

A Web Portal for Centralized Identity and Access Management

By

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Chapter I

Introduction

Abstract:

Implementation of a Web portal for centralized identity and access management

Urjit Mehta, Dhruv Patel, Dharmsinh Desai University

A centralized Authentication System is a tool to have service of single sign-on including authentication and authorization over cross modules in a portal. Active Directory (AD) is used for storing information about the user in the form of objects and makes searching and accessing operations efficient. AD is structured in tree form and every object is stored as a branch, tokens are used to store the users' information based on groups. Groups play an important role to store and manage the users' specifications and give access to the various services based on the groups' role. The goal to develop such a web portal is automation by implementing a registration portal with user account status based on authorities' approvals. Based on the approvals the users' accounts will be reflected. The administrative dashboard will provide services giving details like active/inactive accounts, locked accounts, enrolled users, etc. Common provided services by this portal are password reset, account unlocking, searching users, adding custom user attributes, update user account information. Apart from this admin will manage user accounts, manage reports, and log viewer. Other functionalities like Emails/Notifications alerts, and user-based role assignments. As our web portal is centralized, it will provide other modules selections like VPN, wireless/wired network access, etc. For this project, we have used PHP based framework known as Laravel-v9 which takes the pain out of development by easing common tasks used in our web portal such as authentication, routing, sessions, and mailing system.

Introduction:

Authentication & Authorization are major concerns in this digitalized world. Centralising a portal with authentication and authorization is a way to make various modules of a single organisation used only with single sign-on. Implementing a system like, users have to sign-in only ones and they can allow to use any module across the whole portal without signing-in again if they are authorised and authenticated successfully.

In this project, fetching from database is done through controller's query logic while fetching from AD is done through APIs as AD's fetched data is viewed in the format of JSON like structure and API too uses JSON format to process and display the data. The integration of Laravel project and AD is done through the tool named LDAP-Record which automatically do most of the configurations.

Block Diagram:

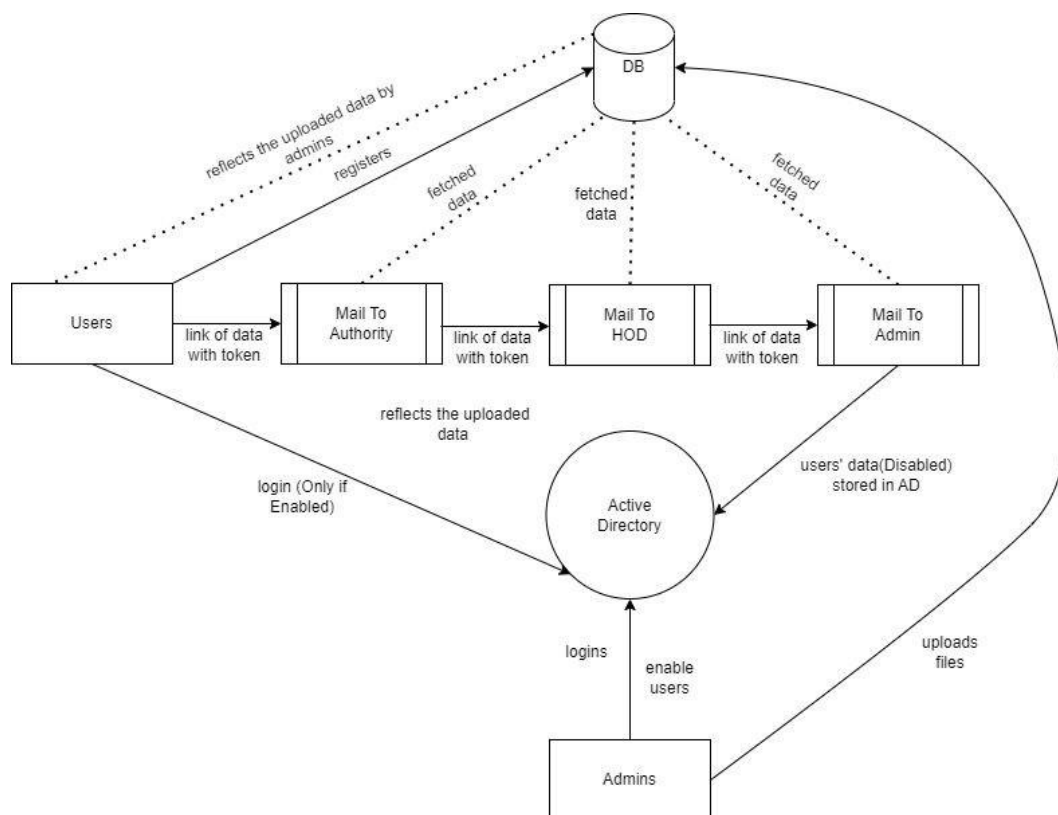


Fig 1.1 Block Diagram

Users need to have their username and password in Active Directory, a centralized authentication system. In the first phase, we are having 3 levels of the mailing system. Here users have to go through a simple registration process by just filling up asked details and the following data will be stored in the local database, parallelly this data will be sent to the user's selected authority (Level-1).

Authority will decide the approval of the users' requests based on the data submitted by them. When the authority will approve the user's request, one other mail containing the user's and authority approval details is sent to the HOD of the computer center department for the second approval (Level-2).

After getting approved by the HOD, mail along with all the previous levels' data will be sent for final approval under the specified authorized person i.e., admin. After the last approval, the users' information will be stored in AD.

But the challenge is still not over, in AD users are made under some OUs (Organizational units), which will be decided by the admin at the time of his approval. After these approvals, the user will be in some group/s, given specified roles and services to access. Users can too request some other services like wired/wireless network access, VPN request, previous requests, the status of their requested services, finding other users, etc.

Apart from this Administrative dashboard will provide some extra functionalities along with the basic ones. Managing each module across the web portal, managing every user's detail, updating some of the information, etc. When users register themselves, they have a field to specify called authority names. Also required authority email for mailing purposes. These details of the authority name and email are in AD. Fetching from AD for only two fields of a single person is a little messy. So, to rationalize this, we have given a file containing all the associates on the admin side or also can add specific authority associates will make entry/entries of name and email of the same in the local database, and from that only user will be given the suggestions for the selection of the authority in a dropdown form. For this admin just needs to upload that file or for a single entry admin just needs to give the inputs and it will make the reflections on the database and user side both at the same time.

After all 3 approvals, the user can request various functionalities like wired/wireless network access, VPN services, viewing the status of their appropriate requests, etc. Other basic functionalities like resetting passwords or changing passwords are also included in the web portal. This change will be reflected in all the modules of across the web portal due to Centralized System. Authentication and authorization will also be parallelly implemented across our web portal for providing single sign-on functionality.

Technology and Tools Used:

- **Technology:**

- > PHP
- > Laravel Framework
- > Active Directory (Main Storage + Other Functionalities)
- > LDAP Record
- > MySQL (Local Database)

- **Tools:**

- > Visual Studio Code
- > XAMPP/WAMP
- > Postman

Chapter II

About the System

- **Scope:**

- The web portal is developed for having a centralized identity and access management, where a user only logs in once, and after that user doesn't have to log in at any other modules across that portal.
- Our web portal is designed such that the hecticness of admin and user is reduced and some manual/paperwork tasks are done automatically.
- Centralized Identity (Cross module logins), managing users as per their groups and roles, 3-level approvals, and managing admins are some major

- **System Functional Requirements:**

- R1: Manage User:**

- **R1.1: Registration of User**

- Description:** The user will enter the asked details in the form which will be passed to further flow.

- Input:** Details of User

- Output:** Confirmation Message

- **R1.1.1: Login of User**

- Description:** The user will log in using very few functionalities like changing passwords, recovering the passwords, etc.

- Input:** Samaccountname (uid) & Password

- Output:** Login Successful

- **R1.1.2: Reset Password**

- Description:** If users want to change their password.

- Input:** Old Password & New Password

- Output:** Confirmation Message and Updated in database.

- **R1.2: Forget password**

Description: If user had forgotten their password, they can reset it.

Input: Mail stored in AD & New Password

Output: Mail on specified email id

R2: Manage Admin

- **R2.1: Login of Admin**

Description: Admins' details will be already there in the Active Directory so the admin will directly login in to the portal.

Input: Samaccountname (uid) & Password

Output: Successful Login in the portal

- **R2.2: Upload Data for user**

Description: Admin will either upload a CSV file or add the authority's name manually so that the user can directly select their authority's name at the user side portal.

Input: CSV file including name, email and payno of the authority.

Output: User will get all the authority's names in the dropdown menu at user side.

- **R2.3: Assigning Roles and Permissions**

Description: Once the user is approved by the admin, they will get their functionalities according to their given permissions, and the permissions are based on assigned roles.

Input: Roles' checkboxes on admin side

Output: User will get the functionality based on their roles at user side

- **R2.4: Update User's Profile**

Description: If users have to update their profile, they can edit some of the details accordingly.

Input: Some editable details

Output: Confirmation Message and Updated in database

❖ **System Non-Functional Requirements:**

1. Performance:

As our web portal is using Active Directory plus database mainly, the fetching and searching operation will have a time complexity a little high. Here to cover that delay we had integrated loaders on every page and most of the data will be retrieved from a database so fetching will be faster compared to AD.

2. Active Directory:

The system requires a centralized identity across different portals which is mainly managed by the active directory, so, must have to live every time and be maintained regularly.

3. Database:

Not every piece of information is required to store in the active directory, so heavy data will be stored in the database and only required data will be given to the active directory for storing.

