

Online Quarter Allotment System

An Industrial Internship Report

submitted by

AYUSH LAL

14BCE0574

in partial fulfillment for the award of the degree of

Bachelors in Technology

in

Computer Science and Engineering



SCHOOL OF COMPUTING SCIENCE AND ENGINEERING

February, 2017

DECLARATION BY THE CANDIDATE

I hereby declare that the Industrial Internship report entitled “**ONLINE QUARTER ALLOTMENT SYSTEM**” submitted by me to Vellore Institute of Technology, Vellore in partial fulfillment of the requirement for the award of the degree of **B.tech in Computer Science and Engineering** is a record of bonafide industrial training undertaken by me under the supervision of **Mr. Rayees Ahmad Naik** and **Prof. Ramanathan L.** I further declare that the work reported in this report has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university.

HONOR CODE

I, **Gobind Manuja**, a Computer Science and Engineering undergraduate student at VIT University, Vellore

and

I, **Ayush Lal**, a Computer Science and Engineering undergraduate student at VIT University, Vellore

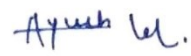
would like to declare that the project entitled – Online Quarter Allotment System submitted in fulfilment of the requirements for the Internship programme at Systems Department at Central Coalfields Limited is an original work.

Place: Ranchi

Date: 31/12/2016

Signature of the candidate:


Gobind Manuja


Ayush Lal



School of Computing Science & Engineering

BONAFIDE CERTIFICATE

This is to certify that the Industrial Internship report entitled “**ONLINE QUARTER ALLOTMENT SYSTEM**” submitted by **AYUSH LAL (14BCE0574)** to Vellore Institute of Technology, Vellore in partial fulfillment of the requirement for the award of the degree of **B.tech in Computer Science and Engineering** is a record of bonafide Industrial Internship undertaken by him under my supervision. The training fulfills the requirements as per the regulations of this Institute and in my opinion meets the necessary standards for submission. The contents of this report have not been submitted and will not be submitted either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university.

Mr. Rayees Ahmad Naik
Asst. Manager, Systems – CCL

SUPERVISOR

Date:

Date:

Internal Examiner (s)

External Examiner (s)

Certificate issued by the Training Manager

CERTIFICATE

This is to certify that

Mr. Gobind Manuja, S/O Chandrabhan Manuja, a student of B. Tech Computer Science and Engineering at VIT University, Vellore

and

Mr. Ayush Lal, S/O Jyoti Narayan Lal, a student of B. Tech Computer Science and Engineering at VIT University, Vellore

have successfully completed a four weeks internship programme at Systems Department at Central Coalfields Limited, Ranchi Head Office.

During the period of their internship, they were found to be punctual, hardworking and inquisitive.

We wish them very success in life.

Period of Internship: 03-12-2016 to 31-12-2016

सहायक प्रबंधक (प्रणाली)
Assistant Manager (Systems)

सीसीएल, राँची।
CCL, Ranchi

Authorised Signatory

Guide – Mr. Rayees Ahmad Naik
Asst. Manager, Systems

Certificate issued by the Organisation



CENTRAL COALFIELDS LIMITED
(A Miniratna Company)
Human Resource Development Department
Darbhanga House, Ranchi – 834 029
Tele Fax No. 0651 – 2360597



पत्रांक संख्या/सीसीएल/टीआरजी/प्रमाण पत्र/16-17/911

Dated: 03/01/2017

TO WHOM IT MAY CONCERN

This is to certify that Mr. AYUSH LAL a student of B.Tech (CSE), VIT, University, Vellore has done Project training at System Department of Central Coalfields Limited from 03rd December 2016 to 31st December 2016 on the topic "ONLINE QUARTER ALLOTMENT SYSTEM".

He has completed his training satisfactorily. I wish all success in his life.


Sr. Manager (M)/HRD
CCL, Ranchi
वरतीय प्रबंधक (खनन)
मानव संसाधन विकास
सी. सी. एल., राँची
Sr. Manager (Mining)
HRD, CCL, Ranchi

ACKNOWLEDGEMENT

The Internship opportunity with Central Coalfields Limited was a great platform for my learning and professional development. I consider myself very lucky to have got a chance to work with this esteemed organisation and its extremely talented workforce.

I express my deepest thanks to the Systems Department, CCL-Ranchi for allowing me to carry out the project and work with their employees. I would also take this opportunity to thank HR department, CCL-Ranchi for all the cooperation and arranging all the facilities to make my work easier during the internship period.

I would in particular like to express my deepest gratitude and special thanks to my Project Guide, Mr. Rayees Ahmad Naik, Asst. Manager-Systems who always guided me and kept me on the correct path during the whole internship period.

I perceive this opportunity as a big milestone in my career development. I will strive to use the gained skills and knowledge in the best possible way, and I will continue to work on their improvement in order to attain the desired career objectives.

Hoping for the same level of cooperation in future.

Sincerely,

Ayush Lal

Place: Ranchi

Date: 31/12/2016

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ORGANISATION PROFILE

Central Coalfields Limited (CCL) is a subsidiary of **Coal India Limited (CIL)**, an undertaking of the Government of India. CCL manages the nationalized coal mines of the Coal Mines Authority, Central division. CCL is headquartered at Darbhanga House, Ranchi.

