



# **WEB-BASED APPLICATION FOR TRACKING, LISTING AND REPORTING DOCUMENT REVIEW (CASE STUDY: PT. XYZ)**

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*Abstract— Clinical laboratories as health care providers must implement good clinical laboratory practices in order to provide accurate examination results that will be used as information to support diagnosis, treatment, and recovery of health. Information technology can be used in the implementation of good clinical laboratory practices. PT. XYZ, especially the Technical Quality Assurance division, has a large number of documents related to laboratory examination that must be reviewed periodically as the implementation of good clinical laboratory practice. Tracking, listing, and reporting the results of the review of TQA's internal documents is currently done manually. Developing an application system related to these needs by utilizing information technology can be a continuous improvement that increases productivity. This research was conducted in XYZ Clinical Laboratory with the aim of helping TQA division employees monitor, record, and report lists of documents that have been or have not been reviewed. The research was carried out with methods of observation, interviews, and literature studies to produce analysis, design, and application of tracking, recording, and reporting the results of document review. This application is made using the Python programming language and Django as web framework.*

*Keywords— django, clinical laboratory, python, information system, document tracking*

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## **I. INTRODUCTION**

Every clinical laboratorium need standard operating procedures which is regulate how test is performed. Standard operating procedures (SOP) is needed to make sure that the laboratorium is producing result that meet the quality standard. Without SOP, laboratorium will have difficulty controlling the quality of the results and doesn't know how to troubleshoot them.

A routine review of documents or SOP is required to ensure the relevance of the contents of the document to the development of science and technology. PT. XYZ, the organizer of XYZ Clinical Laboratory (XYZ), is the clinical laboratory with the largest network in Indonesia. XYZ through its

quality-based performance, is committed to producing excellent health checks and services that satisfy customers and make continuous improvements. XYZ has a department that is responsible for quality assurance, which is the Technical Quality Assurance (TQA) division. This division is responsible for ensuring the quality of examination and providing documents related to laboratory examinations, etc. As a laboratory with a complete examination, the documents managed by the TQA division are numerous.

The results of the document review are reported monthly and counted as performance indicator. Currently, the tracking, listing and reporting process of the TQA division's internal documents in PT XYZ is carried out manually. The process is prone to errors and ineffective.

With the above problems, a proposed system is needed to facilitate the process of tracking, listing and reporting of document review results at PT XYZ at TQA Division. The purpose of this study is to find out how to provide a tracking system, recording and reporting the results of document reviews so that the business process can run effectively and efficiently.

## II. FUNDAMENTAL THEORY

To support this research, there are several theories related to the problem and need to be mentioned as the foundation of this research.

### 1. Clinical laboratory

Based on Minister of Health Regulation No. 411 of 2010, the definition of clinical laboratories is a laboratory in health field that carries out clinical specimen inspection services to obtain information about individual health especially to support efforts to diagnose diseases, cure diseases and health recovery [1].

### 2. Good Laboratory Practice (GLP)

Definition of GLP is a quality system that deals with organizational processes and conditions in which non-clinical health studies and environmental safety are planned, implemented, monitored, recorded, stored and reported. Administrative work also part of GLP. This quality system intends to ensure the careful and accurate documentation, which covering all aspects of a study and of its environment, the quality, integrity and reliability of safety data [2].

More specifically for clinical laboratories is a good clinical laboratory practice (GCLP). GCLP is an important part of starting and maintaining a clinical laboratory. GCLP is a reference in directing, managing, and working in clinical laboratories so that it can guarantee quality and data integrity, accurate and repeatable checks, and reliable results [3].

### 3. Information System

According to Boell and Cecez-Kezmanovic, definition of IS are complex. Different approaches all different angles of seeing, understanding, and researching this complex phenomena in conceptualizing IS. [4].

According to Wikipedia cited by Paul in Journal of Computing and Information Technology, information system (IS) in a general sense could be refers to a system of people, data records and activities that process the data and information in an organization, and it includes the organization's manual and automated processes [5]. This research will use web technology because it's available all the time and can be accessed anywhere, anytime [6].

