A Synopsis on

Appraisal System for Educational Institutes

Submitted in partial fulfillment of the requirements
of the degree of

Bachelor of Engineering

in

Information Technology

by

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CERTIFICATE

This is to certify that the project Synopsis entitled ***Appraisal System for Educational Institutes*** Submitted by ***Anagha Devade (16104011),Debashish Choudhury (16104060),Utkarsh Naik (15104048)"*** for the partial fulfillment of the requirement for award of a degree ***Bachelor of Engineering*** in ***Information Technology*** to the University of Mumbai,is a bonafide work carried out during academic year 2019-2020

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We declare that this written submission represents our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. we also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

Employee is the masses foundation and impetus for development and expansion of the organization. Rapid and sustainable development of the organization can be achieved by proper implementation of appraisal techniques. An appraisal system is an integral part of any organization having salaried employees like banks, IT companies, education institute, etc. It is utilized to track individual contribution and performance against organizational goals and to identify individual strengths and opportunities for future improvements and assessed whether organizational goals are achieved or serves as a basis for the company's future planning and development of the organization. The parameters considered for appraisal for each domain are different from those in other domains. Similarly, for educational institutes, the requirements, and parameters used for evaluation are different from the ones used in IT companies or other domains. A domain specific common appraisal system for Educational institutes is the need of the hour.

Chapter 1: Introduction

Employee is influential as well as a vital part of any organization. Performance Appraisal is a step where the management finds out how effective it is whether to hire employees or not. It is a process of evaluating the performance and qualifications of the employee in terms of the requirements of the job for which he/she has applied,for purposes of administration including student's placement, selection for promotion,providing any other rewards and any other growth aspect. In simple words it is a process of assessing employees at their field for further growth and development. So our project is a Staff Appraisal System for Educational institutes which will make the traditionally paper-based system online. Teacher performance management is a continuous process for identifying, evaluating and developing the work performance of teachers, so that the goals and objectives of the school are more effectively achieved, while at the same time benefiting teachers in terms of recognition of performance, professional development and career guidance.

The assessment is mainly based on the progress of the pupils due to the current steps and planning and implementing new steps accordingly. At each of the three proficiency levels pupils can take a summative test to prove their proficiency. The components of the evaluation system comprise: a self-report form, a peer feedback form, and a summative skills test and summative assessment form. The evaluation system provides guidelines for building and keeping profiles and assessments of pupils, and a general assessment procedure that guides the start of the process. Evaluation is based on an inquiry approach that views inquiry as a scientific discovery process consisting of the following phases:

(1) orientation

(2) conceptualization

(3) investigation

(4) conclusion and discussion

Our system is flexible and versatile than the traditional pen-paper based system It identifies strengths and weaknesses of teachers on all those aspects which are important for the progress of students. This information and analysis may also be used by higher authorities of the institute to form proper teams of faculty members for different academic and administrative activities of the institute considering the domain and other skills of the faculty. Apart from having a command on the subject, there are various other factors like teaching attitude, doubt solving, ease of understanding based on which students create either a positive or a negative opinion about the teacher Every teacher has his/her own way of delivering lectures and students can easily identify the qualities/features of any teacher. For instance, the way a teacher introduces a new topic, his/her gesture in the class, writing skills, the method of answering questions, the knowledge of subject, etc may be more important to a student than the actual contents covered by the teacher to complete the course. Therefore, instead of taking only pre-defined aspects, it will be more meaningful to extract the relevant features of a teacher from students' feedback apart from pre-defined criteria.

Chapter 2: Objectives

The primary objective of our project, Appraisal system for educational institutes, is to convert the traditional pen-paper based system into an easy-to-use web based system. Some of the other objectives are:

- To optimize the process of performance evaluation.
- To improve the overall teaching quality of the institute.
- To make the appraisal process hassle-free.
- To create a positive impact of the performance appraisal system towards the performance of the respondents in terms of commitment, skills and responsibilities.
- To make the process of appraisal economical
- To provide detailed analysis of the faculties' performance to both the faculty as well as higher authorities.

Chapter 3: Literature Review

The papers referred to while developing the system are mentioned below.

- Employee Performance Assessment in Virtual Organization using Domain-Driven Data Mining and Sentiment Analysis,Tejshree D. Chungade and Prof. Shweta Kharat, IEEE, International Conference on Innovations in information Embedded and Communication Systems (ICIIECS), 2017.