Chapter III

Analysis

- **Use Case Diagram:**

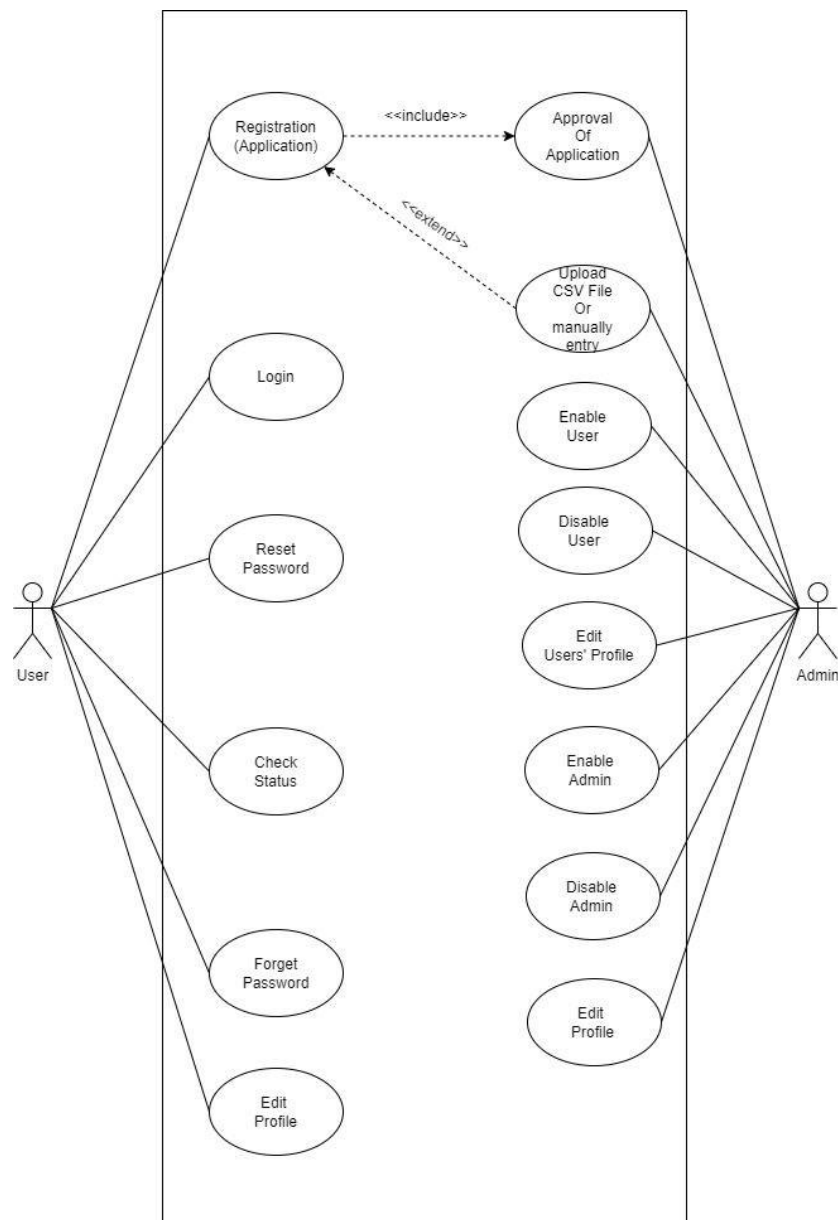


Fig 3.1 Use Case Diagram

- **Sequence Diagram:**

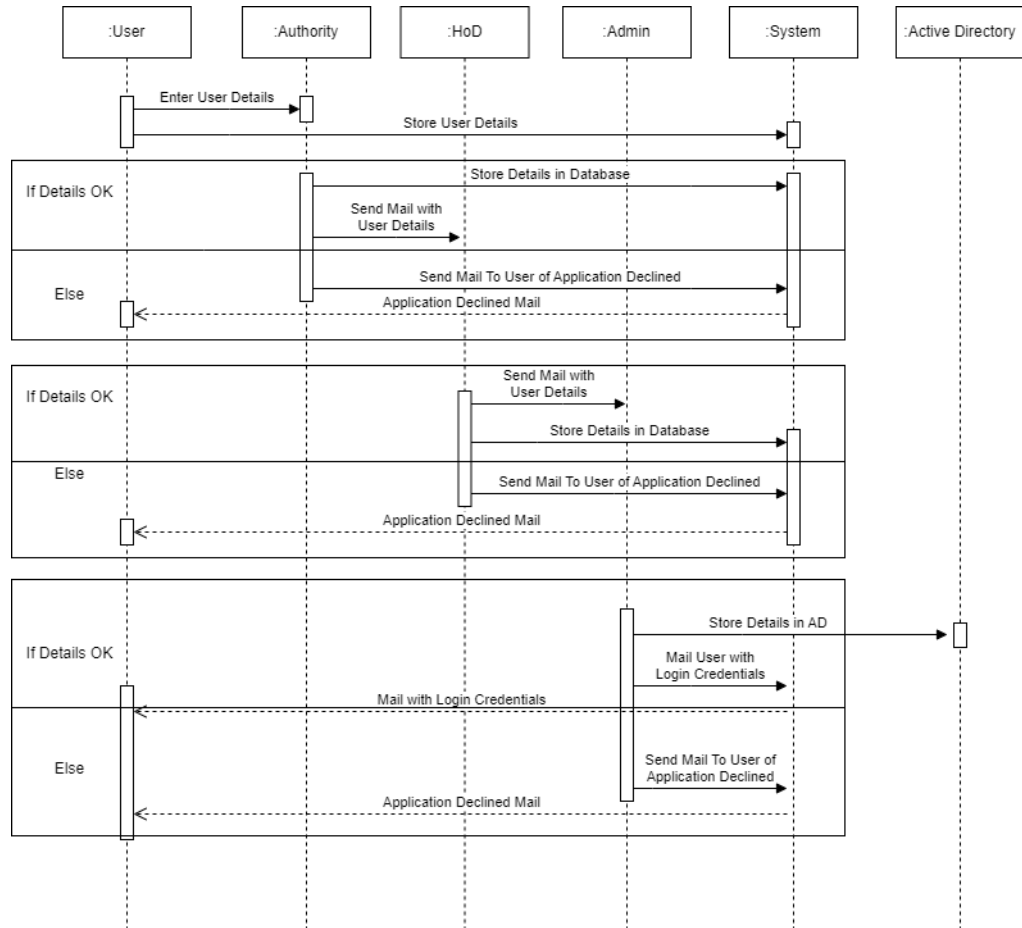


Fig 3.2 Sequence Diagram

- **Activity Diagram:**

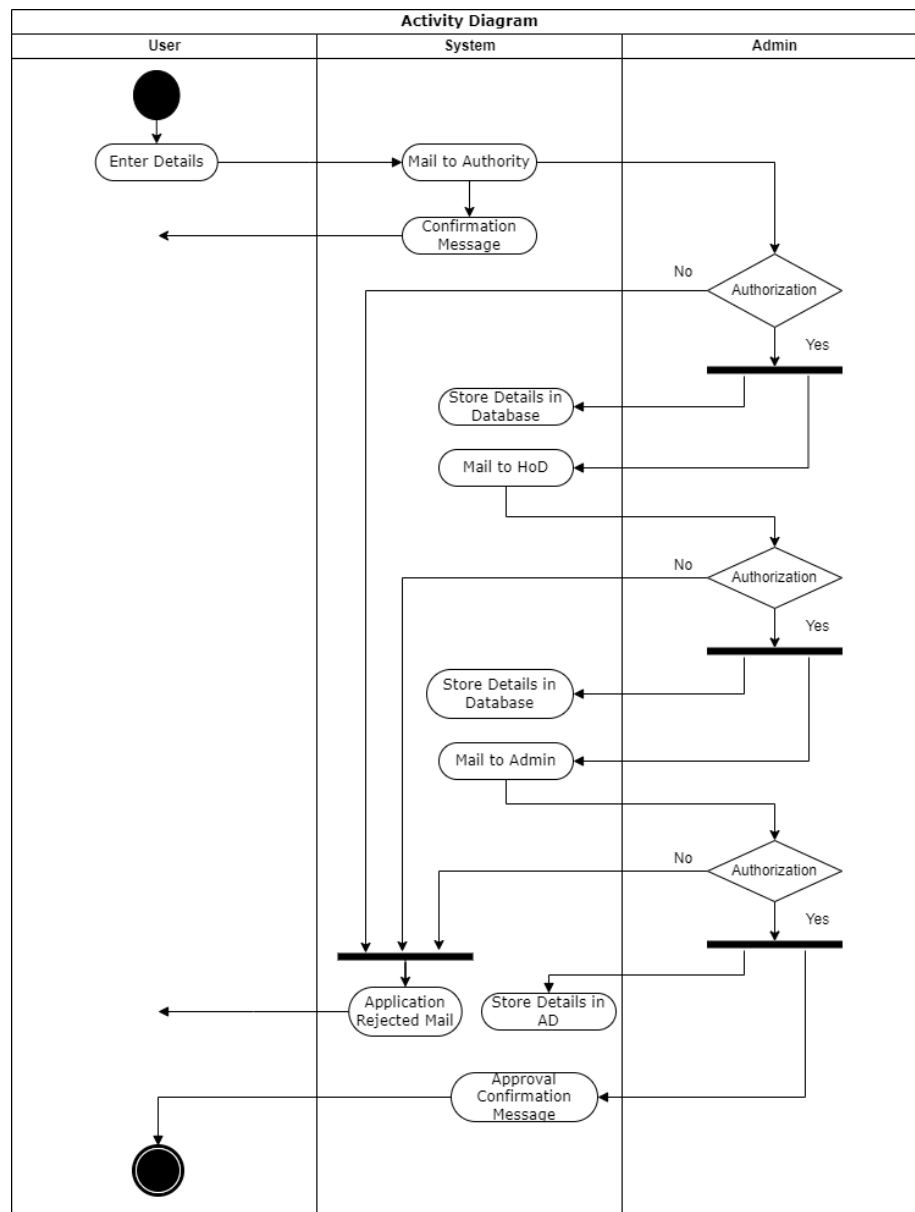


Fig 3.3 Activity Diagram

- **Class Diagram:**

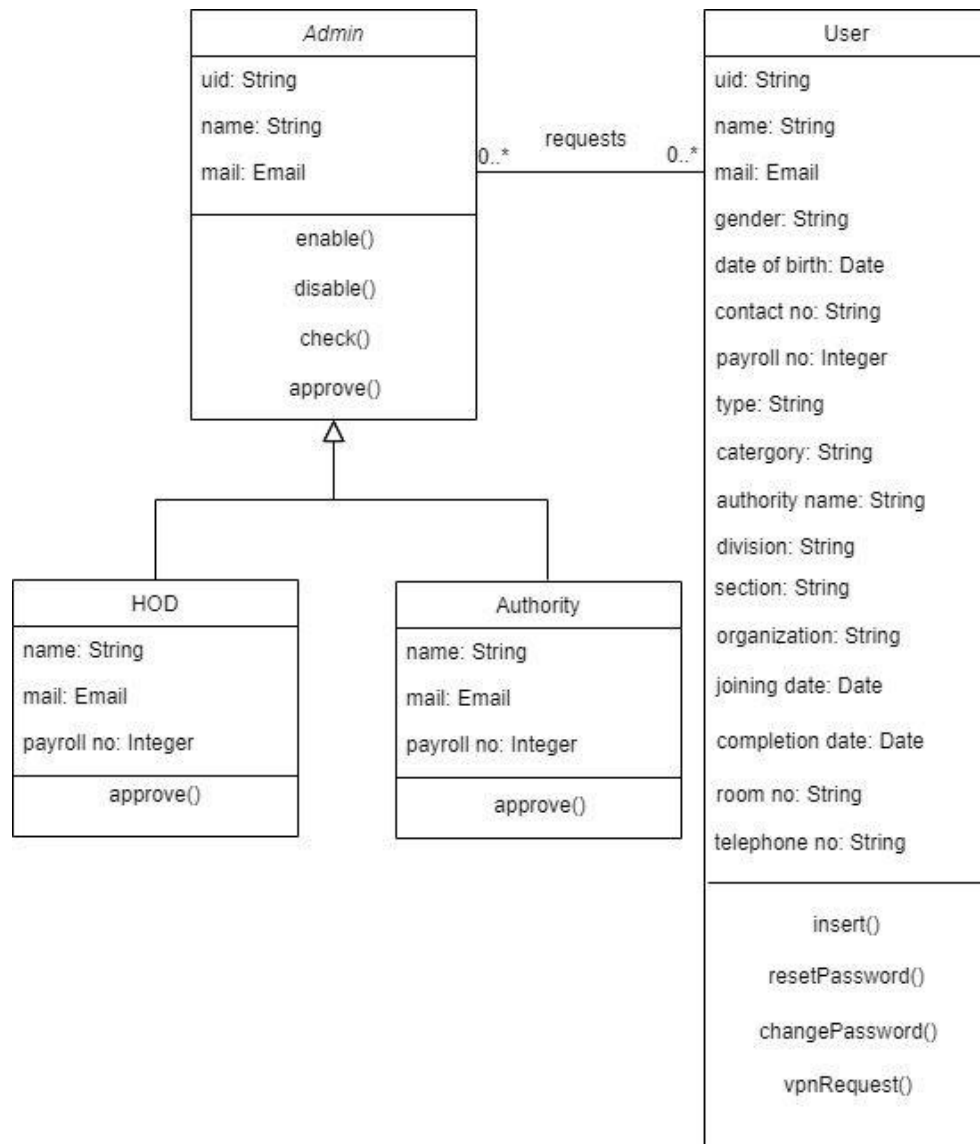


Fig 3.4 Class Diagram

- **ER Diagram:**

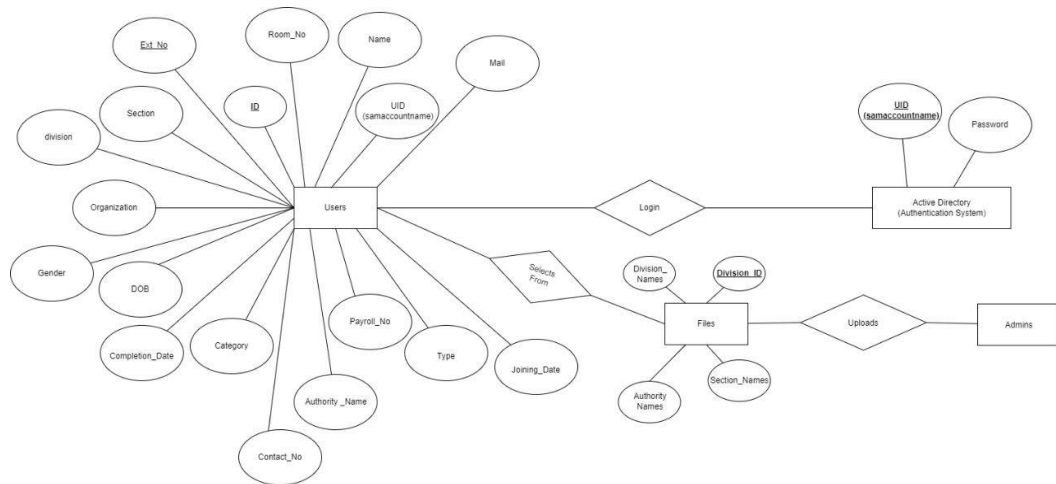


Fig 3.5 ER diagram

Chapter IV

Design

- **Data Dictionary:**

All Tables

Table 4.1.1 List of All Tables

Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> authoriy_names	★ Browse Structure Search Insert Empty Drop	97	InnoDB	utf8mb4_unicode_ci	48.0 KiB	-
<input type="checkbox"/> division	★ Browse Structure Search Insert Empty Drop	79	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> emp_cat	★ Browse Structure Search Insert Empty Drop	6	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> emp_type	★ Browse Structure Search Insert Empty Drop	5	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> failed_jobs	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> gender	★ Browse Structure Search Insert Empty Drop	3	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> initials	★ Browse Structure Search Insert Empty Drop	5	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> migrations	★ Browse Structure Search Insert Empty Drop	21	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> organization	★ Browse Structure Search Insert Empty Drop	4	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> password_resets	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> password_reset_tokens	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> personal_access_tokens	★ Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> reg_user	★ Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_unicode_ci	64.0 KiB	-
<input type="checkbox"/> section	★ Browse Structure Search Insert Empty Drop	61	InnoDB	utf8mb4_unicode_ci	16.0 KiB	-
<input type="checkbox"/> users	★ Browse Structure Search Insert Empty Drop	4	InnoDB	utf8mb4_unicode_ci	48.0 KiB	-
15 tables	Sum	287	InnoDB	utf8mb4_0900_ai_ci	352.0 KiB	0 B