Coal India Limited (CIL) is an Indian state-controlled coal mining company. It is the largest coal producer company in the world and contributes around 82% of the coal production in India. Coal India Limited (CIL) produces coal through seven of its wholly owned subsidiaries. Central Coalfields Limited is one of those subsidiaries.

CCL presently has 62 operative mines (22 underground and 40 opencast) in regions located in India. CCL has also earned a Mini Ratna status by the government of India.

Headquarter of the company is located at Ranchi (Darbhanga House). CCL aims to include all the modern technologies to the use of its employees. Hence Systems Department was set up at CCL-Ranchi Darbhanga House office. The Systems department deals with all the technical advancements and operations of the company in the field of Information and Technology and other computer and systems related affairs.

Making and managing company's websites, intranet, software, web-apps, mobile apps, web-portals, managing the company databases are some of the few works of the system department. Systems Department at CCL-Ranchi also maintains the centralised servers (which are both Rack and Tower Servers) of CCL for both the company's intranet facilities and the internet facilities. The Systems Department is also responsible for maintaining a record of the payroll, finance, sales and the production statistics of the CCL.

Systems Department every year gives opportunities to the graduates and undergraduates from various colleges of the country to work with the company in its IT and Computer Science related projects as interns or trainees.

A detailed and complete description of the organisation profile and its work can be viewed on the official website (www.centralcoalfields.in) of the company.

INTRODUCTION AND PROBLEM STATEMENT

The Quarter Allotment System developed here is a project of Central Coalfields Limited, Ranchi for the allotment of Quarters to its employees.

The system developed here is a combination of a website and a portal. The website for the Quarter Allotment System and its certain features can be publicly accessed with a unique Uniform Resource Locator, i.e. URL or web address. The web pages are organised into a hierarchical form based on the URL to help the user navigate through the pages. Also, there are predefined private locations on the website that can be accessed with a unique URL along with a unique username and password thus adding the features of a web portal. Hence in together, this system is developed with all the salient features of both a web-portal and a website.

The problem statement for this project lies in the need of developing such a system for quarter allotment for Public Sector Undertakings. CCL being a subsidiary of Coal India comes under the category of PSUs which are directly in control of the Government. To increase the transparency and to decrease the discrepancies involved during the manual pen-paper method for quarter allotment by the PSUs, the signs of a dire need of developing such a system was clearly seen by the Central Coalfields Limited.

Hence this system was developed to ease the process of application and to increase the transparency during the allotment procedures.

The system also provides different set of features for the user and the site-administrator as well. The user can view the details, download notices in the form of pdfs, check his/her application status etc. without any need of logging into their respective user accounts thus enabling a better user experience. Also, after logging into the user account, the user can have access to even more features that can only be accessed privately using a user id and password thus enabling more security features for the user.

There is also a different login account provided for the site-administrator. The site-administrator can manage the quarter allotment of all the users just with a click thus enabling any official with or without any technical knowledge to operate the admin dashboard just with a pre-decided login-id and password. Also, the site-administrator can view year-wise reports, quarter details, their previous occupants etc. through the admin dashboard. All the processes involved can be checked and monitored by the user through their login thus creating a transparency during the process of the allotment.

QUARTER ALLOTMENT SYSTEM

The overall idea was to develop an employee portal where an employee can register for the service using his 8 digit PIS number and his PAN number as password. After registration, the employee is forced to set a password for his account using which he can log in later. After the login, the employee can either make a request for quarter allotment by submitting the required form or view his application status. There is also a provision for him/her to update his/her account password.

We also developed an admin panel for the site administrator. The administrator dashboard lists all applications and has options for necessary actions to take. The allotment procedure is based on the criteria set by the quarter allotment committee. All details on the application form are considered while evaluating an employee's candidature. Based on the decision of the committee, the site administrator allots quarters to the applicants. Through the administrator dashboard, the site admin can also view the status of each quarter, their allotment history and can also view reports.

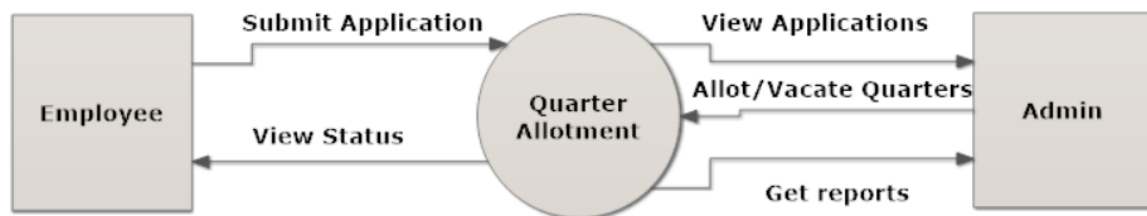


Fig. Overall Idea

IMPLEMENTATION

I. Technologies and IDEs used:-

The following technologies and IDEs are used in developing this Quarter Allotment System:

- i. **HTML**
We have used HyperText Markup Language for creating the structural framework of the webpages and the pages of the portal. HTML is the standard markup language for all the websites, web applications and web portals. All the standards of The World Wide Web Consortium (W3C) have been complied and followed with in the code of the project prepared here.
- ii. **CSS**
The markup language frameworks in the project are styled with Cascading Style Sheets for describing the presentation of the web-pages. All the aspects of document presentation such as layouts, colors and fonts have been included in an external stylesheet to have a continuum display and design of the web pages. Also, all the graphic properties of the website are also made using CSS.
- iii. **JavaScript**
JavaScript is a high-level and a dynamic programming language. Alongside HTML and CSS, JavaScript is one of the three core technologies that is used by the World Wide Web content production. JavaScript is supported on all the browsers without any requirement of supportive plugins. We have used snippets of JavaScript code and the functions used in different pages of the website and the portal as a single scripting language page placed in a separate script folder/file. All the client-side scripting requirements of the portal are also written in this.
- iv. **PHP**
PHP or Hypertext Preprocessor (recursive acronym) is a server-side scripting language that is widely used for all across the globe for web development and general-purpose programming. We have used PHP exclusively for all the server-side scripting. All the data validations, form validations, fetching database contents, sessions, captcha, encryption and security features which are added to the website and the portal are written in PHP in this project.
- v. **MySQL**
MySQL or My- Structured Query Language is an open source relational database management system. It is the most widely used database over the internet with big giants like Google, Facebook, Youtube etc. using MySQL

databases. The website and the portal is made dynamic using PHP with MySQL as the backend.

vi. **AJAX**

We have also used asynchronous JavaScript and XML (AJAX) to send and receive the data from the server in the background without interfering with the display and behaviour of the existing page. Thus this creates a better experience for the user.

- Both PHP and MySQL have been implemented with **Wamp** Server, a virtual server consisting of the Apache web server, MySQL database and PHP programming language. We have used **Notepad++** for writing the code.

II. **DATABASE DESIGN:-**

Each application has a unique reference number besides fields such as name, date of joining, designation, department quarter type opted for, whether or not the employee has a personal residence in the city, his grade, salary, and so on and so forth. Employee's personal details appear on the application form by default. Each quarter has a type (A, B or C) and a number which together uniquely identify each quarter. Besides, each quarter also has a status (Occupied, Vacant or Damaged). Each allotment comprises a start date and end date. Start date is the date of allotment whereas end date is data of vacating.

Based on these details, an entity relationship diagram was drawn for designing the database.

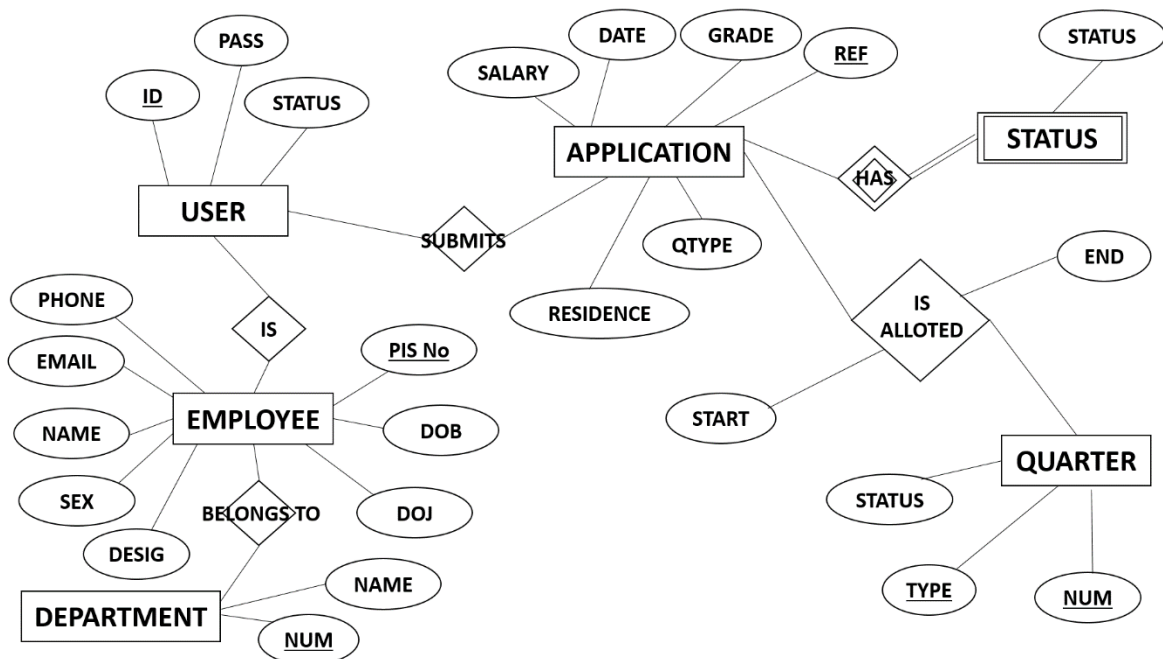


Fig. 1: ER Diagram

The ER diagram was then mapped to a relational schema based on which all necessary tables were created and relationship among them were established.