  This paper describes the implementation of an Employee Appraisal system in a Virtual Organization. Virtual Organizations are those organizations having a team of freelancers or employees geographically apart. It becomes difficult to evaluate by traditional performance evaluation methods in such cases. A combination of 360 degrees feedback and Online Tests is used for performance evaluation in this case. A 360 degree feedback is a feedback collected from all people with whom the employee interacts with during working hours (including one-time clients). Here, online test may include Logical Reasoning, Technical, Aptitude, etc. K Means clustering, a data mining algorithm has been used to generate the score based on the above parameters. The appraisals are calculated based on that score.

  This method evaluates skills as well as behavior of the employees. It is useful for increasing self awareness among employees. It helps to identify development opportunities among them. But a major disadvantage is that it might create a negative work culture in case of negative reviews by peers. Although the feedback is anonymous, the low collective score might result in escalation of misunderstandings among employees and may have adverse effects on the work culture as well as quality of work. There is a possibility of bias in 360 degree feedback as the feedback may be based on personal relations rather than professional. Also, it may happen that experienced employees or employees with a

high post won't be in a favor for an online test as an appraisal. Too often the priority for managers using a 360 program is to uncover their teams' weaknesses. While, this is intended to be a consequence of use, there should be more of an emphasis on praise and positive feedback. If 360 feedbacks are used only to highlight negative aspects of a team member's work, it is likely that they will foster a negative attitude towards the feedback culture, and then ultimately disengage from it. Also, data mining algorithms work more efficiently on large datasets. Hence, it is suitable for large organizations rather than startups and educational institutes.

- 720 Degree performance appraisals: An effective tool to efficiency of modern employees, J. George, IEEE International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT), 2016

  This paper tries to overcome some of of the shortcomings of 360 degree feedback by using 360 degree feedback twice. This is known as 720 degree feedback. While, 360 degree feedback is generally conducted once a year, 720 degree feedback is conducted at least twice a year, thus increasing the regularity of feedback. It works in two phases: Pre-Appraisal and Post Appraisal. In Pre-Appraisal phase, the first 360 degree feedback is conducted. In Post-Appraisal phase, the results are analyzed and the employee is made aware of his/her positives and shortcomings. A set of time bound goals are assigned accordingly. A second 360 degree feedback is conducted after a predefined time duration. The results of both the 360 degree appraisals are compared for the final appraisal score. No algorithm is mentioned here but as it uses 360 degree feedback twice, it can be compatible with any algorithm used for 360 degree feedback. Mainly classification or clustering algorithms are used for this method.

  Since completion of goals is also considered, it reduces the amount of bias due to prejudice or other personal reasons. This method is also more favorable from an employee point-of-view as it gives them a second chance to improve and perform better. It is ensured by regularity in feedback. This in turn creates a happy and productive work environment. The immediate seniors or supervisors are in a much better position to suggest improvements or take action by comparing the Pre-Appraisal and Post-Appraisal feedback. But

it is a time consuming process compared to the 360 degree feedback which occurs once a year. It is also a more expensive process. In practice, it focuses more on the negatives rather than the positives. It requires commitment from top management and HR in terms of time, financial resources, etc. A main reason for the failure of this method is that feedback is given, but then swiftly forgotten. If no plan to implement the feedback is made; there is no change in behavior, and the feedback is redundant. Managers should therefore be included and actively involved in the process. Like 360 degree feedback, 720 degree feedback is not suitable for small datasets like those of small companies startups and educational institutes. Hence, this is useful only for large or established organizations.

- HiSPEED: A System for Mining Performance Appraisal Data and Text, Girish Keshav Palshikar, Manoj Apte, Sachin Pawar, Nitin Ramrakhiyani., IEEE, International Conference on Data Science and Advanced Analytics, 2017.

  This system uses Data Mining to implement a rating system for Performance Appraisal. There are two types of appraisal forms: Self-appraisal and Supervisor-appraisal form. In Selfappraisal, the employee has to rate himself/herself on a scale of 1 to 5, with 5 being the highest, on various parameters pre-defined by the organization. For Supervisor appraisal, only the immediate seniors or supervisors are considered. Immediate supervisors are in a much better position to give an accurate rating on the employee. But along with the above parameters, another parameter called Supervisor reliability is considered. Like a junior employee, even a supervisor may be rated by his/her seniors. A higher supervisor rating may indicate more reliability while a low rating may indicate less reliability. These three parameters are used to generate the final score using classification algorithms like Naive Bayes classifier.