Registration Table (reg_user)

Table 4.1.2 Registration Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	displayname	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	samaccountname	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	mail	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
5	empsex	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
6	birthdate	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
7	contactNumber	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
8	payno	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
9	empType	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
10	empCat	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
11	reporting	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
12	division	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
13	section	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
14	officeregion	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
15	joindate	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
16	retiredate	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
17	telephoneNumber	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
18	extNo	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
19	terms	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
20	count	int			No	2			Change Drop More
21	is_user	tinyint(1)			No	1			Change Drop More
22	created_at	timestamp			Yes	NULL			Change Drop More
23	updated_at	timestamp			Yes	NULL			Change Drop More

Login Table (users)

Table 4.1.3 Login Table

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
3	mail	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
4	password	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
5	email_verified_at	timestamp			Yes	NULL			Change Drop More
6	remember_token	varchar(100)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
7	created_at	timestamp			Yes	NULL			Change Drop More
8	updated_at	timestamp			Yes	NULL			Change Drop More
9	guid	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
10	domain	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More

Authority Names (authority_names)

Table 4.1.4 Authority Names Table

Server: localhost:3306 » Database: laravel » Table: authority_names

[Browse](#)
[Structure](#)
[SQL](#)
[Search](#)
[Insert](#)
[Export](#)
[Import](#)
[Privileges](#)
[Operations](#)
[Tracking](#)

[Table structure](#)
[Relation view](#)

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	name	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
<input type="checkbox"/> 3	email	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
<input type="checkbox"/> 4	payno	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
<input type="checkbox"/> 5	created_at	timestamp			Yes	NULL			Change Drop More
<input type="checkbox"/> 6	updated_at	timestamp			Yes	NULL			Change Drop More

☐ Check all
 With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Fulltext](#) [Add to central columns](#)
[Remove from central columns](#)

[Print](#)
[Track table](#)
[Move columns](#)
[Normalize](#)

[Add](#) 1 column(s) after updated_at [Go](#)

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	id	97	A	No	
Edit Drop	authoriy_names_email_unique	BTREE	Yes	No	email	97	A	No	
Edit Drop	authoriy_names_payno_unique	BTREE	Yes	No	payno	97	A	No	

Divisions (division)

Table 4.1.5 Divisions Table

Server: localhost:3306 » Database: laravel » Table: division

[Browse](#)
[Structure](#)
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[Search](#)
[Insert](#)
[Export](#)
[Import](#)
[Privileges](#)
[Operations](#)
[Tracking](#)

[Table structure](#)
[Relation view](#)

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	DivisionName	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
<input type="checkbox"/> 3	created_at	timestamp			Yes	NULL			Change Drop More
<input type="checkbox"/> 4	updated_at	timestamp			Yes	NULL			Change Drop More

☐ Check all
 With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Fulltext](#) [Add to central columns](#)
[Remove from central columns](#)

[Print](#)
[Track table](#)
[Move columns](#)
[Normalize](#)

[Add](#) 1 column(s) after updated_at [Go](#)

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	id	79	A	No	

Create an index on 1 columns [Go](#)

Section (section)

Table 4.1.6 Section Table

Server: localhost:3306 » Database: laravel » Table: section

Browse Structure SQL Search Insert Export Import Privileges Operations Tracking

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	Divid	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
<input type="checkbox"/> 3	SectionName	varchar(255)	utf8mb4_unicode_ci		Yes	NULL			Change Drop More
<input type="checkbox"/> 4	created_at	timestamp			Yes	NULL			Change Drop More
<input type="checkbox"/> 5	updated_at	timestamp			Yes	NULL			Change Drop More

☐ Check all With selected: Browse Change Drop Primary Unique Index Fulltext Add to central columns
 Remove from central columns

Print Track table Move columns Normalize

Add 1 column(s) after updated_at Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	id	61	A	No	

Create an index on 1 columns Go

Employee Type (emp_type)

Table 4.1.7 Employee Type Table

Server: localhost:3306 » Database: laravel » Table: emp_type

Browse Structure SQL Search Insert Export Import Privileges Operations Tracking

Table structure Relation view

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	employeeType	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
<input type="checkbox"/> 3	created_at	timestamp			Yes	NULL			Change Drop More
<input type="checkbox"/> 4	updated_at	timestamp			Yes	NULL			Change Drop More

☐ Check all With selected: Browse Change Drop Primary Unique Index Fulltext Add to central columns
 Remove from central columns

Print Track table Move columns Normalize

Add 1 column(s) after updated_at Go

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	id	4	A	No	

Create an index on 1 columns Go

Employee Category (emp_cat)

Table 4.1.8 Employee Category Table

Server: localhost:3306 » Database: laravel » Table: emp_cat

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[Table structure](#)
[Relation view](#)

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	empCat	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
<input type="checkbox"/> 3	created_at	timestamp			Yes	NULL			Change Drop More
<input type="checkbox"/> 4	updated_at	timestamp			Yes	NULL			Change Drop More

☐ Check all
 With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Fulltext](#) [Add to central colu](#)
[Remove from central columns](#)

[Print](#)
[Track table](#)
[Move columns](#)
[Normalize](#)

[Add](#) 1 column(s) after updated_at [Go](#)

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	id	6	A	No	

Create an index on 1 columns [Go](#)

Gender (gender)

Table 4.1.9 Gender Table

Server: localhost:3306 » Database: laravel » Table: gender

[Browse](#)
[Structure](#)
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[Import](#)
[Privileges](#)
[Operations](#)
[Tracking](#)

[Table structure](#)
[Relation view](#)

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	gender	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
<input type="checkbox"/> 3	created_at	timestamp			Yes	NULL			Change Drop More
<input type="checkbox"/> 4	updated_at	timestamp			Yes	NULL			Change Drop More

☐ Check all
 With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Fulltext](#) [Add to central colu](#)
[Remove from central columns](#)

[Print](#)
[Track table](#)
[Move columns](#)
[Normalize](#)

[Add](#) 1 column(s) after updated_at [Go](#)

Indexes

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	id	2	A	No	

Create an index on 1 columns [Go](#)

Organization (organization)

Table 4.1.10 Organization Table

Server: localhost:3306 » Database: laravel » Table: organization

[Browse](#)
[Structure](#)
[SQL](#)
[Search](#)
[Insert](#)
[Export](#)
[Import](#)
[Privileges](#)
[Operations](#)
[Tracking](#)

[Table structure](#)
[Relation view](#)

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/> 1	id	bigint		UNSIGNED	No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/> 2	org	varchar(255)	utf8mb4_unicode_ci		No	None			Change Drop More
<input type="checkbox"/> 3	created_at	timestamp			Yes	NULL			Change Drop More
<input type="checkbox"/> 4	updated_at	timestamp			Yes	NULL			Change Drop More

☐ Check all
 With selected: [Browse](#) [Change](#) [Drop](#) [Primary](#) [Unique](#) [Index](#) [Fulltext](#) [Add to central columns](#)

[Print](#)
[Track table](#)
[Move columns](#)
[Normalize](#)

[Add](#) 1 column(s) after updated_at [Go](#)

[Indexes](#)

Action	Keyname	Type	Unique	Packed	Column	Cardinality	Collation	Null	Comment
Edit Drop	PRIMARY	BTREE	Yes	No	id	4	A	No	

Create an index on 1 columns [Go](#)

MemberOf (memberof_groups)

Table 4.1.11 MemberOf Table

[Browse](#)
[Structure](#)
[SQL](#)
[Search](#)
[Insert](#)
[Export](#)
[Import](#)
[Privileges](#)
[Operations](#)
[Tracking](#)

Showing rows 0 - 5 (6 total, Query took 0.0004 seconds.)

[SELECT](#) * FROM `memberof_groups`

☐ Profiling [\[Edit inline\]](#) [\[Edit\]](#) [\[Expl\]](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

+ Options

				id	groups	created_at	updated_at
<input type="checkbox"/>	Edit	Copy	Delete	1	ecloud	NULL	NULL
<input type="checkbox"/>	Edit	Copy	Delete	2	Netteam	NULL	NULL
<input type="checkbox"/>	Edit	Copy	Delete	3	Designation Manager	NULL	NULL
<input type="checkbox"/>	Edit	Copy	Delete	4	MDAccess	NULL	NULL
<input type="checkbox"/>	Edit	Copy	Delete	5	InternetAccess	NULL	NULL
<input type="checkbox"/>	Edit	Copy	Delete	6	ComputerDivision	NULL	NULL

☐ Check all
 With selected: [Edit](#) [Copy](#) [Delete](#) [Export](#)

☐ Show all | Number of rows: 25 | Filter rows: Search this table | Sort by key: None

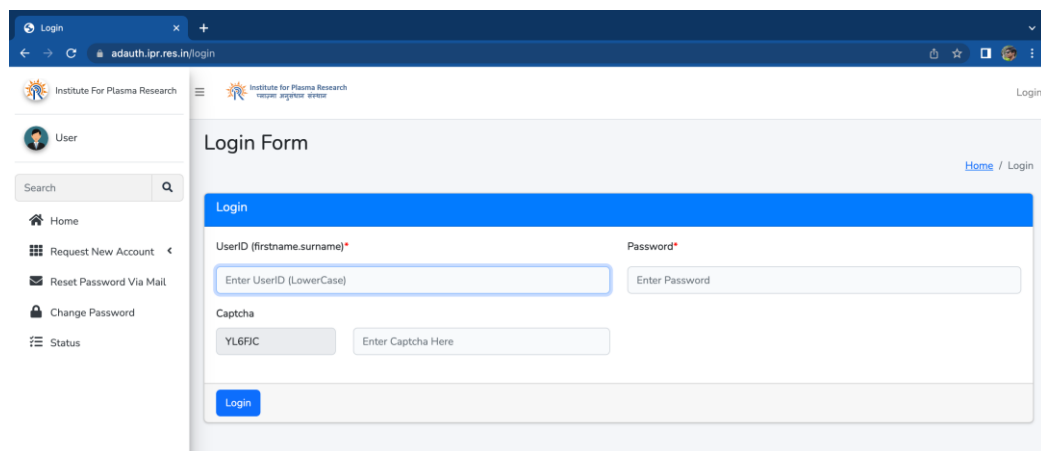
Query results operations

[Print](#) [Copy to clipboard](#) [Export](#) [Display chart](#) [Create view](#)

- **Front-end interface :**

- **General Pages:**

Login Page



The screenshot displays the login interface of the Institute for Plasma Research. The browser address bar shows the URL `adauth.ipr.res.in/login`. The page layout includes a sidebar on the left with a search bar and navigation links: Home, Request New Account, Reset Password Via Mail, Change Password, and Status. The main content area is titled "Login Form" and contains a "Login" section with a blue header. This section has three input fields: "UserID (firstname.surname)*" with a placeholder "Enter UserID (LowerCase)", "Password*" with a placeholder "Enter Password", and a "Captcha" field showing the image "YL6FJC" and a placeholder "Enter Captcha Here". A blue "Login" button is positioned at the bottom of the form.

Fig 4.2.1 Login Page

Registration Page

Registration Form

[Home](#) / [Register](#)

Register Yourself

Name*	UserID (firstname.surname)*
Test	test.test
E-Mail*	Gender*
urjit.ipr@gmail.com	MALE
Date Of Birth*	Contact No*
01/12/2001	7573932323
PayRoll/Employee No.* (If not Assigned, Please Enter '0')	Select Your Type*
0	Student
Select Your Category*	Enter your Approving Authority*
Student/Interns/Trainee	Arvind Singh
Select Your Division*	Select Your Section*
Administration	Admin-3
Organisation*	Email Of Selected Authority
IPR	arvind@ipr.res.in
Joining Date*	Completion Date*
27/03/2023	28/03/2023
Room No.*	Extension No.*
1234	8764

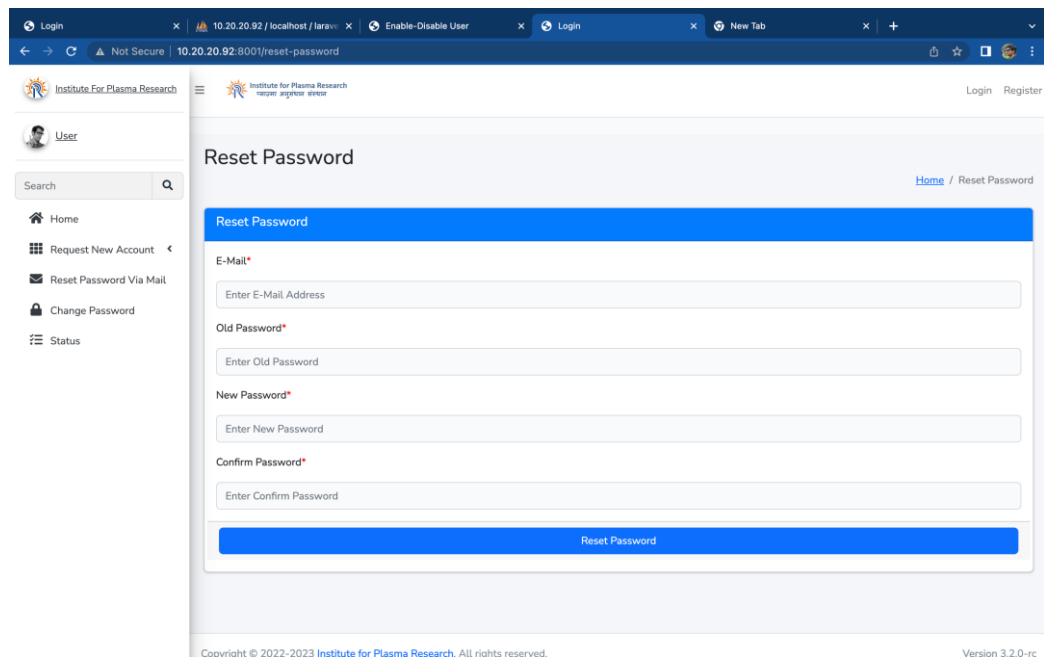
☒ I hereby declare that I have read, understood and thereby accept the [AUP \(Acceptable Use Policy\)](#) of Institute for Plasma Research. I promise to abide strictly to Institute's IT security policy. The Competant Authority of IPR can take necessary action against me in case of the violation of this policy.