### 4. Django

Django is one of the Python based web frameworks developed by Adrian Holovaty and Jacob Kaplan Moss in 2003. Django has a Model View Template (MVT) architecture. The advantage of Django is that programmers can create applications in a short time and follow the principle of Don't Repeat Yourself. Another advantage of Django is its functionality which can be expanded with packages ready to install [7].

### III. METHODOLOGY

In doing this research, the author has define and take steps systematically so the purpose desired of this research can be achieved [8]. Figure 1 is the flow diagram of the research steps taken to finish this study.

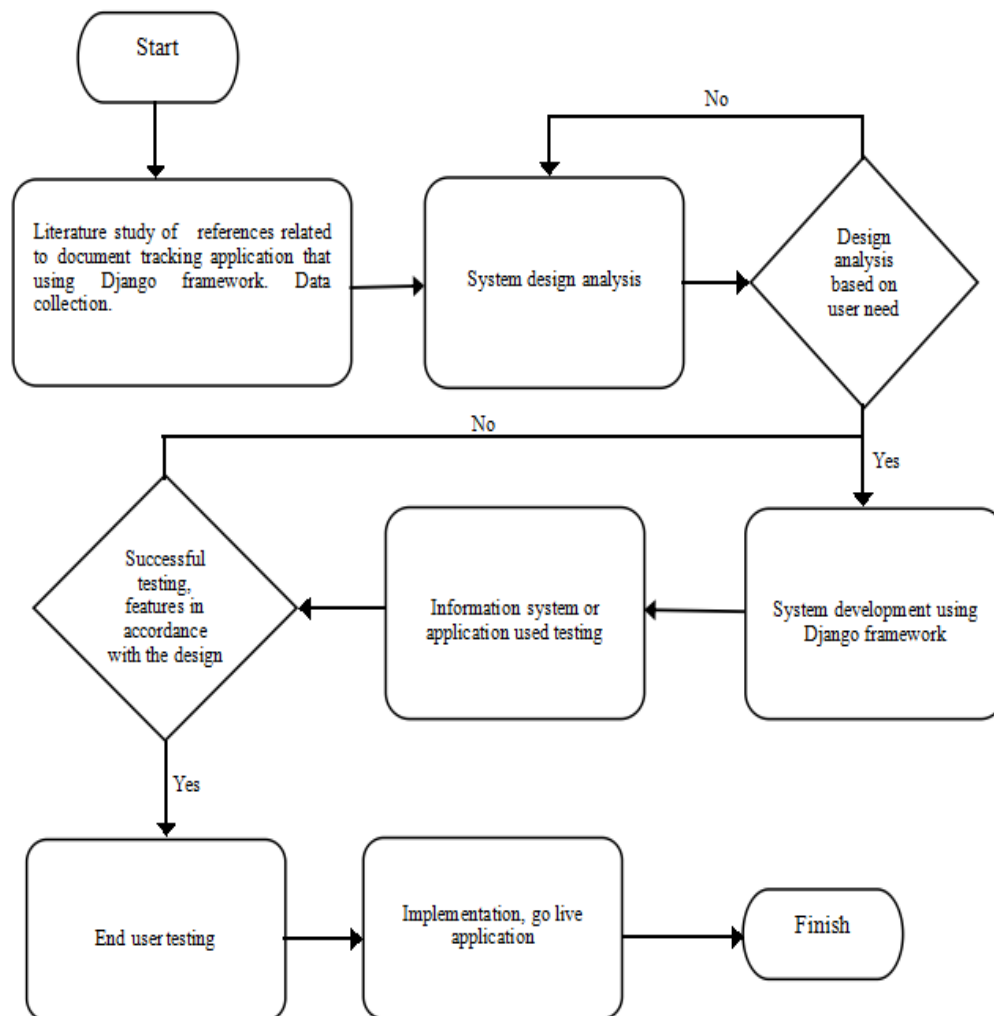


Fig. 1 Research flow diagram

#### A. Data Collection

In this study, data collection was done by three techniques:

1. Observation

Observation is done at TQA Division PT XYZ to analyze the running business process of tracking, listing and reporting of document review results.

2. Interview

The interview was conducted at PT XYZ with admin officer, assistant manager, manager and head division as part of the running business process.

3. Literature study

#### B. System development method

The system development method used in this research is the waterfall model. The Waterfall method uses sequential (Sequential) systematic approach to software development starting from the planning, modeling, construction, system submission or software stages to the customers (deployment).

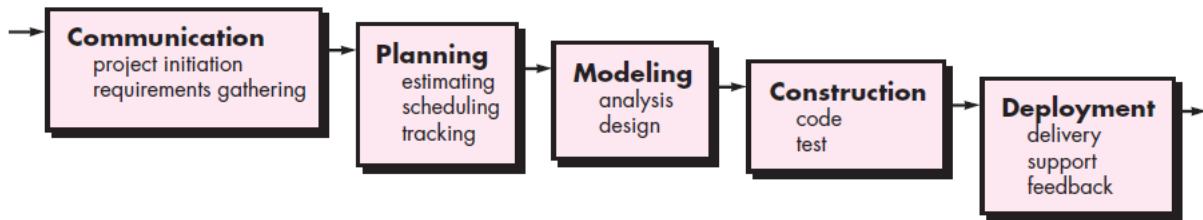


Fig.2 Waterfall process method

- 1) *Communication*: developers must analyze and understand the information contained in the software, then proceed with the requirements (requirements) for all system elements.
- 2) *Planning*: the design phase is based on the needs and estimated time needed to make the application.
- 3) *Modeling*: stages of system architecture / software modeling and design that focus on data structure, software architecture, interface display, and program algorithms.
- 4) *Construction*: after going through the modeling stage, the design that has been made is converted into machine language. If the development process has been completed, testing can be done to make sure the code written does not have a bug or error.
- 5) *System (software) submission*: delivery of software to end-users along with adjustments and system / software improvements based on user feedback [9].

#### IV. RESULTS AND DISCUSSIONS

##### 1. Current Business Process

The following is the flow map of the current business process

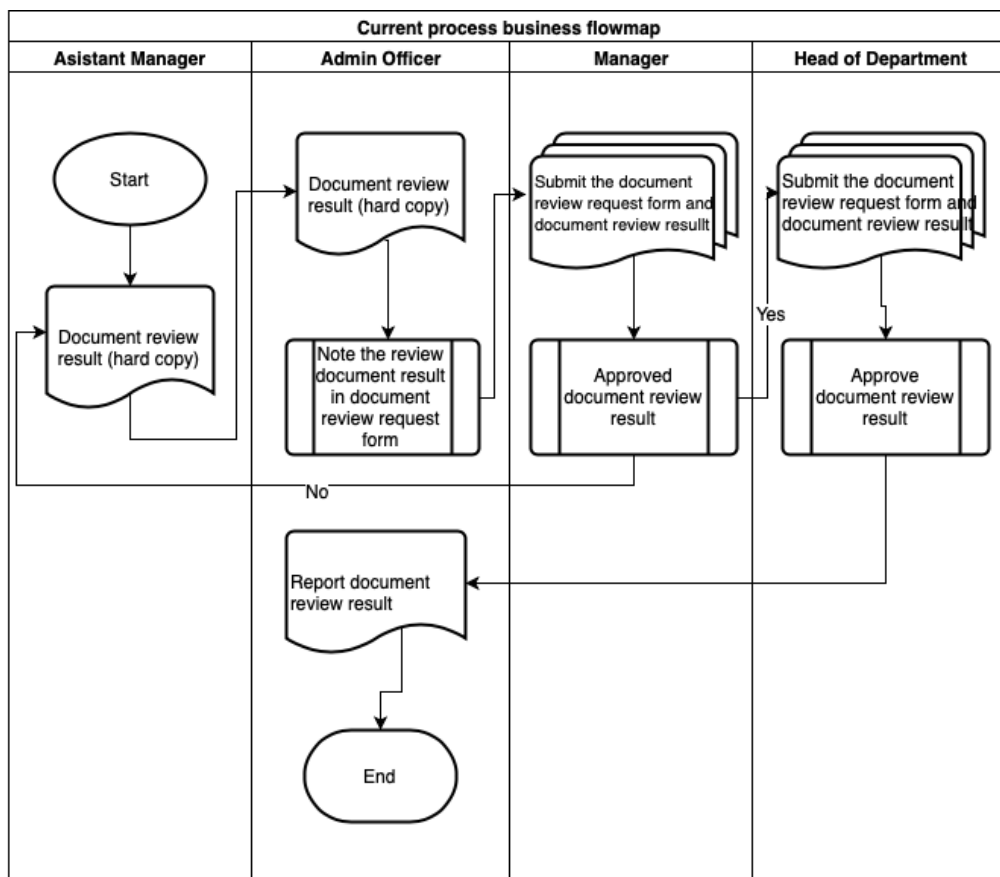


Fig.3 Current Business Process Flowmap

Figure 3 explains that there are several stages in review document process. First, Assistant Manager give hard copy of document review result to the Admin Officer. Admin Officer then take a note of the reviewed document and submit both of the form and document review result to the Manager. The manager will give correction and if approved, the documents and the form goes to Head of Department. If the document is approved, it goes back to the Admin Officer. Admin Officer then report the document review result to the management.

2. Analysis of Proposed System

Since the process of document review is far from effective and efficient, the author propose to create a document tracking, listing and reporting system which can be used to solve the problem at TQA Division PT XYZ.

