IT314 Software Engineering Team 7

Low Level Design Document

[Keywords: Design, Modules, Data Flow Diagrams, Use Case Diagrams]

Version 1.0

5 March, 2013

Winter 2012-13
DA-IICT, Gandhinagar

Overview

This is the low level design document for Entelechy website project.

Target Audience

Software Development Team

Document Revision History

Version	Author(s)	Description	Reviewer(s)	Date
1.0	Surabhi, Akash, Manjeet	First Draft	Sonu, Sumit	5 March, 2013

Table of Contents

1. Introduction

A software design document (SDD) is a written description of the software product, that a software designer writes in order to give a software development team an overall guidance of the architecture of the software project.

1.1 Purpose

The purpose of this document is to outline the technical design of the college magazine website 'entelechy.daiict.ac.in' and provide an overview for its usage and management by the users and the site admin respectively. Its main purpose is to –

- Provide low level design of our system
- Provide the link between the Functional Specification and the detailed Technical Design document
- Document the functionality provided by each module or group of modules and show how the various components interact in the design
- This document is intended to help the coding team to build our system.

1.2 Document Overview

This document is organized into the following sections:

- Introduction: Provides information related to this document (e.g. purpose, scope, term definitions etc.)
- Design Overview: Describes the approach and guiding principles
- System Overview: Describes User Characteristics, User Objectives, Hardware and software Requirements, interfaces and Design Constraints.
- System Design: Contains use case diagram, E-R diagram, Relational Scheme, Data-flow Diagram.
- Architecture: Describes architecture design and also describes briefly the functionality of various modules and how group of modules interact to provide common functionality.
- Glossary

1.3 Scope

This document contains the low level design which shows the various modules and how they interact with each other thus enabling our system to work. The Design for various modules outlined in this document builds upon the scope defined in the Requirements phase. This document will serve as a link between design team and coding team and will be frequently referred by coding team to build our system.

1.4 Definitions, Acronyms and Abbreviations

- **PHP** – Hypertext Processor scripting language
- **MySQL** – relational database management system (RDBMS)

1.5 Methodology, Tools, Techniques

- Dia
- Microsoft Word
- WordPress

1.6 Key Stakeholders

- Team Entelechy at DA-IICT
- Prof. Sanjay Srivastava
- Student Community at DA-IICT

1.7 Intended Audience

This document is meant for the technical team for reference during the implementation phase.

2. Design Overview

We aim to redesign the existing college magazine website “entelechy.daiict.ac.in” hosted on wordpress. The website will also have new features for both the site administrator and the users. It will address some of the existing problems on the old website like addition of individual categories for every edition, direct upload system and archival system.

The user registration data, edition information, category information and different post content and details will be stored in a database. This database will be managed by wordpress. Relational and ER diagram of the database are depicted below.

2.1 Background Information

At system level we need to understand the user requirements very clearly before designing the database, information architecture, archival system and UI. For the same we have analysed the various forms filled by the website users, including faculty mentor and other faculty members, to understand their expectations we have also had client meetings to understand their needs and specific requirements.

2.2 Current Process

The current work done for designing includes:

1.) Logic Design: Understanding the requirements and dividing the project into 3 parts. Each part is independent and will be developed as parts of separate evolutions.

2.) Technical Design: Further we have done the flow of processes which is described in section 4 “Use case Diagrams”, understood wordpress database by using wordpress “Relational Schema” and also the old entelechy website database by creating its “Relational Schema”. Finally we have mapped each table and table entries so that we can transfer the old website content to the new website with minimum labour. The final top level architecture is explained in section 5.

2.3 Constraints/ Risks

- Used “Dia” as software tool for E-R Diagram.
- Assuming that requirements are as the client has informed us. We have not added new features.
- Dynamically change the page links for every edition is not being done now, but may be looked upon at a later stage.

2.4 Guiding Principles

- Scalability – It can be used for hosting college website by making minimal changes such as changing name of taxonomies, changing images folder, plug-ins can also be modified for making them work as per user choice.

- Maintainability - It is easy to maintain, as only the admin and the section heads have to ensure that the data being published is of good quality, rest is all automated updation and data extraction.

- Portability - It’s a system tested for only Windows and Linux OS. But since wordpress 3.5 is stable and is platform independent, it should work equally well in android and other OS as well.

3. System Overview

3.1 User Characteristics

- Literate- Yes.
- Language Proficiency- Can speak/write/read/understand English well.
  The initial website build will be shipped in with English language support only.
- Education- Any level of education is good enough provided the person is able to read and understand English properly.
- Computer literacy- The users have no prior issue in handling a computer.

3.2 User Problem Statement

Entelechy is published online by the student club – 'Press Club' since academic year 2004-05. As the magazine has grown over the years, and as its writers and readers have increased, the technical platform on which it operates is becoming seemingly inadequate. The website – *entelechy.daiict.ac.in* is currently hosted on popular, open source publishing tool and content management system (CMS) – 'WordPress' (*wordpress.org*). Although WordPress provides lots of features and services, and the flexibility to develop one's own plugins, themes, etc but the website in its current structure and design is not able to make good use of them—there are number of issues which the editors of the magazine face while editing/publishing articles and managing the website, some examples –

- No direct upload system. Status quo - Writers send their articles to Press Club via mail and the editors have to copy-paste articles on Wordpress
- Categories and tags system is inefficient as they have to be re-created for every edition
- Archival system is inefficient – the entire list of the articles of a particular edition appear instead of section/category wise look
- User profiles have very few options – no place to find articles author wise
- Recommendation system – to allow system to recommend an article to reader based on the kind of articles the reader has read before, and person to person recommendation
- Proper and more robust 'like' and 'comment' functionality
- Twitter integration based on hashtags of tweets
- New improved designs and themes

The Press Club, because of its focus on 'writing' part of the magazine hasn't been able to work much on the technical platform so, there is an essential requirement for reconstruction and redesign of the Entelechy website in a systematic manner which could meet the needs of the Press Club as well as the DA-IICT community at large, which constitutes the readers of the magazine.

3.3 System Objectives

This section outlines the System objectives and requirements for the new system.

- Enabling direct upload for articles.
- No category creation for each new edition.
- To enable section/category wise look on the entire list of the articles of a particular edition.
- Find articles author wise.
- Publish Bulletins.

3.4 Hardware Requirements

Any computing machine – PC, tablet, smart-phone, etc. with internet access is the only hardware requirement from the user side to access the website. The website will be hosted on DA-IICT's servers.

3.5 Software Requirements

The project development would require Adobe Dreamweaver to develop the themes of the website in terms of .css and .php source files and other development work. At the server side, we would require XAMPP software to provide the server capability to run PHP scripts for server side programming. XAMMP also contains within it a MySQL database server program and apache tomcat web server program. The server running XAMPP will be a database server as well as a web server. The database at the server side will be in MySQL and will be used for maintaining whole of the website's and users' information.
We will use various visualization tools like EDraw Maxx 6 and Dia 0.96 for creating the design documents diagrams like sequence diagram, Activity diagram, Data flow Diagram, Database Schema, etc. Microsoft word will be used for writing the documents. Furthermore to move old entelechy website data to new entelechy website database, we will be extensively using MySQL WorkBench 5.2 CE to edit and reformat older data. It will be used to run queries on database of old entelechy website in order to re-structure it according to the new database design of current entelechy website (i.e. the database design offered by Wordpress 3.5).

3.6 Interfaces

Wordpress offers five interfaces logically:

- Administrator - Somebody who has access to all the administration features.
- Editor - Somebody who can publish and manage posts and pages as well as manage other users' posts, etc.
- Author - Somebody who can publish and manage their own posts.
- Contributor - Somebody who can write and manage their posts but not publish them.
- Subscriber - Somebody who can only manage their profile.

All of the above interfaces provide a specific privilege to each user class. All of them will be web interfaces. The user has to login into their account on the website. Once logged in, the users can belong to any of the above category, and will enjoy their respective privileges.

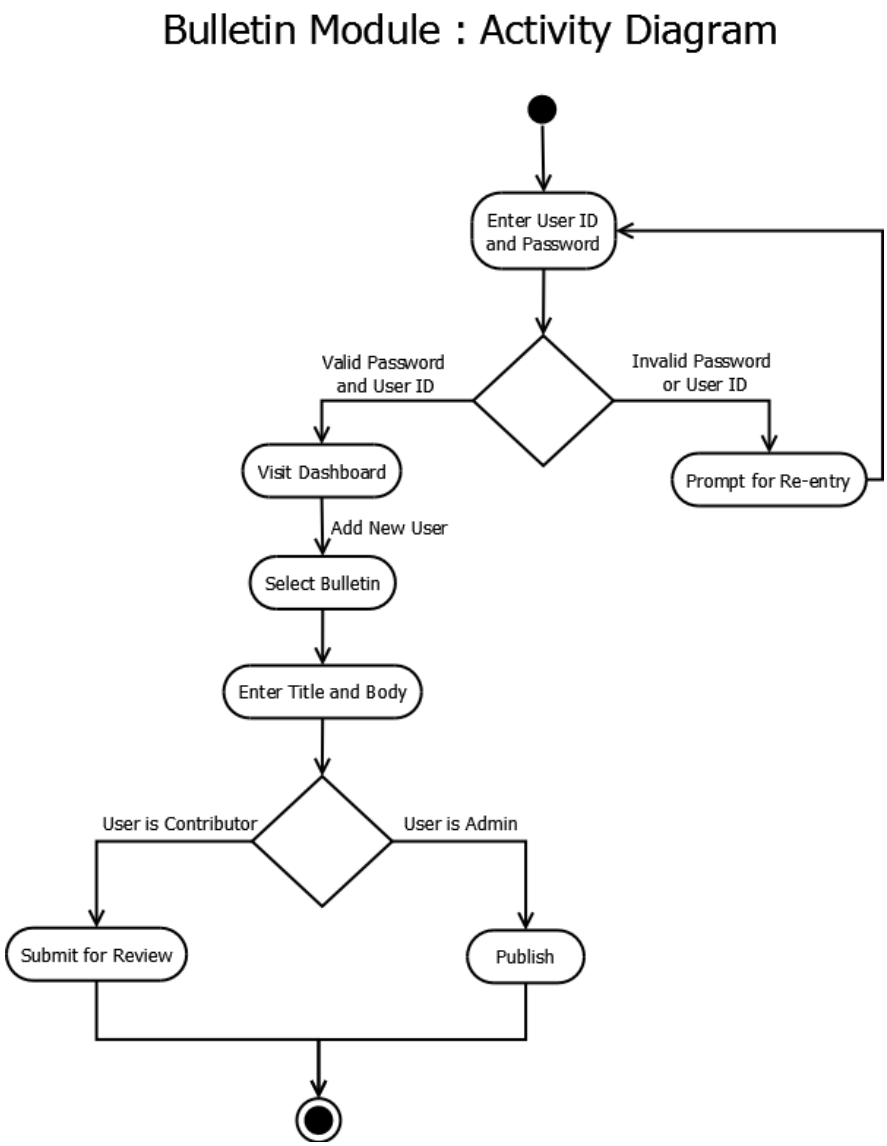
In entelechy, we will be using only three interfaces namely the site admin, editors also known as section heads and contributors for general users.
Any person registering on the site would be made a contributor by default unless admin changes her/his role. This can be done simply be selecting default role as contributor from the admin profile.