  The major advantage of this system is the supervisor reliability feature. A top level employee may not have much knowledge about a junior employee to give accurate feedback. An immediate supervisor may have more knowledge about the employee This is an attempt to reduce bias as the supervisor with low rating won't be considered reliable so the supervisor rating won't be given more weightage in such cases. On the other hand, a supervisor with higher rating would be considered more reliable so the supervisor's rating

would be given more weightage in this case. Its accuracy will be more if the input dataset is large. So, it can be useful for large organizations. But on the contrary, small organizations, startups and educational institutes won't have a large dataset which may have a negative impact on the accuracy and reliability of the system. Also, even if a supervisor has good ratings, natural bias on his/her part may come into picture.

- A Scrutiny of Teachers' Pursuance Using Classification Techniques, V. Shanmugarajeshwari, R Lawrence, IEEE International Conference on Intelligent Techniques in Control, Optimization and Signal Processing, 2017.

  This system is based on appraisal system for an Educational institute. It uses a combination of self-appraisal and students feedback. In Self-appraisal, the employee has to rate himself/herself on a scale of 1 to 5, with 5 being the highest, on various parameters pre-defined by the organization. Students are important stakeholders for any educational institutes. The success of the institute is dependent on the current students results. Also, the future admissions depends on the students' reviews. So, taking feedback from students is an important part of appraisal system inn an educational institute. Classification algorithms such as Naive Bayes, Decision Tree Classifier are used on the above parameters. Naive Bayes helps to find the range of answers while Decision Tree is useful when we require to make decisions like affirmation or negation.

  Since it includes students in the process, it affirms the students' (and therefore parents') faith in the institute as they are important elements of the educational system. Since students are the ones who attend lectures of the faculties, no one else, other than students, is in a better position to give an accurate feedback. An unbiased feedback will help the teacher rectify mistakes and explore development opportunities which in turn may have a positive impact on the results as well as overall development of the students. Also, it might help the institute in identifying and rewarding the faculties who are good at their job. The system works well for medium sized datasets too. A major disadvantage is that students feedback can also be based on favoritism or grudges on the faculties. This might lead to incorrect scores which in turn may reduce the importance of the system in the eyes of both faculties as well as students. Also, even in the case of unbiased feedback, if

higher authorities are not taking action based on students feedback, it may reduce the faith of the students in the system and the institute.

- Educational data mining that supports quality teaching: How to create a culture of data in educational policies, IEEE Global Engineering Education Conference (EDUCON), 2016.

  This system uses Data Mining to implement a rating system for Performance Appraisal. There are three types of appraisal forms: Students, Peer and Seniors review. Students are important stakeholders for any educational institutes. The success of the institute and future admissions is dependent on the current students' results and reviews So, taking feedback from students is an important part of appraisal system inn an educational institute. Peer review is important mainly for behavioral analysis of the faculty. Seniors review form may be filled by an experienced faculty or the Head of Department. Multiple data mining algorithms including K star, Random Tree, KNN are used. The most accurate result is considered.

  Actual classroom performance of the teacher matters in this appraisal system. The parameters used for student feedback mostly deal with the teaching quality, punctuality, behavior and other aspects related to classroom lectures. An unbiased feedback from students will help the teacher rectify mistakes and explore development opportunities which in turn may have a positive impact on the results as well as overall development of the students. Peer review will deal with the teacher's behavior outside the classroom while Seniors review may be more inclined towards completion of goals. All these factors may result in a well balanced score of the faculty considering all aspects like teaching, behavior, completion of syllabus, results, etc. But as in the earlier case, student feedback may be based on favoritism or grudges against the faculties. Also, a negative peer review might result in a negative work environment.

Chapter 4: Problem Definition

Educational institutes traditionally rely on pen-paper method to manually get data, analyze and generate performance score. Some institutes may use a paid software. There is no common portal for staff appraisal as each institute may consider different parameters. If the performance appraisal is not linked to specific career goals, top talent might not see the point—and thus may view them as a negative experience. This problem means that the mere act of having a performance review process can actually result in higher turnover—especially for top talent.

