Business Sentiment Analysis using Twitter and YouTube Comments

Project Proposal

Supervisor/Panel

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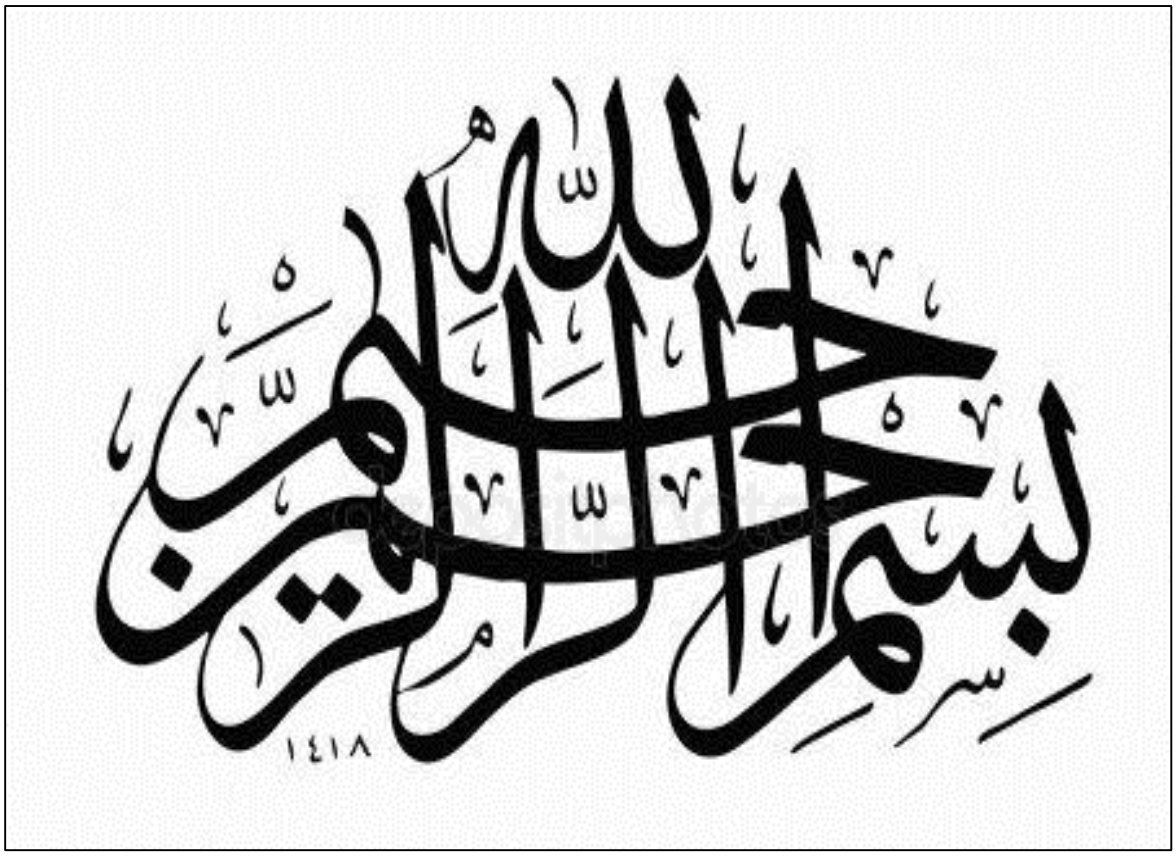

IN THE NAME OF ALLAH THE BENEFICENT THE MERCIFUL

Department of Computer Science and Software Engineering

International Islamic University, Islamabad

Final Approval

Dated: _____

It is certified that we have read the project report title "*Business Sentiment Analysis using Twitter and YouTube Comments*" submitted by Mahnoor Malik, 3901-FBAS/BSCS/F18 and Amrat-un-Nisa, 3856-FBAS/BSCS/F18 and we judge that this project is of sufficient standard to warrant its acceptance by the International Islamic University, Islamabad for the BS Degree in Computer Science.

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DEDICATION

We are grateful to our gracious **ALLAH ALMIGHTY** who blessed us courage and determination to complete this project. Our parents deserve our special thanks who sacrificed time and money for our education and always prayed for our success. We pray to **ALMIGHTY ALLAH** to shower His blessings on them and sustain their shadow over our head forever.

It's a great pleasure for us to extend our gratitude to our respectable supervisor, **Ms. Anum Yasmin** and **Ms. Shaista Rashid**, department of computer science, International Islamic University, Islamabad, Pakistan. They provided us proper guidance and support to complete my project. Their valuable comments and theoretical experience helped us achieving this task.

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DISSERTATION

A dissertation submitted to the Department of Computer Sciences & Software Engineering, International Islamic University, Islamabad, In particular fulfilment of requirements, for the award of the degree BS in Computer Science.

DECLARATION

We hereby declare that this website "*Business Sentiment Analysis using Twitter and YouTube Comments*" is not copied from any source as we have our own idea and efforts to make that idea into reality. It is further declared that we have done this project with our efforts and with the guidance of our teacher and supervisor **Ms. Anum Yasmin** and **Ms. Shaista Rashid**. No portion of the work presented in this report has been submitted in support of any application for any other degree or qualification of this or any other university or institute of learning.

Mahnoor Malik (3901-FBAS/BSCS/F18)

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First of all, we are thankful to Allah Almighty the Merciful, the Most Beneficent and the source of all Knowledge, for granting us the courage, understanding and knowledge to complete this Project.

We are thankful to our parents, who supported us wholeheartedly in our studies and the position on which we are standing today is only possible because of their efforts.

Here we take the opportunity to acknowledge the efforts put up by some of our teachers in helping us pave our way to the ultimate end of this degree. I express my appreciation to our supervisor **Ms. Anum Yasmin** and **Ms. Shaista Rashid** for supporting and providing us with the opportunity to enhance our learning and knowledge

I would like to mention my siblings and Friends, here who were there to help us whenever we got stuck somewhere in the development or later phases.

Mahnoor Malik

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Project In Brief

Objective:	This project aims to provide a website to the users that can help them to perform sentiment analysis using twitter and youtube comments about their product or brand.
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Supervisor:	Ms. Anum Yasmin Ms. Shaista Rashid Department of Computer Science and Software Engineering, International Islamic University, Islamabad.
Date Started:	September 2021
Date Ended:	August 2022
Technologies:	Tools Used: PyCharm SqLite
System Used:	Intel core i5 8th Generation
Operating system:	Windows 10

ABSTRACT

In today's world, the field of Information Technology has advanced so much that nothing is impossible and being a student of the Computer Science and Software Engineering department we must be able to create new ideas and invent innovative software so that our society can gain some benefits from it.

Business Sentiment Analysis using twitter and YouTube comments is a web application in which python technology is used to make an innovative web portal. The traditional way to know public reviews is by different surveys. So, as today is the age of technology we think to perform this work automatically. Our system will perform sentiment analysis on English, Urdu, roman Urdu and emoji comments from the post uploaded on twitter and YouTube. This system will display the graphs which shows the ratio of negative and positive comments. It will also give some suggestion to the organization based on the reviews of public.

Table of Contents

Chapter 1
Introduction

1. Introduction:

The requirements and scope of the system are introduced in this chapter. From the point of view of the end-user, this study describes the requirements and goals for designing this software.

1.1 Introduction of the Project:

To know public opinion about any company or product different surveys, elections, etc. are performed. But these methods are quite expensive in both perspectives; time and money. As today is the age of technology, almost all tasks are performed with the help of technology. So, we decide to develop a web-based application, Business Sentiment Analysis, which is based on comments on social media (YouTube, Twitter) posts. It will help different businesses to check the reviews of the people about their product as well as business, with the help of different pictorial representation (charts) and will give suggestion according to comments, how to improve their business or product?. People upload a photo or video of their business or product on YouTube and Twitter and paste the link of that post in this web, comments on that post, and retweets will display different charts that will show the ratio of negative and positive comments and will give some suggestion based on the comments. If comments are negative then it will suggest why people are disliking that product and give suggestions (by analyzing comments) on how to improve that product/Organization.

1.2 Purpose:

The purpose of developing this project is to provide a platform for businesses and organizations to know public reviews about their organization or product. They can easily know with the help of a graph whether the public is liking their organization/product/services or not. Using this system, they also get some suggestions from comments (what changes should perform to improve the product? How to improve the product? Etc.).

1.3 Project Motivation:

As today is the age of technology everything is automated which saves people time, effort, and money. Every other person is using YouTube and Twitter. According to a report 2.3 billion active YouTube users and 206 million users worldwide. So, by YouTube and

Twitter comments we perform sentiment analysis. The real motivation of this project is that there is not any website exists that perform sentiment analysis on comments in Urdu, Roman Urdu, English, and emoji.

1.4 Scope:

The target audience of our system is organizations (profitable/non-profit) only who want to know public reviews about their organization/products. As the system is a web-based application and can be accessed from anywhere can make the scope of the system wider. The scope of this project is to analyze customers' sentiments by Twitter and YouTube comments on some specific posts. It will help users to improve business with the help of graphs (obtained after analysis) and suggestions were given by the system.

Chapter 2
Problem Analysis

2. Problem Analysis:

This chapter will address the existing way of knowing customers' reviews about the company or any product, difficulties faced by the company from an existing system. This chapter will also discuss the proposed system and this system will effectively work for solving the problems faced by the existing system.

2.1 Existing System:

To know public reviews about any company or product different surveys are performed. Now many sentiment analysis systems are available that extract comments in the English language from Twitter and YouTube and some systems extract comments in Urdu language and roman Urdu. But no system is available that extracts comments and performs sentiment analysis on the comments in English, Urdu, Roman Urdu, and emoji both from YouTube and Twitter simultaneously.

2.2 Drawbacks in the existing system:

Existing systems perform sentiment analysis from YouTube comments and Twitter either in English or the in the Urdu language. But no system is available that help brand to know customer reviews and take suggestion from comments from YouTube and Twitter in English, Urdu, Roman Urdu, and emoji.

2.3 Proposed System:

Our system is a web application in which we design a real-time sentiment analysis for businesses that will help also provide benefits to the companies and eliminate the chance of resources loss (that was wasted during different surveys) as well as data loss. Our system provides the functionality for the organizations (i.e. profitable and non-profitable). It will help different businesses to know whether people are appreciating their company/product or not. Brand upload any picture/video of a product or company (about which they want to know customers review) on Twitter and YouTube. On our website, they will paste the links to their posts. By performing different operations in different languages three graphs will display that tell user public review about his/her company/product. Our system will give some suggestions to the user about his/her product based on comments.

2.4 System Modules:

This website has the following modules.

- Brand/company.
- YouTube.
- Twitter.

2.5 Developing Environment:

- **PyCharm:**

  The development and coding will be done in Pycharm. Python; Django framework will be used at frontend coding.

- **SqLite:**

  It will be used as a backend repository. All the records and information will be saved here.

- **Operating system:**

  Window 10.

2.5.1 Hardware Specifications of the Developing Environment:

The system will be developed using the following hardware specifications:

Processor:	Intel Core i5.
Generation:	8^{th}.
RAM:	8.00GB.
Hard Disk:	112GB.

