

Development of Project Document Management System Based on Data Governance With DAMA International Framework

Hanung Nindito Prasetyo
Informatics Management Department,
School of Applied Science, Telkom University
Bandung, Indonesia

Ferra Arik Tridalestari
Informatics Management Department,
School of Applied Science,
Telkom University
Bandung, Indonesia

Regina Nathania Djepapu
Informatics Management Department, School of Applied
Science, Telkom University
Bandung, Indonesia

Irman Hariman
Informatics Engineering Department
Kebangsaan University
Bandung, Indonesia

Abstract- Information will continue to grow in an organization, various forms of information may come in different from of files, documents, archives, policies, procedures, and so forth. In the current era of information technology, document management becomes an absolute factor for an organization. All business processes related to decision-making require updated and valid documents. From this fact, it can be seen that there are still many organizations that do not have an information system based on data governance capable of at the same time managing documents both for the benefit of key business processes and supporting processes, including the management of project documents. It is common that organizations entrust their project management to be handled by a certain group of people in their organizations who are familiar with the documents related to the project. If the organizations, for example, need some documents, they should contact those people and ask for the copies. However, sometimes, the documents do not provide some sufficient data. Therefore, a good document management system model is needed to manage project documents. One of the standards that can be used is the management of documents based on DAMA International standards. With reference to DAMA International as a data governance standard, organizations will be easy to manage project documents in improving organizational performance.

Keywords— Document Management System; DAMA International; Project Documents

I. INTRODUCTION

Information will continue to evolve. In an organization, for instance, it has been developed to be then formed into files, documents, archives, policies, procedures, etc. Document management, however, becomes essential for an organization, particularly in the era of information technology. They will certainly need some updated and valid documents to run all of their business processes.. In this case the Document Management System(DMS). Organizational Information Systems will not run optimally without a good document management system. From these facts, it can be concluded that some organizations in Indonesia do not yet have an information

system which is able to manage their documents for the benefit of either their key business or supporting processes. Organizations may face some difficulties in managing the structure and unstructured data generated from the processes. [1]. Unstructured data tends to be difficult to be manage properly Included in this case is the organization that manages the project Documents. It is commonly known that the documents are handled by only a group of people. If They will be contacted whenever a copy of document is needed for a project. However, the data provided are sometimes insufficient. The requested document also does not have sufficient data related to project work. These problems require a standard in managing data pertaining to project documents that can improve the team's performance in completing the project.

Based on these problems it is necessary to model a document management system in accordance with the characteristics of the problem. One of the standards that can be used is document management based on DAMA International standard. DAMA is a standard of organizational data governance. Data governance DAMA is a framework widely used by organizations in the world because it has a complete and adequate framework as a reference for data governance development [3].

II. LITERATURE REVIEW

2.1 Document Management System

Document management System (DMS) is an approach dealing with complex documents. Document management requires an arrangement of all phases in preparing and producing, modifying, formatting, composing, printing, distributing and storing documents. Document management is a system that aims to manage documents digitally using various formats as well as centrally[2].

The main purpose of document management is to convey the value associated with an information. The Benefit of DMS

is that the content is managed digitally that it may appropriately be delivered from the manufacturer to the appropriate user through a process that meets different applicable rules and policies. In this case, among others, Business processes, for instance, are processed through workflow, approval, and security and the monitoring towards the changes in the systems is centralized through an integrated system architecture that supports the task process and work processes which can later improve the organizational performance.

2.2 DAMA International Framework

DAMA Association issues a framework as a reference for data management known as DMBOK (Data Management Body of Knowledge). International DAMA classifies data governance functions into 10 (ten) areas as shown in Figure 1[4].

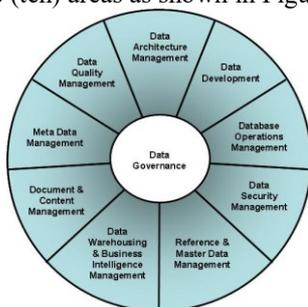


Figure 1 Data Management Model

It can be seen in Figure 1 that the data governance function is the core of the framework. The function of data governance interacts and affects other functions that surround it. Data governance deals with authority and control (planning, monitoring, implementation) of data assets [4]. The 10 (ten) Data management functions in DAMA International are as follows:

- (1) Data Governance, which includes planning, supervision and management control and data usage.
- (2) Data Architecture Management, which is a part of integrating enterprise architecture.
- (3) Data Development, which includes analysis, design, development and testing, distribution and maintenance of data.
- (4) Operational Management Database, which supports the physical structure of data assets, defines the need for data recovery and performance, and helps service levels in this area.
- (5) Data Security Management, which ensures privacy, trust and access rights.
- (6) Reference Management and Master Data, which manage major versions and replicas of data, supervise the creation, alteration and deletion of code and other reference data, define the needs of master data management, identify the issue of master data management.
- (7) Data Warehouse Management and Business Intelligence, which open some access in providing decision support data in terms of reporting and analysis.
- (8) Document and Content Management, which includes storage, protection, indexes and permissions to find

unstructured data. Create and manage business metadata (names, meanings, business rules), define metadata access and integration needs, and use metadata to make effective data management and governance decisions.

- (9) Data Meta Management integrates, which controls and distributes metadata
- (10) Data Quality Management, which defines, supervises and improves data quality.

2.3 Document and Content Management of DAMA

The Document and Content Management Function shall be the basis for the development of this DMS with reference to the activities carried out under the function. Document and Content Management is divided into two parts: document management and content management. Document management focuses on storage, inventory, and document control, while content management focuses on processes, techniques, and technologies for organizing, categorizing, and accessing information structures. The activities carried out under document management are Planning, Development, Operational, and Control [5].

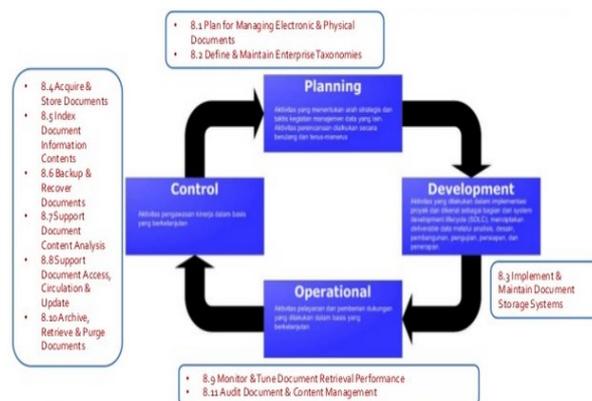


Figure 2. Document Management Activities

Meanwhile, DAMA establishes a framework for document management as can be seen in Table 1.

Table 1. DAMA Document Management Function Framework[8]

No	Documents Management of DAMA
1	Planning for managing documents
2	Implementing document management system, storage, access and security control
3	Having some back up and document recovery
4	Retaining and disposing documents
5	Auditing Document Management

2.4 Related research

There are small number of studies in document management system, including the one implemented in a company, However, they do not have sufficient explanation pertaining to the subject.[9]. This study tries to use DAMA as one of the frameworks to manage company information

III. RESEARCH METHODOLOGY

There are several steps involved in building the project document management system for this organization, including:

1. Library Studies, i.e. by searching the journals, articles, e-books and literatures discussing the design, development and standards used to obtain materials related to the research.
2. Interview, i.e. asking and answering question(s) directly. This method is to ensure that the data obtained are related to the document management system used in the organization and the resource persons are those who manage the project documents.
3. Observation, i.e. a method to collect data or facts. It is, however, quite effective to collect the data or facts by way observing and recording activities related to document management in the organization
4. Analyze, i.e. by analyzing the process and development of standards in document management system through mapping the development needs based on DAMA International Framework..
5. Model Design, i.e. making the design of the document management system model in the organization.
6. Model Development, i.e. developing some application by making some designs using SDLC methodology and UML approach[6][7].

IV. ANALYSIS AND DEVELOPMENT OF DOCUMENT MANAGEMENT SYSTEM BASED ON INTERNATIONAL DAMA

4.1 Plan for managing documents

In this section, the Organization determines the document planning by:

- Defining the key processes and support processes in document management
- Designing the document management system by using Object Oriented Object-based SDLC (OO)

4.2 System Design

4.2.1 Usecase Diagram

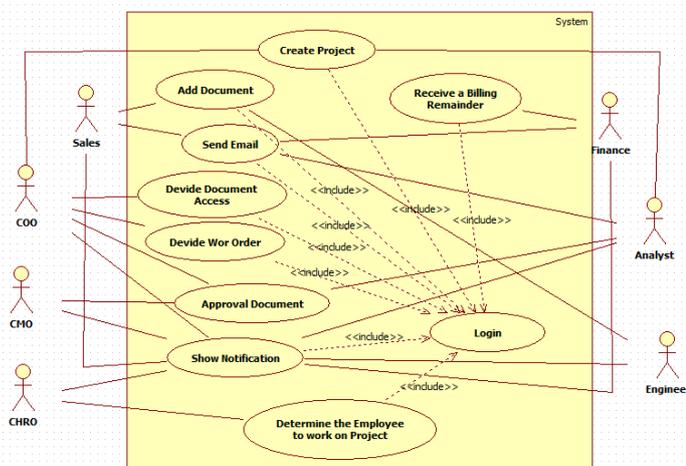


Figure 3. Use Case Diagram

Figure 3 is a use case diagram of the application Management of project documents on the organization

