



SOFTWARE ENGINEERING

LAB PROJECT SUBMISSION

SUBMITTED TO : **DR. SHRUTI AGGARWAL**

PROJECT NAME : **REVIEWVIZ**

SUBMITTED BY :

TEAM - BITS, Please!

ADITI BINJOLA - 102116099

SAMARTH KAPOOR - 102116103

SHOURYA DE - 102116106

LEENA GUPTA - 102116115

INDEX

INDEX OF THE PROJECT

PAGE NO	CONTENT
2	Project selection phase
4	Analysis phase
12	Design phase
15	Implementation
20	Testing

1. PROJECT SELECTION PHASE

1.1 SOFTWARE BID

TEAM NAME : BITS, PLEASE !

NAME	ROLL NO
ADITI BINJOLA	102116099
SAMARTH KAPOOR	102116103
SHOURYA DE	102116106
LEENA GUPTA	102116115

PROGRAMMING LANGUAGE/ ENVIRONMENT EXPERIENCE

List the languages you are most comfortable developing in, as a team, in your order of preference. Many of the projects involve Java or C/C++ programming.

1. Python
2. JavaScript

Choices of Projects:

Please select 4 projects your team would like to work on, by order of preference:
[Write at-least one paragraph for each choice (motivation, reason for choice, feasibility analysis, etc.)]

First Choice: Product Review Analysis

Second Choice: Disease Prediction System

Third Choice: Book Recommendation System

Fourth Choice: Parking Management System

1.2 PROJECT OVERVIEW

ReviewViz is a sentiment analysis-based review visualization platform that aims to help consumers make informed purchasing decisions. The platform is designed to scrape reviews from a given Amazon URL, perform sentiment analysis on the text, and generate a word cloud that categorizes the words used in the reviews. This word cloud provides an easy-to-read visualization of the overall sentiment towards the product, as well as the most frequently used terms in the reviews.

The platform also includes user registration and login functionality, allowing users to save their favourite products and view the reviews they have written. Users can also add new reviews and view the word cloud for any product in the system.

The scraping service is responsible for collecting the reviews from the provided Amazon URL, which are then passed to the sentiment analysis service. The sentiment analysis service uses natural language processing (NLP) techniques to analyze the text and assign a sentiment score to each review. This sentiment score is then used to generate the word cloud.

The user management service handles user authentication and authorization, as well as storing and retrieving user information and reviews. The word cloud service generates the word cloud image and stores it in the platform's file system, where it can be accessed and displayed by the user interface.

ReviewViz is a powerful tool for analysing and visualizing product reviews, enabling consumers to make informed purchasing decisions. By leveraging sentiment analysis and NLP techniques, the platform provides users with a comprehensive understanding of the sentiment surrounding a given product. With the potential for further development, ReviewViz is an exciting platform that has the potential to revolutionize the way we make purchasing decisions.

2. ANALYSIS PHASE

2.1.1 USE CASE TEMPLATE

Use Case Name: Generate Word cloud from Product Reviews

Primary Actor: User

Goal in Context: The user wants to generate a word cloud visualization from a product page's reviews to identify the most commonly mentioned topics and evaluate customer sentiment.

Preconditions:

- The user has access to the Product Review Analysis via Word cloud Generation system.
- The user has a valid URL to a product page with reviews.

Trigger: The user provides the valid URL to the product page with reviews.

Main Success Flow:

1. The system extracts the reviews from the product page and performs data preprocessing to clean and format the data.
2. The system applies NLP techniques to identify the most commonly mentioned topics in the product reviews.
3. The system generates a word cloud visualization with the identified topics, weighted by frequency of occurrence.
4. The system displays the word cloud visualization to the user.
5. The user can download an image of the word cloud for further use.

Postconditions:

- The user has a clear understanding of the most commonly mentioned topics and the overall sentiment of the product reviews.
- The user can export the word cloud visualization for further analysis or sharing.

Alternative Flow :

1a. If the product page does not have any reviews or is not accessible, the system displays an error message and prompts the user to provide a valid URL to a product page with reviews.

2a. If the NLP analysis fails to identify any significant topics, the system displays a message to inform the user of the issue and suggest possible solutions.

Exceptions :

The system encounters an error during data preprocessing or NLP analysis, causing the process to fail. The system displays an error message and prompts the user to try again, or contact technical support.

Assumptions:

- The user has basic computer skills and understands the concept of a word cloud

visualization.

- The product page has reviews that are relevant to the product being analysed.

2.1.2 USE CASE SCENARIO

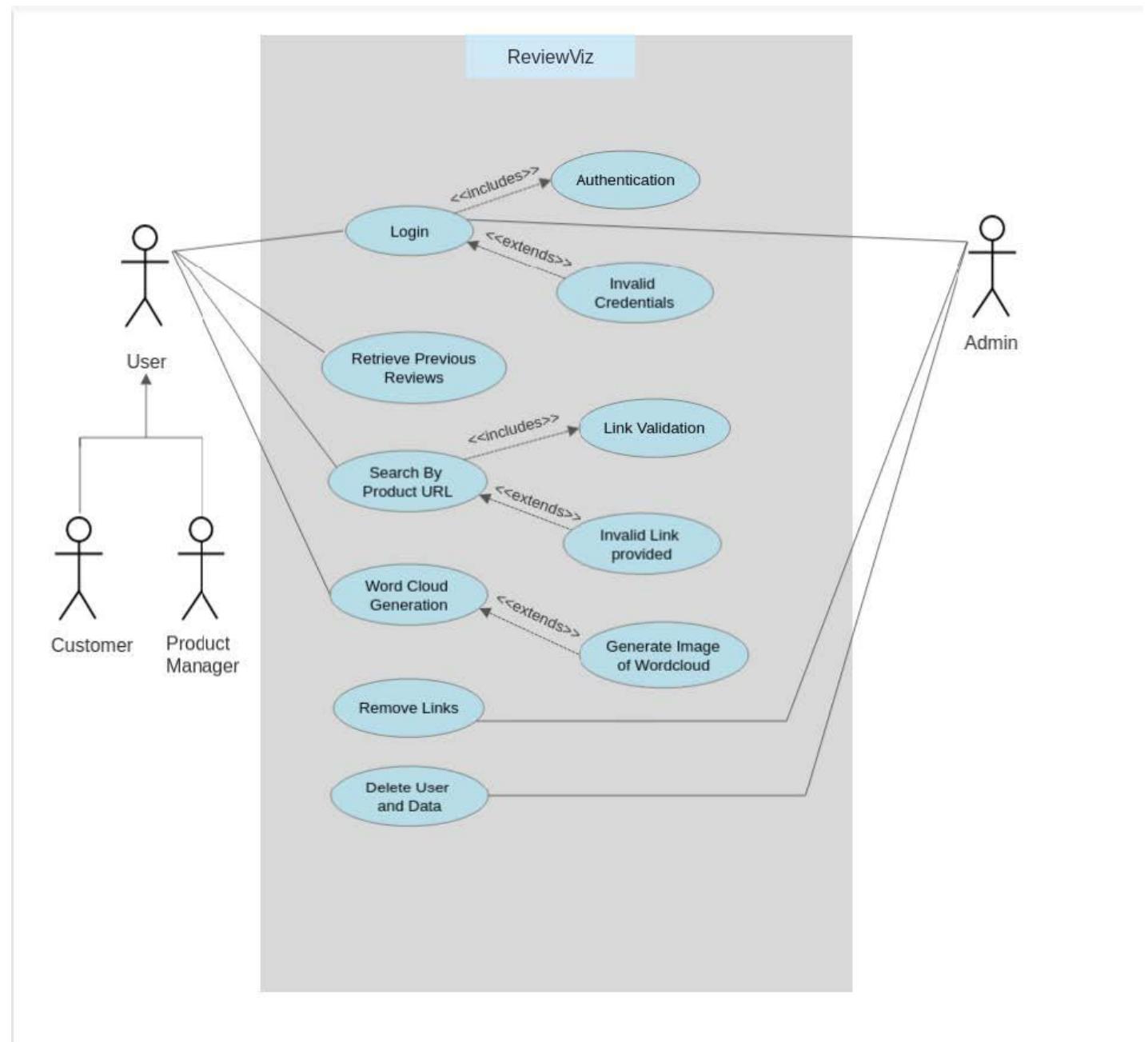
Scenario:

Product Review Analysis via Word Cloud Generation System.

The system is designed to analyze thousands of reviews of products and generate a word cloud visualization to provide a quick and easy view to the customer.

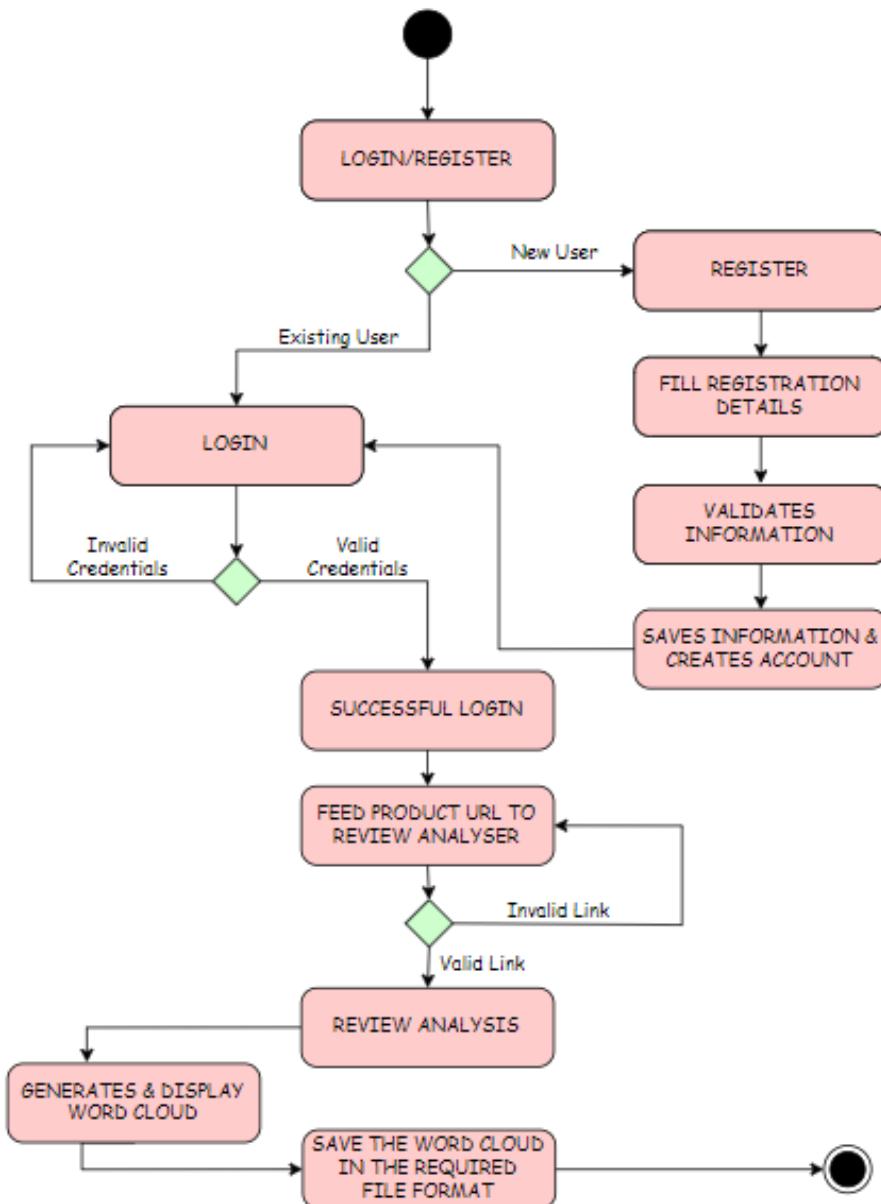
- The user logins into the system and the credentials go under verification.
- Wrong credentials display “Wrong Password” and the user is denied access.
- Successful login enables the user to provide the URL of the product to the system for results.
- The system checks if the link is valid or not.
- The invalid link displays “Invalid Link” and no word cloud generation occurs.
- The correct link is then provided to the review analyser.
- The system extracts the reviews from the product page and performs data preprocessing to clean and format the data.
- The system applies NLP techniques to identify the most commonly mentioned topics in the product reviews.
- The system generates a word cloud highlighting all the positive and negative features of the required product.
- The user can download the image of the generated word cloud for further use.
- The admin has permission access to remove the link or delete the user.

2.1.3 USE CASE DIAGRAM

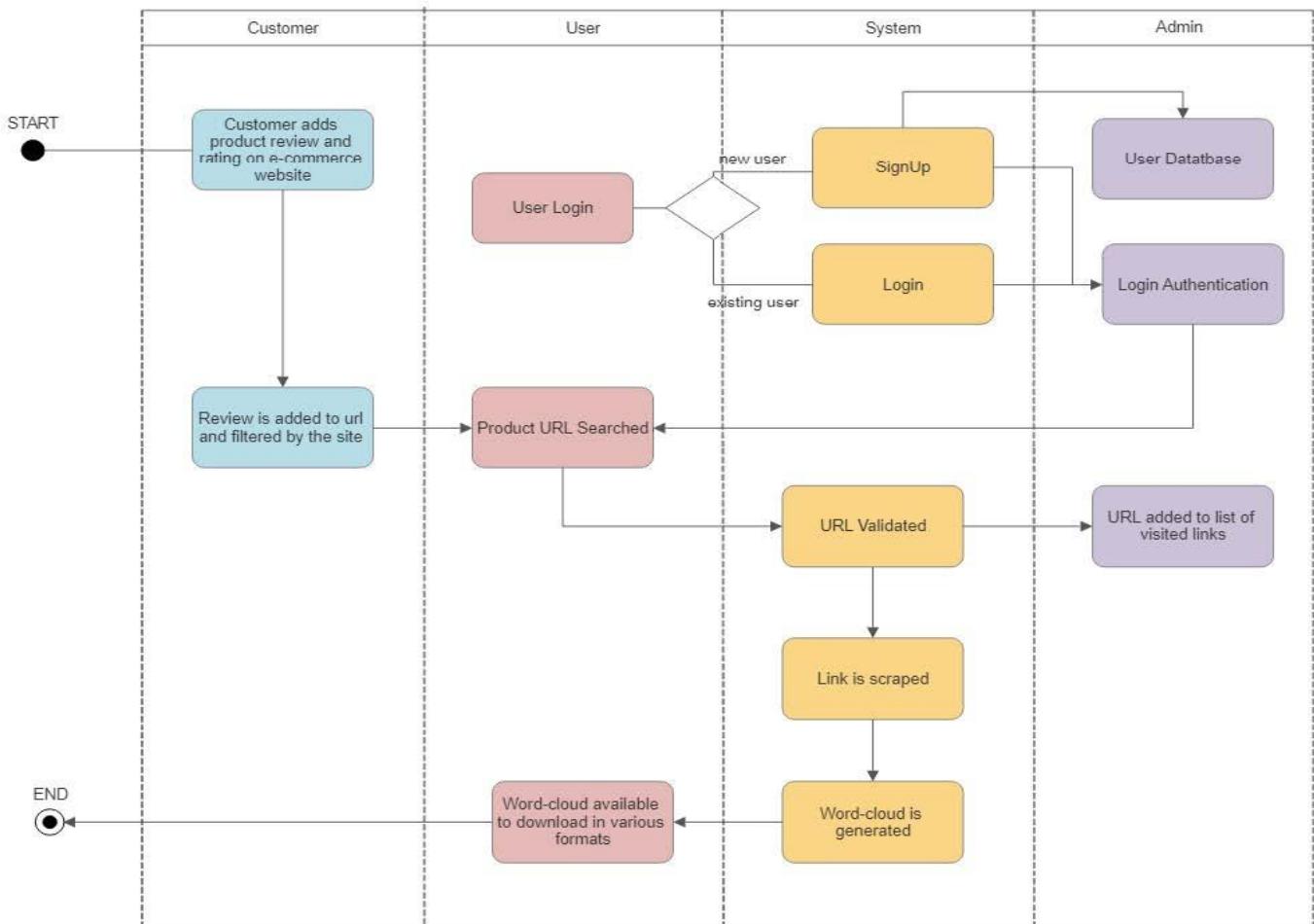


2.2 ACTIVITY AND SWIMLANE DIAGRAMS

2.2.1 ACTIVITY DIAGRAM

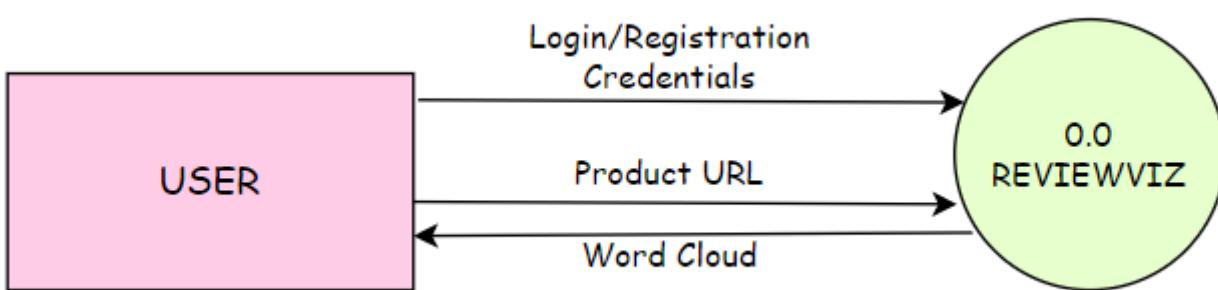


2.2.2 SWIMLANE DIAGRAM

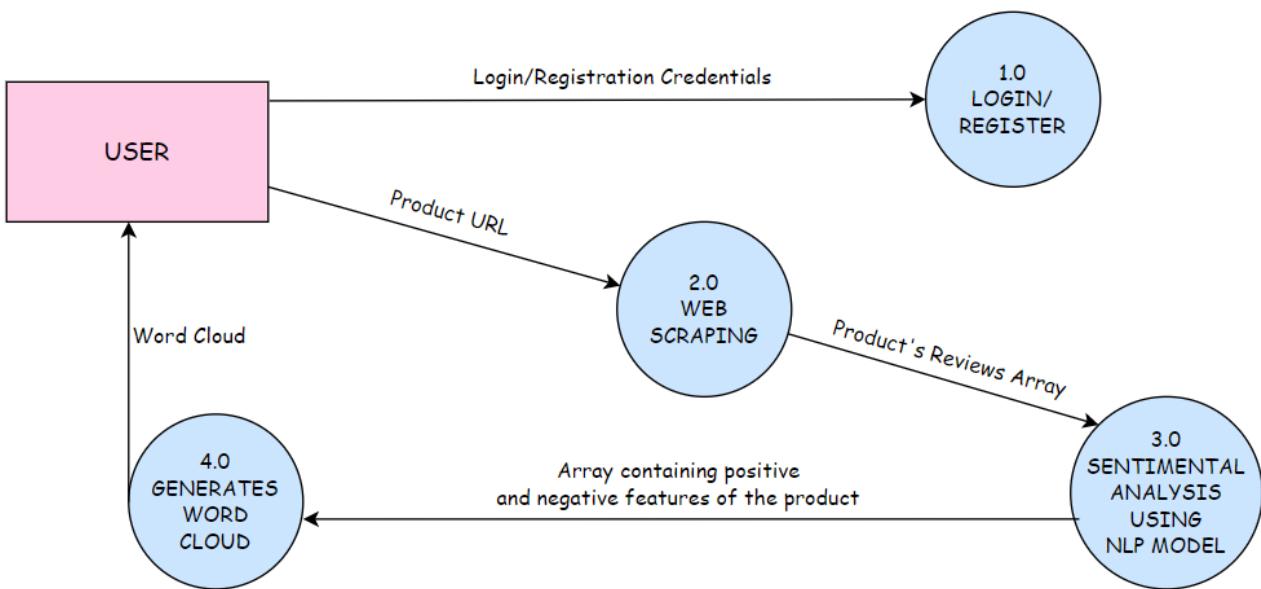


2.3 DATA FLOW DIAGRAMS (DFDs)

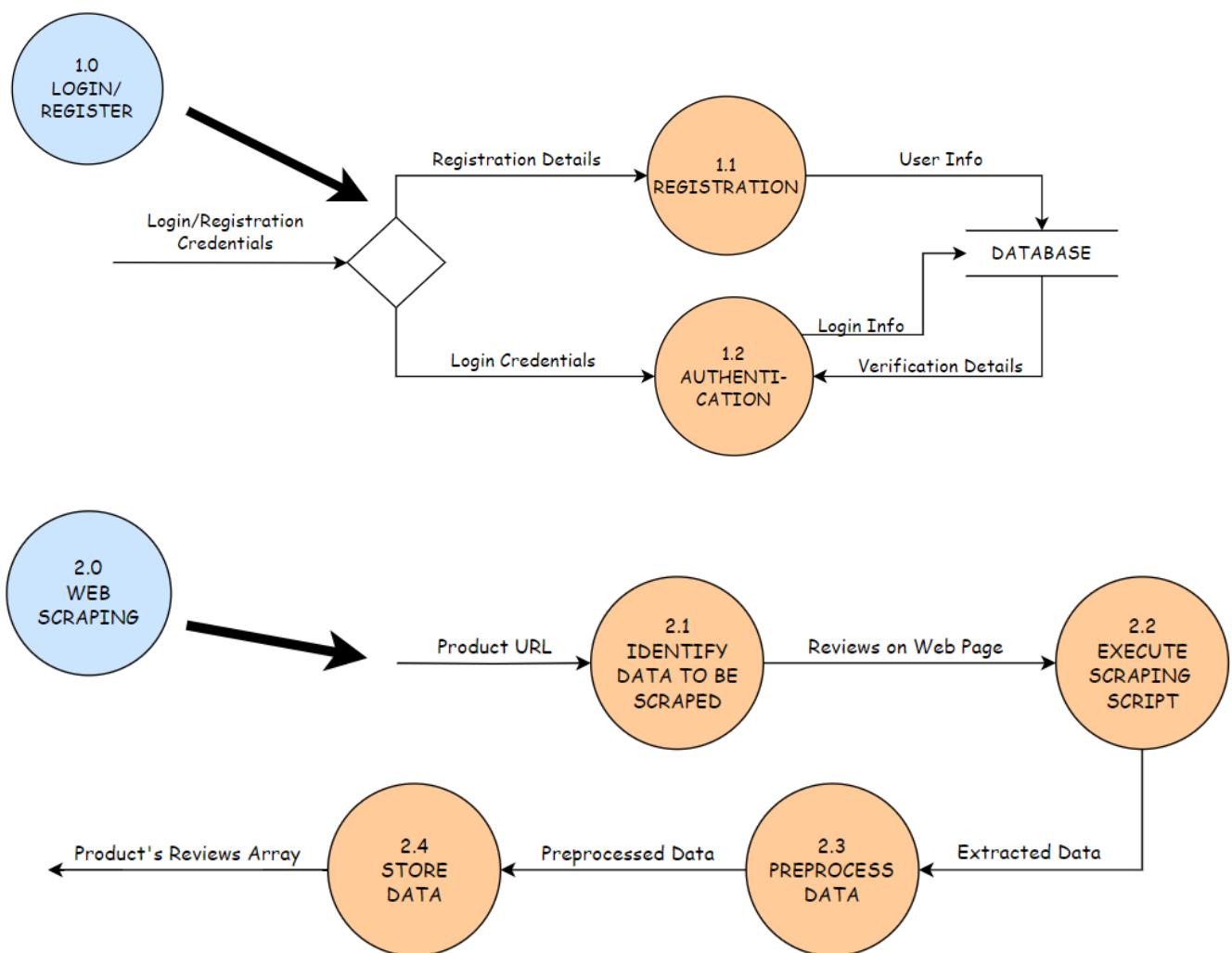
2.3.1 DFD Level 0

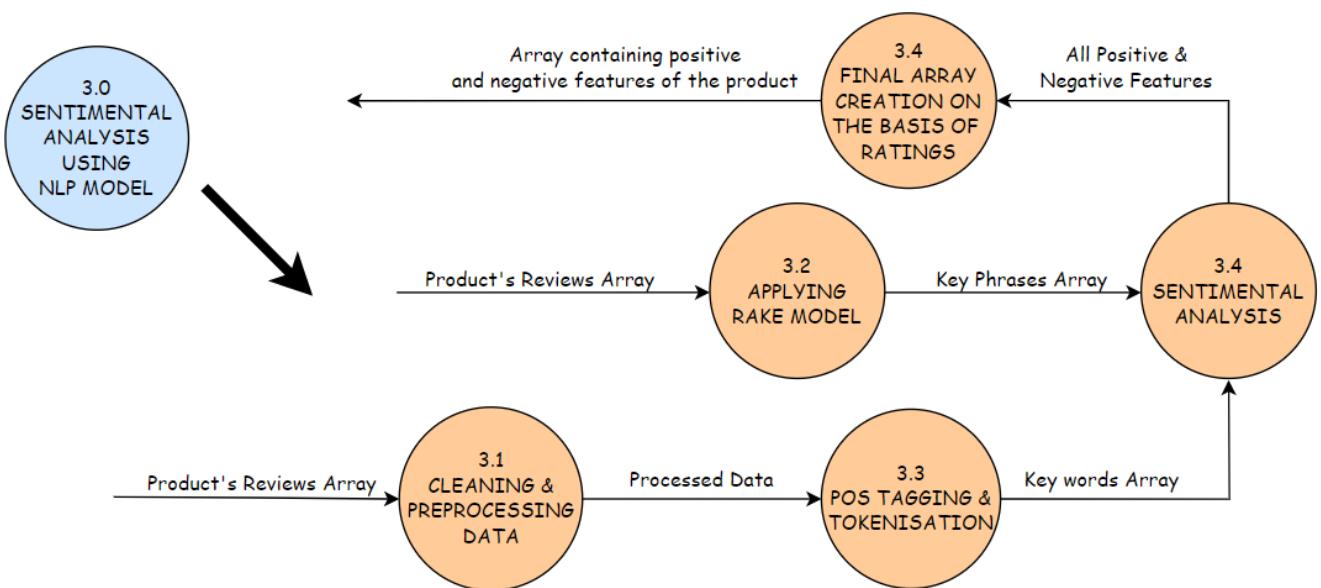


2.3.2 DFD Level 1



2.3.2 DFD Level 2





2.4 SOFTWARE REQUIREMENT SPECIFICATION IN IEEE Format

Software Requirements Specification

for
ReviewViz

Version 1.0 approved

**Prepared by Aditi Binjola
Samarth Kapoor
Shourya De
Leena Gupta**

Bits, Please!

18.02.2023

Table of Contents

Table of Contents	ii
Revision History	ii
1. Introduction	1
1.1 Purpose	1
1.2 Document Conventions	1
1.3 Intended Audience and Reading Suggestions	1
1.4 Product Scope	1
1.5 References	1
2. Overall Description	2
2.1 Product Perspective	2
2.2 Product Functions	2
2.3 User Classes and Characteristics	2
2.4 Operating Environment	2
2.5 Design and Implementation Constraints	2
2.6 User Documentation	2
2.7 Assumptions and Dependencies	3
3. External Interface Requirements	3
3.1 User Interfaces	3
3.2 Hardware Interfaces	3
3.3 Software Interfaces	3
3.4 Communications Interfaces	3
4. System Features	4
4.1 System Feature 1	4
4.2 System Feature 2 (and so on)	4
5. Other Nonfunctional Requirements	4
5.1 Performance Requirements	4
5.2 Safety Requirements	5
5.3 Security Requirements	5
5.4 Software Quality Attributes	5
5.5 Business Rules	5
6. Other Requirements	5
Appendix A: Glossary	5
Appendix B: Analysis Models	5
Appendix C: To Be Determined List	6

Revision History

Name	Date	Reason For Changes	Version

--	--	--	--

1. Introduction

1.1 Purpose

The purpose of this SRS document is to provide a detailed overview of the Product Review Analysis System via Word cloud Generation. It explains the purpose and features of the system, the interfaces of the system, what the system will do, and the constraints under which it must operate. It describes the project's target audience and its user interface, hardware and software requirements.

1.2 Document Conventions

- The entire document should be justified.
- Convention for Main Title:
 - Font Face: Times
 - Font Style: Bold
 - Font Size: 18
- Convention for SubTitle:
 - Font Face: Times
 - Font Style: Bold
 - Font Size: 14
- Convention for Body:
 - Font Face: Arial
 - Font Style: Regular
 - Font Size: 11

1.3 Intended Audience and Reading Suggestions

This project's target audience includes customers or users who can get reviews generated regarding all the key features of their interested product easily, business owners and product managers who get a glimpse of their product's good or bad reviews within an array to understand how users perceive their product, marketing and sales teams which can develop marketing strategies that align with customer preferences easily through the generated word cloud. Also, e-commerce platforms can use this system as a resource to highlight their key features about a certain product directly. The rest of the SRS contains all the detailed information including the description of the project, its interfaces, its features and functional and non-functional requirements.

1.4 Product Scope

The scope of this project is to achieve the goal of minimizing the tedious and wearisome process of the user going through several reviews on e-commerce platforms before purchasing a product. Through this efficient system, all the existing reviews are analysed and a word cloud is generated highlighting all the specific and key features about the product using Natural Language Processing. More specifically, an array of 50 words is generated describing the product's characteristics according to the reviews, making it quick and easy for the user to gain feedback.

1.5 References

Roger S. Pressman, Software Engineering : A Practitioner's Approach

2. Overall Description

2.1 Product Perspective

The Product Review Analysis via Word cloud Generation system is a web application designed to help businesses and individuals mitigate the task of analysing thousands of reviews of products manually. It is an AI based solution using advanced Natural Language Processing (NLP) techniques to accurately identify and rank the most commonly mentioned topics in customer reviews, and generates a word cloud visualization to provide a quick and easy-to-understand view of customer sentiment.

2.2 Product Functions

The Product Review Analysis System receives input data as an Amazon link to the product. The link is validated and scraped for reviews, which are then preprocessed before sending it to the NLP model. The NLP model analyses the reviews and generates an array of 50 most significant words/topics in the reviews, and sends it to the web application, which then generates a word cloud based on the frequencies of the words. The user can download an image of the word cloud or use the array of words as a starting point for decision-making.

2.3 User Classes and Characteristics

The system is designed to be used by businesses who want to gain insights into customer sentiment and improve their products or services based on customer feedback and individuals buying products based after careful consideration of reviews. The typical user is someone who is familiar with basic computer skills and has some knowledge of data analysis and visualization techniques.

The system will support two types of user privileges, Viewer, and Admin. Viewers will have access to viewer functions, and the Admin will have access to both Viewer and user management functions. The Viewer should be able to do the following functions:

- Sign Up for the service
- Login as an existing user
- Paste the URL of any product on the web application
- Regenerate reviews for a previous product for which a word cloud has been made.
- Download the word cloud generated in different image formats.

The Admin should have the following management functionalities:

VIEWER FUNCTIONS

- Return product links searched by a particular viewer.
- Return login and signup details of the viewer.

ADMINISTRATIVE

- Delete a link.
- Add/Delete a user.

2.4 Operating Environment

The system can be run on any modern computer or server, and can be accessed through a web browser or a desktop application. It requires an internet connection to access the web-based version and can be hosted locally on a desktop computer or server with an internet connection for scraping the reviews.

- Client/Server system
- Operating system: Windows/macOS/Linux
- Database: MongoDB
- Platform: Containerized Python and JavaScript environment

2.5 Design and Implementation Constraints

The system is designed to be highly accurate and reliable, using advanced NLP techniques to accurately identify and rank the most commonly mentioned topics in customer reviews. The system should include robust data cleaning and preprocessing techniques to ensure that the input data is of sufficient quality. The system should be designed to handle large volumes of data efficiently, without compromising on performance. The system should adhere to standard security practices, such as authentication and authorization, to prevent unauthorized access or data breaches. The system should be compatible with a wide range of platforms, operating systems, and web browsers to ensure that users can access the system from their preferred device and environment.

2.6 User Documentation

The system comes with user documentation that includes step-by-step instructions on how to use the application, as well as FAQs and troubleshooting tips. A detailed README file would be provided for users locally hosting the application and perform tests and contribute to the system.

2.7 Assumptions and Dependencies

The system assumes that the input data is an Amazon link to the product, and that the user has basic knowledge of data analysis and visualization techniques. It also depends on a reliable internet connection to access the web-based version, and may require additional software or hardware for the locally hosted version.

3. External Interface Requirements

3.1 User Interfaces

The web app shall have a dashboard where all user details and previously visited links can be viewed. The app shall have a responsive and user-friendly interface that is accessible via modern web browsers on various device types and screen sizes. The landing page shall have a search bar where links can be added and there shall be intuitive controls. The interface shall employ JavaScript features to provide a dynamic and interactive experience to the users.

3.2 Hardware Interfaces

The web app shall be compatible with any hardware that can run modern web browsers and shall not require any additional hardware or software on the client-side.

3.3 Software Interfaces

The web app shall integrate with external software systems, such as databases, web servers etc to support its functionality. The web app shall use standard protocols to communicate with these external systems. The web app shall use popular libraries and frameworks, such as React, to simplify the integration with these external systems.

3.4 Communications Interfaces

The web app shall use secure and reliable communication protocols to protect the confidentiality and integrity of the data transmitted between the user's device and the web server. The web app shall use server-side validation techniques to ensure that the user-entered data is valid and safe. The web app shall use cookies and local storage to maintain the session state and user preferences. The web app shall provide informative and timely feedback to the users.

4. System Features

4.1 User Authentication and Link Validation

4.1.1 Description and Priority

Permits the authenticate users to log in or register. Users should be able to create an account in order to submit product reviews and access the word cloud analysis features.

Priority: High

4.1.2 Stimulus/Response Sequences

- User requests to log in to the system.
- The system receives the login credentials and validates them against the system's database of registered users.
- Allows the user to use the login in if the login credentials are valid.
- The system accepts the link of the product's review from the user and validates it.

4.1.3 Functional Requirements

REQ-1: User registration

REQ-2: User login

REQ-3: Password recovery

REQ-4: Fetch registered user's data from database

REQ-5: Displays appropriate message for invalid login credentials

REQ-6: Validation of the link provided by the user

4.2 Analysis of a product's reviews

4.2.1 Description and Priority

The AI-model uses various NLP algorithms such as topic modelling, keyword extraction for data processing to extract the main attributes of the product from the reviews. The system should analyse the text of product reviews to determine the sentiment of the review.

Priority: High

4.2.2 Stimulus/Response Sequences

- The NLP based AI-model analyses the reviews and identifies the product's characteristics.
- The model inspects the frequency of product reviews and sentiment.
- Generates an array of 50 most frequent words that describes the product.

4.2.3 Functional Requirements

REQ-1: Elimination of the reviews containing bad words.

REQ-2: Screening for the stop words.

REQ-4: Analyse the sentiments of the reviews and categorize them as positive, negative or neutral.

REQ-3: Generation of an array of 50 words describing the product's features.

4.3 Word Cloud Generation

4.3.1 Description and Priority

The system should generate a word cloud based on the text of product reviews, with larger words indicating higher frequency in the reviews.

Priority: Medium

4.3.2 Stimulus/Response Sequences

- User requests to view the word cloud for a particular product.
- Generates a word cloud from the previously created array.

4.3.3 Functional Requirements

REQ-1: Arrangement of the selected words in a visually appealing and readable layout.

REQ-2: Displaying the words such that they are sized and positioned based on their importance or frequency, with larger and more frequently used words given more prominence.

REQ-3: To depict the words falling under a particular category with a particular colour scheme.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The word-clouds shall be generated within about 5 seconds of URL input by the user and shall respond to user inputs promptly. The web app shall be able to handle numerous concurrent users without significant performance degradation.

5.2 Safety Requirements

The web app shall provide user authentication to verify the identity of the users before granting access to the system.

5.3 Security Requirements

The system shall require users to authenticate themselves before accessing it. The system shall ensure that the users can only access the data and functionality they require. In order to protect sensitive user data, the system shall use encryption to secure data in transit and at rest. To enable monitoring of system activity, the system shall maintain access logs of all user activity.

5.4 Software Quality Attributes

- Usability-The system shall be designed with a user-friendly interface, easy to use for both novice and experienced users.
- Reliability- The system should be reliable with minimal downtime and errors. The word cloud must give optimal results based on input data.
- Maintainability- The system should be designed to be easy to maintain and update, with fewer disruptions to user access.
- Scalability- The system shall be able to handle increasing amounts of data and user requests without impacting system performance or reliability.

5.5 Business Rules

- Reviews must be relevant to the product being reviewed.
- Reviews must be submitted by a verified user.
- Reviews must not be written by employees or affiliates of the company that produces or sells the product.
- The application should allow users to export the word cloud as an image in common formats such as PNG, JPG, and SVG.

6. Other Requirements

The system should be packaged as a Docker container to simplify deployment and ensure consistent behaviour across different environments. The system should have clear and detailed

documentation on how to set up and run the Docker container. The system should be able to run on any platform that supports Docker, including Windows, Linux, and macOS.

Appendix A: Glossary

URL : Amazon Link to the product.

NLP : Natural Language Processing

Appendix B: Analysis Models

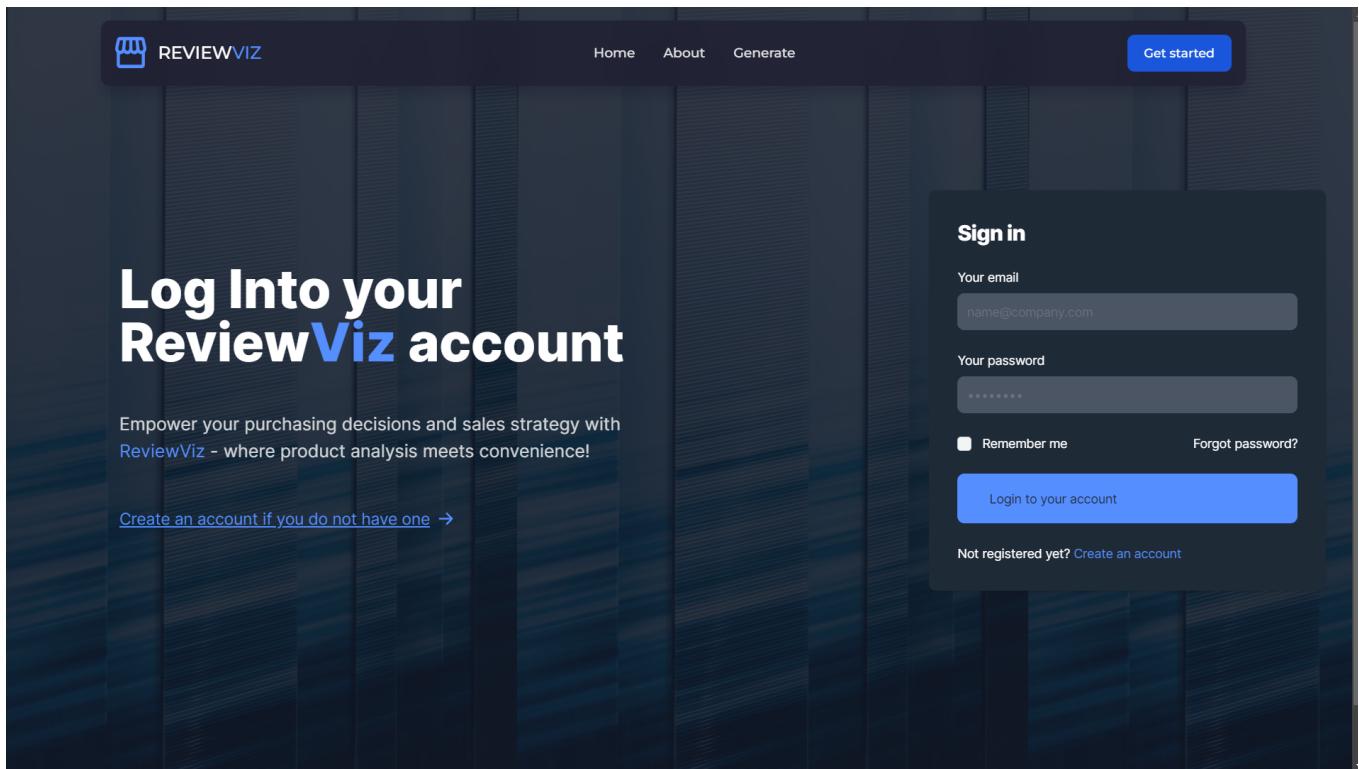
<Optionally, include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams.> Currently None

Appendix C: To Be Determined List

<Collect a numbered list of the TBD (to be determined) references that remain in the SRS so they can be tracked to closure.> Currently None

2.5 USER STORIES AND STORY CARD

#0001	User login
As a user, I want to be able to input an Amazon product URL and generate a word cloud that categorizes the words used in the reviews, so that I can easily understand the overall sentiment towards the product.	



CONFIRMATION:

Success :

- The user inputs a valid Amazon product URL.
- The system successfully scrapes reviews from the provided URL.
- The system successfully performs sentiment analysis on the reviews and generates a word cloud.
- The word cloud accurately represents the sentiment towards the product.
- The user can download the word cloud in PNG, JPG, or PDF format.
- The user is satisfied with the accuracy of the sentiment analysis and the quality of the generated word cloud.

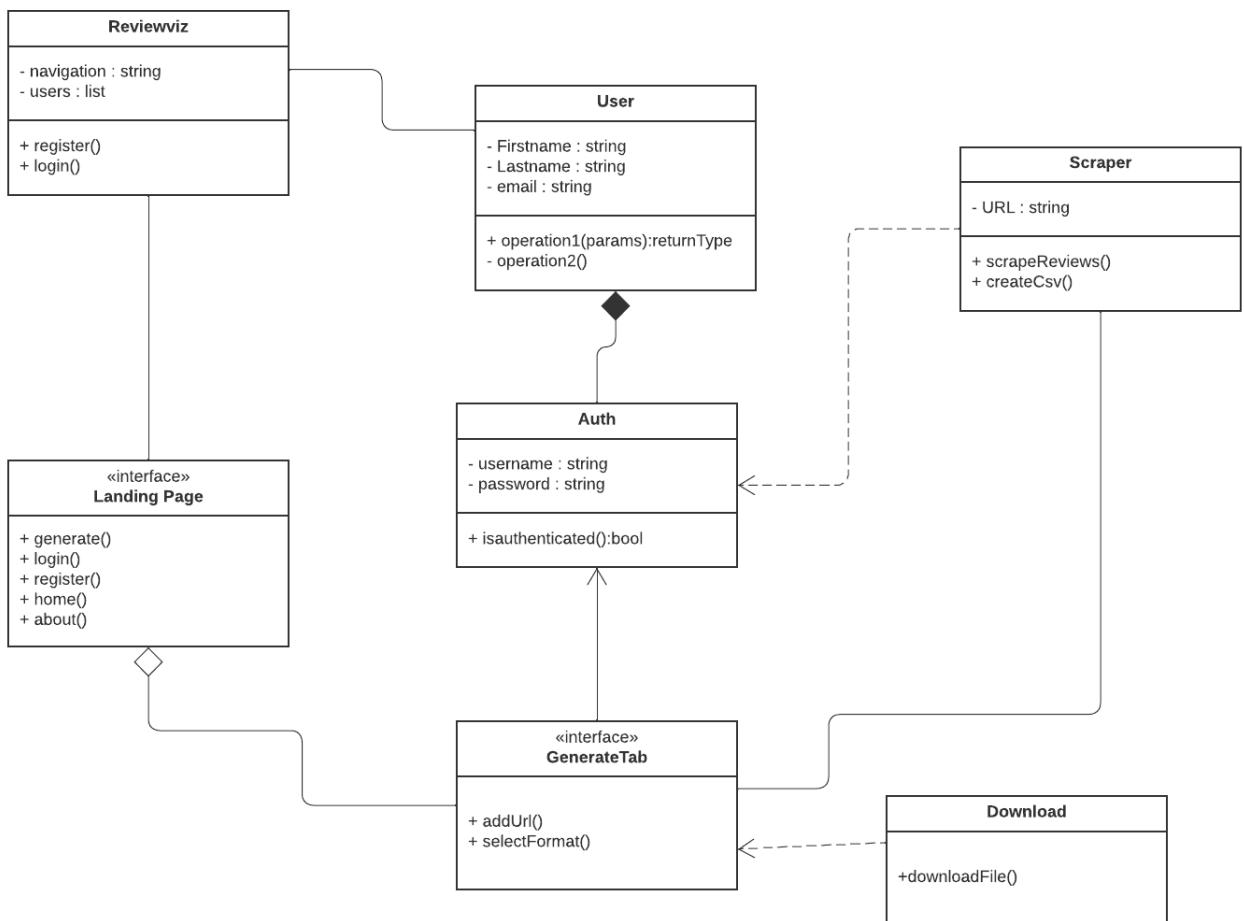
Failure :

- The user inputs an invalid Amazon product URL.
- The system is unable to scrape reviews from the provided URL.
- The system is unable to perform sentiment analysis on the reviews and generate a word cloud.

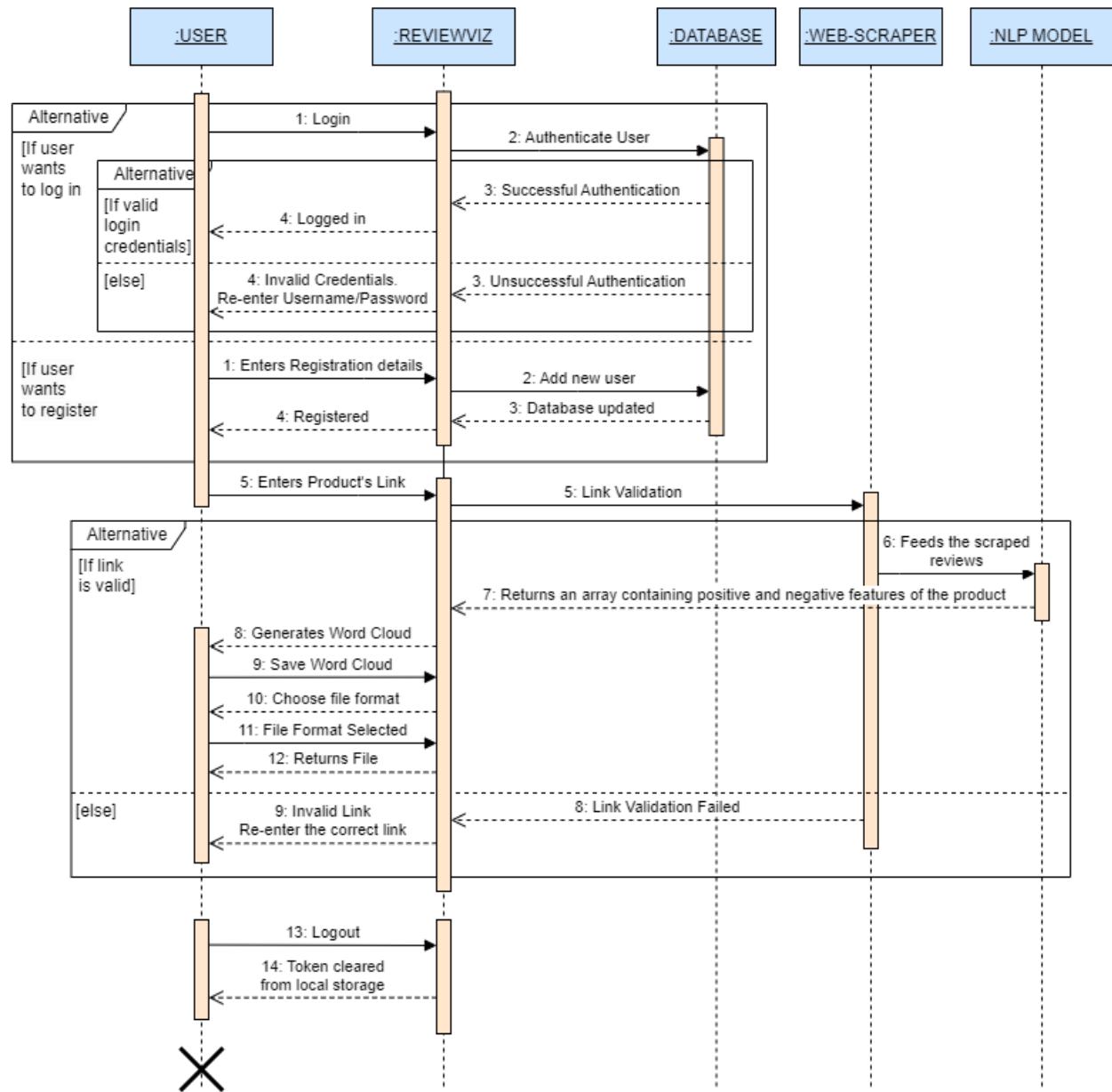
- The word cloud inaccurately represents the sentiment towards the product.
- The user is unable to download the word cloud in PNG, JPG, or PDF format.
- The user is dissatisfied with the accuracy of the sentiment analysis or the quality of the generated word cloud.

3. DESIGN PHASE

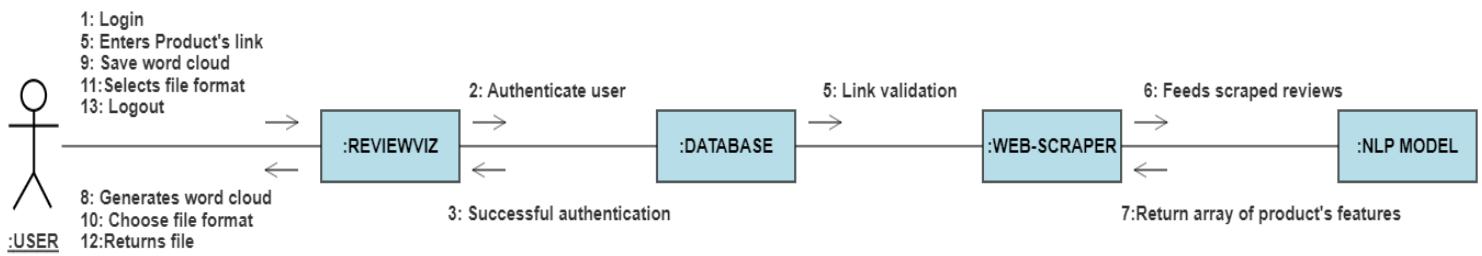
3.1 CLASS DIAGRAM



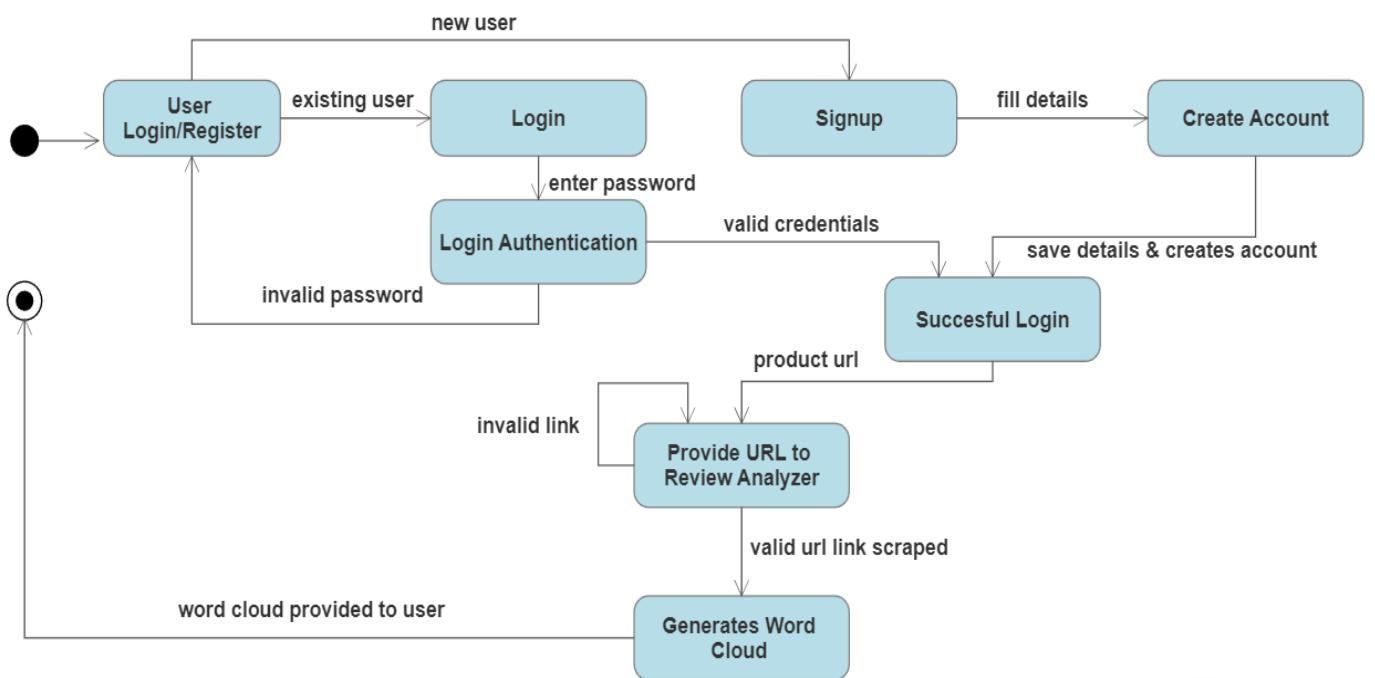
3.2 SEQUENCE DIAGRAM



3.3 COLLABORATION DIAGRAM

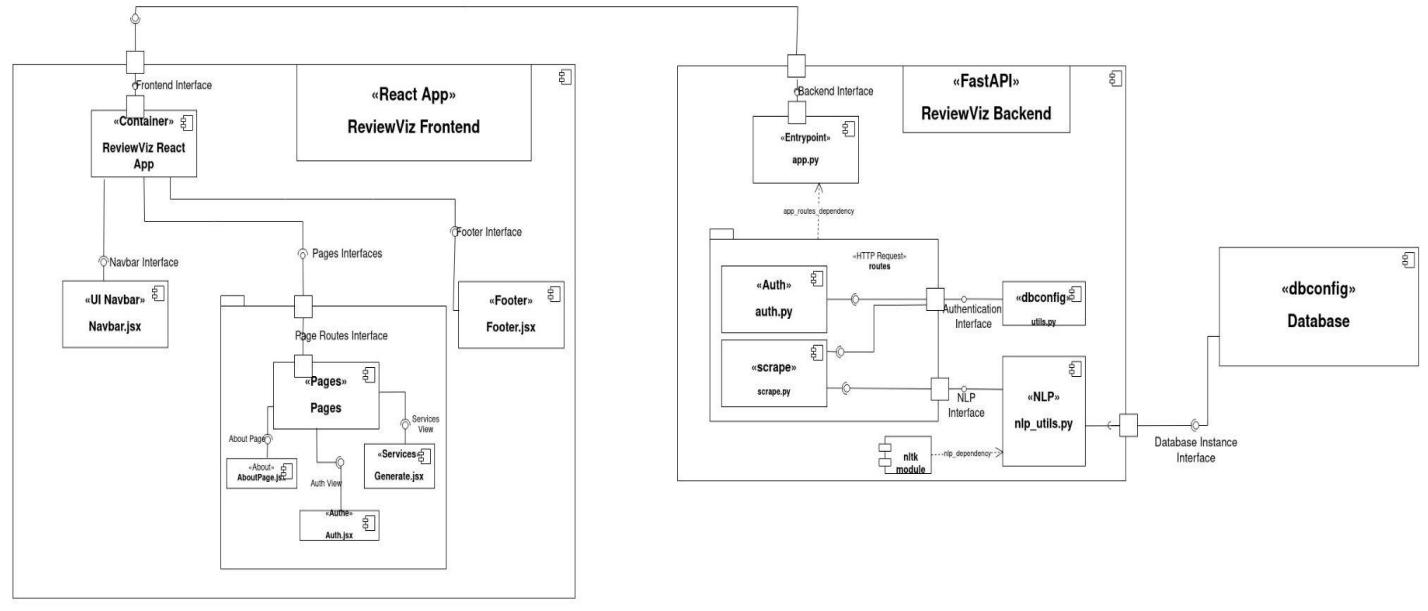


3.4 STATE CHART DIAGRAM

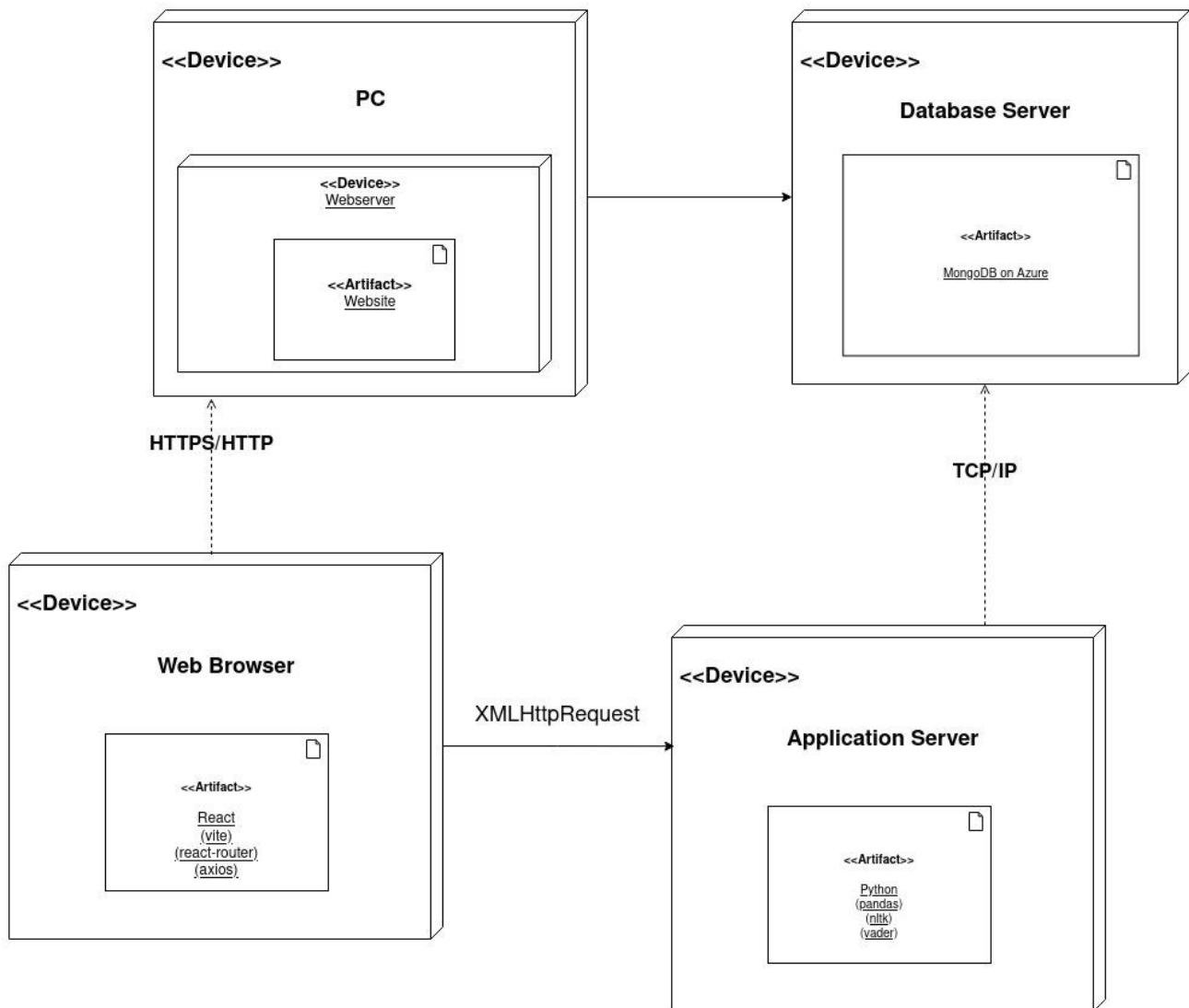


4. IMPLEMENTATION

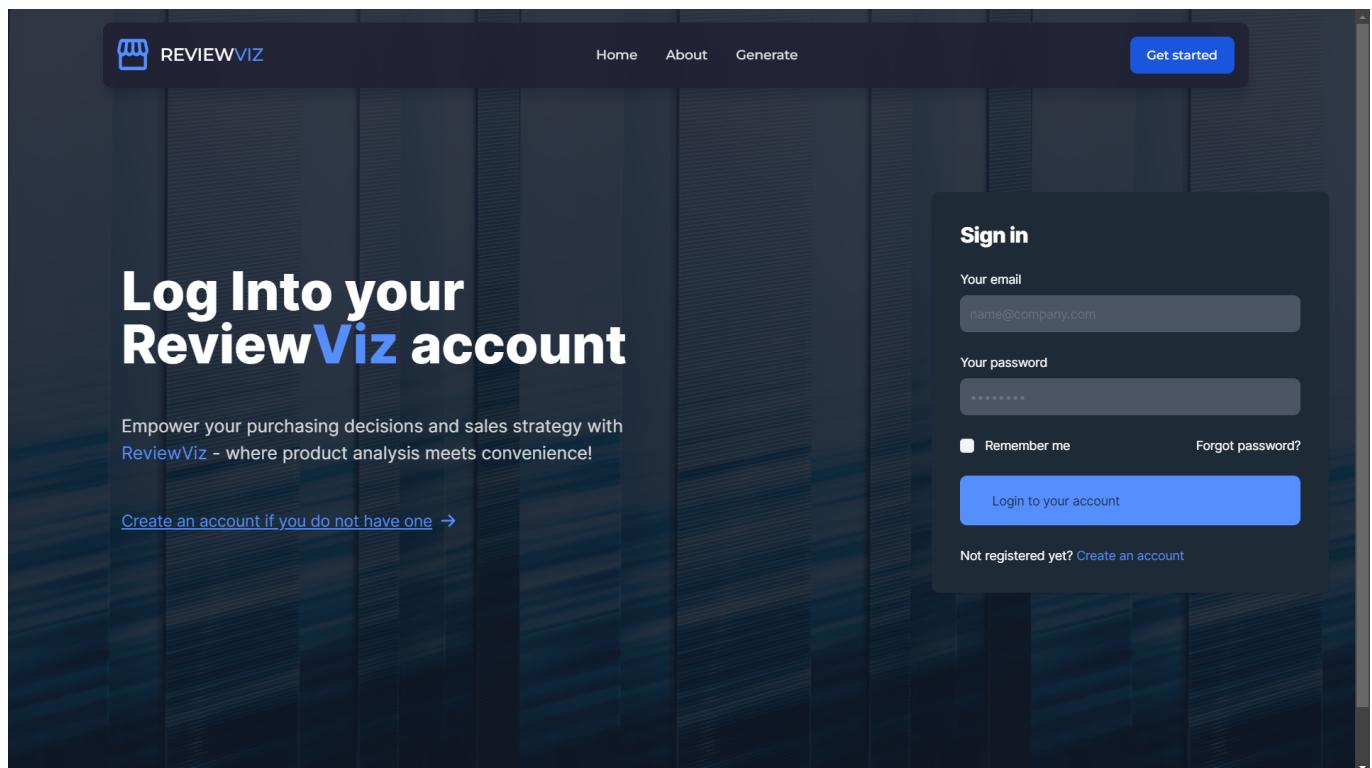
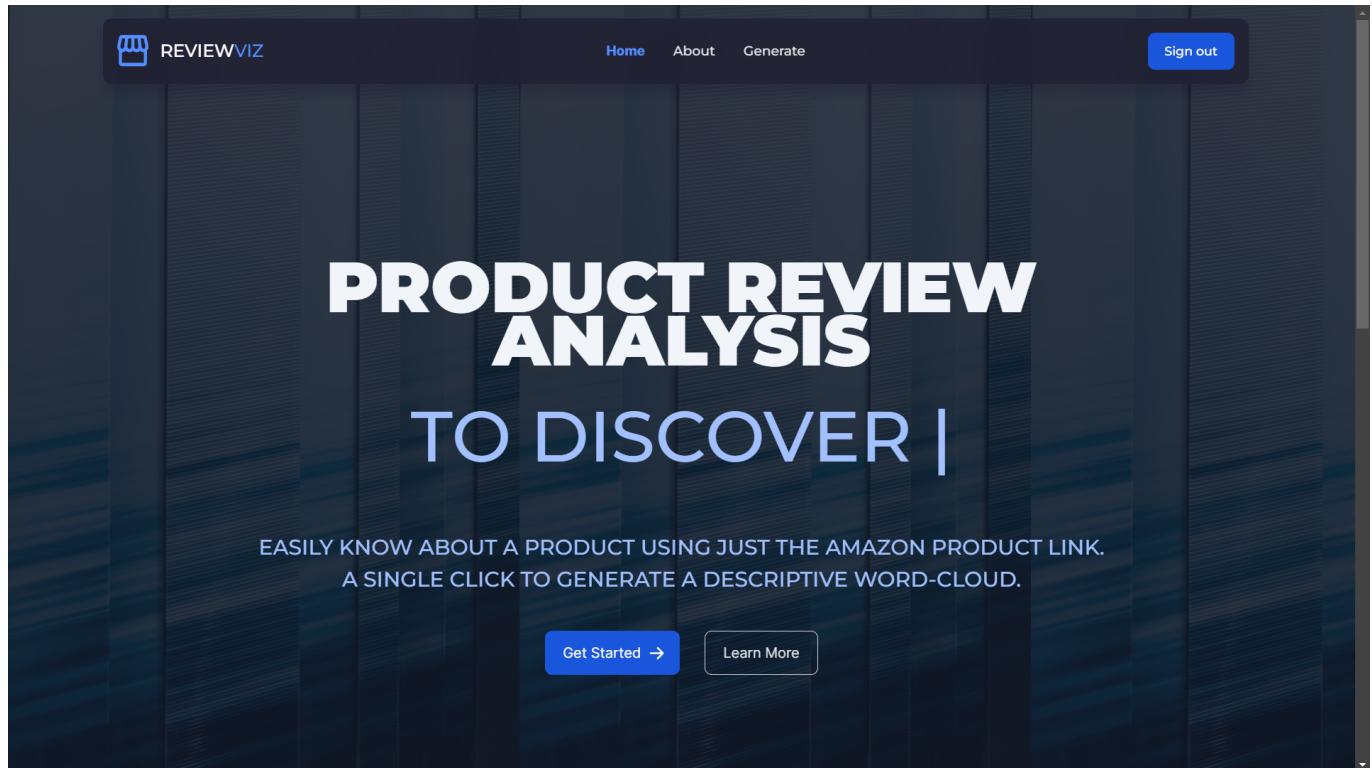
4.1 COMPONENT DIAGRAM



4.2 DEPLOYMENT DIAGRAM

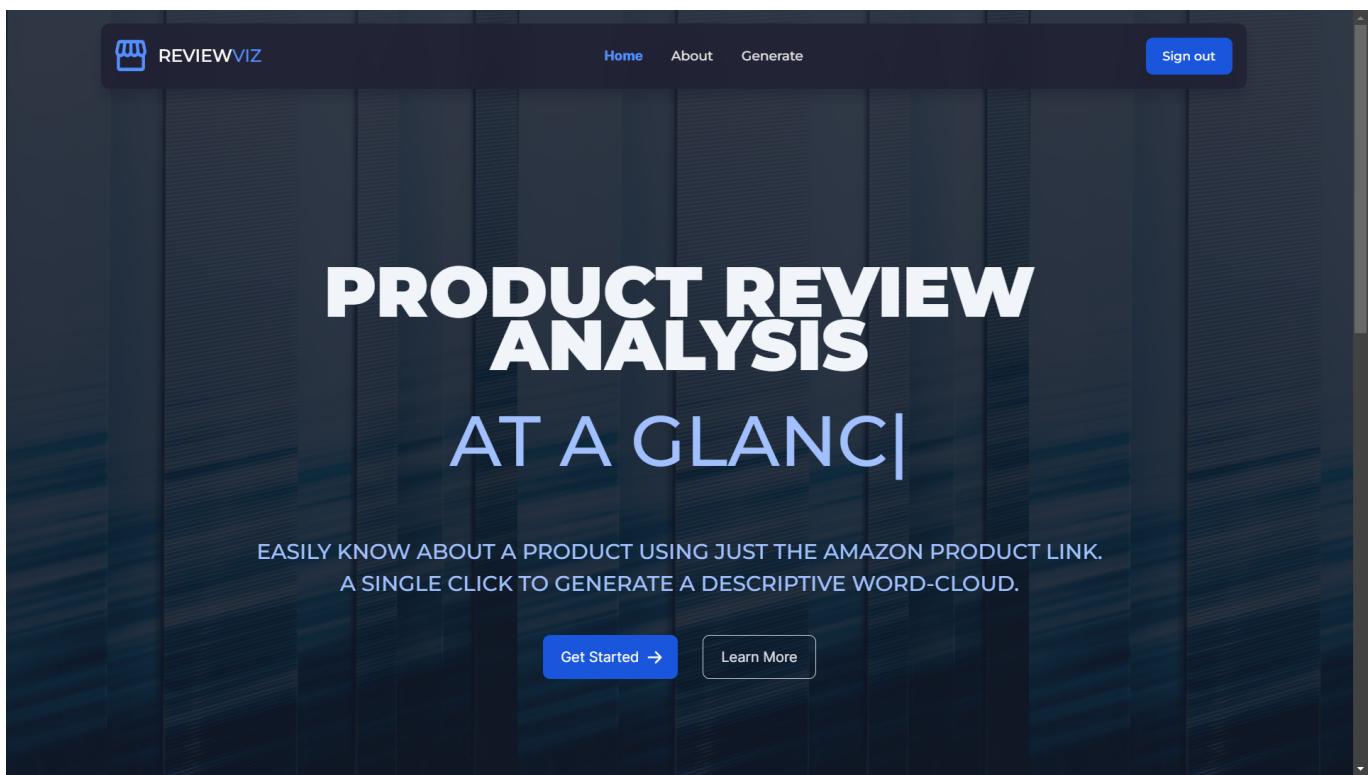


4.3 SCREENSHOTS



The screenshot shows the homepage of ReviewViz. At the top, there is a navigation bar with the logo "REVIEWVIZ", "Home", "About", "Generate", and a "Sign out" button. Below the navigation bar, there is a large central box with a "Tutorial" button. The main title "How to Generate the Word Cloud" is displayed in bold. A sub-instruction below it says: "Simply switch to the generate tab or click get started, copy the url of the Amazon product that you want to generate the word cloud for, then select the output format and then click generate." A blue "Get Started →" button is located at the bottom of this box. To the left, there is a box titled "Features" with the sub-section "Know both the Good and the Bad". It explains that generated word clouds display negative and positive words differently to know the pros and cons of a product. To the right, there is a box titled "Other Features" with the sub-section "Different formats of the word cloud". It states that word clouds can be exported in various popular image formats.

The screenshot shows the "Generate" page of ReviewViz. The top navigation bar includes "Home", "About", "Generate", and a "Sign out" button. Below the navigation bar, there is a link "Learn How it Works >". The main heading "PLEASE PROVIDE THE PRODUCT LINK" is displayed in large, bold, white letters. A sub-instruction below it says: "Grab the product link which can be found in the search bar of your browser and start exploring". At the bottom, there is a form field labeled "Amazon Link IN" containing the URL "https://www.amazon.in/Logitech-Wireless-Cross-Compu". Next to it is a "Select Image Type" dropdown menu. A large blue "GENERATE" button is centered at the bottom of the form.



5. TESTING

5.1 TEST PLAN

1. Test Approach The testing will be conducted at the following levels:

- Unit Testing: testing of individual components or modules of the website.
- Integration Testing: testing of the website's integration with other components or systems.
- System Testing: testing of the overall functionality and usability of the website.

2. The testing will be conducted in the following environment:

- Operating System: Linux
- Browser: Firefox
- Devices: Desktop

3. Test Cases

3.1 Unit Testing

- Test the functionality of each component or module of the website using unit tests.

3.2 Integration Testing

- Test the integration of the website with other components or systems using integration tests.

3.3 System Testing

- Verify that all links and buttons on the website work correctly.
- Verify that the search functionality returns relevant results.
- Verify that the login and registration functionality works correctly.
- Verify that the website is easy to navigate and use.

- Verify that the website's layout and design are visually appealing and consistent.
- Verify that the website meets the performance and security requirements.

5.2 TEST CASES

Test Case #: 1	Test Case Name: Frontend ReactJS Unit Test for Login Functionality
System: Linux/Firefox	Subsystem: Authentication
Designed by: Shourya De	Design Date: 25.04.2023
Executed by: Shourya De	Execution Date: 26.04.2023
<p>Short Description: This test case verifies the login functionality of the ReviewViz platform.</p>	

Pre-conditions	<ul style="list-style-type: none"> • The user has an active internet connection. • The platform is deployed and running.
----------------	--

Step	Action	Expected System Response	Pass/Fail	Comments
1.	Enter a valid email and password.	Display validation on email Input.	Pass	
2.	Click on the Login button.	<ul style="list-style-type: none"> • The Generate page is displayed. • The user's JWT token is stored in the browser's local storage. 	Pass	

- | | |
|-----------------|--|
| Post-conditions | <ul style="list-style-type: none"> The user is redirected to the Generate page upon successful login. |
|-----------------|--|

Test Case #: 2	Test Case Name: Backend FastAPI Unit Test for Review Scraping
System: Linux/Firefox	Subsystem: Review Scraping
Designed by: Shourya De	Design Date: 25.04.2023
Executed by: Shourya De	Execution Date: 26.04.2023
Short Description: This test case verifies that the backend is able to scrape reviews from a given Amazon URL.	

- | | |
|----------------|--|
| Pre-conditions | <ul style="list-style-type: none"> The platform is deployed and running. The user is registered. A valid Amazon product URL is provided. The token is not expired. |
|----------------|--|

Step	Action	Expected System Response	Pass/Fail	Comments
1.	Send a POST request to the /scrape endpoint with a valid Amazon product URL.	<ul style="list-style-type: none"> A list of reviews is scraped, and NLP functions are applied to the reviews. An array of words is returned for the specific product. 	Pass	

2.	Verify that the response contains a list of words.	The system is ready to process another product URL after sending HTTP status code 200.	Pass	
----	--	--	------	--

Post-conditions

- The response contains a list of reviews.

Test Case #: 3

Test Case Name: Integration Test for Generating Word Cloud

System: Linux/Firefox

Subsystem: Word Cloud Generation

Designed by: Aditi Binjola

Design Date: 25.04.2023

Executed by: Leena Gupta

Execution Date: 26.04.2023

Short Description:

This test case verifies that the system is able to generate a word cloud based on scraped reviews.

Pre-conditions

- The platform is deployed and running.
- A valid Amazon product URL is provided.
- A user is logged in.

Step	Action	Expected System Response	Pass/Fail	Comments
1.	Enter a valid Amazon product URL on the Generate page.	The user is prompted to select a media format for exporting the word cloud.	Pass	

2.	Click on the Generate button.	<ul style="list-style-type: none"> The webpage displays a Spinner for 5–6 seconds. A word cloud image is displayed on the page. 	Pass	
3.	Verify that the response contains a word cloud and download the word cloud.	The word cloud is downloaded in the exported format.	Pass	

Post-conditions	<ul style="list-style-type: none"> The response contains a word cloud. The word cloud is exported to an image/ document format.
-----------------	---

Test Case #: 4	Test Case Name: System Compatibility
System: ReviewViz	Subsystem:
Designed by: Leena Gupta	Design Date: 25.04.2023
Executed by: Samarth Kapoor	Execution Date: 26.04.2023
Short Description: Verify that ReviewViz is compatible with the Windows operating system and Firefox web browser.	

Pre-conditions	<ul style="list-style-type: none"> The ReviewViz application is installed on a Windows operating system The Firefox web browser is installed on the system.
----------------	---

Step	Action	Expected System Response	Pass/Fail	Comments
1.	Open the browser and navigate to the ReviewViz website:	The ReviewViz website should load successfully, displaying the homepage of the website with all the necessary UI elements.	Pass	
2.	Click on the "Register" button and fill out the registration form with valid details	The website should validate the input data and create a new user account in the MongoDB database. The website should display a success message on the registration page and redirect the user to the login page.	Pass	
3.	Log in to the website using the newly created user account:	The website should validate the user credentials and allow the user to access the Generate page. The website should display the Generate page with all the necessary UI elements.	Pass	
4.	Enter a valid Amazon product URL in the input field and click on the "Generate".	The website should validate the input URL and initiate a background task to scrape the reviews, perform sentiment analysis, and generate a word cloud. The website should display a loading spinner to indicate that the process is in progress.	Pass	
5.	Wait for the word cloud to be generated.	The website should continue to display the loading spinner until the word cloud generation process is complete.	Pass	

6.	Verify that the word cloud has been generated and displayed.	The website should display the generated word cloud on the Generate page, with the most frequently used terms in the reviews being larger and bolder than less frequently used terms. The website should also display a download button to allow the user to download the word cloud as an image.	Pass	
7.	Click on the download button to download the word cloud.	The website should allow the user to download the word cloud as an image file, such as a PNG or JPEG.	Pass	

Post-conditions

- The word cloud is displayed correctly on the webpage
- The word cloud is successfully exported into the desired media format and downloaded.

5.3 TEST REPORTS

The test report is based on the testing activities performed on the ReviewViz sentiment analysis-based review visualization platform using Linux/Windows as the operating system and Firefox as the browser on a desktop system. The testing was performed using a combination of unit tests, integration tests, and system tests. Two unit tests and one integration test were designed and executed to ensure the functionality and integration of the ReactJS frontend, FastAPI backend, and MongoDB database. The system test was designed and executed to test the overall system functionality and ensure that the platform meets the requirements outlined in the project scope. The tests were successful, and the ReviewViz platform is ready for deployment.