2.6. Stakeholders:

- Developer
- Tester
- Twitter
- YouTube

- User/Brand/Company

2.7 Actor Goal List:

2.8.1 User:

- Create an account on Twitter and YouTube and log in.
- Post on Twitter and YouTube.
- Copy the URL of the specific product.
- Create an account on the website.
- Login.
- Paste the Youtube or Twitter URL of the specific product on the website.
- Submit the URL.
- View the reviews of the customers related to the product.

Chapter 3
System Analysis

3. System Analysis:

System analysis is a task that links and connects the system-level requirement and the designing of the software. It helps in designing the document based on analysis gathered by requirement engineering.

3.1 Problem Overview:

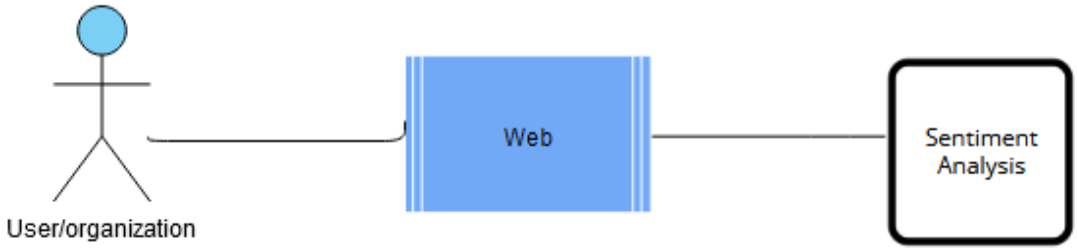


Figure 3.1 Problem Overview

3.2 Specific Requirements:

Specific requirements are categorized as functional and non-functional requirements and discussed below.

3.2.1. Functional Requirements:

Functional requirements are the requirements that a system should perform. Software Module is the subunits of a system called modules that are designed and developed according to the user's requirements and priority. Following are the modules of Study Abroad Web Portal:

BRAND (USER):

3.2.1.1. Register User:

If a user is new to the system then he has to register himself to the system by providing the necessary information.

3.2.1.2. Sign in:

Users will log in to the website through an already registered account by providing credentials.

3.2.1.3. Register on Twitter and YouTube:

Brand/user must have to register on Twitter and YouTube for post sharing.

3.2.1.4. Sign in to Twitter and YouTube:

User will log in to Twitter or YouTube and both if he is already registered.

3.2.1.5. Upload Post on Twitter and YouTube:

The brand will upload post/posts on Twitter or YouTube and both app. The brands will explain their product by providing the detail of that product that has been uploaded.

3.2.1.6. Copy post's link:

The brand will copy the links of the posts that are uploaded on Twitter or YouTube or both for public reviews.

3.2.1.7. Submit:

Brand/user will click on submit button for further processing.

3.2.1.8. View reviews ratio and suggestions:

Brand/user will view the graphs that show the ratio of positive and negative comments and the system will also give suggestion to the user based on the reviews generated by comments.

3.2.1.9. Log out:

Log out to the system by clicking the log out button.

SYSTEM:

3.2.1.10. Request to Twitter and YouTube:

The system sent the request to Twitter and YouTube for API.

3.2.1.11. Comments Extraction:

The system will extract the comments by using the API that was provide by YouTube as well as Twitter.

3.2.1.12. Store Comments:

The system will store the comments in database for further processing.

3.2.1.13. Display Reviews:

The system will generate the result by using the comments after processing perform on the comments, the system tells about the posted product either it goes toward the positive reviews ratio or the negative reviews.

3.2.1.14. Give Suggestions:

The system will provide suggestions on the basis of the generated result. If the posted product goes toward positive reviews ratio the system suggests the brand should lunch that product. If the posted product goes toward the negative reviews ratio the system suggests the brand should be changed that specific attribute that does not fulfill the requirement of the viewers.

3.2.2. Non Functional Requirements

Non-functional requirements are the limitations that are very critical to ensure the working of functional requirements and usability and effectiveness of the system. Non-functional requirements are constraints to the system that enhance the functionality. To implement the Business Sentiment Analysis using Twitter and YouTube Comments, we need to consider the following non-functional requirements:

3.2.2.1. User Friendly:

Our system is user friendly because the interface is simple. Color used in this website are also very professional and user friendly. User simply login the web and then paste the links of uploaded posts on twitter and YouTube. Click the submit button. After that pie charts and suggestion will show to the user.

3.2.2.2. Maintainability:

Business Sentiment Analysis Using Twitter and YouTube Comments website is easy to maintain. As specific work is performed in specific class with proper comments. We use agile method that support changes. Proper UML diagrams is provided to maintain the maintainability of our system.

3.2.2.4. Performance:

We preload the critical resources using **`preload`** and **`preconnect`** attributes. Images are not used and no need to send the request again and again to the server that may cause the delay. Python is used which is very powerful and fast language for machine learning algorithms.

3.2.2.5. Usability

The **Business Sentiment Analysis using Twitter and YouTube Comments** is simple to use. Interface and color combination of website is straightforward and professional. Even a person who is not tech aware can use this website easily.

3.3 Use Case:

3.3.1. Use Case Diagram for Sentiment Analysis Using Twitter and YouTube Comments

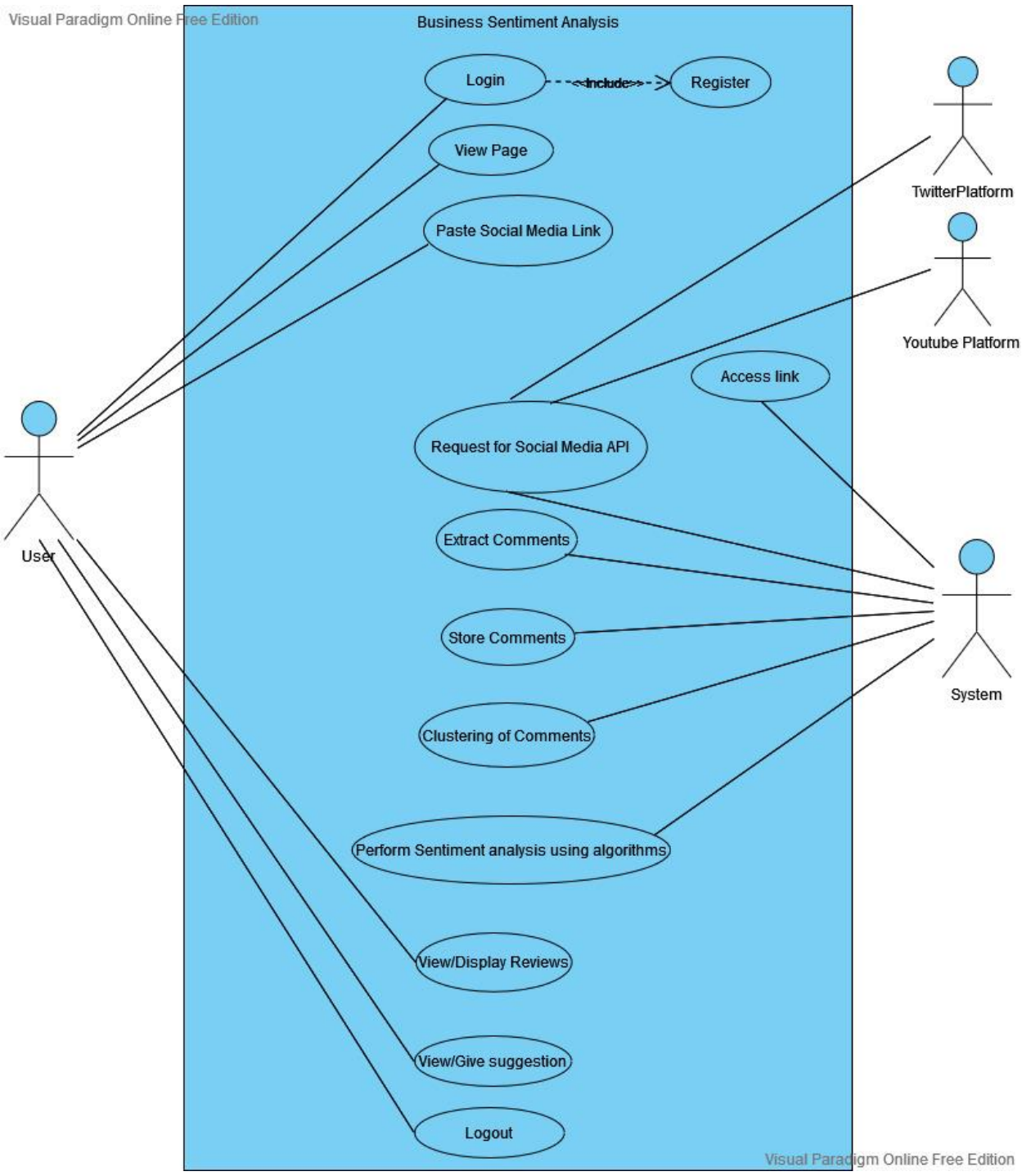


Figure 3.3.1 1 Use Case Diagram for Business Sentiment Analysis using twitter and YouTube comments

3.3.2. Fully Dressed Use Case:

3.3.2.1. Register:

UC-01	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Primary Actor	Organization/brand
Stakeholders & Interests	The organization wants to Sign Up to access the system.
Pre-Conditions	1. User open the web. 2. User enters details.
Post Conditions	The user register into the system successfully and the page is shown.
Main Success Scenario	
Actor	**System**
1. The user select the “Register” option. 2. The user enters the required credentials.	1.1 The system shows the signup interface. 2.1 The system verifies the entered information. 2.2 If the information is correct, the system successfully signup the student. 2.3 If the information is not correct, the system displays the error message.
Alternate Scenario	If same email is already in database system will display the message “This email already exist.”

Table 3.3.2.1 Use case for Register

3.3.2.2. **Login:** (to system)

UC-02	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	User Goal
Primary Actor	User
Stakeholders and Interests	User: The user wants to login into the system.
Pre-Conditions	1. Users open the system. 2. Users select the "Log In" option. 3. A user enters details.
Post Conditions	The user login successfully into the system interface that has been displayed.
Main Success Scenario	1. User enters details. 2. User successfully login.
Alternate Scenario /Extensions	1. If the user enters an incorrect user name and password. 1.1. The system displays the invalid user name or password to the user and asks the user to enter valid Information for login into the system.
Specific Requirement	Password should be secure.
Frequency of occurrence	Many times, during a day

Table 3.3.2.2 Use case of Login

3.3.2.3. **View Page:**

UC-03	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	User goal

Primary Actor	User
Stakeholders and Interests	The user views the page for performing further operations.
Pre-Conditions	The user must log in to the system.
Post Conditions	The system will paste the links of the posts from Twitter and YouTube for sentiment analysis.
Main Success Scenario	1. The user will view the page.
Alternate Scenario /Extensions	Website struck reload the website.
System Requirement	Must enter proper login details.
Frequency of occurrence	Many times in a day.

Table 3.3.2.3 Use case of View Page

3.3.2.4. Paste YouTube Link:

UC-04	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	User goal
Primary Actor	User
Stakeholders and Interests	The user paste the links of the YouTube posts.
Pre-Conditions	1. The user must copy the link of the uploaded post of YouTube. 2. Also, users must log in to the system.
Post Conditions	The system will send API request to the YouTube for extraction of comments.

