SELF APPRAISAL SYSTEM

Submitted in Partial fulfilment of Requirement for the award of the Degree of

MASTER OF TECHNOLOGY

in

Software Engineering

BY: MEGHANA MOHAN (1MS19SSE09)

MEGHANA S (1MS19SSE10)

SRISHYLA K (1MS19SSE18)

Under Guidance of

Dr. Krishna Raj P M

Associate Professor

Department of Information Science and Engineerring

RAMAIAH INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)

Accredited By National Board of Accreditation & NAAC with 'A' Grade

MSR Nagar, MSRIT Post, Bangalore-560054

www.msrit.edu

2020

RAMAIAH
Institute of Technology

CERTIFICATE

This is to certify that the dessertation work entitled **"Self-Appraisal System"** is carried out by **Meghana Mohan(1MS19SSE09), Meghana S (1MS19SSE10), Srishyla K(1MS19SSE18)**, a bonafide student of Ramaiah Institute of Technology, Bangalore, in partial fulfillment for the award of Master of Technology in Software Engineering of the Visvesvaraya Technological University, Belgaum, during the year 2019-2020. It is certified that all corrections / suggestions indicated for Internal Assessment have been incorporated in the thesis deposited in the departmental library. The thesis has been approved as it satisfies the academic requirements in respect to dessertation work prescribed for the said degree.

Dr. Krishna Raj P M
Associate Professor,
Department of
Information Science and
Engineering.

Name & Signature of Examiners with Date:-

1)

2)

RAMAIAH
Institute of Technology

DECLARATION

We **Meghana Mohan, Meghana S, Srishyla K** are students of Master of Technology in Department of Information Science and Engineering, Ramaiah Institute of Technology, Bangalore hereby declare that the project entitled **"Self Appraisal System"** has been carried out independently at the Institute under the Guidance of **Dr. Krishna Raj P M.**

We hereby declare that work submitted in this thesis is my own, except where acknowledged in the text and has not been previously submitted for the award of the degree of Visvesvaraya Technological University, Belgaum or any other institute or University.

Signature of Student:

Meghana Mohan (1MS19SSE09),

Meghana S(1MS19SSE10),

Srishyla K(1MS19SSE18)

Place: Bangalore

Date: 20-02-2020

RAMAIAH
Institute of Technology

ACKNOWLEDGEMENTS

The successful completion of any task would be incomplete without the thanking the people who have constantly guided me and supported for the completion of the task. First of all, special thanks to my guide**, Dr. Krishna Raj P M** Associate Professor, Dept. of ISE, who guided me well throughout the Project and focused on betterment of the project, his supervision, support and vital contribution from an early stage of this research and providing me extraordinary experiences throughout the work. I am highly grateful to faculties, library staff and laboratory staff of ISE department for their extended long-term support and coordination. This project would never have been completed without the unending encouragement and devotion of my family and friends.

RAMAIAH
Institute of Technology

ABSTRACT

Appraisal form is a form where it discusses about which has done for the appraisal period, and what further improvements are to be done in the future. It talks about the achievements of the current year.

In the appraisal form, the working details and achievements will be filled. The self-appraisal form includes self-evaluation system which helps the user to self-rate their performance, their own progress, and self-correct them. In further it allows the users to identify their strengths, weaknesses, and developments needed. The self-evaluation in appraisal process helps the institute to understand how the users carry out the work given to them, how they perceive about their performance in comparison with others, and what trainings they need and grades they deserve.

The most important purpose of teacher appraisals is to measure users' performance. Various organizations may use it for several reasons including to make sure users are working to the required standard. To gauge which users are performing the best and therefore eligible for bonuses, pay rises and other rewards. To address performance issues where necessary.

Using appraisals for user development is where it is observed whether staff is performing well or poorly, user appraisals present an ideal opportunity for HR to identify the next stage in their development. Many organisations use personal development plans within staff appraisals, to direct and record staff development. For under-performing staff, one can use appraisals **to** identify skills gaps and training needs. Users can then take the training programmes they need to perform their role better. Using appraisals to improve performance is when the goals are set in user appraisals and don't just have to be about staff development. **User**s can improve their performance, and increase team's productivity as a result. Performance goals must be fair and achievable, or they could have a negative impact.

RAMAIAH
Institute of Technology

TABLE OF CONTENTS

List of Figures

PROJECT PLANNING

Project planning refers to everything that does to set up the project for success. It's the process which goes through to establish the steps required to define the project objectives, clarify the scope of what needs to be done and develop the task list to do it. The activities in project planning are varied because have to work out how to achieve the goals. Every project is going to be different as the objectives will be different. Most of the work of planning is thinking about what needs to do to get everything done and putting the structure in place to make that happen. The project planning phase comes at the start of the project: It's after the initiation phase where all really done is got approval to go ahead and put the basics in place and before the delivery phase where actually do the work.

Pert chart

A PERT chart is a project management tool used to schedule, organize, and coordinate tasks within a project. It is basically a method to analyze the tasks involved in completing a given project, especially the time needed to complete each task, and to identify the minimum time needed to complete the total project.

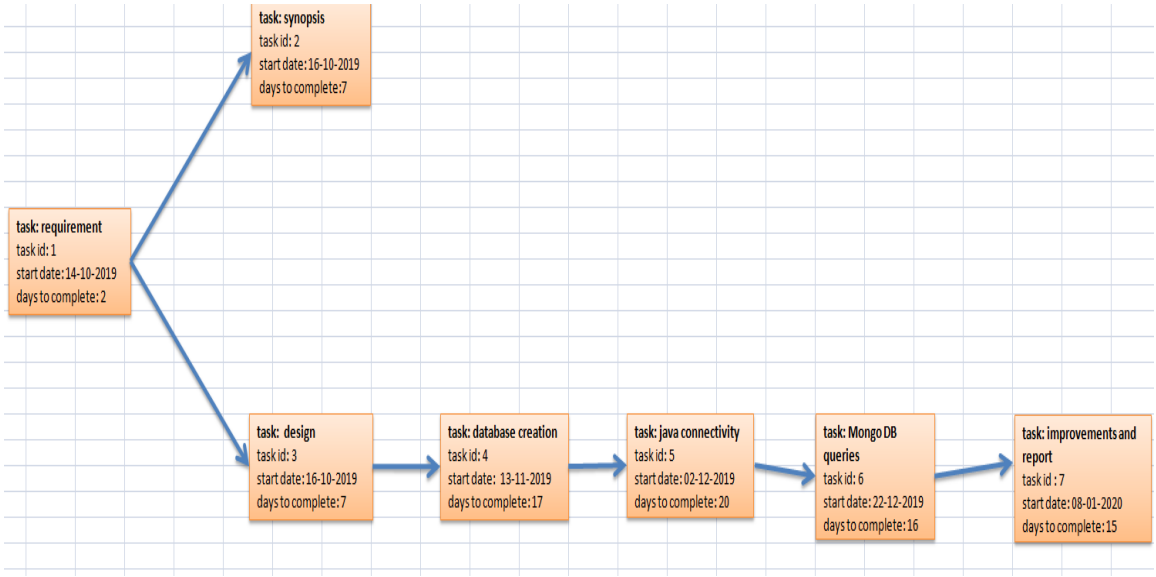


Figure 1: this the figure of the pert chart created initially

Gantt chart

A Gantt chart, commonly used in project management, is one of the most popular and useful ways of showing activities (tasks or events) displayed against time. On the left of the chart is a list of the activities and along the top is a suitable time scale. Each activity is represented by a bar; the position and length of the bar reflects the start date, duration and end date of the activity. This allows seeing at a glance:

- What the various activities are
- When each activity begins and ends
- How long each activity is scheduled to last
- Where activities overlap with other activities, and by how much
- The start and end date of the whole project

Table 1: the Gantt chart table showing the tasks and the dates

Task	Start date	Days to complete
Requirement	14-10-2019	2
Synopsis	16-10-2019	7
Design	16-10-2019	7
Database creation	13-11-2019	17
Java connectivity	02-12-2019	20
Mongo DB queries	22-12-2019	16
Improvements and report	08-01-2020	15

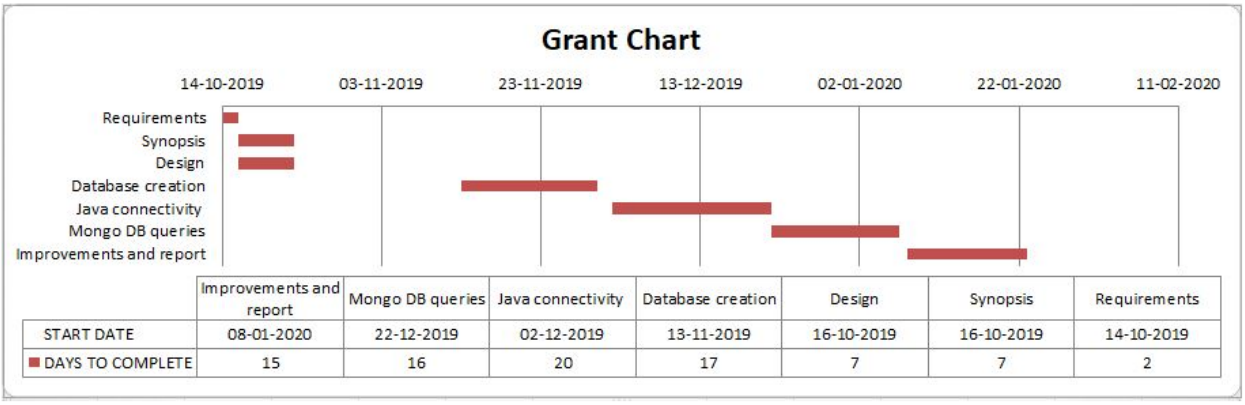


Figure 2: the Gantt chart showing the level of work that has to completed within the days

QUALITY ASSURANCE PLAN

Test planning is very important, essential, and crucial part of the test life cycle. Well planned and executed test ensures good quality software. In simple words, Test Planning is planning everything involved in testing and Test Plan is a document where test planning is written. Similarly, to conduct core activity "Testing", various parameters are considered.

- Software to test
- What and how to test
- Infrastructure required for the software to run
- Skills required to execute the test
- When to test
- To whom and what to report
- Total efforts required to complete the test
- When to stop testing and release the software.

The output of through consideration of all above factors is nothing but a **"Test Plan".**

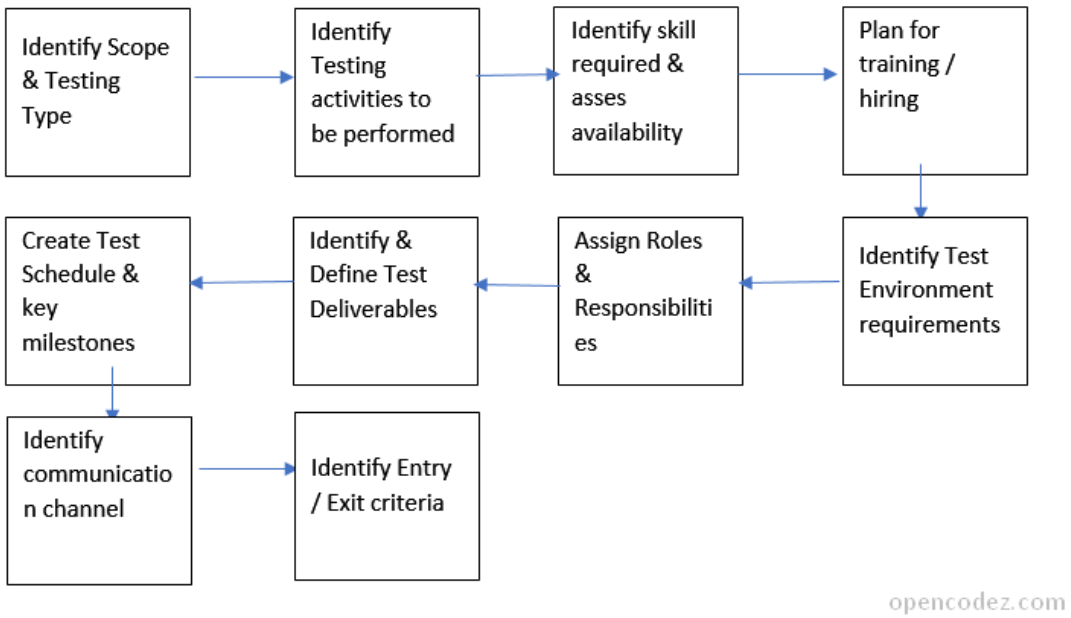


Figure 3: these are steps involved in the QA plan

Test plan format and content may vary depending upon the standards followed. The following format details the points usually covered in test plan.

Test Plan Identifier: Provides a unique identifier for the document. Every deliverable has a unique identification number which could be numeric or alphanumeric based on the company configuration management. Test Plan should also adhere to configuration management policy for unique ID. Here test case1 and test case2 are the Ids provided for the test cases

Introduction: The most important purpose of teacher appraisals is to measure users' performance. Various organizations may use it for several reasons including to make sure users are working to the required standard. To gauge which users are performing the best and therefore eligible for bonuses, pay rises and other rewards. To address performance issues where necessary.

Using appraisals for user development is where it is observed whether staff are performing well or poorly, user appraisals present an ideal opportunity for HR to identify the next stage in their development. Many organisations use personal development plans within staff appraisals, to direct and record staff development. For under-performing staff, one can use appraisals to identify skills gaps and training needs. Users can then take the training programmes they need to perform their role better. Using appraisals to improve performance is when the goals are set in user appraisals and don't just have to be about staff development. Users can improve their performance, and increase team's productivity as a result. Performance goals must be fair and achievable, or they could have a negative impact. Project could be platform configuration tool and objective is to get a web application enhancement in existing product or defect fixes.

Test item: Introduction and overview of Software under Test. Eclipse is an integrated development environment (IDE) used in computer programming. It contains a base workspace and an extensible plug-in system for customizing the environment. Eclipse is written mostly in JAVA and its primary use is for developing Java applications, but it may also be used to develop applications in other programming languages via plug-ins.

Java Enterprise Edition, formerly Java 2 Platform, Enterprise Edition, currently rebranded as Jakarta EE, is a set of specifications, extending Java SE 8 with specifications for enterprise features such as distributed computing and web services.

Features to test: In scope features. This could be newly added or updated features. Indirect features that has technical or functional dependency on newly added or updated features.

Approach: Strategy to test the software. Test case1: During adding the details into the database, the variables given are in the form of string and calculated in terms of integers. Whenever the values are given as nothing, the particular field is set to null value. There is no empty value given to the data so that whenever the data is being searched and found out that the data if having null value can be used to update to some known information. If there is no value present that would be a problem because the person who wants to update the data won't get to know about the data which is present and he can assume and put in some random data. This saving of null data is one of the test case observed and tested.

Test case2: During the search of the details using the full name, whenever the full name is not clearly given or whenever the data is not present in the database, there is a message showing the search has been failed. There can be a situation where the database has been changed or the data may have been changed so that whenever there is access to it then the data searched will show error. If not showing error even if the data is not present then the test case would fail in that matter.

Test deliverables: All the deliverables from the testing that includes the test cases.

Item pass/fail criteria: Entry and Exit criteria for all items.

TestCase: All Steps passed
Testing tasks: All tasks / steps to execute for test planning and execution

Environmental needs: Infrastructure required for application and testing is the software that is eclipse IDE and the MongoDB.

Responsibilities: Roles and responsibilities for various testing / supported activities.

Staffing and training needs: Training / hiring needs to bridge the gap of available and expected skill that takes over the testing of the cases perfectly.

Schedule: Test estimation (Efforts) and high-level schedule. Schedule should be for key deliverables or important milestones. Ideally, all test deliverables included in the test plan should be scheduled. Detailed test schedule (at feature or defects or resource level) is prepared at appropriate time during test execution.

Risks and Mitigation: Risk identification for applicable items, assumptions, and mitigation plan.

Approvals: Approvals and sign of dates.

Test plan is a guideline based on which test execution should be tracked. For successful testing and good product test delivery, it is important to update and make required changes in the plan as per changes in the any of the parameter which was basis of the test plan.

CHAPTER 1

INTRODUCTION

Appraisal form is a form where it discusses about which has done for the appraisal period, and what further improvements are to be done in the future. It talks about the achievements of the current year.

In the appraisal form, the working details and achievements will be filled. The self-appraisal form includes self-evaluation system which helps the user to self-rate their performance, their own progress, and self-correct them. In further it allows the users to identify their strengths, weaknesses, and developments needed. The self-evaluation in appraisal process helps the institute to understand how the users carry out the work given to them, how they perceive about their performance in comparison with others, and what trainings they need and grades they deserve.

The importance of the self-appraisal system:

1. It gives the institute a broader perspective: having the user's complete self-evaluation allows the institute to view the performance of the user and understand the user's strengths, and the weaknesses from the user's perspective.
2. Promotes more effective discussions about performance, priorities and challenges.
3. Self-appraisal helps in self-development of the user. It helps in giving positive feedback as well as identifying the areas for improvement.
4. It is easy to identify the under- performers and decide whether there requires improvement for the user or not.
5. The self-appraisal helps the user to increase their sense of confidence.

In self-appraisal system, the lecturers / professors will be filling their appraisal form by giving his or her full name, department, designation. The designation will contain the fields such as assistant professor, associate professor, professor, and professor & head.

The lecturer/ professors has to enter details of activities like FCI score (average of all courses handled) under teaching attribute.

In the research field there are sub fields such as number of non-paid refereed journal paper published which is a compulsory field, number of indexed conference paper, number of non-paid non-refereed journals and non-indexed conferences where the faculty should be one among the first 3 authors for these three fields. The research field also contains the fields like books or chapters published among the first three authors where the book field contains the fields like number of books and number of book chapters. The field like disclosure filed, patents granted should be filled. The researches done under graduate program, research done under master's program and researchers done under Ph.d has to be filled under research field. The funds for the project has to be filled where the funds can be greater than 10 Lakhs, greater than 5 lakhs, greater than 1 lakhs or less than 1 lakh.

The lecturer has to fill the field for service and professional development which include number of conference chair, session chair attended, number of FDP/ seminar/ workshops organized as coordinator either for 5 days or 3 days. The lecturer will also fill the number of technical talks he or she has attended outside the institute, number of events participated outside the institute, number of events participated inside the institute, the number of technical talks within the industry relation, number of awards and honours received and other major contributions. The form calculates the total score, bonus scores and the final score.

1.1 MOTIVATION

The most important purpose of appraisal is to measure performance of the teachers. Various organizations may use it for several reasons including to make sure professors are working to the required standard. To gauge which teachers are performing the best and therefore eligible for bonuses, pay rises and other rewards. To address performance issues where necessary.

Using appraisals for performance development is where it is observed whether staff is performing well or poorly, teacher appraisals present an ideal opportunity for HR to identify the next stage in their development. Many organizations use personal

development plans within staff appraisals, to direct and record staff development. For under-performing staff, one can use appraisals to **identify skills gaps and training needs**. Teachers can then take the training programs they need to perform their role better. Using appraisals to improve performance is when the goals are set in teacher appraisals and don't just have to be about staff development. Teachers can improve their performance, and increase team's productivity as a result. Performance goals must be fair and achievable, or they could have a negative impact.

1.2: PROBLEM STATEMENT

In the existing self-appraisal system, the data is not saved anywhere. It is converting the form to PDF as soon as the appraisal form is submitted. In proposed self-appraisal system, the data uploaded to the database using mongo db. The data is retrieved from the database using the search query implemented in the program.

1.3: SCOPE AND OBJECTIVES

A performance appraisal is a formal process used to assess an teacher' effectiveness and productivity and serves both administrative and developmental purposes. Administratively, it helps guide decision-making regarding employment actions, personnel planning and training and development.

The objective of the MongoDB language is to implement a data store that provides high performance, high availability, and automatic scaling. MongoDB is extremely simple to install and implement. MongoDB uses JSON or BSON documents to store data

1.4: PROPOSED SOLUTION

The proposed solution aims in the design and development of an appraisal form where we can store the data and retrieve at anytime we need. Just by searching the user by his name we can get all the details about that person. Also nowadays we use more of no-sql techniques and hence MongoDB is a very good solution for this work.

1.5: Organization of the Report

The organization of this report is as follows:

- Chapter 1 gives the brief introduction of the self-appraisal form, system and problem statement to define the propose. It also defines motivation behind the proposed model, scope and objectives of the proposed model and proposed solution.
- Chapter 2 contains the literature survey of projects and research works carried out for prediction of system. It also gives a brief description of outcome of systematic literature survey.
- Chapter 3 gives a description about the requirement specification consisting of functional and non-functional requirements. It also specifies the hardware and software requirements used for building the proposed system.
- Chapter 4 presents a detailed description of the design of the proposed system. It also represents each objective of the design through UML diagrams.
- Chapter 5 gives the implementation procedure for the proposed system.
- Chapter 6 contains describes experimental results and analysis taken by the proposed system.
- Chapter 7 contains the conclusions and future work of the project.
- Chapter 8 provides list of references referred to design the project.

CHAPTER 2

LITERATURE SURVEY

A literature survey is a summary of published research work relevant to the topic under consideration for research. The purpose of this chapter is to create familiarity with the research on self-appraisal system. This chapter presents research papers, which includes the current knowledge as well as theoretical contributions regarding appraisal forms.

Systematic literature reviews are a type of literature review that uses systematic methods to collect secondary data, critically appraise research studies, and synthesize studies [1]. Systematic reviews formulate research questions that are broad or narrow in scope, and identify and synthesize studies that directly relate to the systematic review question. They are designed to provide a complete, [2] exhaustive summary of current evidence relevant to a research question. Systematic reviews of randomized controlled trials are key to the practice.

2.1SCOPING

The scope of performance appraisal is to improve the efficiency of an enterprise by attempting to mobilize the best possible efforts from individuals employed in it. Such appraisals achieve four objectives including salary reviews, development and training of individuals, planning job rotation and assisting in promotions. It can in fact serve for a wider range of objectives which are; identifying training needs, improving present performance of employees, improving potentials, improving communication, improving motivation and aids in pay determination. Performance appraisal has been considered as a most significant and indispensable tool for an organization, for the information it provides is highly useful in making decisions regarding various personnel aspects such as promotions and merit increases. Performance measures also link information gathering and decision-making processes, which provide a basis for judging the effectiveness of personnel sub-divisions such as recruiting, selection, training and compensation. If valid performance data are available, timely, accurate, objective, standardized and relevant management can maintain consistent promotion and compensation policies throughout the total system. It provides systematic

judgment to the organization to back up salary increases. It is a means of telling a subordinate how he is doing and suggesting needed changes in his behaviour, attitude and skill or job knowledge. It lets him know where he stands with the boss. It is being used as a base for coaching and counselling the individual by the superior.

2.2QUALITY OF THE PERFORMANCE APPRAISAL

No evaluation system will achieve its objectives unless there is some consequences to the evaluation. It is of no value, just a waste of effort, time and money. It should serve as a standard to plan promotions, empowerment, salary revisions and training and development. The success of every appraisal system depends on the key results of such tool. Good result is impossible without giving importance to employee value. Evaluation without appropriate action and results is useless it will only create more problems in the organization. Employee will always look forward to finishing a job with enthusiasm if they are given appropriate recognition or reward for doing a good job. People will be more creative and willing to extend a mile of their time and will always work at their best. The findings of the study reflect that the objective of the appraisal tool is appropriate to the needs of the staffs and faculty and the appraisal system is effective in encouraging to work hard. However, the respondents disclosed that the appraisal of the organization/company is not designed to motivate them as reflected in their responses. This indicates that the quality of the performance appraisal system of the company needs to be redesign that is appropriate and align to the vision and mission of the organisation.

2.3: COLLECTION OF DATA

Sample method is used for data collection. The types of data collected were primary data and secondary data. Primary data is the data which is collected for once own research purpose. The primary data was collected through questionnaire & informal discussion & it is interpreted. The questions were framed so as to gain maximum first-hand knowledge from workers, which were analysed in order to arrive at suitable conclusion. The primary data was collected through Questionnaires: 65 questionnaires were distributed covering various departments such as Personnel, Marketing, Export, Manufacturing, Finance, Training, Materials etc. Informal discussions: Informal discussions were held with various employees

in the organization, especially in the Personnel department & the Training department. Secondary data were collected from past records and manual of the company, books, internet etc. It is the data already collected, which is made available for reference purposes.

Both primary and secondary data were collected for the purpose of the research. Primary data was more useful in analyzing and finding out the drawbacks of industrial relation & disciplinary action system in the organization. Secondary data was useful in gathering information about the history & growth of the organisation, the industrial relation & disciplinary action system used in the former years in the organization & the revised system that is being followed today, financial position in recent years etc.

2.4: OBSERVATION

Most of the organizations are not followed the 360 degree feedback method in company and the parameters of appraisals for higher-level employees are too many in which some employees say's that the Performance Appraisal System is complicated. Maximum number of employees considered the Performance Appraisal System is held on only for organizations development not for them. The Appraises also expect that their Comments and Suggestions should be taken in to account while conducting the appraisal. From the survey it is evident that both the Appraiser's and Appraise's expectation from Performance Appraisal system are the same i.e. determination of Promotion or Transfer and Salary Administration and Benefits. Also, a majority of Employees were satisfied with the current Appraisal system although they requested for few changes. Maximum number of employees says that the review of Performance Appraisal System is taken only once in a year.

Summary

Chapter 2 gave a brief description of various techniques. This chapter further highlighted the challenges faced in the self-appraisal system. The next chapter will specify detailed requirements analysis taken for the proposed system.

CHAPTER 3

REQUIREMENT ANALYSIS

This chapter describes requirement specifications of the proposed system. Requirement specifications help to understand the user requirements accurately and communicate it to the developer. It is the basic step of software development. It also covers the overall description of the software as well as hardware requirements taken in designing the project.

3.1 Requirements specification

Requirements specification provides a brief description of functional and non-functional requirements taken in building the system.

3.1.1 Functional requirements

Functional requirements always focus on the agents such as users or end users of the software model and the resources of the software model which are required for the successful working of the product. The functional requirements of any software model are based on the objective measures taken for the project implementation.

The functional requirements of this project are as follows.

1. The software must enable the user to enter the details and place it in the database.
2. The IP address provided should only be accessible from the campus internet/wifi.
3. The data entered by the user must be available all the time.
4. The database should be designed so that the data can be retrieved any time.
5. The inputs entered should be in user readable format.
6. The data should be accessible to only the person who has authority to access.

3.1.2 Non-functional requirements

Non-functional requirements specify the parameters on which we can measure the performance of the model of a system. In other words non-functional requirements indicate the qualitative attributes such as accessibility performance of the system that is significant for

the increased user-acceptance of the application. Non-functional requirement specifies the criterion that can be used to predict the operation of a system.

The non-functional requirements of the proposed system are as follows:

1. The software must able to connect to the database in a correct time.
2. The database must enable to store large amount of data.
3. The database must be made available all the time in the university.
4. The online form must be in speed with the LAN.
5. The software must be scalable, meaning it has to be reachable within the university.
6. The software must be easily readable.

3.2 Hardware requirements

The most common set of requirements defined by any operating system or software application is the physical computer resources, also known as hardware which is often accompanied by a hardware compatibility list, especially in case of operating systems. It lists tested, compatible, and sometimes incompatible hardware devices for a particular operating system or application. Following are the hardware requirements of the system proposed.

Operating system: Windows 7 or above, Ubuntu.

Processor: Minimum 1 GHz; Recommended 2GHz or more.

Ethernet connection (LAN) OR a wireless adapter (Wi-Fi).

Hard Drive: Minimum 32 GB; Recommended 64 GB or more.

Memory (RAM): Minimum 1 GB; Recommended 4 GB or above.

Monitor Resolution 1024 X 768 or higher recommended.

Keyboard and a Microsoft Mouse or some other compatible pointing device.

3.3 Software requirements

Software requirement is a field of software engineering deals with establishing the needs of stakeholders that are to be solved by software. These are the software resource requirements that are needed to be installed on the operating host to provide optimal functionality of an application. These requirements are installed separately on the operating host to perform their own corresponding operation.

The software requirements of the proposed system are as follows:

- Eclipse
- Scrum
- MongoDB

3.3.1 Eclipse: Eclipse is an integrated development environment (IDE) used in computer programming. It contains a base workspace and an extensible plug-in system for customizing the environment. Eclipse is written mostly in Java and its primary use is for developing Java applications, but it may also be used to develop applications in other programming languages such as C, C++, Ruby, Python etc via plugins. It can also be used to develop documents with LaTeX via a TeXlipse plug-in and packages for the software mathematics. Development environments include the Eclipse Java development tools (JDT) for Java and Scala, Eclipse CDT for C/C++, and Eclipse PDT for PHP, among others. The initial codebase originated from IBM VisualAge. The eclipse software development kit (SDK), which includes the Java development tools, is meant for Java developers. Users can extend its abilities by installing plug-ins written for the Eclipse Platform, such as development toolkits for other programming languages, and can write and contribute their own plug-in modules. Eclipse software development kit (SDK) is free and open-source software, released under the terms of the Eclipse Public License.

3.3.2. Scrum: Scrum is an agile process framework for managing complex knowledge work, with an initial emphasis on software development, it has been used in other fields and is slowly starting to be explored for other complex work, research and advanced technologies. It is designed for teams of ten or fewer members, who break their work into goals that can be completed within timeboxed iterations, called sprints, no longer than one month and most commonly two weeks, then track progress and re-plan in 15-minute time-

boxed stand-up meetings, called daily scrums. There are three roles in the Scrum framework. These are ideally co-located to ensure optimal communication among team members. Together these three roles form the scrum team. While many organizations have other roles involved with defining and delivering the product, Scrum defines only these three. It has product owner, development team and scrum master. The workflow contains sprint, sprint planning, daily scrum, sprint review, sprint retrospective, backlog refinement and cancelling of the sprint.

3.3.3: MongoDB: MongoDB is a cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with schema. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License (SSPL). The main features of MongoDB are ad hoc queries, indexing, replication, load balancing, file storage, aggregation, server-side JavaScript execution, capped collections, transactions. MongoDB works on concept of collection and document. Collection is a group of MongoDB documents. It is the equivalent of an RDBMS table. A collection exists within a single database. Collections do not enforce a schema. Documents within a collection can have different fields. Typically, all documents in a collection are of similar or related purpose. A document is a set of key-value pairs. Documents have dynamic schema. Dynamic schema means that documents in the same collection do not need to have the same set of fields or structure, and common fields in a collection's documents may hold different types of data. The advantages of using MongoDB are that it is schema less, structure of a single object is clear, no complex joins, deep query, ease of scale-out, etc. MongoDB is used because it has document-oriented storage, has index on any attribute, replication and high availability, auto-sharding, rich queries, fast in-place updates, professional support by MongoDB. It is used in places where there is big data, content management and delivery, mobile and social infrastructure, user data management, data hub etc.

Summary

This chapter discussed requirement specifications with respect to hardware and software requirements of the proposed system. The next chapter will give the detailed description of the design of the proposed system.

CHAPTER 4

DESIGN

Design is the most important phase of the software development. Designing is a creative process of building a software which satisfies functional and non-functional requirements of the project. The output software of the design process is the system architecture. System design gives us the brief description of the consideration, methodologies and detailed architecture of the proposed project. It also gives a detailed description of the objectives of the proposed system.

4.1 Design Consideration

The design strategies for the system developments are as follows:

- Design an appraisal system which stores the details entered by the user in the database.
- Install eclipse IDE latest version software to develop java code for the self-appraisal system.
- Install Mongodb latest version to store the details entered by the user for future references.

4.2 System Architecture

Software architecture is a conceptual model that defines structural and behavioural representation of the proposed system. The system architecture is an outcome of the design process. It is represented by the model diagram shown in figure 4.2. The proposed system architecture aims in design and development of the appraisal system which takes the details of the user and saves in database which may be requires for the future use.

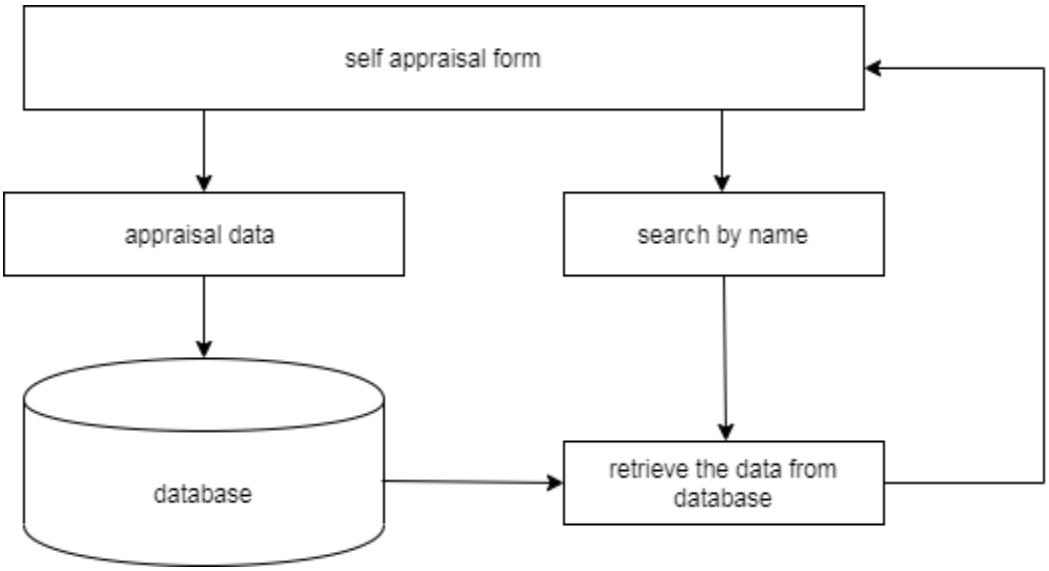


Figure 4: the block diagram of software architecture

The figure 1 shows the software architecture of self-appraisal system. The user goes to the appraisal form by giving the IP address provided by the institute in the campus premises. The user enters all the details and submits the form which stores all the details in the database and shows all the details entered. In the appraisal form when a person details is searched by his name the data is retrieved from the database and shown in the appraisal form. The software architecture helps the developer to develop the system/ software in systematic way.

4.3 Sequence diagram

A sequence diagram is an interaction diagram that shows how different objects interact with each other. Sequence diagrams are typically associated with use case realizations in the logical view of the system under the development. It gives the overview of the sequence of the events occurring between various end users of the system like database, system. Each step of the proposed system is represented by sequence diagrams.

4.3.1 To add the data in appraisal form

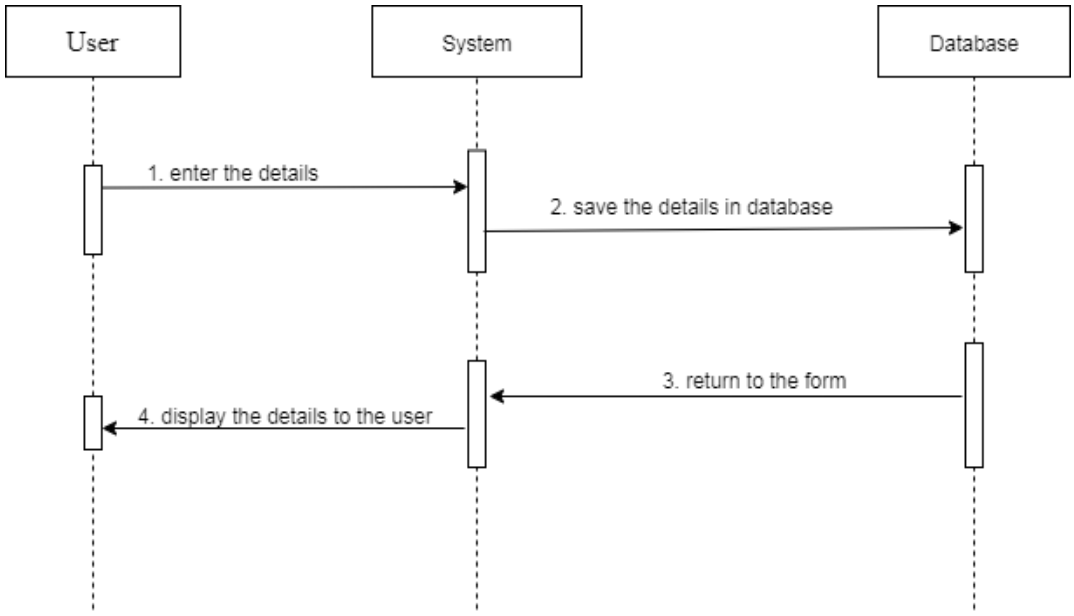


Figure 5: the sequence diagram for adding the data to appraisal form

Figure 2 shows the sequence diagram of adding the data to the self-appraisal form. The user enters the details in the appraisal form and submits. The data will be saved in the database. As soon as the user submits the data it return to the form and displays the data to the user.

4.3.2 If search is successful

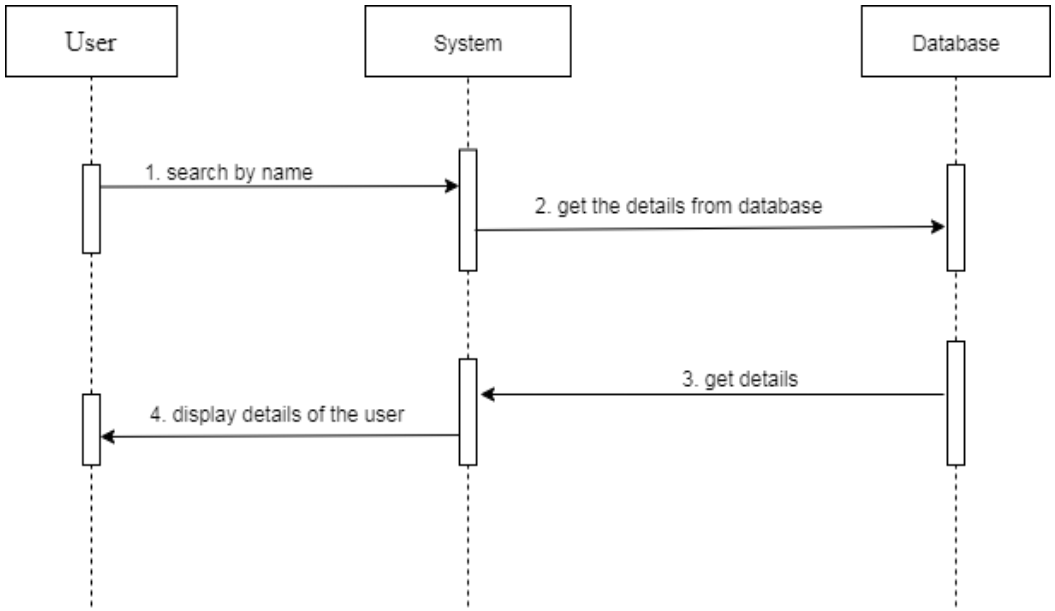


Figure 6: the sequence diagram for search successful

Figure 3 shows if the searched detail of the user is successfully retrieved from the database. The person will search the users by giving his/her name in the appraisal form. The system will get the details from the data base and displays it to the user. The detail is displayed only if the detail of the particular name is present in database.

4.3.3 If search is fail

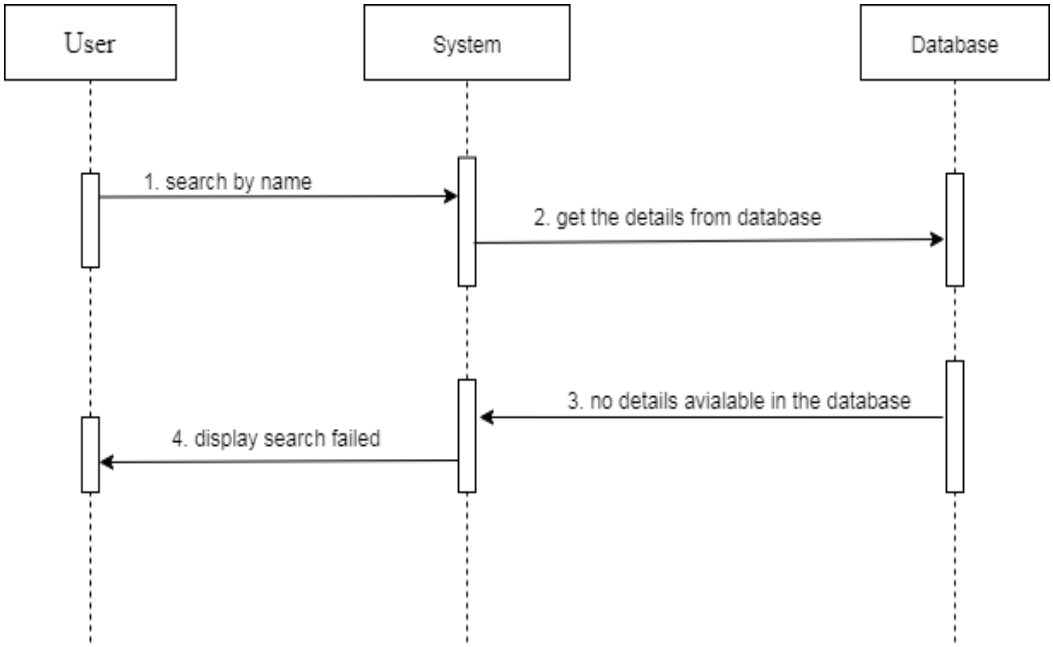


Figure 7: the sequence diagram for search failed

Figure 4shows the sequence diagram if search is failed. The user is searched by his/ her name in the appraisal form. The system searches the name in the database. It the name is not present in the database then the system will display the message search failed in the appraisal form.

4.4 Flow chart

A flowchart is a type of diagram that represents a workflow or process. A flowchart can also be defined as a diagrammatic representation of an algorithm, a step-by-step approach to solving a task. The flowchart shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows. This diagrammatic representation illustrates a solution model to a given problem. Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields.

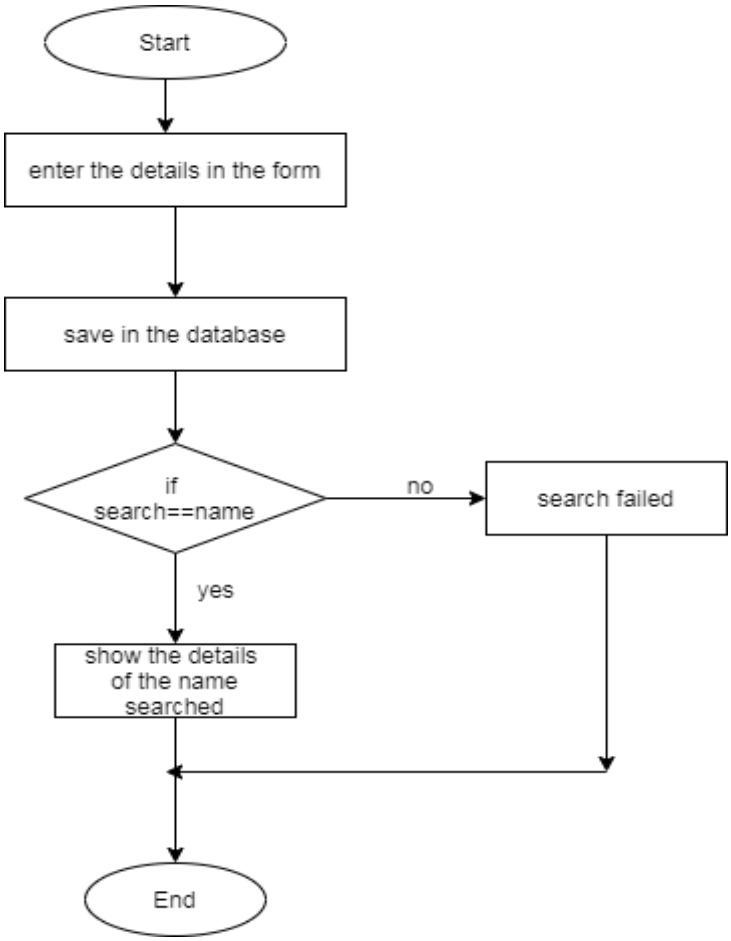


Figure 8: Flow chart of self-appraisal system

Figure 5 shows the flow chart of the self-appraisal system. The user enters the details in the self-appraisal form. The details entered in the form are saved in the database as soon as the user submits the form. If the name is searched and is present in the database then it shows the details of the searched name. If the searched name is not present in the database then it displays search failed and returns into the form.

Summary

This chapter discussed the overall design considerations, development methodology and system architecture for the proposed system. It also provided UML diagram representation for each of the objectives of the proposed system. The next chapter will give the implementation procedure as per the design of the proposed system.

CHAPTER 5

IMPLEMENTATION

Implementation is one of the important phases of software development where design is executed to get the desired output. It mainly deals with coding, testing and execution of software. This chapter describes the various functions used to save and retrieve the data of the users (professors) into and from the database. It also defines the flow of steps implemented in building the proposed system.

5.1: Collecting data from the user:

This part of function aims in taking the results entered by the user and then have to be saved in the Database. The data base used is Mongo DB which is highly used database which stores data as collections. The java file which computes the connectivity to the database acts as a client to the mongo DB. The HTML view of the self-appraisal form uses JSP instead of servlet and java scripts have been used inside the JSP to get the hold on the calculations done in Java file. Java Server Pages is a collection of technologies that helps software developers create dynamically generated web pages based on HTML, XML, SOAP, or other document types whereas JavaScript, often abbreviated as JS, is a high-level, just-in-time compiled, multi-paradigm programming language which is highly used in mongo DB. Also there is another functionality to search the appraisal details, given by the full name.

5.2: Coding language: The following are the coding languages that are to be used in the development of the system. The coding language is necessary because the end product must be user friendly, accepted by the user and it should follow the recent standards.

5.2.1: Java

It is a popular programming language, owned by Oracle, and more than **3 billion** devices run Java.It is used for, mobile applications (especially Android apps), desktop applications, web applications, web servers and application servers, games, database connection. Its features are:

- Java works on different platforms (Windows, Mac, Linux, Raspberry Pi, etc.)
- It is one of the most popular programming language in the world
- It is easy to learn and simple to use
- It is open-source and free
- It is secure, fast and powerful
- Java is an object oriented language which gives a clear structure to programs and allows code to be reused, lowering development costs.

The system developed is the java web application along with the enterprise application which uses server servlets into picture.

The platform which uses this programming is java enterprise edition (java EE) which is an enterprise platform which is mainly used to develop web and enterprise applications. It is built on the top of the Java SE platform. It includes topics like Servlet, JSP, Web Services, EJB, JPA, etc.

5.2.2: Java server pages

JSP technology is used to create web application just like Servlet technology. It can be thought of as an extension to Servlet because it provides more functionality than servlet such as expression language, JSTL, etc.

A JSP page consists of HTML tags and JSP tags. The JSP pages are easier to maintain than Servlet because we can separate designing and development. It provides some additional features such as Expression Language, Custom Tags, etc. taking this as a reference, java script is written into this. Features are

- JSP technology is the extension to Servlet technology. Implicit objects, predefined tags, expression language and Custom tags in JSP that makes JSP development easy and can be used.
- JSP can be easily managed because it can easily separate our business logic with presentation logic.
- If JSP page is modified, we don't need to recompile and redeploy the project.

- In JSP, many tags such as action tags, JSTL, custom tags, etc. that reduces the code are used.

5.2.3: JavaScript

JavaScript is a scripting language used to create and control dynamic website content, i.e. anything that moves, refreshes, or otherwise changes on the screen without requiring to manually reload a web page. Features like:

- animated graphics
- photo slideshows
- autocomplete text suggestions
- interactive forms

5.3: Eclipse Java platform:

Eclipse is an integrated development environment (IDE) used in computer programming. It contains a base workspace and an extensible plugin system for customizing the environment. Eclipse is written mostly in JAVA and its primary use is for developing Java applications, but it may also be used to develop applications in other programming languages via plug-ins.

Java Enterprise Edition, formerly Java 2 Platform, Enterprise Edition, currently rebranded as Jakarta EE, is a set of specifications, extending Java SE 8 with specifications for enterprise features such as distributed computing and web services.

5.4: Mongo Database:

MongoDB is a document database, which means it stores data in JSON-like documents. We believe this is the most natural way to think about data, and is much more expressive and powerful than the traditional row/column model.

Rich JSON Documents

- The most natural and productive way to work with data.

- Supports arrays and nested objects as values.
- Allows for flexible and dynamic schemas.
- Powerful query language

Rich and expressive query language allows filtering and sorting by any field, no matter how nested it may be within a document. Support for aggregations and other modern use-cases such as geo-based search, graph search, and text search. Queries are themselves JSON, and thus easily composable. No more concatenating strings to dynamically generate SQL queries.

Below are the Algorithms/ Psuedo codes for the following implementation

5.5: Database creation:

New database in the Mongo DB is created and saved with the new collection comprising of the all the attributes which were mentioned in the schema of the database. The data attributes having the variable is matched with the variable name given form the form so that there is saving of data to the particular record.

Input: Empty collection

Output: Values saved into the collection

Begin

1. Use the database creation command
2. After which use the creation of collection inside the created database using db.collection.insert(){}
3. Using values insert into it

End

5.6: Data adding to the Database

The data which is entered by the user has to be saved in the database created. To do this there should a connection between the eclipse IDE and Mongo DB. The connectivity part is achieved by the java and jsp files. This enables the java file to act as a client to connect to the mongo db server. The connection algorithm is as follows.

Input: new Client

Output: Client connected

Begin

1. Create a new client in the java file called as mongoclient()
2. After creation, create a connection to contact the mongodb database using getdb()
3. The collection inside the database is being accessed using the getcollection()

End

5.7: Data getting from the form:

The data which is being entered by the user in the form of self-appraisal should be taken by the Java file through servlet and store those data in the database. The data which is entered by the user is taken as string in all parameters, and the variables given in the database and the java file should match so that there is no error in saving the appraisal

Input: get the form details

Output: saved in the database

Begin

1. Using dopost() function which consists of the http servlet request and response
2. Create an object in the java file to get the form variables using request.getParameter()
3. Assign a variable to each of the parameters shown up.

4. After assigning the parameters to the java variables, create an object which appends those variables to the database variables using object().append()
5. Then the request dispatcher after insertion stay in the same jsp file confirming the saving of data to the database.

End

5.8: Data retrieving from the database using search function

The data retrieve is getting the information from the database. This is achieved by searching the database by full name. The user has to enter the full name as in the database, so that the details of his or her are shown correctly otherwise there is error.

Input: get the full name

Output: details from the database

Begin

1. Create a new client in the java file called as mongoclient()
2. After creation, create a connection to contact the mongodb database using getdb()
3. The collection inside the database is being accessed using the getcollection()
4. Using dopost() function which consists of the http servlet request and response
5. Create a new parameter of the fullname
6. Search query is used to search the fullname and its details.
7. After assigning the parameters to the java variables, create an object which appends those variables from the database variables using request.setattribute().
8. Then the request dispatcher after insertion stay in the same jsp file confirming the fail in retrieving the data from database.

End

Summary

This chapter gave the detailed description of various modules used in the implementation of the proposed system. The next chapter will give the testing taken by the proposed system.

CHAPTER 6

SOFTWARE TESTING

SOFTWARE TESTING is defined as an activity to check whether the actual results match the expected results and to ensure that the software system is defect free. It involves execution of a software component or system component to evaluate one or more properties of interest. Software testing also helps to identify errors, gaps or missing requirements in contrary to the actual requirements. It can be either done manually or using automated tools.

Here there is simple testing that is taken into consideration. One is regarding adding of the details into the database and another is about searching the details of the person which is not present in the database.

During adding the details into the database, the variables given are in the form of string and calculated in terms of integers. Whenever the values are given as nothing, the particular field is set to null value. There is no empty value given to the data so that whenever the data is being searched and found out that the data if having null value can be used to update to some known information. If there is no value present that would be a problem because the person who wants to update the data won't get to know about the data which is present and he can assume and put in some random data. This saving of null data is one of the test case observed and tested.

During the search of the details using the full name, whenever the full name is not clearly given or whenever the data is not present in the database, there is a message showing the search has been failed. There can be a situation where the database has been changed or the data may have been changed so that whenever there is access to it then the data searched will show error. If not showing error even if the data is not present then the test case would fail in that matter.

Figure 9: the user checks for the hari name

Figure 10:It is shown in the console that the user is not present and search is failed.

This is basically the testing whether the data is there or not

Summary

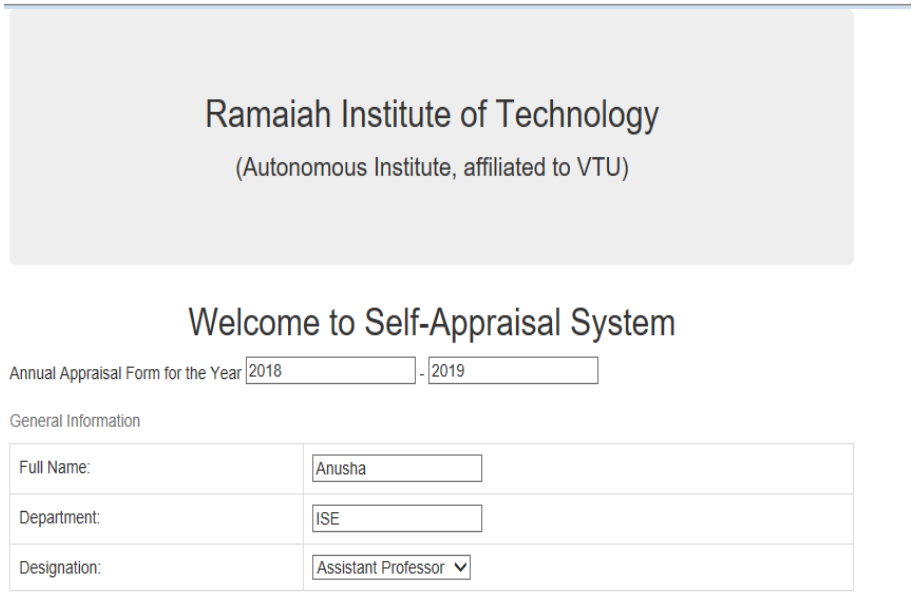
This chapter gave the detailed description of various testing of the proposed system. The next chapter will give the experimental results and performance measures taken by the proposed system.

CHAPTER 7

RESULTS AND DISCUSSION

This chapter summarizes the experimental setup made for the proposed system. It explains functionalities of the Arduino IDE, Thing Speak host and Python IDE. It also gives a detailed description of various performance measures taken by the proposed system.

Inserting the data in to the database



Details of Activities

Sl. No.	Scoring Category	Number
Teaching (Asst. Prof - 60, Assoc.Prof - 50, Prof - 40)		
1	FCI Score (Average of all courses handled)	10
Research (Asst. Prof - 10, Assoc.Prof - 20, Prof - 30)		
2	No. of non-paid refereed journal papers in SJR* (The faculty should be one among first 3 authors)	12
3	No. of indexed conference papers in SJR (The faculty should be one among first 3 authors)	1
4	No. of non-paid non-refereed journals and non-indexed conferences (The faculty should be one among first 3 authors)	12
5	Books/Chapters (The faculty should be one among first 3 authors)	**Books:** 13 **Book Chapters:** 2
6	Disclosures Filed	12
7	Patents Granted*	3
8	Research Guidance Under Graduate Program	2
9	Research Guidance Master's Program	13
10	Research Guidance Ph.D.	12
11	Funded Projects*	**>= 10 Lakhs:** 2 **>=5 Lakhs and < 10 Lakhs:** 3 **>=1 Lakhs and < 5 Lakhs:** 5 **<1 Lakhs:** 6
12	Consulting Projects*	**>= 10 Lakhs:** 7 **>= 5 Lakhs and < 10 Lakhs:** 1 **>=1 Lakhs and < 5 Lakhs:** 3 **<1 Lakhs:** 4
Service and Professional Development (Asst. Prof - 30, Assoc.Prof - 30, Prof - 30)		
13	No. of Conference Chair, Session Chair, Reviewer of Q1 or Q2 Journal	2

14	No. of FDP/ Seminar/ Workshop organized as coordinator	**5 Days:** 1 **3 Days:** 2
15	No. of invited technical talks outside the institute	3
16	No. of events participation outside the institute (FDP/Seminar/Workshop/Conference)	8
17	No. of events participation inside the institute (FDP/Seminar/Workshop/Conference)	1
18	Industry Relations (MoU, Co-hosted event, Technical Talk Series)	8
19	Institutional/Departmental Services such as NBA/NIRF	**Coordinator** 5 **Others** 3
20	Other Services to the institution or society contribution	12
21	Awards and Honours	11
22	Professionalism / Team spirit	0
23	Any other major contributions: (Max 500 characters)	Served at NGO

Figure 11: the data are inserted into the database.

Result 1:

```
INFO: Opened connection [connectionId{localValue:4, serverValue:13}] to 127.0.0.1:27017
Insertion complete
```

Figure 12: In the console the insertion complete message is displayed

The result shows that the program is running successfully and the data being entered is saved into the database.

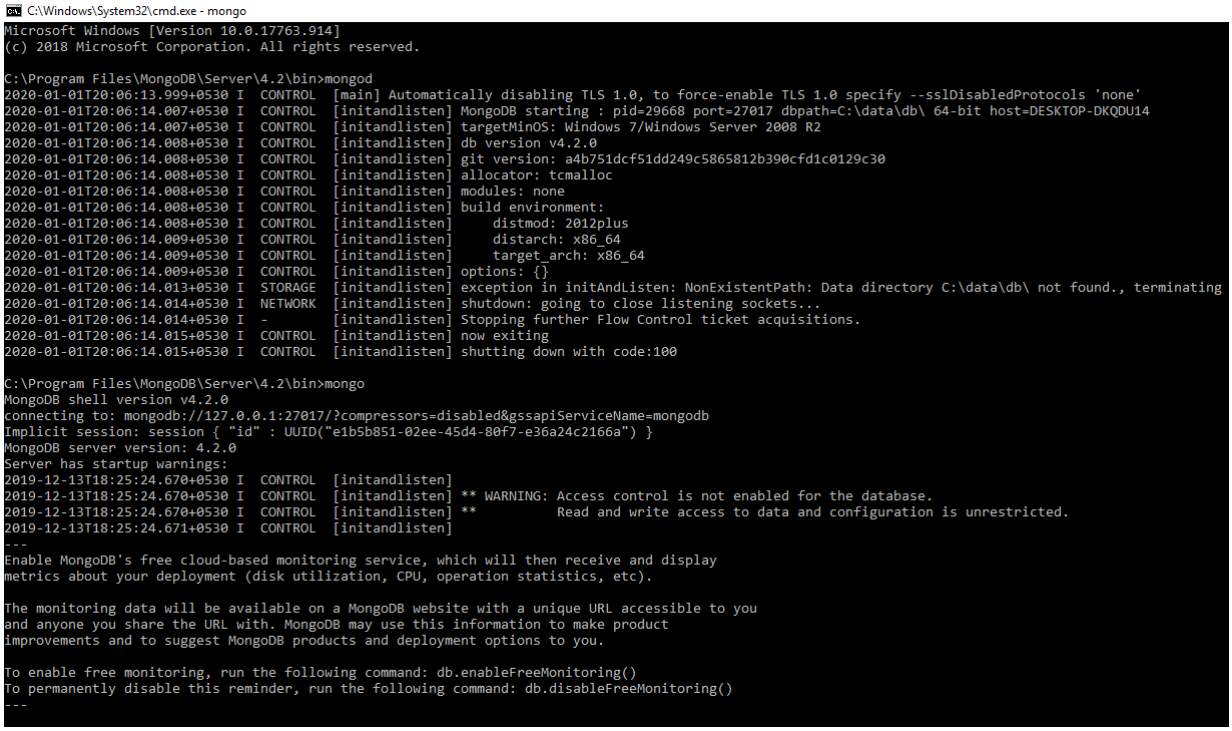


Figure 13: database-initialising commands in the cmd of the mongodb

In figure 10 the database commands are shown to give the steps to check the database whether the data has been inserted or not

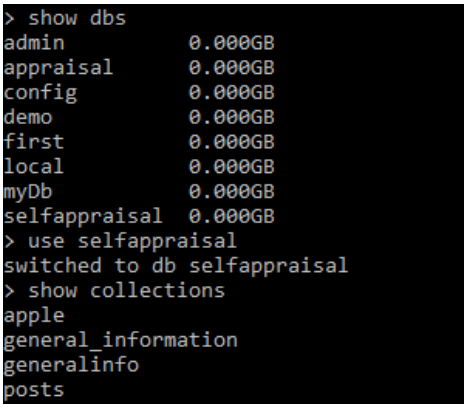


Figure 14: it shows the database and the collections included

The figure 11 shows the databases already present

```
> db.general_information.find().pretty()
```

Figure 15: command to display all the details of the user after filling the form


```
{
        "_id" : ObjectId("5e0cae349d501836870e9b68"),
        "Fullname" : "Anusha",
        "Dept" : "ISE",
        "Desgn" : "Assistant Professor",
        "StartYear" : "2018",
        "EndYear" : "2019",
        "FCI" : "10",
        "SJR" : "12",
        "IND" : "1",
        "NIND" : "12",
        "Num" : "13",
        "Num_chap" : "2",
        "DISC" : "12",
        "Patent" : "3",
        "UG" : "2",
        "MS" : "13",
        "PHD" : "12",
        "FTL" : "2",
        "FFTL" : "3",
        "FOFL" : "5",
        "FOL" : "6",
        "CTL" : "7",
        "CFTL" : "1",
        "COFL" : "3",
        "COL" : "4",
        "Journal" : "2",
        "Fivedays" : "1",
        "Threedays" : "2",
        "TECH" : "3",
        "EOUT" : "8",
        "EIN" : "1",
        "Industry" : "8",
        "Coordinate" : "5",
        "NOther" : "3",
        "Society" : "12",
        "Award" : "11",
        "Team" : "0",
        "Other" : "Served at NGO"
}
```


Figure 16: the result in the mongo db showing the details of anusha user details filled in the form

The above figure shows how the data is being organised into the database having all the attributes into it.

Result2: Searching the details of the user

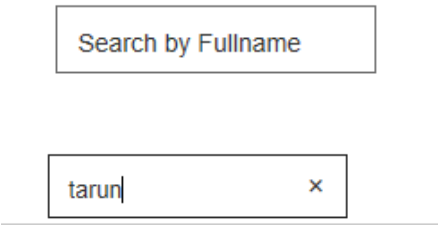


Figure 17: the user can search the details by giving the full name

The figure 14 shows that the user wants to check for the name and the details present in the database.

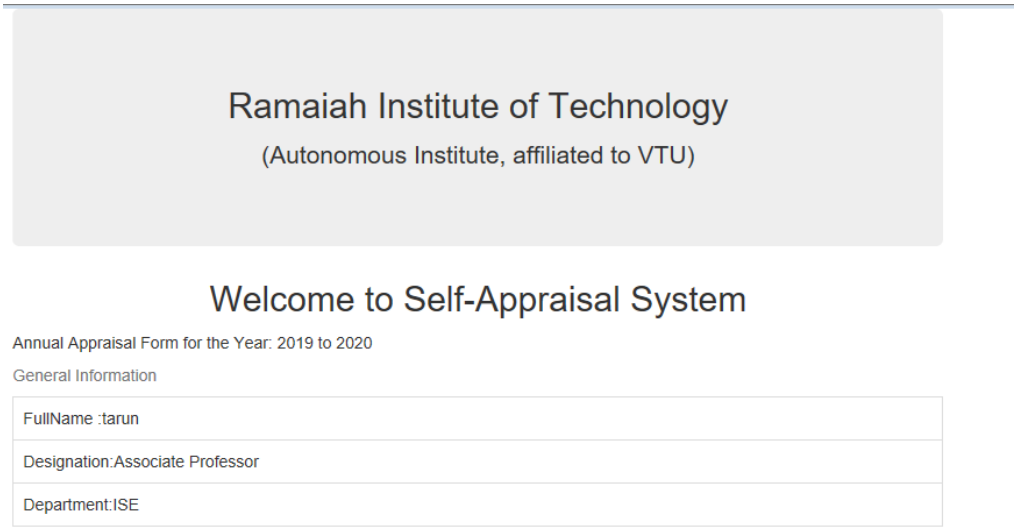


Figure 18:after the user full name is given for the searching then the new page opens which displays the details

Details of Activities

Sl. No.	Scoring Category	Number
Teaching (Asst. Prof - 60, Assoc.Prof - 50, Prof - 40)		
1	FCI Score (Average of all courses handled)	100
Research (Asst. Prof - 10, Assoc.Prof - 20, Prof - 30)		
2	No. of non-paid refereed journal papers in SJR* (The faculty should be one among first 3 authors):18	18
3	No. of indexed conference papers in SJR (The faculty should be one among first 3 authors):40	40
4	No. of non-paid non-refereed journals and non-indexed conferences (The faculty should be one among first 3 authors):30	30
5	Books/Chapters (The faculty should be one among first 3 authors)	**Books:** 20 **Book Chapters:** 10
6	Disclosures Filed	10
7	Patents Granted*	20
8	Research Guidance Under Graduate Program	30
9	Research Guidance Master's Program	40
10	Research Guidance Ph.D.	10
11	Funded Projects*	>= 10 Lakhs: 0 >=5 Lakhs and < 10 Lakhs: 0 >=1 Lakhs and < 5 Lakhs: 20 **<1 Lakhs:** 10
12	Consulting Projects*	>= 10 Lakhs: 0 >= 5 Lakhs and < 10 Lakhs: 0 >=1 Lakhs and < 5 Lakhs: 69 <1 Lakhs: 89
Service and Professional Development (Asst. Prof - 30, Assoc.Prof - 30, Prof - 30)		
13	No. of Conference Chair, Session Chair, Reviewer of Q1 or Q2 Journal	0
14	No. of FDP/ Seminar/ Workshop organized as coordinator	5 Days:8 3 Days:9
15	No. of invited technical talks outside the institute	56
16	No. of events participation outside the institute (FDP/Seminar/Workshop/Conference)	8
17	No. of events participation inside the institute (FDP/Seminar/Workshop/Conference)	12
18	Industry Relations (MoU, Co-hosted event, Technical Talk Series)	13
19	Institutional/Departmental Services such as NBA/NIRF	Coordinator10 Others 19
20	Other Services to the institution or society contribution	20
21	Awards and Honours	29

Figure 19: all the details of tarun has been displayed

Summary

The analysis carried out in this chapter shows that all the objectives of the problem solution are met successfully. The next chapter gives the conclusion and future work that can be taken up to improve system.

CHAPTER 8

CONCULSION AND FUTURE WORK

This chapter gives a description of conclusion and future work on the proposed project.

7.1 Conclusion

In this system, various details such as the designation, department etc. of the faculty are collected and along with that the information such as the number of books and publications made by the faculty is collected and all of this information is stored in the database. By storing all this information in the database one can view the data when needed. The score is also calculated for each faculty. If the user wants then he can also search the details of the faculty by giving their full name and hence can retrieve data of interest.

7.2 Future work

In the future work various functions such as retrieval of data based on grouping or searching through other attributes such as designation etc. can be implemented. The user operating the database can be given authorisation.

REFERENCES

[1] D. B. Bagul, "A RESEARCH PAPER ON "STUDY OF EMPLOYEE'S PERFORMANCE APPRAISAL SYSTEM", 2nd International conference on Computer Science & Engineering (UBMK'17), Department of Computer Engineering Yildirim Beyazit University Ankara, Turkey.

[2] Mukesh Kumar, Dr. N Shirley, Dr. GD Singh, " A Research Paper on "Employee's Performance Appraisal System and its Implication for Individual and Organizational Growth"", International Journal of Enhanced Research in Management & Computer Applications ISSN: 2319-7471, Vol. 6 Issue 1, January-2017, Impact Factor: 1.544.

[3] Idowu, Ayomikun,"Effectiveness of Performance Appraisal System and its Effect on Employee Motivation". Nile Journal of Business and Economics. 3. 10.20321/nilejbe.v3i5.88,(2017).