Having an official performance review process can actually hinder timely feedback the rest of the year if the process is carried out without proper planning. Lack of documentation of problems becomes a problem itself. This means employers are open to wrongful termination claims if an employee has a record of good reviews but is later fired for poor performance seemingly out of nowhere. It costs a lot both in terms of time spent and money invested in performance appraisal systems to implement a performance appraisal process. That money does not always translate to improved productivity if the process is not carried out to its highest potential.

Chapter 5: Proposed System Architecture

Our proposed system be a web application developed using NodeJS and MongoDB at the backend and Node Templates in the frontend.

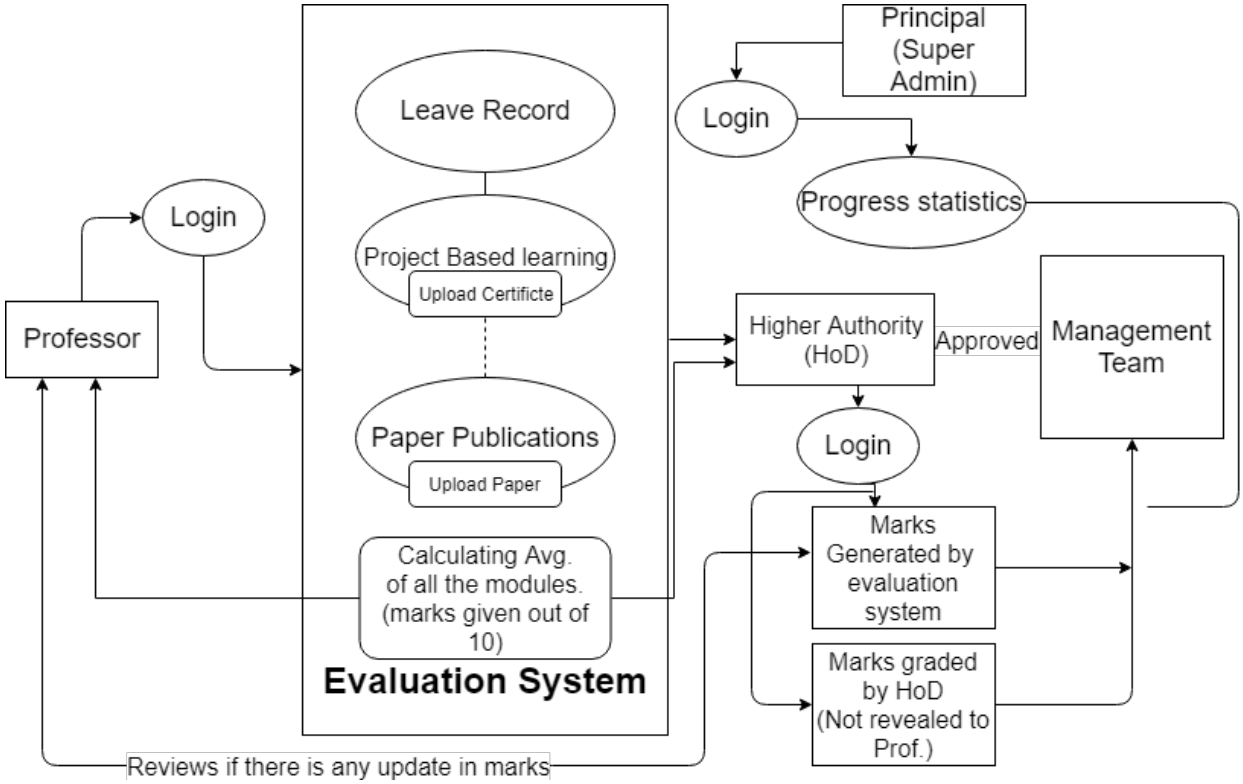

Fig 5.1:Proposed system

After login, faculties can access and fill relevant form online and also have an option to upload certificates if required. On the basics of the form filled each staff will be graded marks, both by self-appraisal and by HOD. The marks will be provided on the basis of the data filled and other parameters like total leaves taken, extra curricular activities, number of paper published etc. These parameters are to be provided by the college itself, using these multiple parameter particular staff will be graded. After submitting the form it will be proceeded to higher authority and thereafter the management for final appraisal.