Main Success Scenario	1. The user should copy the link of the uploaded post of YouTube 2. The user should log in to the system. 3. The user paste the link of uploaded posts on YouTube into the text field.
Alternate Scenario /Extensions	Website struck or server down. Reload the website and again paste the link.
System Requirement	The user must have the link of YouTube post.
Frequency of occurrence	Many times in a day.
Miscellaneous	The user must have a login on the system also copy the link of the uploaded post.

Table 3.3.2.4 Use case of Paste YouTube Link

3.3.2.5. Paste Twitter Link:

UC-05	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	User goal
Primary Actor	User
Stakeholders and Interests	The user paste the links of the Twitter posts.
Pre-Conditions	3. The user must copy the link of the uploaded post of Twitter. 4. Also, users must log in to the system.
Post Conditions	The system will send API request to the twitter for extraction of comments.
Main Success Scenario	1. The user should copy the link of the uploaded post on Twitter. 2. The user should log in to the system. 3. The user paste the link of uploaded posts on Twitter into the given text box.

Alternate Scenario /Extensions	Website struck or server down. Reload the website and again paste the link.
System Requirement	The user must have the link of twitter post.
Frequency of occurrence	Many times in a day.
Miscellaneous	The user must have a login on the system also copy the link of the uploaded post.

Table 3.3.2.5 Use case of Paste Twitter Link

3.3.2.6. View Reviews:

UC-06	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	User goal
Primary Actor	User
Stakeholders & Interests	The user will view the ratio of negative and positive comments and shows different graphs.
Pre-Conditions	1. The user Login to the system. 2. Users must upload a post on Twitter and YouTube. 3. User paste the uploaded posts link for sentiment analysis.
Post Conditions	Users will view the ratio of negative and positive comments by the graph and clusters of different languages.
Main Success Scenario	User will view different types of graphs that shows the ratio of positive and negative comments and clusters of different languages.
Alternate Scenario /Extensions	1. Invalid links.

	System will display the message "Sorry cannot view reviews kindly try again with valid links."
System Requirement	The user must upload posts and paste post's links.
Frequency of occurrence	Many times in a day.
Miscellaneous	The user must be login into the system. The user must upload posts on Twitter or YouTube and paste links into the system.

Table 3.3.2.6 Use case of View Reviews

3.3.2.7. View Suggestions:

UC-07	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	User goal
Primary Actor	User
Stakeholders & Interests	The user will view suggestions.
Pre-Conditions	1. The user Login to the system. 2. Users must upload posts on Twitter or YouTube. 3. User paste the posts link uploaded on Twitter or YouTube for sentiment analysis.
Post Conditions	Users will view suggestions given by the system based on the comments on posts.
Main Success Scenario	1. User successfully login. 2. The user should enter a valid link to the posts. 3. Users will view suggestions.

Alternate Scenario /Extensions	1. Invalid links. System will display the message "Sorry cannot view reviews kindly try again with valid links."
System Requirement	The user must upload posts on Twitter or YouTube. Paste post's links.
Frequency of occurrence	Many times in a day.
Miscellaneous	The user must be login into the system. The user must upload posts on Twitter or YouTube and paste links into the system.

Table 3.3.2.7 Use case of View Suggestions

3.3.2.8. Access Link:

UC-08	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	System goal
Primary Actor	System
Stakeholders & Interests	The system access the links.
Pre-Conditions	1. User paste the links.
Post Conditions	System access to post's pasted links.
Main Success Scenario	The system will successfully access pasted links.
Alternate Scenario /Extensions	System is busy so cannot access the link, message will display to user "again enter links."
Frequency of occurrence	Many times in a day.

Table 3.3.2.8 Use case of Access Link

3.3.2.9. Request for API:

UC-09	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	System goal
Primary Actor	System
Stakeholders & Interests	The system request for API's.
Pre-Conditions	System access the links.
Post Conditions	System will extract the comments from posts.
Main Success Scenario	Request to access the posts comments successfully given to the system from twitter and YouTube.
Alternate Scenario /Extensions	1. Invalid links. System will display the message "Sorry cannot view reviews kindly try again with valid links."
Frequency of occurrence	Many times in a day.

Table 3.3.2.9 Use case of Request for API

3.3.2.10. Extract Comments:

UC-10	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	System goal
Primary Actor	System
Stakeholders & Interests	The system will extract comments.
Pre-Conditions	The system access the links.
Post Conditions	The system extracts the comments successfully.

Main Success Scenario	1. The system successfully access the links. 2. The system extracts the comments.
Alternate Scenario /Extensions	API request deny. Error message will display “kindly again enter links.”
System Requirement	The system access the link and extract comments.
Frequency of occurrence	Many times in a day.

Table 3.3.2.10 Use case of Extract Comments

3.3.2.11. Store comments:

UC-11	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	System goal
Primary Actor	System
Stakeholders & Interests	The system store the comments in database.
Pre-Conditions	1. The system access the links. 2. The system extracts the comments successfully.
Post Conditions	The system stores comments database.
Main Success Scenario	1. The system access the links. 2. The system extracts the comments successfully. 3. System store comments in .database.
Alternate Scenario /Extensions	Database error. If data cannot store in database. Try again.

Table 3.3.2.9 Use case of Store Comments

3.3.2.12. Clustering of Comments:

UC-12	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	System goal
Primary Actor	System
Stakeholders & Interests	The system makes clusters of different languages.
Pre-Conditions	1. The system access the links. 2. The system extracts the comments successfully. 3. System store comments.
Post Conditions	The system will make clusters of different languages by different algorithms.
Main Success Scenario	1. System store comments. 2. The system will make clusters of different languages.
Alternate Scenario /Extensions	Again extract the comments the make the clusters of different languages.

Table 3.3.2.12 Use case of Clustering of Comments

3.3.2.13. Perform Sentiment Analysis

UC-13	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	System goal
Primary Actor	System
Stakeholders & Interests	The system will perform sentiment analysis on clusters of different languages.
Pre-Conditions	1. The system will extract comments.

	2. Clusters of different languages are formed.
Post Conditions	1. The system will perform sentiment analysis on different clusters. 2. The system will display the graphs also give a suggestion to the user.
Main Success Scenario	1. The system extracts YouTube and Twitter comments. 2. Clusters of different languages are made. 3. Sentiment analysis was performed on different clusters of different languages.
Alternate Scenario /Extensions	Ask user to again paste the links.
System Requirement	Proper clusters of different languages are formed.
Frequency of occurrence	Many times in a day.
Miscellaneous	1. The user must be login into the system. 2. Paste twitter or youtube post link.

Table 3.3.2.13 Use case of perform Sentiment Analysis

3.3.2.14. Display Reviews:

UC-14	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	System goal
Primary Actor	System
Stakeholders & Interests	The system will display the graphs to tell the positive ration and negative ratio.
Pre-Conditions	The system must extract the comments.
Post Conditions	The system will display the pictorial representation of the extracted comments.

Main Success Scenario	1. The user must have pasted the link of the brand product into the system. 2. The system will extract the comments by using the pasted link of the user. 3. The system will display the pictorial representation of the extracted comments.
Alternate Scenario /Extensions	1. Again apply sentiment analysis algorithms. 2. Ask user to again paste the links.
System Requirement	The user should paste the valid link of the brand product on the system.

Table 3.2.2.14 Use case of Display Reviews

3.3.2.15. Give Suggestions:

UC-15	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	System goal
Primary Actor	System
Stakeholders & Interests	The system will give the suggestions to the user also the user will be able to see these suggestions.
Pre-Conditions	The system must have extracted the comments of the brand product's post.
Post Conditions	The system will display the suggestions to the user by performing feature extraction on comments.
Main Success Scenario	1. The system must have to extract the comments

	2. The system must display the suggestions based on the comments to the user.
Alternate Scenario /Extensions	1. Again apply sentiment analysis algorithms. 2. Ask user to again paste the links.
System Requirements	The system must have a valid link to the brand product that have been posted.

Table 3.3.2.15 Use case of give suggestions

3.3.2.16. Logout: (from system)

UC-16	
Scope	Business Sentiment Analysis Using Twitter and YouTube comments.
Level	user goal
Primary Actor	user
Stakeholders and Interests	User: The user wants to log out from the system after displaying the result of the brand-specific product.
Pre-Conditions	Users must be login into the system.
Post Conditions	The user logs out successfully from the system.
Main Success Scenario	The user logout from the system after the system will displaying the result of the brand to the specific product.
Alternate Scenario /Extensions	Display message “logout error try again.”
Specific Requirement	The user must be login.
Frequency of occurrence	Many times during a day

Table 3.3.2.16 Use case of Logout on System

3.4 System Sequence Diagram:

3.4.1. Sign In:

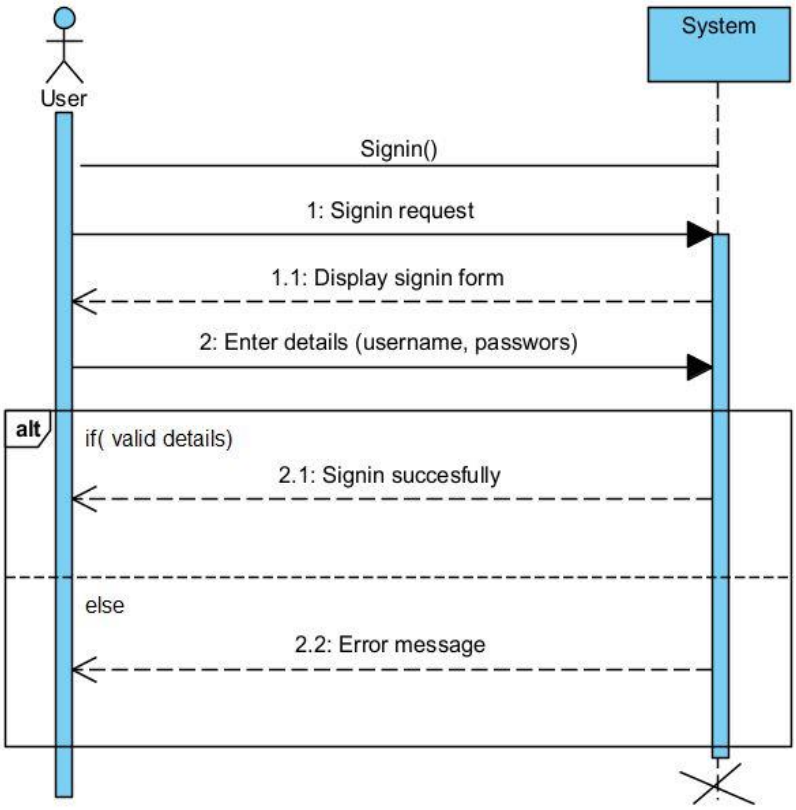


Figure3.4.1 System Sequence Diagram for Sign in (Samsoodeen)