[Register](#)

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Fig 4.2.2 Registration Page

Change Password Page



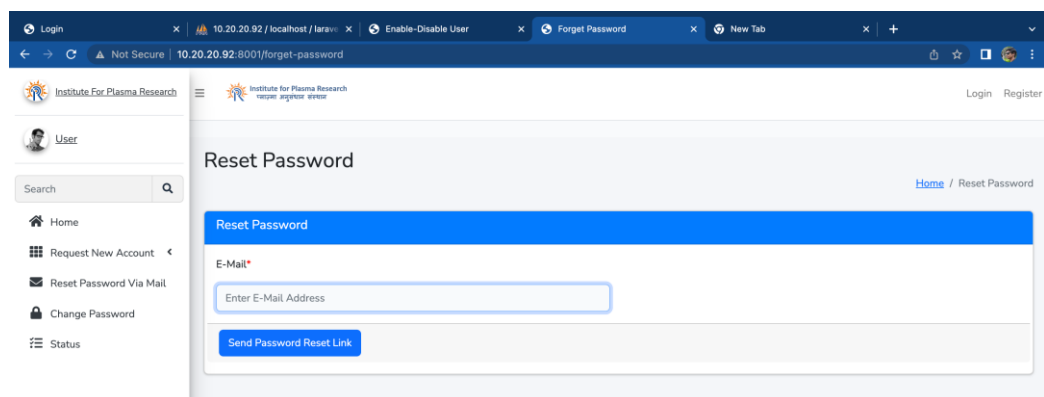
The screenshot shows a web browser window with the URL `10.20.20.92:8001/reset-password`. The page is titled "Reset Password" and features a sidebar with navigation links: Home, Request New Account, Reset Password Via Mail, Change Password, and Status. The main content area contains a "Reset Password" form with the following fields:

- E-Mail***: Enter E-Mail Address
- Old Password***: Enter Old Password
- New Password***: Enter New Password
- Confirm Password***: Enter Confirm Password

A blue "Reset Password" button is located at the bottom of the form. The footer includes the copyright notice "Copyright © 2022-2023 Institute for Plasma Research. All rights reserved." and the version "Version 3.2.0-rc".

Fig 4.2.3 Change Password Page

Reset Password Page



The screenshot shows a web browser window with the URL `10.20.20.92:8001/forget-password`. The page is titled "Reset Password" and features a sidebar with navigation links: Home, Request New Account, Reset Password Via Mail, Change Password, and Status. The main content area contains a "Reset Password" form with the following fields:

- E-Mail***: Enter E-Mail Address

A blue "Send Password Reset Link" button is located below the form. The footer includes the copyright notice "Copyright © 2022-2023 Institute for Plasma Research. All rights reserved." and the version "Version 3.2.0-rc".

Fig 4.2.4 Reset Password Page

Forget Password Page

Reset Password

The New password must contain at least one number and one uppercase one lowercase letter and one special character from (@,#,\$,%,&,(,),-,_) and at least 7 or more characters. Do not enter your username or user id in the password.

E-Mail Address

Password

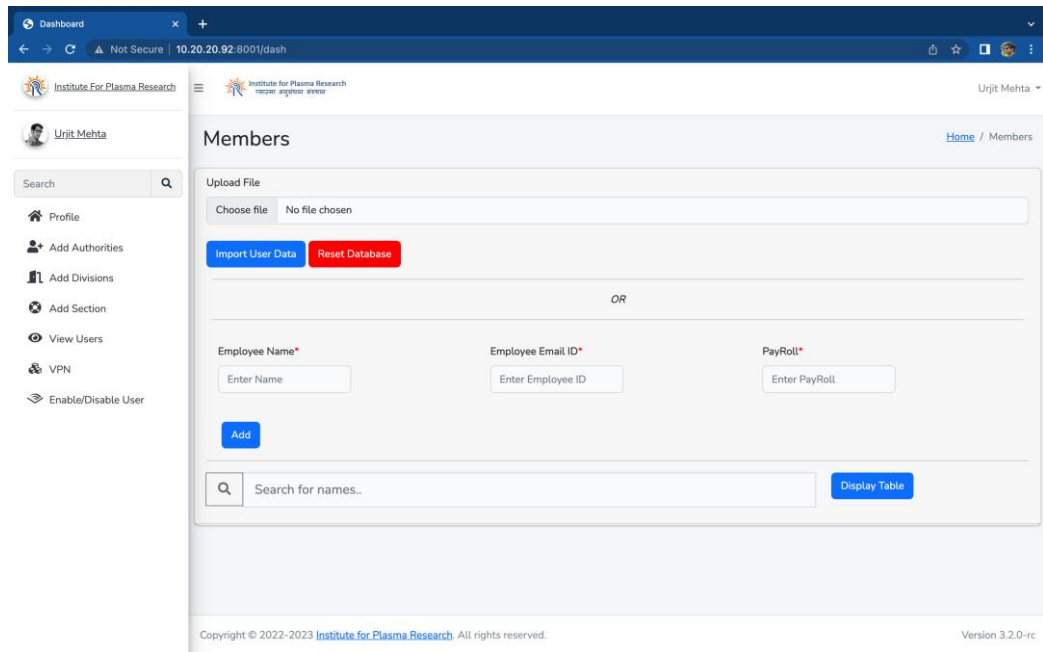
Confirm Password

[Reset Password](#)

Fig 4.2.5 Forget Password Page

- **Admin Side:**

Home

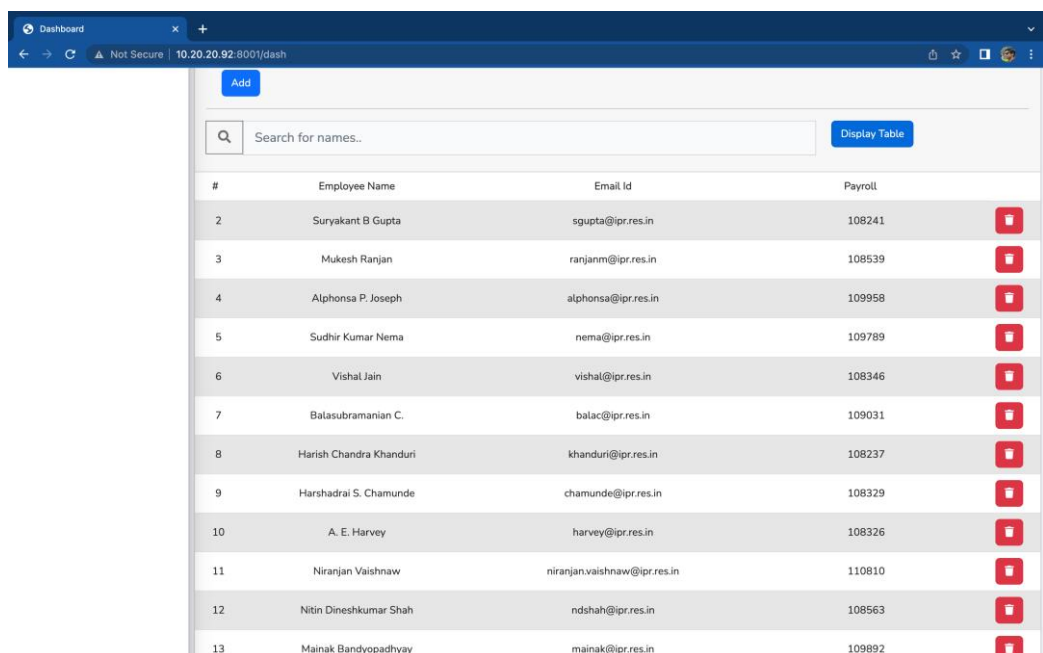


The screenshot shows the Admin Home Page for the Institute for Plasma Research. The sidebar on the left contains the following menu items: Profile, Add Authorities, Add Divisions, Add Section, View Users, VPN, and Enable/Disable User. The main content area is titled 'Members' and includes an 'Upload File' section with a 'Choose file' button and a 'No file chosen' message. Below this are 'Import User Data' and 'Reset Database' buttons. A search bar with the placeholder 'Search for names..' and a 'Display Table' button is also present. The table below contains the following data:

#	Employee Name	Email Id	Payroll
2	Suryakant B Gupta	sgupta@ipr.res.in	108241
3	Mukesh Ranjan	ranjanm@ipr.res.in	108539
4	Alphonsa P. Joseph	alphonsa@ipr.res.in	109958
5	Sudhir Kumar Nema	nema@ipr.res.in	109789
6	Vishal Jain	vishal@ipr.res.in	108346
7	Balasubramanian C.	balac@ipr.res.in	109031
8	Harish Chandra Khanduri	khanduri@ipr.res.in	108237
9	Harshadrai S. Chamunde	chamunde@ipr.res.in	108329
10	A. E. Harvey	harvey@ipr.res.in	108326
11	Niranjan Vaishnaw	niranjan.vaishnaw@ipr.res.in	110810
12	Nitin Dineshkumar Shah	ndshah@ipr.res.in	108563
13	Mainak Bandyopadhyay	mainak@ipr.res.in	109892

Fig 4.3.1 Admin Home Page

Add Authority



The screenshot shows the Add Authority Page, which displays a table of employees. The table has four columns: #, Employee Name, Email Id, and Payroll. Each row has a red delete button (X icon) on the right. The data is as follows:

#	Employee Name	Email Id	Payroll
2	Suryakant B Gupta	sgupta@ipr.res.in	108241
3	Mukesh Ranjan	ranjanm@ipr.res.in	108539
4	Alphonsa P. Joseph	alphonsa@ipr.res.in	109958
5	Sudhir Kumar Nema	nema@ipr.res.in	109789
6	Vishal Jain	vishal@ipr.res.in	108346
7	Balasubramanian C.	balac@ipr.res.in	109031
8	Harish Chandra Khanduri	khanduri@ipr.res.in	108237
9	Harshadrai S. Chamunde	chamunde@ipr.res.in	108329
10	A. E. Harvey	harvey@ipr.res.in	108326
11	Niranjan Vaishnaw	niranjan.vaishnaw@ipr.res.in	110810
12	Nitin Dineshkumar Shah	ndshah@ipr.res.in	108563
13	Mainak Bandyopadhyay	mainak@ipr.res.in	109892