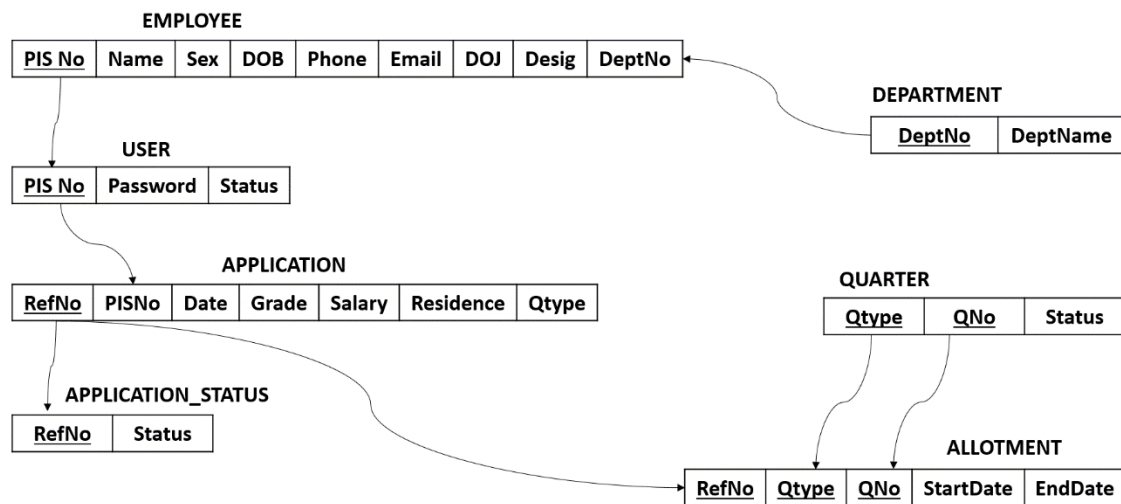


Fig2. Relational Schema

III. MODULES:-

a. Home Page

The home page contains the following tabs:

- i. Home
- ii. About Us
- iii. Notice
- iv. Register
- v. Login
- vi. Check Status
- vii. Admin

The screenshots of the above are shown below:

Home

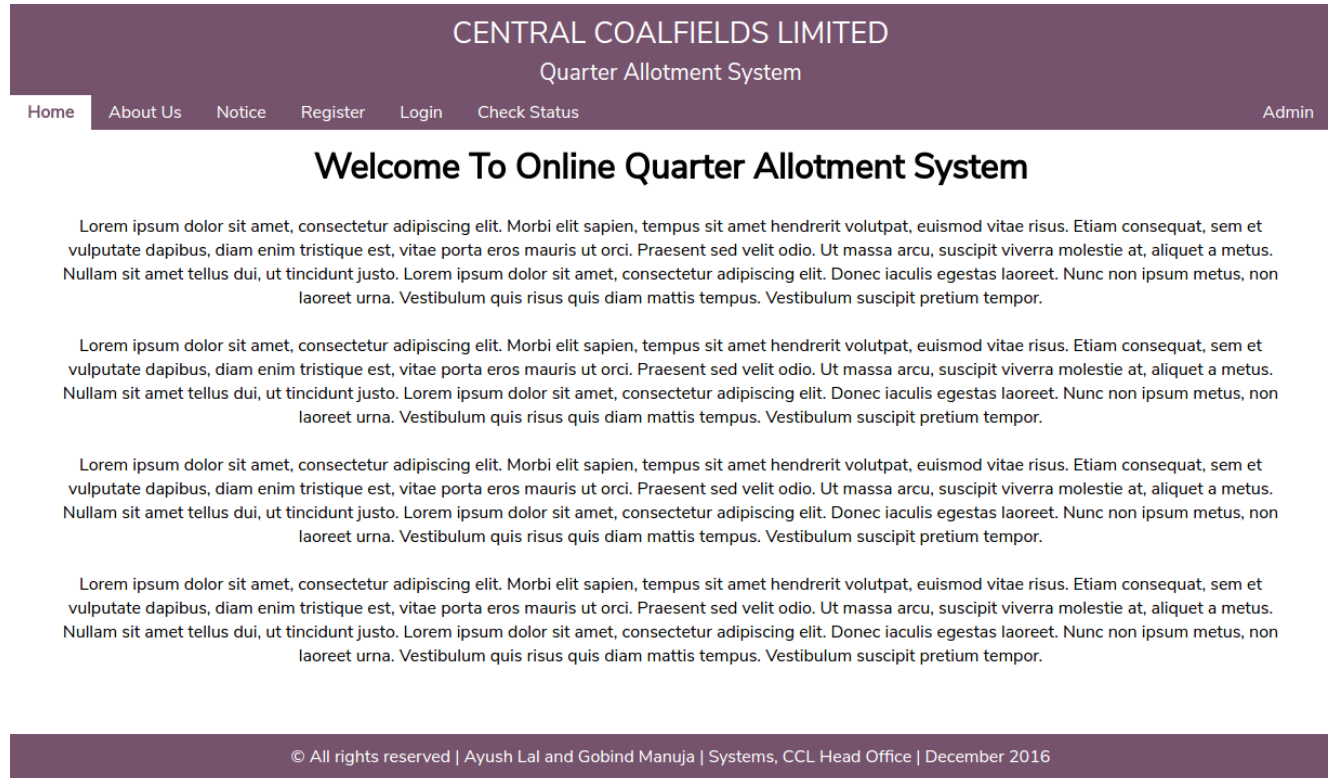


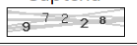
Fig3. Home

The homepage or **Home** is the starting webpage that will appear on the website of Quarter Allotment System has 7 tabs. The **About Us** tab is linked to the official website of CCL, i.e., www.centralcoalfields.in. The **Notice** tab will be used to display a pdf notice or notification of Quarter Allotment on a new tab. The **Register** tab helps a new user to register using his PIS number and PAN number which is already present in company's database. The **Login** tab is for the already registered user to login to his account. The **Check Status** tab helps the user to check his/her status of application for quarter allotment. On the extreme right there is a tab provided for **Admin** login. The site-administrator can get access to the admin dashboard after logging into his account.