3.4.2. Paste YouTube and Twitter Post Link:

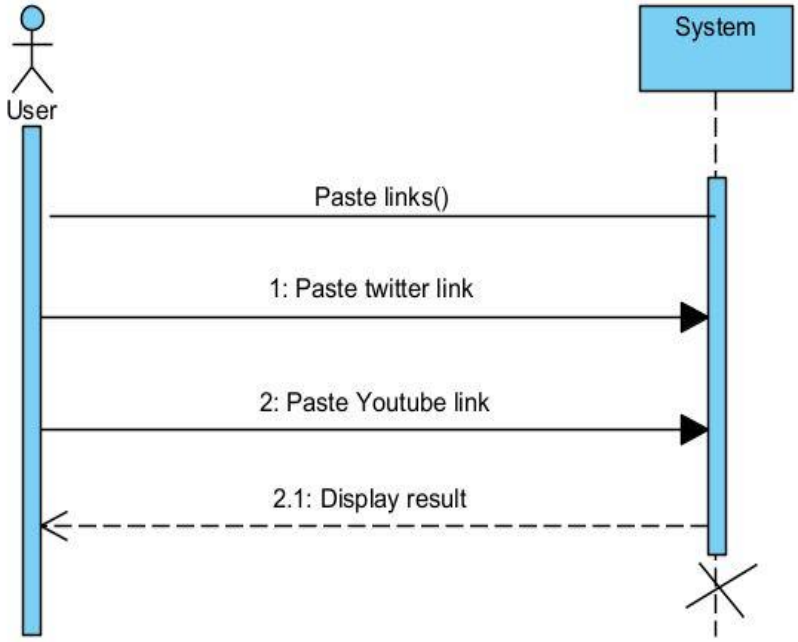


Figure 3.4.2 System Sequence Diagram for Post Link

3.4.3. View Suggestions:

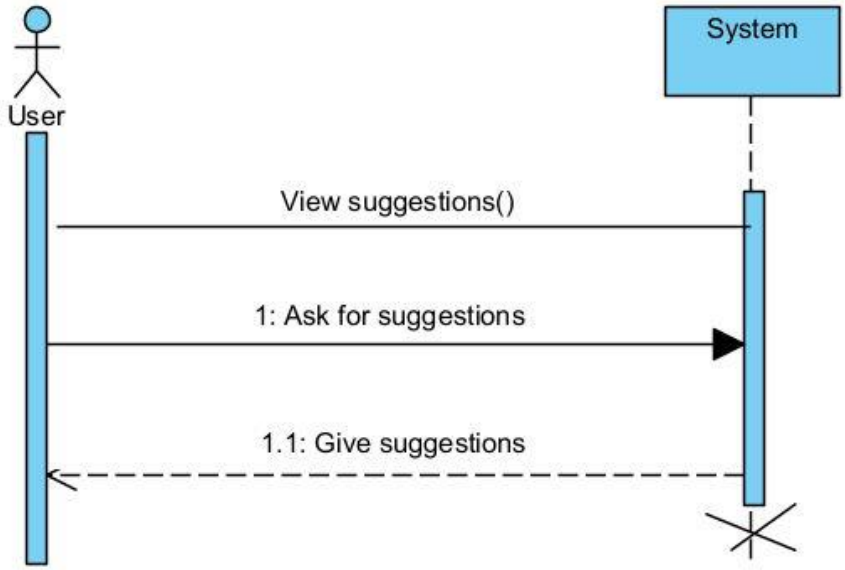


Figure 3.2.3 System Sequence Diagram for View Suggestion

3.4.4. View Reviews:

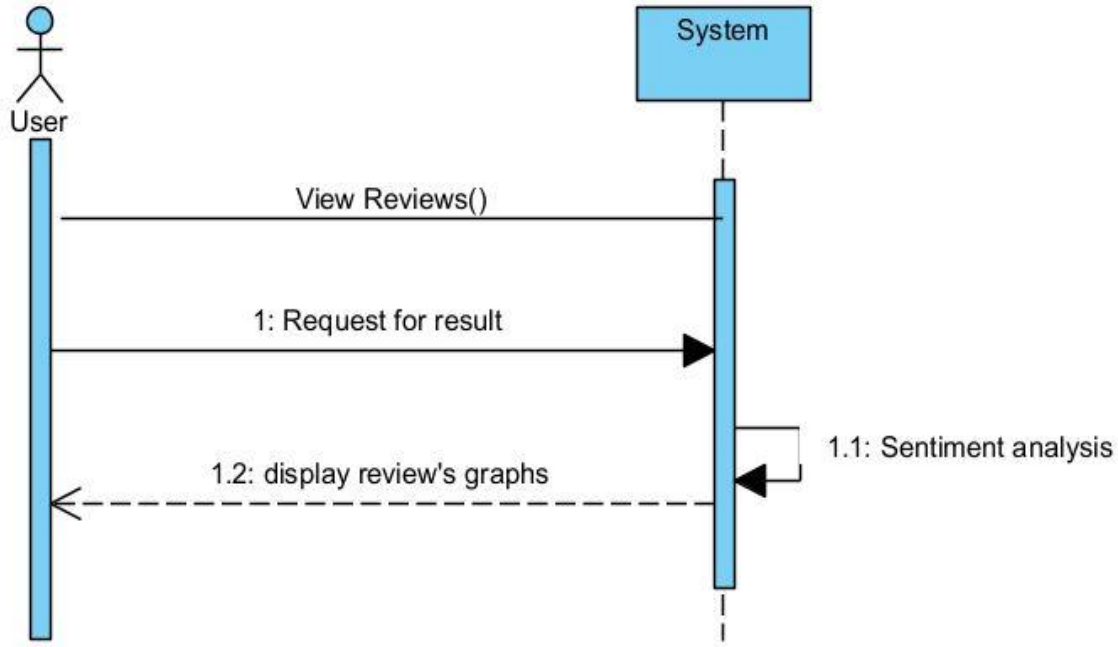


Figure 3.4.4 System Sequence Diagram for View Reviews

Chapter 4
System Design

4. System Design:

4.1. Activity Diagram:

4.1.1. User Side:

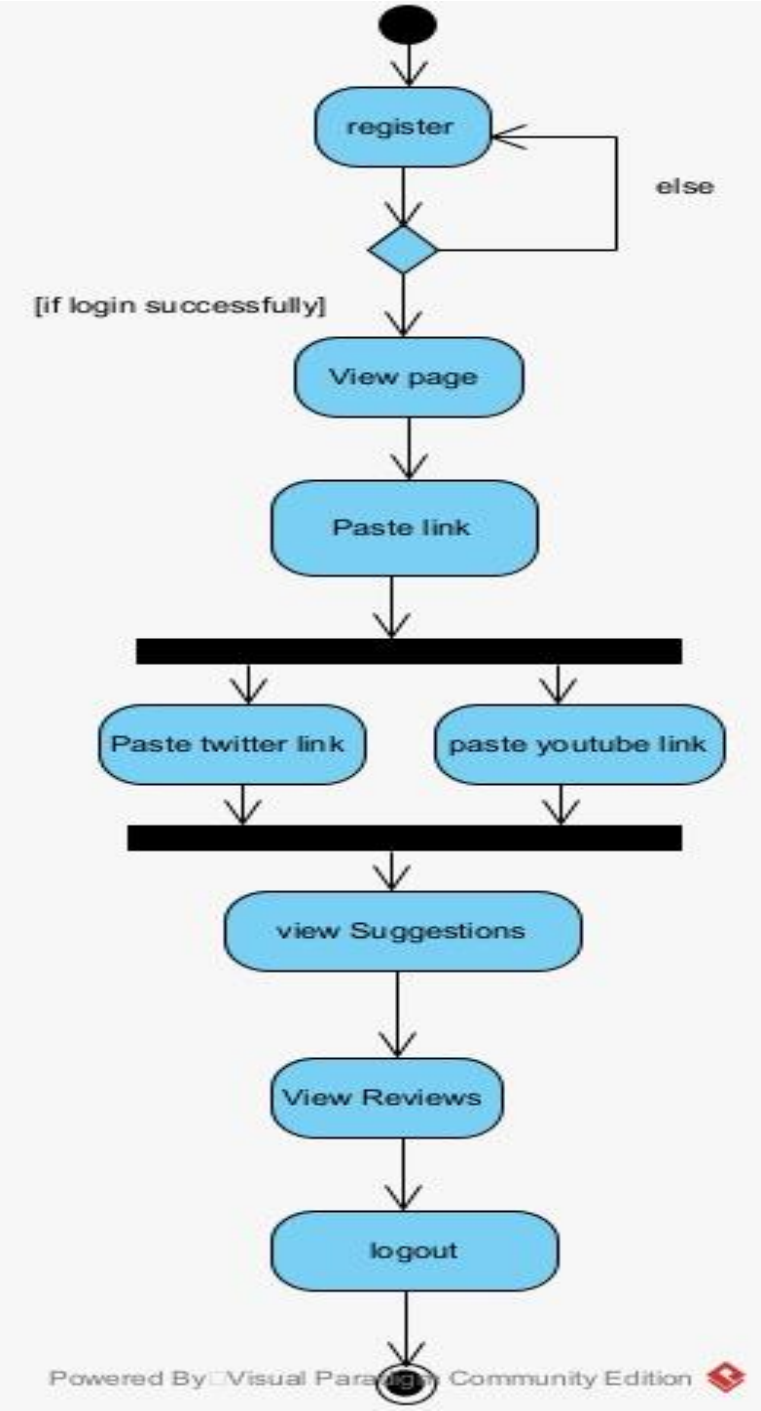


Figure 4.1. Activity Diagram for User side

4.1.2. System Side:

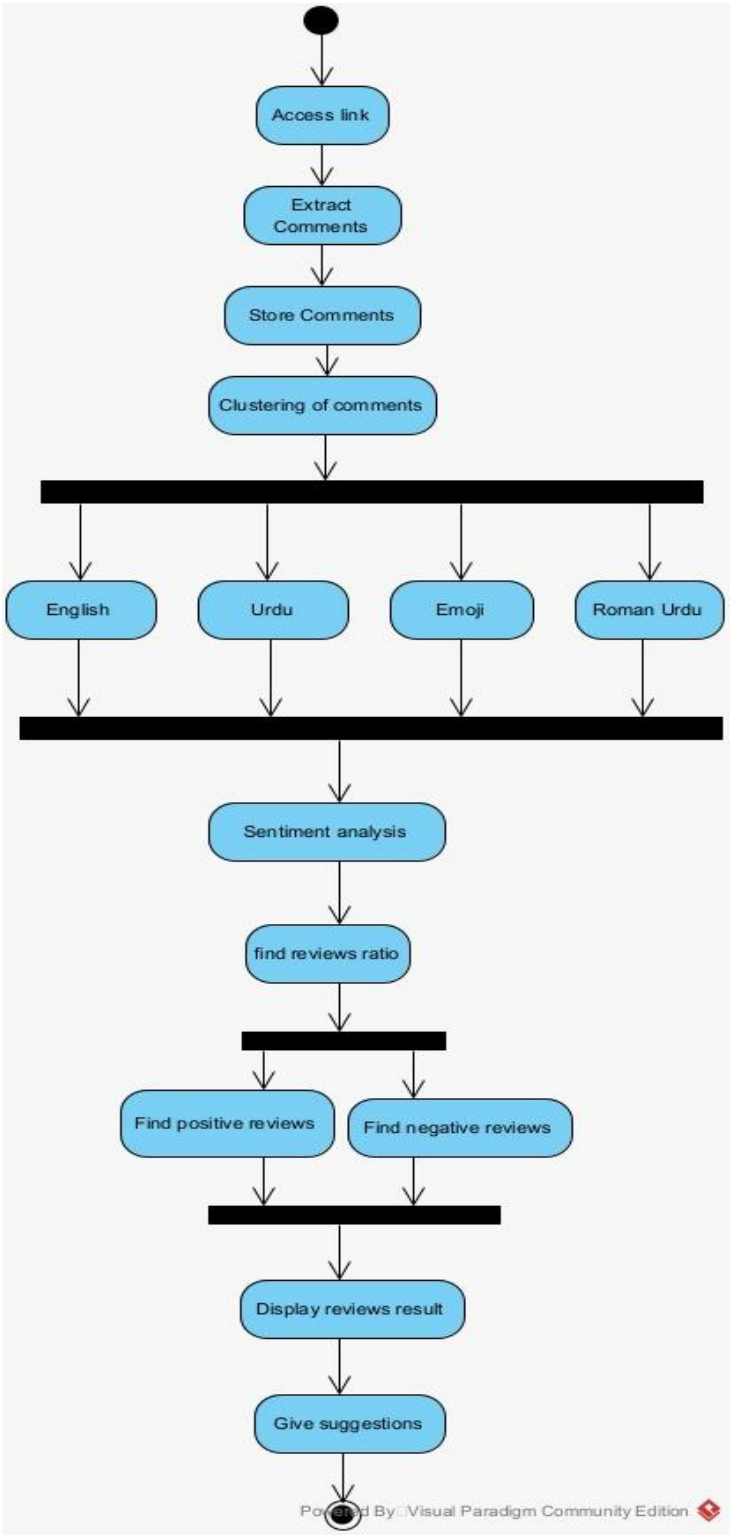


Figure 4.2. Activity Diagram for System

4.2. ERD:

The ERD of Business Sentiment Analysis Using Twitter and YouTube comments is normalized to 3rd normal form.

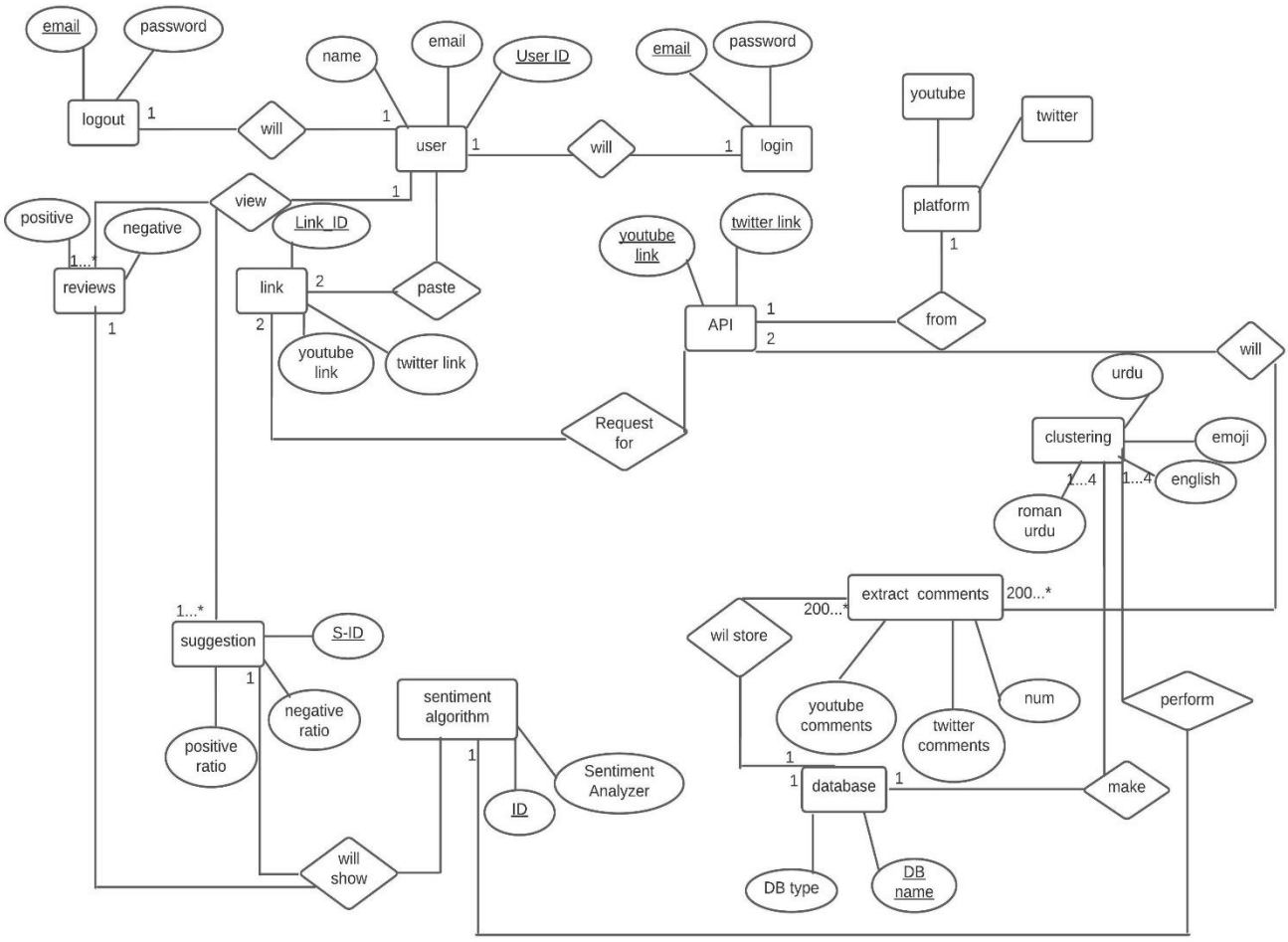


Figure 4.3 ERD for Business Sentiment Analysis using Twitter and YouTube Comments

4.3. Class Diagram:

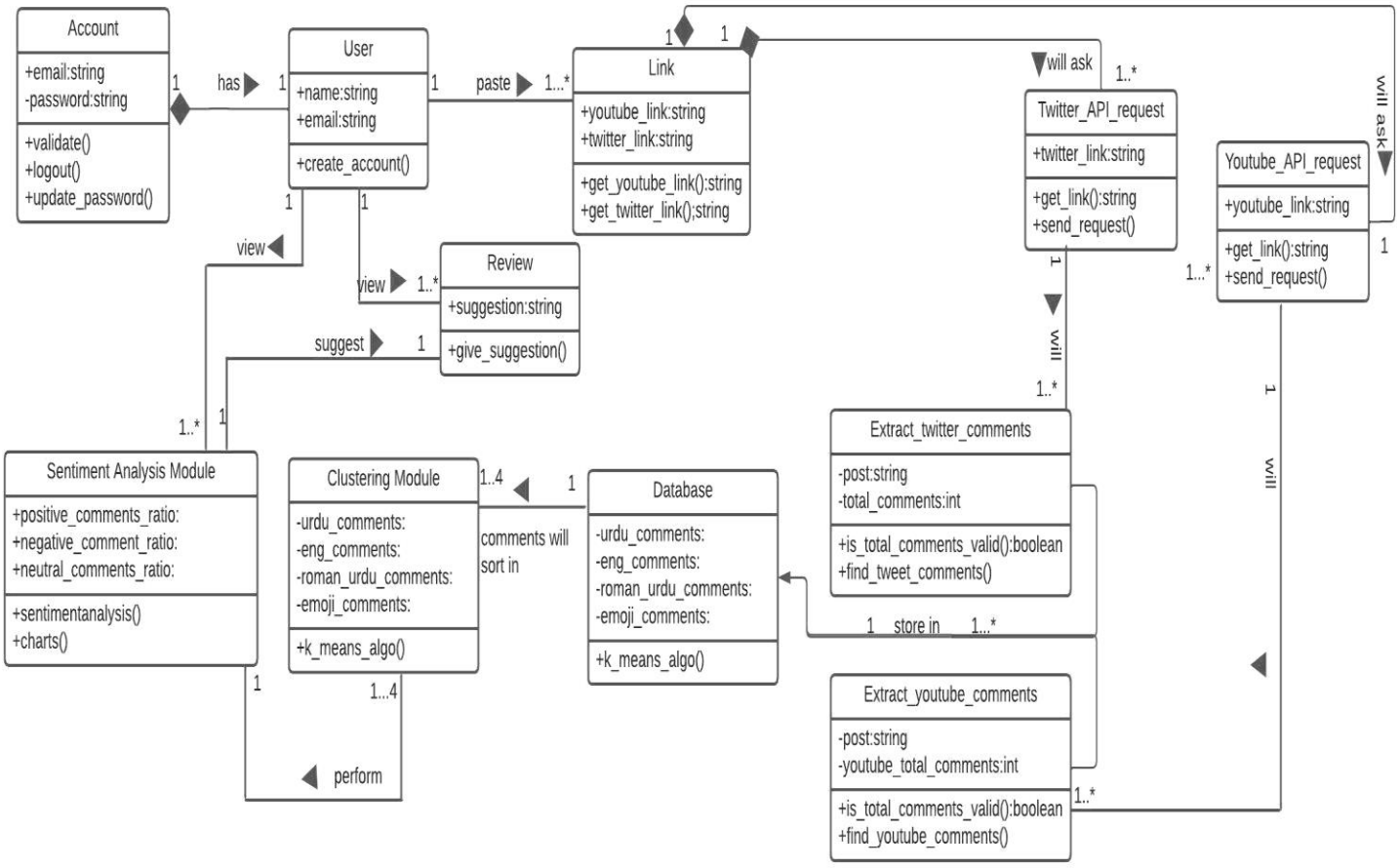


Figure 4.4 Class Diagram for Business Sentiment Analysis using Twitter and YouTube Comments

Chapter 5
Implementation

5. Implementation:

5.1. Software Development Model:

The software development model used for the *Business Sentiment Analysis using Twitter and YouTube Comments* is the Iterative Software Development Model. The purpose of using this development model is to develop a system through repeated cycles. This will allow the developer to learn from previous versions of the system. The developer will learn from both the development and use of the system and will help in enhancing and evolving the versions until the full system is implemented.

5.2. Development Tools:

The tools used for implementing the *Business Sentiment Analysis using Twitter and YouTube Comments* are:

- PyCharm 2021.3.3
- MySQL

5.3. Reason for using above mentioned tools:

5.3.1. PyCharm 2021.3.3:

PyCharm is a tool used to run code in Python language. It is one of the best Python IDEs around. It supports many complex programming like image processing etc. It supports many framework e.g. Django, Flask etc. We use Django framework. It is high-level Python web framework that enables rapid development of secure and maintainable websites.

5.3.2. Microsoft SQL Server Management Studio:

SQL Server Management Studio is used to easily do database and server related tasks. It quickly creates and modifies the database and provide store procedures as well. We can connect the database with IDE and query to get runtime results. Also, it provides a backup database and restores the database. It is cost-free and provides an advanced user experience.

Chapter 6
Testing

6. Testing:

Testing in software is an analysis that is conducted to provide information about the quality of software. It is a process that helps to identify the completeness, correctness and quality of software. The purpose of testing is to find the defects in the system. Testing helps to establish the confidence that the system does what it is supposed to do. It also helps to minimize the uncertainties and potential errors. So, testing gives confidence and satisfaction to both tester and user and provide certainty of quality to all the concerned plaintiffs.

