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].

![Data Management Model](image)

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].

![Document Management Activities](image)

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Document Management of DAMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Planning for managing documents</td>
</tr>
<tr>
<td>2</td>
<td>Implementing document management system, storage, access and security control</td>
</tr>
<tr>
<td>3</td>
<td>Having some back up and document recovery</td>
</tr>
<tr>
<td>4</td>
<td>Retaining and disposing documents</td>
</tr>
<tr>
<td>5</td>
<td>Auditing Document Management</td>
</tr>
</tbody>
</table>

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

4.2.2 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 relationship diagram of the project Document management System.
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

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

B. Setting for Master Data of Document

C. Master Data of Users

D.1 Master Data of a position in the Organization

D.2 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](image)

E.2 Post-Sale Form

![Figure 13. Post Sale Form](image)

E.3 Pre-Development Form

![Figure 14. Pre-Development Form](image)

F. Development Form

![Figure 15. Development Form](image)

G. 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>
<thead>
<tr>
<th>Data Asset</th>
<th>Format</th>
<th>Revision</th>
<th>Custody</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Agreement</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Terms of References</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Order Form</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Work Order</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Schedule Development</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Schedule Demo</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Invoice</td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Test Plan</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Technical Documents</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finishing Form</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

4.3.5 Data Storage and Destruction

F. Project Document Retrieval

![Figure 16. Document Delivery Form](image)

![Figure 17. Project Document Retrieval](image)
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

![Figure 18. Documents Approval](image)

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

<table>
<thead>
<tr>
<th>Document Management Component</th>
<th>Audit Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inventory</td>
<td>Using document storage is provided with permission.</td>
</tr>
<tr>
<td>Storage</td>
<td>Document storage is set up by the organization through a built server.</td>
</tr>
<tr>
<td>Reliability &amp; Accuracy</td>
<td>Documents are stored as needed by the organization</td>
</tr>
<tr>
<td>Classification &amp; Indexing Schemes</td>
<td>Document metadata already exists</td>
</tr>
<tr>
<td>Access &amp; Retrieval</td>
<td>There are access and form to search documents</td>
</tr>
<tr>
<td>Retention Process</td>
<td>The storage process is done gradually through certain access according to the process flow</td>
</tr>
<tr>
<td>Disposition Methods</td>
<td>The mechanism to stored document is done in stages in accordance with the authority</td>
</tr>
<tr>
<td>Security &amp; Confidentiality</td>
<td>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.</td>
</tr>
<tr>
<td>Organizational Understanding Documents</td>
<td>The right to access documents can support the performance of the organization</td>
</tr>
</tbody>
</table>

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.

REFERENCES