Register

CENTRAL COALFIELDS LIMITED	
Quarter Allotment System	
Home	About Us
Notice	Register
Login	Check Status

Register Here

PIS Number	<input type="text"/>
PAN Number	<input type="text"/>
Captcha	<input type="text"/>
	
<input type="button" value="Submit"/> <input type="button" value="Reset"/>	

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Fig4. Employee Register

This **Register** page is exclusively for the new users. New users can register using their PIS number, an 8-digit unique identity number given to all the employees and their PAN number. A captcha code is also provided in the register form which changes each time the page is refreshed. If both the PIS number and the PAN number along with captcha match correctly with the values taken from the company's employee database (PIS and PAN), the user can register. Else subsequent error messages are shown.

Also, after the new user registers, he/she is by default taken to a new page where the user compulsorily needs to set a password for his/her account. This is done to keep the user's account more secure. Further details will be mentioned in the figures that follow.

Login

CENTRAL COALFIELDS LIMITED	
Quarter Allotment System	
Home	About Us
Notice	Register
Login	Check Status

Log in to continue	
PIS Number	<input type="text"/>
Password	<input type="password"/>
Captcha	<input type="text"/>
<input type="button" value="Submit"/> <input type="button" value="Reset"/>	

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Fig5. Employee Login

The already registered users can **Login** to their account using their PIS number, an 8-digit unique identity number given to all the employees and their password (8-20 characters long) which they had set after registering. A captcha is also provided for keeping the login secure from bot attacks. After all the details are matched, the user can register into their account, else subsequent error messages are shown.

Check Status

CENTRAL COALFIELDS LIMITED	
Quarter Allotment System	
Home	About Us
Notice	Register
Login	Check Status

Check your application status here

<input type="text" value="PIS Number"/>	<input type="button" value="Search"/>	<input type="button" value="Reset"/>
---	---------------------------------------	--------------------------------------

<input type="text" value="14"/>	<input type="button" value="Search"/>	<input type="button" value="Reset"/>
---------------------------------	---------------------------------------	--------------------------------------

Reference No	PIS No	Date	Status
14	12341234	2016-12-22 14:34:46	Approved

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Fig6. Check Application Status

To make the browsing experience of the user to be better, a separate **Check Status** tab has been provided. The users who have already applied for the quarter can check their status through

their PIS number or the application Reference number that is provided after applying for the quarters based on their convenience.

If the values of PIS or the Reference number is correct, then the application status of the user is displayed. The displayed result contains the fields- Reference Number, PIS Number, Date and Time of applying for the quarter and the status of the application.

Admin Login

When the user clicks the **Admin** tab, he/she is directed to a new page for Administrator Dashboard Login page.

Set Password

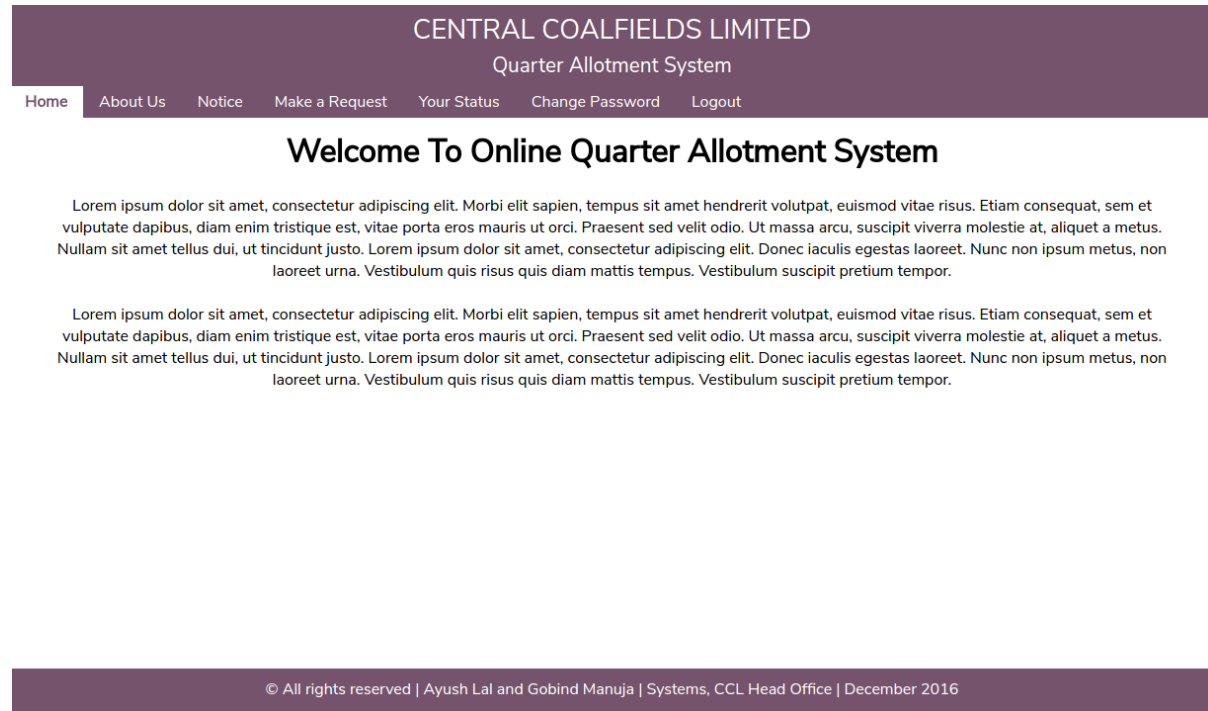


Fig7. Set Password for new users

Also, after the new user registers, he/she is by default taken to a new page where the user compulsorily needs to set a password for his/her account. This is done to keep the user's account more secure.