Fig 4.3.2 Add Authority Page

Add Division

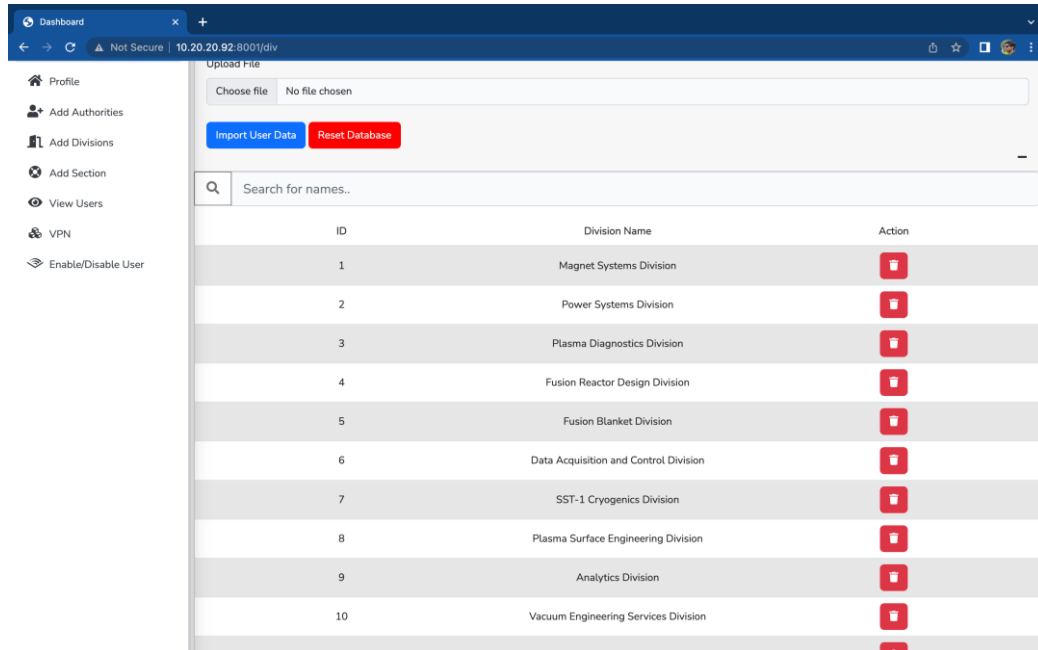


Fig 4.3.3 Add Division Page

Add Section

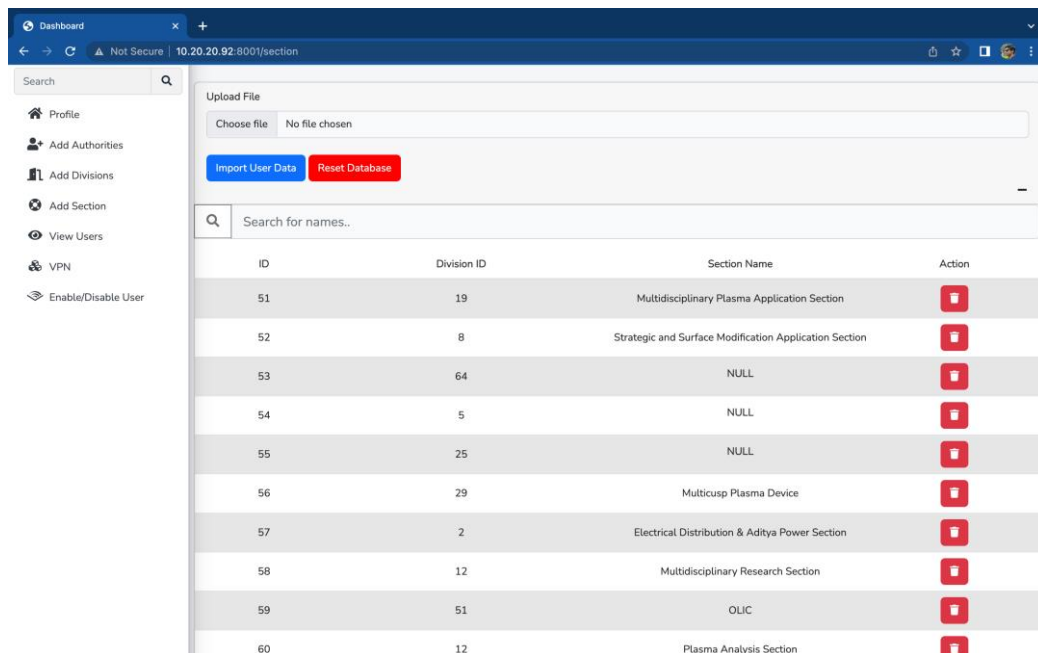


Fig 4.3.4 Add Section Page

View Users

The screenshot displays the 'View Users' interface. At the top, a summary bar indicates 'Total Users: 961', 'Enabled User: 957', and 'Disabled User: 4'. Below this is a search bar with the placeholder text 'Search for names..'. The main content area is a table with three columns: 'ID', 'User Name', and 'Action'. The table lists 10 users, each with an 'Edit Details' button in the 'Action' column. The sidebar on the left provides navigation options, and the top header shows the user's name 'Ujjit Mehta'.

ID	User Name	Action
1		Edit Details
2		Edit Details
3		Edit Details
4	test1	Edit Details
5	adfs	Edit Details
6	Shirin Sam Bhesania	Edit Details
7	Falguni Ashvinbhai Shah	Edit Details
8	Nilaykumar Manharlal Adhvaryu	Edit Details
9	Vipulkumar D. Datania	Edit Details
10	Munaf Mohammed Hanif Tandurwala	Edit Details

Fig 4.3.5 View Users Page

Edit Users

The screenshot shows a web application interface for editing user data. The browser address bar indicates the URL is `adauth.ipr.res.in/viewUsers/getUser/urjit.mehta?`. A notification bar at the top says "Press (fn) F to exit full screen". On the left, a sidebar menu contains: Profile, Add Authorities, Add Divisions, Add Section, View Users, and Enable/Disable User. The main content area is titled "User Data" and contains a form with the following fields:

Field Name	Value
CN	urjit.mehta
Title	Student
Distinguished Name	CN=urjit.mehta,OU=Student,OU=Technical,OU=IPR-FCIPT,DC=iprho,DC=local
Instance Type	4
When Created	2022-12-06 09:53:54
When Changed	2023-03-20 09:31:28
Display Name	Urjit Mehta
USN Created	228442228
Member Of	CN=InternetAccess,OU=Security Groups,DC=iprho,DC=local
USN Changed	237658709
Company	IPR
Name	urjit.mehta
Last LogOn	2023-03-28 07:32:58
Primary Group Id	513
Account Expires	2008-09-14 02:48:05
LogOn Count	0
Sam Account Name	urjit.mehta
Division	Computer Div
Sam Account Type	805306368
User Principal Name	urjit.mehta
E-Mail	mehtaurjit01@gmail.com
Gender	M
Joining Date	06-12-2022
Retire Date	15-04-2022
Birth Date	01-12-2001
Payno Reporting	0
Payno	0
Reporting	Arvind