4. Design Overview

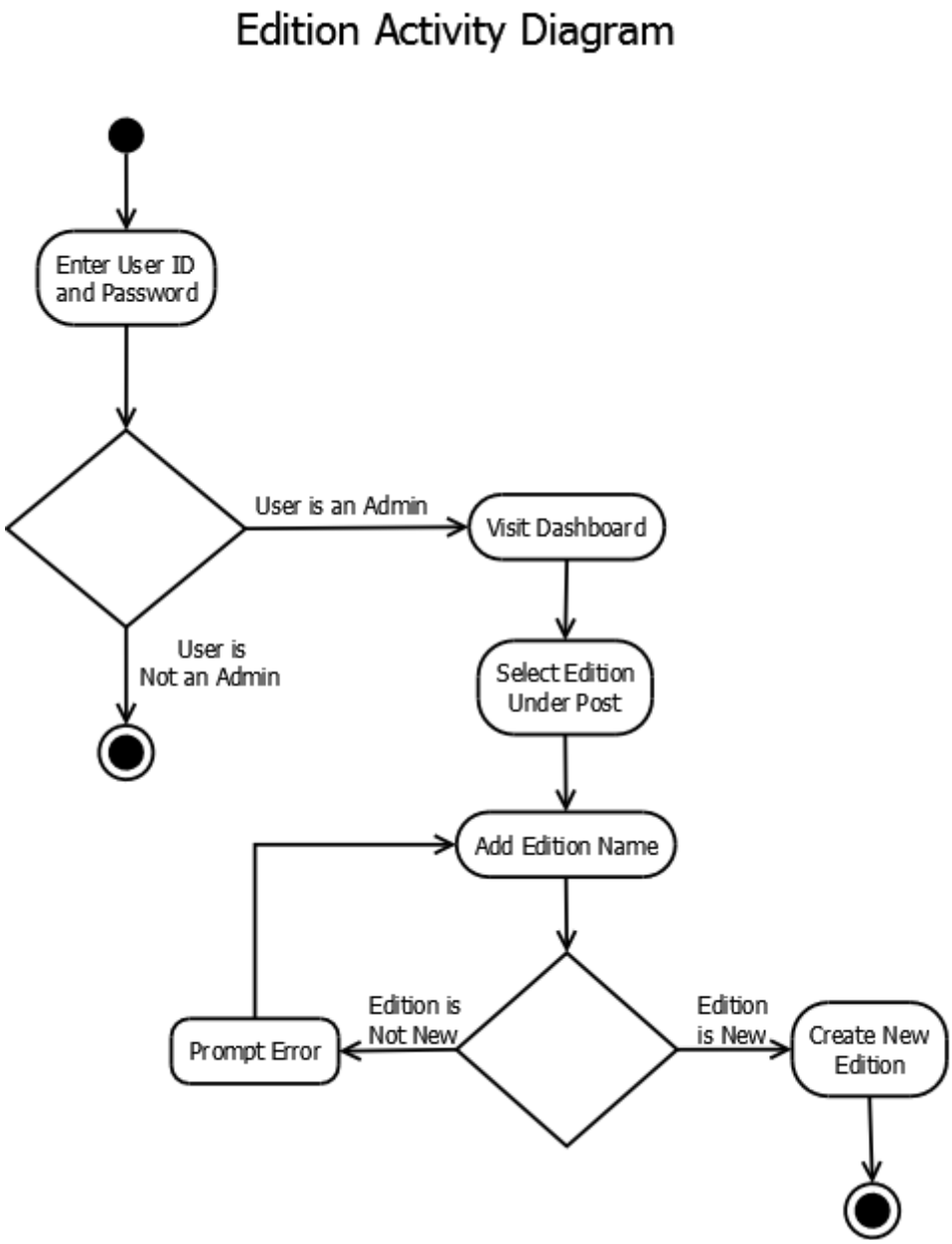
4.1 Activity Diagram

Users of the system will be the Admin, Editor, Contributor, Author and Subscriber. Each type of user has different needs and hence performs different functions as mentioned in the Software Requirements Specification**.**

