PERFORMANCE APPRAISAL SITE

IT5613 SOCIALLY RELEVANT PROJECT LABORATORY

A PROJECT REPORT

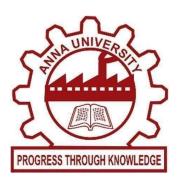
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FEBRUARY 2023 - JUNE 2023

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ACKNOWLEDGEMENT

It is essential to mention the names of the people, whose guidance and encouragementmade us accomplish this project.

We express our thankfulness to our project supervisor **Dr. M. R. Sumalatha**, Professor,MIT Campus, for providing project guidance and encouragement to do the project.

We express our gratitude and sincere thanks to our respected Dean of MIT Campus, **Dr. J Prakash**, for providing computing facilities

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ABSTRACT

Our streamlined performance appraisal site is a flexible online hub designed to streamline and improve the performance review procedure for businesses/universities of all sizes. The site is designed with the user in mind, making it easy for businesses to assess, track, and encourage the development of their staff. The platform promotes openness, cooperation, and ongoing enhancement by means of its cutting-edge features and user-friendly layout. The appraisal site provides a number of helpful tools that are necessary for a successful appraisal. Employers can receive evaluation templates that can be modified to meet their specific needs, allowing for objective and reliable assessments of staff performance. Timely evaluations are completed without any additional effort on the part of the employee or the manager thanks to automated reminders and notifications. The site allows for constant two-way communication between upper-level management and their staff. Users are able to communicate and work together to achieve common goals and improve performance without ever leaving the platform. Having people take charge of their own professional growth is a direct result of this culture of engagement and empowerment. The site's in-depth analytics reveal instructive patterns in user and team performance. Employers can get the whole picture of their workforce's strengths, opportunities for growth, and talent distribution through interactive dashboards and reports. Organizations can better allocate resources, invest in their employees, and prepare for the future with the help of these data-driven insights. It is crucial that all appraisal information be kept private and secure. Permission-based access, and routine backups are all in place to keep your private data safe on our site. By strictly adhering to industry norms and data protection legislation, users can have faith that their appraisal data will remain private and secure. Organizational performance is directly tied to the development of staff members, which is

something our site greatly facilitates. For businesses to realize their full potential and bring up a high-performance culture, they need a user-friendly platform that combines robust capabilities, smooth communication, and actionable analytics.

Keywords: analysis, cooperation, data security, continuous improvement, realtime feedback, individualized templates, and staff development.

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CHAPTER 1 INTRODUCTION

1.1 OVERVIEW

At the moment, performance evaluation is one of the most active areas that is being discussed in both the theory and practice of educational institutions. As a result of this, a number of different approaches and theories have been proposed, one after the other. The characteristics of the software that will be used to create the academic candidate's performance evaluation system are discussed in this article. The system that is being suggested allows for the registration of new candidates, the carrying out of assessments, and the management of various activities under the admin login and user login sections, respectively. The MERN stack, which is a collection of technologies that enables speedier application development, has been employed in this project. The development of apps that just use JavaScript is the primary objective of using the MERN stack. This is due to the fact that each of the four technologies that comprise the technology stack uses JS as its foundation. Information regarding candidates' actions is analysed and used by management to promote the quality and efficiency of activities, which in turn influences the promotion of the organization. This information is used to promote the quality and efficiency of activities. Apex charts, which are intended to provide superior analytics, have been utilized to view the progression of the prospects. In the following section, existing research works that are related to the same field have been discussed.

1.2 OBJECTIVE

The objective of this project is to develop a software instrument that, when used, will enable managers to evaluate the job performance of candidates in a manner that is both efficient and accurate. The process of data collection will be automated by the tool, as well as the generation of thorough reports and the

provision of insights into employee performance trends. The purpose of this project is to make the performance review process more equitable, consistent, and objective so that it can contribute to an increase in employee engagement, motivation, and job satisfaction, which will ultimately lead to improved outcomes.