6.1. Test Cases:

6.1.1. Register:

Test Case ID	TC-01	
Test Case Name	**Register**	
Functionality to be Tested	The company/organization wants to register to access the system.	
Actors	company/organization, User	
Pre-Requisites	The company/organization is not signed up from an already existing account	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. The user clicks the "Register" button from the website. 2. The user enters email: 'mahnoor@gmail.com' in and password: mahnoor123. 3. The user enters 'mahnoor.gmail.com' in and password: mahnoor123. 4. Enter empty value for email.	1. The system shows the signup screen to the user. 2. Account created successfully. 3. Display error message "Enter a valid email address". 4. Display message "Please fill out this field".	1. Pass 2. Pass 3. Pass

5. Enter an empty value for Password. 6. Enter 'mahnoor@gmail.com' in the email field. 7. Enter password "hi123"	5. Display message "Please fill out this field". 6. Display error message "Email already exists. 7. Display error message "Please use atleast 6 characters".	4. Pass 5. Pass 6. Pass 7. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20,2022	

Table 6.1.1 Test case for Register

6.1.2. Log In:

Test Case ID	TC-02	
Test Case Name	Log in	
Functionality to be Tested	The user wants to log in to access the system.	
Actors	company/organization, User	
Pre-Requisites	The user is not signing up from a non-existing account.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. The user clicks the "LOGIN" button from the website. 2. The user enters email: 'mahnoor@gmail.com' in and password: mahnoor123 and clicks button. 3. Enter the incorrect email address and password.	1. The system shows the sign-in screen to the user. 2. Login Successfully. 3. System clear the password field and again ask for credentials.	1. Pass 2. Pass 3. Pass

4. Enter an empty email address and a filled password. 5. Enter the email address and empty password.	4. Show message “Please fill out this field”. 5. Show message “Please fill out this field”.	4. Pass 5. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20,2022	

Table 6.1.2 Test case for Sign In

6.1.3. View Page:

Test Case ID	TC-03	
Test Case Name	View Page	
Functionality to be Tested	Dashboard shown to user.	
Actors	Company/Organization, User	
Pre-Requisites	User must be signed in.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. User login to the system. 2. Dashboard shown to user with two buttons “Twitter Analysis” and “Youtube Analysis”.	1. The system shows the dashboard screen to the user. 2. The system shows the dashboard screen to the user.	1. Pass 2. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Table 6.2 Test case for View Page

6.1.4. Paste Twitter Link:

Test Case ID	TC-04	
Test Case Name	Paste Twitter Link	
Functionality to be Tested	User paste the Twitter post link for sentiment analysis.	
Actors	Organization/company, User	
Pre-Requisites	User is signed in. User clicks on Twitter analysis from dashboard.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. The user clicks on the "Twitter Analysis" button from the dashboard. 2. User paste the twitter post link in the given dialogue box and click on "Submit" button. 3. User does not paste the link and click "Submit" button.	1. The system display the page that show the text box to paste Twitter post URL. 2. The system validates the field and redirect to next page. 3. Show message "Please fill out this field".	1. Pass 2. Pass 3. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.4 Test case for Paste Twitter Link

6.1.5. Paste Youtube Link:

Test Case ID	TC-05	
Test Case Name	Paste Youtube Link	
Functionality to be Tested	User paste the Youtube post link for sentiment analysis.	
Actors	Organization/company, User	
Pre-Requisites	User is signed in. User clicks on Twitter analysis from dashboard.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. The user clicks on the "Youtube Analysis" button from the dashboard. 2. User paste the youtube post link in the given dialogue box and click on "Submit" button. 3. User does not paste the link and click "Submit" button.	1. The system display the page that show the text box to paste Youtube post URL. 2. The system validates the field and redirect to next page. 3. Show message "Please fill out this field".	1. Pass 2. Pass 3. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.5 Test case for Paste Youtube Link

6.1.6. Request for API:

Test Case ID	TC-06
Test Case Name	**Request for API.**

Functionality to be Tested	System request for API.	
Actors	System	
Pre-Requisites	User must paste the proper link of post.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. User paste the post link and click “Submit” button.	1. System will request for the API to extract comments.	1. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.6 Test case for Request for API

6.1.7. Extract Comments:

Test Case ID	TC-07	
Test Case Name	**Extract Comments**	
Functionality to be Tested	System extract comments to perform sentiment analysis.	
Actors	System	
Pre-Requisites	API request accepted by platform.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. System will extract the comments after accepting the API request.	1. System will extract the comments from specific post that’s link is posted by user.	1.Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.7 Test case for Extract Comments

6.1.8. Store Comments:

Test Case ID	TC-08	
Test Case Name	**Store Comments**	
Functionality to be Tested	System store the comments in database.	
Actors	system	
Pre-Requisites	System extract the comments.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. The system store the comments in database.	1. System store the comments in database after extracting comments from the specific post.	1.Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.8 Test case for Store Comments

6.1.9. Clustering of Comments:

Test Case ID	TC-09	
Test Case Name	Clustering of Comments.	
Functionality to be Tested	System make the four different clusters of comments for each language i.e. English, Urdu, Roman Urdu and Emoji.	
Actors	System	
Pre-Requisites	System extract and store the comments.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**

1. System make the clusters of comments for each language.	1. The system successfully make the clusters of comments of each language i.e. English, Urdu, Roman Urdu and Emoji	1. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.9 Test case for Clustering of Comments

6.1.10. Perform sentiment Analysis:

Test Case ID	TC-10	
Test Case Name	**Perform Sentiment Analysis**	
Functionality to be Tested	System successfully perform sentiment analysis on each cluster of comments and overall.	
Actors	System	
Pre-Requisites	System extract the comments and make clusters of comments.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. The system perform sentiment analysis on comments.	1. System perform sentiment analysis on each cluster of comments and perform overall sentiment analysis.	1.Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.10 Test case for Perform Sentiment Analysis

6.1.11. View Reviews:

Test Case ID	TC-11
Test Case Name	**View Reviews**

Functionality to be Tested	System display reviews to the user with the help of different types of graphs.	
Actors	User	
Pre-Requisites	User paste the link of post.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. User paste the link of post and click “Submit” button.	1. The system shows the reviews to the user (after performing sentiment analysis) with the help of different types of graphs.	1.Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.11 Test case for View Reviews

6.1.12. View Suggestion:

Test Case ID	TC-12	
Test Case Name	**View Suggestion**	
Functionality to be Tested	The user view the suggestion given by the system based upon the comments.	
Actors	User	
Pre-Requisites	User paste the proper link of post.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. The user paste the link of post and click on “Submit” button.	1. The system gives the suggestion to the user based on the comments that are extracted from the specific post.	1. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20, 2022	

Figure 6.1.12Test case for View Suggestion

6.1.13. Logout:

Test Case ID	TC-13	
Test Case Name	**Logout**	
Functionality to be Tested	The user wants to log out from the portal.	
Actors	User	
Pre-Requisites	The user is signed in.	
Actions to Perform	**Expected Results**	**Actual Results (Pass/Fail)**
1. The user clicks on the "Logout" button in the top right corner.	1. The system logout the user from the system. 1.2 The system redirect the student to the login screen.	1. Pass
Test Case Engineer	Mahnoor Malik	
Date	July 20,2022	

Figure 6.1.13 Test case for Logout

Chapter 7
Conclusion

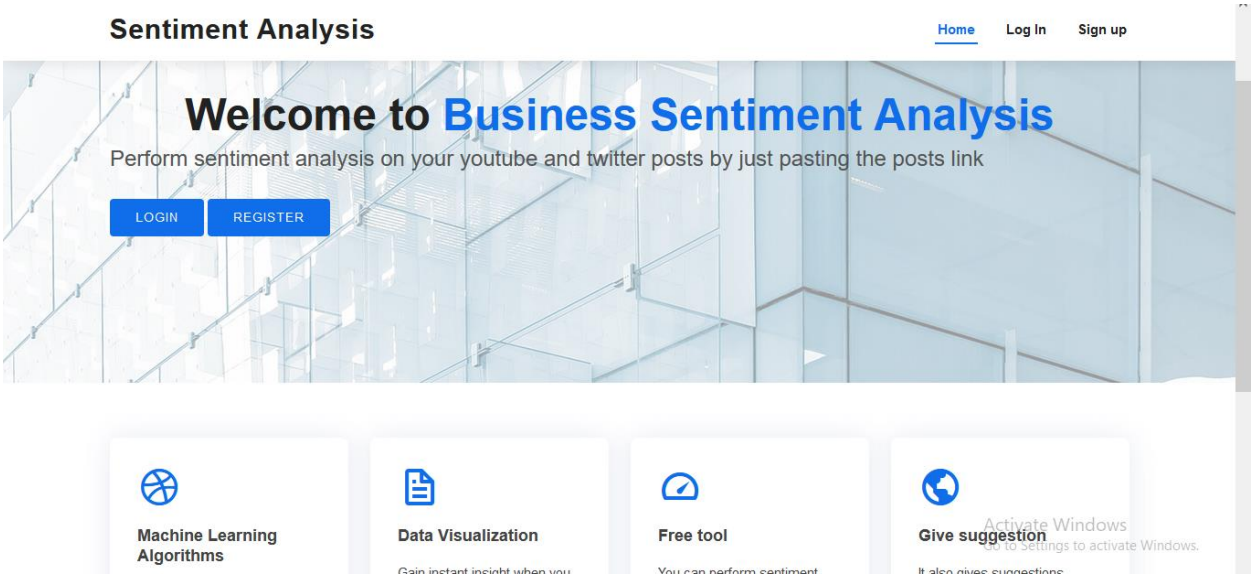
7. Conclusion:

Following are the results achieved after completing the product and matching it with the system's objective. As today is the era of technology so, *Business Sentiment Analysis using Twitter and YouTube Comments* is a website in which user/business can determine the sentiment of clients about their product or business from the comments on the uploaded post on twitter or YouTube, rather than performing traditional analysis. We used everything that we have learned in my degree. *Business Sentiment Analysis using Twitter and YouTube Comments* is a complete software that helps users to know people sentiment about their brand/product/business.

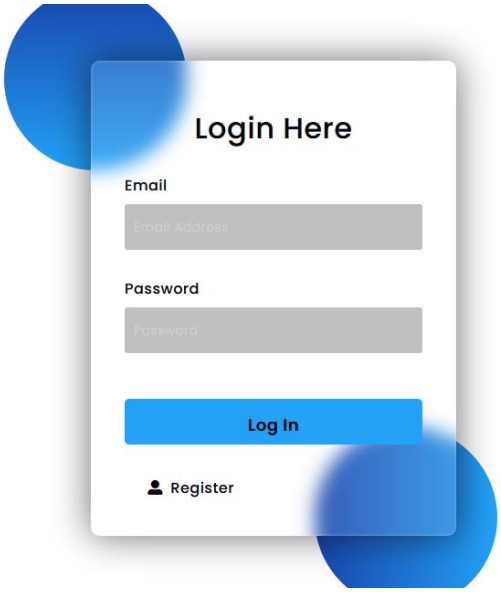
7.1. Future Enhancement:

The future scope of this system will be the using more languages to perform sentiment analysis on more languages.