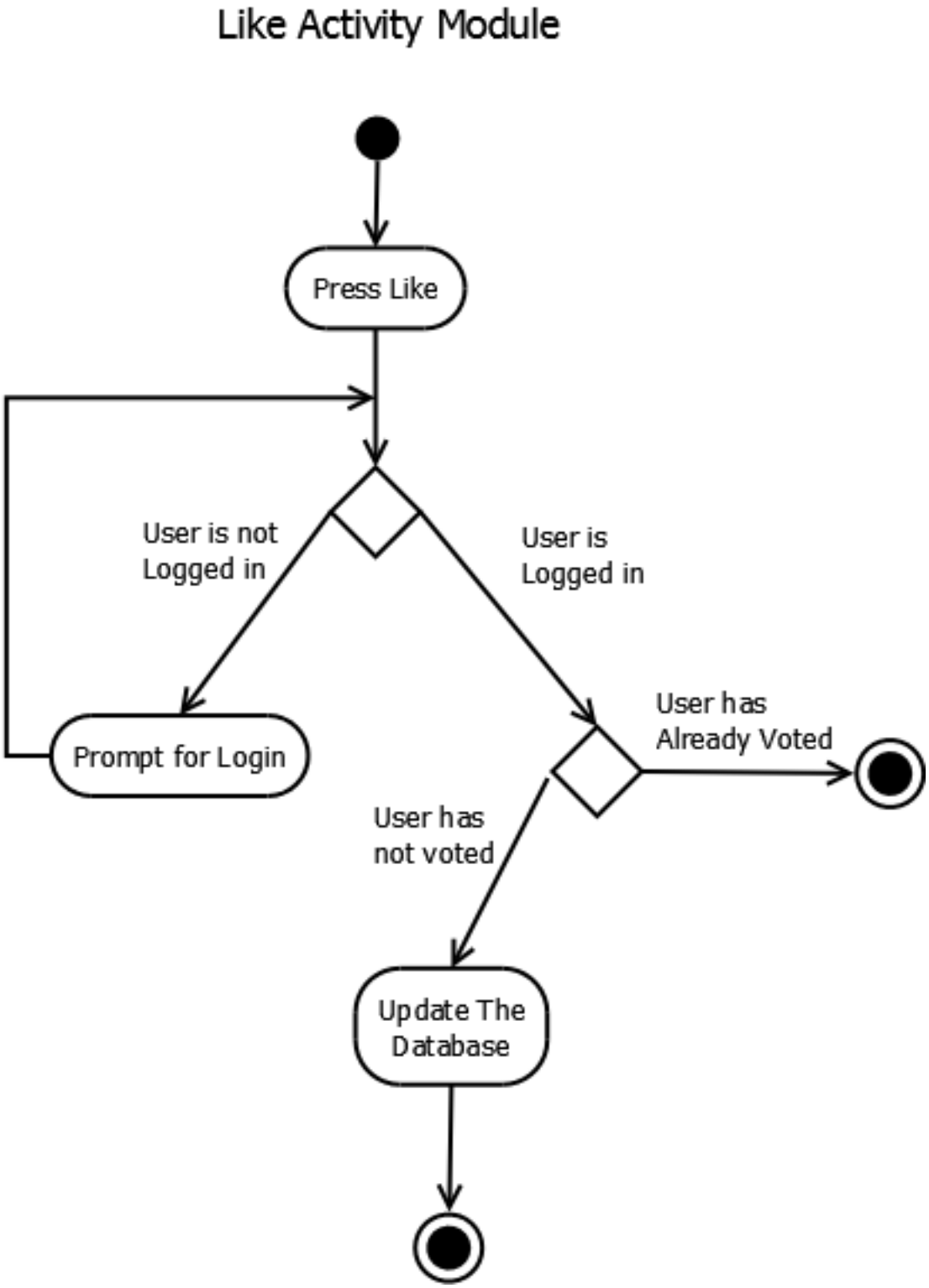
Bulletin Module



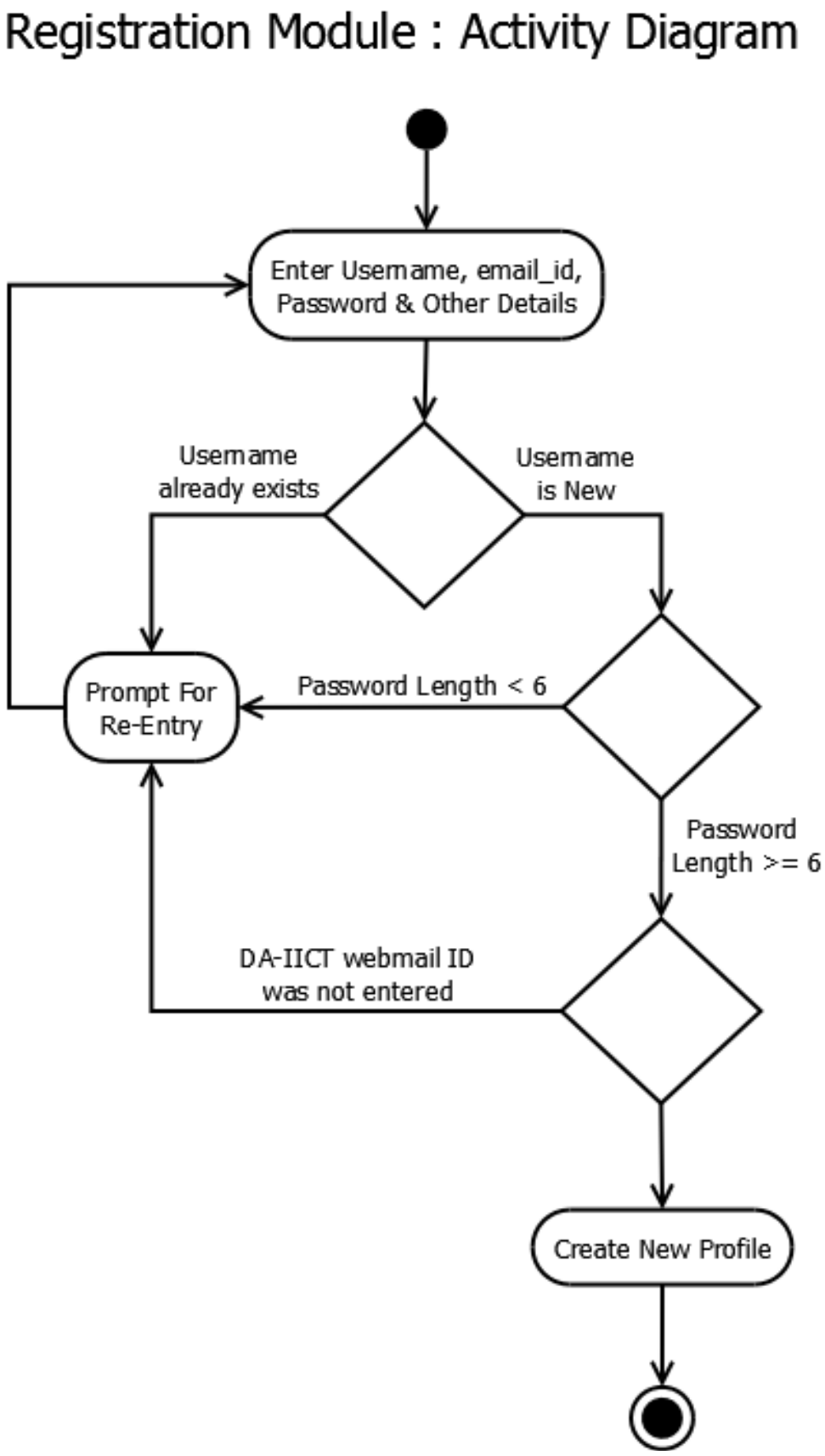
Edition Module



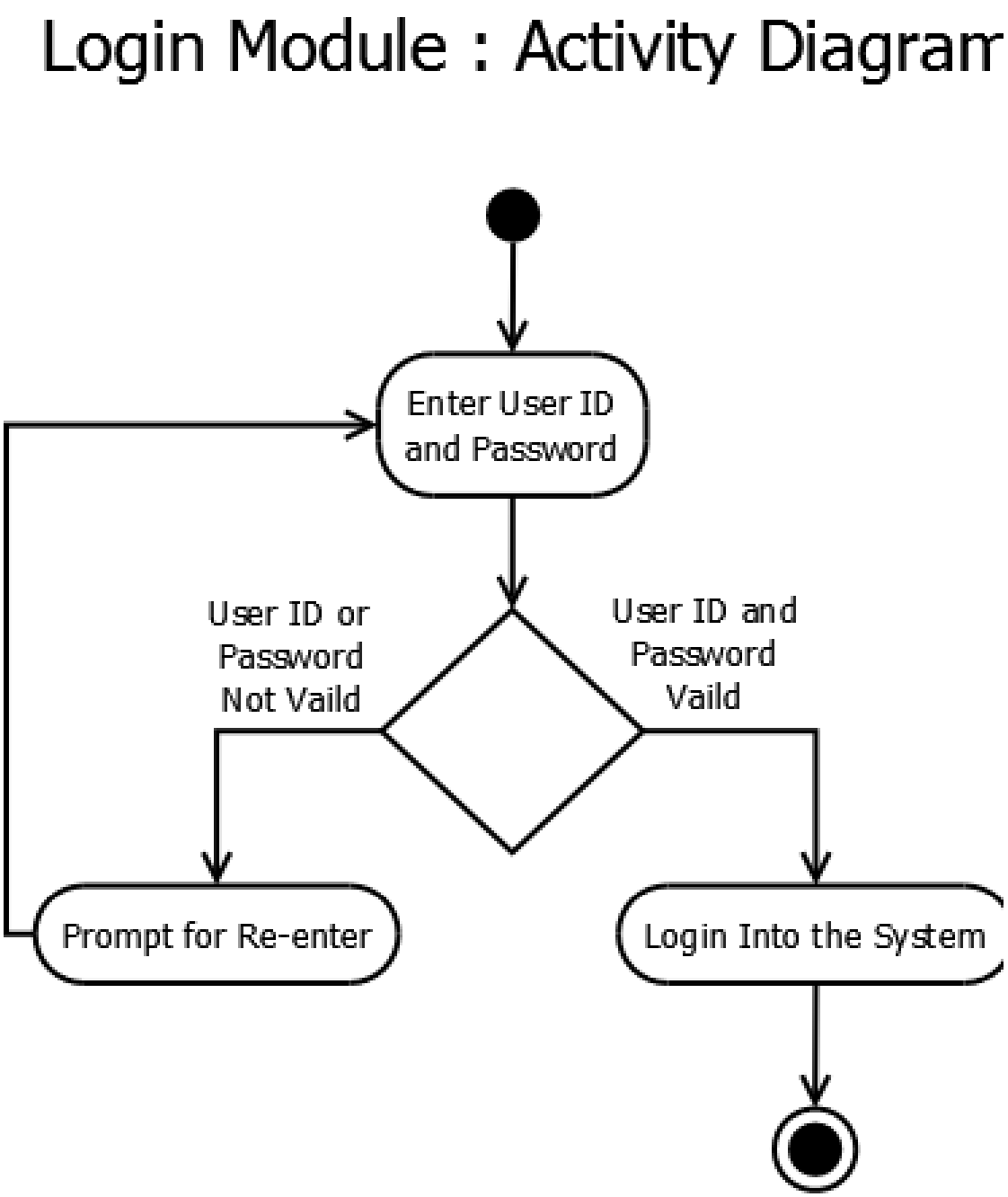
Like Module


Like Activity Module
Press Like
User is not
Logged in
User is
Logged in
Prompt for Login
User has
Already Voted
User has
not voted
Update The
Database

