Developing a scientific Career Counseling software

Submitted in partial fulfilment of the requirements

of the degree of

BACHELOR OF ENGINEERING

in

INFORMATION TECHNOLGY

(A.Y. 2020-2021)

by

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Estd. in 2001

Choice Based Credit Grading System with Holistic Student Development (CBCGS-H 2019)

Jagdu Singh Charitable Trust's (Regd.)

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DEPARTMENT OF INFORMATION TECHNOLOGY (IT)

Credit Based Grading System [CBGS - 2012(R)]/Choice Based Credit and Grading Scheme [CBCGS - 2016(R)]

University of Mumbai

Certificate

This is to certify that Ms. Chanchal Gupta, Ms. Suman Gupta, Mr. Raj Jadhav, are bonafide students of Information Technology Department, Thakur College of Engineering and Technology, Mumbai. They have satisfactorily completed the requirements of RBL-II as prescribed by the University of Mumbai, while working on "Developing a scientific Career Counseling software".

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Internal Examiner:

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Name :

External Examiner:

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Thakur College of Engineering and Technology, Kandivali(East) Mumbai.

Date:

Place:

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Date:

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ABSTRACT

In the current Career Guidance System, there are different counsellors available who offer individual counselling to help students to choose their career in a systematic way. There are various websites available to conduct online Personality test, Aptitude test, Personal interest test, Domain test to predict which professional field a particular student should choose.

Understanding the current education trend and suggesting the most suitable field accurately is very difficult task in Career guidance process. So, students are not seemed to be satisfied by the current system due to inconsistent result and hence a application is required which could generate much accurate result. Accordingly, Survey was taken in order to understand what problems they face so that we try to overcome those problems for the upcoming generation. We will be implementing 2-3 machine learning algorithms followed by testing and the one which will give more accurate results will be considered.

C O N T E N T S

5.4 Deployment

Chapter 6 Conclusion

6.1 Conclusion

References:

Style of list in references of some standards are as below;

[1] Text book references

[2] Journal references

[3] Web references

CHAPTER 1

OVERVIEW

CHAPTER 1

OVERVIEW

1.1 Introduction

Students are often seemed to be confused regarding career choices because they have no one to guide them. Sometimes, they are unaware of various career opportunities available for them, hence they end up choosing the stream in which they are least interested. Career Guidance system helps them to choose their career which is most suitable for them by providing them with proper career details. Students can even consult the counsellors if they are still confused about career choices. This system not only helps the students but also the counsellors are benefitted from this, as they get clients through this system. This system ultimately, assist the students making appropriate, satisfying, and interesting educational occupational choices regarding the selection of a career. Hence, it has huge future scope amongst Students, Counsellors, etc.

1.2 Background

Career Counselling is a process wherein we gain knowledge about the world of work and know and understand yourself to make a career for future life. This Online Career Guidance System proves to be a decisive point for the career choosing phase. There are immense tools and data made available for students who keep interest in variety of fields therefore our system helps students to make a choice over wide variety without research or any resource, the software takes care of all that.

The Online Career Guidance System initiates its job by choosing an apt career for the students. The pros and cons of the same are made known to the students. This unique system will not only help students of std 10th to 12th or lower class but also higher education graduates and post graduates. The guidance system embedded in our project is based on overall factors like the marks scored in individual subjects by a student, personality-based questions which predict a student's likings, knowledge about subjects, intelligence and the most important skills. It is not only based on their Academic scores but also based on personality, thus giving a best overall choice and recommendation to the student.

There are a variety of tests available developed using Machine learning algorithms to help figure out one's aptitude. This system will provide access to such tests and will let the user know about the score and the choice recommended by the system which the student can save for further reference. Students will also be able to view student testimonies and articles by counsellors so that that get a review from an experienced person. A feedback system is also a part of our system so that students can directly connect with us and share their grievances or doubts in a way making our system more accurate and user friendly. Thus, this career guidance system provides an economical, accurate and proper research driven path for deciding the students' future career.

1.3 Importance of the Project

As we all know at the initial phases of our career, we are confused of what stream to choose so that we get one step closer to our career or future goals. Nevertheless, this path way varies among different individuals as it depends on a number of factors such as area of interest, scope of that career, some sort of expenses, etc.

However, we have various online platforms help us to do so. But for the most accurate results we have to pay some hefty fees. Some platforms recommend streams based on their scope rather than the user's interest. Every website lack in some or the other way, this includes lack in accuracy, lack in availability, lack of confidence on the website and so on.

Keeping in mind all the important and necessary aspects and it's importance in an individual's life, we are developing to have a Scientific Career Counselling Software. This will help all the individuals from Std 10^{th} until Graduation.

1.4 Perspective of stakeholders and customers

The application is designed for all 10^{th}, 12^{th} grade and graduate students regardless of their experience to avail any services. It must function effectively and maintain an efficient level of service. Even counselors will be benefitted from this system as they will get clients.

1.5 Objectives and Scope of the project

The purpose of the application is to consider all factors for guiding students after 10^{th}, 12^{th} grade and Graduation in choosing career by measuring their interest through accurate personality test. To make them aware about various career opportunities. To provide them information about various exams to pursue their career goals.

The application should be able to run on any system regardless of the operating system or hardware; within reason. It can be accessed using a simple internet connection on a home users desktop computer or laptop. The application is designed for all 10^{th}, 12^{th} grade and graduate students regardless of their experience to avail any services. It must function effectively and maintain an efficient level of service.

1.6 Summary

In the current Career Guidance System, there are different counsellors available who offer individual counselling to help students to choose their career in a systematic way. There are various websites available to conduct online Personality test, Aptitude test, Personal interest test, Domain test to predict which professional field a particular student should choose. Understanding the current education trend and suggesting the most suitable field accurately is very difficult task in Career guidance process. So, students are not seemed to be satisfied by the current system due to inconsistent result and hence a application is required which could generate much accurate result. Accordingly, Survey was taken in order to understand what problems they face so that we try to overcome those problems for the upcoming generation. We will be implementing 2-3 machine learning algorithms followed by testing and the one which will give more accurate results will be considered.

CHAPTER 2

LITERATURE SURVEY
& PROPOSED WORK

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LITERATURE SURVEY & PROPOSED WORK

2.1 Introduction

This chapter involves the literature survey and proposed work. The literature survey table will include the paper title, Author's name, year of publication, key findings and research gaps. The points obtained in the research gap will turn out to be the problem definition. This problem definition will be phase wise. This chapter will also include the description of the methodology used.

2.2 Literature Survey Table

Ref No.	Paper Title	Authors, Year of Publication	Methodology	Key Findings	Research Gaps
1	A Career Guidance Mobile Application Based on Personality	Faith Too-091673, Faculty of Information Technology Strathmore University Nairobi, Kenya, 2017	Agile methodology was adopted as the software methodology for developing the application.	1) A comprehensive study of the career guidance situation in the country and globally. 2) Analysis of the data collected was done using Google analysis tool and the results used to come up with system requirements.	1) The mobile application is only usable by smartphone owners with Android operating system. 2) Some information on mobile application and the entire web application need Internet for one to access them. 3) The mobile application should be developed for other mobile platforms to allow users who do not have Android to access the mobile application's functionality.
222	A Web Based Career Guidance Information System for Pre-Tertiary	Abisoye Opeyemi A., Alabi I. O., Ganiyu Shefiu O., Abisoye Blessing O, Omokore Josiah , 2015	Agile Methodology was used since the data collected was from interviewing human	1) The following scripting languages were employed: PHP, MySQL , HTML, Java Script and CSS. 2)The system was implemented and	1)They didn't Club all the career guidance services into one portal as it was limited to certain services only

	Institution Students in Nigeria		counsellors and surveys.	tested with 50 students and 76% of them found the career system very useful. 3) It provide solutions to each problems faced in Nigeria	
3	Online Career Counseling System using Adaptive e-Learning	Kazi Fakir Mohammed, SushoptiGawade, Vinit Nimkar 2017	They have initiated with the Bayesian Network Algorithm and have quite well studied about the various problems faced in the existing system.	1.They tend to apply the Bayesian Network Algorithm and IRT mechanism so as to achieve the Goal of the System. 2. Giving Advice to students as to which field would be suitable for their Professional Future.	1. The system developed was only available for Standard 10^{th}. 2. The results were not as it was calculated using score rather than focusing on the pattern in which questions were answered.
4	Online Career Guidance System	Crystal D'Mello, Rini Aranha, Boni Gregory, Varsha Shrivastava, 2016	They have integrated methodologies from Artificial Intelligence (AI) analysis of data, Genetic Algorithms, Networks bays, Neural Networks, Fuzzy logic, Petri nets, Case-based reasoning, Data mining.	1. The system was available for student with detailed results of the quiz that they'll be undertaking. 2. The system made sure that it provides accurate results using AI, Neural Networks and so on.	1. The system does not give information about various competitive exams.
555	Online Career Guidance System	Saad Ahmed, Suraj Prakash Maurya, Vaibhav Khalane 2018	Agile methodology was used as they have also considered the drawbacks in the existing system and worked accordingly.	1) They have focused on different tests like General Aptitude Test, Personal Interest Test, Domain Test, Personality Test and the combined result of these tests was used to suggest the career path to a particular student.	1) They has not targeted different audience like students after 10^{th}, 12^{th} and graduation as their academic details was not considered well. 2) They hasn't analyzed the data well, hence the result generated was not accurate due to lack of Machine Learning algorithms.
6	Educational Recommendation and	Prof. Seema K. Yadav, Mr. Sujit J. Singh, Mr. Akshay M.	Agile methodology was used as their proposed	1) They have made a general survey questionnaire depending upon	1) There are various career options available to the student's. Although the questionnaire for all

	Tracking System	Bora, Mr. Shashankit N. Thakur 2016.	system follows SRT (Survey, Recommendation and Tracking) model.	different factors like different career related field questions, personality identifying questions. 2) The results consist of the career option along with the percentage of inclination of student in that career.	career option is not created.
7	ONLINE CAREER GUIDANCE SYSTEM	Vishal Bende, Prachi Erande, Priyanka Jore, Ankita Bhor, Ms.Dumbre T.M	Cluster Technique,search system are used for a systematic analysis of the data. Agile methodology was also used for more study.	The approach includes basic information also like for eg: this study suggests student how and what opt after their qualification (SSC/HSC). It also helps the student go according to their talent wise.So entire course from 10^{th} to graduation is being helped in.	1) There is no provison mentioned to conduct aptitude tests for analysing the real likes as well as talent of students. 2)There is no proper mention of any sort of online guidance from experts, teachers or any material required for that kind.
8	Application expert system career guidance for students	G Supriyanto, I Widiaty, A G Abdullahand Y R Yustiana, 2019	Agile methodology was used and analysis of the study was carried out on aspects of educational guidance, educational evaluation, academic career guidance and work guidance and to find out trends in future research opportunities regarding the application of expert systems in student career guidance.	The findings of the showed that the implementation of expert systems in educational guidance greatly helped students achieve: learning success, training specialization, student performance, achievement and self evaluation.	1)There was no provision made available for students who are unaccompanied or are unaware of the new technologies, to use it. 2)No provision mentioned for special students. 3)This was only helpful for students of 10^{th} or 12^{th} but no guidance for higher class students.

2.3 Problem Definition

As we all know at the initial phases of our career, we are confused of what stream to choose so that we

get one step closer to our career or future goals. Nevertheless, this path way varies among different individuals as it depends on a number of factors such as area of interest, scope of that career, some sort of expenses, etc.

However, we have various online platforms help us to do so. But for the most accurate results we have to pay some hefty fees. Keeping in mind all the important and necessary aspects, we propose to have a Scientific Career Counselling Software. This will help all the individuals from Std 10th until Graduation.

Phase 1:

- **Planning:**
  Planning will involve a strong base for the project, on how the system is to be created, secured and maintained. The earlier stages are to include career details for 10^{th}, 12^{th}, and after graduation. And provide user with a call request form so that he/she can easily contact the counsellor if further guidance is needed. This phase will further include planning for the database system.

- **Analysis:**
  This phase will address the software required to create such a system, as well as minimum requirement of software and hardware required for the user to access the same system.

- **Design &Implementation:**
  After gathering the requirements, the blueprint for the said system will be designed for implementation. Various coding platforms would be used for the same.

Phase 2:

- **Coding:**
  This will include actual implementation where the frontend and backend would be designed. HTML, CSS, Java script, Bootstrap 5 would be used for frontend development. The system will be an express App built of NodeJS and Express JS, and will have a NoSQL database, of MongoDB, to enable storing of data in JSON format for ease in accessibility.
- **Testing:**
  Various testing would be conducted regarding the access to the database system, and proper functioning of the system.

- **Deployment:**
  Once the testing is done, the system will then get ready for the deployment. Deployment activities will include the release, activation, adaptation, updates, version tracking of the system etc.

2.1 Features of the project

- Enable user to access everything related to career details for 10^{th}, 12^{th}, and after graduation.
- Provide user with a call request form so that he/she can easily contact the counsellor if further guidance is needed.
- Users will be able to measure interest through accurate personality test
- To make aware about career opportunities
- To provide them information about various exams to pursue their career goals

2.2 Methodology Used

For developing a project or software it is important to know the flow or which type of software development lifecycle model we are going to use. Out of various SDLC model we need to choose the model which will be perfect for our project and therefore we are using Iterative model.

As the name suggest Iterative model is basically an iterative process where the input is processed through various phases and if it doesn't satisfy it is repeated until it becomes satisfactory. The model consists of five phases namely:

1. Planning.
2. Analysis and Design.
3. Implementation.
4. Testing.
5. Deployment.

2.3 Summary

With the help of literature survey, the research gaps were identified from the existing papers/system. The research gaps identified has led to the problem definition of our project. The problem definition was discussed in two phases. Phase 1 included planning, analysis, design and implementation where the project plan, requirement gathering, the layout of the system and the coding technique to be used was elaborated. Phase 2 included Coding, Testing and deployment where how the system will be tested using various cases and how the system will be deployed was discussed. The complete methodology used for our project was also discussed.

CHAPTER 3

ANALYSIS AND PLANNING

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ANALYSIS AND PLANNING

3.1 Introduction

The Online Career Guidance System initiates its job by choosing a apt career for the students. The pros and cons of the same are made known to the students. This unique system will not only help students of std 10th to 12th or lower class but also higher education graduates and post graduates. The guidance system embedded in our project is based on overall factors like the marks scored in individual subjects by a student, personality-based questions which predict a student's likings, knowledge about subjects, intelligence and the most important skills. It is not only based on their Academic scores but also based on personality, thus giving a best overall choice and recommendation to the student.

3.2 Product Backlog

User story	Priority
As a user, I can give aptitude tests and is able to get a report	1
As a student I can compare different types of career options and decide the best for me	2
As a user, I can contact the counsellors for any query	3
As a student I can view the list of various colleges and universities to apply and also check what exams to apply for	4
As a counsellor , I could sign up and guide the student upon his/her request	5
As a counsellor , I am able to connect to the student effectively	6
As a admin verify the counsellors identity and qualification and to be able to generate accurate test reports	7
As a user I am able to register , sign in and sign out without facing any difficulties	8

3.3 Project Planning

1. User Interfaces

The user interface will have the features mentioned below:

There will be a menu bar which contains all the options mentioned below.