Chapter 6: Design and Implementation

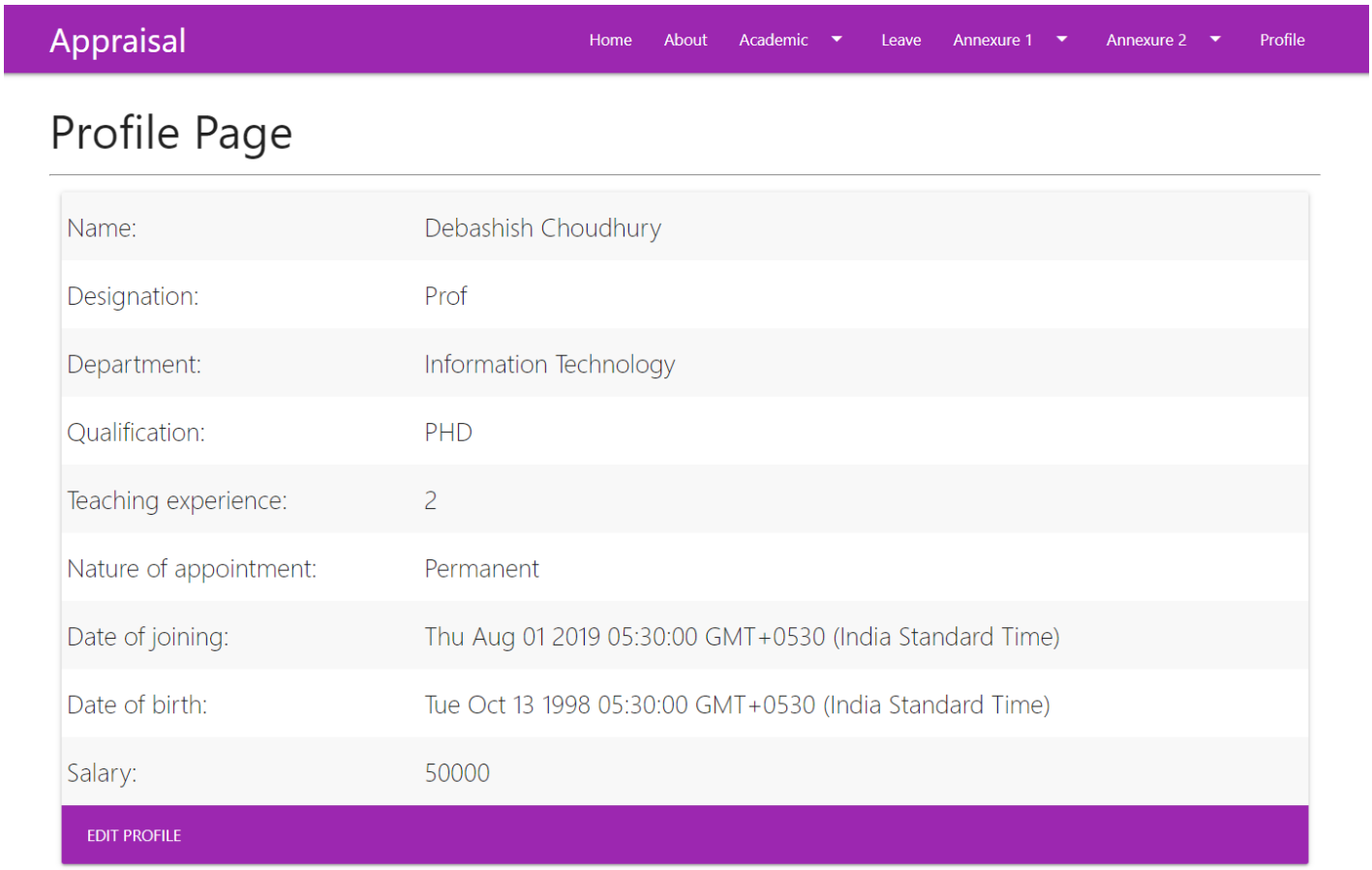

Fig 6.1:Sample Faculty Profile

Fig 6.1 depicts faculty profile page where all the details of the faculty be visible after login. The details contain basic information about the faculty such as Name, Qualification, Joining Date, etc. The faculty will be able to edit these details anytime.