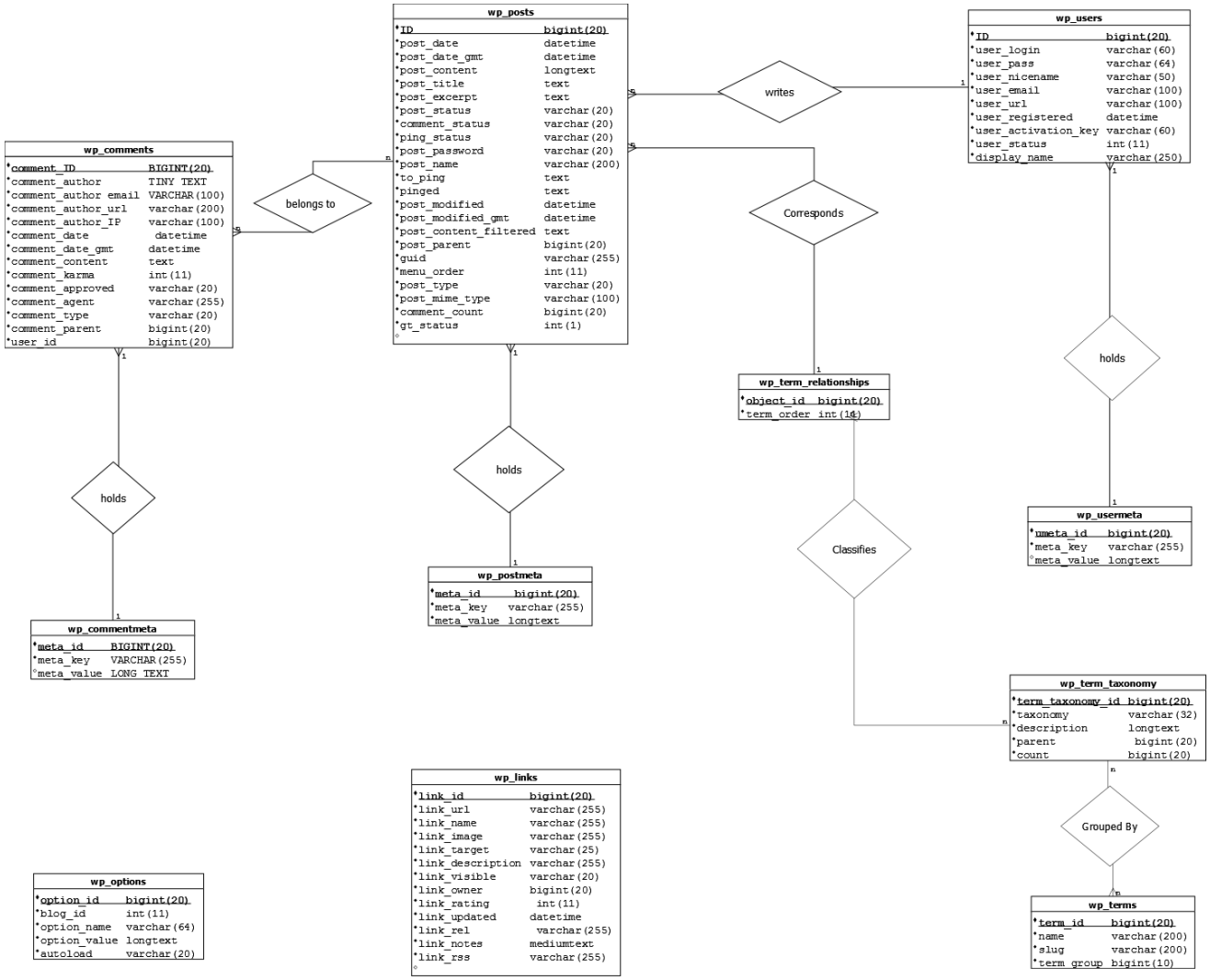
Registration Module



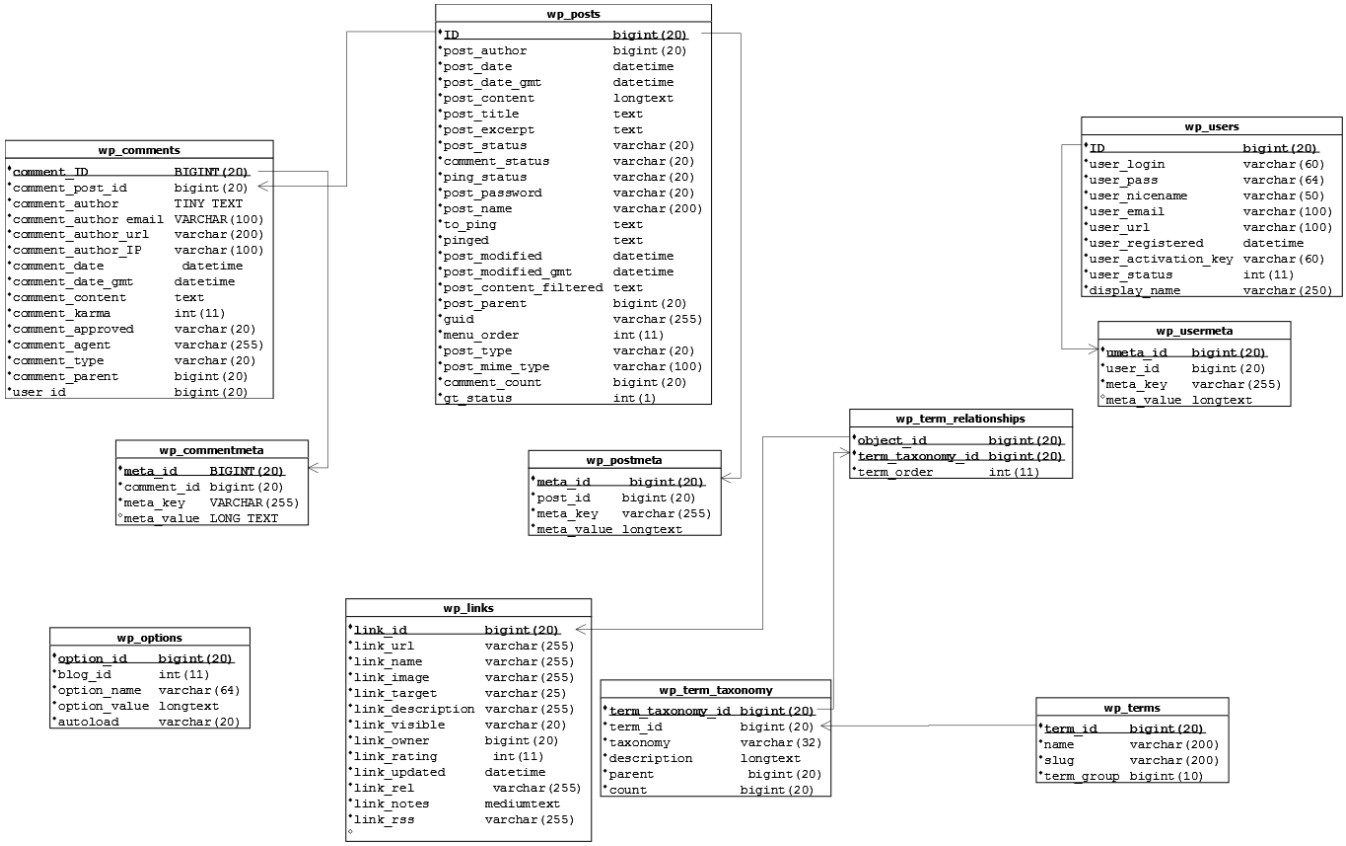
Login Module



4.2 E-R Diagrams

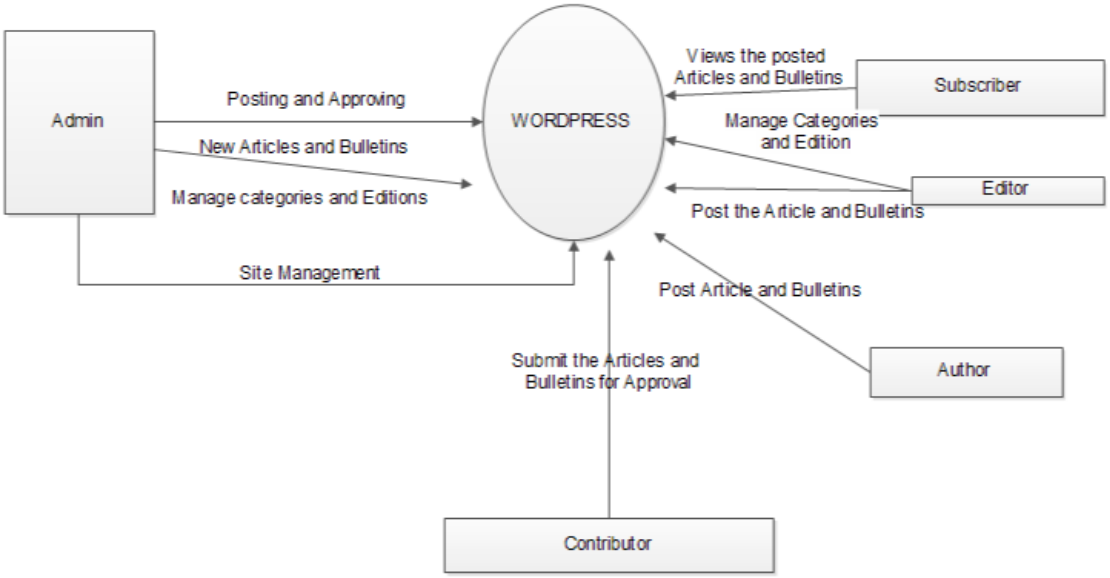


4.3 Relational Schema

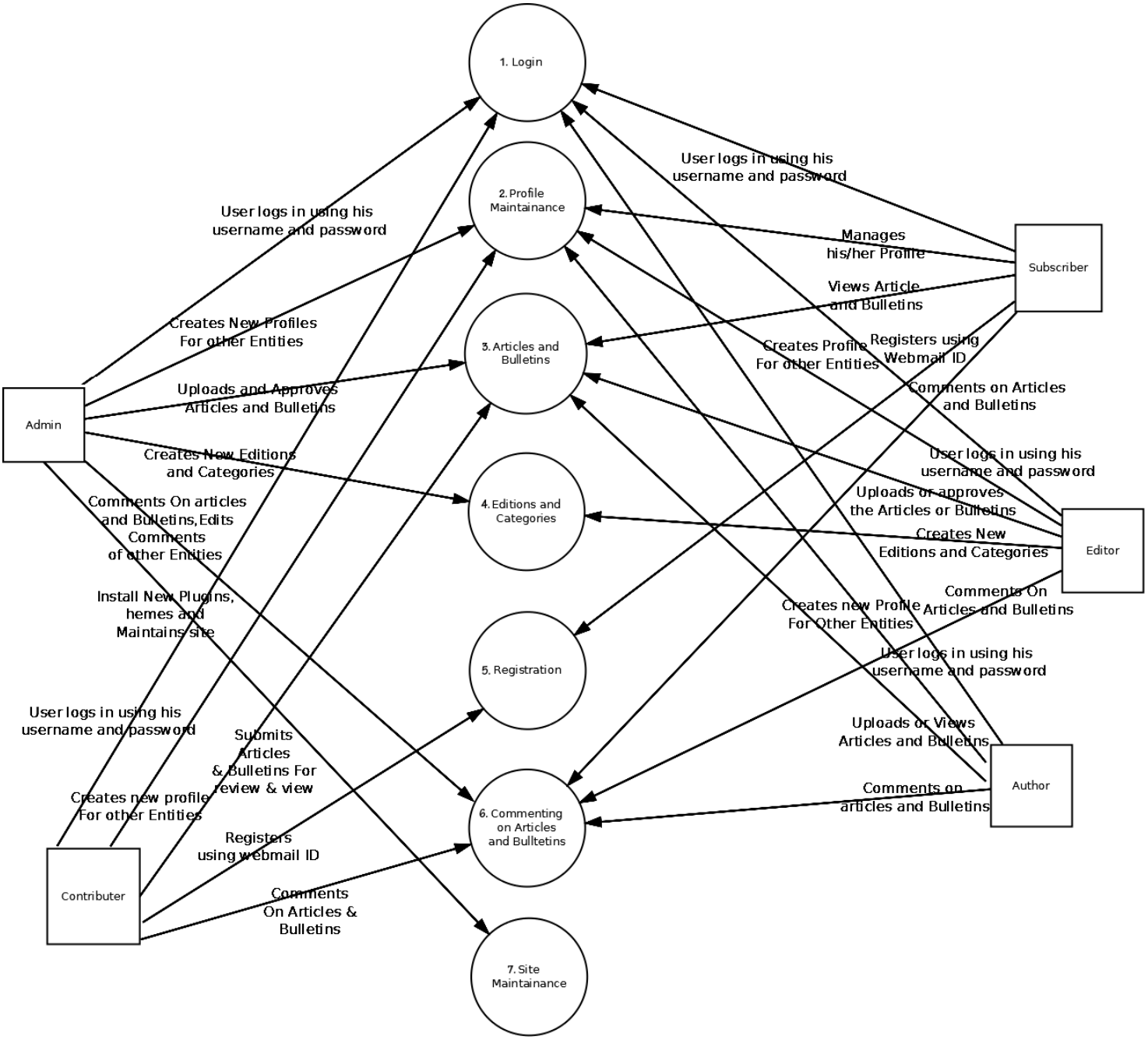


4.4 Data Flow Diagrams

Context Level Diagram

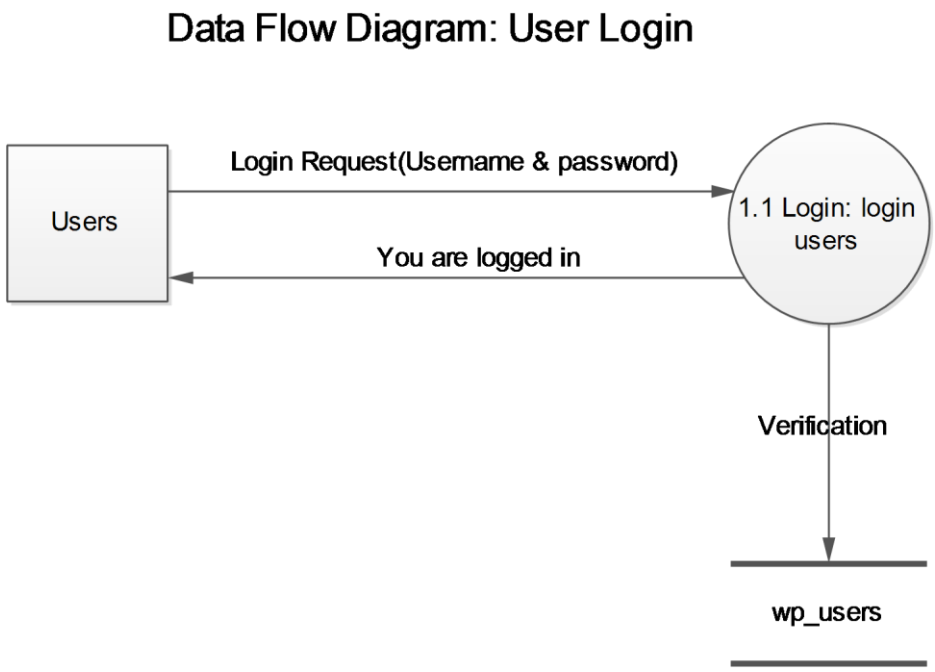

Admin
Posting and Approving
New Articles and Bulletins
Manage categories and Editions
WORDPRESS
Views the posted Articles and Bulletins
Subscriber
Manage Categories and Edition
Editor
Post the Article and Bulletins
Site Management
Post Article and Bulletins
Author
Submit the Articles and Bulletins for Approval
Contributor