1) Counselor's panel

2) 10th, 12th and after Graduation career details list

3) Link to Home page

The UI will be responsive so that it can smoothly viewed on devices like mobile, tablet, laptop, pc, etc.

2. Hardware Interfaces

The system must allow compatible hardware devices to be connected to the system.

3. Software Interfaces

The system shall be compatible with all browsers. This will allow the user to avail all our career guidance services, give tests and consult the counselors or experts if required.

Software used:

Description:

Operating system: We have chosen Windows operating system for its best support and user-friendliness.

Database: To save the career details as well as users information.

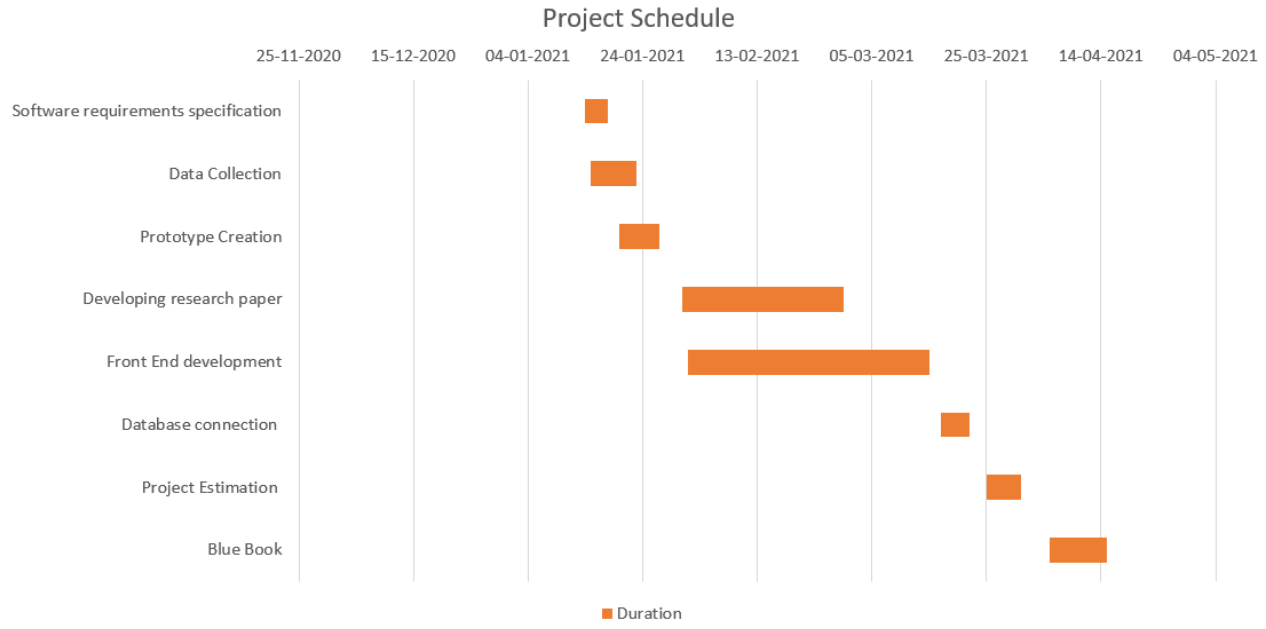
Programming language: We have chosen Python as the programming language for implementing machine learning algorithm for career prediction.

4. Communications Interfaces:

The user should have good Internet connectivity. This will enable the user to avail our career guidance services.

3.4 Scheduling

Timeline chart based on backlog:



3.4 Summary

Thus, the analysis and planning are described in this chapter. Product Backlog was understood and the requirements for the project were mentioned. Moreover, the timeline of the project was analyzed with the help of a Gantt chart.

CHAPTER 4

DESIGN AND IMPLEMENTATION

CHAPTER 4

DESIGN AND IMPLEMENTATION

4.1. Use Case Diagram

A use case diagram is a dynamic or behavior diagram in UML. Use case diagrams model the functionality of a system using actors and use cases. Use cases are a set of actions, services, and functions that the system needs to perform.

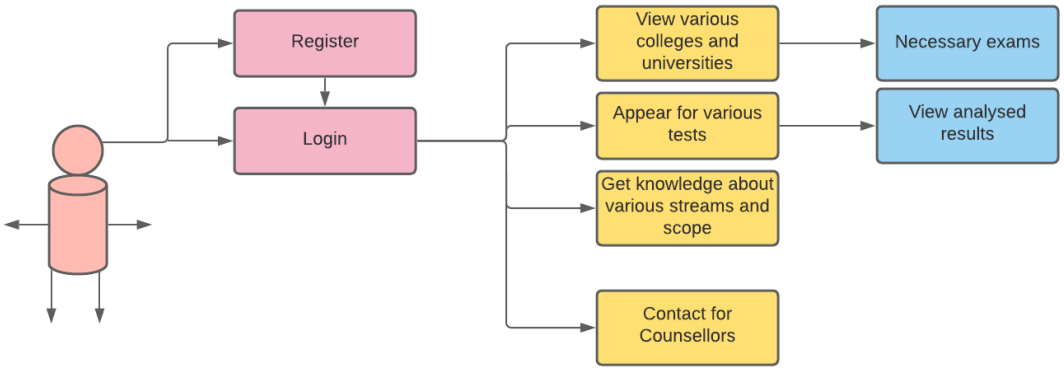


Figure 4.1: Use Case Diagram

4.2 Class Diagram

A class diagram in the Unified Modelling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

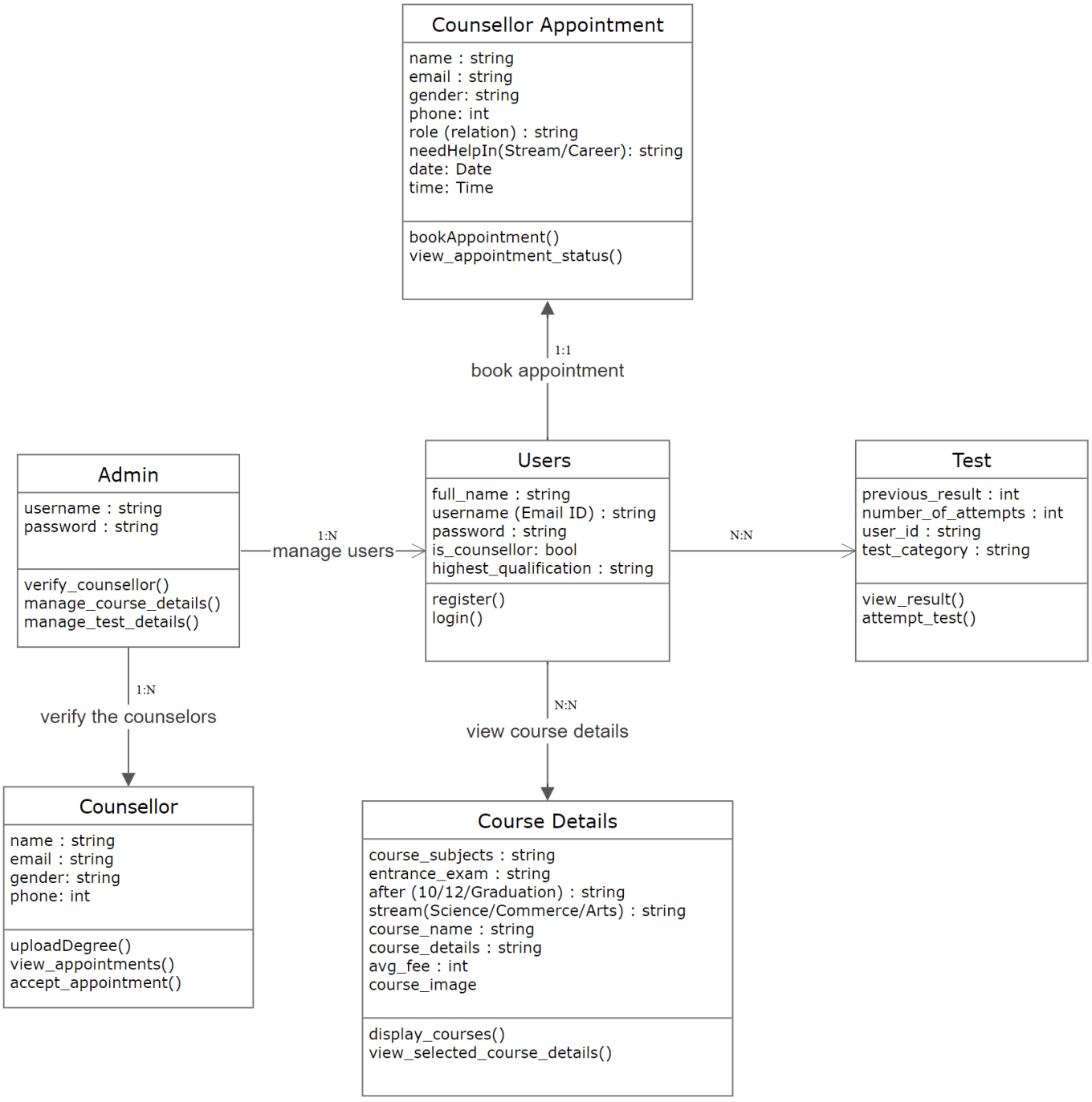


Figure 4.2: Class Diagram

4.3 Sequence Diagram

A sequence diagram simply depicts interaction between objects in a sequential order i.e. the order in which these interactions take place. We can also use the terms event diagrams or event scenarios to refer to a sequence diagram. Sequence diagrams describe how and in what order the objects in a system function.

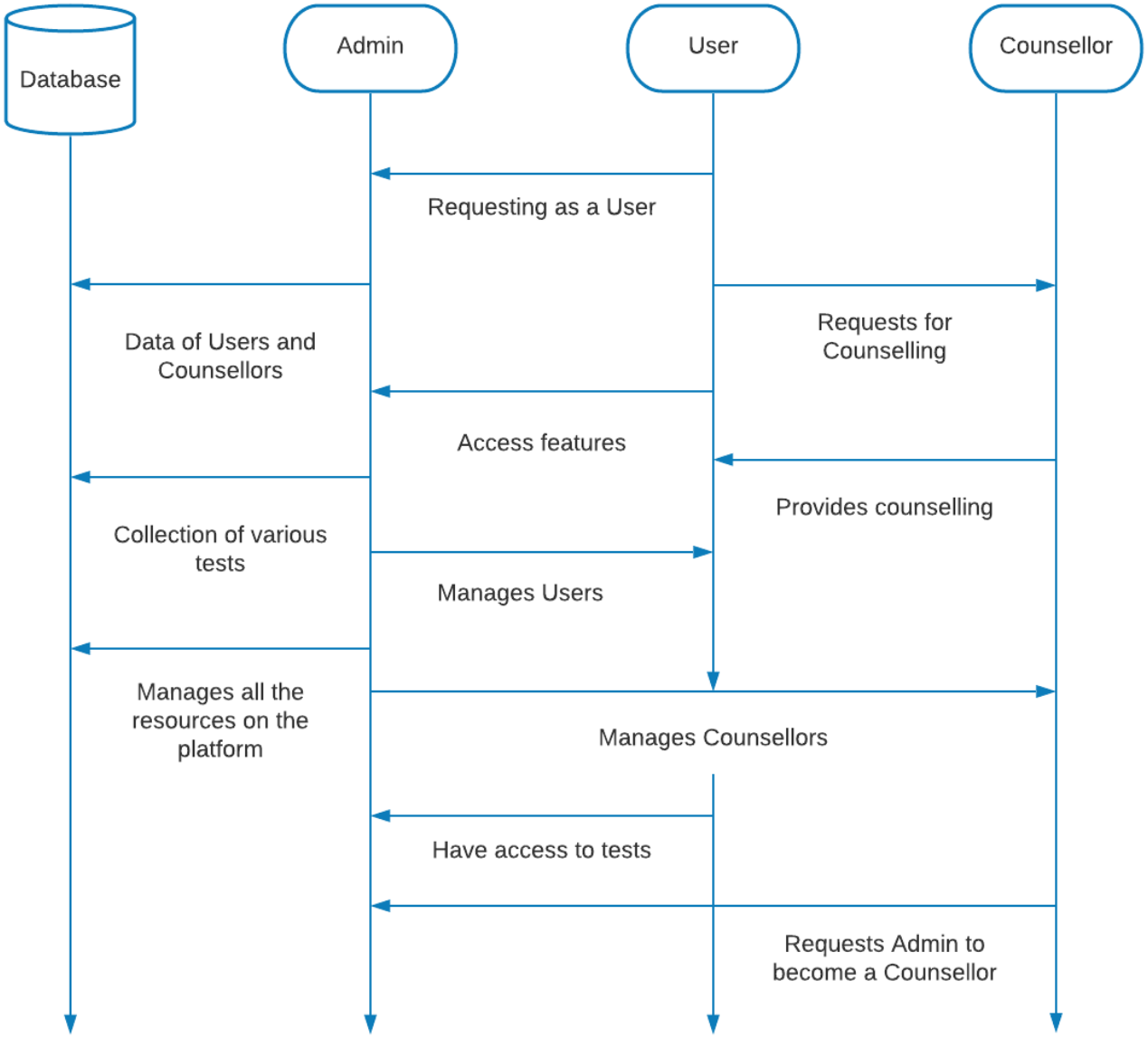


Figure 4.3: Sequence Diagram

4.4 Activity Diagram

Activity diagram is used to describe the dynamic aspects of the system. Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another.

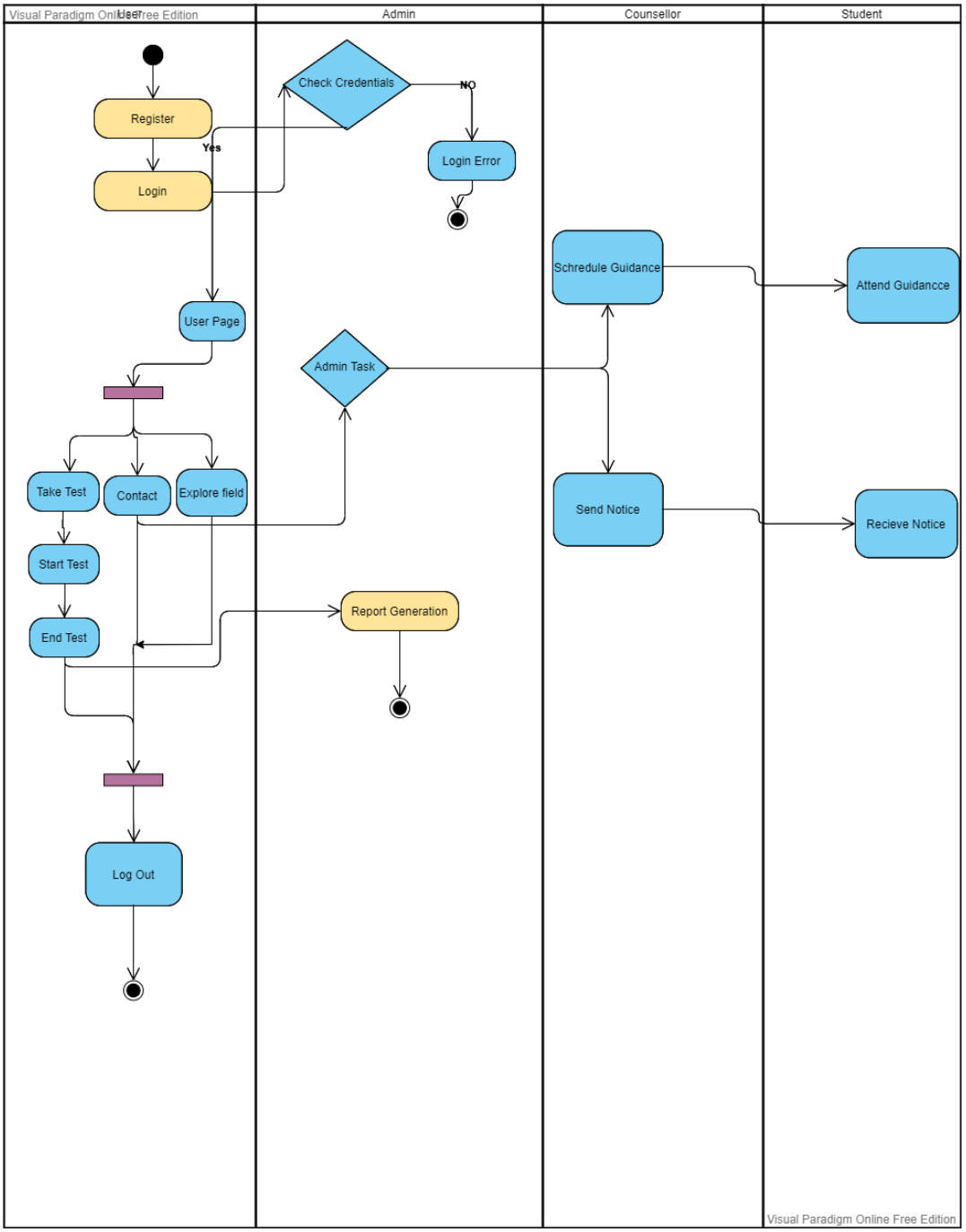


Figure 4.4: Activity Diagram

4.5 Data Flow Diagram

A data-flow diagram (DFD) is a way of representing a flow of a data of a process or a system (usually an information system) The DFD also provides information about the outputs and inputs of each entity and the process itself.