1.3 SCOPE OF THE PROJECT

The design of the system that has been proposed prioritizes cutting down on the utilization of human resources while simultaneously saving the time of administrators working in an organization. Candidates won't be able to get away with lying about their backgrounds because the controls are located in the company's head. Admin is also able to evaluate the progress of the candidate in comparison to their earlier evaluations, providing them with a more comprehensive understanding of the selection and promotion processes. The developed software will enable the selection of candidates to be made automatically, according to the criteria specified by the Admin. Additionally, the system enables the maintenance of candidate records, making it possible for an organization to construct a hierarchical candidate database.

CHAPTER 2

LITERATURE SURVEY

In [1] Chiung Moon and colleagues came up with a structure that may be implemented in the process of selecting candidates based on individualized standards of performance evaluation. The framework enables the identification of the candidate with the highest level of qualifications by taking into account both the quantitative scores and the qualitative aspects of the candidate's performance. It also provides fairness, objectivity, and transparency because the evaluators first decide the metrics of performance evaluation as well as the weighting among the metrics before aggregating the appraisal scores to produce the ranking of each candidate. This ensures that the ranking of each candidate is determined in a manner that is accurate, fair, and objective. Various operations and the membership function are both applied, and the results are used to calculate the ranking. We propose a fuzzy ranking technique in conjunction with an innovative integrated performance evaluation and promotion ranking system in order to determine the promotion rank of applicants. This will allow us to make a decision regarding the order in which candidates will be promoted.

Ali A. Mahmoud and colleagues in [2], conducted a study in which they proposed a follow-up conceptual model of using artificial intelligence (AI) in the hiring process with the use of performance management and social screening to predict the new candidate's expected performance by analyzing historical performances and conditions of employees. This model was made as part of a study that was made by Ali A. Mahmoud and colleagues. The individuals in charge of making employment decisions will benefit from having access to this strategy because it provides an extra criterion for consideration.

In [3], An employee performance evaluation was proposed by Safrizal and colleagues as a means of recommending candidates for achievers to receive an award. The primary objective of this study is to develop potential solutions to challenges encountered while identifying exceptional workers deserving of recognition. The decision support system using the approach of profile matching is the solution to the problem of determining which employees have the most potential. This approach first establishes the weight value for each attribute, and then it moves on to the ranking procedure, which is used to select the best alternative among the most prospective employee candidates. The outcome of the employee performance review was a level of accuracy of 93%, which was acquired by employing 200 employee appraisals. Of those data, 193 were in accordance with the value produced from the employee performance evaluation method.

An evaluation of past performance was presented by Yang Hongbo and colleagues in [4] is currently being discussed in the theory and practice of bank management. As a result of this, a number of different approaches and theories have been proposed, one after the other. Confronting the challenging internal and external environment of the bank, figuring out how to conduct performance evaluations in a way that is objective and fair, and avoiding pursuits of indices that are one-sided while remaining ignorant of total benefits are all essential steps toward achieving success in the competitive arena. The paper uses contingency theory to conduct an analysis of the performance appraisal system, and it proposes a performance appraisal process for banks based on an examination of their environments. The author believes that this is the only way that structural disparities in competitiveness can be established in an appropriate manner.

CHAPTER 3

SYSTEM ARCHITECTURE AND DESIGN

3.1 ARCHITECTURE

The system architecture comprises of three main parts namely the user, admin and registration section. The user side of the architecture holds the taking up of the assessments and filling up the data which can be submitted when locked by the admin and for the manipulation of the data must be requested to the admin. The admin manages the assessment can modify/delete the user data, approve or reject the new registers and also can have a brief analytics of the user performances. On the registration side a new registration can either be denied or approved by the admin. On denial the registration would be removed, the approved registers would be able to take up the assessments and submit them to the admin.