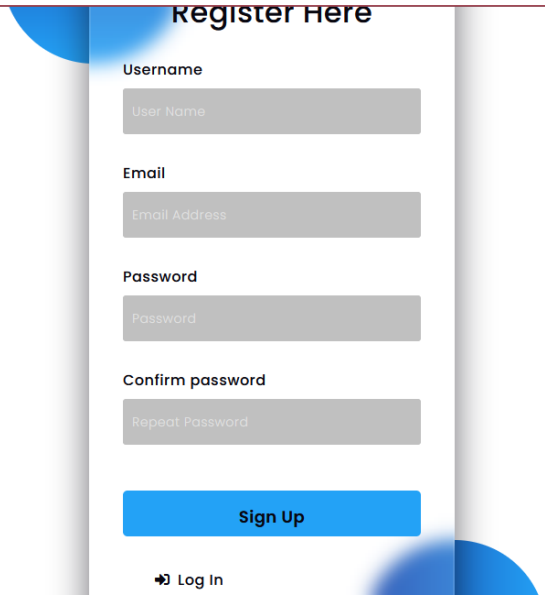
7.2. Screenshots of Website:



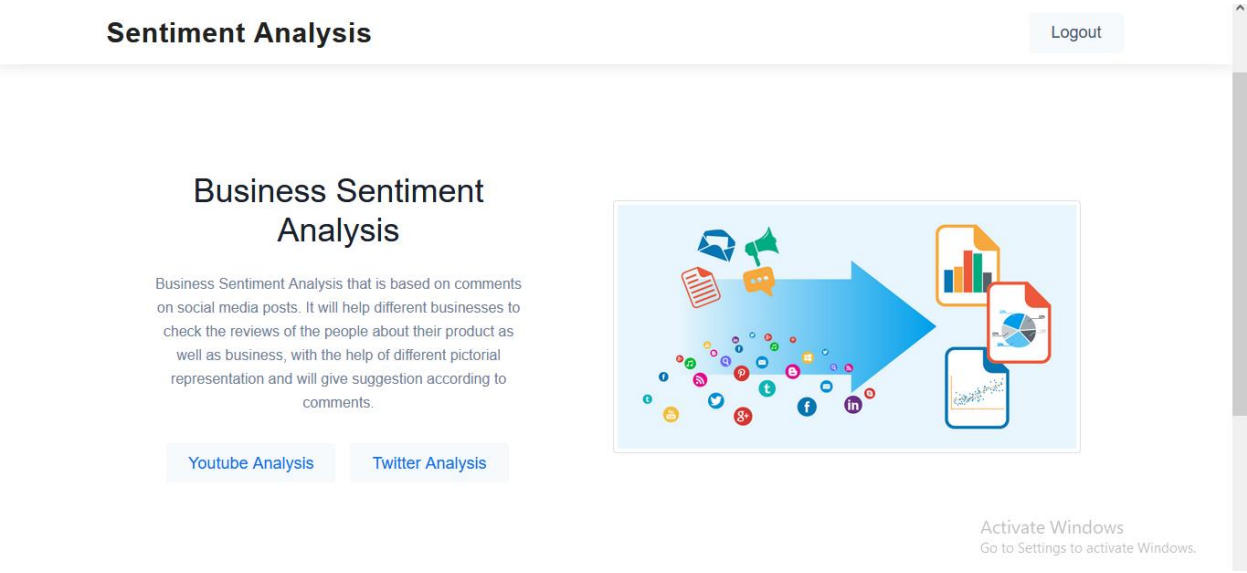
Login:



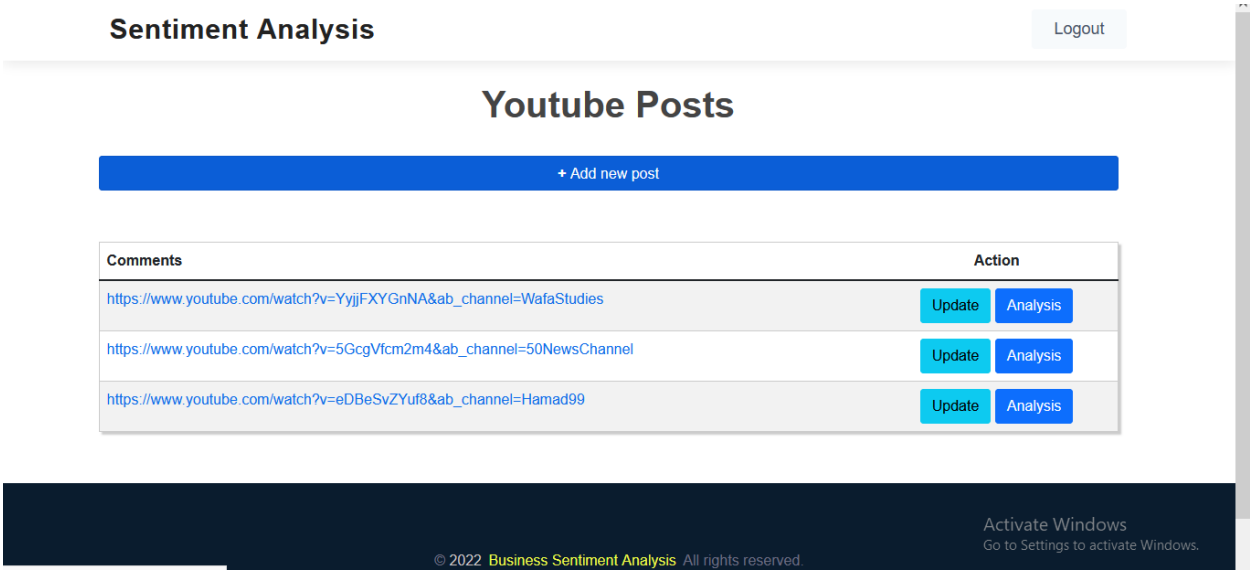
Register:



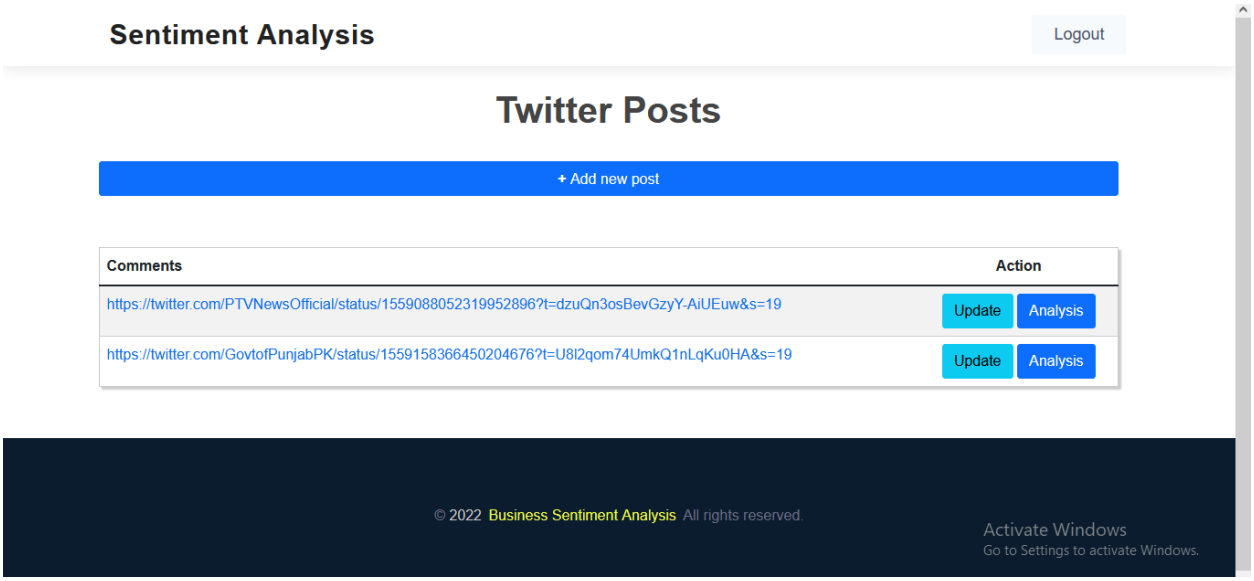
Dashboard:



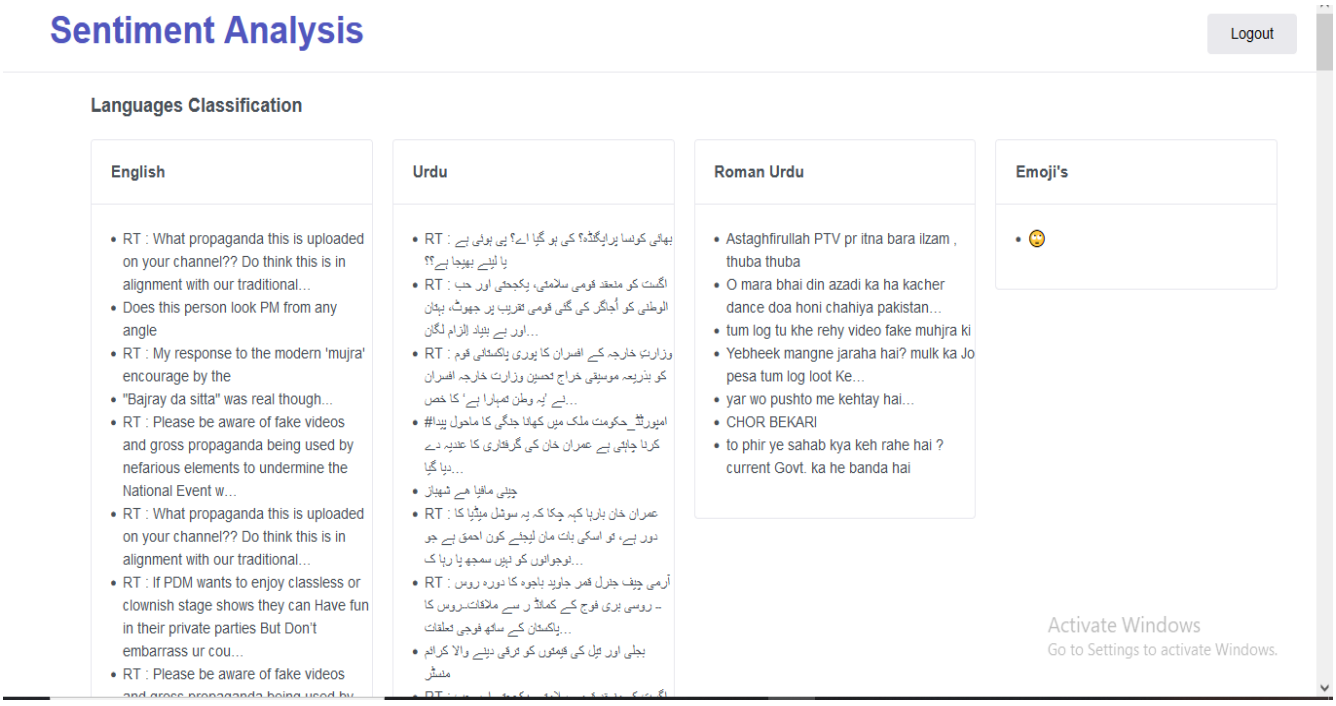
YouTube Analysis:



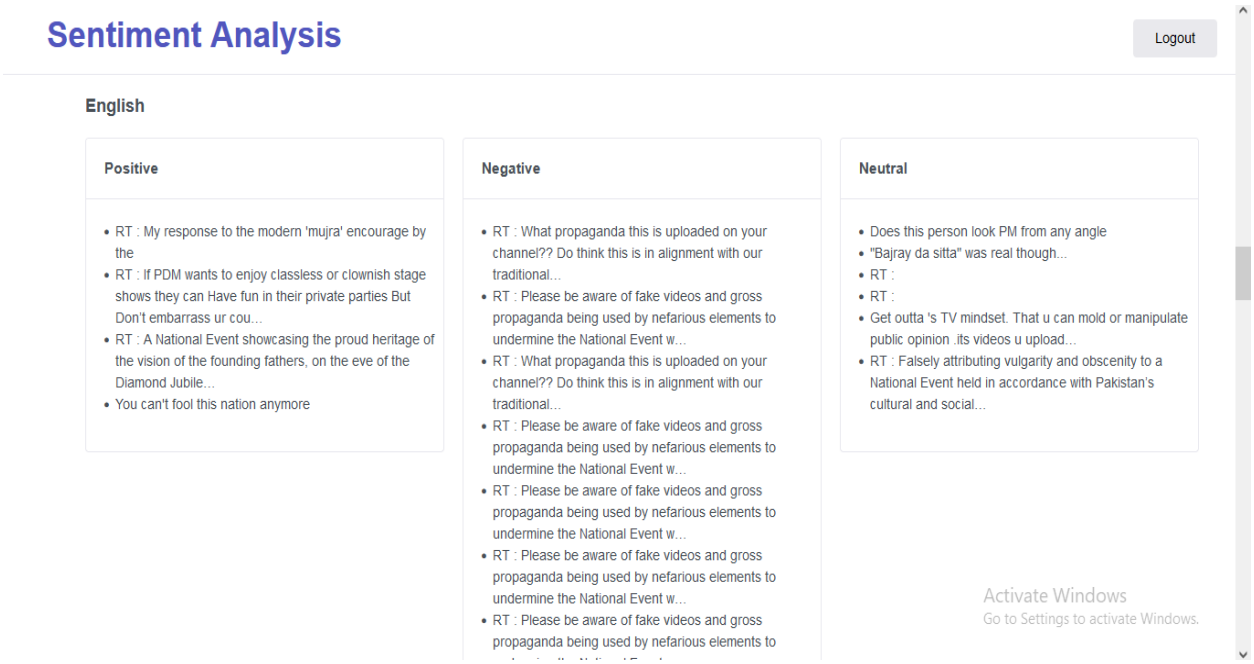
Twitter Analysis:



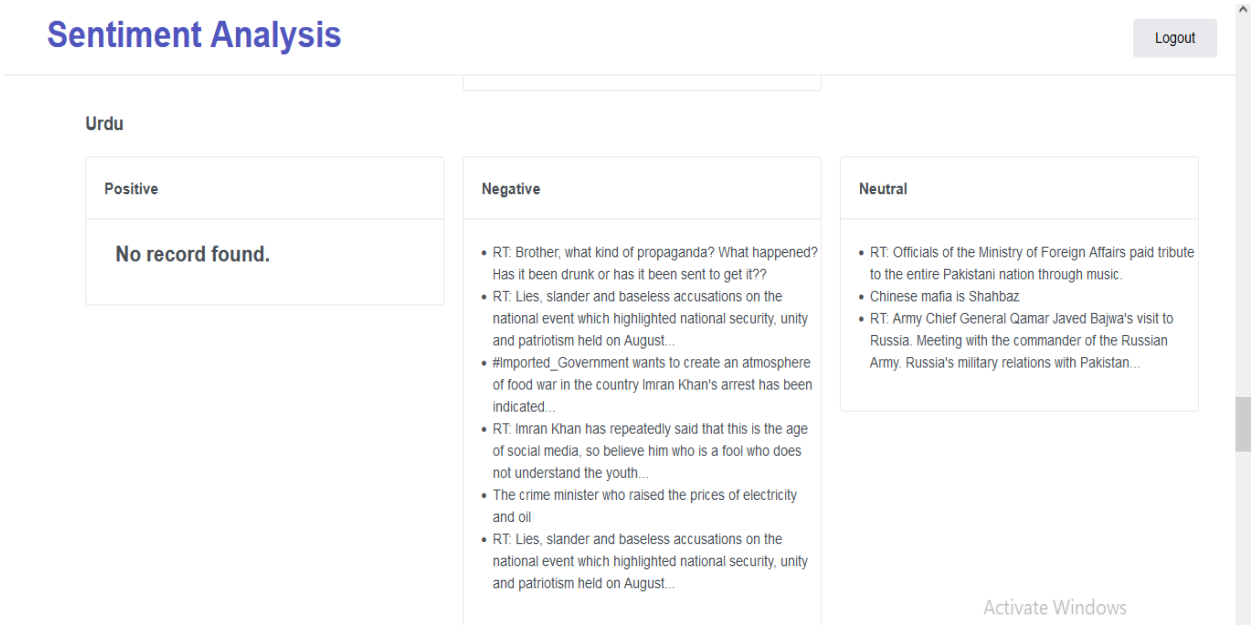
Result:



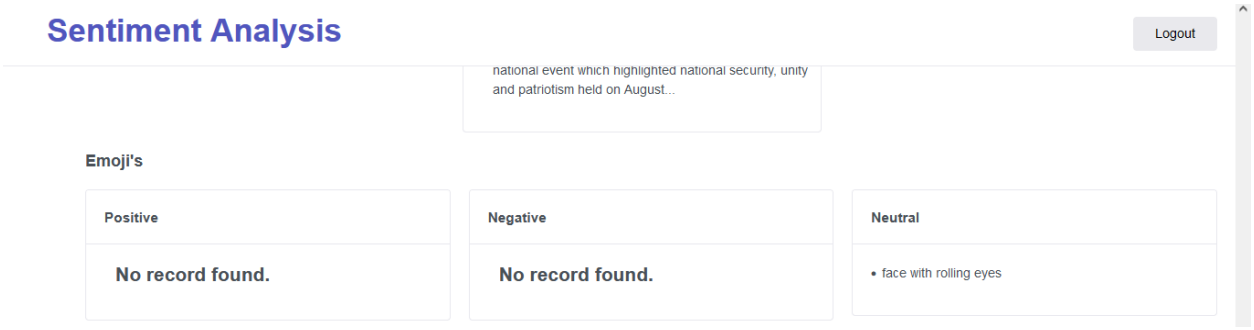
Cluster of English:



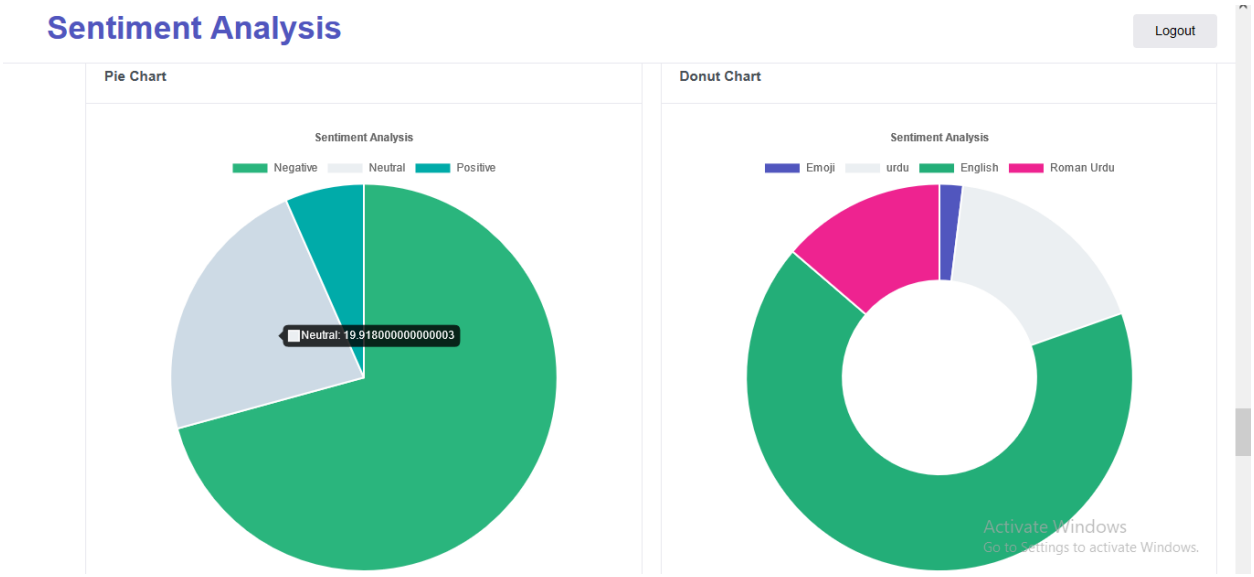
Cluster of Urdu (after conversion in english):

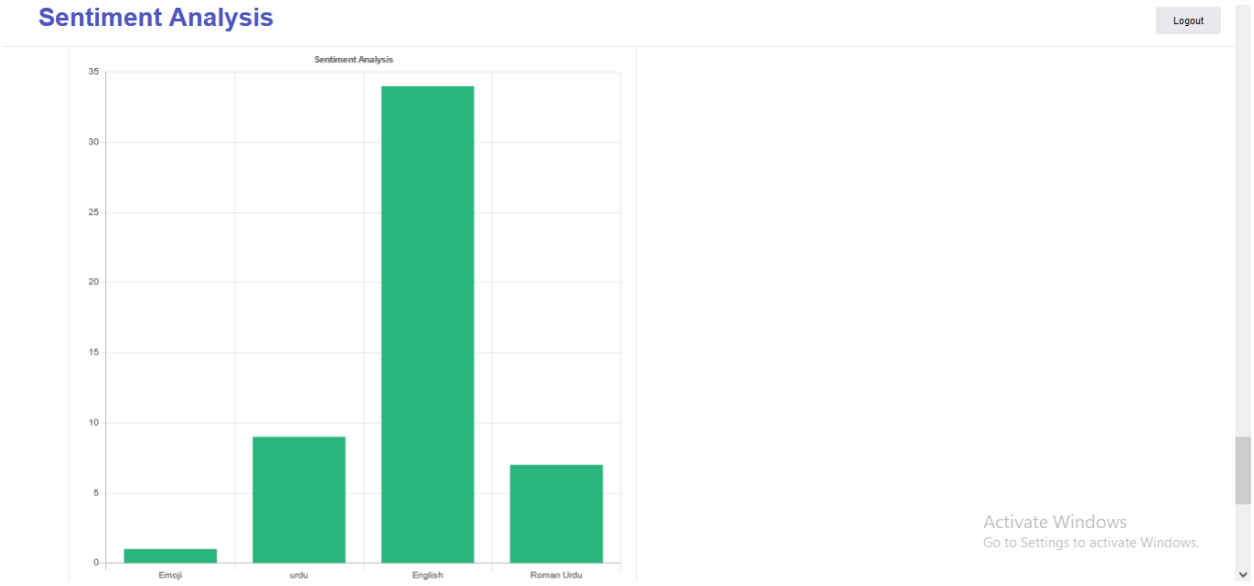


Cluster of Emoji:



Sentiment Analysis:





Feature Extraction: