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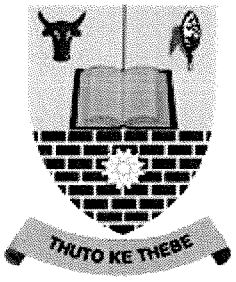

UNIVERSITY of BOTSWANA

PUMAS: A Web-based Publication Management System

SYSTEM DESIGN DOCUMENT

OKAILE R MARUMO	**201101426**
GABRIEL RASENYAI	**200503652**
OFENTSE JABARI	**201006088**
KGALALELO MPIPI	**200101032**
COULSON KGATHI	**200800533**
TSHEPO MOILE	**201005818**

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1. Introduction

1.1 Purpose of the system

The purpose of the PUMAS system is to manage publication of research output from University of Botswana by lecturers and students. It is a web-based platform for upload and viewing of published articles, journals and past projects in the University of Botswana by the University community and the world at large. It addresses (detects and prevents aka controls) publishing of plagiarized academic content.

1.2 Design goals

a) Availability - The system shall be accessible everywhere in the world
b) Security - The system shall implement security measures to protect published document from abuse.
c) Scalability - The system must support concurrent access and querying of the repository from multiple users without any performance degradation.
d) Consistency - The system's look and feel should be uniform across all major web browsers.
e) Fast Delivery - The system shall be delivered by the end of the 2016/2017 first semester period, i.e. within 3 months.

1.4 Overview of the Design Document

The PUMAS System Design Document provides the documentation that will be used to aid in the development of the PUMAS system by providing the details for how the software should be built. Within this document are narrative descriptions and graphical models of the software design for the project including subsystems of the PUMAS system, system architecture decisions and other supporting information about the PUMAS system. It is separated into different sections representing:

a) An analysis of the current system architecture;
b) Description of the Proposed Software Architecture;
c) And Subsystem Services

2. Current Software Architecture

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The University of Botswana uses two systems to manage research publications.

→ First, talk about the current software

Research Management System (RMS)

Function

Facilitates the conduction of research and the management of research publications.

Scope

The RMS system manages the whole research process from idea to proposal, budgeting, project management through to the final research output.

Design

User Profiles:
Lecturers
Graduate Students
Deployment:
It is a web-based application available only within the University of Botswana.
Interfaces: — ?
None

Features

Supports the complete research lifecycle
Supports multiple data file formats
CV generator module
Public Web Profile Generator
IP Portfolio Management

Limitations

a) RMS is proprietary and depends on availability of license funds to continue using it.
b) It cannot interface with existing University of Botswana systems such as Open Journal System (OJS) and Open Conference System (OCS).

UBRISA

Function

UBRISA is a collection or repository of research outputs.

Scope

UBRISA is simply an archive. It stores research outputs for preservation and obviously for open access.

Design

User Profiles:

a) Lecturers
b) Graduate Students

Deployment:
It is a web-based application. It uses an open source application called DSPACE that is developed by Universities for purposes of open access. ?
It mains an asset store and as associated metadata store in a relational database.
Interfaces:
It can interface with existing applications Open Journal System (OJS) and Open Conference System (OCS) for purposes of archiving and preserving University of Botswana research *output.*
Supports integration with LDAP for federated access by Lecturers and Students.

Features

Content Indexing and cataloguing
Supports administration, deposit, ingest, search and access
Built-in workflows
Built-in search engine called Lucene
Permissions granularity
Built-in data integrity checks

Limitations: Depends on activity of the open source developer community supporting it.

Both existing systems do not address the gap of documenting previous undergraduate projects and their continued use is dependent on external factors, and so the need to develop the PUMAS system.