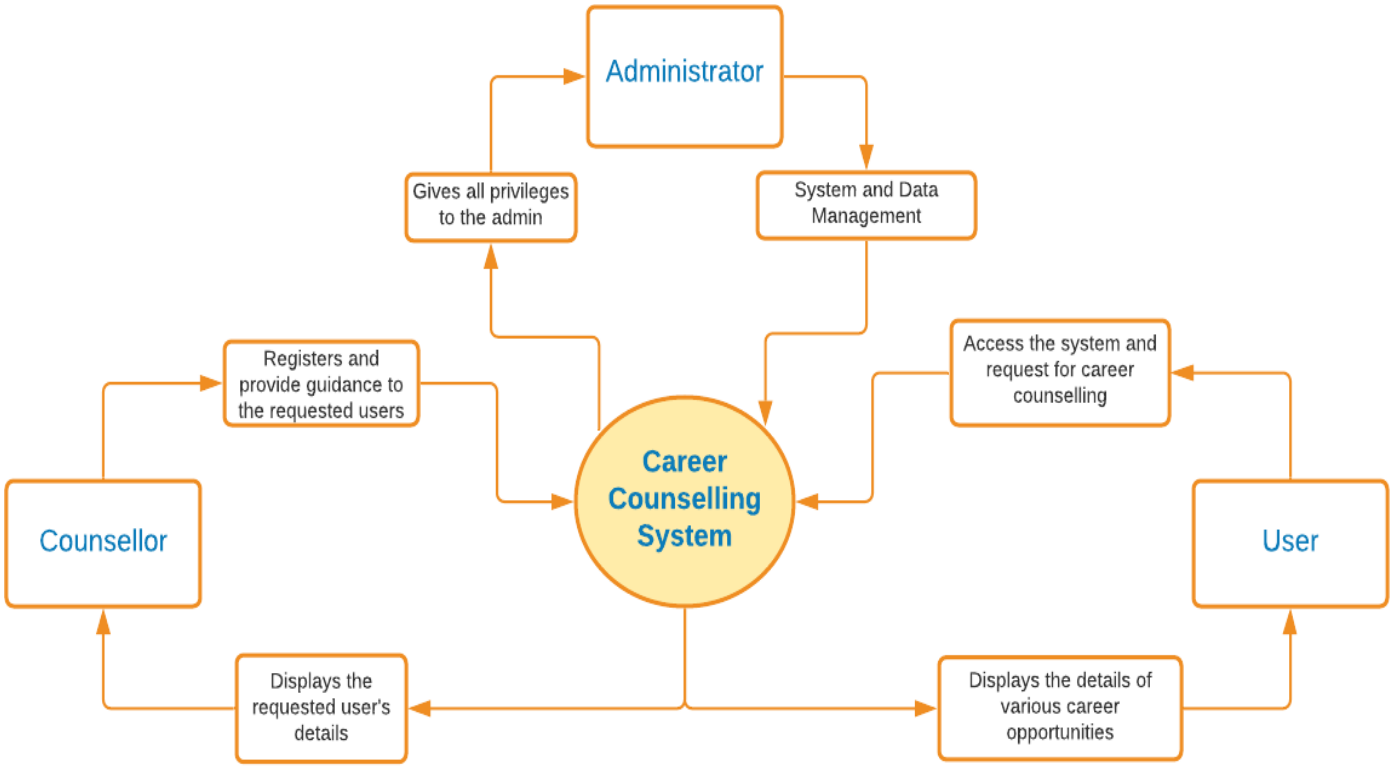


Figure 4.5.1: Data Flow Diagram (Level 0)

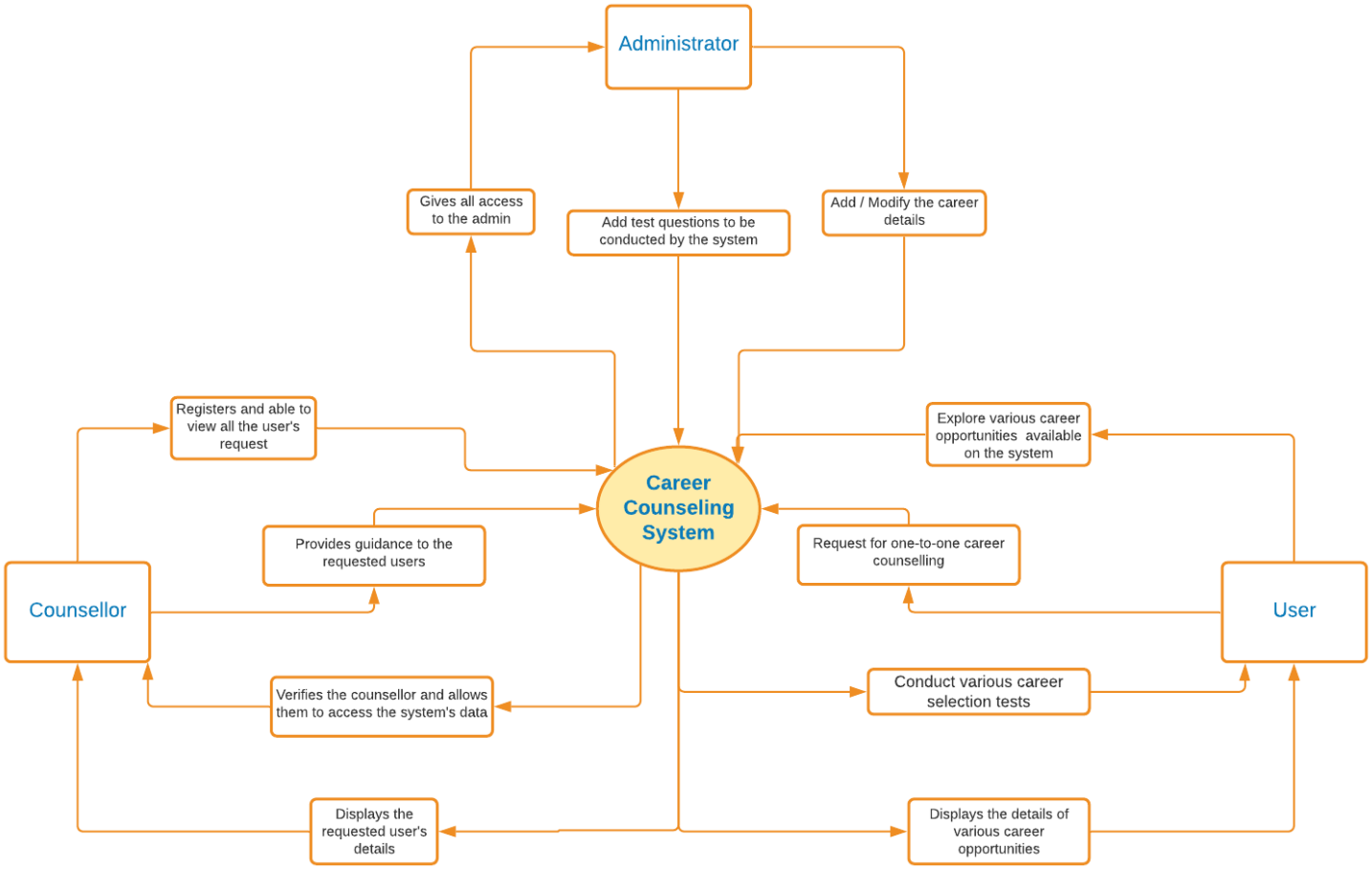


Figure 4.5.2: Data Flow Diagram (Level 1)

4.6 Flow Chart

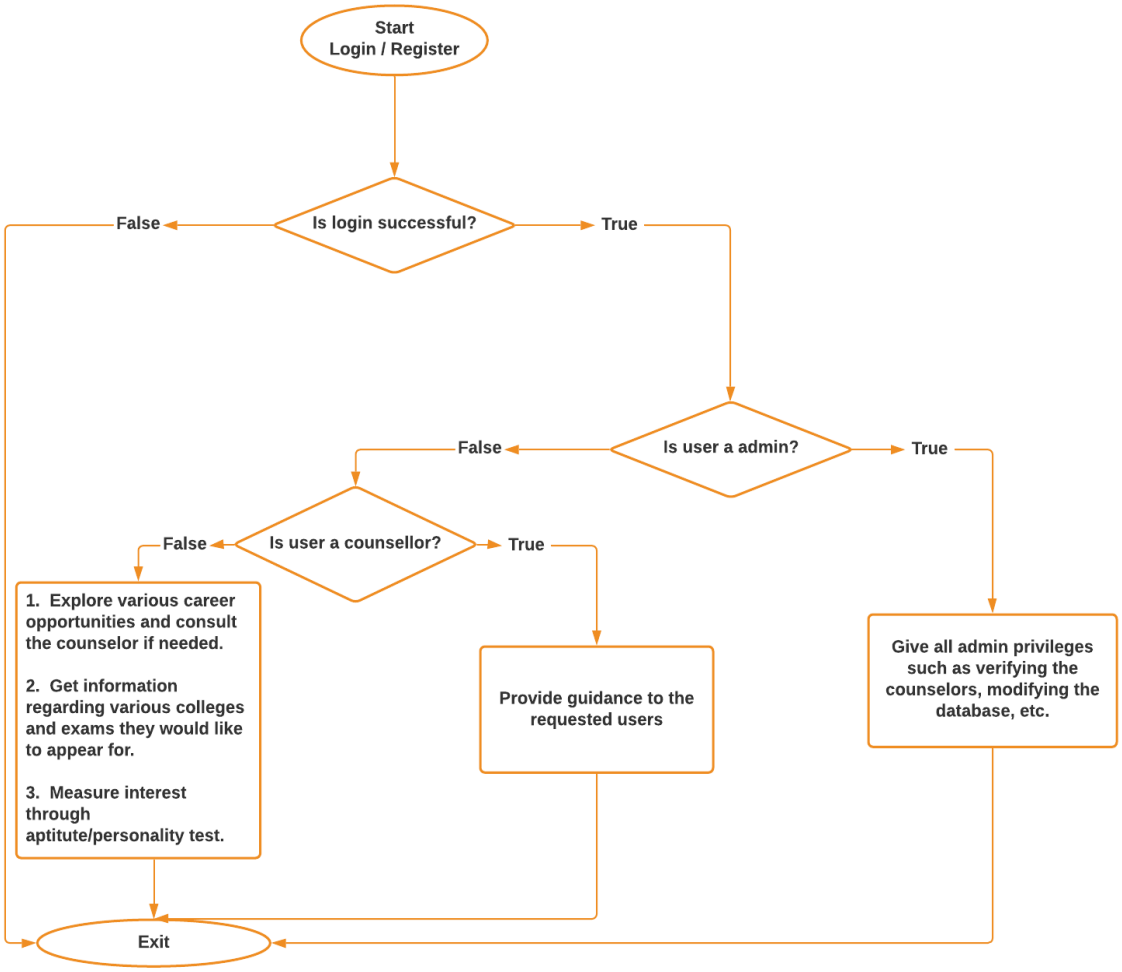


Figure 4.6: Flow Chart

4.7 GUI Screenshots

- Homepage:

CareerGuidance Home Explore Login

Confused about Career Choices??

Discover your Perfect Career with our Career Experts

Join Now

Explore Career Opportunities

Full name:

Email address:

Phone no:

I need help with:

- Choosing my stream
- Choosing my career

I am a:

- Student
- Father
- Mother
- Other

Request a Call back

Our Services

What you can expect?

Our Career Counsellor will:

Help you figure out who you are and what you want out of your education, your career, and your life.
Be someone for you to talk to about your thoughts, ideas, feelings, and concerns about your career and educational choices, who will help you sort out, organize, and make sense of your thoughts and feelings.
Help you identify the factors influencing your career development, and help you assess your interests, abilities, and values.
Help you locate resources and sources of career information.
Help you to determine next steps and develop a plan to achieve your goals.

Exploring Career and Major Options like:

"I have no idea what I want to do with my life."
"I don't know what to major in."
"I've narrowed it down to a couple career options, but I'm having a hard time choosing between them."
"I know what I want to major in, but I have no idea what I want to do once I graduate."

Resolving Conflicts like:

"I like a lot of different subjects, and I keep changing my major because I'm not sure which one is the best for me!"
"I don't like any of my classes and none of the majors seem really appealing to me."
"I have a lot of work experience and I want to find a new career path that will build on the skills I already have."
"I was planning on going into the _____ program, but I applied and didn't get in. What do I do now?"

Have a look on various streams and opportunities available after:

10th	12th	Graduation

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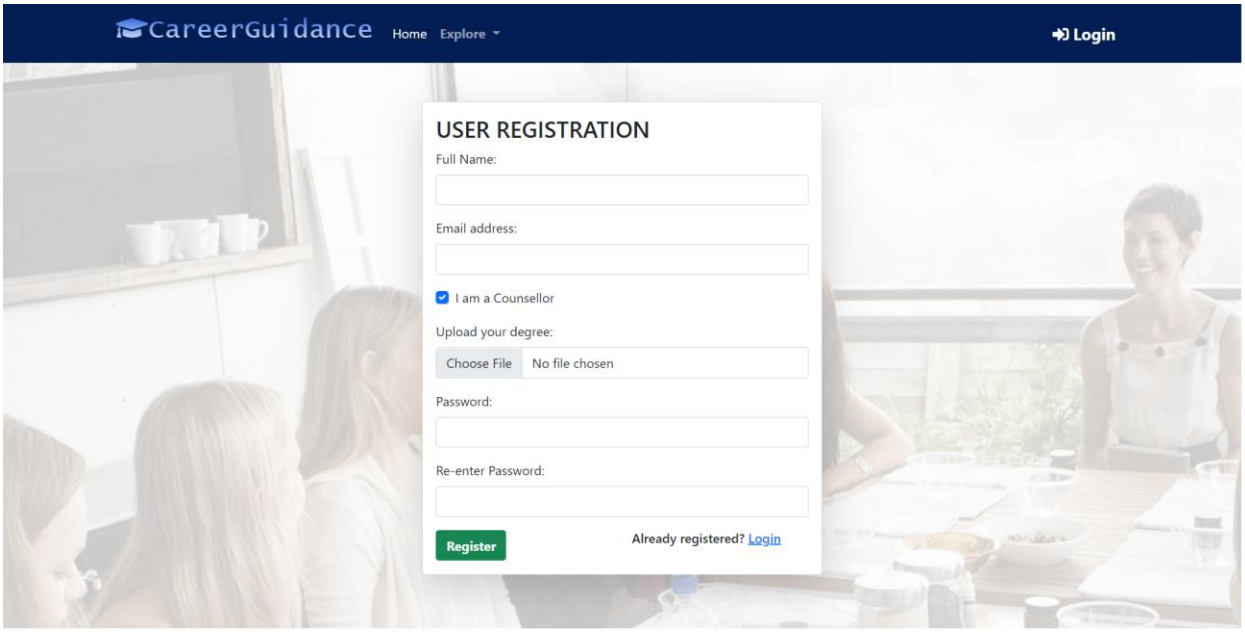
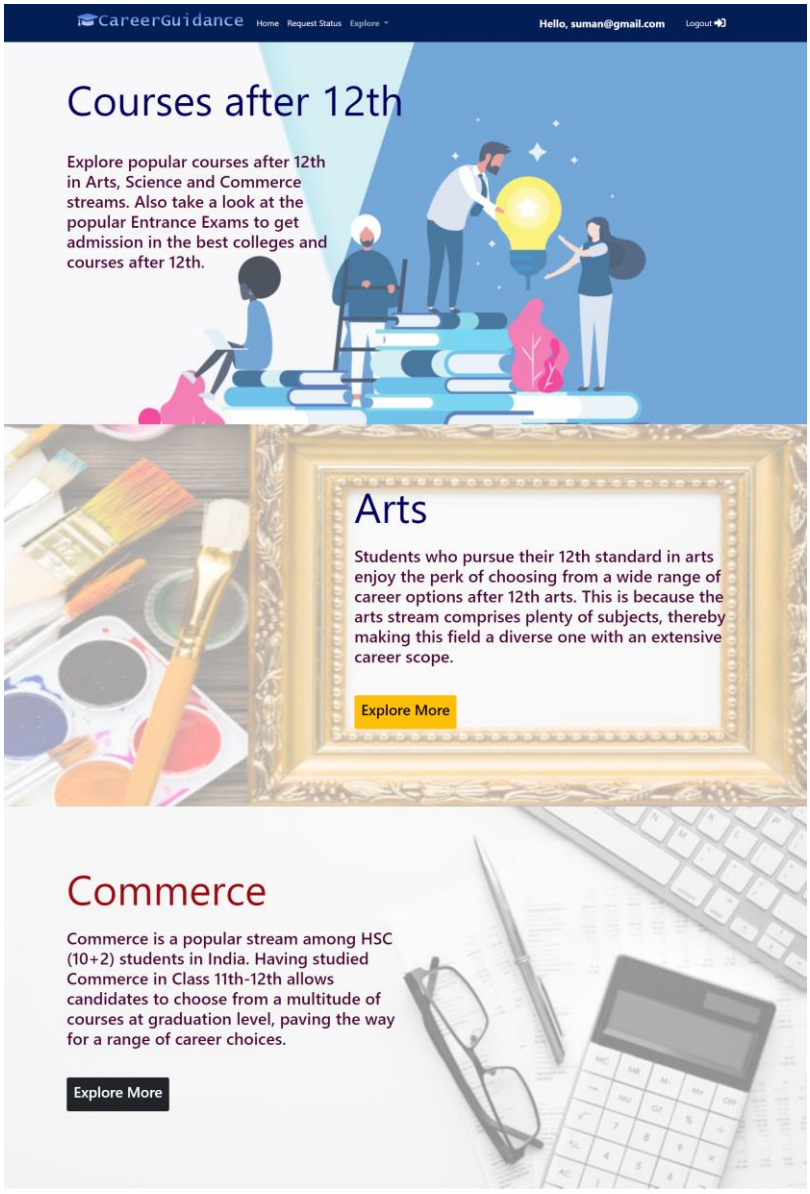
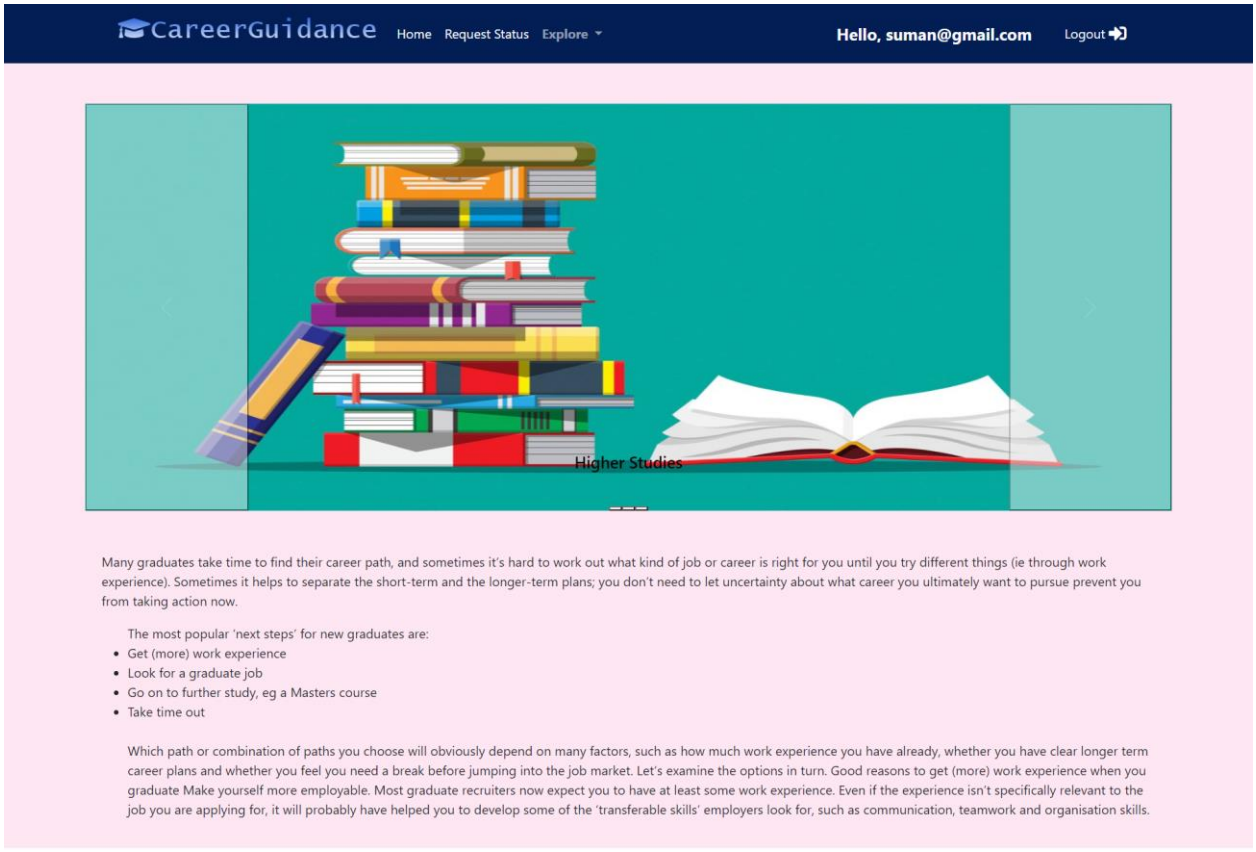


- After 10th page:

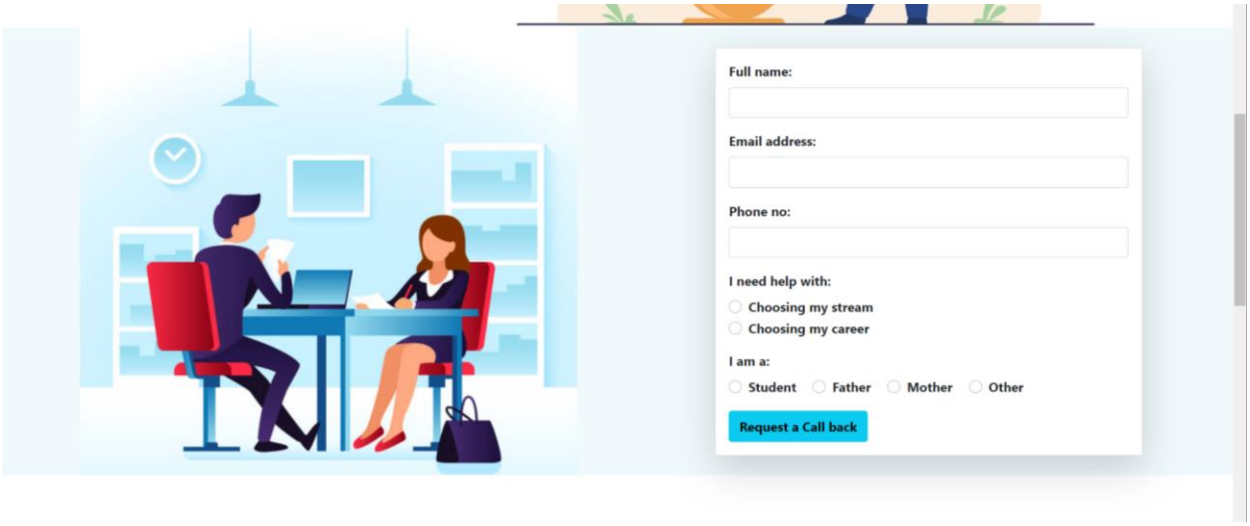
- After 12th page:



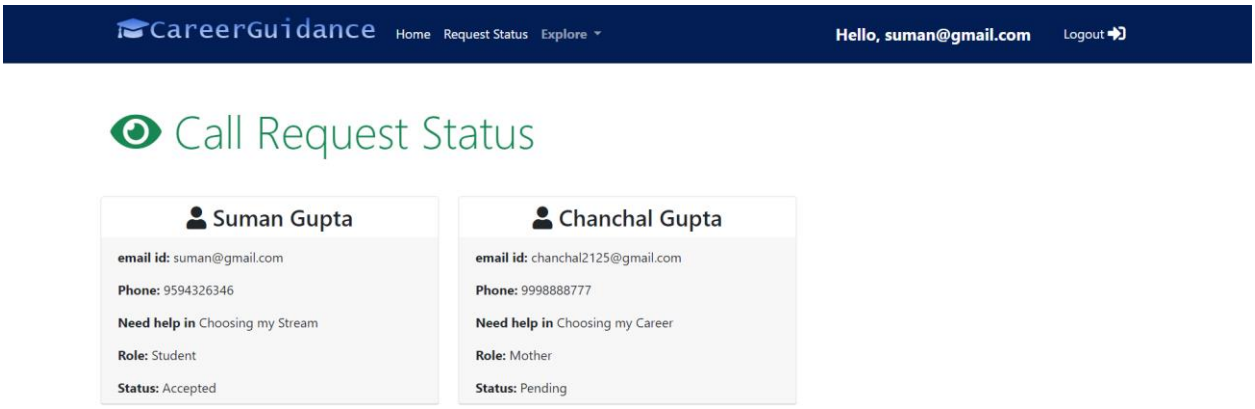
- After graduation page



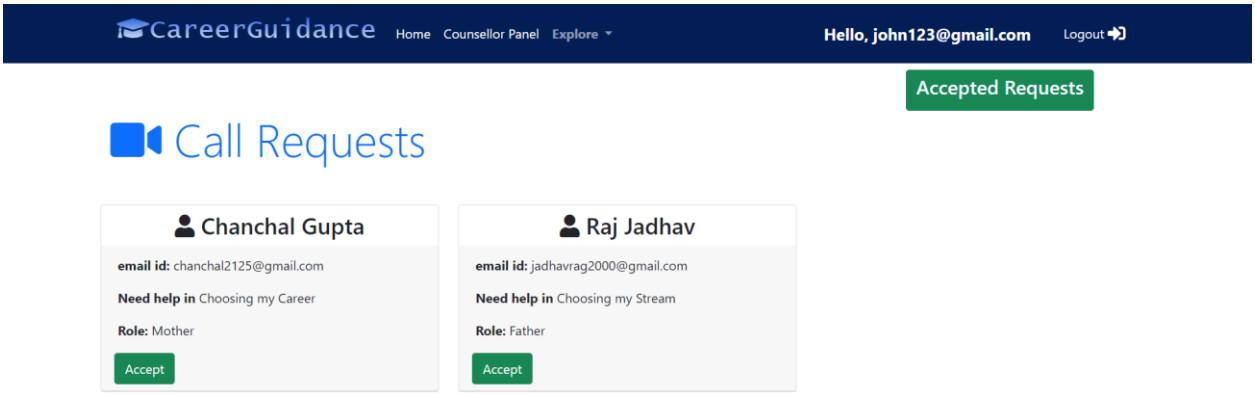
- Counsellor call request form:

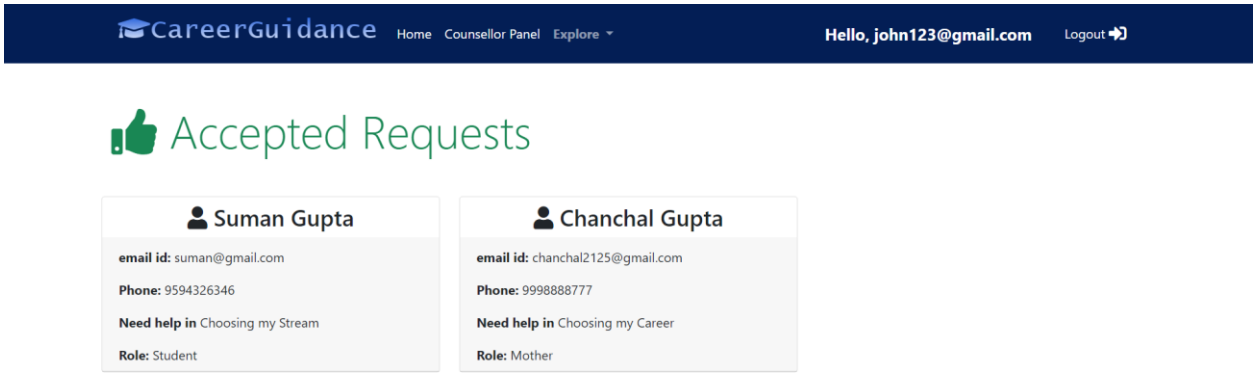


- Call request status on user's side:



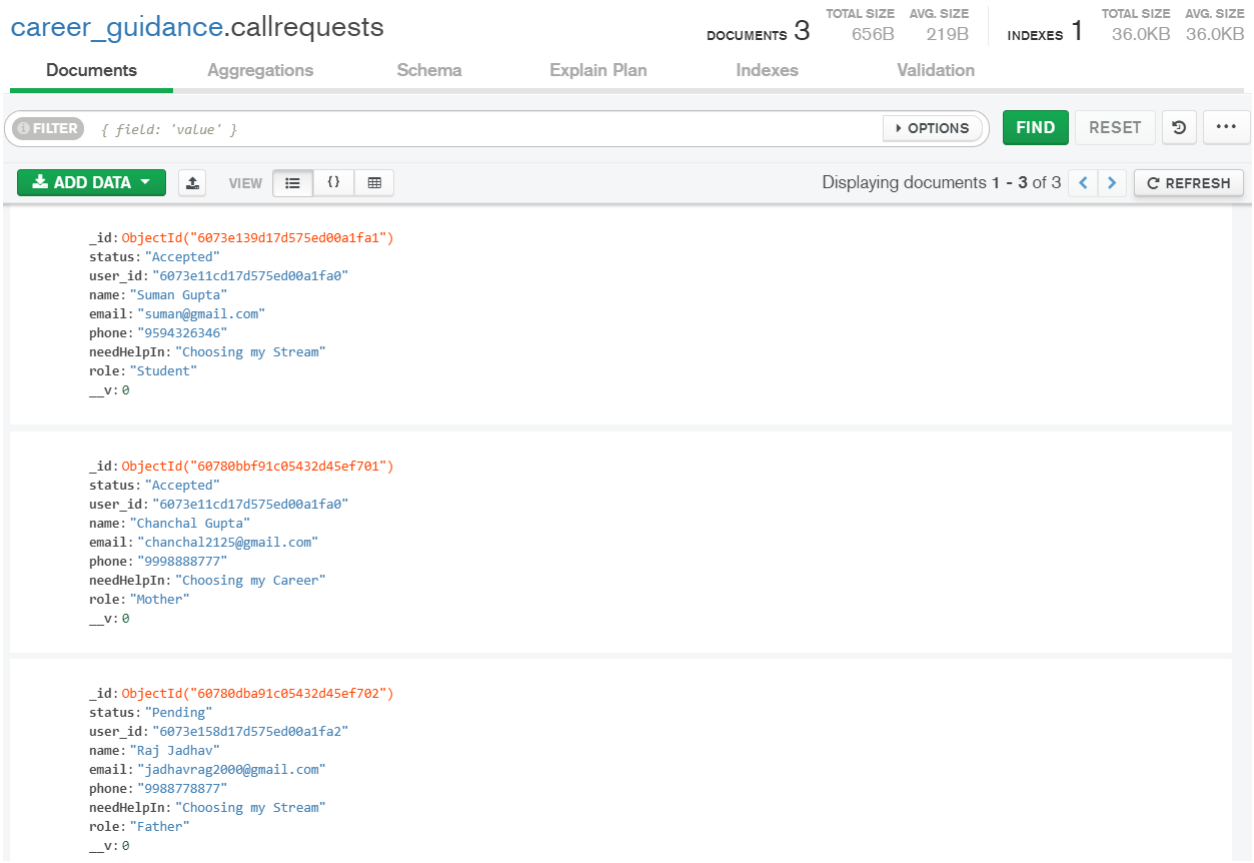
- Accepted request page:



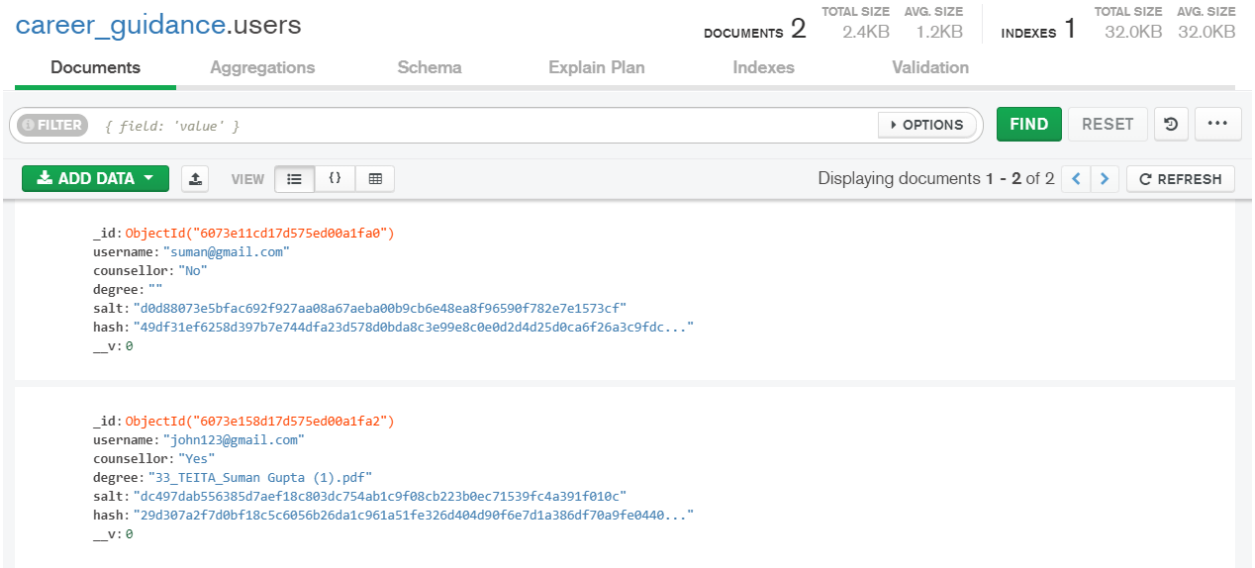


4.8 Database Screenshots

Call requests collection:



Users collection:



CHAPTER 5

RESULT AND DISCUSSION

CHAPTER 5

RESULT AND DISCUSSION

5.1Actual Results

a. Outputs (sprint wise)

Phase 1: Career details for 10^{th}, 12^{th} and Graduation

We were able to connect to students of different grades so that we come to know the newer problems in the system and we can work upon. Feedback on the current career guidance system helped us a lot in making this project.

Phase 2: Counsellor Call Request

This is an important feature of the website since it helps us to directly connect us with a counsellor and we can surely find a way out of it. A direct communication with an individual (counsellor) is the best way to clarify doubts.

b. Outcomes

We have been able to develop a website for 10^{th}, 12^{th} and Graduation for which they can access various stream's knowledge and further more.

c. Discussion of the results

5.2 Future Scope (further phases)

The knowledge system will get increased as and when we try down with new algorithms. Trying different Machine Learning Algorithms would definitely open up the gates for new possibilities and high accuracy.

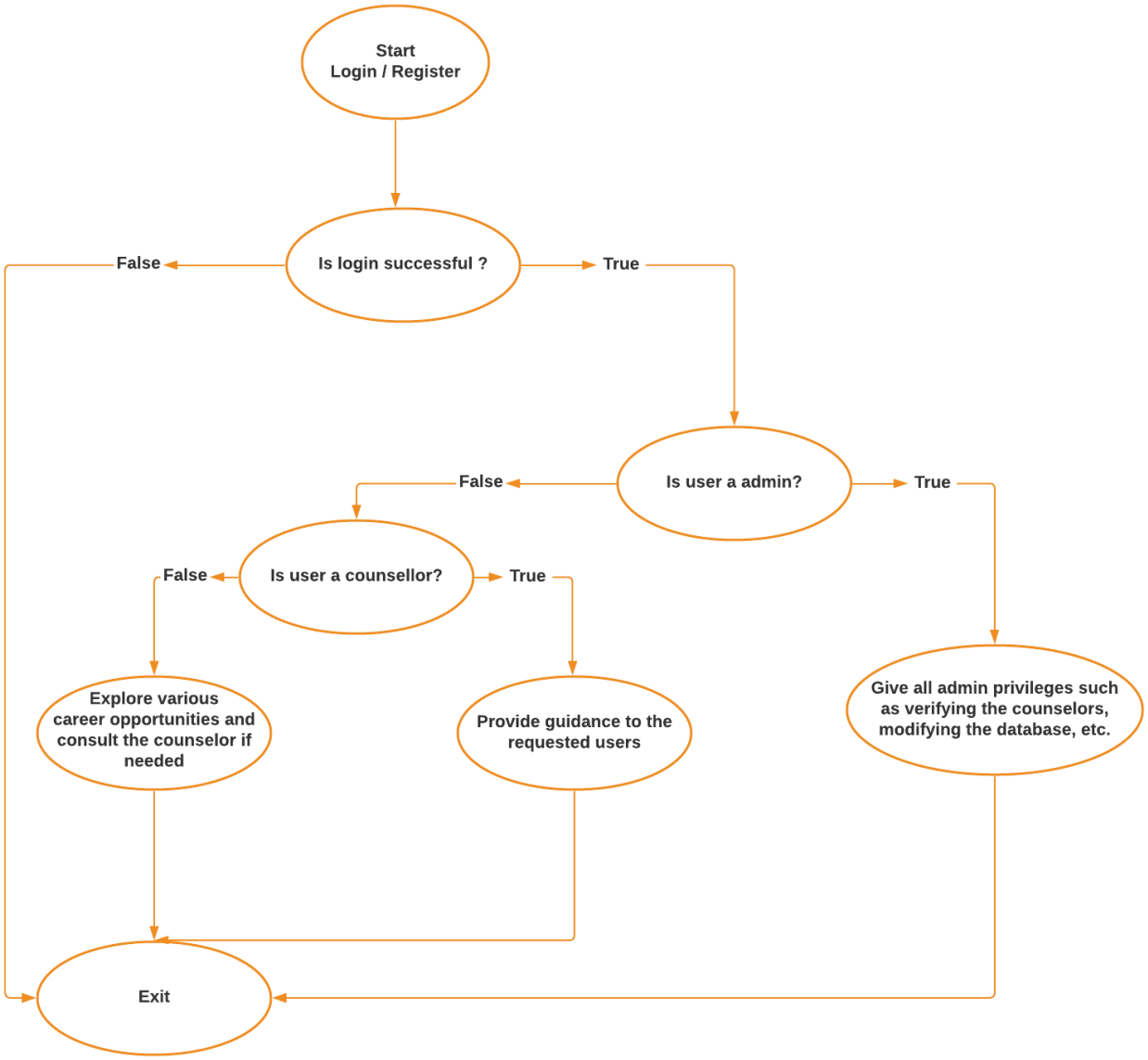
Moreover, we can add new tests for aptitude, personality and so on. From this, we will be able to target large number of audience and many could get benefits out of this.

5.3 Testing

Cyclomatic Complexity

Cyclomatic complexity is a software metric used to indicate the complexity of a program. It is a quantitative measure of the number of linearly independent paths through a program's source code.

Flow Graph:



Cyclomatic complexity = Number of edges – Number of nodes + 2

The Cyclomatic complexity for the above graph is 4

5.4 Deployment

We are planning to add on tests and upgrade the scope of the website to all age genres so that many people can take more out of it.

\

CHAPTER 6

CONCLUSION

CHAPTER 6

CONCLUSION

6.1 Conclusion

For future life, students face many problems when they need to choose a career. Career selection becomes an important part since it well describes the path of our future goals. Suiting their interest as well as scope is an important aspect. Catering every student's needs as well as providing proper guidance is not possible for every school, college and institution. Comparing certain attributes of one case with the previous cases collected of the same results students can be achieved by comparing various Machine Learning Algorithms. Support Vector Machines (SVM), Naïve Bayes have perfectly enlightened the way for students in order to select a career based on their interest as well as IQ.

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BLOCKCHAIN EXCHANGE FOR TOKEN REDEMPTION

BACHELOR OF ENGINEERING
in
INFORMATION TECHNOLGY
(A.Y. 2020-2021)

by

Bhushan Chaudhary (08)
Pratibha Dwivedi (18)
Alisha Gupta (26)

Under the Guidance of
(Dr. Deven Shah)
Vice- Principal, I.T Department, TCET

Estd. in 2001

Choice Based Credit Grading System with Holistic Student Development (CBCGS-H 2019)

Zagdu Singh Charitable Trust's (Regd.)
THAKUR COLLEGE OF ENGINEERING & TECHNOLOGY
Autonomous College Affiliated to University of Mumbai
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1st cycle of NAAC Accreditation : • "A" Grade for 5 years (w.e.f. 30-10-2017)

Certificate

This is to certify that Mr. Bhushan Chaudhary, Ms. Pratibha Dwivedi, Ms. Alisha Gupta are bonafide students of Information Technology Department, Thakur College of Engineering and Technology, Mumbai. They have satisfactorily completed the requirements of RBL-I as prescribed by the University of Mumbai, while working on "Blockchain exchange for Token Redemption".

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Internal Examiner:

Signature: ----------

External Examiner:

Signature:----------

Name:

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Date:

Place:

Declaration

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 I/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 my/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.

(Signature)

1. Bhushan Chaudhary (08)
2. Pratibha Dwivedi (18)
3. Alisha Gupta (26)

Date:

ACKNOWLEDGEMENT

The success and final outcome of this project required a lot of guidance and assistance from many people and we are extremely privileged to have completed the project successfully. We would like to thank everyone for their guidance.

We sincerely thank our Principal, Dr. B. K. Mishra, Vice Principal, Dr. Deven Shah Mentor Dean, Dr. Kamal Shah and HOD, Dr. Bijith Marakarkandy for always encouraging us to do our best. We are highly indebted to our guide Dr. Deven Shah who supported and constantly supervised us through this project and helped us in not only completing this project but also provided us with sample amount of knowledge that was really beneficial to us.

We are thankful to and fortunate enough to get constant encouragement, support and guide from all teaching staff of IT Department who helped us in successfully completing our project work. Also, we would like to extend our sincere thanks to all staff in laboratory for their timely support.

We would like to express our gratitude towards our parents for their kind cooperation and encouragement which helped us in completion of this project.

1. Bhushan Chaudhary (08)
2. Pratibha Dwivedi (18)
3. Alisha Gupta (26)

INDEX

Problem Definition:

There are several problems in the world, many of which go unnoticed. One such issue is that we now pay for things online, where we may obtain a lot of discount coupons which goes in waste if we don't use that particular object. For example, suppose I received a Domino's coupon and my buddy received a Pizza Hut coupon. If he uses only Dominos and if I use only Pizza Hut then both our coupons get waste.

Proposed Idea:

In order to resolve the issue in the above-mentioned problem statement, we have elaborated the idea of token exchange where the user will be allowed to put up coupon/coupons for exchange on the platform and describe the specifications (validity or expiration date, type of coupon like money off, percentage off, etc.) of the coupon and also the details regarding what they expect in return. Depending on the demand-supply chain the user can demand a varying number of coupons. A search filter option be available for users who wish to check for any existing desirable offers, where they can add a filter and search based on any particular brand, coupon type, discount amount, etc.

Background:

Blockchain is the key point of our project which will help us to reach out to more people. There are mainly 5 major advantages which we can showcase to everyone.

1) **Better Transparency:** It works towards our mission to build trust and transparency between organisations and individuals. Using the Stellar public ledger means we can build audit trails around the exchange and movement of personal data between organisations and individuals. The impact of this could lead to better data insights, safer more transparent movement of data, and the prospect of improved trust between customers and organisations.
2) **Enhanced Security:** Blockchain technology also utilizes advanced security compared to other platforms or record-keeping systems. Any transactions that are ever recorded needs to be agreed upon according to the consensus method. Also, each transaction is encrypted and has a proper link to the old transaction using a hashing method. Security is also enhanced by the fact that each node holds a copy of the transactions ever performed on the network. So, if any malicious actor ever wanted to make changes in the transaction, he won't be able to do so as other nodes will reject his request to write transactions to the network. Blockchain networks are also immutable, which means the data, once written, cannot be reverted by any means. This is also the right choice for systems that thrive on immutable data, such as systems that user's age.

3) **Reduced Costs:** Right now, businesses spend a lot of money to improve to manage their current system. That's why they want to reduce cost and divert the money into building something new or improving current processes. By using blockchain, organizations can bring down a lot of costs associated with 3rd party vendors. As blockchain has no inherited centralized player, there is no need to pay for any vendor costs. On top of that, there is less interaction needed when it comes to validating a transaction, further removing the need to spend money or time to do basic stuff.
4) **True Traceability:** With blockchain, companies can focus on creating a supply chain that works with both vendors and suppliers. In the traditional supply chain, it is hard to trace items that can lead to multiple problems, including theft, counterfeit, and loss of goods. With blockchain, the supply chain becomes more transparent than ever. It enables every party to trace the goods and ensure that it is not being replaced or misused during the supply chain process. Organizations can also make the most out of blockchain traceability by implementing it in-house.
5) **Improved Speed and Highly Efficient:** The last industrial benefit that blockchain brings is improved efficiency and speed. Blockchain solves the time-consuming process and automates them to maximize efficiency. It also eradicates human-based errors with the help of automation. The digital ledger makes everything this possible by providing a single place to store transactions. The streamlining and automation of processes also mean that everything becomes highly efficient and fast.

The fact that everything is stored in a decentralized ledger also makes it easy for everyone to trust each other. In short, blockchain utilizes its unique way of data storage to provide a highly efficient process with trust, transparency, and immutability.

Technologies:

We propose a 3-tier architecture where we use MERN stack with Blockchain technology to create our web platform. Blockchain will provide the necessary data and transaction security as well as serve as a core technology for our software. Other technologies used are as follows:

1. MongoDB – database
2. ExpressJs - backend
3. ReactJs – frontend
4. NodeJs – server

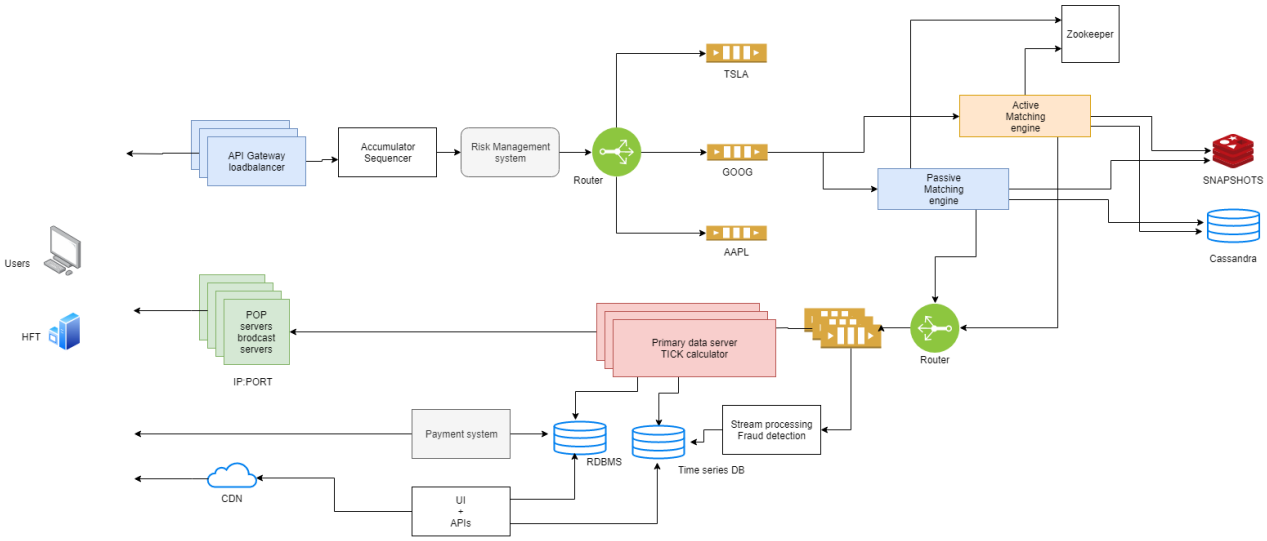
3-tier architecture will help to accommodate more users easily by lessening the load on server. ReactJs will help to create a friendly and interesting UI to attract more users. MongoDB serves as a leading brand in db industry and reliable and NoSql is our choice of db language. Nodejs and expressjs is an optimal choice for our pair or backend and server.

Literature Survey:

SR. NO.	TITLE OF THE PAPER	AUTHOR	DESCRIPTION	GAPS IDENTIFIED
1.	Centralization and Decentralization	Dr. S. B. M. Marume, R. R. Jubenkanda,	1) Authority at the top level of the administrative system. 2) Dispersal of authority among the lower levels of the administrative system.	Two concepts must be used in the wisest manner otherwise it can get complex unnecessarily.
2.	Advantages and Disadvantages of Blockchain	Andrejs Romanovs and Julija Golosova	Each action is recorded to the Blockchain and the data of records are available to every participant of this Blockchain and cannot be changed or deleted. The results of this recording give the Blockchain's transparency, immutability and trusty	The Blockchain is the new type of the database which solved some of the problems in the centralized system, such as the transactions without a middleman, the spent time on each transaction, the unintentional or special deletion or modification of data in the Blockchain.
3.	The impact of blockchain on e-commerce: A framework for salient research topics	Horst Treiblmaier Christian Sillaberb	Using blockchain smart contracts, TradeLens enables digital collaboration across the multiple parties involved in international trade.	where which system is to be used highly depends upon the requirements of the data control and permission access. We need to keep the system easy to understand

4.	Hyperledger Frameworks with a special focus on Hyperledger fabric	Marija S. Krsti, Lazar J. Krstic	Tools, such as software that facilitate deployment, debugging, and design, can make a huge difference in the ease of use of any system, for both developers and users. Hyperledger is constantly investing in building great support tools.	Which part of blockchain should be used where has to understood before we design the architecture
5.	Blockchain and the Tokenization of the Individual: Societal Implications	Monique J. Morrow and Mehran Zarrebini	Tokenization significantly reduces risk based on the fact that sensitive data cannot be breached if it is not there in the first place. However, there are a number of other use cases where tokens create value such as the tokenization of traditional financial assets where liquidity creates barriers to entry, and tokenizing these assets, for instance, using blockchain to convert rights into a digital token backed by the asset itself can solve this problem.	The need for token in the market today has to be studied very efficiently first before investing it into a project

System Architecture:



Results & Discussions:

The trade or exchange will occur via a decentralized system based on blockchain which is the technology used for bitcoin trading. Blockchain is a distributed ledger technology that could make trading commodities simpler, cheaper, and more transparent. It can be used in any process involving transactions and exchanging data.

Conclusion:

This project will promote increase in coupon distribution and the customers will be more likely to purchase products for they will have coupons for the product which they would have bought regardless. This process will form a cycle which will help raise the product sales and bring in more profit for the companies as their revenue goes up. The manufacturer/retailers will also find attracting more costumers feasible and more opportunities for popularizing products in this competitive marketing will increase.

SENTIMENT ANALYSIS USING TEXT FEEDBACK

Submitted in partial fulfilment of the requirements

of the degree of

BACHELOR OF ENGINEERING
in
INFORMATION TECHNOLGY
(A.Y. 2020-2021)

by

Richa Gupta (Roll No.:30)
Shilpi Char (Roll No.:43)
Chaithanya Moozhickal (Roll No.:63)

Under the Guidance of
Mr. Vijay Yele
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Certificate

This is to certify that Ms. Richa Gupta, Ms. Shilpi Char, Ms. Chaithanya Moozhickal, are bonafide students of Information Technology Department, Thakur College of Engineering and Technology, Mumbai. They have satisfactorily completed the requirements of RBL-II as prescribed by the University of Mumbai, while working on "**Sentiment Analysis Using Text Feedback**".

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Place:

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We sincerely thank to our guide Mr. Vijay Yele for his guidance and support for carrying out our project work. We would also like to express our special thanks of gratitude to our HOD(Dr. Bijith Marakarkandy)who gave us the golden opportunity to do this wonderful project on the topic *(***Sentiment Analysis Using Text Feedback***)*, which also helped us in doing a lot of Research and we came to know about so many new things, we are really thankful to them. Secondly we would also like to thank our parents and friends who helped us a lot in finalizing this project within the limited time frame.

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Abstract

Sentiment analysis is in fact, the new immerging conceptual technology. People have already embraced it and are working closely with it in the day to day lives. In this paper, demonstration of machine learning algorithms are done to study bulk reviews on a certain product and understand the sentiment of the customer using the feedback and use it as constructive material to enhance the product quality until it receives only positive feedback.

Contents

Chapter 1: Overview

1.1 Introduction

Sentiments are feelings, opinions, emotions, like/dislikes, good/bad. Sentiment Analysis is a study of human behavior in which we extract user opinion from plain text. Sentiment Analysis is also known as Opinion Mining. The most frequent kind of sentiment analysis performed is called polarity detection that, understands if a text about a given subject is positive, neutral, or negative. Advanced, sentiment classification looks, for instance, at emotional states such as "angry", "sad", and "happy". Sentiment analysis is mostly applied to the voice of the customer or material such as a text feedback or a survey depicting certain statistics and can be used for the future of the product in question.

Common uses have been observed in social media, health care or for a pubic consumer good. One can also classify a document's polarity on a multi-way scale, which was attempted by Pang and Snyder among others: Pang and Lee expanded the basic task of classifying a movie review as either positive or negative to predict star ratings on either a 3- or a 4-star scale, while Snyder performed an in-depth analysis of restaurant reviews, predicting ratings for various aspects of the given restaurant, such as the food and atmosphere (on a five-star scale).

1.2 Objectives and Scope of the project

The objective of this project is to develop a Sentimental analysis on text feedback can turn customer insights into action by easily evaluation customer satisfaction index by requesting customer to share their product or service experiences through custom-built surveys in the form of feedback or review. The customer needs and how they feel about a certain product and studying the reviews about it, we can deduce if the product will do well of fail.

1.3 Importance of Project

Advanced sentiment analysis can also categorize text by emotional state like angry, happy, or sad. It is often used in customer experience, user research, and qualitative data analysis on everything from user feedback and reviews to

social media posts.Sentiment analysis can be combined with Machine Learning (ML) to further categorize text by topic. Together, sentiment analysis and machine learning provide researchers with a method to automate the analysis of lots of qualitative textual data in order to identify patterns and track trends over time

Sentiment analysis is extremely important as it helps identify what customers like and dislike about the brand. It becomes extremely useful in such scenarios where, companies can use the behaviours and reactions of their audiences and their response for the content generated.

Chapter 2: Literature Survey & Proposed Work

2.1 Literature Survey Table

LITERATURE SURVEY

SR. NO.	AUTHOR	PROBLEM STATEMENT	METHODOLOGY	TOOLS USED
1.	Prashali S. Shinde | Asmita R. Kanase | Rutuja S. Pawar | Yamini U. Waingankar "Sentiment Analysis of Feedback Data" Published in International Journal of Trend in Scientific Research and Development (ijtsrd)	Sentiment Analysis of Feedback Data (STUDENT FEEDBACK)	1. Collected data for study purpose from Kaggle. 2. The tool used for analysis is "Microsoft Excel". 3.By using excel we did the analysis of feedback by creating pivot table followed by which we created frequency table for the feedback and also given the scores, then by using positive, negative and neutral sentiments we present bar chart, histogram, pie chart which shows the highest frequency for which feedback. 4.The feedback from the students is collected using SRS (Student Response System).	As have used excel as tool for analysis similarly we can use R programming and Python likewise another tool. Sentiment analysis defection (also called as opinion mining) that refers to the use of natural language processing(NLP), text analysis (TA) and computational linguistics (CL) to identify and extract subjective information in source materials.
2.	Venkata Satya Sai Abhishikth Tholana Department of Computer Science GITAM University Visakhapatnam, India	SENTIMENT ANALYSIS USING PRODUCT REVIEW DATA	a total of 25 million adjectives, 22 million adverbs and 56 million verbs are 450 identified, which usually tend to determine the sentiment. The negation words like no, not, and more are included in the adverbs whereas Negation of Adjective and Negation of Verb are specially used to identify the phrases. 21,586 phrases are identified with a total of 0.68 million. The algorithm also makes a list of phrases based on occurrence. The following are the various classification models which are selected for categorization: Naïve Bayesian, Random Forest, and Support Vector Machine.	1. POS tagger is used in order to classify the words of the sentence 2.An additional python program is particularly used to speed up this process
3.	Yang Peng, Melody Moh, and Teng-Sheng Moh	EFFICIENT ADVERSE DRUG EVENT EXTRACTION USING TWITTER SENTIMENT ANALYSIS	A simple and efficient pipeline is proposed to retrieve data from Twitter. The process of the pipeline is, the tweets from twitter are captured firstly and then the data is pre-processed (cleaned data is the output of data pre-processing). The drug classification is done for the cleaned data and the user opinion data is collected from which the ADEs are extracted. The captured tweets are stored in HIVE. Tweets are in JSON file and can, therefore, be stored in HIVE directly. They used python NLP tool for capturing tweets and Data pre-processing. For storing datasets of drug-related classification and tweets of sentiment analysis WEKA is used. Thus after thorough research on different tweets pipelines are built and they are compared to newly designed ones to extract numerous ADEs. As, a result an average of 5 times of total number of ADEs, among them 20% are new ADEs.	1.Topsy API, using more drugs as keywords in the experiments, applying Apache Spark for processing a lot of tweets. 2.JSON 3.HIVE 4. PYTHON NLP

2.2 Problem definition

A basic task in sentiment analysis is classifying the polarity of a given text at the document, sentence, or feature/aspect level — whether the expressed opinion in a document, a sentence or an entity feature/aspect is positive, negative, or neutral. Advanced, "beyond polarity" sentiment classification looks, for instance, at emotional states such as "angry", "sad", and "happy".

Any business is obliged to understand clients — their needs, their opinions, their satisfaction with the product. In case of large web-based companies we need to analyse hundreds of thousands or even millions of opinions to different products, and simply searching for pre-defined "good" or "bad" words in the comments is not enough. With rise of machine learning, in particular, deep neural networks, sentiment analysis — the problem of understanding the emotional tone of a text has been solved with very high accuracy.

2.3 Proposed System

The planned course of action is to make an application which will store and study separate categories of words from a word database, almost like a dictionary. Since the database is going to be dynamically changing, we plan to use Mongo DB for the backend.For the front end, we will have a simple UI asking to enter words or sentences according to the convenience of the user. In case of bulk study on a huge number of reviews, we shall ask to upload a file containing all the reviews which will then be put in our machine learning algorithm. The output will state whether the input is positive, negative or neutral by identifying the keyword in the reviews. For mass reviews, a generalized visual statistic will be displayed siting the most used keys.

The machine learning type that we shall be used is supervised learning. The initial stages will be manual and then it will keep growing based on what it's taught. As for the algorithm, we will initially use linear regression, decision tree and then Naïve Bayes. But mostly the focus will be on Naïve Bayes since it is a relatively easy model and commonly used for huge data. It can also solve sophisticated and complex problems easily. Our program has mainly to do with grammar since it studies the suffixes prefixes and the general tone of the words and sentences.

2.4 Methodology Used

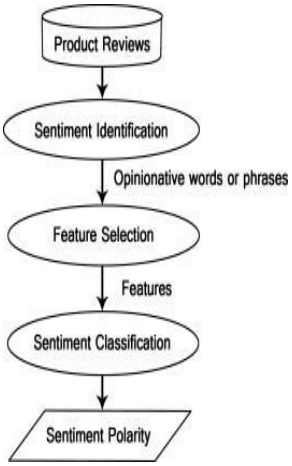
An evaluation of the collected data will be done and an analytic will be graphed up to study the deviation and common responses to a common stimulus questionnaire. Data collection will be done using Google doc, and other survey/feedback mechanisms asking the participants to fill them based on a demo product. Various questions need to be answered which is going to be stored in a CSV file, which will later be analyzed and segregated thoroughly

We make presumption like, in what stage we lying in market and how the competition is progressing, in what sector we need to improve and how we are satisfying our customers. We could include what are the customer needs and how they feel about a certain product and studying the reviews about it, we can deduce if the product will do well of fail.

The following research are used in our topic:

- **Qualitative Research**: It is often used in customer experience, user research, and qualitative data analysis on everything from user feedback and reviews to social media posts.

- **Empirical Research**: In this research, the problem of determining the polarity of sentences of customer review data is studied. We have used the sentence-level classification for analysis. Given different set of customer review, the task involves three subtasks.



Flow chart for project planning

Chapter 3: Analysis and Planning

3.1 Introduction

1. Purpose

One can also classify a document's polarity on a multi-way scale, which was attempted by Pang and Snyder among others: Pang and Lee expanded the basic task of classifying a movie review as either positive or negative to predict star ratings on either a 3- or a 4-star scale, while Snyder performed an in-depth analysis of restaurant reviews, predicting ratings for various aspects of the given restaurant, such as the food and atmosphere (on a five-star scale).

2. Document Conventions

This document uses the following conventions.

AI	*Artifical Intelligence*
DB	*Database*
DDB	*Distributed Database*
ML	*Machine Learning*

3. Intended Audience and Reading Suggestions

Sentimental analysis on text feedback can turn customer insights into action by easily evaluation customer satisfaction index by requesting customer to share their product or service experiences through custom-built surveys in the form of feedback or review .

4. Product Scope

In today's environment where we're suffering from data overload (although this does not mean better or deeper insights), companies might have mountains of customer feedback collected. Yet for mere humans, it's still impossible to analyze it manually without any sort of error or bias.Oftentimes, companies with the best intentions find themselves in an insights vacuum. You know you

need insights to inform your decision making. And you know that you're lacking them. But you don't know how best to get them.Sentiment analysis provides answers into what the most important issues are. Because sentiment analysis can be automated, decisions can be made based on a significant amount of data rather than plain intuition that isn't always right**.**

3.2 Project Planning

1. Product Perspective

- **Feedback:** Feedback is one of the major concepts in systems thinking. Instead of thinking in a linear way, it recognises that as well as one cause (A) leading to an effect (B), B will also affect A in various ways. This circular causality is called a 'feedback loop'.
- **Sentimental analysis:** Sentiment Analysis (SA) is indeed a fascinating area of research which has stolen the attention of researchers as it has many facets and more importantly it promises economic stakes in the corporate and governance sector.

2. Product Functions

- **Hypothesis in sentimental analysis**: We make presumption like in what stage we laying in market and how the competition getting tough and in what sector we need to improve and how we satisfied our customers we could include what are the customer needs and how they feel about a certain product and studying the reviews about it, we can deduce if the product will do well of fail.
- **Database Management System**: Using the data collected by feedback recognition a database management system will be established and we can perform various queries to extract the required data.
- **Data Visualization**: Data collection will be done using google doc, asking the participants to fill them based on various questions which is going to be stored in a csv file and analyzed and segregated thoroughly

3. User Classes and Characteristics

Users of the system should be able to retrieve feedback information of the selected product from the database. There will be two user of the system i.e. Authority and users from website. Users will be able to see the quantity of each product category. They should be able to see the feedback percentage of product according to which rating will be given to each product.

The customer should be able to do the following functions:

CUSTOMER FUNCTIONS:

•See the review of each category of product.
• See text feedback about the product.
• Give text feedback for the product.
• Contact the Authority.

ADMINISTRATIVE:

• Add/Delete a product.
• Add a new category.
• See product rating.
• Update product feedback with graphics

4. Operating Environment

Operating environment for the Garbage classification system is as listed below.

- distributed database
- client/server system
- Operating system: Windows.
- database: sql, database
- platform: Python
- framework: Django

5. Design and Implementation Constraints

The software must be designed in Python language so that there must not be any compromise with the security and robustness of the system. System must be able to handle all possible kinds of errors. Interface of the software must be so simple that native users can also use it easily.

6. User Documentation

The user can use the following documentation:

- User manuals
- On-line help
- tutorials

that will be delivered along with the software.

7. Assumptions and Dependencies

The coporate body will assign the employee to maintain the software and to take care of the entire system.

3.3 Project Charter

A project charter is a formal, typically short document that describes your project in its entirety — including what the objectives are, how it will be carried out, and who the stakeholders are. It is a crucial ingredient in planning the project because it is used throughout the project lifecycle.

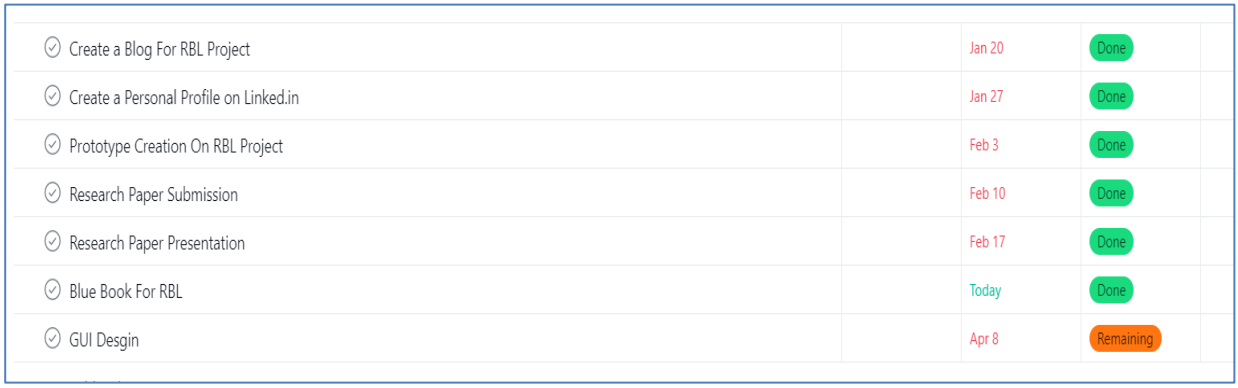
General Information		
Project Title		Date
Sentiment Analysis using Text Feedback		22/02/2021
Project Manager	Phone	E-mail

Richa Gupta	9967935363	richag536@gmail.com
Executive Sponsor	Phone	E-mail
Chaithanya Moozhickal	8879039352	binuchaithanya0015@gmail.com
Executive Sponsor	Phone	E-mail
Shilpi Char	9892039630	shilpichar@email.com
Document Version		Updated date
1.0		22/02/2021

Project Scope
Situation/Problem/Opportunity
sentiment analysis (a form of text analytics) measures the attitude of the customer towards the aspects of a service or product which they describe in text.
Project Goals
In today's environment where we're suffering from data overload ,companies might have mountains of customer feedback collected. Yet for more humans, it's still impossible to analyze it manually without any sort of error or bias. So, Sentiment analysis provides answers into what the most important issues are and Provide the analysis report of feedback like it positive, negative or neutral.
In Scope/Out of Scope
In Scope:- • Text categorization based on keywords specified to the machine learning algorithm and depicting them using graphical representations. • We Provide Graphs and report on Feedback of customer to analysis like it positive, negative or neutral. Out of Scope:- • Accuracy of results for feedback. • Implement More emotions rather than positive, negative or neutral.

3.4 Gant Chart

Gantt charts are useful for planning and scheduling projects. They help you assess how long a project should take, determine the resources needed, and plan the order in which you'll complete tasks. They're also helpful for managing the dependencies between tasks.



Chapter 4: Design and Implementation

4.1 UML

A use case diagram is a dynamic or behavior diagram in UML. Use case diagrams model the functionality of a system using actors and use cases. Use cases are a set of actions, services, and functions that the system needs to perform.

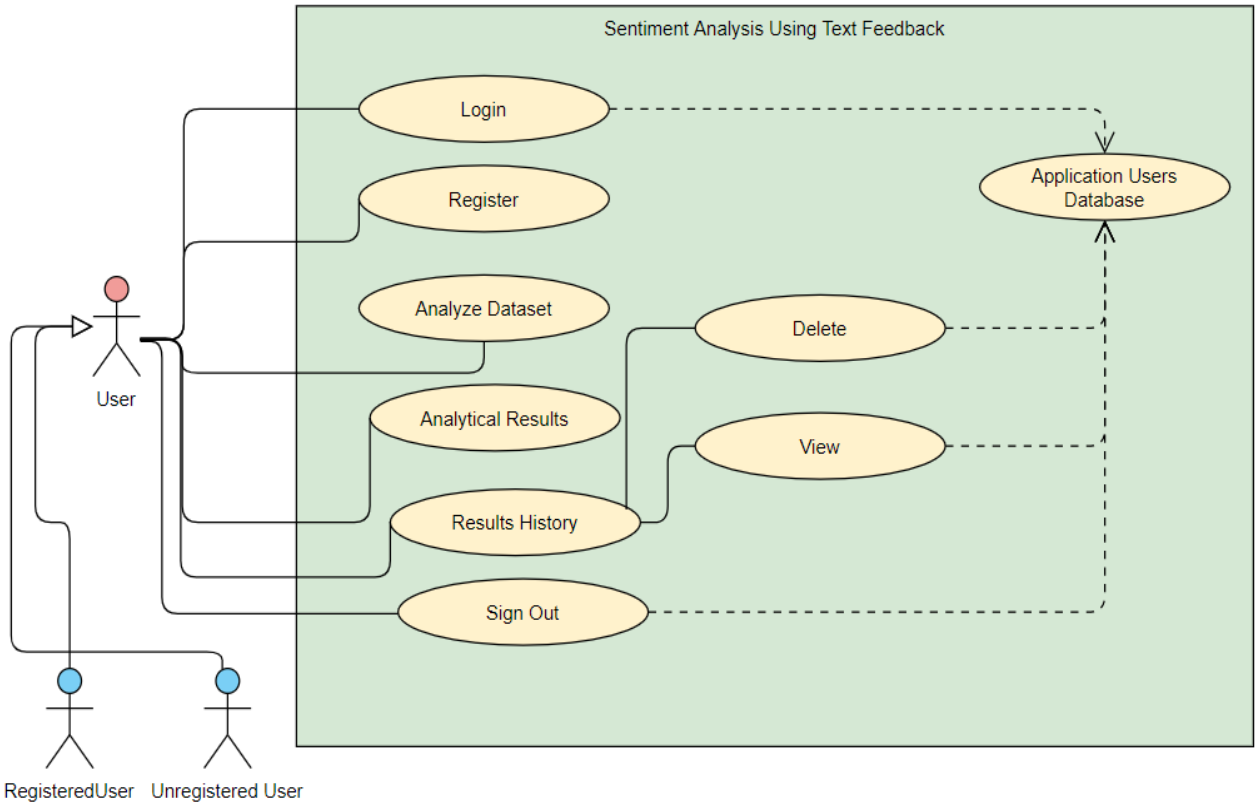


Figure 4.1: Use Case Diagram

4.2 Class Diagram

A class diagram in the Unified Modelling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects.

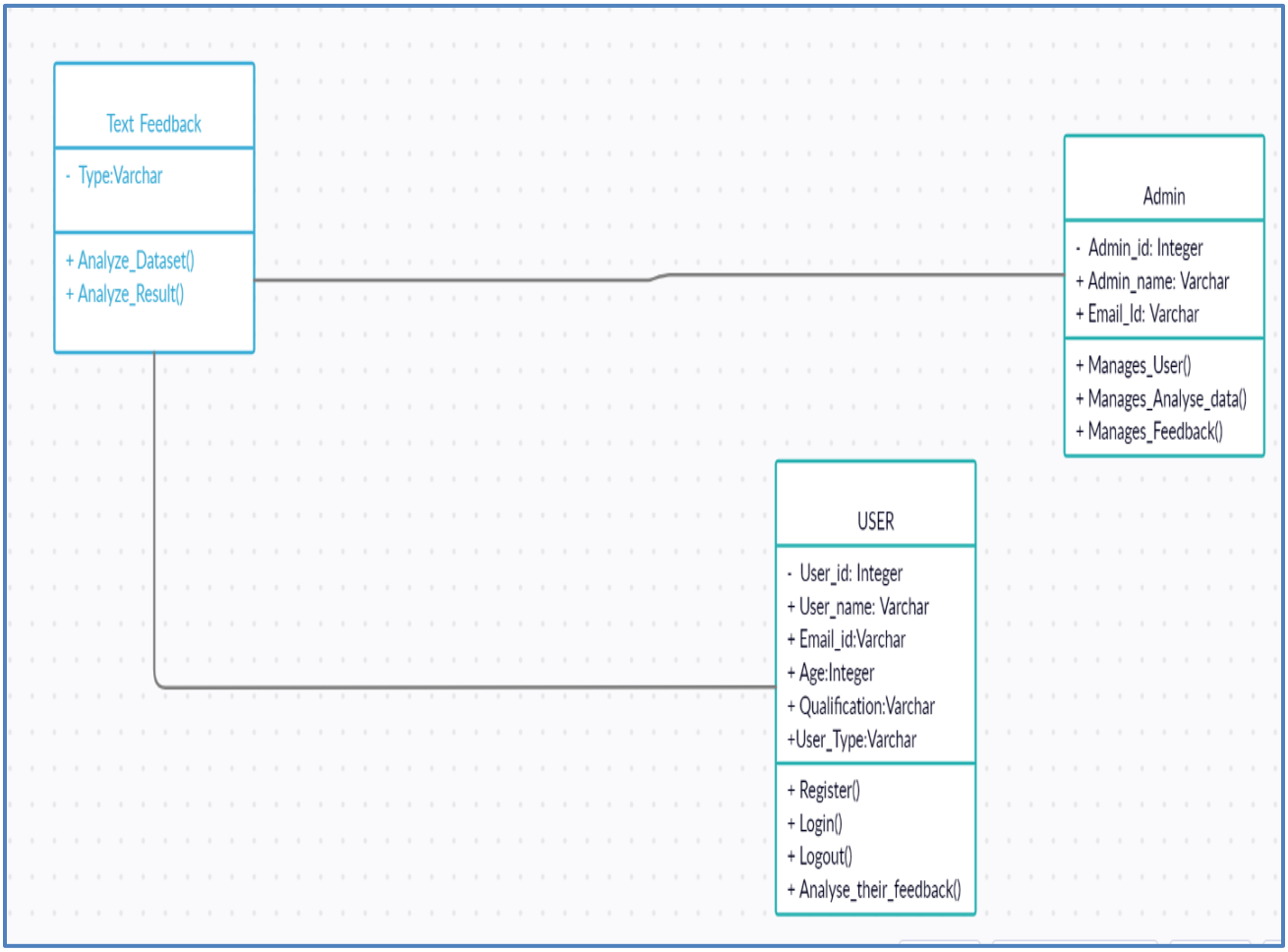


Figure 4.2: Class Diagram

4.3 Sequence Diagram

A sequence diagram simply depicts interaction between objects in a sequential order i.e. the order in which these interactions take place. We can also use the terms event diagrams or event scenarios to refer to a sequence diagram.

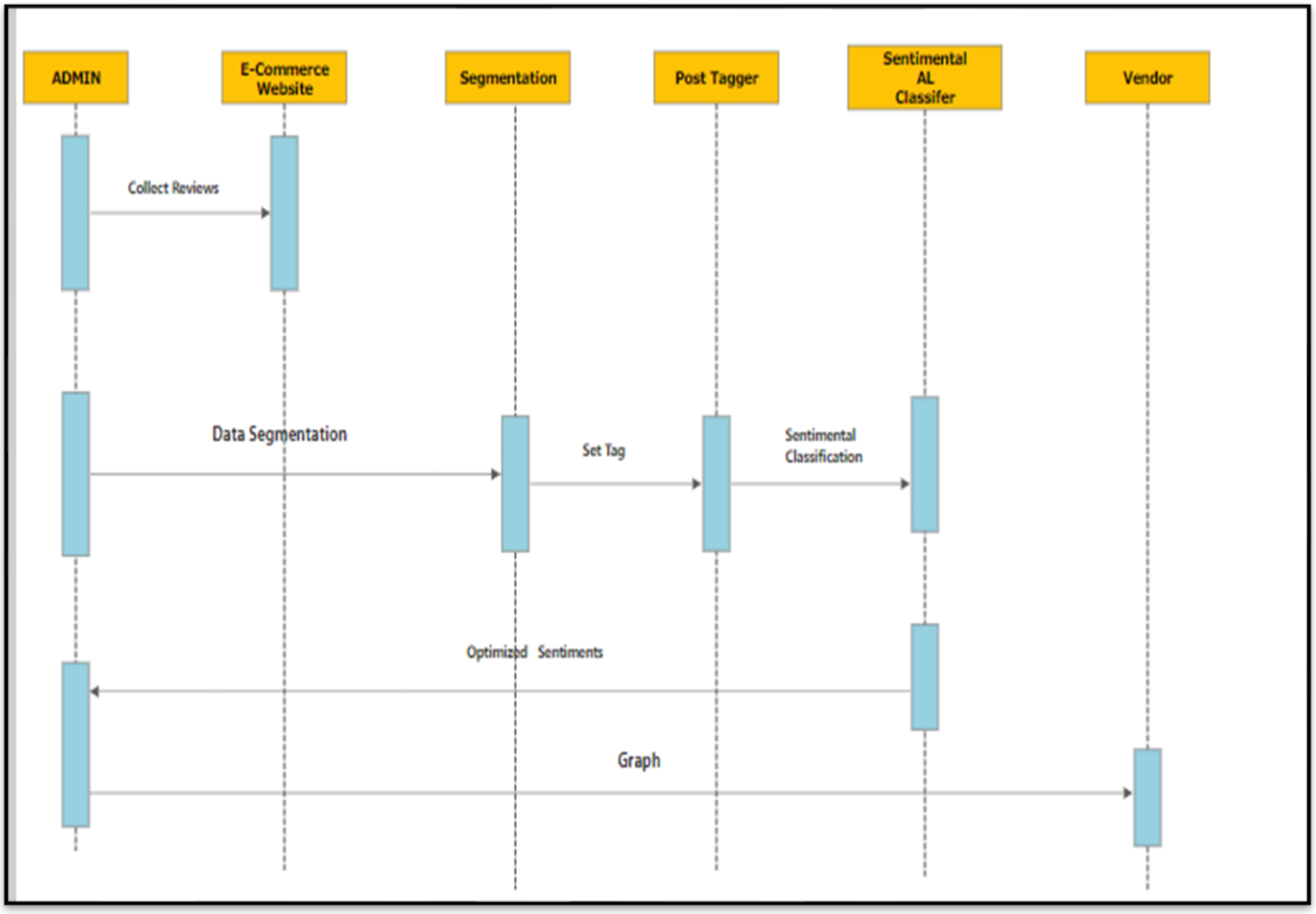


Figure 4.3:Sequence Diagram

4.4 Data Flow Diagram

A data-flow diagram (DFD) is a way of representing a flow of a data of a process or a system (usually an information system) The DFD also provides information about the outputs and inputs of each entity and the process itself.

Figure 4.5.1: Data Flow Diagram (Level 0)

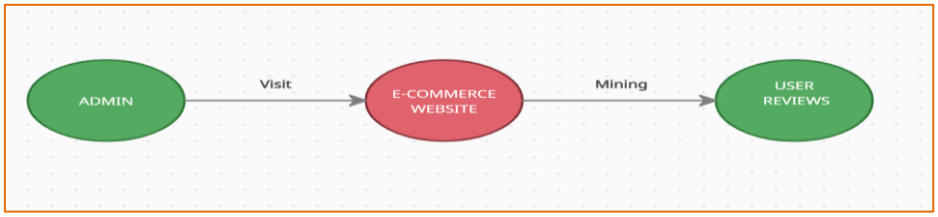


Figure 4.5.2: Data Flow Diagram (Level 1)

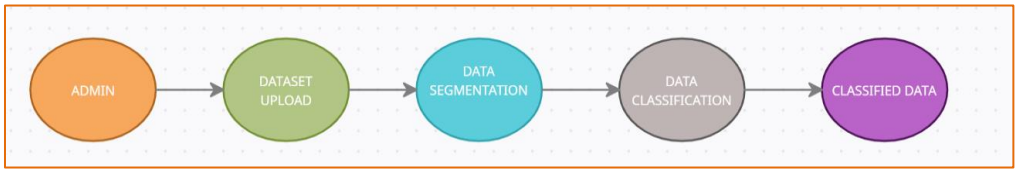


Figure 4.5.3: Data Flow Diagram (Level 1.1)

Figure 4.5.4: Data Flow Diagram (Level 1.2)

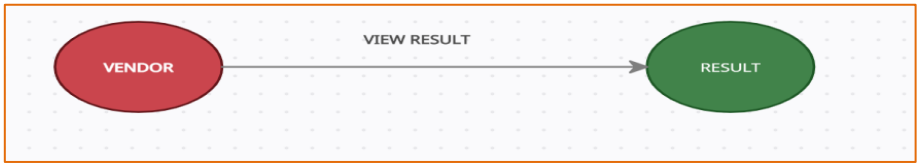
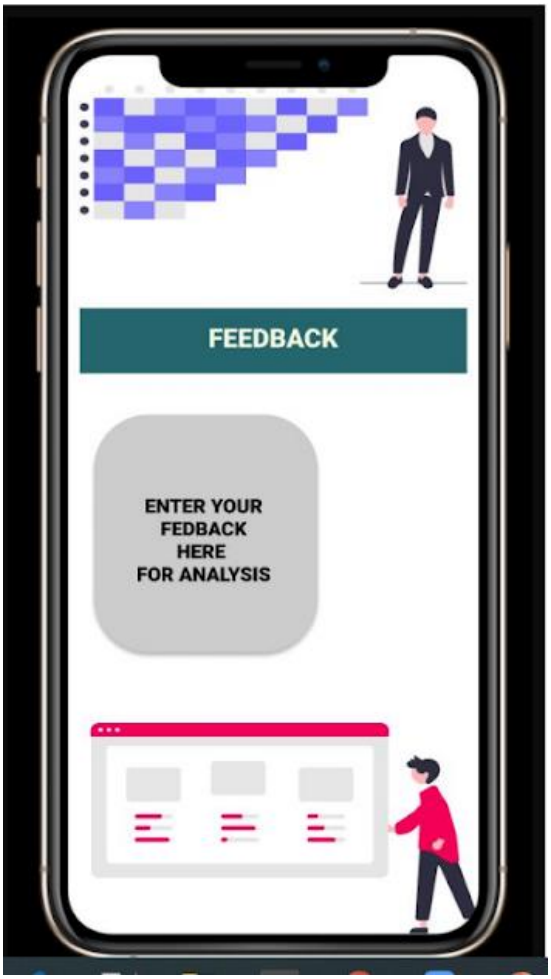
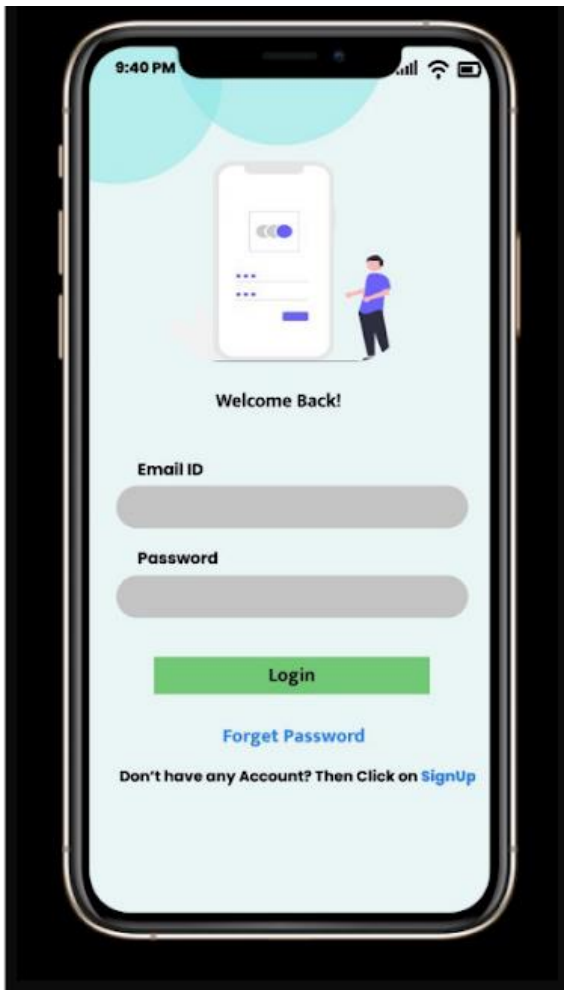
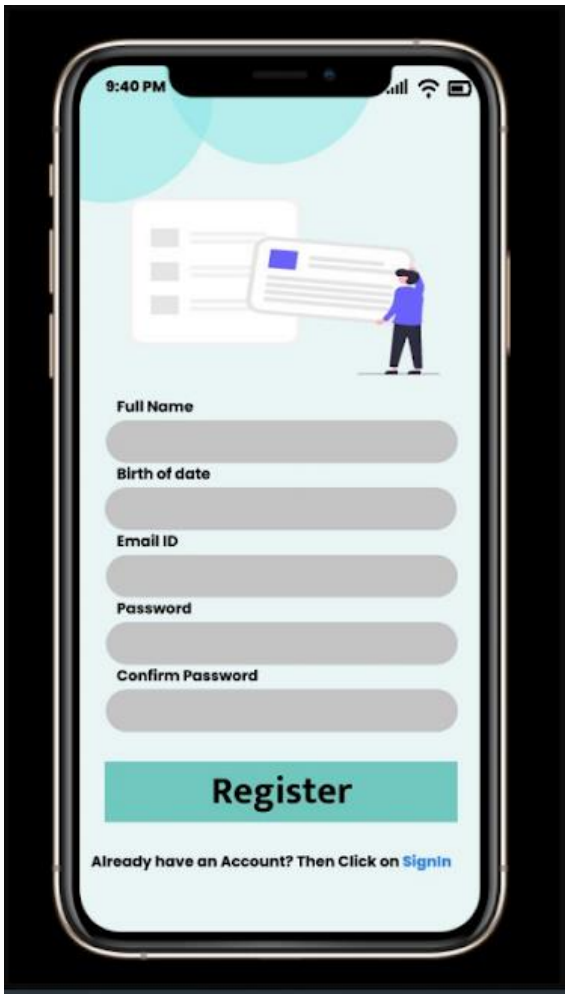


Figure 4.5.5: Data Flow Diagram (Level 2)

4.5 GUI Screenshots



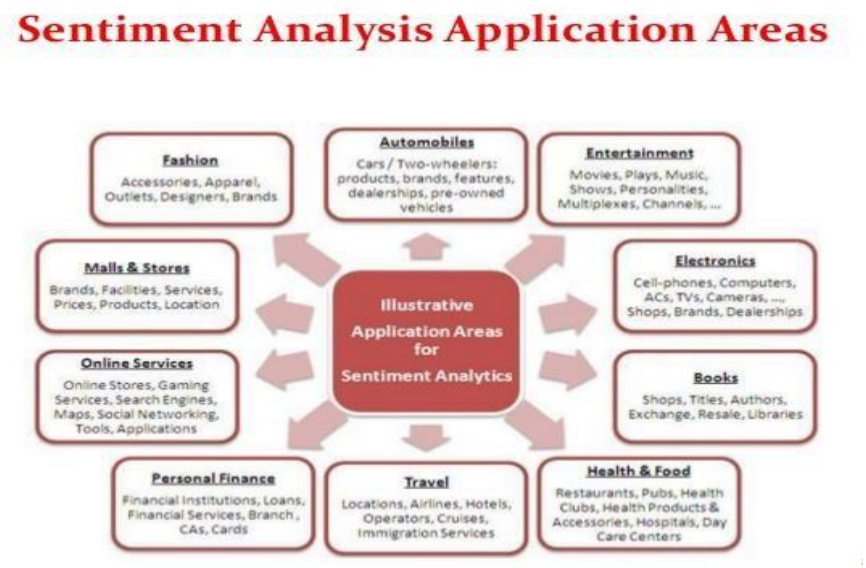

9:40 PM
Welcome Back!
Email ID
Password
Login
Forget Password
Don't have any Account? Then Click on SignUp


9:40 PM
Full Name
Birth of date
Email ID
Password
Confirm Password
Register
Already have an Account? Then Click on Signin

Chapter 5: Results & Discussion

5.1 Discussion of the Results

- An evaluation of the collected data will also be done and an analytic will be graphed up to study the deviation and common responses to a common stimulus questionnaire.
- Data collection will be done using Google doc, asking the participants to fill them based on various questions which is going to be stored in a CSV file and analyzed and segregated thoroughly
- We make presumption like in what stage we lying in market and how the competition getting tough and in what sector we need to improve and how we satisfied our customers.
- We could include what are the customer needs and how they feel about a certain product and studying the reviews about it, we can deduce if the product will do well of fail.



5.2 Future Scope

For future scope of this project, we will deploy algorithm for more complex text identifying a larger range of sentiments which is usually more difficult to explain. Also, in the future multilanguage segregation will be available too.

Chapter 6: Conclusion

6.1 Conclusion

This project will be useful for companies seeking feedback for their product and are focusing growing and developing based on the public opinions and demands. This will not only help the developers but also the consumers to judge and decide for themselves whether they want to use the product or not by studying the efficiently segregated positive and negative reviews.

The program will keep learning new words and associate them with the related emotions based on previous learning; the database will also be monitored from time to time for errors in recognizing the words properly and can be easily fixed.

This will be an easy to use and understand project which can be molded according to the user party and hence good flexibility is guaranteed.

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