Level 0

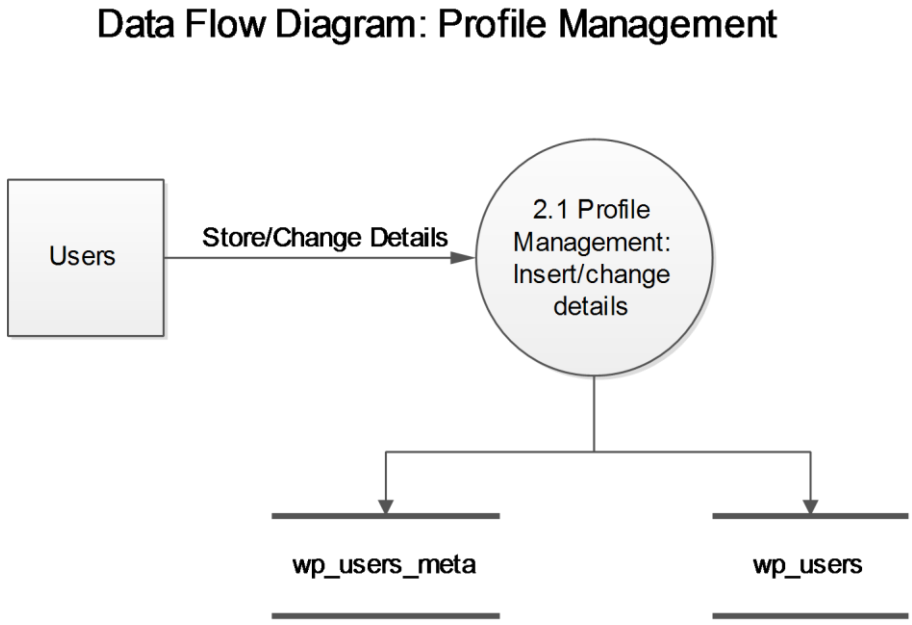

1. Login
2. Profile Maintainance
3. Articles and Bulletins
4. Editions and Categories
5. Registration
6. Commenting on Articles and Bulltetins
7. Site Maintainance
Admin
Contributer
Subscriber
Editor
Author
User logs in using his username and password
Creates New Profiles For other Entities
Uploads and Approves Articles and Bulletins
Creates New Editions and Categories
Comments On articles and Bulletins, Edits Comments of other Entities
Install New Plugins, hemes and Maintains site
User logs in using his username and password
Submits Articles & Bulletins For review & view
Creates new profile For other Entities
Registers using webmail ID
Comments On Articles & Bulletins
Manages his/her Profile
Views Article and Bulletins
Creates Profile For other Entities
Registers using Webmail ID
Comments on Articles and Bulletins
User logs in using his username and password
Uploads or approves the Articles or Bulletins
Creates New Editions and Categories
Comments On Articles and Bulletins
Creates new Profile For Other Entities
User logs in using his username and password
Uploads or Views Articles and Bulletins
Comments on articles and Bulletins

Level 1

1.Login

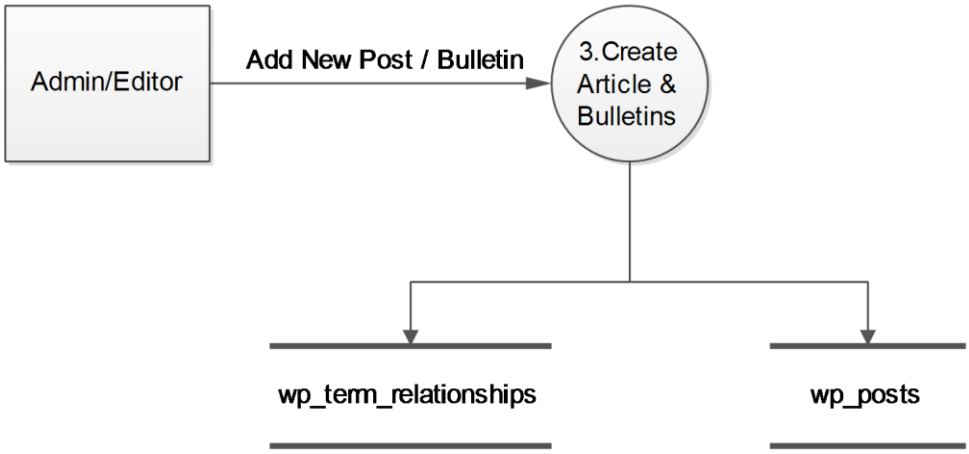


2. Profile Maintenance



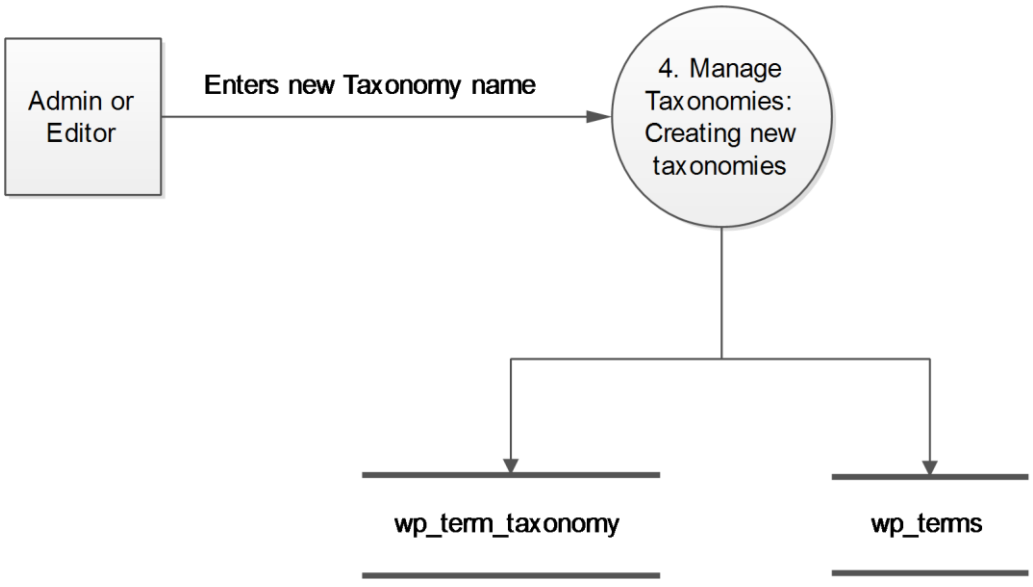
3. Articles and Bulletins

Data Flow Diagram: Create Article and Bulletin



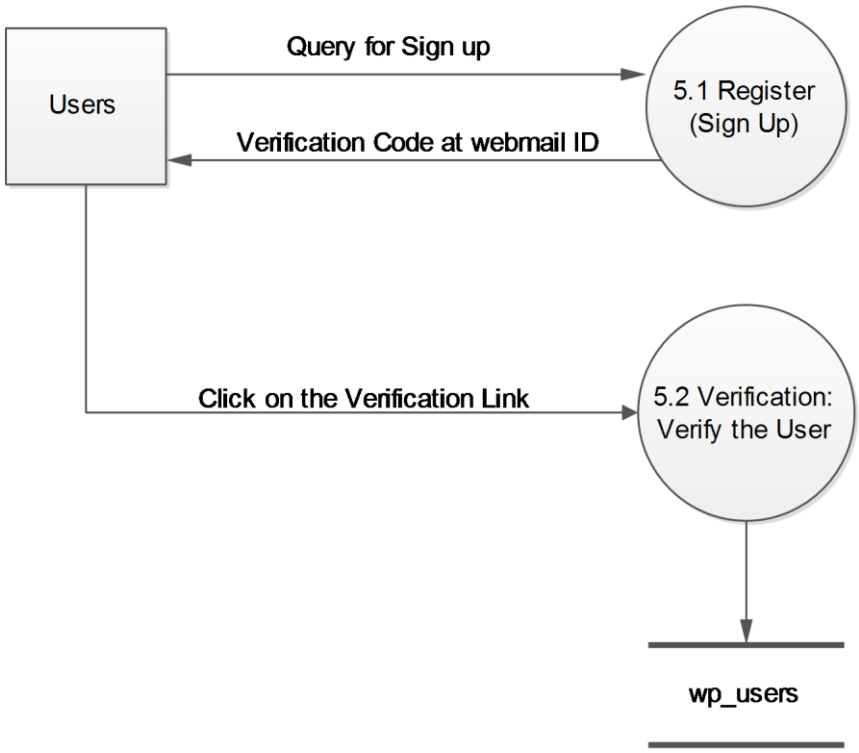
4. Editions and Categories

Data Flow Diagram: Manage Taxonomies



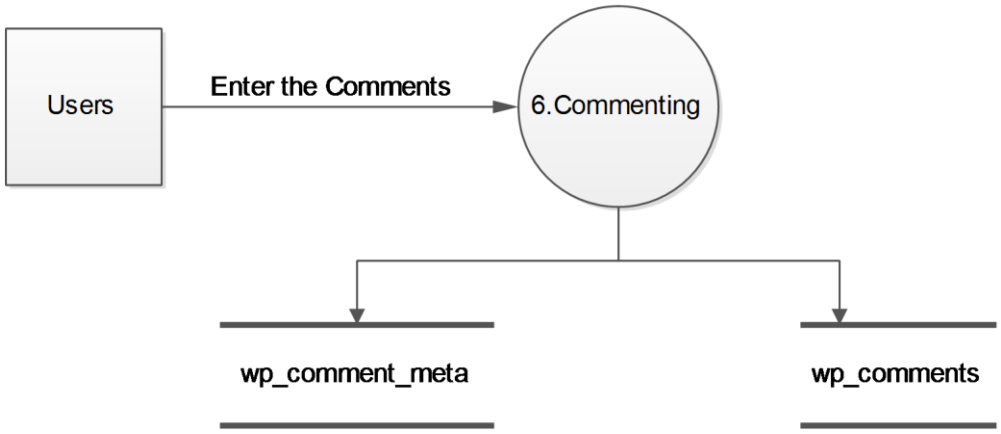
5. Registration

Data Flow Diagram:Registration

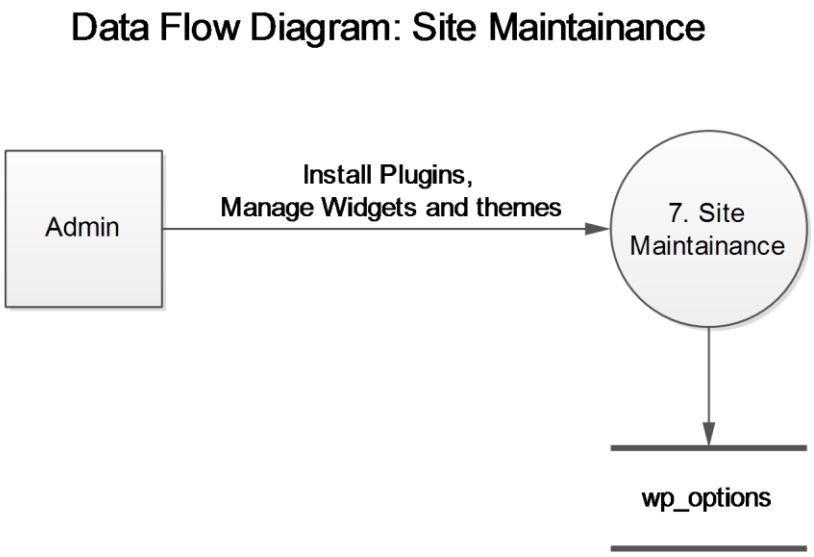


6. Commenting on articles and Bulletins

Data Flow Diagram: Commenting

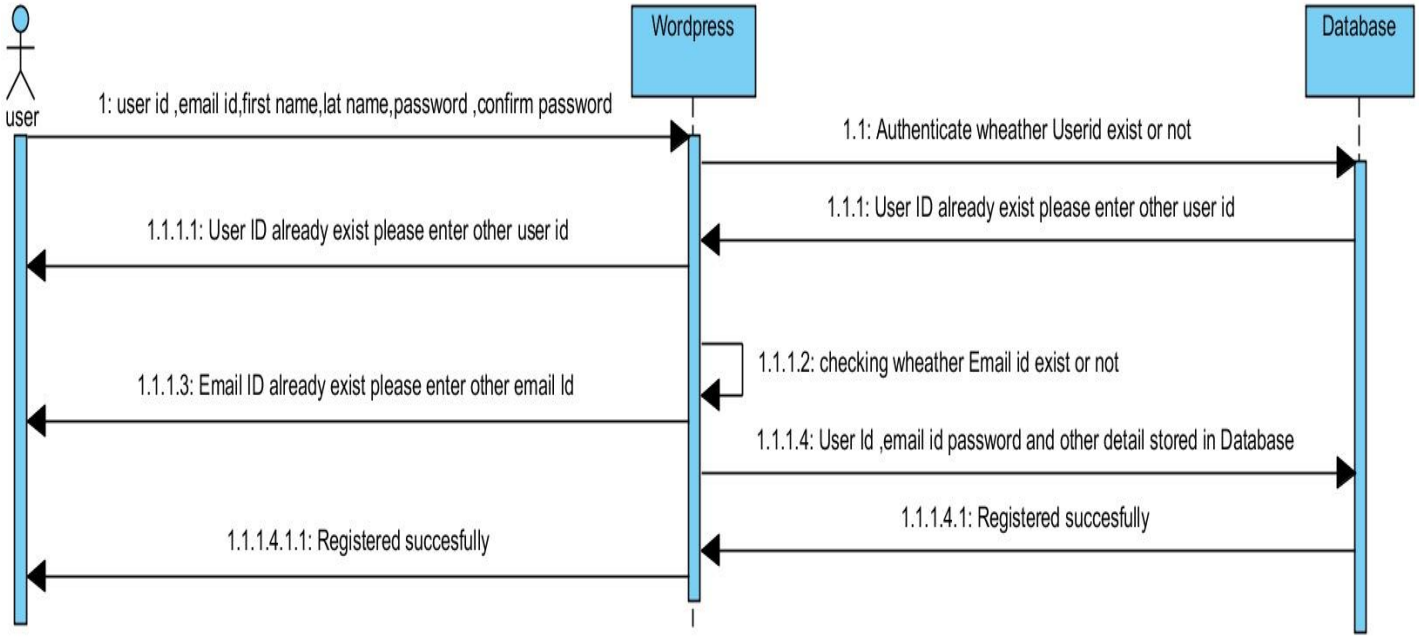


7. Site Maintenance

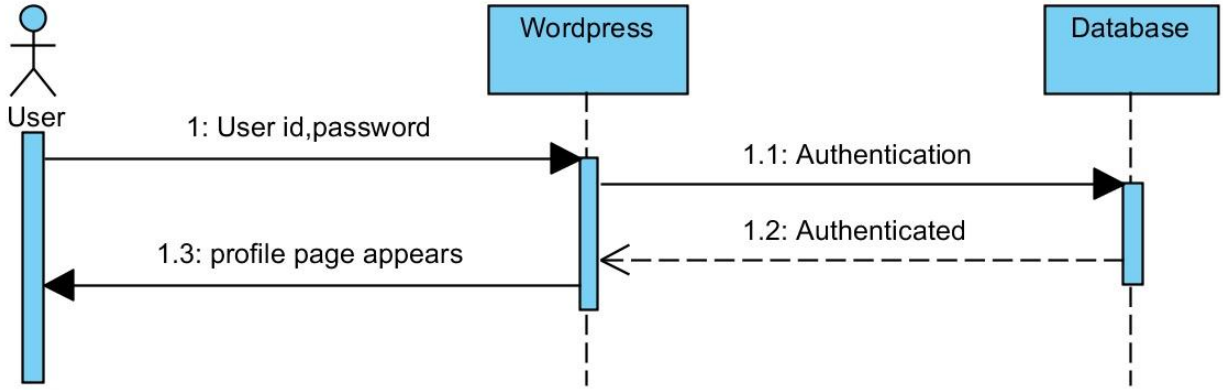


4.4 Sequence Diagram

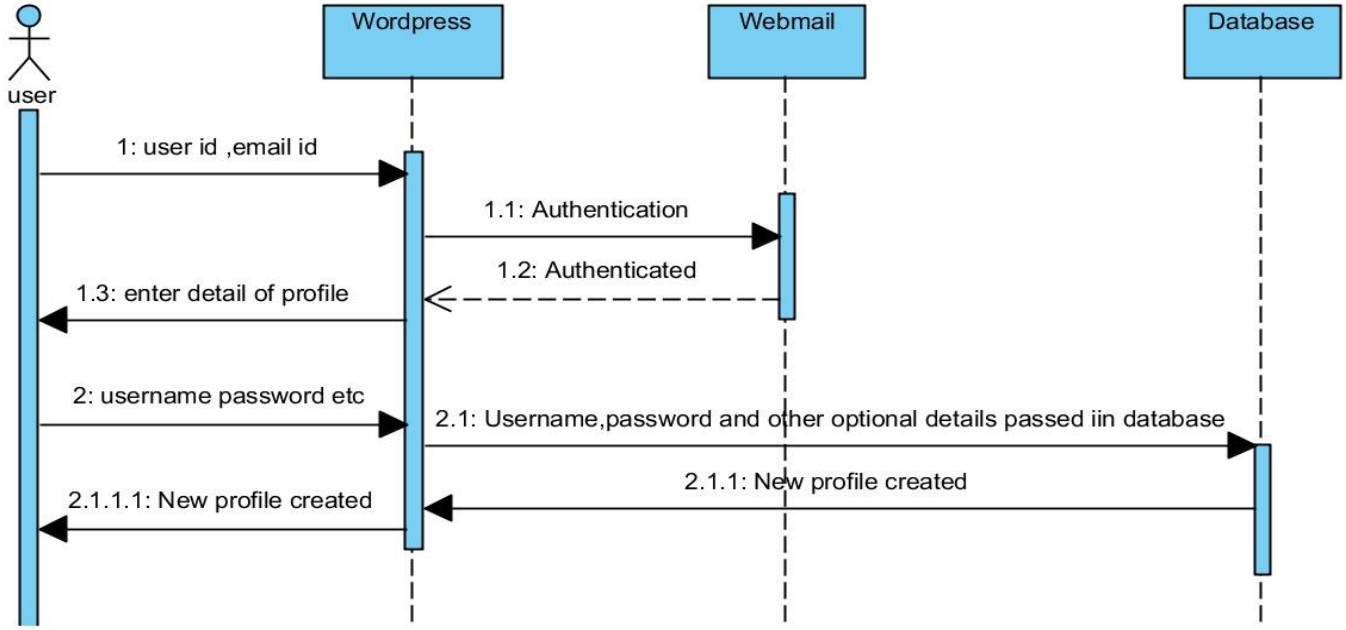
1. Registration Module:



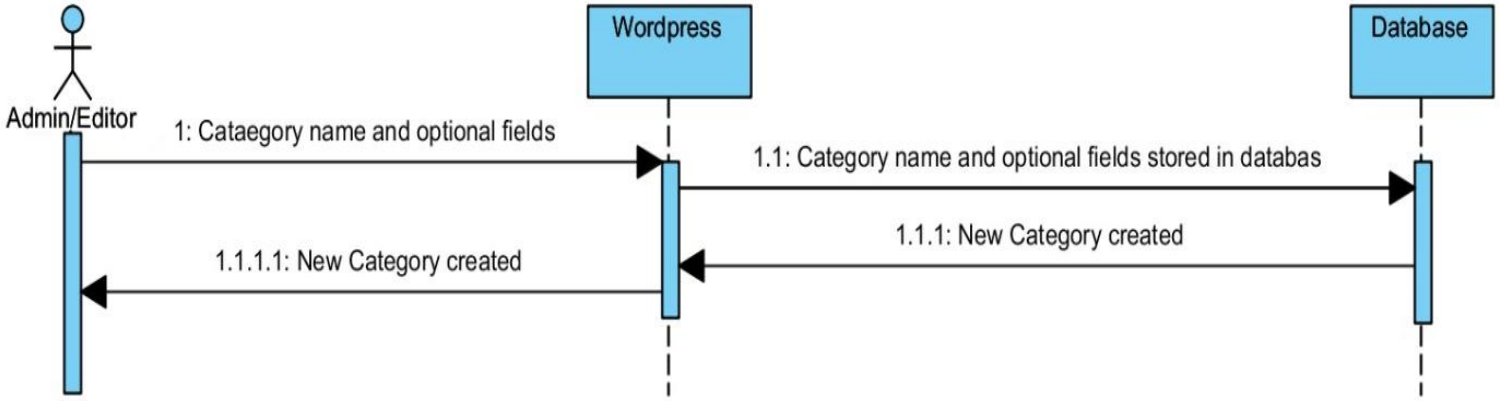
2. Login Module



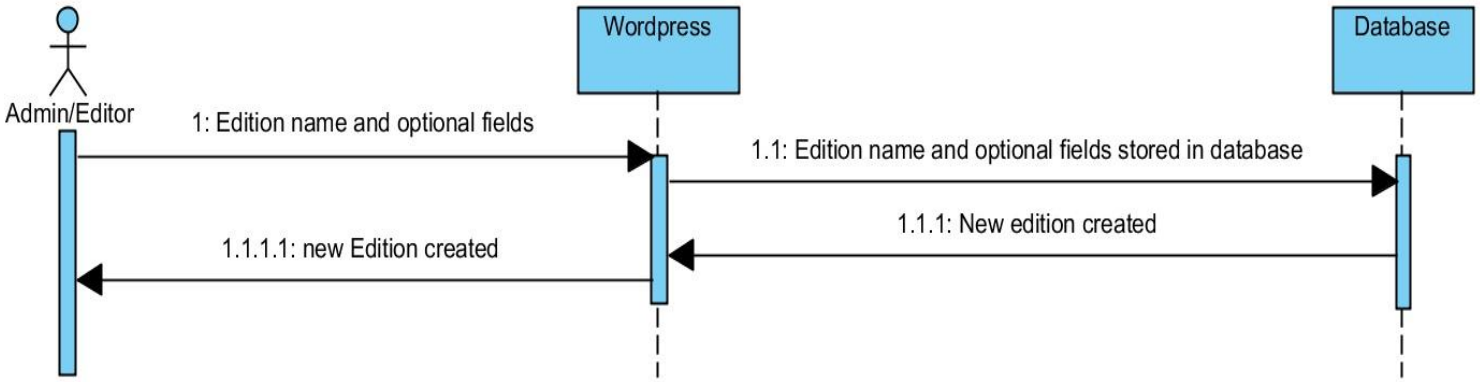
3. Profile Creation



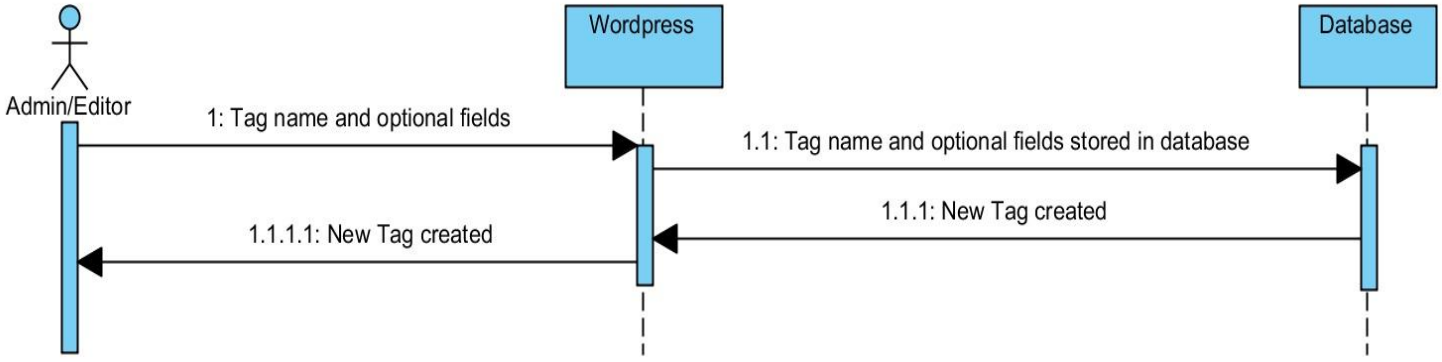
4. Category Creation



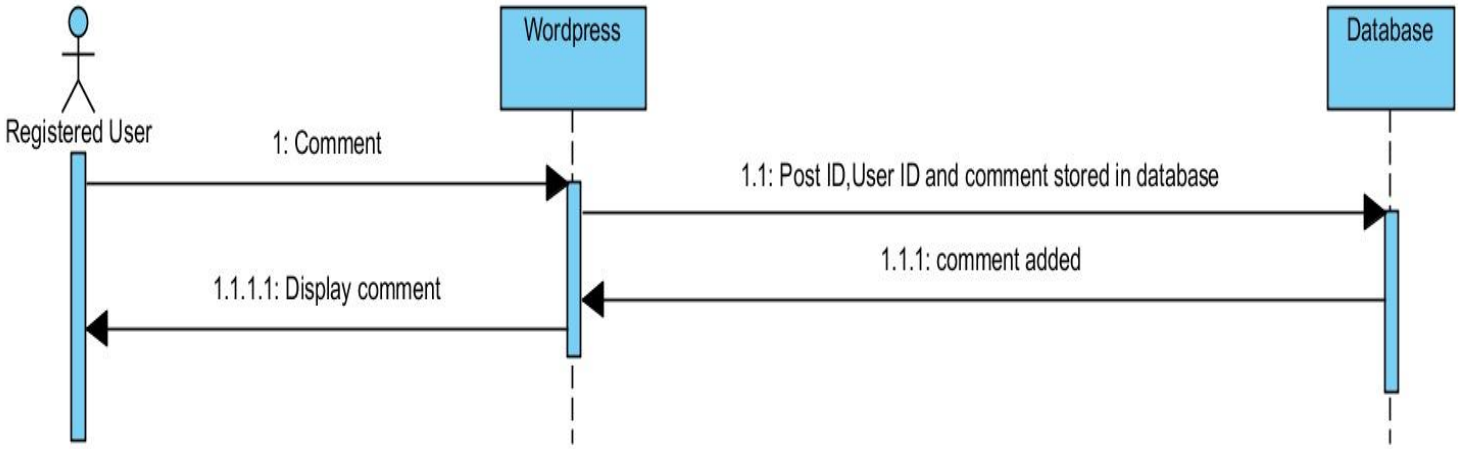
5. Edition Creation



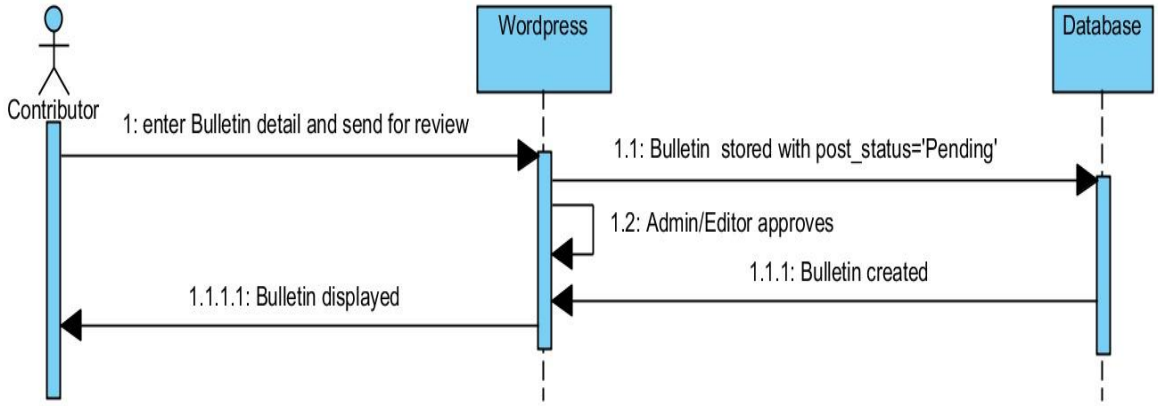
6. Tag Creation



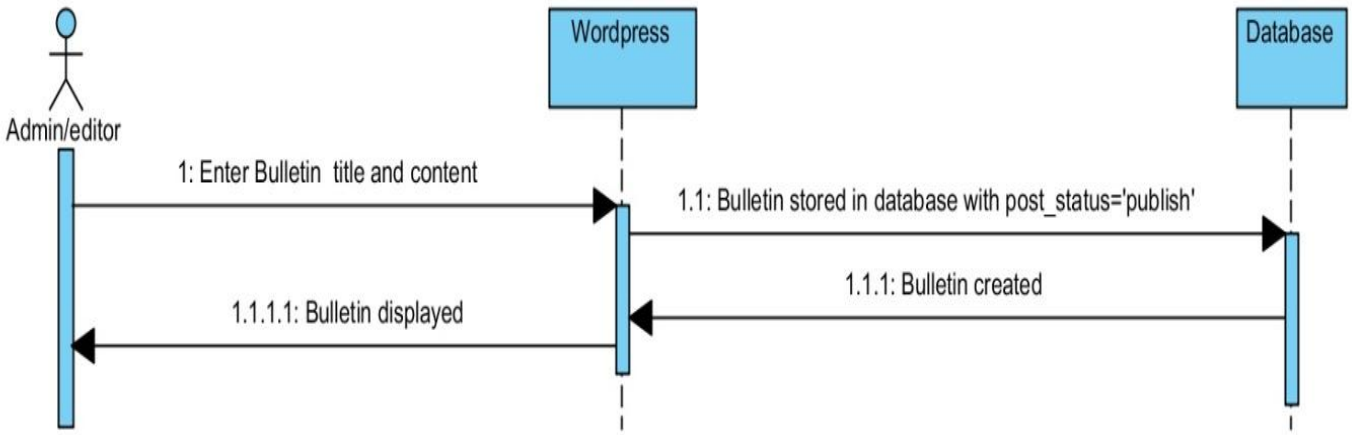
7. Comment Creation



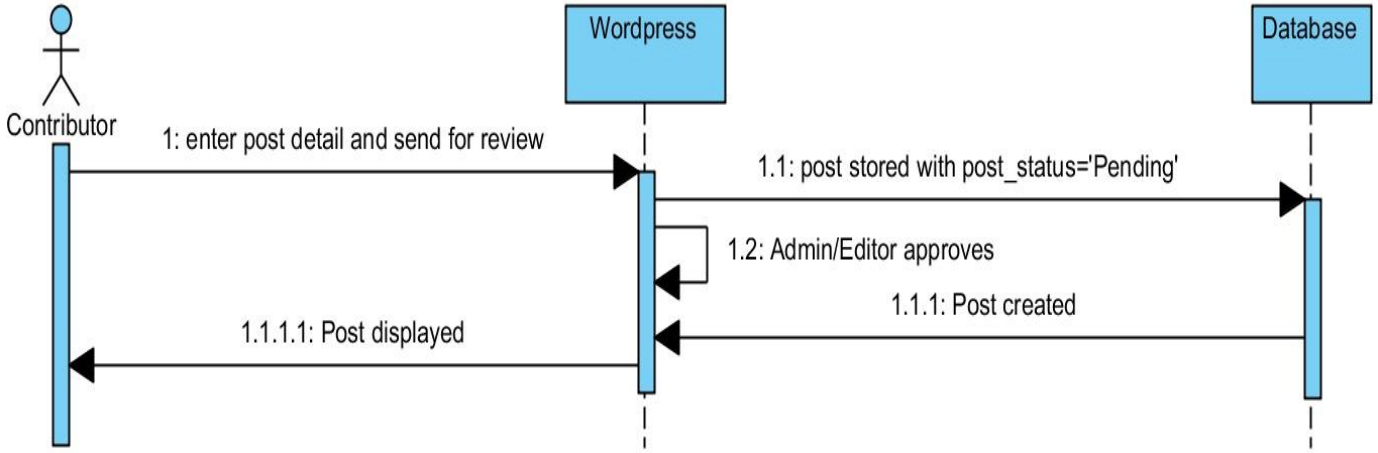
8. Post Bulletin by Contributor



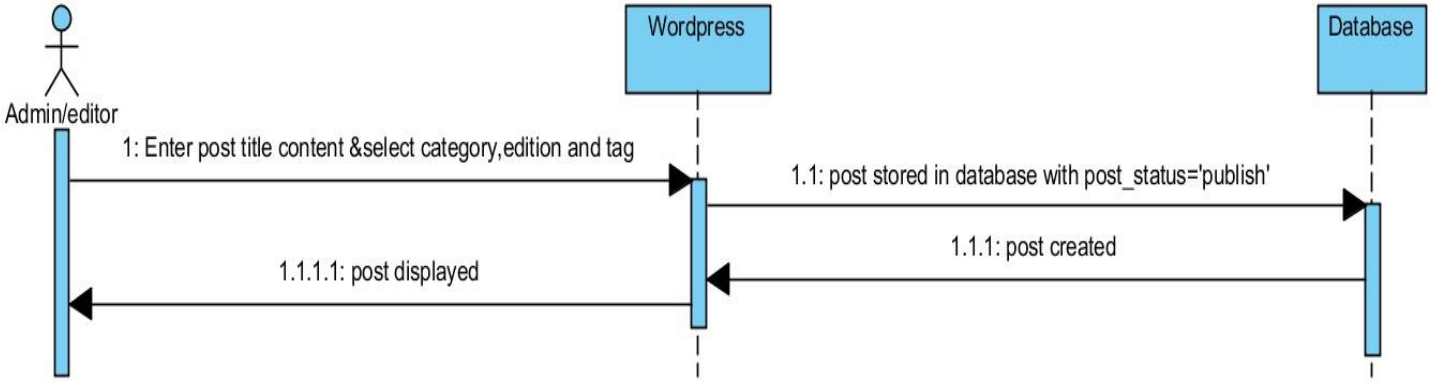
9. Post Bulletin by Admin/Editor



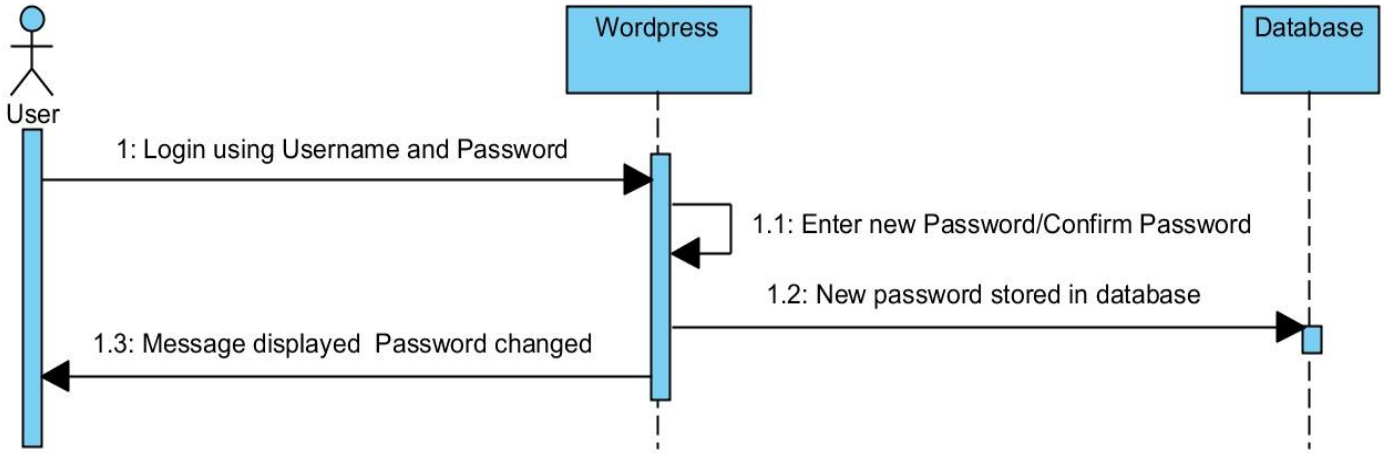
10. Post Article by Contributor



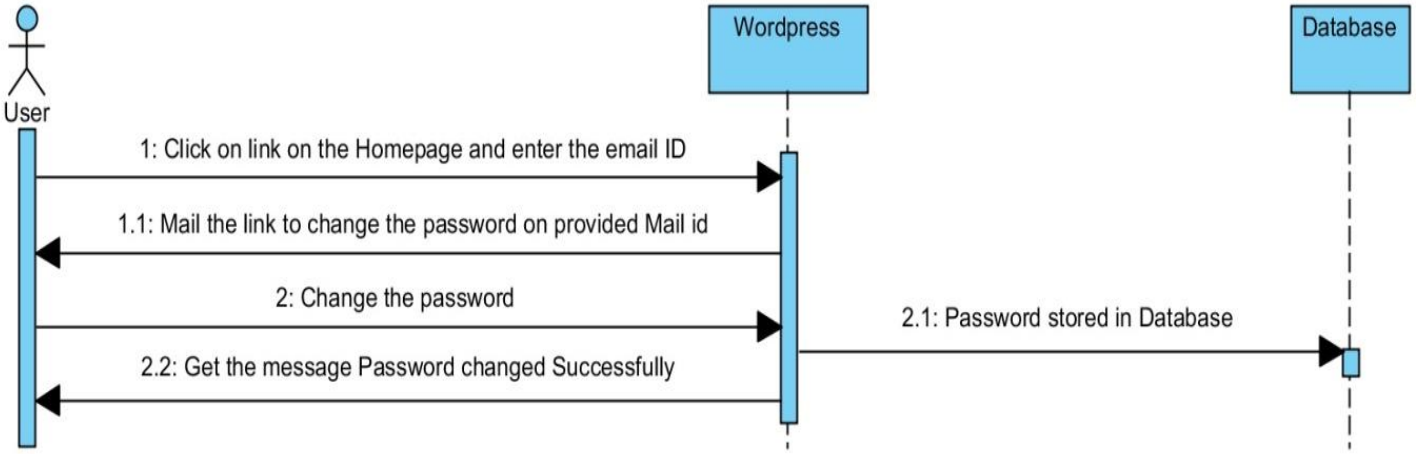
11. Post Article by Admin/Editor



12. Change Password



13. Forgot Password



5. Low Level Description of Modules

5.1 Registration Module: This module restricts the user to register with her/his DA-IICT webmail ID only.

- Loads the registration form.
- User enters the details(last name, first name, unique username, password and confirm password). He/She is also provided with an optional field 'website'.
- When the submission is made, sizeable_restrict_domains() function which will be hooked to the registration action, will be called to check if the entered email-id is DA-IICT webmail id.
- Other validations such as unique username and password character count greater than 6 will be performed by already provided wordpress functions.
- Upon validation if all the data fields are found valid a confirmation link is sent to the provided webmail id.

5.2 Edition Module:

This module allow administrators and Editiors to create New Edition as a seperate taxonomy different from category and tags. This feature will create a new taxonomy 'Edition' under Post using create_ediiton_taxonomy()function. Next we will register this function and hook the above function to init action so that new edition will be created when the site loads. This will eliminate the need for creating all categories everytime a new edition is created.

