email each day, which is 20% of their work time.

- Employees get 50% - 75% of their relevant information directly from other people.

- More than 80% of enterprise’s digitized information reside in individual hard drives and personal files.

Options on Knowledge Storage

- file system storage:
  - Local
  - Network directories and folders
- Databases
- e-mail
- websites (intranet and external).
Approach on Knowledge Storage

• **Structured**
  • Storage-wise
    • Easy to locate
  • Document-wise
    • Easy to understand

• **Un Structured**
  • Storage-wise
    • Flexibility on storing new type of knowledge
Structured Design in Storage-wise

Example of segmentation:

- Based on Subject:
  - DDC (Dewey Decimal Classification)
  - MARC (Machine Readable Cataloging)

- Based on bibliography

- Based on Format:
  - VPS (Virtual Private Server)
Structured Design in Document-wise

Example of Excerption:
• Based on Metadata:
  • DC (Dublin Core Metadata Initiative)
• Based on RDF:
  • Semantic Web
Un-Structured Design in Storage-wise

Need additional tools:

- OLTP (Online Transaction Processing)
- OLAP (Online Analytical Processing)
Organizing Knowledge

• two-step process:
  1. the information should be divided into manageable units
  2. each unit should be categorized.

• Before the information is divided into smaller units, there is need to determine the size, or granularity, of each meaningful unit. The finer the subdivision or granularity of each unit the more tedious and time consuming the cataloging effort will be.

• After the information is divided into smaller units, the units must then be categorized by content type. In order to do this, it is necessary to create a list of all the content types for the organization. This list may include classifications such as proposals, invoices, white papers, and correspondence.
Expected Result on Better Knowledge Storage

- Faster accessibility
- Higher availability
- Easier to operate and maintain
Tools
DSpace – EPrints – OJS
Why the three?

- **DSpace is the most used (ROAR)**
Registry of Open Access Repositories

ROAR

Number of Repositories

- **DSpace**: 1608
- **EPrints**: 578
- **OJS**: 2 (578)
- **Other**: 3469

Additional Repositories:
- ARNO (4)
- BePress (364)
- CDS Invenio (20)
- ContentDM by OCLC (9)
- DIGIRB (22)
- DigiTool (10)
- DiVA (26)
- DoKs (5)
- DSpace (1608)
- EDOC (1)
- EPrints (578)
- Equella (5)
- ETD-db (30)
- Fedora (58)
- Faz (11)
- Greenstone (21)
- HAL (23)
- i-Top (1)
- Keystone DLS (1)
- MiTOS (15)
- MyCoRe (9)
- Open Journal System (24)
- Open Repository (19)
- OPUS (Open Publications System) (72)
- Other softwares (various) (611)
- PMB Services (3)
- SBCAT (3)
- Scix (3)
- SobekCM (1)
- WIKINDX (1)
- Zentity (1)
Role of Responsibility

Author → Editor → Publisher

Reviewer

OJS + Open Library

DSpace + EPrints
Openness

- Search Engine Friendly
- Metadata Format
- Ability for Indexing

\[\Sigma \text{documents}\]
<table>
<thead>
<tr>
<th>Institution</th>
<th>Num. of Documents</th>
<th>Chosen Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>UGM</td>
<td>71100</td>
<td>Eprints</td>
</tr>
<tr>
<td>IPB</td>
<td>67400</td>
<td>OJS</td>
</tr>
<tr>
<td>UNDIP</td>
<td>41700</td>
<td>EPrints</td>
</tr>
<tr>
<td>UI</td>
<td>18500</td>
<td>OJS</td>
</tr>
<tr>
<td>TEL-U</td>
<td>7580</td>
<td>Open Library</td>
</tr>
<tr>
<td>ITB</td>
<td>6970</td>
<td>OJS</td>
</tr>
<tr>
<td>ITS</td>
<td>4690</td>
<td>OJS</td>
</tr>
<tr>
<td>UNPAD</td>
<td>3730</td>
<td>OJS</td>
</tr>
</tbody>
</table>
## Comparison

<table>
<thead>
<tr>
<th>Aspect</th>
<th>DSpace</th>
<th>EPrints</th>
<th>OJS</th>
<th>OpenLib</th>
</tr>
</thead>
<tbody>
<tr>
<td>Search Engine Friendly</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Metadata Format</td>
<td>QDublin + MARC</td>
<td>Dublin</td>
<td>Dublin + MARC</td>
<td>QDublin</td>
</tr>
<tr>
<td>Technology</td>
<td>Java</td>
<td>Perl</td>
<td>PHP</td>
<td>PHP</td>
</tr>
<tr>
<td>Knowledge Sharing</td>
<td>OAI-PMH SWORD</td>
<td>OAI-PMH SWORD</td>
<td>OAI-PMH</td>
<td>OAI-PMH</td>
</tr>
<tr>
<td>Open Source Software</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Which One?

• Do you need an editorial-reviewer process?
• Or you just need a place to publish?
• Who will be the publisher? You’ll do the extra hour?
Thank You

nyoman.bogi@gmail.com