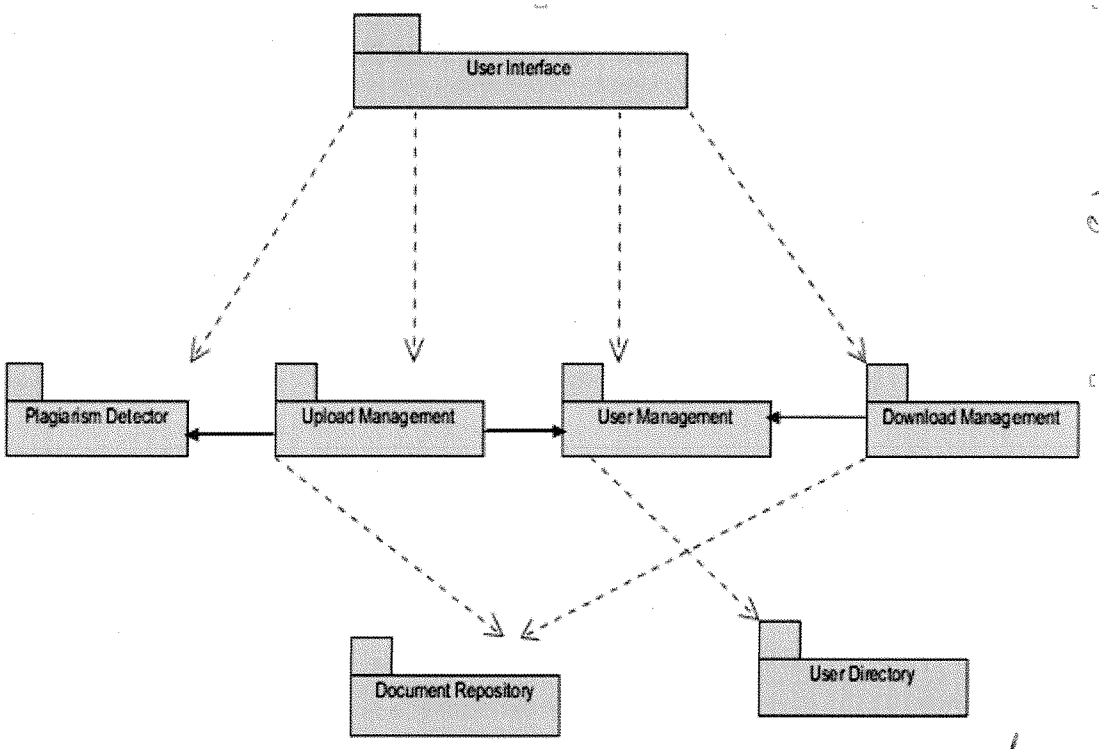
what about their architectures?

3. Proposed Software Architecture

3.1. Overview

The purpose of the proposed system is to provide a central repository for management of publications from the lecturers and students of the University of Botswana. The system aims to make these publications accessible to both the UB community and members of the public. The system will have a plagiarism detection mechanism that will aid in ensuring that research papers produced by students are authentic.

3.2. Subsystem Decomposition



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Describe the function of each subsystem. /

3.3. Hardware/software Mapping

The diagram shown below depicts the outline of the deployment scheme for the PUMAS.