Fig 4.3.6 Edit Users

Checking Enable/Disable Status

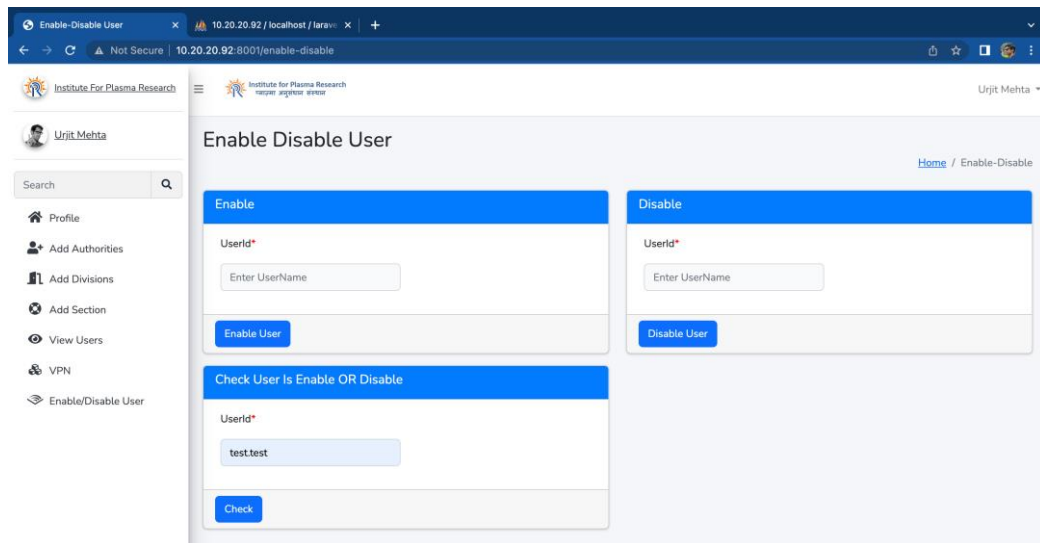


Fig 4.3.7 Checking Enable/Disable Status Page

User Account Checking Status: Enabled

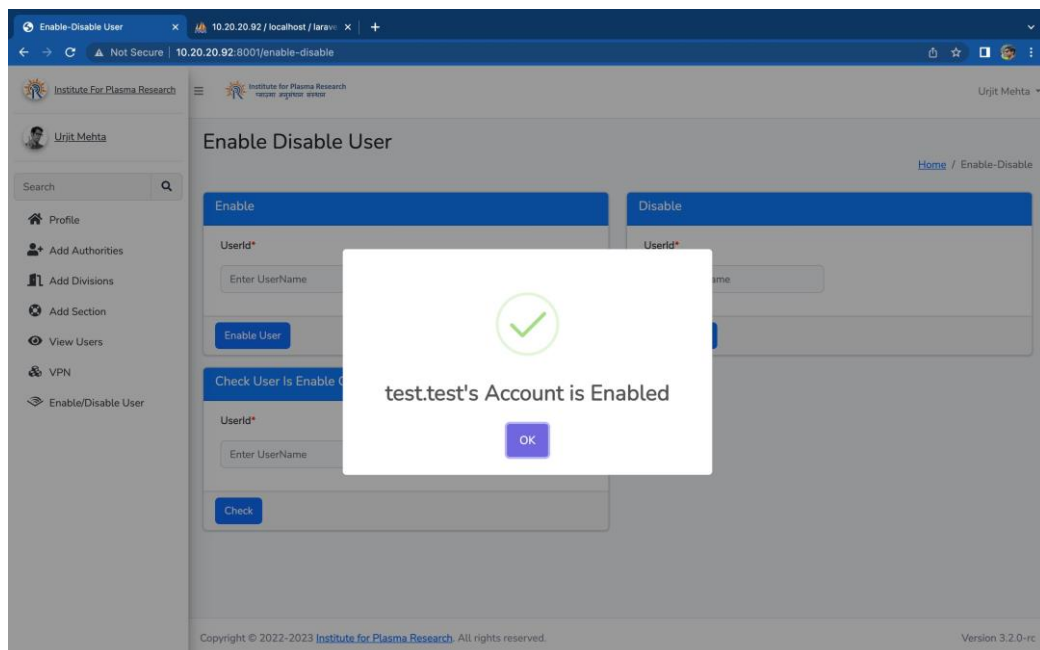


Fig 4.3.8 User Account Status: Enabled

User Account Checking Status: Disabled

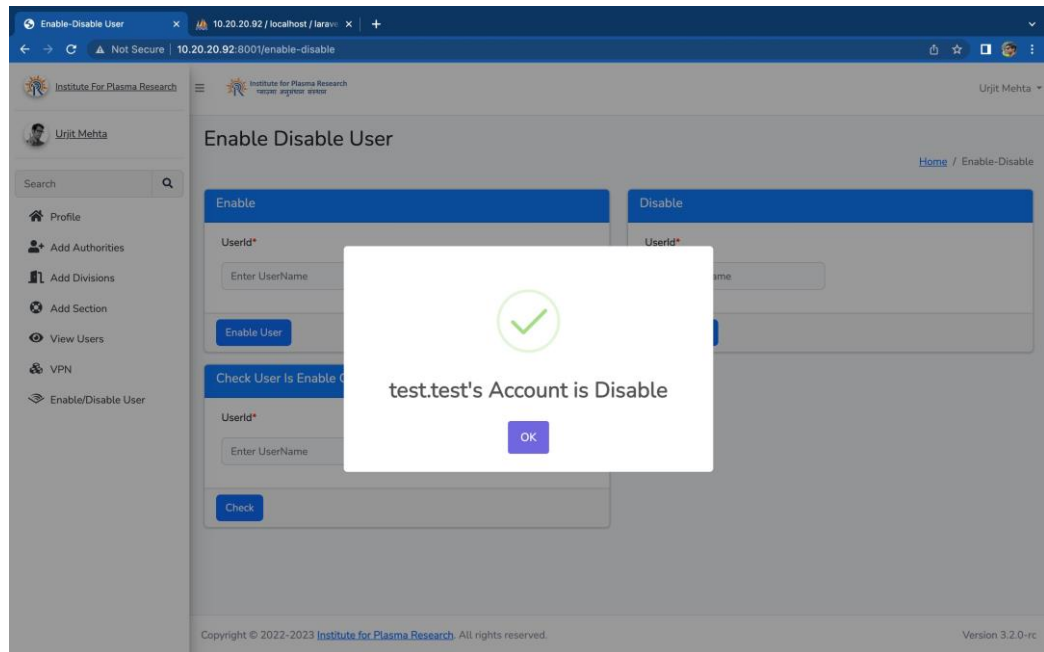


Fig 4.3.9 User Account Status: Disabled

Enabling User

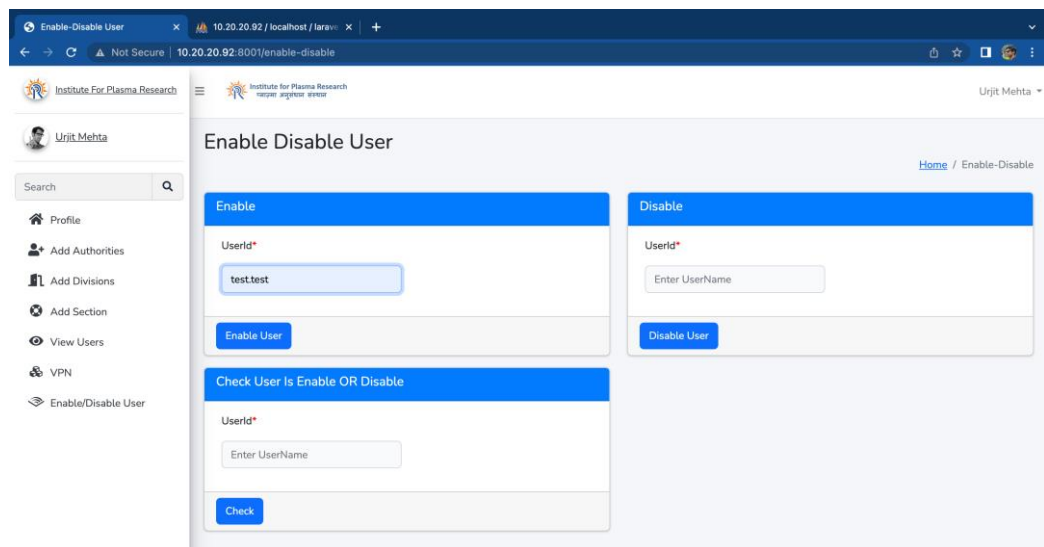


Fig 4.3.10 Enabling User

User Enabled

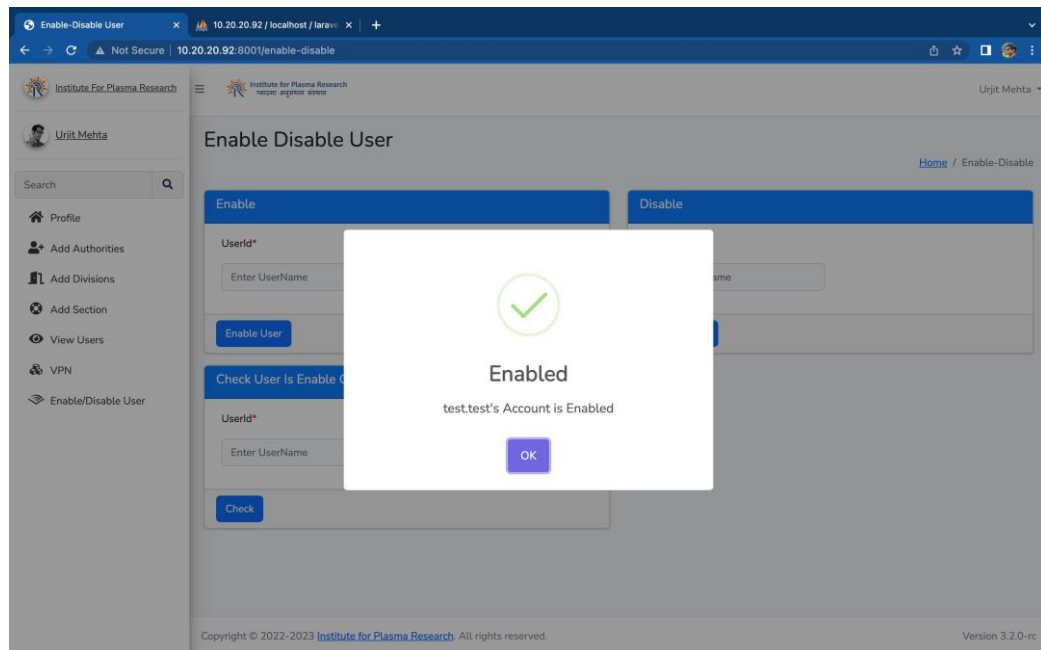


Fig 4.3.11 User Enabled

Disabling User

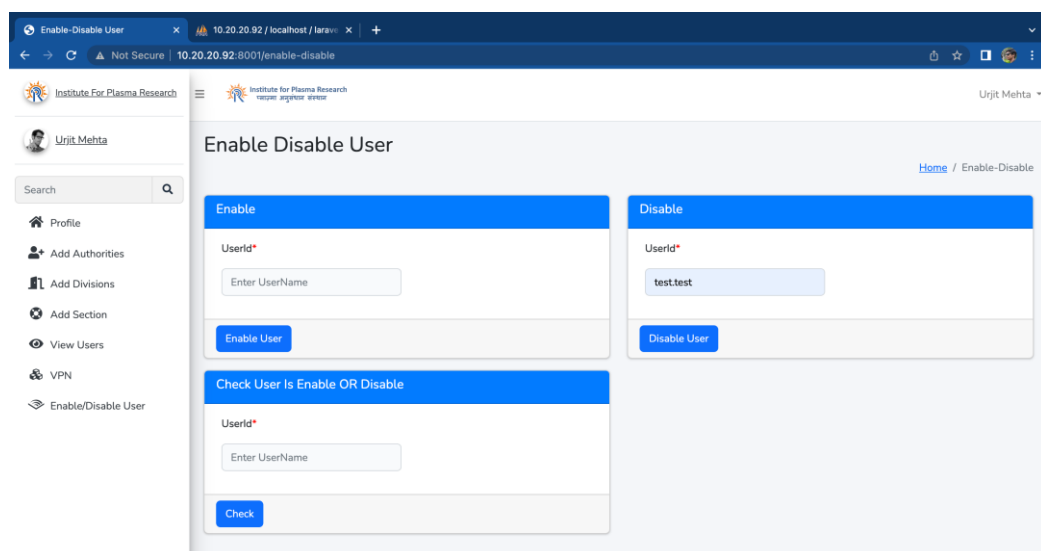


Fig 4.3.12 Disabling User

User Disabled

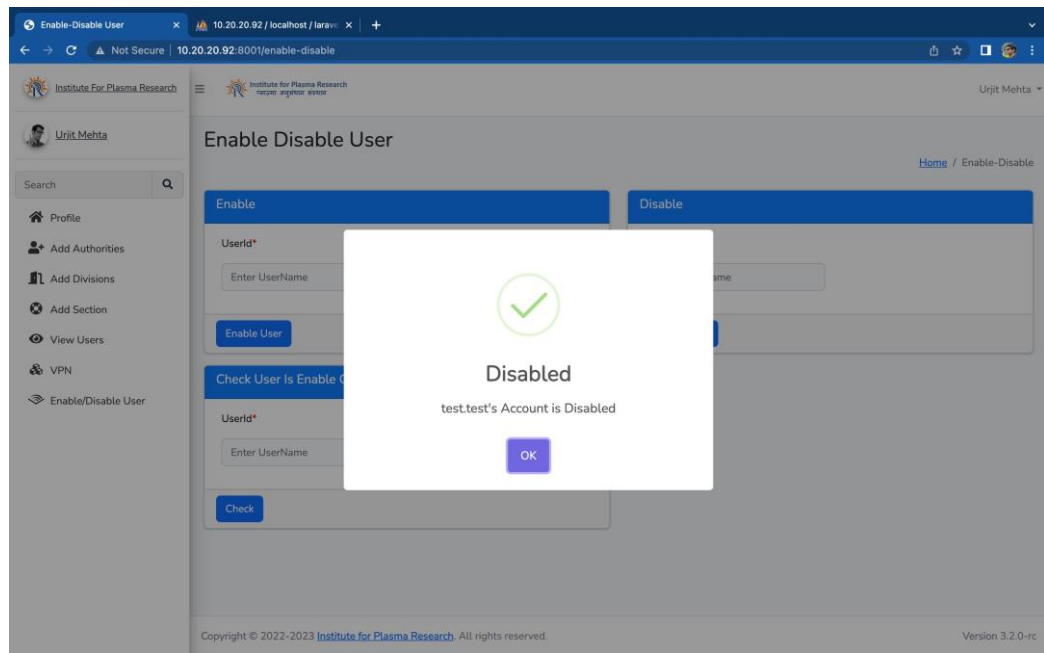


Fig 4.3.13 User Disabled

MemberOf Page

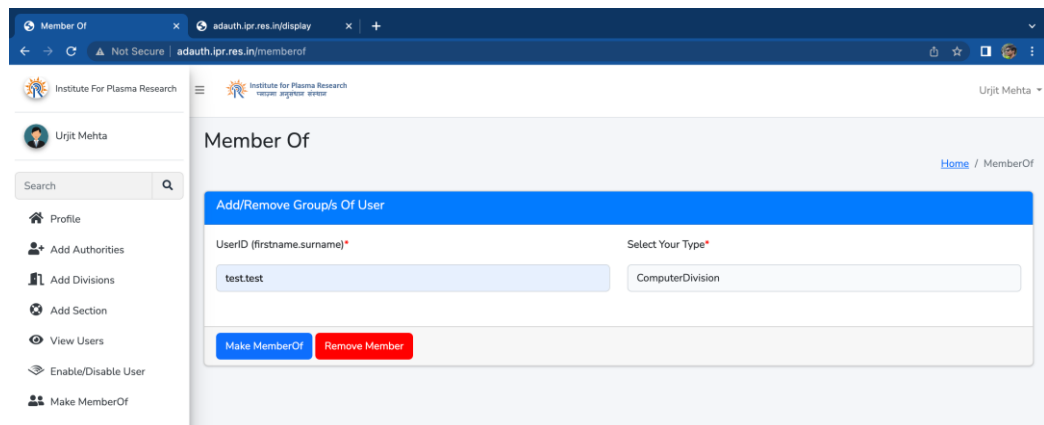


Fig 4.3.14 MemberOf Page

Make User MemberOf a Group

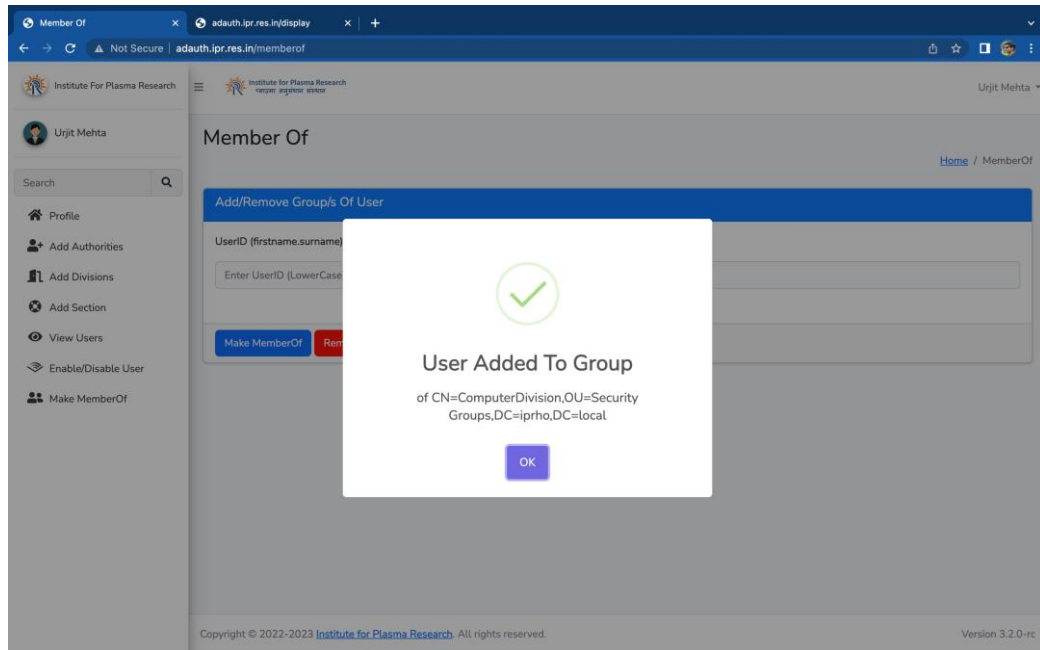


Fig 4.3.15 Make User MemberOf a Group

Remove User from Group

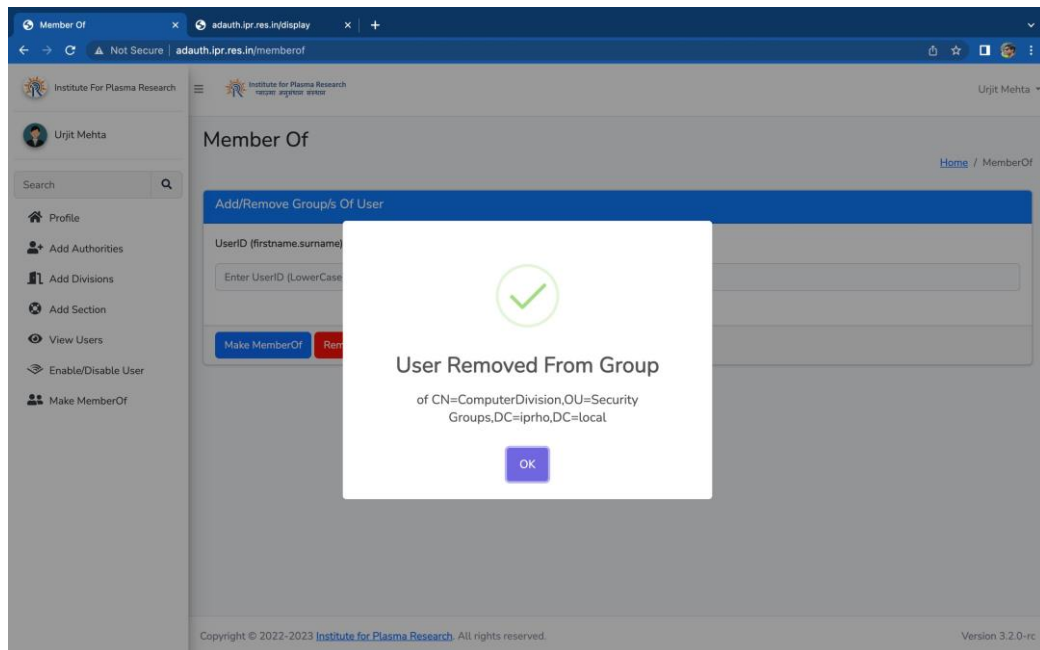


Fig 4.3.16 Remove User from Group

- **User Side:**

Profile

Hey Test1!!