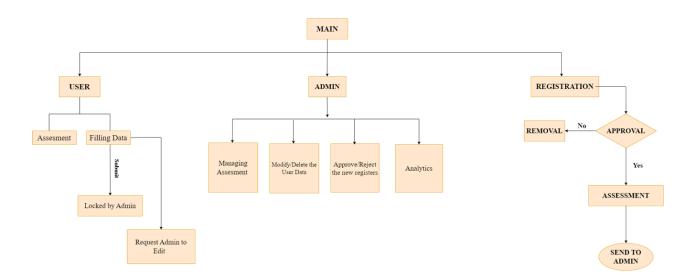


Fig 3.1 – System Architecture

3.2 ADMIN

The admin has the access to control all the activities, creating the new academic year, grant permission, view results, managing and validating the assessment, manipulating the details of the users and other activities taking place. Admin has the access to create announcements which the user can view and get the information. Admin can check the status of the various users, can decide whether to grant permission to new registers or to deny them with the help of the details of the users which they have given during the time of registration, the admin can give the access to create the account for the new user after the approval, create the assessments using suitable type and also monitor the status and results of the candidates.

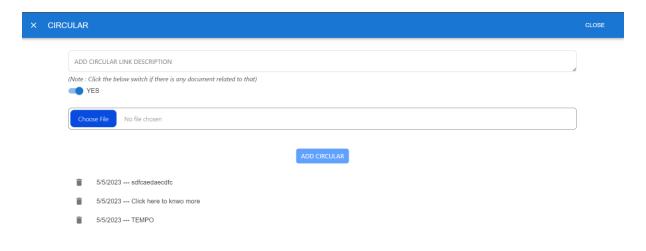


Fig 3.2 Circular section

3.3 USER

The users can view the announcements section and get to know the information. The user must enter the email address in the check status section inorder to know about their status of registration or signup. A new user must undergo the registration process. The registration consists of name, email, date of birth,

gender, contact number and other details. Once the registration is successful the user can utilize the system by signing up. On successful registration that is after the approval from the admin the user would be able to take up the assessments, which would be of the choice based or multiple type. The assessments can be submitted and user would be able to view their results and the solutions to it. On future uses in the site the user can signup with their registered details.

3.4 REGISTRATION

New users should complete their registration with the site. The registration approval is given only to the admin. On receiving a registration the admin can either grant or deny it. On denial the request would be removed and the user will know their status of approval and need to register again based on their need. When the admin approves the registration, the user will now be able to takeup the assessments, view their status, announcements and results of the test. On future usage of the site the users can signup rather than undergoing the registration process, since an email address can be used for a maximum of one registration only.

3.5 ASSESSMENT WINDOW

The assessment for performance appraisal plays a critical role in evaluating and measuring candidates job performance, skills, and contributions within an organization. Through a systematic and structured process, it aims to provide an objective and fair assessment of individual performance, enabling effective talent management and development. By conducting performance appraisals, organizations can identify high-performing employees, recognize their achievements, and provide them with appropriate rewards and recognition. Additionally, performance appraisals help identify areas where employees may

require support or additional training, fostering their professional growth and improvement. These assessments facilitate meaningful feedback and communication between employees and managers, enhancing performance discussions and fostering a culture of continuous improvement. Furthermore, performance appraisals enable organizations to align individual goals with organizational objectives, ensuring that employees' efforts contribute to overall business success. By leveraging performance appraisals, organizations can optimize their workforce, nurture talent, and cultivate a high-performance work environment.

The assessment can be taken in multiple ways that is for newly registered candidates they did not have the account, so they don't have the login credentials for that case they can take the assessment from the home page itself. After entering into that tab, they to check their eligibility to write the test, if they had already registered and it was approved by the admin then they are eligible. Then the logged in users have the facility to take up the test from their user login itself, they don't need to take from the landing page.

CHAPTER 4

ABOUT OUR PROJECT

4.1 MERN BASED APPROACH

MongoDB, Express.js, React.js, and Node.js make up the MERN stack, a well-liked web development technology stack. Full-stack web applications are a typical use case for it. The following is a description of each part and how it functions within the larger framework of a performance evaluation portal.

First, there's MongoDB, a NoSQL database that uses the versatile document-like JSON (JavaScript Object Notation) format to store data. A performance appraisal website can utilize MongoDB to store information about employees, including their performance indicators, appraisal scores, feedback, and more. Because of its flexible and dynamic schema, MongoDB is well-suited for use in dynamic applications. SQL injection is not possible in MongoDB because MongoDB does not use Structured Query Language (SQL) for querying and manipulating data. Unlike traditional relational databases that rely on SQL, MongoDB is a NoSQL database that uses its own query language called the MongoDB Query Language (MQL).