- Computer/laptop/tablet
  Web Browser

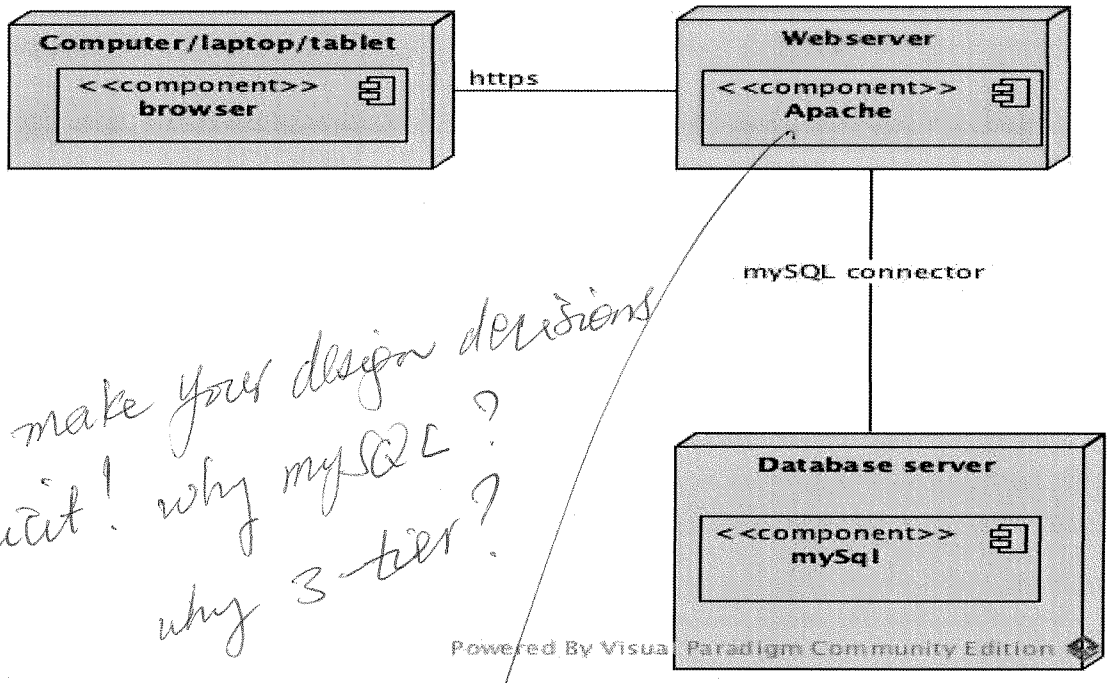
- Server
  Apache web Server

- Database Server

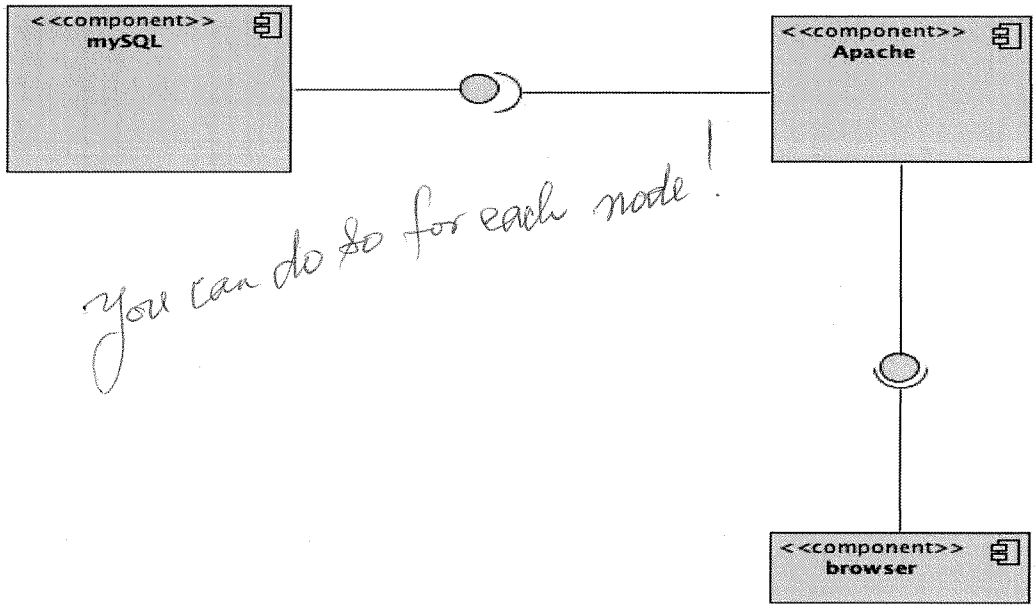
mySQL Database

The using the Browser uses HTTP/HTTPS protocol in their respective computers. TCP/IP protocol is used for connection between the servers and the computers. The Application Server has a Tomcat Application Server running on a particular port listening for requests from the user computers. Database Server uses the MySQL connector for connecting an application with MySQL database.

DEPLOYMENT DIAGRAM



COMPONENT DIAGRAM



You can do so for each node!

3.4. Persistent Data Management

Documents submitted file system

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There is a need to maintain a file system for all the submitted to reside physically. Files will have to be managed, deletion, update of documents and the security on the documents.

Database

A database will be used to store data, documents meta data.
The following users table will exist.

- provide the data model for your persistent data!
- describe database infrastructure decisions!