The user has to input a password which should be 8-20 characters long. Then the same password has to be re-typed again so as there is no mistake in making the password. If both the password match, the new input password is set as the default password for the PIS number that was used for registering. Else, subsequent error messages are shown.

If the user by mistake closes the browser, the session gets deactivated and the user again needs to register as shown in Fig4 and set the password.

b. Employee Zone

The Employee Zone contains the following tabs:

- i. Home
- ii. About Us
- iii. Notice
- iv. Make a Request
- v. Your Status
- vi. Change Password
- vii. Logout

The screenshots of the above are shown below:

Home

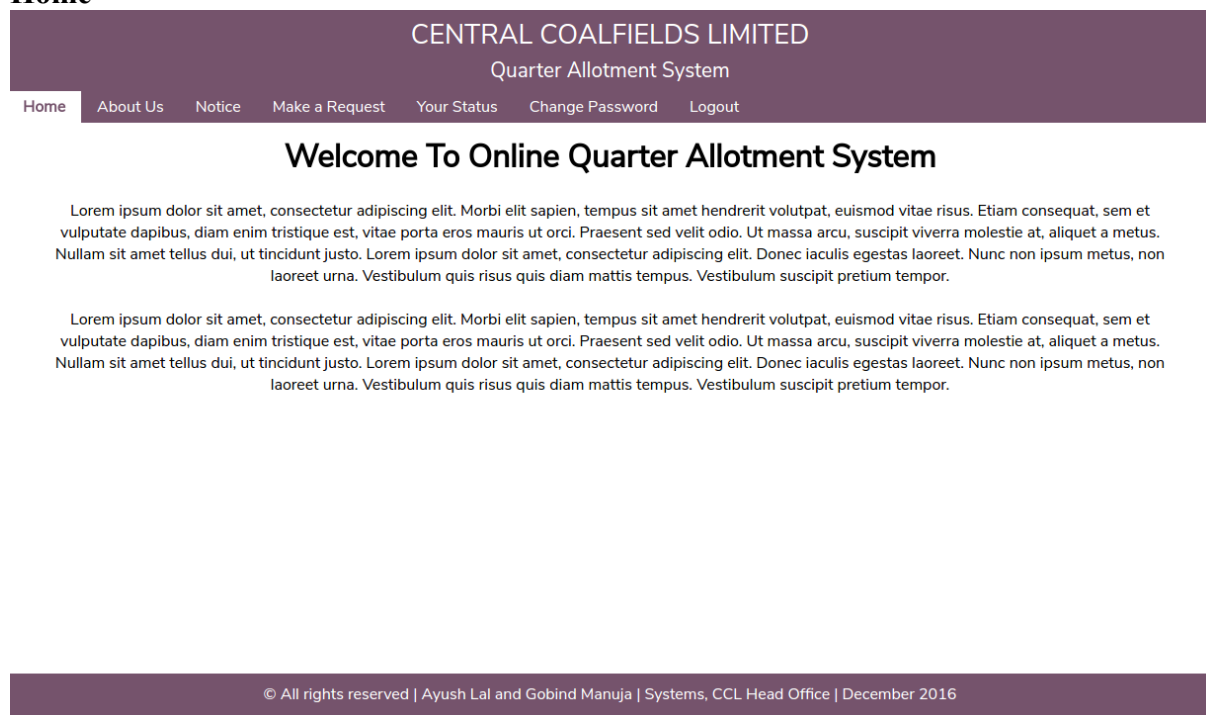


Fig8. Home-Login

After the user successfully logs in using the PIS and the Password (shown in Fig5.), the homepage or **Home** appears for user. The **About Us** tab is linked to the official website of CCL, i.e., www.centralcoalfields.in. The **Notice** tab is used to display a pdf notice or notification of Quarter Allotment on a new tab. The **Make a Request** tab helps the user to apply for quarters. This is exclusively for the users that can login. The **Your Status** tab helps the user to check his/her status of application for quarter allotment. The **Change Password** tab is used for changing the password of the account. The **Logout** tab is for logging out of the account and ending the active session.

Make a Request

CENTRAL COALFIELDS LIMITED

Quarter Allotment System

[Home](#) [About Us](#) [Notice](#) [Make a Request](#) [Your Status](#) [Change Password](#) [Logout](#)

Request for quarter here

Please fill in the details.	
PIS	55555555
Name	Temp5
Gender	M
Designation	Temp
Department	Production
Date of Joining	2016-12-01
Salary	
Grade	Select ▼
Do you have a personal residence in Ranchi?	
<input checked="" type="radio"/> Yes <input type="radio"/> No	

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Fig9. Make a Request

The user, when logged in, can apply for the quarters by filling the **Make a Request** form. The PIS, Name, Gender, Designation, Department and Date of Joining are already filled by the default values pre-fetched from the employee database of the company. The user has to input his/her Salary and Grade (E1 to E8). The user is also asked if he/she has a personal residence. The value (Yes/No) input by the user is taken into consideration for the quarter allotment.

