Functional specification

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1. Introduction

1.1 Objective

The purpose of this document is to summarise and outline the functional specifications for the project. All requirements, dependencies and functionality will be discussed in this document.

1.2 Project Scope

The goal of this project is to produce a fully functional application which is capable or retrieving, storing and analysing tweets on twitter. Twitter application programming interface (API) will be used to retrieve the tweets. Tweets then will be stored on MariaDB database and after enough tweets have been stored – they will then be analysed using sentiment analysis techniques. In the end, the application will summarise scores from all tweets and output the final result stating whether the object queried is liked by people on twitter or not.

1.3 Internal Audience

This project will be developed by one student – Ignas Usinskas.
Project will be supervised by a lecturer in college – Greg Doyle.
The users of the end product will be anyone and everyone who want to get a quick summary of a certain product, person or anything that the query is about.

1.4 References

- Graphical user interface (GUI) - https://en.wikipedia.org/wiki/Graphical_user_interface
- MariaDB database management system - https://en.wikipedia.org/wiki/MariaDB
- Twitter - https://en.wikipedia.org/wiki/Twitter
- Application programming interface (API) - https://en.wikipedia.org/wiki/Application_programming_interface
- Sentiment viz - https://www.csc.ncsu.edu/faculty/healey/tweet_viz/tweet_app/
- Socialmention - http://www.socialmention.com/

2. Overall Description

2.1 Product Perspective

This product is a replacement for certain existing products with similar functionality. The product will be similar to existing products, just more simplistic and hopefully more accurate which will provide easiest graphical user interface (GUI) and best results.

2.2 Product Features

The core features of this product are:
- **Extraction of relevant tweets** – this application will be able to determine which tweets are relevant to the search query and the extract them.
- **Store tweets on database** – since the maximum amount of tweets that can be extracted per day using twitter API is limited to 140. Tweets need to be extracted over several days to get a bigger amount of tweets for better analysis. For this to be possible, MariaDB database will be used.

- **Analyse tweets** – sentiment analysis techniques will be used to analyse the emotions of tweets to determine whether they are positive, negative or neutral. In research manual, the decision was made to use simplest analysing approach called keyword spotting, and later use a more advanced and efficient approach which is machine learning algorithms.
- **Output overall result** – once all relevant tweets have been analysed, an overall result will be displayed to the user stating whether people like or dislike the queried term. Tweets which have been analysed will also be displayed in the same window.

2.3 Operating Environment

The software will operate on windows computers. Since it will be a web application – no installation or hardware requirements are present. That being said, internet is vital. No internet connection means no software operation.

2.4 Design and Implementation Constraints

There are several constraints that will limit the functionality and overall performance of this software:
- **Learning curve** – the student has not done anything related to sentiment analysis before which means there is a huge learning curve involved which will affect the overall quality of the end product. Also the student has decided to use Python programming language and MariaDB database management system. Both are new to him and will need to be learned.
- **Time limit** – the project has a time limit of 18 weeks. It is not that much taking into consideration that the student will be attending a full time studies and has other projects to work on at the same time.
- **Twitter API limitations** – twitter API limits how many tweets can be extracted per day to 140. This means that the software will/might not be as accurate as other software which has thousands if not millions of tweets at their disposal. More tweets analysed will give a more accurate result.

2.5 Assumptions and Dependencies

2.5.1 Assumptions
- **Familiarity with web applications** – users have basic understanding of how to use web applications and read provided results.

2.5.2 Dependencies
- **Internet connection** – the software will be a web application – meaning that internet connection will be required at all times for it to work.