SQL injection is a vulnerability that occurs when untrusted user input is not properly sanitized and is directly concatenated into SQL queries. Attackers can exploit this vulnerability by injecting malicious SQL code, which can lead to unauthorized access, data manipulation, or even data loss. In MongoDB, data is stored in a JSON-like document format known as BSON (Binary JSON). Queries in MongoDB are performed using MQL, which is designed to work directly with these documents and does not involve the use of SQL syntax. MQL provides its own set of operators and methods for querying and manipulating data, eliminating the risk of SQL injection vulnerabilities.

MongoDB is often described as a "schemaless" or "schema-flexible" database, which means that it does not enforce a strict schema or structure for the data stored within it. This is in contrast to traditional relational databases where a fixed schema must be defined upfront.

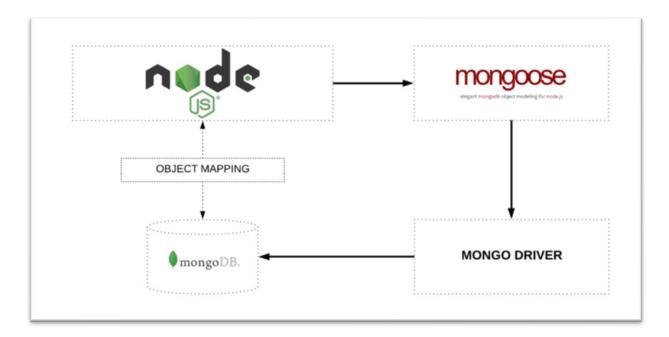


Fig 4.1: Mapping of data into the database

Express.js is a web application framework for Node.js that is both lightweight and adaptable. It offers a toolkit for developing websites and application programming interfaces. A performance evaluation website can employ Express.js for routing, HTTP request handling, and MongoDB integration. You can use this to build the system's logic for managing appraisal-related tasks like collecting and storing employee information and accumulating and analysing appraisal results and reports.

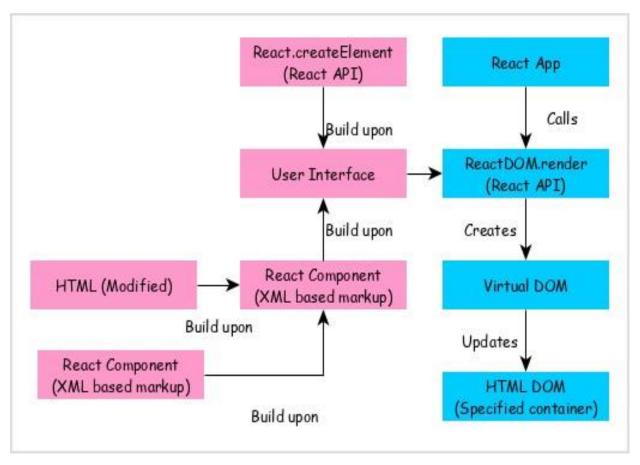


Fig 4.2: Architecture of React JS

Thirdly, the JavaScript library React.js is widely used for creating user interfaces with the help of the material UI for styling. It makes it possible to design UI elements that are adaptable, responsive, and interactive. The front end of an application that provides performance reviews might be built with React.js. Employee profiles, Performance indicators, performance reviews, and interactive graphs and charts can all be built as separate UI pieces. React.js's virtual DOM rendering and streamlined state management contribute to the framework's overall speed boost.



Fig 4.3: Working of MERN

Node.js is a server-side JavaScript runtime that facilitates the execution of JavaScript programs. It's ideal for developing scalable, high-performance web apps due to its event-driven, non-blocking I/O style. Node.js can be utilized as the server-side runtime to power the Express.js backend of a performance review website. You may process data, manage numerous connections, and interact with the MongoDB database all at once.

The REST API serves as the backend of the MERN project, providing data storage, retrieval, and manipulation functionalities. It handles HTTP requests and communicates with the MongoDB database to perform CRUD operations (Create, Read, Update, Delete) on the data.

The MERN stack includes the components necessary to create a performance evaluation website with a flexible front end (React.js) and a solid backend (MongoDB, Express.js, and Node.js). The advantages of this stack are numerous, and include support for massive data sets, near-instantaneous updates, and an

intuitive interface. It's appropriate for constructing complicated web applications like a performance evaluation site since it permits code reuse, is easy to maintain, and can scale.

4.2 LANDING PAGE

A new user will be able to register their details and take the assessments on the Landing Page. This landing page can even be used for an existing user's assessments if they decide to do so. The site will display any and all essential circulars that have been sent out. In addition to this, it possesses the important characteristics, which are referred to as "Announcement, Check Status, New Register, Candidates Section, Check Status, Assessment Section, Sign Up, and Admin Section.". It consists of status checking facility to enable the user to check the status of the approval of their registration to take the assessment and also they can check the sign up status, once the sign up request is accept is accepted by the admin then the account will be created automatically and the user can login to view their details.

4.3 REGISTRATION

New users can register themselves by providing both personal and academic information in the appropriate fields. The rule for this competition is that each email address can submit only one submission. In the event that they prompt the user to register again using the same email address, the user will not be granted permission to register. After the candidate has submitted their registration, Admin has the authority to accept or reject the applicant's registration form at their discretion.

4.4 PROPOSED SYSTEM IMPLEMENTATION

The client-server approach is incorporated into the planned architecture for the system. A graphical representation of the client-server model, coupled with an explanation of its primary capabilities. It is a representation of the specific functions of both the client and the server, as well as the ways in which those functions link with one another. In this context, the candidates function as the client, and Admin acts as the server, controlling the capabilities of the client.

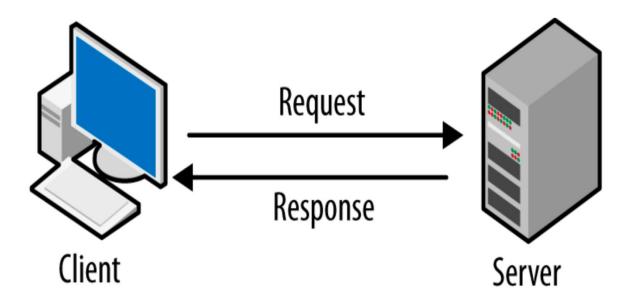


Fig 4.4: Client – Server model

4.4.1 Server

The server has the access to control all the activities, grant permission, view results and other activities taking place. Server has the access to create announcements which the user can view and get the information. Server can check the status of the various users, can decide whether to grant permission to new registers or to deny them, create the assessments using suitable type and also monitor the status and results of the candidates.

4.4.2 Client

It facilitates the user to communicate with the server. Here, they can view the announcements section and get to know the information. The client must enter the email address in the check status section inorder to know about their status. A new client must undergo the registration process. The registration consists of name, email, date of birth, gender, contact number and other details. Once the registration is successful the user can utilize the system by signing up. On successful registration the client would be able to take up the assessments, which would be of the choice based or multiple type. The assessments can be submitted and client would be able to view their results and the solutions to it. On future uses in the site the client can signup with their registered details.

4.5 ASSESSMENT

This assessment questions are set by the admin like it consists of choice based question and description. The main objective of the assessment for performance appraisal is to systematically evaluate and measure an employee's job performance, skills, competencies, and accomplishments within an organization. It aims to provide a fair and objective assessment of an individual's contributions and effectiveness in meeting job expectations and performance standards. Ultimately, the objective of the assessment for performance appraisal is to drive employee development, foster a culture of continuous improvement, and align individual and organizational goals. By establishing clear performance expectations, providing meaningful feedback, and supporting employee growth, organizations/universities can optimize performance, enhance productivity, and cultivate a high-performance work environment. In this assessment the descriptive questions are evaluated by the admin to award the marks based on the answer given by the user to express their thoughts and idea towards the problem.