Also, there is a default setting that is set which allows only grade E8 employees to choose all types of quarters (type A, B and C) , grade E5-E7 to choose only between quarters of type B and C and grade E1-E4 to choose only type C quarters.

Thus based on the rules of the company, the application for the quarter allotment can be approved or rejected. The application details are thus fed into the database. The site-Admin can thus take further actions.

Your Status

CENTRAL COALFIELDS LIMITED
Quarter Allotment System

[Home](#) [About Us](#) [Notice](#) [Make a Request](#) [Your Status](#) [Change Password](#) [Logout](#)

Your application status

Reference No	Date	Status
19	2016-12-26 20:36:47	Approved

Quarter Type	Quarter Number
B	102

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Fig10. User Application Status

The logged in user can check his/her application status through **Your Status** tab. The displayed result contains the fields- Reference Number, Date and Time of applying for the quarter and the status of the application. Also, if the application is approved, then the quarter type and the quarter number are also displayed.

Change Password

CENTRAL COALFIELDS LIMITED
Quarter Allotment System

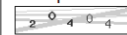
[Home](#) [About Us](#) [Notice](#) [Make a Request](#) [Your Status](#) [Change Password](#) [Logout](#)

Update Password

New Password

Re-enter New Password

Captcha



Submit

Reset

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Fig11. Update Password

The **Change Password** tab allows the logged in user to update the existing password. The user needs to input a new password which should be 8-20 characters long. Then the same password has to be re-typed again so as there is no mistake in making the password. A captcha is also provided to make the password change process more secure. If both the password match and

the captcha code input is correct, the password is updated. Else, subsequent error messages are shown.

Logout

The user can end his/her active session by clicking the Logout tab. After Logging out, the user is directed to the main homepage of the website (as shown in Fig3.)

c. Admin Panel

The Admin Panel contains the following tabs:

- i. View Applications
- ii. Quarter Status
- iii. Manage Quarters
- iv. Annual Reports
- v. Profile Settings
- vi. Logout

The screenshots of the above are shown below:

Admin Login

Administrator Dashboard

Log in to continue

Admin ID

Password

Captcha

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Fig12. Admin Login Page

When the user clicks the **Admin** tab on the homepage, he/she is directed to a new page for Administrator Dashboard Login page. This is exclusive for all the site-administrators. The site administrator is provided with a unique Admin ID and password (the password can be changed after logging into the Admin Dashboard). A captcha is also provided so as to keep the Admin Login page secured from bots. If all the values input are correct, then the access to the Administrator Dashboard is authenticated. Else, subsequent error messages are shown.

View Applications

Administrator Dashboard

View Applications

Quarter Status

Manage Quarters

Annual Reports

Change Password

Logout

All Applications between 2016-12-01 and 2016-12-31

All Requests | Pending | Approved | Rejected

01/12/2016 31/12/2016 Submit

Reference No	PIS No	Date	Status	Action
19	55555555	2016-12-26 20:36:47	Approved	View
18	44444444	2016-12-25 19:15:54	Rejected	View
17	22222222	2016-12-22 18:19:26	Approved	View
15	11111111	2016-12-22 16:52:38	Vacated	View
14	12341234	2016-12-22 14:34:46	Approved	View
1	12345678	2016-12-15 16:56:22	Vacated	View

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Fig13. View Applications

The Administrator can view the application history of all the applicants using the View Applications option. The administrator can view All Requests, Pending Requests, Approved Requests and Rejected Requests. The displayed result contains the fields- Reference Number, PIS Number, Date and Time of applying for the quarter, the status of the application and view action. Using the view action, the Admin can view all the details of the applicant. The status includes Approved, Rejected and Vacated based on the current status of the application. Also, the Admin can filter the requests based on the date of the application.

Quarter Status

The Administrator can use the **Quarter Status** option to view the quarter status of all the quarters that are available with the company. Under Summary, the Administrator can view the Current Status of all the Quarters, Vacant Quarters, Occupied Quarters and Damaged Quarters. Also, under Quick Search option, the site-administrator can search for individual quarter details by filtering the results with quarter type or quarter number or both. The status of the quarters is shown. Under the history option, the Admin can see the history of that particular quarter number. The details of all the previous user and the present user is shown on a new tab after using the history option. This way, the company can claim damage penalties on the users under whom the quarter was allotted, in case there is any damage done to the quarter.

Administrator Dashboard

View Applications

Quarter Status

Manage Quarters

Annual Reports

Change Password

Logout

Summary

Current Status

Vacant Quarters

Occupied Quarters

Damaged Quarters

Quick Search

Select Quarter Type

Select Quarter Number

Search

Quarter Type	Quarter Number	Status	Options
A	101	Vacant	History
A	102	Vacant	History
A	103	Vacant	History
B	101	Vacant	History
B	103	Vacant	History
C	102	Vacant	History

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Fig14. Quarter Status

Manage Quarters

Administrator Dashboard

View Applications

Quarter Status

Manage Quarters

Annual Reports

Change Password

Logout

Check Details

PIS Number

Search

Reset

Reference Number

Search

Reset

Allot

Reference Number

Select Quarter Type

Select Quarter Number

Allot Quarter

Reset

Vacate

Reference Number

Select Quarter Type

Select Quarter Number

Vacate Quarter

Reset

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Fig15. Manage Quarters

The admin can manage all the procedures for quarter allotment using the **Manage Quarters** option.

The administrator can search for the applications of the users using their PIS number or their Application Reference number. Based on the criteria for quarter allotment, the admin can then

either Approve or Reject or keep the request in the pending (which is by default, unless other actions are not taken).

For allotting the quarters, the admin can use the Reference number of the user, select the quarter type, available quarter number and then allot that quarter to the applicant.

Also, if an existing resident of a quarter wishes to vacate the quarter or the admin wishes to vacate the quarter of an existing user, the admin can use the vacate quarter option. For vacating the quarters, the admin can use the Reference number of the existing user, select the quarter type, available quarter number and then vacate that quarter of the applicant.

All the actions are stored dynamically in the database. All the options that have already been mentioned, will have the respective updated result lists of actions done.

Annual Reports

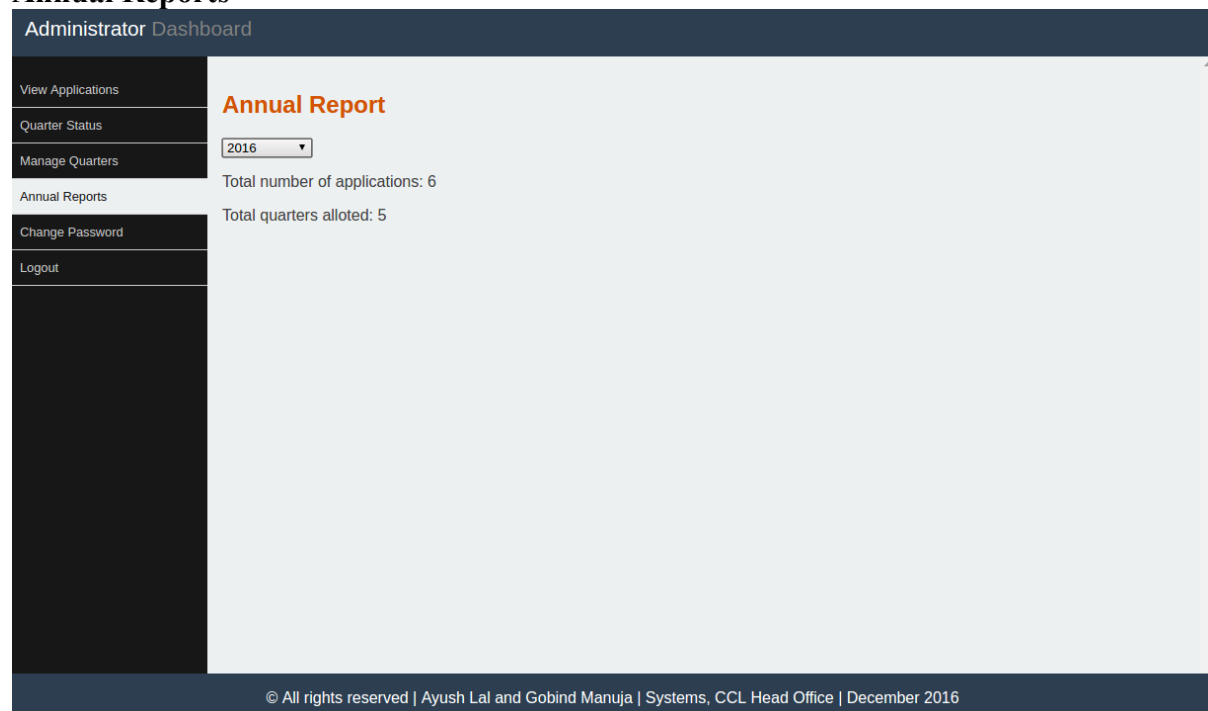


Fig16. Annual Reports

The Admin can also use the option of **Annual Reports** to have a quick view of the number of total applications and total quarters allotted. This feature is added so as to help publish the allotment report based on year wise basis.

Profile Settings

Administrator Dashboard

View Applications
Quarter Status
Manage Quarters
Annual Reports
Change Password
Logout

Profile Settings

Update Password	
New Password	<input type="text"/>
Re-type Password	<input type="text"/>
Captcha	<input type="text"/>
<div>5 3 2 6 8</div>	
<input type="button" value="Submit"/> <input type="button" value="Reset"/>	

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Fig17. Profile Settings

The **Profile Settings** tab allows the administrator to update the existing password. The admin needs to input a new password which should be 8-20 characters long. Then the same password has to be re-typed again so as there is no mistake in making the password. A captcha is also provided to make the password change process more secure. If both the password match and the captcha code input is correct, the password is updated. Else, subsequent error messages are shown.

Logout

The admin can end his/her active session by clicking the Logout option. After Logging out, the admin is directed to the admin login of the website (as shown in Fig12.)

CONCLUSION **and** **FUTURE-WORK**

It gave us a good insight into developing software for the web as well as how technology can help automate pen-paper tasks. The Quarter Allotment System was developed keeping in mind the guidance of our guide and necessary operations that the system was supposed to perform. The database was designed after examining the requirements of the system and keeping in mind future extensions.

This project was a great learning opportunity.

APPENDIX

The code for developed the above system is available on request.