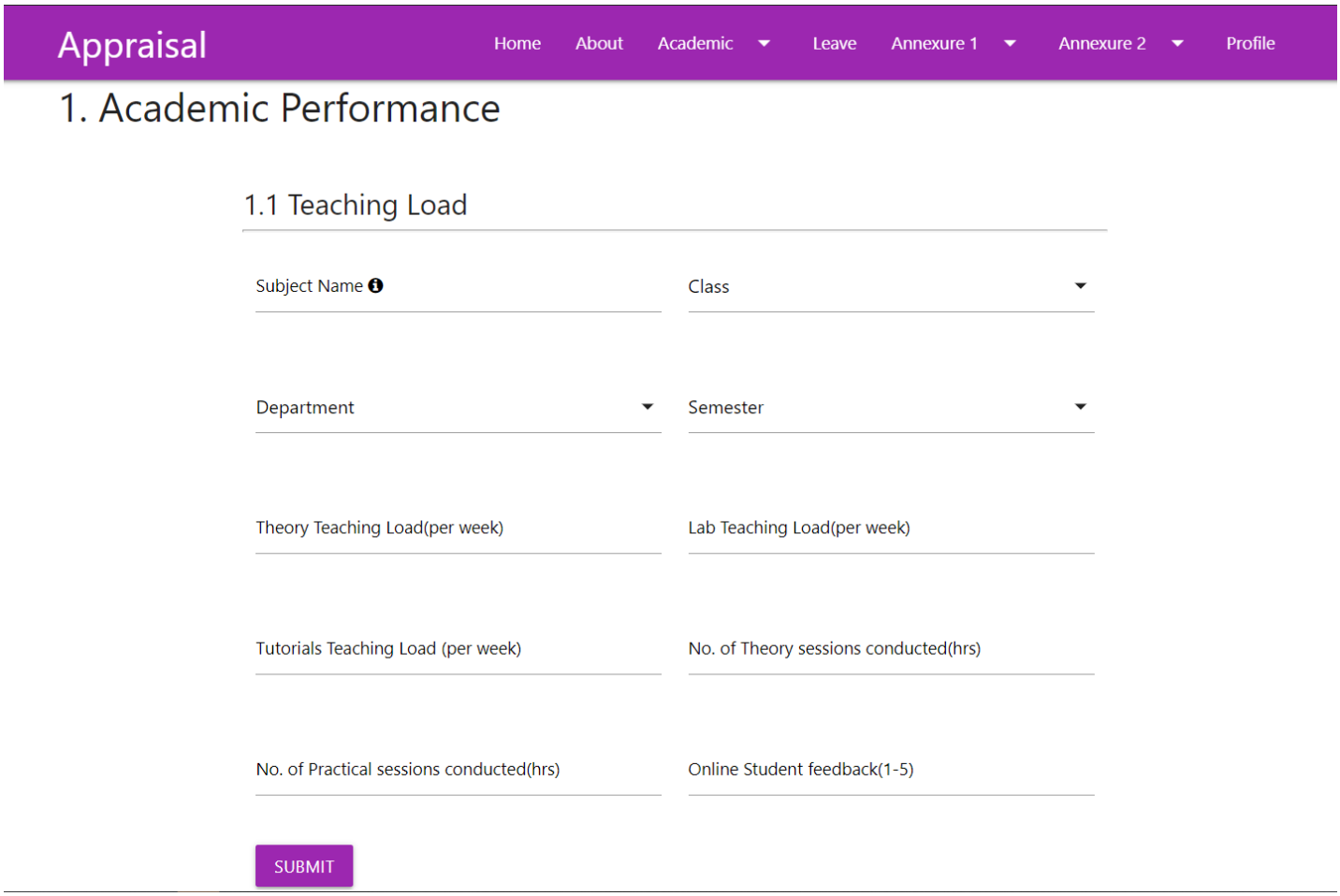

Fig 6.2:Academic Performance form

Fig 6.2 depicts Academic Performance form which is one of the several requirements for appraisal. It gathers data related to the teaching of subjects in theory lectures, practicals and tutorials. It is also useful to compare the teaching load allotted to actual teaching hours.

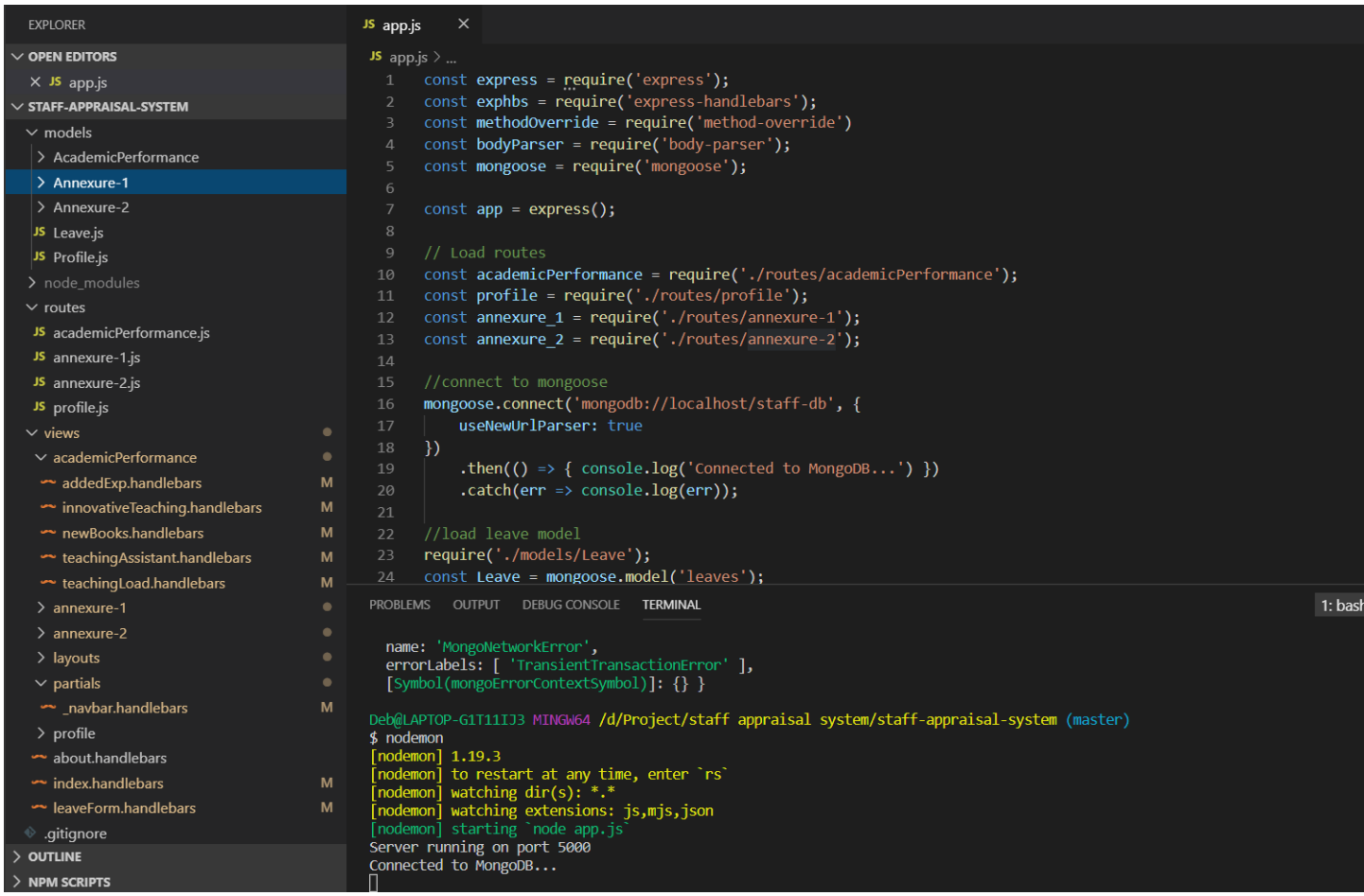

Fig 6.3: App.js file

Fig 6.3 depicts App.js which is the main file of NodeJS. It is the backbone of the web app. It is used for several functions including Database connectivity, Package import/export, Middleware Configuration, Routes and Server configuration. It is responsible for the smooth running of the web app.