a. Use Case Diagram of Proposed System

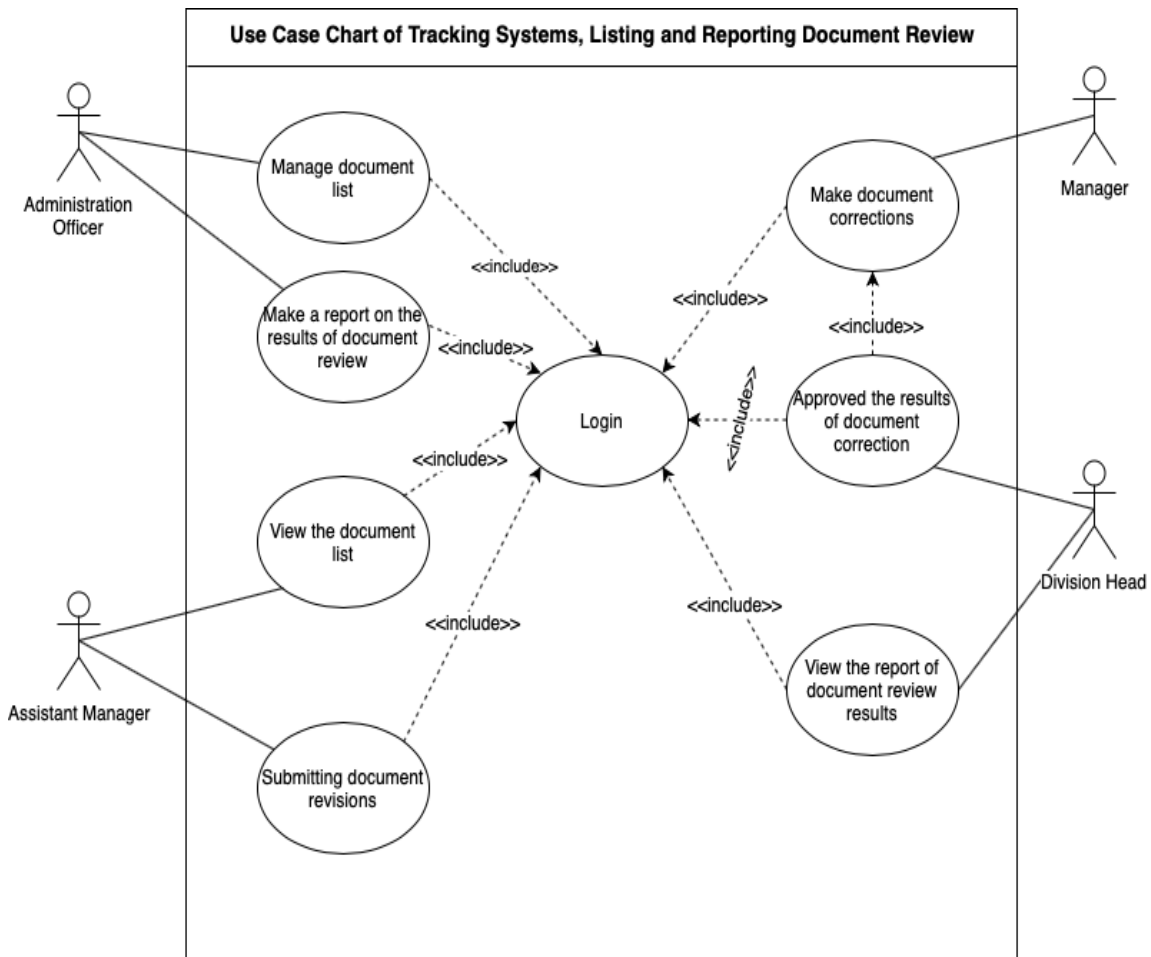


Fig.4 Use Case Diagram of Proposed System

## b. Class Diagram of Proposed System

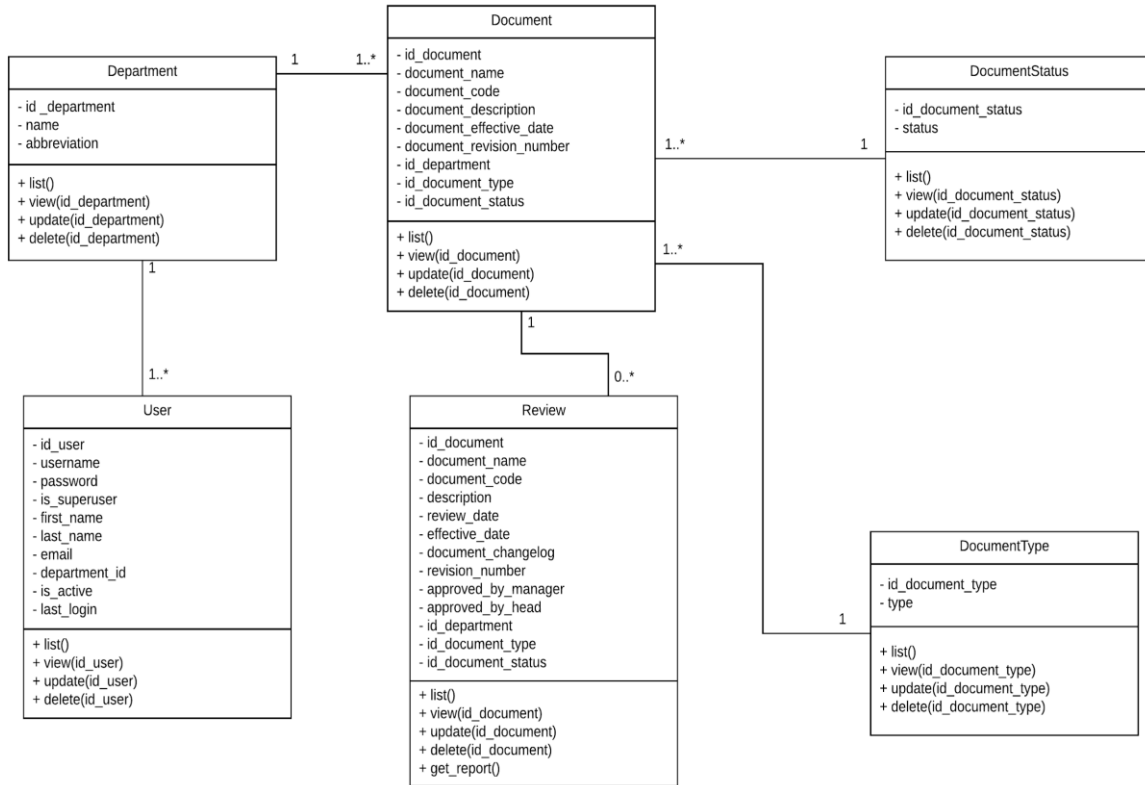


Fig.5 Class Diagram of Proposed System\

## 3. Implementation

### a. Login Screen

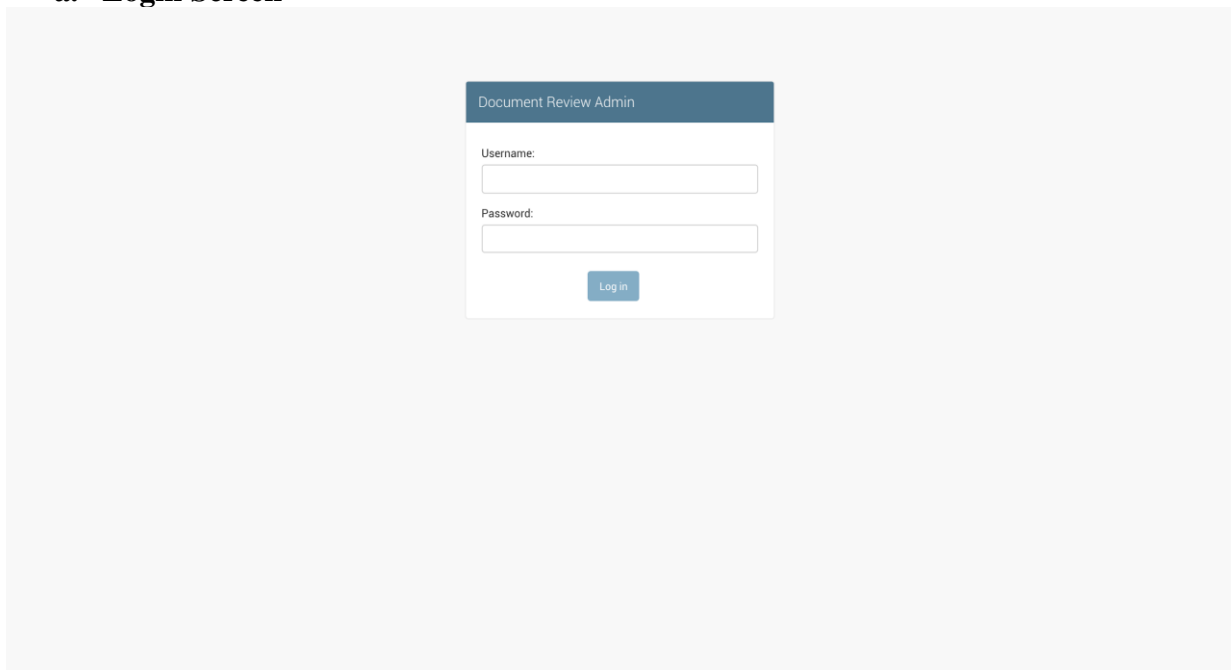


Fig.6 Login Screen to Document Review Admin

Figure 6 is login page display. Every user must be login using username and password that has been recorded on the system. If the username and password match with the ones saved on the system, User is redirected to the dashboard admin page. If username and password not match, user redirected back to the login page with error messages.

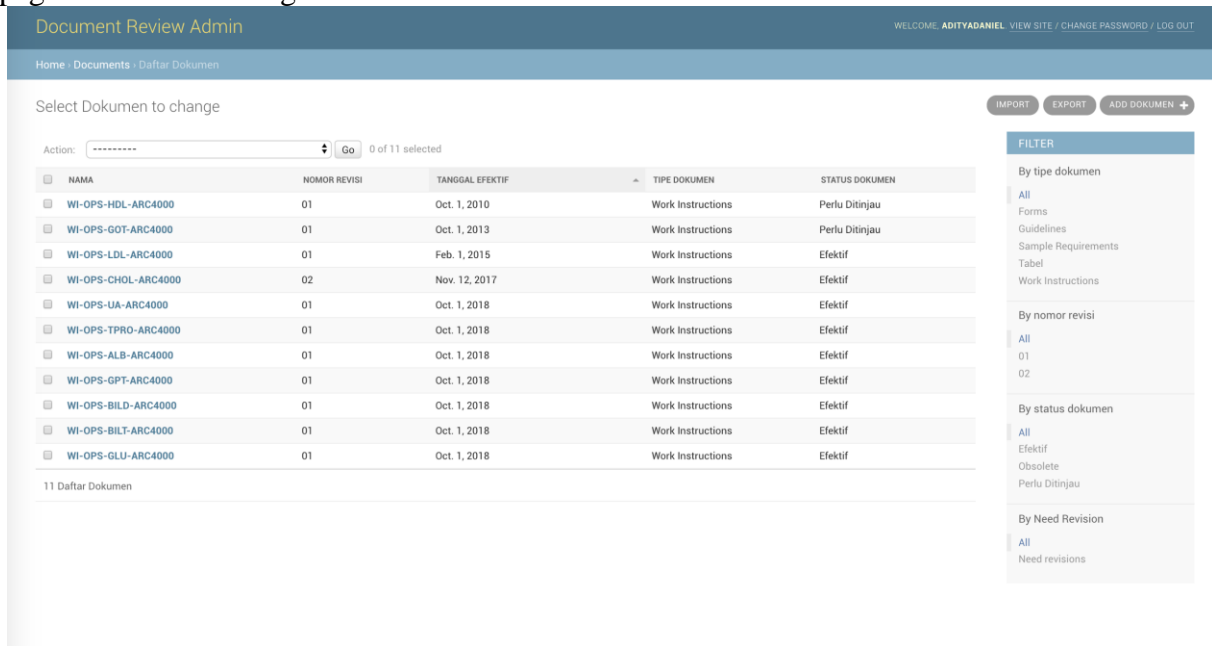


Fig.7 List of Documents.

Figure 7 shows list of documents stored on the system. After user login using username and password, they can click Documents menu to show list of documents. On this page, user can see which documents need to be reviewed and which one is still effective in use. Admin officer can add new document using Add Document button or import it by utilizing excel files. Admin officer also can filter documents based on document status or document type using link at the right box of document list

#### 4. Testing

In this research the testing method is performed using Black Box method utilizing Selenium webdriver and Python language binding. Based on the testing performed, all the functionality provided by the application can be used properly.

No	Actor	Activities	Information
1	Admin Officer	Login into system, manage documents and create report of reviewed documents	All activities can be performed successfully
2	Assistant Manager	Login into system and request correction for reviewed documents	All activities can be performed successfully
3	Manager	Login into system and approve correction request from Assistant Manager	All activities can be performed successfully
4	Head of Department	Login into system, approve reviewed correction from Manager and see reports	All activities can be performed successfully

## V. CONCLUSIONS

- A. The design of web based application to tracking, listing and reporting document review result at PT XYZ successfully carried out using Unified Modeling Language using several diagrams
- B. The web based application to track, listing and reporting document review result at PT XYZ has been successfully developed using Python especially using Django Framework with Waterfall method and can be used to help document review process effective and efficiently.

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