DOCUMENT TABLE

Column	Type	Comments
document_id(PRIMARY KEY)	int	The primary key that makes each field unique.
Title	VarChar	
Author (FOREIGN KEY)	User	
programm	VarChar	Subject of study e.g computer science
Abstract	VarChar	
Publication_date	Date	
Publication_location	Varchar	

USERS TABLE

Column	Type	Comments
Id_no (PRIMARY KEY)	Int	The primary key for the users, this will be either the stuff it, or student id
Firstname	Varchar	
Surname	Varchar	
Password	Password	
Email	Varchar	
Group(FOREIGN KEY)	Group	The group of permissions that a user belongs to.
Username	Varchar	
User type	Varchar	

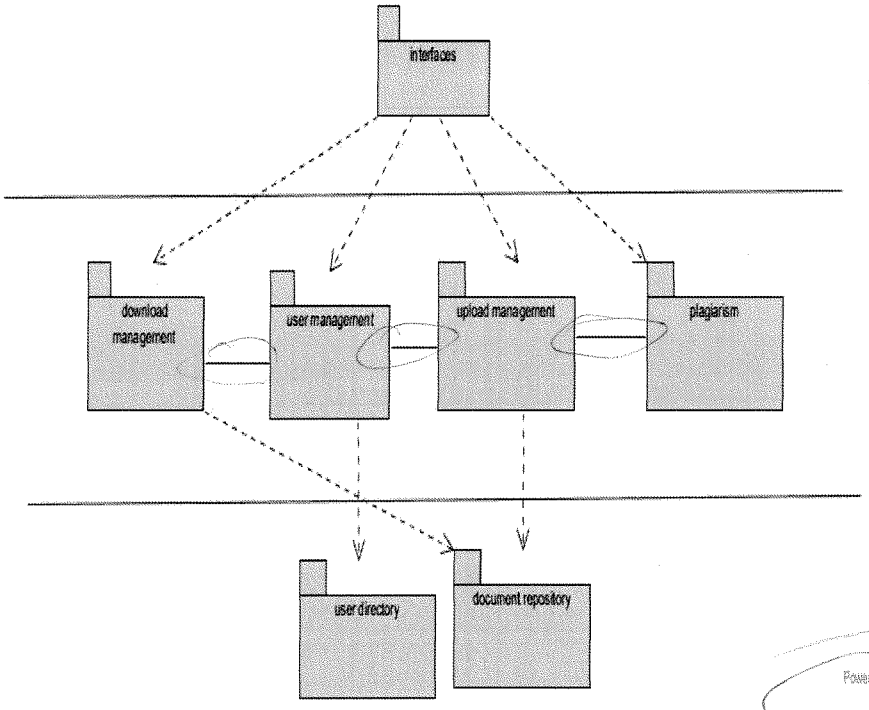
not during system design!

3.5. Access Control and Security

The following access control table will be used.

	Document	Source code	User
Graduate Student	Upload() Download() View()		
Undergraduate student	Upload() Download() View()	upload()	
Lecturer	Upload() Download() View()	Download() View()	
Administrator			<<create>> Manage()
Guest	Download() View()		

3.6. Architecture



MODEL DESCRIPTION

The three layer architecture was selected because it reflected the hierarchy in subsystem dependencies best. A considerable number of the subsystems provide business logic (layer 2) services to user interfaces for example authentication mechanisms, document upload and download services. The layer 2 provides controls to layer 1 and 3, the functionality employed by layer 2 includes the plagiarism detection, a subsystem that provides service to the upload

management subsystem through file processing and storing the results of each document upload.

4.0 Subsystem Services

1. Subsystem Services

1. **User interface:** The main service provided by this subsystem is the interface between the user and the system. It enables the user to be able to access all the services in the Pumas System by providing an interaction between the user and the system.
    - Takes user input
    - Passes input to the Controller
    - Display the system output
2. **Upload Management:** Manages all services and functions that have to do with the uploading of a document.
    - It manages all uploads
    - It Manages all uploads approvals
3. **Download Management**: Manages all services and functions that have to do with the Download of a document.
    - Handles searching process and criteria's
    - Manages view functions
    - Manages downloading of documents
4. **User Management:** User Management provides user privileges management and access control. User Accounts administration is done here.
    - Assigning different groups with different access rights (privileges)

- Adding users into different groups (students, Lecturers)
- Modifying user accounts and user groups

5. **User Directory:** This the main storage for the PUMAS system users
    - Provides user details.
6. **Document Repository:** Provides the system with a storage platform for all the document data it requires to store.
    - Allows updates into the data from different subsystems

plagiarism? The most important subsystem is left out!