4.2.2 Class Diagram

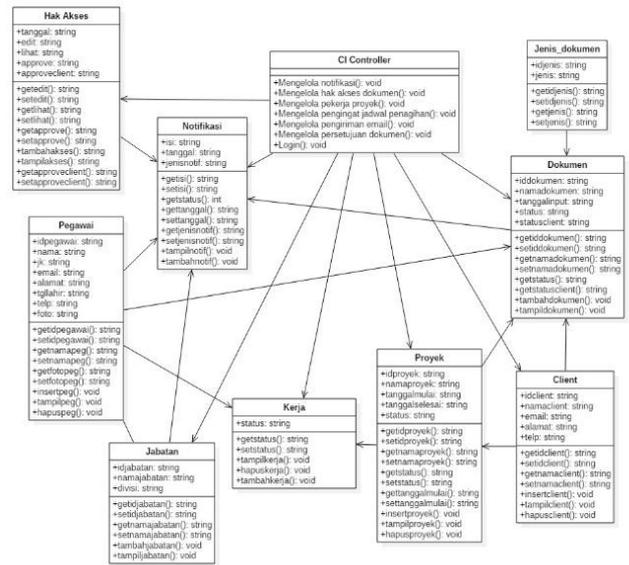


Figure 4. Class Diagram

Figure 4 is a class diagram of management application Project document that has several classes, namely access rights class, notification class, document class, document type class, class staff, class jobdesk, project class, work class, client class, ci controller class.

4.2.3 Relationship Diagram

The following is relation diagram of the project Document management System.

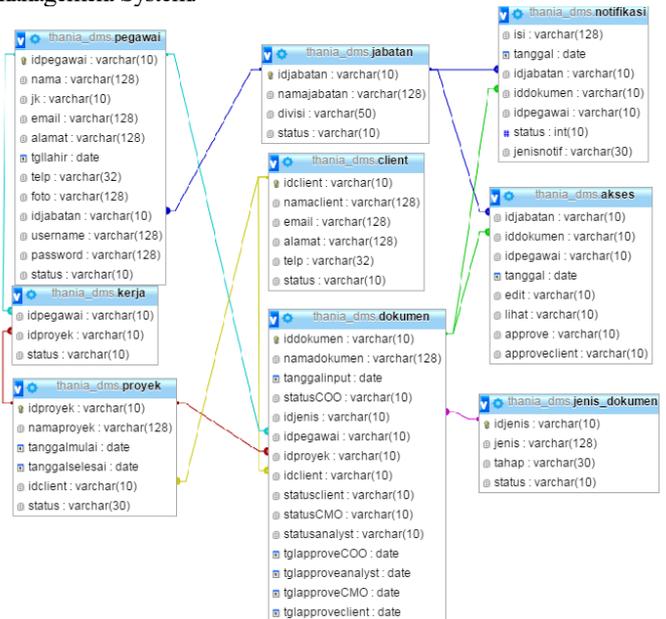


Figure 5. Relationship Diagram

4.3 Implementation of document management system, storage, access and security control

Here is the implementation of the project Document management system in the Organization.

4.3.1 Access Setting

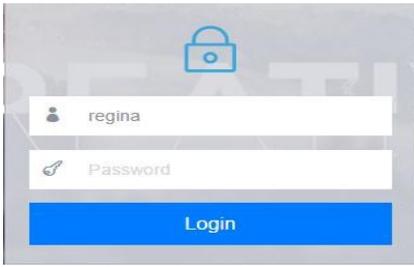


Figure 6. Login Form

The login page is an access control mechanism used by the user including Sales, CHRO, COO, CMO, Finance, Analyst and Engineer. Each user has an existing Username and Password account in the database.

4.3.2 Document Management Settings

A. Setting for Master Data of Client

ID Client	Nama	Email	Alamat	No. Telepon	AKSI
CL001	Gamedia	gamedia@gmail.com	Jl. Tubagus Ismail	0221133456	Edit Hapus
CL002	Nutrifood	nutrifood@gmail.com	Jl. Soekarno Hatta	02211220399	Edit Hapus
CL003	hahad	ddd	sdad	4343	Edit Hapus

Figure 7 Master Data of Client

B. Setting for Master Data of Document

ID Jenis Dokumen	Nama	AKSI
JEN001	Service Agreement	Edit Hapus
JEN002	Terms of References	Edit Hapus
JEN003	Order Form	Edit Hapus
JEN004	Work Order	Edit Hapus
JEN005	Schedule Development	Edit Hapus
JEN006	Design	Edit Hapus
JEN007	Schedule Demo	Edit Hapus
JEN008	Invoice	Edit Hapus
JEN009	Test Plan	Edit Hapus
JEN010	Technical Document	Edit Hapus
JEN011	Berita Acara Penyelesaian	Edit Hapus

Figure 8. Master Data of Documents

C. Master Data of Users

Foto	ID Pegawai	Jabatan	Nama	Email	Username	AKSI
	PEG001	COO	Ragna Djepapu	regnanathanadjeppu@gmail.com	regina	Edit Hapus
	PEG003	Finance	Gabriel Djepapu	gabrie@gmail.com	gabriel	Edit Hapus
	PEG007	CMO	Marenda Adeputa	indra@gmail.com	indra	Edit Hapus
	PEG002	CHRO	Magdalena Waworuntu	magg@gmail.com	magg	Edit Hapus
	PEG006	Engineer	Robert Januana	robertjan@gmail.com	robert	Edit Hapus
	PEG004	Analyst	Jayanti Kusuma Wardani	jay@gmail.com	jayanti	Edit Hapus
	PEG008	Analyst	Rian Saputra	rian@gmail.com	rian	Edit Hapus
	PEG005	Sales	Putri Handayani	put@gmail.com	putri	Edit Hapus
	PEG009	Sales	Thany Puty	thany@gmail.com	-	Tambah User

Figure 9. Master Data of Users

The Master Data page is a page to add the data required in project management. The menu above is a data master page that can only be accessed by COO.

D.1 Master Data of a position in the Organization

ID Jabatan	Nama Jabatan	Divisi	AKSI
JAB001	COO	Operational	Edit Hapus
JAB002	Finance	Finance	Edit Hapus
JAB003	CMO	Account Manager	Edit Hapus
JAB004	CHRO	HR	Edit Hapus
JAB005	Engineer	Developer	Edit Hapus
JAB006	Analyst	Developer	Edit Hapus
JAB007	Sales	Sales	Edit Hapus

Figure 10. Master Data from a role in the organization

D.2 Master Data of staff

Foto	ID Pegawai	Jabatan	Nama	Gender	Email	Username	Alamat	Tanggal Lahir	No. Telepon	AKSI
	PEG001	COO	Ragna Djepapu	Pemempuan	regnanathanadjeppu@gmail.com	regina	PGA	1994-03-10	081221177357	Edit Hapus
	PEG003	Finance	Gabriel Djepapu	Laki-laki	gabrie@gmail.com	gabriel	Jl. Dan Thomas	1993-03-23	0811301210	Edit Hapus
	PEG007	CMO	Marenda Adeputa	Laki-laki	indra@gmail.com	indra	Jl. Pasiranti, Cileunyi	1999-08-28	087563212343	Edit Hapus
	PEG002	CHRO	Magdalena Waworuntu	Pemempuan	magg@gmail.com	magg	Mauwatu	1994-11-22	0813362096	Edit Hapus
	PEG006	Engineer	Robert Januana	Laki-laki	robertjan@gmail.com	robert	Jl. Telekomunikasi, Gung PGA No. 77	1991-04-10	081665077885	Edit Hapus
	PEG004	Analyst	Jayanti Kusuma Wardani	Pemempuan	jay@gmail.com	jayanti	Jl. Torasan Budi, Nara No. 140	1994-01-28	081223344557	Edit Hapus
	PEG008	Analyst	Rian Saputra	Laki-laki	rian@gmail.com	rian	Jl. Soekarno Hatta, Bandung	2015-03-01	0829574844	Edit Hapus
	PEG005	Sales	Putri Handayani	Pemempuan	put@gmail.com	putri	Jl. Soekarno Hatta No.279	1990-07-10	08122788061	Edit Hapus
	PEG009	Sales	Thany Puty	Pemempuan	thany@gmail.com	thany	Jl. Tubagus Ismail, Bandung	2016-05-02	081228850733	Edit Hapus

Figure 11. Master Data of staff

4.3.3 Storage of Project Documents

E. Project Proposal Management Setting

E.1 Pre-Sale Form

Figure 12. Pre-Sale Form

E.2 Post –Sale Form

Figure 13. Post Sale Form

E.3 Pre-Development Form

Figure 14. Pre-Development Form

F. Development Form

Figure 15. Development Form

G. Document Delivery Form

Figure 16. Document Delivery Form

The last is the Delivery page where it can only be accessed by Analyst and Engineer and the types of documents that can be input are only Technical Document and Finishing Form.

4.3.4 Back up dan Document Recovery

Determine the back up of documents on the system by determining the mechanism of backup and recovery.

Table 2 Set of Document Recovery

Data Asset	Format	Revision	Custody
Service Agreement		X	
Terms of References		X	
Order Form	X	X	X
Work Order			X
Schedule Development		X	X
Design		X	
Schedule Demo	X		X
Invoice		X	X
Test Plan	X		X
Technical Documents	X		
Finishing Form	X		X

4.3.5 Data Storage and Destruction

F. Project Document Retrieval

ID Proyek	Nama Proyek	Tanggal Mulai	Tanggal Selesai	Client	List Pegawai yang Terlibat
PRC001	Penggajian Karyawan	2015-01-02	2015-08-14	CU001	Lihat
PRC002	Absensi Karyawan	2015-09-04	2016-09-04	CU001	Lihat
PRC003	Penjualan	2015-09-09	2015-09-30	CU002	Lihat
PRC004	Absensi Fingerprint	2015-09-10	2016-09-10	CU001	Lihat
PRC005	Penyediaan Barang ATK	2015-09-17	2016-09-17	CU001	Lihat
PRC006	Pengelolaan Order	2015-09-20	2016-09-20	CU002	Lihat

Figure 17. Project Document Retrieval

In the search of project documents, it can be seen that there is a list of projects where this page can only be accessed by CHRO.

H. Document Approval

ID Dokumen	Proyek	Client	Nama Dokumen	Status	Aksi
DK002	PR001	CL001	Terms_of_References_Pengajaran_Karyawan_Gamedia.doc	--	Approve
DK003	PR001	CL001	Service_Agreement_Pengajaran_Karyawan_Gamedia1.doc	--	Approve
DK004	PR001	CL001	Service_Agreement_Pengajaran_Karyawan_Gamedia1.jpg	--	Approve
DK005	PR001	CL001	Terms_of_References_Pengajaran_Karyawan_Gamedia1.doc	--	Approve
DK006	PR001	CL001	Terms_of_References_Pengajaran_Karyawan_Gamedia1.doc	--	Approve
DK007	PR001	CL001	Terms_of_References_Pengajaran_Karyawan_Gamedia1.JPG	--	Approve
DK008	PR001	CL001	Terms_of_References_Pengajaran_Karyawan_Gamedia1.JPG	--	Approve
DK009	PR003	CL002	Work_Order_Perjuaan_Nutrifood.doc	--	Approve
DK010	PR003	CL002	Design_Perjuaan_Nutrifood.doc	--	Approve

Figure 18. Documents Approval

On the approval page, the user can give approval to the document.

4.3.6 Document Management Audit

This section is based on the document management system that is built based on the indicators of purposes and measurements made as in table. 3.

Table 3. Audit measurement of Document Management System

Document Management Component	Audit Measurement
Inventory	Using document storage is provided with permission.
Storage	Document storage is set up by the organization through a built server.
Reliability & Accuracy	Documents are stored as needed by the organization
Classification & Indexing Schemes	Document metadata already exists
Access & Retrieval	There are access and form to search documents
Retention Process	The storage process is done gradually through certain access according to the process flow
Disposition Methods	The mechanism to stored document is done in stages in accordance with the authority
Security & Confidentiality	The built system is believed to have been able to manage data security, but some other mechanism need to be added to the document management system.
Organizational Understanding of Documents	The right to access documents can support the performance of the organization

V. CONCLUSION

Based on the discussion, it can be concluded that :

1. Systems generated by DAMA International approach can support data governance mechanisms within the organization.
2. The system is built to be able to manage documents so that documents are stored centrally so that the documents needed are quickly found in precise result and it is also able to control the dissemination of documents appropriately to users who provided with permission so as to improve its performance.

Therefore, the project document management mechanism can work well and support the organization's business processes in accordance with the Data Governance standard.

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