3. System Features

3.1 Search

3.1.1 Description and Priority
The user will be able to search for a specific query by imputing it into a search field.
Priority – High.
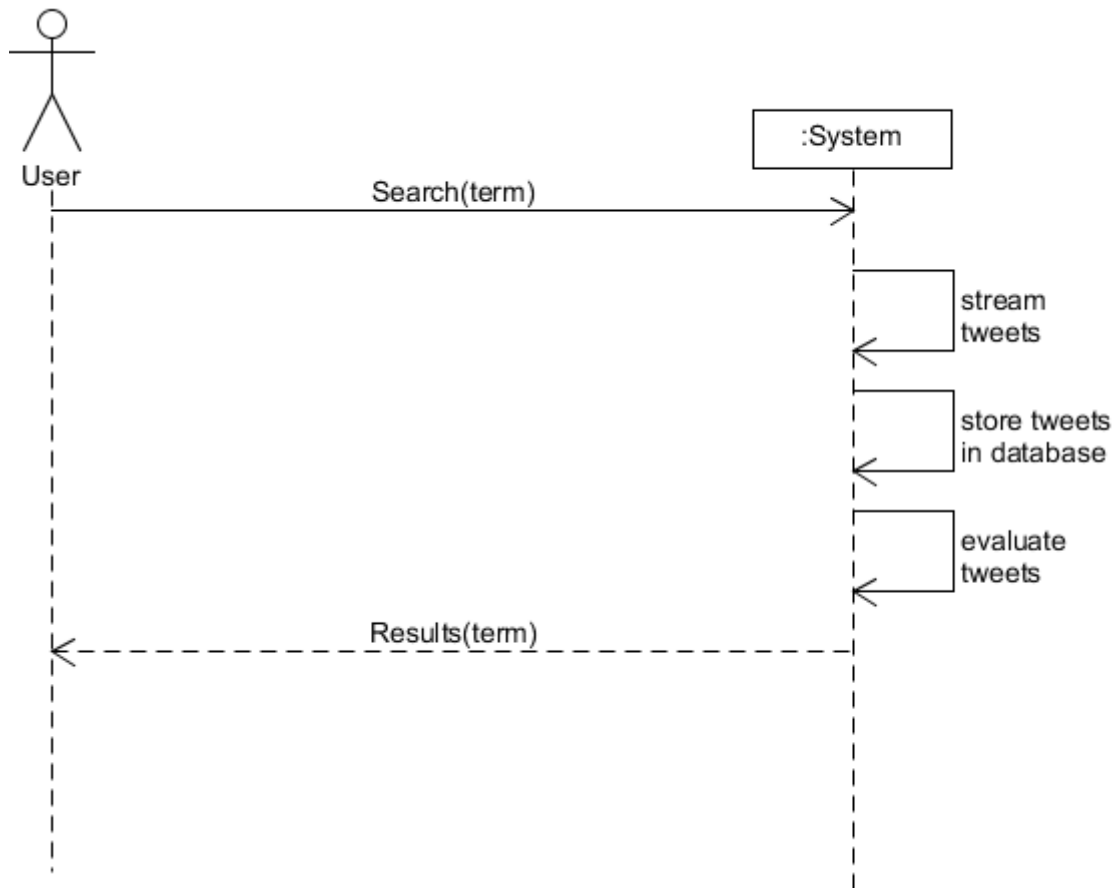
3.1.2 Stimulus/Response Sequences

Figure1. System sequence diagram of search operation.

3.1.3 Functional Requirements

The software will need to provide a search field for a user to input his/her search term. The rest is done by the software automatically – it will retrieve relevant tweets, store them on the MariaDB database and evaluate them using sentiment analysis techniques.

The software then will open a new window and displays the results containing all relevant tweets, the evaluation of each tweet and the overall result stating whether the queried term is liked or disliked by people on twitter.

4. Requirements

4.1 Hardware Requirements

This software will be a web application, meaning that it will not have any hardware requirements apart for a machine capable of opening and running browsers.

4.2 Software Requirements

For a web application to execute – internet connection will be required.

4.3 Database Requirements

Due to twitter API limitations – a database will be required to store twitters each day for a better overall evaluation. The database used will be MariaDB.

4.4 Performance Requirements

Users are inpatient, software will have to execute quickly and accurately otherwise it will not be used.

4.5 Security Requirements

This will be a free application. Since everyone will be allowed to use it indiscriminately and no user data will be stored – no security requirements are necessary.

4.6 Users

This application will be developed for anyone wishing to use it. It is not targeted for a particular user group as everyone in various age categories might require evaluation of a particular product, person or a team.

5. Matrics

The success will be measured in few steps:
1. **Implementation** – whether the developer will be able to implement the application all together.
2. **Accuracy** – will the application be accurate at sorting out relevant tweets according to the search query.
3. **Evaluation** – will the application be accurate at evaluating tweets for the emotion they carry, i.e. – if they are positive, negative or neutral.
4. **GUI** – will the application look attractive enough to users?
5. **Ease of use** – will the application be simple and easy to use.

6. User interface

User interface will be as simple as possible. The user will see a search field where he/she will be able to input their query and press search button. After all results are displayed the user will be able to scroll down to see all tweets that were evaluated and decide whether they are relevant and if the result is accurate.

7. Project planning

Task Name	Duration	Oct 2015			Nov 2015				Dec 2015				Jan 2016				Feb 2016				Mar 2016				Apr 2016				May 2016		
		2W	3W	4W	1W	2W	3W	4W	1W	2W	3W	4W	1W	2W	3W	4W	1W	2W	3W	4W	1W	2W	3W	4W	1W	2W	3W	4W	1W	2W	3W
Research	4 weeks	Research manual and Functional specifications																													
First iteration	6 weeks					Coding																									
Second iteration	6 weeks										Coding																			
Third iteration	6 weeks														Coding																

Figure2. Gantt chart.

8. Related work

A number of similar applications exist today. I will list the applications which have similar functionality and look to the aimed end result of this project.

- Sentiment viz.
- Socialmention.