FAST-NUCES
Department of Computer Science
BS-CS

What's Trending?

Project Proposal
Project-1 CS 4091

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Acknowledgment

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1. Introduction

What's Trending? is to help educate users to differentiate between what they are consuming on Twitter. The web platform deals with trending keywords. Users will be able to identify organic trends from the forced or paid trends before they form an opinion. The Application will provide the user with an interface to view trending keywords, further he can manually add any keyword and check on them if the data is available for that specific word. Also, if the user wants to view statistical analysis on some Twitter account or on trending keyword or the sentiments related to that trending keyword.

In this document, we will briefly explain the features of What's Trending? The document also explains the software requirement specifications. We will deal with all the design related issues as well as the requirements together with the scope of this project. This document will be continuously updated and on completion with be referred throughout the software development.

2. Vision Document

In this section, we discuss project vision in detail.

2.1. Problem Statement

Problem of	distinguishing right and wrong, real and fake, authentic and spam, unique, and bot tweets and thus the trends in real time.
Affects	both businesses and general public.
Impact of which	there is no product that can be used to distinguish between genuine and spam tweets, making it impossible to distinguish between genuine trends and spammy ones.
A Successful solution would be	A platform that can authenticate users, retrieve tweets from Twitter based on keywords, analyze tweet sentiment, display results graphically, compare data, and statistically

	differentiate spam from legitimate tweets will be a successful solution.

Table 1: Problem Statement

2.2. Business Opportunity

People in the present period use social media, particularly Twitter, to find out what other people are thinking and talking about so they may quickly gain knowledge, comprehend, defend, and create opinions. People can learn more about what's going on in their area thanks to this.

There are some products out there that somewhat relates to what we do, but they have relatively few features. The product that is currently on the market has several restrictions. Firstly, none of them carry out our features exactly. Additionally, they do not classify and evaluate Twitter trends and rate them based on actual/spam content. Although some software offers one or two of the features, there isn't a single solution that offers all of them. This creates a significant issue for businesses and the general public who lack access to a specific platform that can be used to complete all the stated activities.

2.3. Objectives

The main Objective of What's Trending? Is to provide people a quick and accurate overview of trends, so that they can analyse trends just at glance rather than spending time to manually analyse.

2.4. Scope

What's Trending? Is web application. The main problem we are currently facing is that there is no platform available where people can check quality of trend, people's sentiment on trend, analyse trend. The impact of it is that people participate in fake/low quality trend. They consider information to be legit which was spreading through these trends. WhatsTrending? will provide an environment through which be able to analyse these trends before taking any action.

2.5. Constraints

Firstly, we assume that internet will work fine all the time to load web page. The website does not require any hardware development or procurement.

2.6. Stakeholder and User Description

As there are projects which are providing sentimental analysis of tweet, analysing people profiles, but they are not providing analysis of trend and sentimental analysis of trends. The differentiating edge of this product is that application will be in real-time. The potential users of this application will be all the literate people who know the usage of web-based application and twitter.

2.6.1. Market Demographics

Our target market includes the general public, businesses, and all English-speaking Twitter users. In order to give them a better platform for unique and valid content and enable them to absorb just the real information.

Everyone is turning away from traditional sources of information and migrating toward social media, particularly Twitter.

It can be used by PTA and possibly Twitter to cut down on spam and teach users on how to make better decisions, but for this project, the intended audience is the general public.

2.6.2. Stakeholder Summary

Name	Description	Responsibilities
Developer	The developer who are developing the system.	Design the flow of system development Monitor progress of development
Tester	Testing system	Removing bugs from system

Trainer	Train system on data	Check and increase accuracy of system on result
Maintainer	Provide maintenance of system	Adding, removing, or modifying feature of system.

Table 2: Stakeholder Summary

2.6.3. User Summary

Name	Description	Responsibilities	Stakeholder
Actor	Person Registered	For first time user need to register on system. Otherwise, login. Can interact with application interface	Development team, User
Secondary Actor	System	Acquired data from twitter through API, Trend analysis, trend sentimental analysis	The end user who are getting result about trend

Table 3: User Summary

2.6.4. User Environment

As this is a one-year project, we are developing a web-based application which will analyse trend and will predict quality of trend and people sentiment on trend. There are 3 members in our group who are working on this project.

The project has been divided into 5 different stages. In September, October we are doing Requirement Specifications, October and November are for Design and Analysis, November to February is for Implementation, February and March are for Testing, March and April are for Deployment.

2.6.5. Stakeholder Profiles

Representative	We are three members working on this project. The stakeholder of system include developer, tester, trainer, maintainer.
Description	Developer is managing requirement, planning thing according to it and writing code for application. Developer is managing requirement, planning thing according to it and writing code for application. Tester will test system and make sure that system is bug free. Trainer will train system on dataset and will make sure its accuracy of result. Maintainer will maintain the product after its development and will add or remove feature.
Type	Our group of three members are working on this project. We have

	divided work into small task and task was done by all of us.
Responsibilities	Develop a system which help people to analyse trend. Providing easily understandable interface to user.
Success Criteria	Firstly, system will acquire data related to trend using Twitter API, then according to option selected by user system will provide accurate result on real time data.
Involvement	All stakeholder is participating in development of system.
Deliverables	Project deliverable will be same as mentioned.
Issues	We have to face issue of identification of bot account while system training.

Table 4: Stakeholder Profiles

3. System Requirement Specification

In this section, features and requirements of the system are explained.

3.1. System Features

- User authentication
- Analyze trends
- Sentiment on trend
- Developer Portal
- Data visualization
- Bot account recognition in trend
- Statistical analysis of account

3.2. Functional Requirements

The functional requirements of the system are listed below.

3.2.1. User Authentication

A graphical interface will be provided to the user for login. New users will sign up for an account. Each user will be provided with a recommendation according to his added keyword.

3.2.2. Trend Quality

The Keywords provided by the user system will predict Trend quality based on factors i.e., unique account participation, unique message, analyzing trend starter accounts, checking bot accounts participation, and some other factors by using AI, and ML techniques.

3.2.3. Trend Analysis

The keyword entered by the user for statistical analysis will predict the trend timeline, growth rate, growth region, activity graph, popular tweet, and popular retweet.

3.2.4. Sentiment Analysis

The keyword will be entered by the user for sentimental analysis, the system will extract the public sentiments positively or negatively using NLP.

3.2.5. Bot Account recognition

The username will be provided by the user; The system will identify whether the participating account was operated by a fake, bot, or authentic account.

3.2.6. Data Visualization

The system will provide frequency analysis and visualize data. It will include the frequency of total account participating, real account, bot account, total tweets made, unique tweets, unique accounts participating in the keyword, number of times the keyword is used, same message retweet, gender ratio, age ratio, and platform ratio.

3.2.7. Statistical analysis of Twitter account

The username will be provided by the user; the system will provide a detailed overview of that Twitter account.

3.2.8. Developer API Portal

System will provide a portal to developer.

3.3. Non functional requirement

The functional requirements of the system are listed below.

3.3.1. Performance

The basic functionality of What's Trending? is its performance, how system will perform, its throughput, accuracy, response time. It's crashing or failure chance will be very low. It should quickly respond to the user.

3.3.2. Availability

The system should be available 24/7.Every time authenticated user made request service will be provided to him.

3.3.3. Robustness

What's Trending? should allow user to achieve their desired result.

3.3.4. Security

There will be no issue of data security. The username and password would be required for authentication. The user who has register on website would be given permission to access made request.

3.3.5. Maintainability

The software should be maintainable. This means that the proper

Object oriented principle should be applied so that in future, if there is any need to update a particular module than the developer needs to modify only specific classes.

3.3.6. Capacity

What's Trending? Will be able to support multiple users at a time.

4. Use Case Diagram
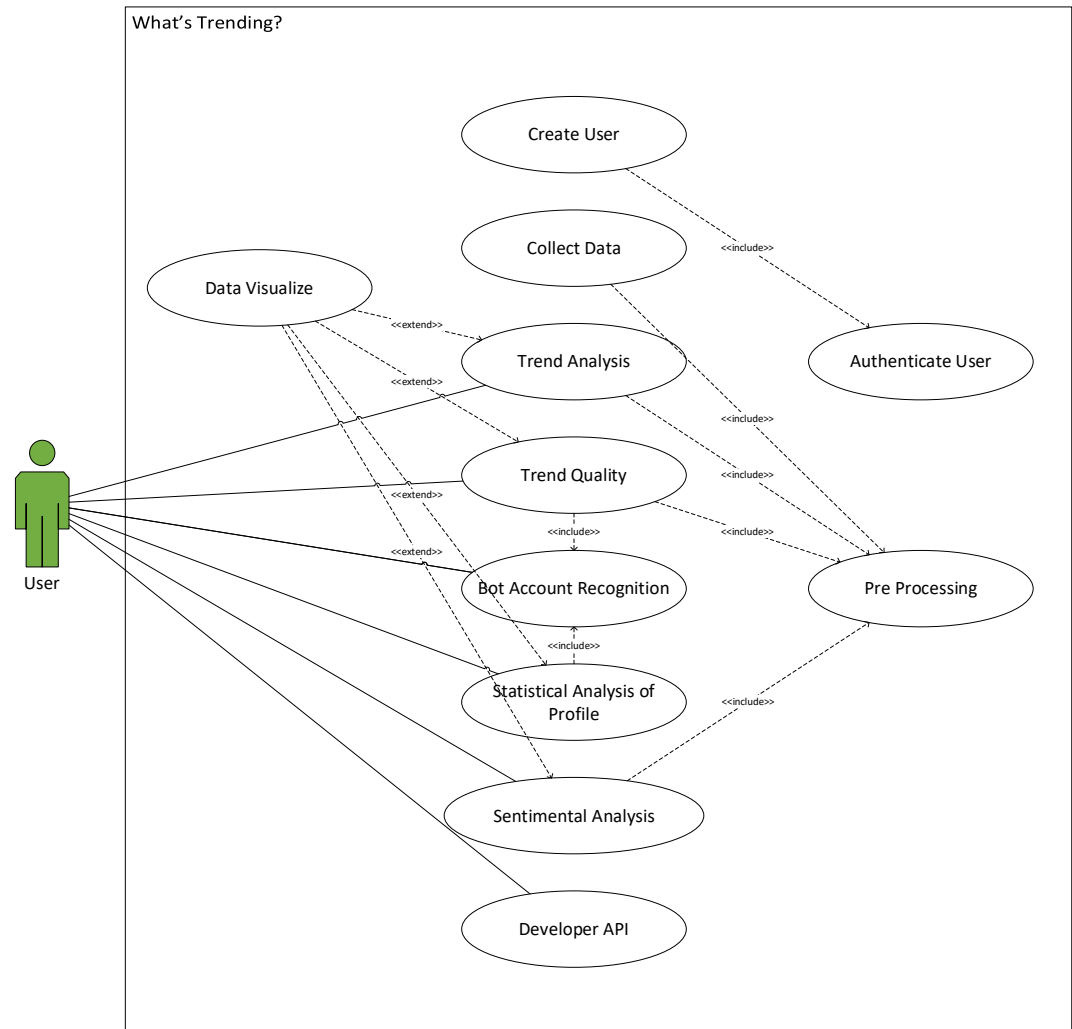
Figure 1: Use Case Diagram

5. High Level Use Case

5.1. Create User

Use Case Name	Create User
Actor	User
Type	Primary
Description	The user needs to be registered on system to continue using system.

Table 5: High Level Use Case of Create User

5.2. Authenticate User

Use Case Name	Authenticate User
Actor	User
Type	Primary
Description	The user needs to be authenticated to continue using system

Table 6: High Level Use Case of Authenticate User

5.3. Sentimental Analysis

Use Case Name	Sentimental Analysis
Actor	User
Type	Primary
Description	After Analysing trend, system will predict sentiment of people on specific trend.

Table 7: High Level Use Case of Sentimental Analysis

5.4. Data Visualize

Use Case Name	Data Visualize
Actor	User
Type	Primary
Description	After Analysing trend, system will show result in graphical form.

Table 8: High Level Use Case of Data Visualize

5.5. Trend Quality

Use Case Name	Trend Quality
Actor	User
Type	Primary
Description	The Keywords provided by the user, the system will predict Trend quality in terms of Authentic, Fabricated, or intermediate.

Table 9: High Level Use Case of Trend Quality

5.6. Trend Analysis

Use Case Name	Trend Analysis
Actor	User
Type	Primary
Description	The Statistical method will be applied on trend to extract information. The system will show the result in graphical form.

Table 10: High Level Use Case of Trend Analysis

5.7. Developer API

Use Case Name	Developer API
Actor	Programmer
Type	Primary
Description	The third-party user will request the System to perform one of provided the use-case.

Table 11: High Level Use Case of Developer API

5.8. Bot Account Recognition

Use Case Name	Bot Account Recognition
Actor	System, User
Type	Secondary, Primary
Description	The System would recognize and identify the Bot accounts.

Table 12: High Level Use Case of Bot Account Recognition

5.9. Statistical Analysis of Profile

Use Case Name	Statistical Analysis of Profile
Actor	User
Type	Primary
Description	The system would perform statistical analysis.

Table 13: High Level Use Case of Statistical Analysis of Profile

6. Expanded Use Case

6.1. Create User

Use Case Name	Create User
Actor	User
Description	The user needs to be registered on system to continue using system.
Pre-condition	The User has access system through web portal.
Post-condition	The User has successfully created account on system.
Normal flow	1. User access system through web portal. 2. User will enter email address, username, password and confirm password. 3. User will be redirect to login page.
Alternate flow	1.a Make sure to have internet connection and try again. 3.a User is unable to login Re-enter password and confirm password they don't match.
Frequency of Use	Normal
Assumption	The user knows how to sign up

Table 14: Expanded Use Case of Create User

6.2. Authenticate User

Use Case Name	Authenticate User
Actor	User
Description	The user needs to be authenticated to continue using system.
Pre-condition	User has access system through web portal.
Post-condition	The User has successfully logged in on system and redirected to login page.
Normal flow	1. User access system through web portal. 2. User enter username and password. 3. User will be redirected to dashboard page.
Alternate flow	1.a Website is not accessible by user. Make sure to have internet connection and try again. 3.a User is unable to login. username or password don't match in database. Make sure to enter correct username and password. 3.b User is unable to login, user profile not exist in system. Create new account and try again.
Frequency of Use	Normal
Assumption	The user knows how to login

Table 15: Expanded Use Case of Authenticate User

6.3. Sentimental Analysis

Use Case Name	Sentimental Analysis
Actor	User
Description	After Analysing trend, system will predict sentiment of people on specific trend.
Pre-condition	The user provide keyword to system, and it is necessary to have data related to that keyword.
Post-condition	The user will be provided with result.
Normal flow	1. The user selects option of sentimental analysis. 2. The user enter keyword manually or from provided keyword list. 3. System after processing show result to user.
Alternate flow	3.a System don't show result to user. There is no data related to provided keyword. Try with another keyword.
Frequency of Use	Normal
Assumption	The user wants sentiment of people on specific trend related to keyword.

Table 16: Expanded Use Case of Sentimental Analysis

6.4. Data Visualize

Use Case Name	Data Visualize
Actor	User

Description	After successful statistical operation, system will show result in graphical form.
Pre-condition	System has successfully completed any desired operation.
Post-condition	The user will be provided with result in graphical form.
Normal flow	1. The user enter keyword manually or from provided keyword list. 2. The user selects any desired operation. 3. Data in graphical form is shown to user.
Alternate flow	3.a system is unable to show result to user due to insufficient data. Try again with keyword that have sufficient data.
Frequency of Use	High
Assumption	The user wants result in graphical form.

Table 17: Expanded Use Case of Data Visualize

6.5. Bot Account Recognition

Use Case Name	Bot Account Recognition
Actor	System, User
Description	The user can request for Bot account recognition, or the System requires it during Profile Analysis.
Pre-condition	User must be logged in.
Post-condition	User/System will be notified if the account is recognized as bot or not.
Normal flow	1. System or User provides the profile's username. 2. Requests for bot account recognition. 3. The system performs analysis and displays outcome.
Alternate flow	3.a System is unable to display result because no user exist with provided username. Renter correct username and try again. 3.b System is unable to display result due to lack of data. Try again with another username.
Special Requirement	Availability of Internet
Assumption	The User or System wants to know if an account is operated by bot or actual user.

Table 18: Expanded Use Case of Bot Account Recognition

6.6. Statistical Analysis of Profile

Use Case Name	Statistical Analysis of Profile
Actor	User
Description	The user can request for statistical analysis of any profile.
Pre-condition	User must be logged in.
Post-condition	User will get a report about the Profile's Statistical Analysis.
Normal flow	1. The user requests for Account statistical analysis. 2. User enters the profile's username. 3. The system performs statistical analysis and displays outcome.
Alternate flow	3.a System is unable to display result because no user exist with provided username. Renter correct username and try again.

	3.b System is unable to display result due to lack of data or account is set to private. Try again with another username.
Frequency of Use	Normal
Assumption	The user wants to know the statistical details about any user's profile.

Table 19: Expanded Use Case of Statistical Analysis of Profile

6.7. Trend Quality

Use Case Name	Trend Quality
Actor	User
Description	The Keywords provided by the user, the system will predict Trend quality in terms of Authentic, Fabricated, or intermediate.
Pre-condition	The user must provide a keyword to the system, so the system can get the required data.
Post-condition	The System will provide the prediction of whether the trend is authentic or not.
Normal flow	1. The user selects the option of Trend Quality. 2. Users enter a keyword manually or from the provided keyword list. 3. The system will perform Trend Analysis. 4. The system will classify the trend. 5. The system will predict trend authenticity.
Alternate flow	5.a System is unable to perform operation due to insufficient data. Try again with another keyword with sufficient data.
Frequency of Use	Normal
Assumption	Users want to know the quality of trend of specific keyword.

Table 20: Expanded Use Case of Trend Quality

6.8. Trend Analysis

Use Case Name	Trend Analysis
Actor	User
Description	The Statistical method will be applied on trend to extract information. The system will show the result in graphical form.
Pre-condition	The user must provide a keyword to the system, so the system can get the required data.
Post-condition	The meaningful information on the requested trend will be shown to the user in graphical form.
Normal flow	1. Users enter a keyword manually or from the provided keyword list. 2. The user selects the option of Trend Analysis. 3. The system will apply Statistical operation on a trend. 4. The results will be shown to the user in graphical form.
Alternate flow	4.a System is unable to do trend analysis due to insufficient data. Try again with another keyword with sufficient data.
Frequency of Use	High
Assumption	The user wants an overall overview of the trend.

Table 21: Expanded Use Case of Trend Analysis

6.9. Developer API

Use Case Name	Developer API
Actor	Programmer
Description	The third-party user will request the System to perform one of provided the use-case.
Pre-condition	The Request is valid. The Twitter Access keys are valid.
Post-condition	The system will respond according to request.
Normal flow	1. The Programmer will request the system. 2. The request is Valid. 3. The system will request data from Twitter API related to the keyword. 4. The system will perform operations according to request. 5. The system will respond according to request.
Alternate flow	2.a Request is invalid. Try again with correct request. 4.a system is unable to perform operation due to insufficient data. Try request with another keyword.
Frequency of Use	High
Assumption	Users want to know the quality of the trend of the related keyword.

Table 22: Expanded Use Case of Developer API

7. Component Diagram
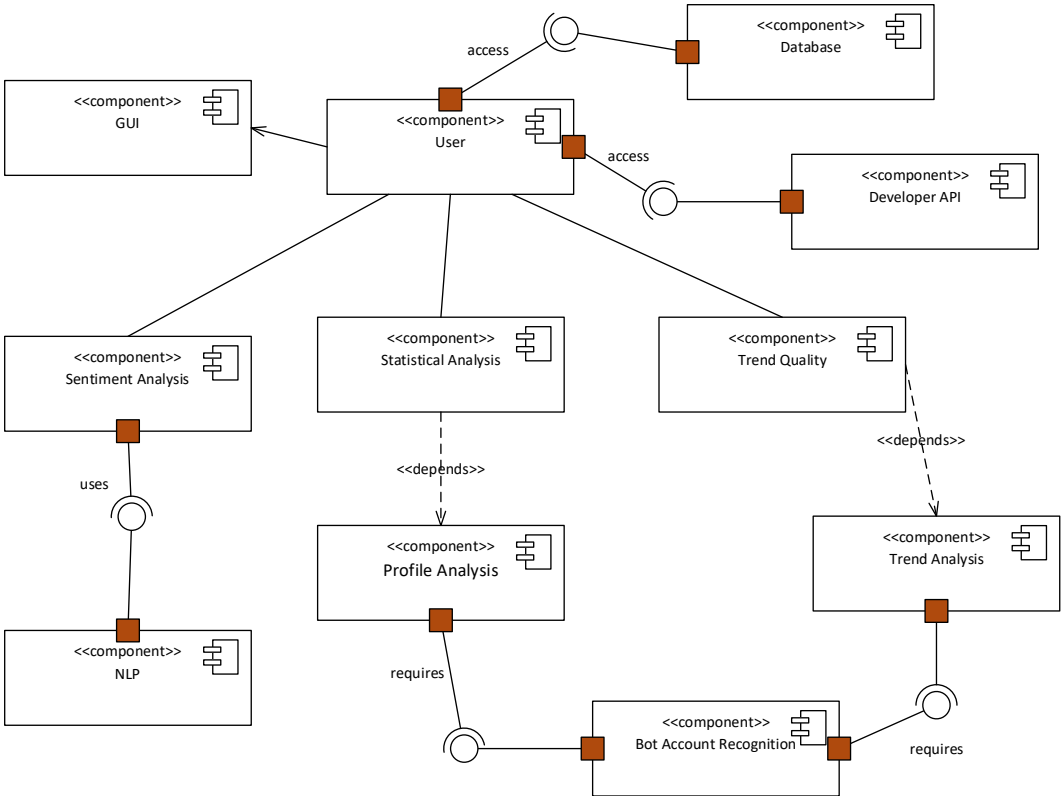
Figure 2: Component Diagram

8. Data Flow Diagram
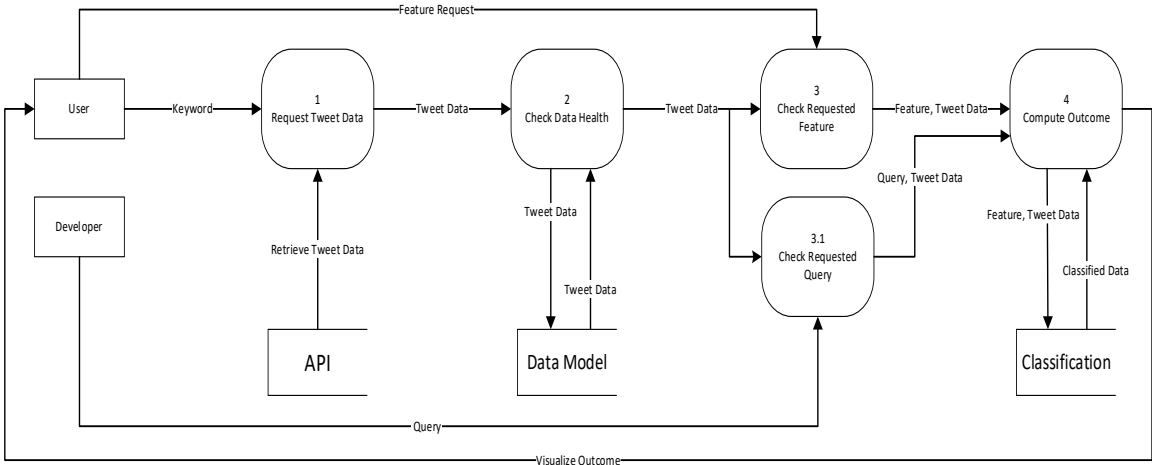
Figure 3: Classic DFD in Gane-Sarson notation

9. Swim Lane Diagram

9.1. Swim Lane Diagram of UI Interface
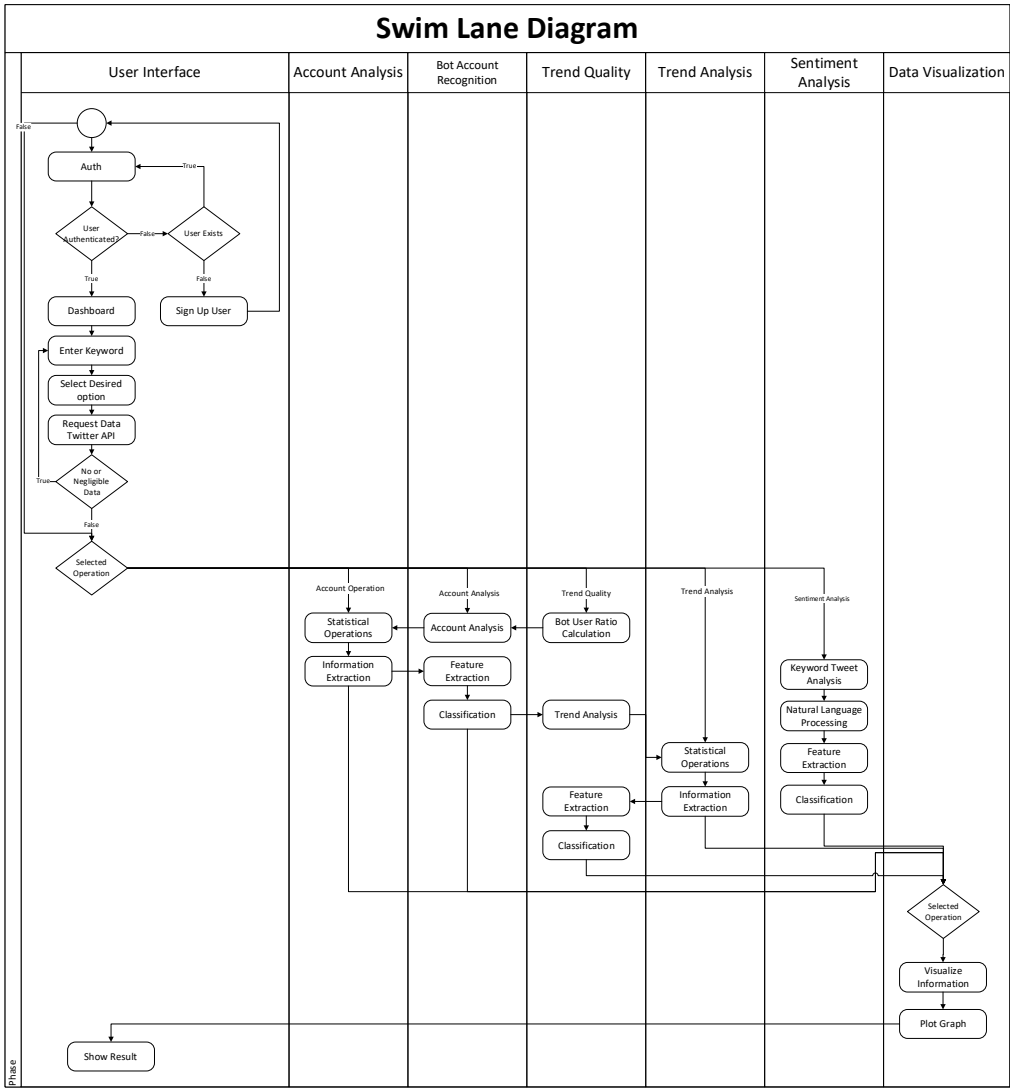
Figure 4:Swim Lane Diagram of UI Interface

9.2.   Swim Lane Diagram of Developer API Interface
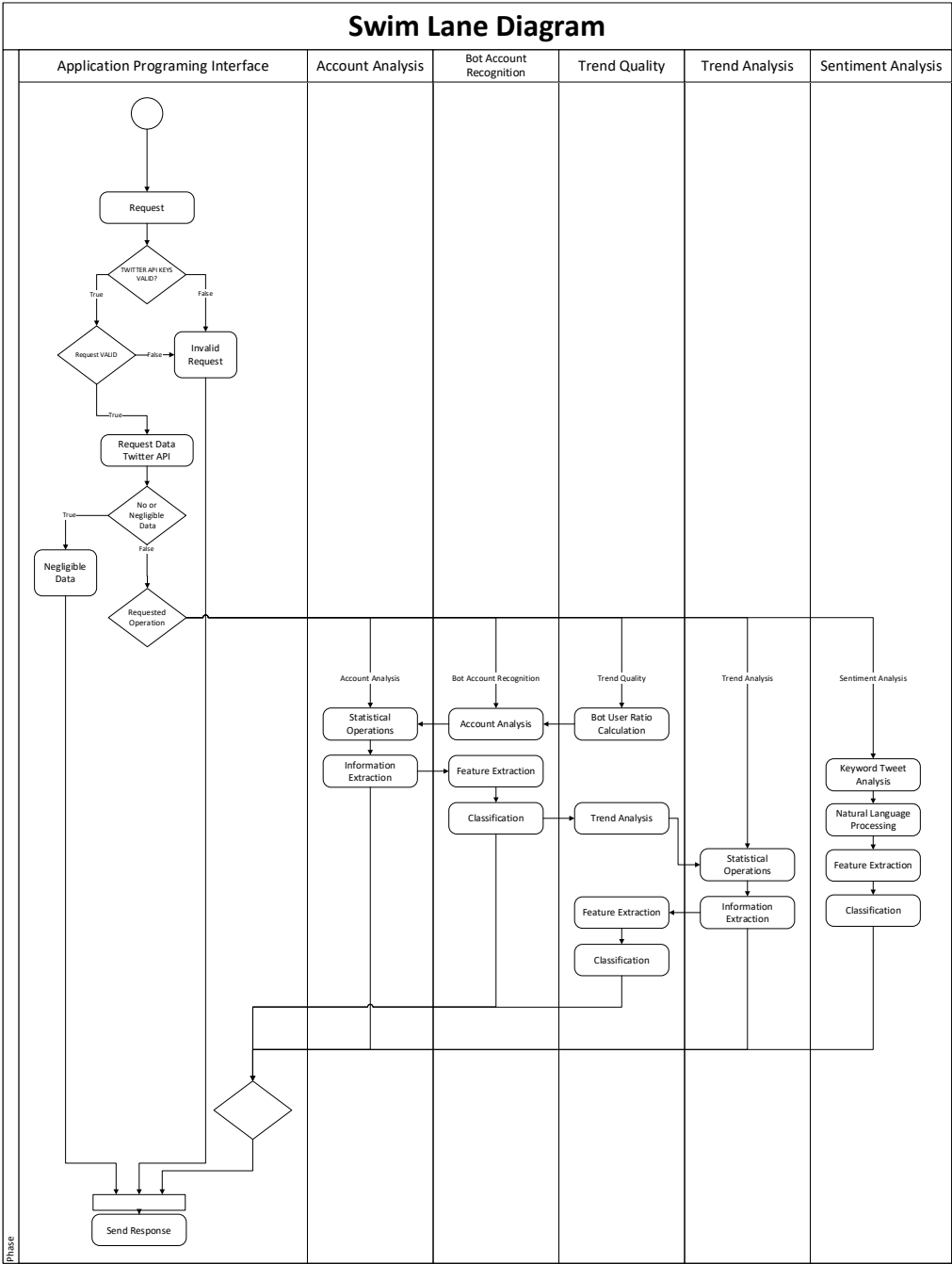
Figure 5:Swim Lane Diagram of Developer API Interface

10. System Sequence Diagram
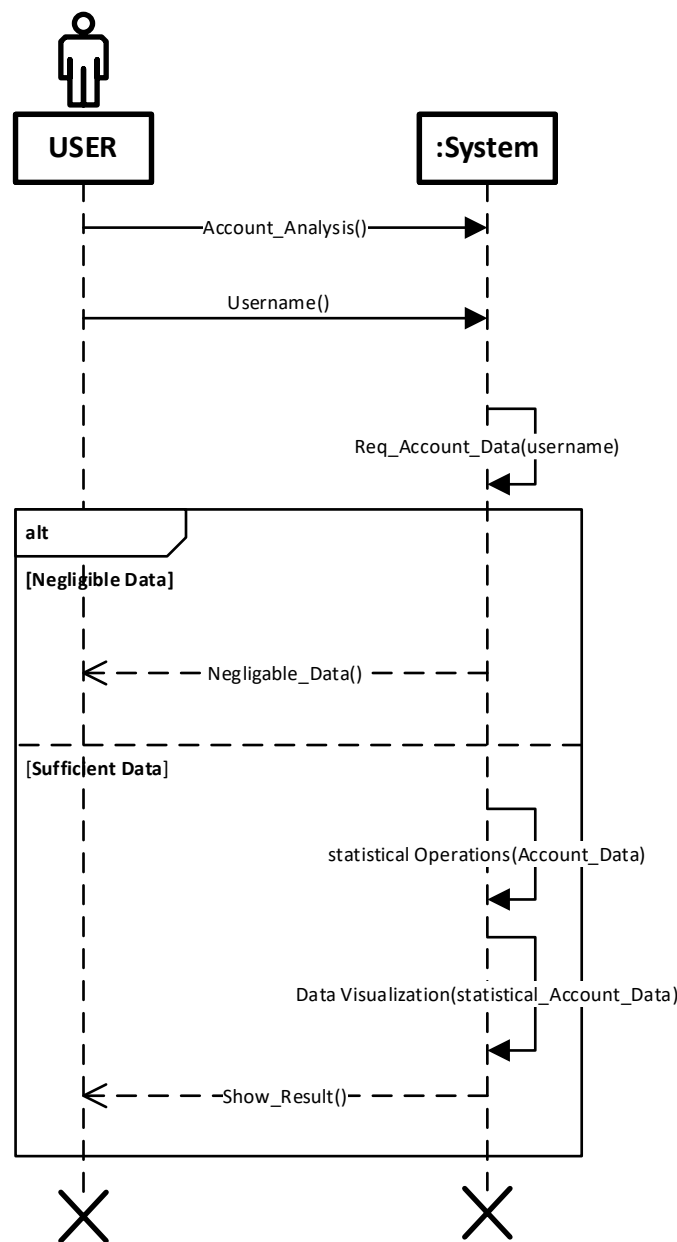
10.1. Statistical Analysis of Profile

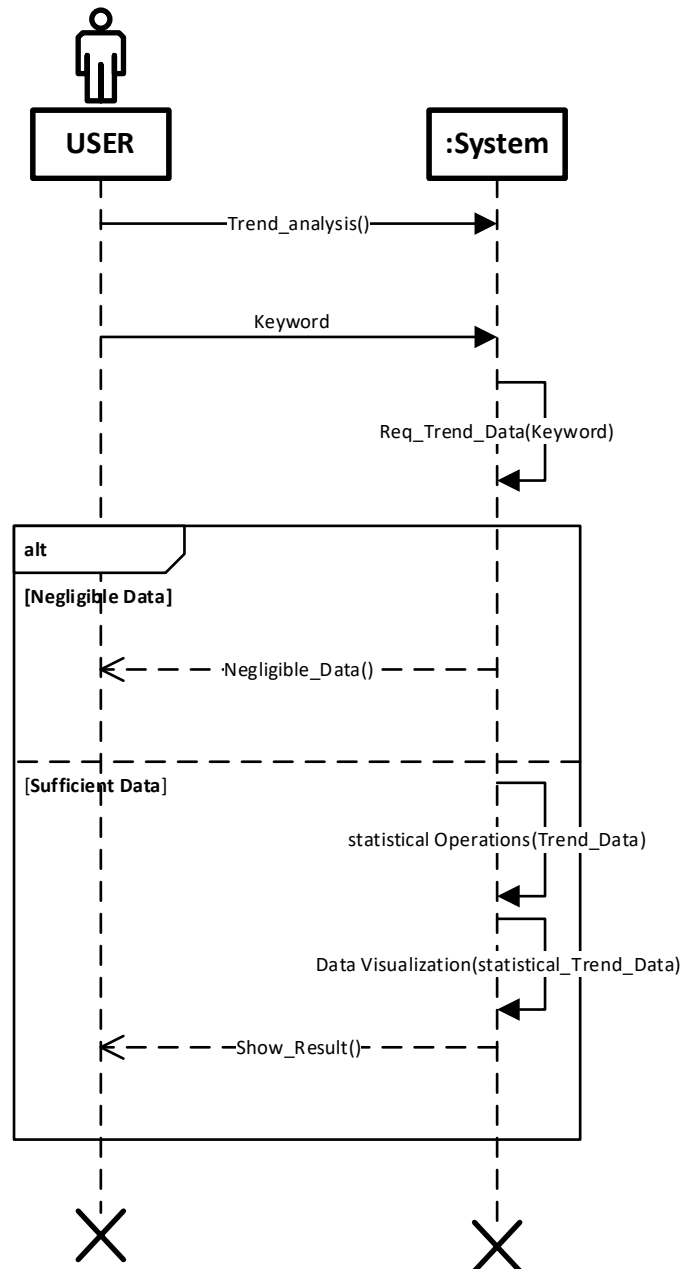*Figure 6: SSD of Statistical Analysis of Profile*

10.2. Trend Analysis

Figure 7: SSD of Trend Analysis

10.3. Trend Quality
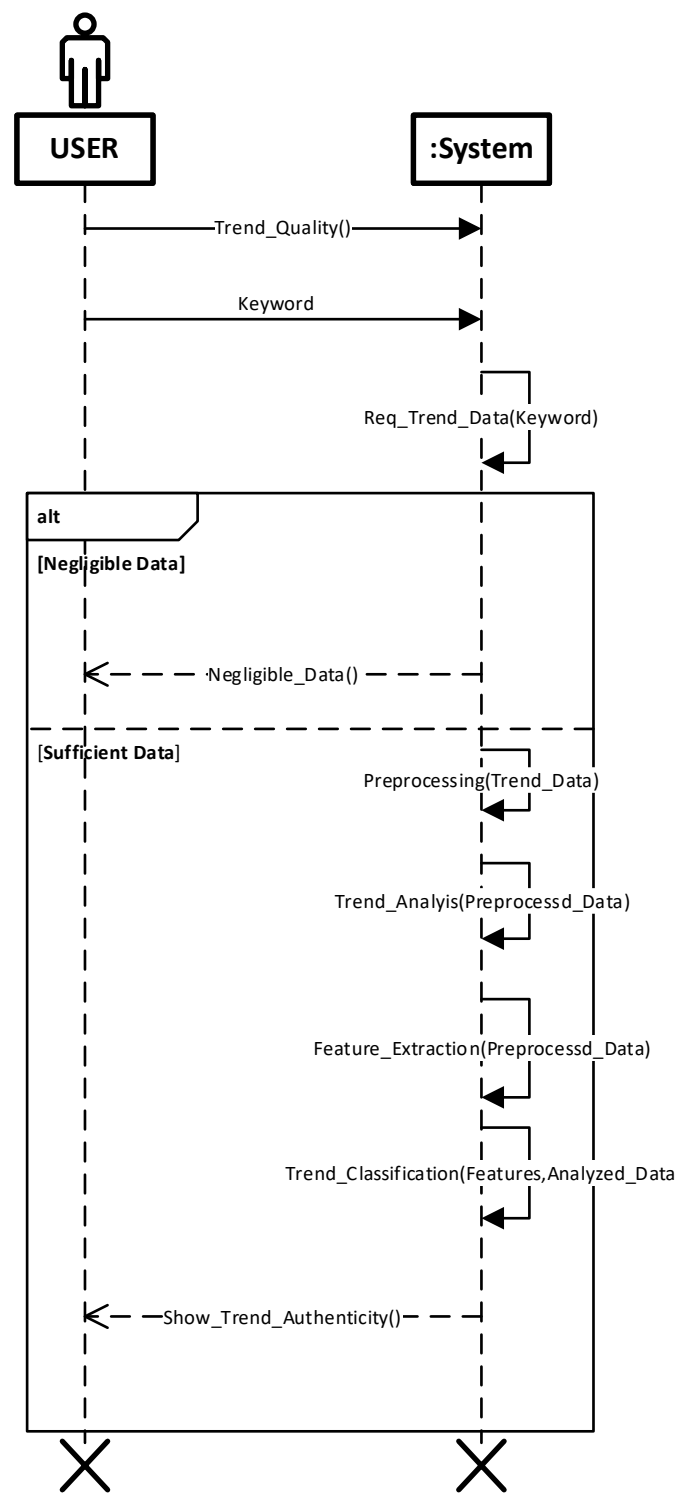
Figure 8: SSD of Trend Quality

10.4. Bot Account Recognition
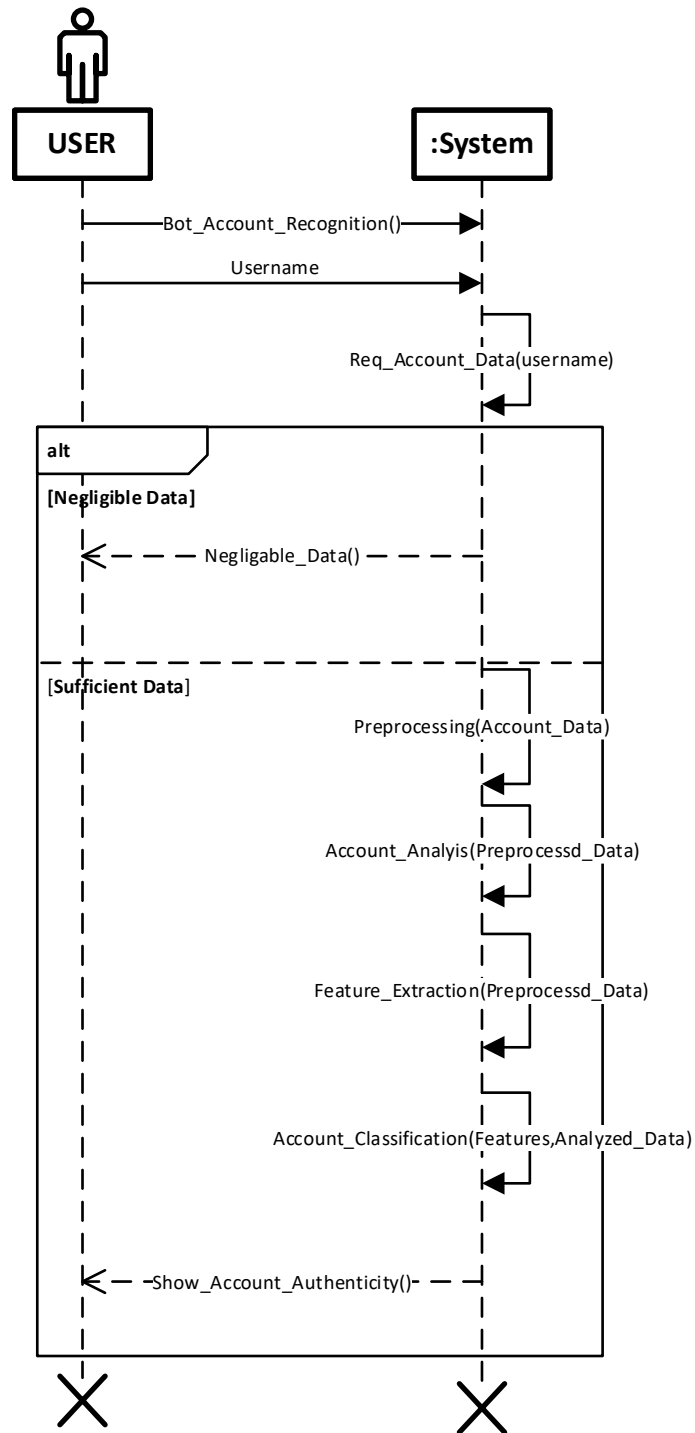
Figure 9: SSD of Bot Account Recognition

10.5. Sentiment Analysis
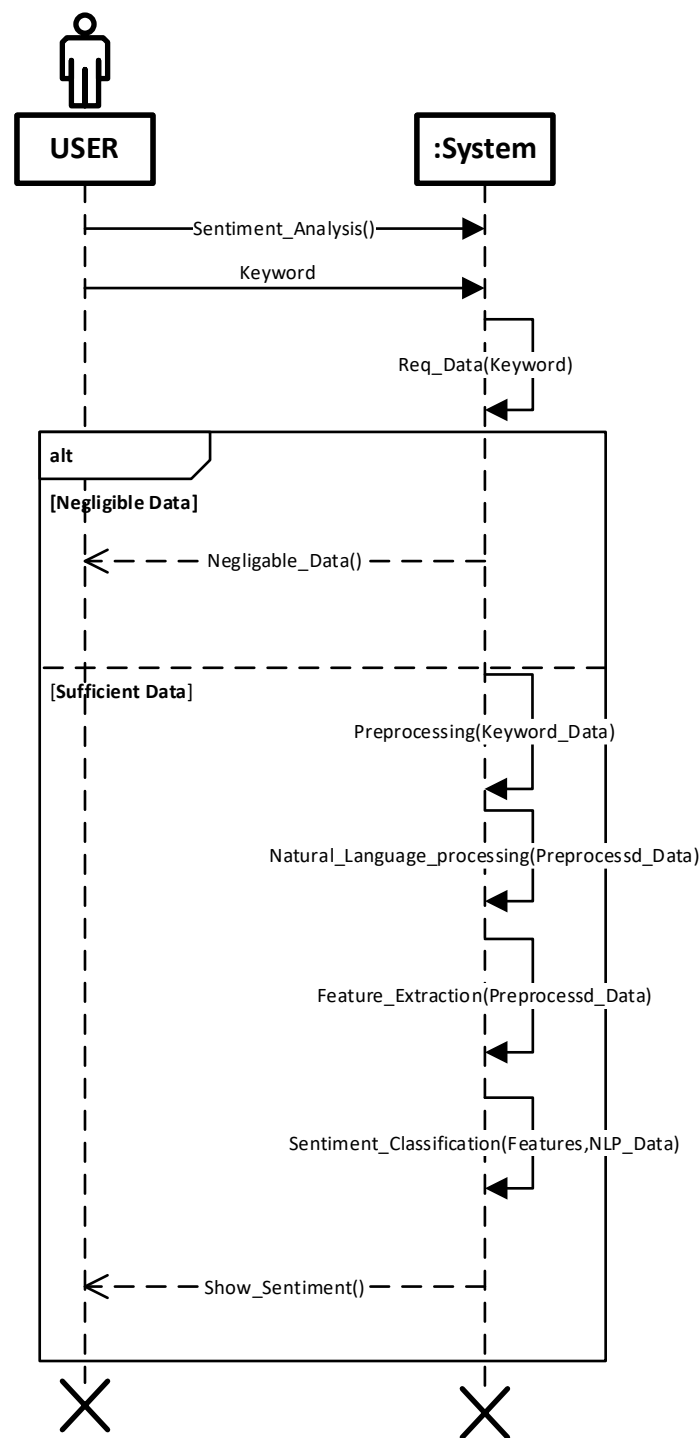
Figure 10: SSD of Sentiment Analysis

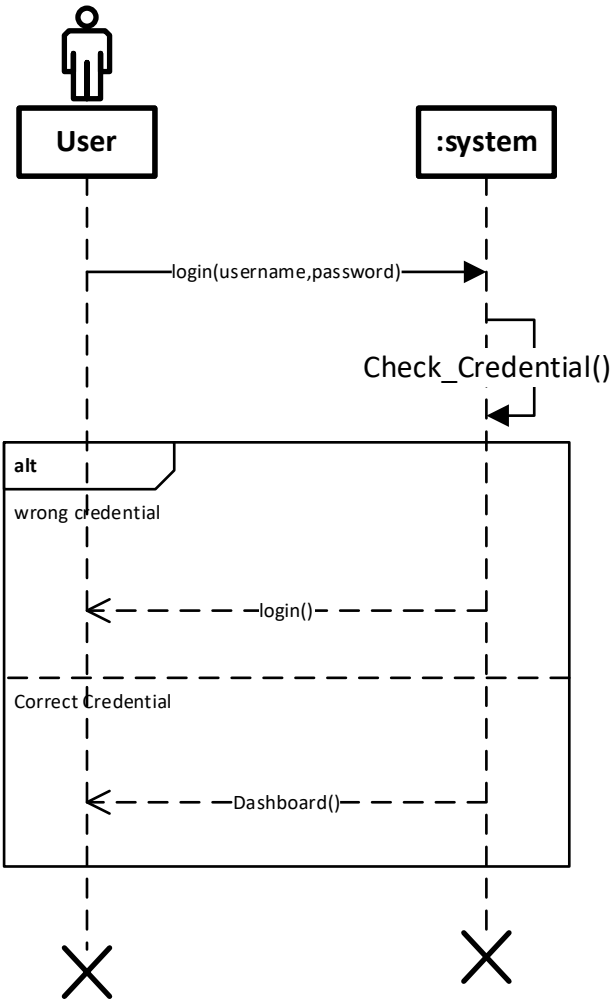## 10.6. Developer API
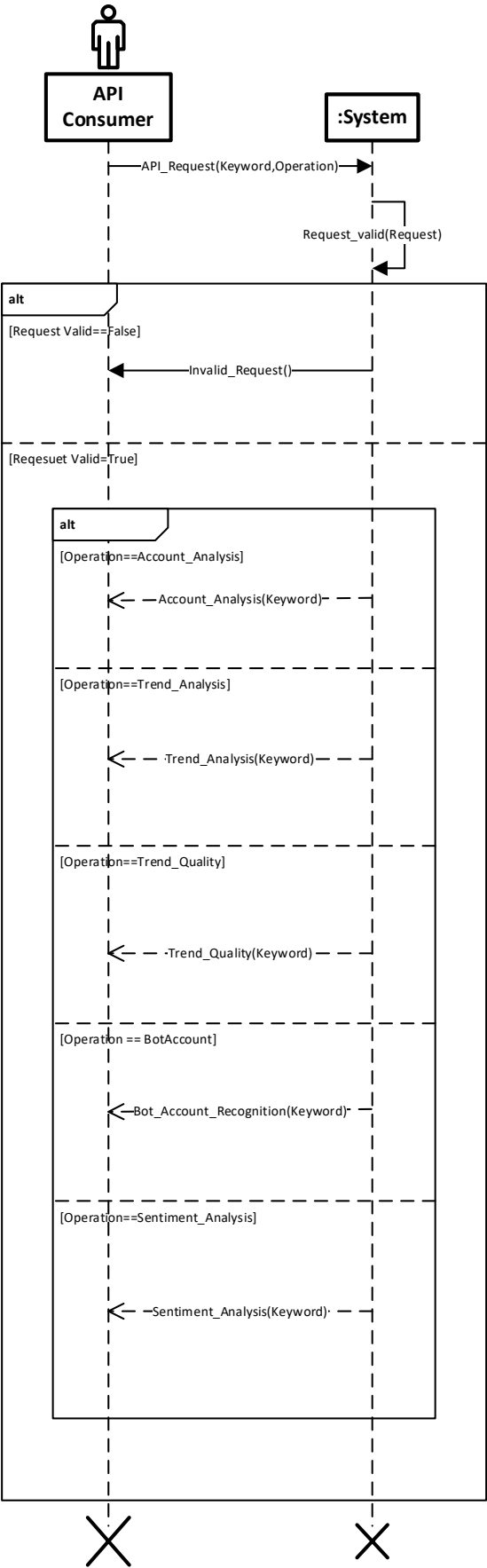
Figure 11: SSD of Developer API

10.7. Login

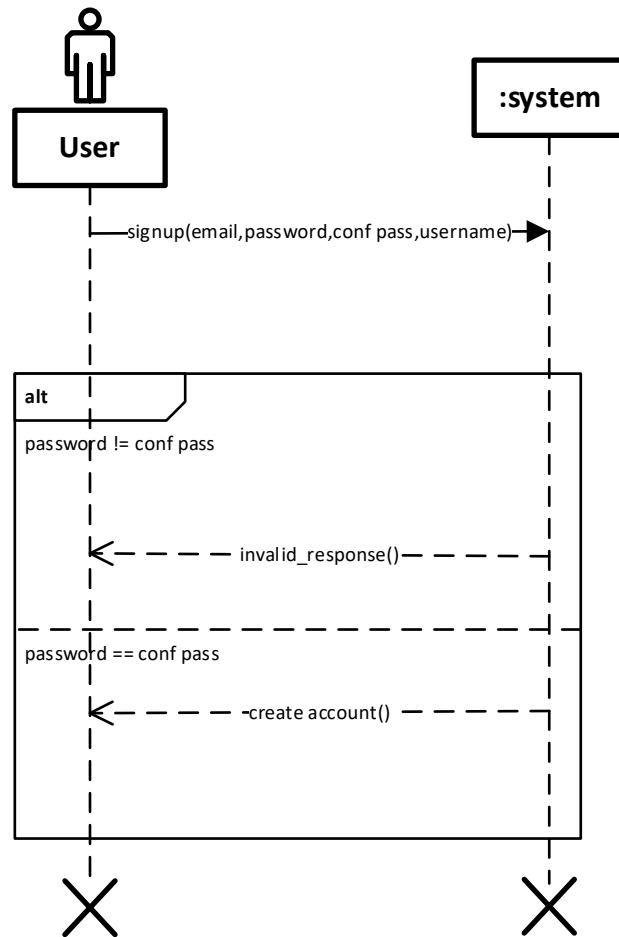*Figure 12: SSD of Login*

10.8. Sign up

Figure 13: SSD of Sign Up

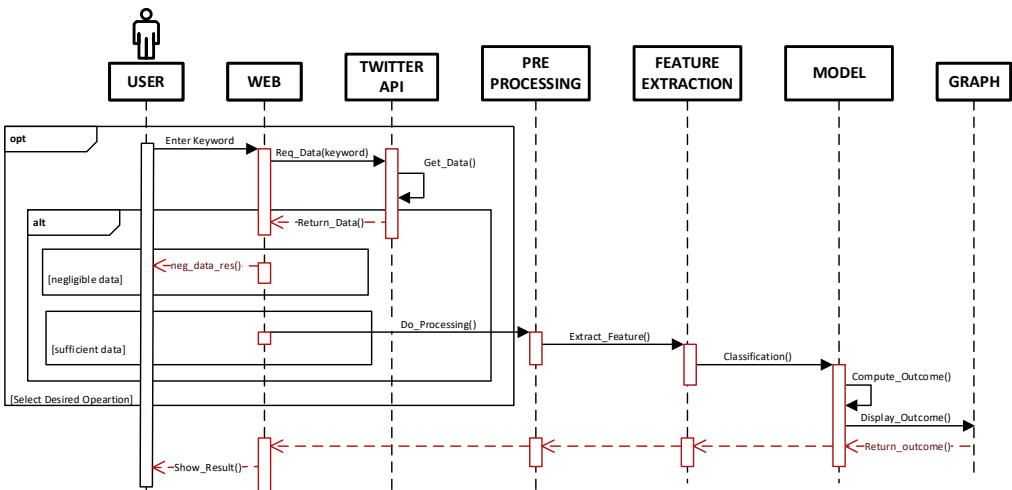# 11. Sequence Diagram

11.1. UI Interface

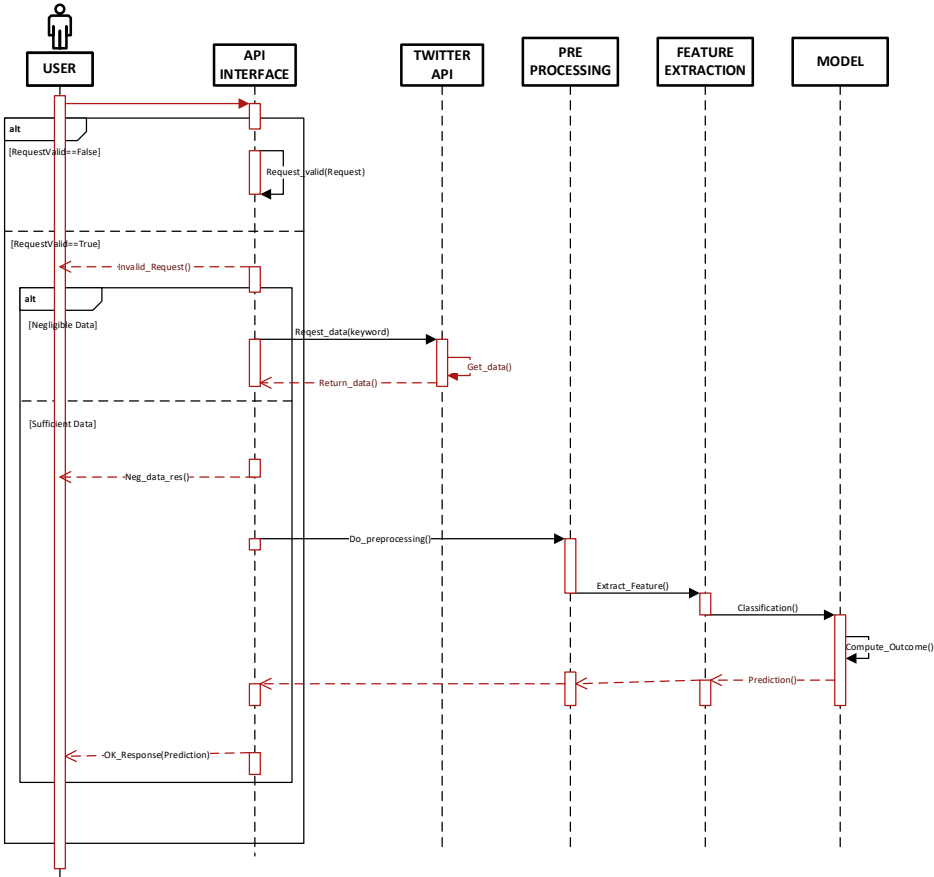*Figure 14: Sequence Diagram of User Interface*

11.2. Developer API Interface

Figure 15: Sequence Diagram of Developer Interface