**4.5 DATABASE DESIGN OVERVIEW**



WPMS uses a structured relational database schema which has the following key elements: User authentication and their respective roles, Project management and their supervision, token authentication and security and messaging and conversation.

**4.5.1 User Authentication and roles**

This is tabulated into several categories based on the role. There is a userAuthe\_user table that contain all users, userAuthe\_studentlead that contains users with their roles assigned to student who are project leads, userAuthe\_supervisor which houses the list of users who are registered as supervisors and django\_admin\_log that stores data related to admin activities on the database and admin dashboard.

|  |  |  |
| --- | --- | --- |
| **User table** | | |
| FIELD | **DATA TYPE** | **DESCRIPTION** |
| id | int | Unique identifier for users |
| password | varchar | Password for the user |
| last\_login | timestamp | Time for last login attempt |
| is\_admin | bool | If the user has admin priviledges |
| is\_supervisor | bool | User has supervisor role |
| Is\_student | bool | User has student role |
| username | varchar | Unique code for users |
| first\_name | varchar | User’s first profile name |
| last\_name | varchar | User’s last profile name |
| email | varchar | User’s email address |
| date\_joined | timestamp | The specific date the user joined |
| role | varchar | Identifies the role of the user |

Users can have permissions (auth\_permission) and role-based identifiers(is\_supervisor, is\_student, is\_admin)

|  |  |  |
| --- | --- | --- |
| **Studentlead table** | | |
| FIELD | **DATA TYPE** | **DESCRIPTION** |
| user\_id | Int | Unique identifier of student lead |
| supervisor\_id | Int | Unique identifier of studentlead’s supervisor |
| first\_name | Varchar | First name of student lead |
| last\_name | Varchar | Last name of student lead |
| programme | Varchar | Programme undertaken by student lead |
| admission\_no | varchar | Registeration number of the student lead |

|  |  |  |
| --- | --- | --- |
| Supervisor table | | |
| FIELD | **DATA TYPE** | **DESCRIPTION** |
| User\_id | int | Supervisor’s unique id |
| department | varchar | Supervisor’s department |
| First\_name | varchar | First name of the supervisor |
| Last\_name | varchar | Last name of the supervisor |

**Django Admin Log Table**

|  |  |
| --- | --- |
| FIELD | DATA TYPE |
| id | Action\_time |
| action\_time | Time stamp |
| object\_id | text |
| object\_representation | Varchar |
| action\_flag | int |
| user\_id | int |

**4.5.2 Project Management and supervision**

This element of the database contains details of the project, project members incase it a group, the specified student lead and assigned supervisor. Tables of student lead and supervisor have already been discussed in 4.5.1. userAuthe\_studentproject stores project details, linking student to projects. userAuthe\_projectparticipants tracks participants involved in the case of group work. userAuthe\_supervisor are linked to students, ensuring structured guidance.

|  |  |  |
| --- | --- | --- |
| **Student Project Table** | | |
| FIELD | DATA TYPE | DESCRIPTION |
| id | int | Unique identifier of the project member |
| first\_name | varchar | First name of the member |
| last\_name | varchar | Last name of the meber |
| admission\_no | varchar | Registeration number of the member |
| programme | varchar | Member’s programme |
| mail | varchar | Email of the member |
| user\_id | int | Unique identifier of the student lead of the member |

|  |  |  |
| --- | --- | --- |
| **Student Project Table** | | |
| FIELD | DATA TYPE | DESCRIPTION |
| user\_id | int | Unique identifier of the student lead creating the project. |
| title | varchar | Title of the project |
| description | text | Contains details related to the project. |

**4.5.3 Messaging and Communication**

This element of the database is responsible for managing conversation between student lead and respective supervisor. It contains table of chat\_chatmessage.

**Chat Message Table**

|  |  |  |
| --- | --- | --- |
| FIELD | DATA TYPE | DESCRIPTION |
| id | int | Message’s unique identifier |
| content | text | Information being passed on to the recipient. |
| student\_lead\_id | int | Unique identifier to assign student lead involved in the conversation |
| supervisor\_id | int | Unique identifier to assign supervisor who involved in the conversation |
| created\_at | timestamp | Date and time of message creation |
| modified\_at | timestamp | Date and time of message alteration |

**4.5.4 Token Authentication and Security**

This element of the database contains authorization details that enable retrieval of login data for the user to enable access into the individual account. It has tables of token\_oustandingtoken and token\_blacklistedtoken

|  |  |
| --- | --- |
| **Blacklisted Token Table** | |
| FIELD | DESCRIPTION |
| id | int |
| blacklisted\_at | timestamp |
| token\_id | int |

|  |
| --- |
| **Outstanding Token Table** |

|  |  |
| --- | --- |
| FIELD | DATA TYPE |
| id | int |
| token | text |
| created\_at | timestamp |
| expires\_at | timestamp |
| user\_id | int |

**4.6 OUTPUT DESIGN**

The elements and aspects of WPMS database described at 4.5 translate into interfaces programmed by React which is a Javascript framework for webpage interfaces after being processed by the backend programmed in Django which is a Python programming language.

To begin with, User authentication and roles is responsible for processing register and login pages. They capture and provide necessary information to enable access to the system only by relevant individuals. Data obtained also help to specify interfaces for admin, students and supervisor.

Secondly, Project management and supervision element of WPMS database provided necessary and relevant data for the purpose of assigning a student lead to supervisor and provide a list of students to their respective supervisor.

Furthermore, Messaging and communication element has table that helps in creating a message and attaches relevant details to the message, these details helps to deliver the message to the targeted student or supervisor.

Lastly, Token authentication and security is a crucial element in the WPMS database as it is responsible for providing access token that enables access into the system, it also has a refresh tokens that provides new access token after they have expired. These token enable seamless login and can be stored in the browser to facilitate login without having to enter credentials for a specified amount of time.

**CONCLUSION**

**[4.5 and 4.6]**

Lastly database design is a crucial to creation of WPMS and its operational functionality can aid in seamless interaction with the system which is secure, accessible and confidential.