[Home](#) / [Profile](#)

My Profile

UserID (firstname.surname)*	Name*
test.test	Test1
E-Mail*	Gender*
dp3395636@gmail.com	MALE
Date Of Birth	Contact No*
2001-12-01	7573932323
PayRoll/Employee No.*	Employee Type*
0	Student
Employee Category*	Division*
Student/Interns/Trainee	10
Section*	Organisation*
105	IPR
Joining Date*	Completion Date
2023-01-01	2024-01-01
Room No.	Extension No.
1234	123
Approving Authority Email*	
arvind@ipr.res.in	

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Fig 4.4.1 User Profile

VPN

Register Yourself for VPN

Search

Profile

Add Authorities

Add Divisions

Add Section

View Users

VPN

Enable/Disable User

Register for VPN

Initials* Mr.

Full Name* Ujrit Mehta

Designation* Student

Division* Computer Division

Section* Enter Your section

Organisation* IPR

E-Mail* mehtaurjit01@gmail.com

Contact No* 7573932323

Purpose of the VPN Access* Intranet Server Access

From Date* 27/03/2023

End Date 28/03/2023

Detailed Justification for Requirement* For Work From Home

☒ I hereby declare that I have read, understood and thereby accept the [AUP \(Acceptable Use Policy\)](#) of Institute for Plasma Research. I promise to abide strictly to Institute's IT security policy. The Competant Authority of IPR can take necessary action against me in case of the violation of this policy.

Fig 4.4.2 VPN Page

End Date dd/mm/yyyy

Detailed Justification for Requirement*

☐ I hereby declare that I have read, understood and thereby accept the [AUP \(Acceptable Use Policy\)](#) of Institute for Plasma Research. I promise to abide strictly to Institute's IT security policy. The Competant Authority of IPR can take necessary action against me in case of the violation of this policy.

Signature Of Requester

Name Of Requester

Date

IPR Staff Validating Requester

Signature

Name

Designation

Date

Contact Number

Approved By

Head, Computer Division

For Computer Division Usage Only

VPN UserID created

Date of VPN Account created

Account created By Computer Division Staff

VPN Access given for the Purpose

Remarks (if any)

Generate Pdf

Fig 4.4.3 VPN Page Append Section

VPN Request

Initials*	Full Name*
Mr.	Urjit Mehta
Designation*	Division*
Student	Computer Division
Section*	Organisation*
Enter Your section	IPR
E-Mail*	Contact No*
mehtaurjit01@gmail.com	7573932323
Purpose of the VPN Access*	From Date*
Intranet Server Access	2023-03-27
End Date	Detailed Justification for Requirement*
2023-03-28	For Work From Home
<p>I hereby declare that I have read, understood and thereby accept the AUP (Acceptable Use Policy) of Institute for Plasma Research. I promise to abide strictly to Institute's IT security policy. The Competant Authority of IPR can take necessary action against me in case of the violation of this policy.</p>	
Signature Of Requester	Name Of Requester
Date	
IPR Staff Validating Requester	
Signature	Name
Designation	Date
Contact Number	
Approved By	
Head, Computer Division	
For Computer Division Usage Only	
VPN UserID created	Date of VPN Account created
Account created By Computer Division Staff	VPN Access given for the Purpose
Remarks(if any)	

Fig 4.4.4 VPN Request

Status

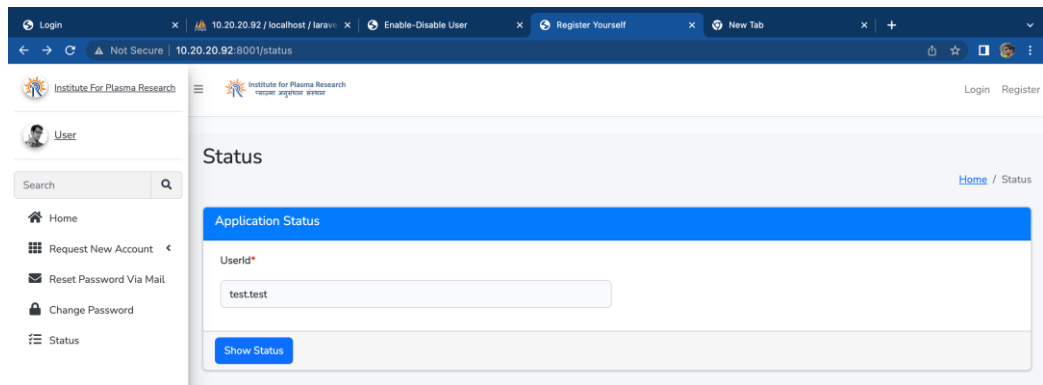


Fig 4.4.5 Status Page

Status (Authority's Approval - Level 1)

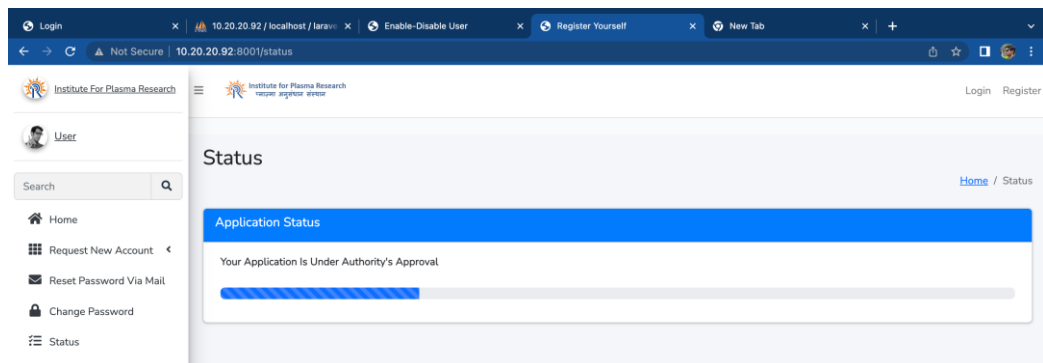


Fig 4.4.6 Status (Authority's Approval - Level 1)

Status (HoD's Approval - Level 2)

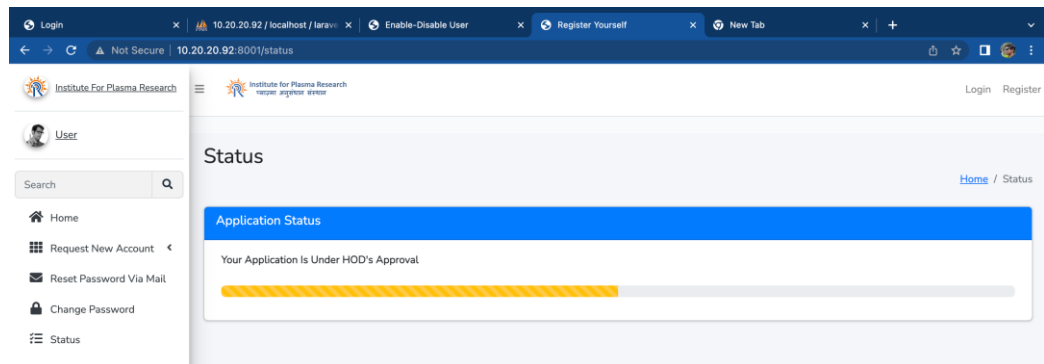


Fig 4.4.7 Status (HoD's Approval - Level 2)

Status (Admin's Approval - Level 3)

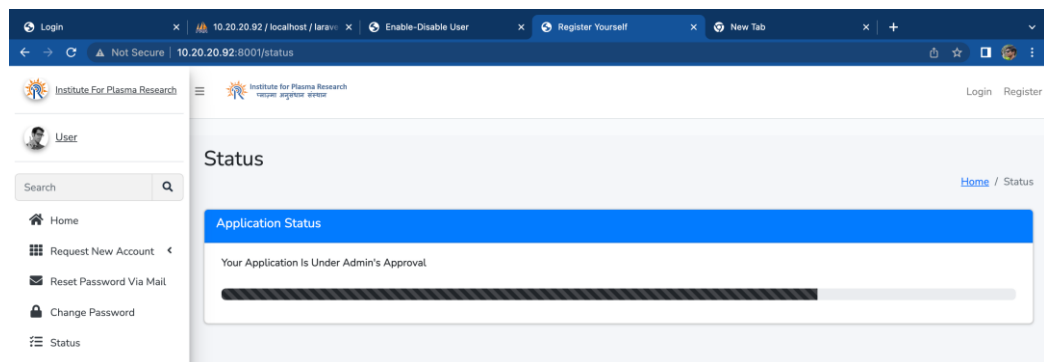


Fig 4.4.8 Status (Admin's Approval - Level 3)

Status (Application Approved)

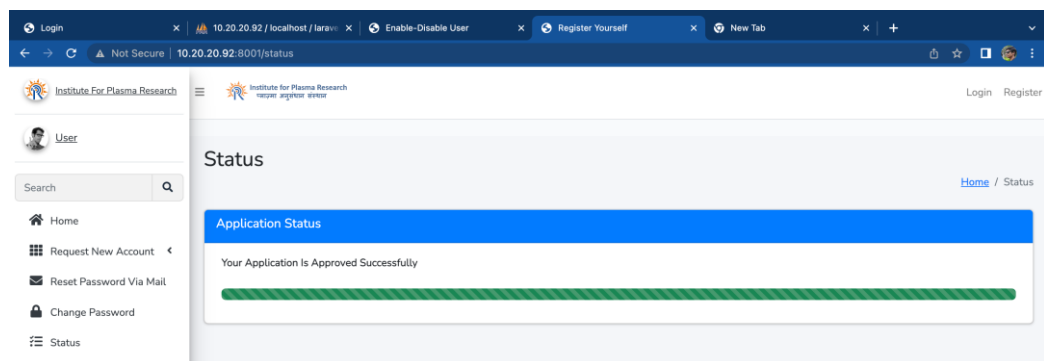


Fig 4.4.9 Status (Application Approved)

- **System Side:**

Mail (Level-1)

The screenshot shows a web application interface for managing user data. The browser address bar indicates the URL is `10.20.20.92:8001/home/test.test/fipctHgy`. The left sidebar contains navigation links: Home, Request New Account, Reset Password Via Mail, Change Password, and Status. The main content area is titled 'User Data' and contains a form with the following fields:

Field Label	Value
User ID (firstname.surname)*	test.test
Name*	Test
E-Mail*	urjit.lpr@gmail.com
Gender*	MALE
Date Of Birth	2001-12-01
Contact No*	7573932323
PayRoll/Employee No.*	0
Employee Type*	Student
Employee Category*	Student/Interns/Trainee
Division*	51
Section*	75
Organisation*	IPR
Joining Date*	2023-03-27
Completion Date	2023-03-28
Room No.	1234
Extension No.	8764
Approving Authority Email*	arvind@ipr.res.in

At the bottom of the form, there are two buttons: 'Approve' (green) and 'Reject' (red).

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Fig 4.5.1 Mail (Level-1)

Mail (Level-2)

The screenshot displays a web application interface for a 'Mail (Level-2)' request. The browser address bar shows the URL '10.20.20.92:8001/home/test.test/FipctHgy'. The page has a sidebar with navigation links: Home, Request New Account, Reset Password Via Mail, Change Password, and Status. The main content area is titled 'User Data' and contains a form with the following fields:

User Data	
UserID (firstname.surname)*	Name*
test.test	Test
E-Mail*	Gender*
urjit.ipr@gmail.com	MALE
Date Of Birth	Contact No*
2001-12-01	7573932323
PayRoll/Employee No.*	Employee Type*
0	Student
Employee Category*	Division*
Student/Interns/Trainee	51
Section*	Organisation*
75	IPR
Joining Date*	Completion Date
2023-03-27	2023-03-28
Room No.	Extension No.
1234	8764
Approving Authority Email*	
arvind@ipr.res.in	
<button>Approve</button> <button>Reject</button>	

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Fig 4.5.2 Mail (Level-2)

Mail (Level-3)

The screenshot shows a web application interface for managing user data. A modal window titled "In Process" is displayed in the center, indicating that the application has been successfully approved and passed to Arvind Sir. The background shows the "Requested User's Data" form with various input fields.