5.3 Bulletin Board:

This module allow users to post new Bulletins which is seperate from Articles.This feature will create a new Custom Post Type 'Bulletin' using my_custom_post_bulletin() function. Next we

will register this function and hook the above function to init action so that new bulletin will be . To Display this custom Post type in widget we will use 'Custom Post Display' plugin.

5.4 Archival Module

This module will provide users a more robust archival feature. Users will be able to search for posts belonging on a particular edition or a particular category or a combination of both.

6. Glossary

E-R Diagram (Entity Relationship diagram): An entity-relationship (ER) diagram is a specialized graphic that illustrates the interrelationships between entities in a database.

Use Case Model: Use Case Model describes the proposed functionality of a new system. A Use Case represents a discrete unit of interaction between a user (human or machine) and the system.

Hook: Hooks are provided by WordPress to allow your plugin to 'hook into' the rest of WordPress; that is, to call functions in your plugin at specific times, and thereby set your plugin in motion.

Action hook: Actions are the hooks that the WordPress core launches at specific points during execution, or when specific events occur. Your plugin can specify that one or more of its PHP functions are executed at these points, using the Action API.

Filter hook: Filters are the hooks that WordPress launches to modify text of various types before adding it to the database or sending it to the browser screen. Your plugin can specify that one or more of its PHP functions is executed to modify specific types of text at these times, using the Filter API.

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7. References

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Sandeep Mertia, et. al., Project Plan v2.0, Team 7, IT314 Software Engineering, Winter 2012-13, DA-IICT