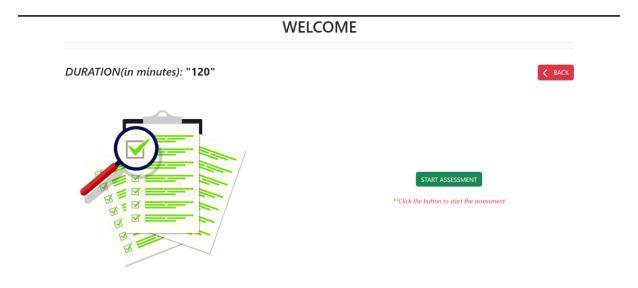


Fig 4.5: Assessment window

4.6 IMPLEMENTATION ENVIRONMENT

Several parts and technologies make up a performance appraisal site's implementation environment. Here's a rundown of the main points:

Incoming HTTP requests are processed by these servers, which then communicate with the system's backend to retrieve and distribute the data.

The backend of your performance review website is where all the action happens, it's where requests are processed, where data is stored and retrieved, and where the business logic is actually implemented. The components of the base for a MERN stack implementation are as follows:

- 1. Node.js is the server-side runtime environment for running JavaScript.
- 2. Express.js is a Node.js web application framework that streamlines the process of managing routes and responding to requests.

3. MongoDB is a NoSQL database suitable for storing information about employees, such as names, addresses, and performance indicators.

Thirdly, the frontend is the component of your performance review site that customers see and engage with. The components of the front end of a MERN stack implementation are as follows:

- 1. HTML and CSS are markup and styling languages used to organize and display content on the World Wide Web.
- 2. To create user interfaces using JavaScript, there is a library called React.js. It offers reusable parts and efficiently adjusts the user interface in response to actions taken by the user.

JavaScript is used for client-side logic implementation, backend API calls, and user interaction. Integration with other services and systems may require the use of application programming interfaces (APIs) on your performance review website. Application programming interfaces (APIs) facilitate communication between programs. To describe and implement the interaction between your front- and back-end components, you can utilize RESTful APIs or GraphQL which serves as the backend of the MERN project, providing data storage, retrieval, and manipulation functionalities. It handles HTTP requests and communicates with the MongoDB database to perform CRUD operations (Create, Read, Update, Delete) on the data.

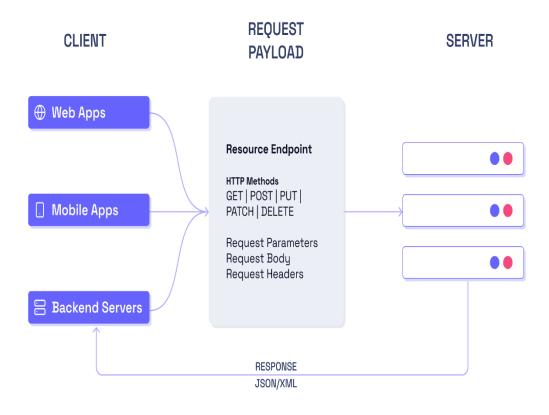


Fig 4.6: Working of REST API

Constructing and maintaining your performance evaluation website is easier with the help of a wide range of development tools and frameworks. Tools for streamlining development processes include code editors (like Visual Studio Code and Sublime Text), version control systems (like Git) to maintain the consistent and updated information, package managers (like npm and Yarn) depending on the platform used, etc.

It's important to remember that the implementation environment can change depending on the needs, technology, and infrastructure choices of the organization. The aforementioned parts make up the basic structure for a performance evaluation website; however, the precise configuration may vary depending on your specific requirements.

CHAPTER 5

RESULTS AND DISCUSSIONS

5.1 VALIDATION OF ASSESSMENTS

Once the potential applicants have submitted their evaluation. The built evaluation site has the capacity to automatically grade the choice based questions, however the admin is responsible for grading the descriptive questions that require more explanation. It was designed in such a way since each candidate would have a unique way of thinking, as well as unique ways of expressing themselves in their writing for the more substantial answers. In order to ensure that the marking system is as accurate as possible, individual marks are determined by the website itself, while the admin considers only the most comprehensive responses. The admin has the facility to re-evaluate the already evaluated assessment answers which will be reflected to the users.