Requested User's Data

User Data

UserID (firstname.surname): test.test

E-Mail*: urjit.ipr@gmail.com

Date Of Birth: 2001-12-01

PayRoll/Employee No.*: 0

Employee Category*: Student/Interns/Trainee

Section*: 75

Joining Date*: 2023-03-27

Room No.: 1234

Approving Authority Email*: arvind@ipr.res.in

Contact No*: 7573932323

Employee Type*: Student

Division*: 51

Organisation*: IPR

Completion Date: 2023-03-28

Extension No.: 8764

Select The OU*: Select Appropriate OU

Buttons: Approve, Reject

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Fig 4.5.3 Mail (Level-3)

After Approval Mail to User

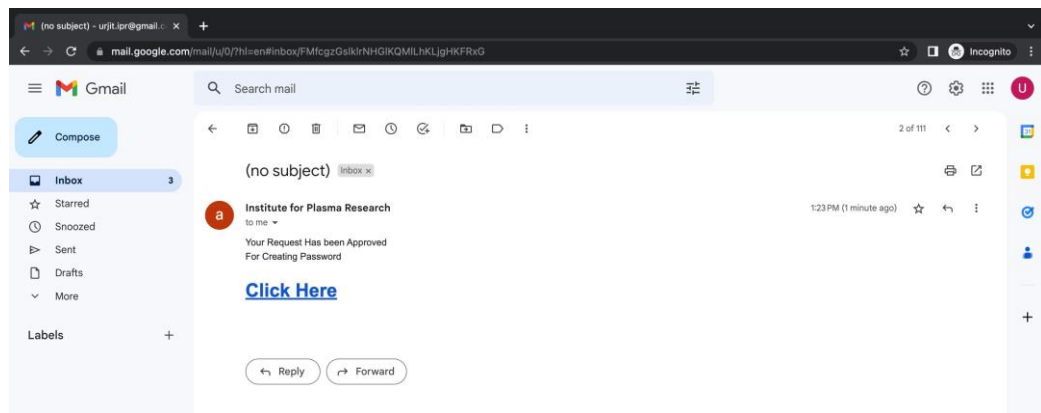
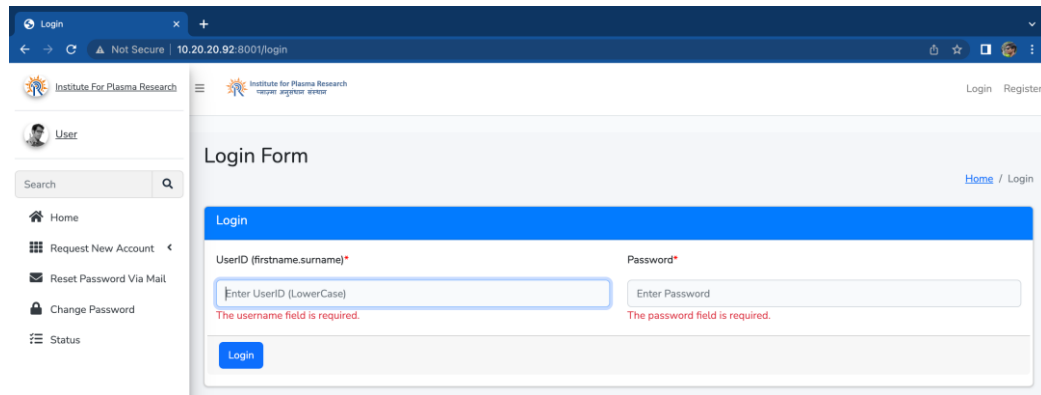


Fig 4.5.4 After Approval Mail to User

- **Validations:**

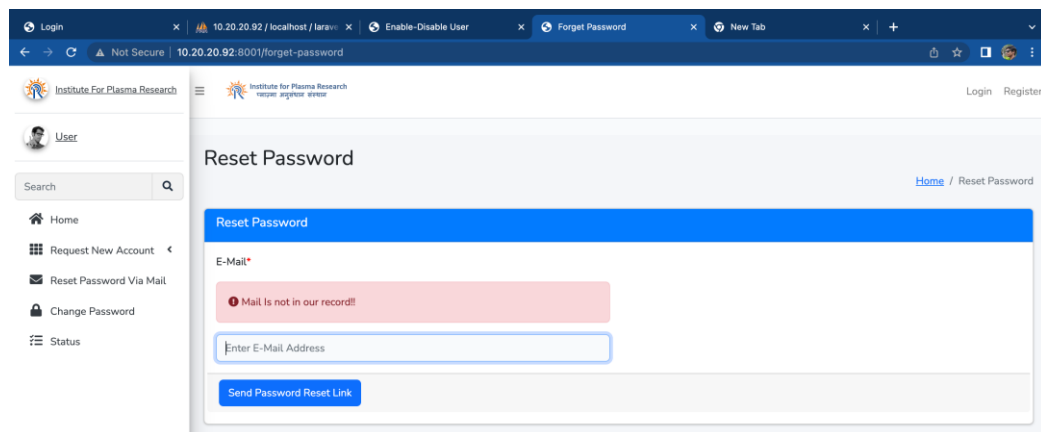
Login



The screenshot shows a web browser window with the URL `10.20.20.92:8001/login`. The page is titled "Login Form" and features a sidebar with navigation links: Home, Request New Account, Reset Password Via Mail, Change Password, and Status. The main content area contains a "Login" form with two input fields: "UserID (firstname.surname)*" and "Password*". The "UserID" field has a placeholder "Enter UserID (LowerCase)" and a red error message "The username field is required." below it. The "Password" field has a placeholder "Enter Password" and a red error message "The password field is required." below it. A "Login" button is located at the bottom of the form.

Fig 4.6.1 Login Validations

Reset



The screenshot shows a web browser window with the URL `10.20.20.92:8001/forget-password`. The page is titled "Reset Password" and features a sidebar with navigation links: Home, Request New Account, Reset Password Via Mail, Change Password, and Status. The main content area contains a "Reset Password" form with an "E-Mail*" input field. The field has a placeholder "Enter E-Mail Address" and a red error message "Mail Is not in our record!!" below it. A "Send Password Reset Link" button is located at the bottom of the form.

Fig 4.6.2 Reset Validations

Disabled User

The screenshot shows a web browser window with the URL `10.20.20.92:8001/login`. The page is titled "Login Form" and features a sidebar on the left with the "Institute For Plasma Research" logo and navigation links: Home, Request New Account, Reset Password Via Mail, Change Password, and Status. The main content area has a blue header "Login" and two input fields: "UserID (firstname.surname)*" containing "test.test" and "Password*" with a placeholder "Enter Password". A red error message below the UserID field states "These credentials do not match our records." A blue "Login" button is at the bottom of the form. The browser's address bar shows "Not Secure" and the page has a dark blue header with the site logo and "Login Register" links.

Fig 4.6.3 Disabled User Validations

Chapter V

Implementation

- **Module:**

1. Users:

- In the User module, registration is the key feature that provides users to request approval based on their applications.
- Users will come and primarily interact with a generic page of registration where they have to make themselves register.
- Parallely mail module comes in the run and the registered data of users are sent to the authority specified by the users at the time of registration.
- After approval the users will interact with the login module as their data will be already stored at AD.
- As per their need, users will come to the login module, make themselves logged in, and can interact with other modules.
- Even if the modules are not from the same portal but in the same organization, users don't want to log in again for different portals.
- Lastly when the users are in the approval process, they can see their status on the status bar module.
- After successful 3-approval, users can log in with their appropriate credentials.
- Initially the user will have their username and password in the mail, but they can only change their password.
- If users forget the password during their logins, they can simply go with the flow with forget password flow where they will be asked to give their email and a reset password link will be sent to the users.
- On clicking that link they will be redirected to the page where they can reset their password.
- The modified password will be reflected in the active directory after some minutes, as the Updation will be done directly in the AD where the password is hidden and hashed.
- So, the password will be stored in AD, hashed at the same time, and due to it reflection is delayed.

- The mail of the user at the forget-password page is checked and then a random token is generated at the same time.
- This mail and random token will generate the Users' link to reset their passwords.
- Initially, the mail and random token will be stored in the database, so if a user forgets his/her password again that same data can be used to link for the mailing purpose of resetting their passwords.

2. Admin:

- Admin Modules have many highs and lows. Firstly, Admin will directly login to the portal from the admin side without registration as their record will be already there in the AD.
- At the initial stage, the admin need to primarily upload the files like the list of authorities, divisions, and sections, so that on the user side user can get those selections based on their requirements.
- Now as there are 3 level mailing modules, i.e.,
 - I.** Approval from Authority (Selected by the user at the time of registration)
 - II.** Approval from HOD
 - III.** Approval from Admin
- As the 3rd level is concerned, the admin will also give an OU to the user under which the user information will be stored at the time of the admin's approval.
- In the module, the admin can manage users and other admins. Upload necessary files for the user-side module.
- Not only admin can modify the information of other admins but also can modify the users' information, if required, on the Edit module.
- On view, the data module admin can have the total number of the users who are currently there in the Active directory.
- On the same admin can enable or disable the user accordingly, by default the user status is disabled.
- Users may have a group under which they can have different roles. Admin can make the users member of some group. Admin will provide the roles and permissions to the users accordingly.

3. System:

- Our System is based on a progressive framework called Laravel which is one of the best choices for building modern, full-stacked web applications.
- Laravel is incredibly scalable. As it is built on PHP, it also gives scaling friendly nature with built-in support for fast, distributed cache systems.
- To progress with Laravel easily and quickly, we have used a tool called composer which is used to install, upgrade and delete some of the external packages.
- LDAPRecord is a PHP package/tool that provides a full ActiveRecord implementation for working with a LDAP server.
- Applications that require ActiveDirectory/LDAP integration are very tricky to set up. Creating these integrations manually is complex.
- LdapRecord sweats the small stuff so you can get up and running as fast as possible. It manages many of the integrations, hence it reduces the task of manual configurations.

Chapter VI

Test Case Design

- Manual testing was performed to find and fix the bugs in the development process.
- Some testing is given below but there are much more :

Table 6.1 Test Cases

Sr No.	Test Scenario	Expected Results	Actual Results	Status
1	Registration	Confirmation Message	Confirmation Message	Success
2	Mail to specified authority along with a link containing the user registration data	Mail to authority for approval of that user application	When user is successfully registered, that registration details will be sent to authority via	Success
3	If application rejected by the authority	Mail of application rejection to user	If authority rejects the application, user will get the mail of rejection	Success

4	If application approved by the authority	Mail to HOD of computer centre department for second approval with user's and previously	HOD will get the mail having user's and previously approved authority's details	Success
5	If application rejected by the HOD	Mail of application rejection to user	If HOD rejects the application, user will get the mail of rejection	Success
6	If application approved by the HOD	Mail to admin of computer centre department for third approval with user's, previously approved authority's and	Admin will get the mail having user's, previously approved authority's and HOD's details	Success
7	If application rejected by the Admin	Mail of application rejection to user	If Admin rejects the application, user will get the mail of rejection	Success
8	If application approved by the Admin	The details of user will be stored in AD	AD is having data of the user for login	Success
9	Login with incorrect credentials	User should not be able to login.	User will be redirected back at the Login page.	Success
10	Login before application is approved.	User should not be able to login until his/her application is not approved	User will be redirected back at the Login page.	Success

11	Login with correct credentials and also	User should be able to login	User is logged in with message of	Success
12	If user forgets the password, resetting it.	User should only get the resetting link in mail, if the given mail id is	User getting link on the specified mail.	Success
13	If user forgets the password, resetting it.	Error if mail id of user is not in the AD.	User is getting error if some other mail id is specified other than	Success
14	Enable Users	Message: Enabled User	Message: Enabled User	Success
15	Disable User	Message: Disable User	Message: Disable User	Success
17	Check User	Displays whether user is enable or disable.	Message: Enable / Disable User	Success
18	Make User Member Of	User will be inserted in specified groups	User is inserted in specified groups	Success
19	Remove User From Group	User will be removed from specified groups	User is remove from specified groups	Success
20	VPN Request via form	User should be able print pdf directly after filling the form	User gets the pdf accordingly	Success

Chapter VII

Conclusion

Conclusion:

The functionalities are implemented in the portal, after understanding all the modules according to the requirements.

Major functionalities are successfully implemented in the portal like registration of the user, a 3-level mailing system for approval of the users' applications, a login system for the user after storing the data in AD for centralizing the portal for cross-platform logins, etc.

The portal will give a better way to get the work done for the user and especially for the admin as admins' work is automated for the approvals, assigning roles and permissions, etc. The user can easily access different portals by only logging in once through AD.

Also, some minor functionalities like uploading the files on the admin side, sending links via mail to the authorities, HOD, and admin that contains all user registration data, etc give users and admin an easy-go-way portal and little automation for better performance. Admins are not needed to go to the database side or AD side to do the CRUD operations, as it will be done on the admin side portal easily on UI.

The portal merges these functionalities and makes a person's paperwork and gets pushed to different tables for signs for just a small approval. This portal will give a better experience to the users and admins as everything is on the desk with some clicks. Users get the signal sign-on method, not making them sign in every time, and no need to feed the same credentials for different modules.

After understanding, implementing, and coding the portal comprehensive testing was performed on the portal to determine the errors and possible flaws in the portal.

Limitations and Future Extensions of System:

- **Limitations:**

At the time of the admin's approval (3rd approval), the admin can only select only one specified OU from the list of OUs.

- **Future Extensions:**

This portal can overcome the above-mentioned drawback in the future Updation, where the admin will be able to select multiple OUs to store the users' information in Active Directory.

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