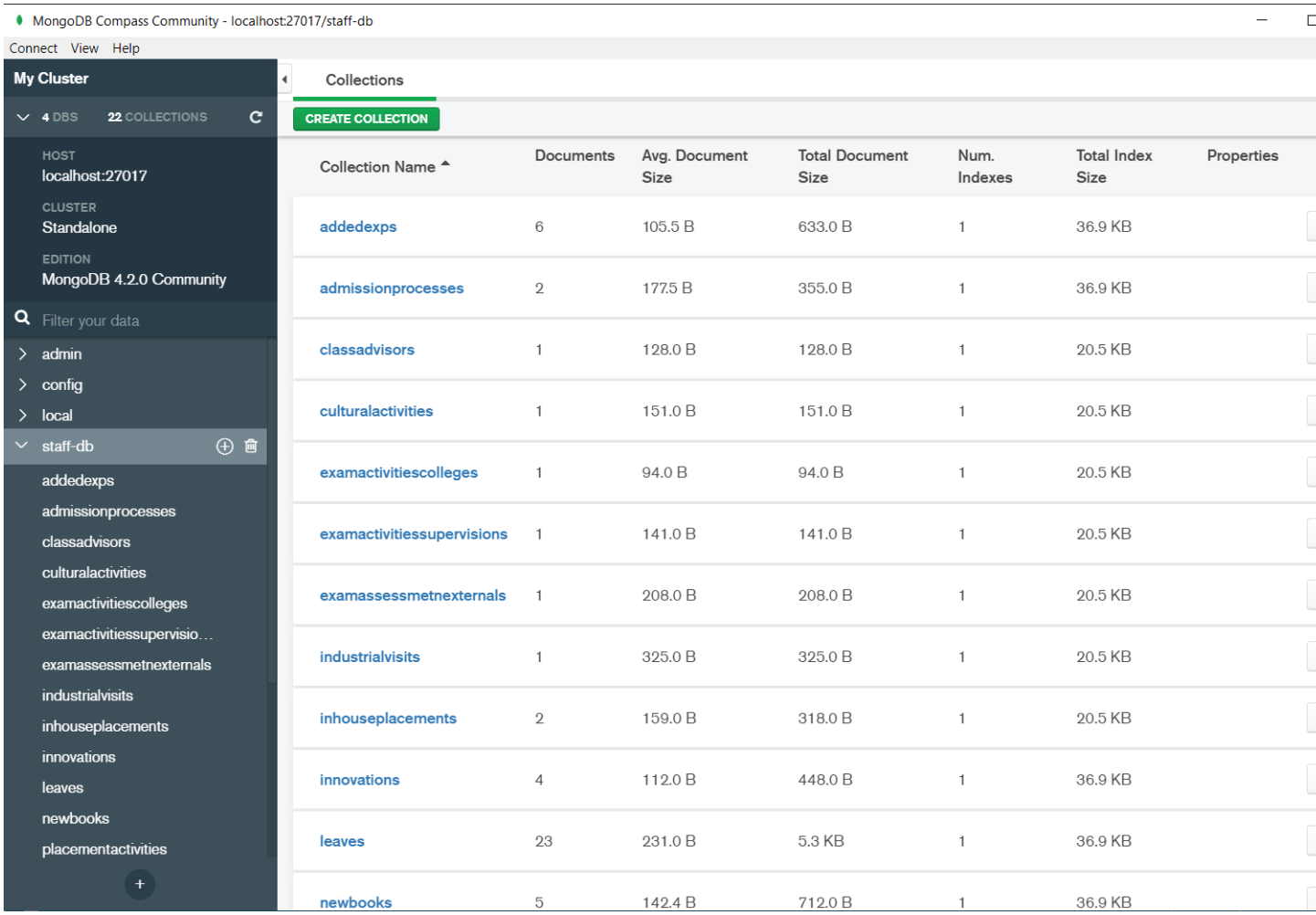

Fig 6.4:Mongodb Tables

Fig 6.4 depicts MongoDB Compass console which is a GUI console for MongoDB, a NoSQL Database. It is connected to the web app using App.js file. Some of the collections used in our project are displayed in the console. If a query is fired for any database action like insert, modify, update and if the collection is not found, mongodb will create a new collection of the specified name and then perform the action if applicable.

Chapter 7: Summary

Our proposed system will be a progressive web-app which will make the Staff appraisal process fully online and hassle free. Along with elimination of physical forms, it will also ease the verification process (by HOD or higher authorities). Also, educational institutes will not have to invest a hefty amount for developing a customized appraisal system as our proposed system will provide the same facilities. This is cost effective as well as saves time compare to the existing system. Appraisal system is vital in ensuring high productivity in any organization. While organizations are transitioning from the traditional pen-paper based systems to computerised system for appraisal, the lack of a uniform appraisal system results in organizations spending a considerable amount of time and money for developing and maintaining an intra organizational appraisal system. Although an intra organizational appraisal system meets the specific demands of the organization, a uniform appraisal system can enable the organization to try and experiment with multiple ways of appraisal without consuming additional time or money.

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1 Publication

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