5.2 PUBLISHING ACADEMIC RESULTS

In determining academic performance, evaluation marks are not the only factor considered. Teaching Workload, Teaching Learning Practices, Project Guidance, Student Feedbacks, Self-Learning Capabilities, Paper Publications in Journals and Conferences, Contributions to Institutions and Department, and Awards won by the Candidate are all Considered It is also important to note that awards won by the candidate are also taken into consideration. The following table will be used to determine the candidate's grade based on the total number of points they have accumulated collectively. If a candidate meets all of the requirements outlined above but

still receives a score that is lower than 50 overall, then it is regrettable that they will not be considered for selection.

RANGE	GRADE
81-100	A
60-80	В
50-61	С
<50	Not satisfying

Table 5.1-Candidate's grade based on their points

The admin is provided with the access of republish the result in case of any change in the data for that academic year which is requested by the user/candidate. The user can view their grade or scores in their respective user login by getting into the results section for the current academic year and the previous academic years.

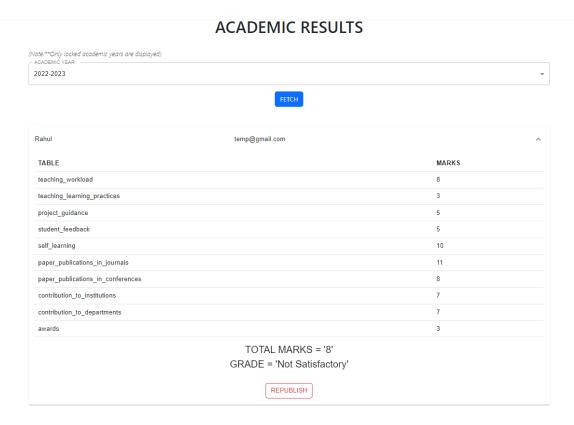


Fig 5.1: Publication of results

5.3 ANALYSING CANDIDATES PROGRESS

The progress of the candidates has been analysed using Apex Charts. ApexCharts has emerged as a potent instrument for increasing the efficiency of performance evaluation platforms. ApexCharts helps businesses make better decisions by showing performance measures, allowing for comparison analysis, allowing for dynamic engagement with data, and offering in-depth insights. Organizations may effectively show data, boost engagement, and instill a culture of performance excellence by taking use of the numerous chart styles and personalization choices available. ApexCharts's flexible capabilities provide an invaluable answer for developing reliable and visually interesting performance evaluation websites. A comprehensive rundown of Apex Charts' functions and capabilities can be found in [7], while documentation for the software's installation can be found in [8].



Fig 5.2 – Candidate's Progress Analysing using Apex Charts

The Figure 5.1 visualises the progress of a candidate for the years 2021-2022 and 2022-2023. The admin is in a position to readily analyse the growth of their candidates, and if that growth is demonstrating a downward trend, then the Admin would be in a position to easily recognize the decline and take the appropriate corrective action to analyse the issue and help to increase the performance.

CHAPTER 6

CONCLUSION AND FUTURE WORK

6.1 CONCLUSION

It is difficult to locate competent people who are suitable for the job that needs to be done. The typical hiring procedure takes a lot of time, and hiring poorly can result in a loss of financial resources. This newly designed method paved the road to help discover the appropriate people to fill the responsibilities that were required to be filled. Additionally, giving the Admin the power to regulate the activities that can be taken by candidates makes the system reliable and free of ambiguity. An enormous number of conditions have been provided by the administrator in order to facilitate the most precise selection possible for the performance of a new applicant. Including things like evaluations and the amount of papers published in various journals and conferences. The longer the evaluations have been conducted and the higher the employee's standing, the selection will be more rational.

6.2 FUTURE WORK

The proposed system has to be implemented in a small space. In terms of scalability, it may be enhanced enormously. The number of selection conditions can potentially be increased to tighten the selection process even further. The features that the admin may control could also be improved.

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