Team Bricksquad

**Final Version**

Requirements Specification

April 28, 2014

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# Introduction

## Project Overview

BrickSquad has taken on the task of constructing a general-purpose Tweet Analyzer. General purpose meaning a technical or non-technical customer could use custom or written classes to link to the tweet analyzer to perform such simple or complex analysis of tweets. The Tweet Analyzer program will contain two classes’ regular expressions and the other weather map. This document includes information on the project estimates as well as the resources, design plan, risk management, team project schedule, iteration project planning, and our milestones. Each will examine the different aspects of general-purpose tweet analyzer.

## Purpose

The purpose of this document is to clearly and concisely lay a road map for the requirements of our project as well as establish a scope. On top of this, we'll be taking into account our potential users of the application, project estimates, stakeholders, and our overall iteration plans. Within this document are adequate details of our tweet analyzer. Also it will detail the impact this application is expected to have. This initial plan will be a skeleton that's laid out throughout the stages of our project. This will ensure that all readers understand BrickSquad’s tasks at hand regarding the development of our tweet analyzer.

## Scope

The scope of this project is to construct a general-purpose tweet analyzer that will work will simple classes as well as complex classes. The tweet analyzer program must be able to link to the tweet analyzer class using regular expressions to find matching tweets. In addition to, the program must also be able to link to the weather class that will produce a weather map based on tweets in the United States. This is both for personal as well as business use.

Scope of BrickSquad Tweet analyzer program:

* Tweet analyzer class using regular expression
* Tweet analyzer class used to produce weather map

The target audience of BrickSquad application is estimated, but not limited to, the general population; this application is projected to be used by a variety of people, but we want it to be user-friendly enough to a degree that even those with little technology experience can use this program. This tweet analyzer is to be very simple and to use.

# Definitions, Acronyms, and Abbreviations

* API (Application Program Interface) – a programming language and messaging format that allows two different applications to communicate, or interface with each other
* JSON (JavaScript Object Notation) -is a lightweight data-interchangeable format
* Twitter- an application that is used to express a thought.
* Tweet-a message that a Twitter user posts to his or her profile page.
* Follow - to subscribe to another user's tweets.
* Retweet - to forward a tweet posted by someone else to all of your followers.
* Reply - a response to an existing tweet, posted by clicking the "reply" button. The reply text automatically begins with @username (the username of the person to whom you are replying). All replies to a user's tweets are logged under the @Mentions tab on the user's home page.
* Mention - a tweet update that contains @your username anywhere in the body of the tweet. Both new tweets and replies can be considered mentions.
* Direct messages (DM)- Messages to another users that can only be seen between the two users
* OAuth- authentication protocol to provide authorized access to its API
* Regular expressions - A regular expression is a sequence of characters that forms a search pattern, mainly for use in pattern matching with strings, or string matching.

# Product/Service Description

Bricksquad looks forward into developing an application that provides users the ability to search tweets on the Tweet Analyzer. The user also has the ability to search weather.

## Product Context

The Tweet Analyzer program works dependently with the Twitter API. It will fetch and process tweets depending on what regular expressions are used to filter through tweets at real-time. The set of streaming APIs offered by Twitter give developers low latency access to Twitter's global stream of Tweet data. Public streams of the public data flowing through Twitter will be the primary use case for this project. It is suitable for following specific users or topics like weather, and data mining. This project will also need to interface with the Google Maps JavaScript API to create, customize and develop the Bricksquad Weather Map

## User Characteristics Descriptions

**3.2.1 Clients**

Dr. Jean Muhammad and Bruce Chittenden are the clients for Tweet Analyzer, an application that performs a simple match of the user’s tweets. They have outlined their expectations on the functionality of this project application in which Team BrickSquad will thoroughly analyze and plan an agreeable final project.

**3.2.2 Users**

The application will support one main user. The user will type in something they would like to search in the Tweet Analyzer and receive matches to their search.

**3.2.3 Stakeholders**

The stakeholders are individuals or an organization that is materially affected by the outcome of the system. With The tweet analyzer application the users and clients are considered the stakeholders.

**3.2.4 Project Manager**

The project manager has the overall responsibility for the project. The Project Manager needs to ensure tasks are scheduled, allocated and completed in accordance with project schedules, budgets and quality requirements. They also need to ensure that all team members are contributing and completing tasks in a satisfactory manner.

**3.2.5 Team Leader**

The team leader is the interface between project management and developers. The team leader is responsible for ensuring that a task is allocated and monitored to completion. The team leader is responsible for ensuring that development staff follow project standards, and adhere to project schedules.

**3.2.6 Business Analyst**

The Business Analyst aids the project manager in organizing the requirements given by the client and the overall organization of the team to develop a project plan. The business analyst focuses mostly on the documentation but has a clear understanding of the back end technical side of the project and therefore can aid in that area.

**3.2.7 Designer**

The Designer has the responsibility of ensuring that the overall design of the web application is pleasing to the client. The designer creates the logo and any other design features the web application might need.

The tester develops test cases based off the requirements of the project. Team BrickSquad will be conducting test on the prototype but the tester is the main person executing test cases and overseeing that all functionality and requirements are met.

**3.2.8 Tester**

The tester develops test cases based off the requirements of the project. Team BrickSquad will be conducting test on the prototype but the tester is the main person executing test cases and overseeing that all functionality and requirements are met.

**3.2.9 Requirements Specification**

The entire team is responsible for meeting with the client and determining the requirements for the application. The requirements are a key aspect to the successfulness of the project. The systems functionality will be described in the requirements therefore it will be analyzed by each member of the team.

## User Characteristics

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Role** | **Name** | **Title** | **Organization** | **Contact** |
| **Customer** | Dr. Jean Muhammad | Professor | Hampton University | jeana.muhammad@hamptonu.edu |
| **Customer** | Mr. Bruce Chittenden | Professor | Hampton University | bruce.chittenden@hamptonu.edu |
| **User** | Anyone interested in using the Tweet Analyzer | General Users | Any | n/a |
| **Stakeholder** | Dr. Jean Muhammad | Professor | Hampton University | jeana.muhammad@hamptonu.edu |
| **Stakeholder** | Mr. Bruce Chittenden | Professor | Hampton University | bruce.chittenden@hamptonu.edu |
| **Project Manager** | Devon Hawkins | Student | Hampton University | hawkinsd90@gmail.com |
| **Business Analyst** | Morgane’ Cole | Student | Hampton University | morgane.cole1228@gmial.com |
| **Team Leader** | Chazz Scott | Student | Hampton University | chazzscott15@gmail.com |
| **Test Specification** | Helena Bemberry | Student | Hampton University | bmbrry07@gmail.com |
| **Designer** | Ebrima Jobe | Student | Hampton University | ebrima.jobe92@gmail.com |

## Constraints

Through developing the tweet analyzer application, there have been various different constraints that have been discovered to exist in creating the application.

* System compatibility – the application will only be compatible with Windows operating systems

## Dependencies

Below is a list of dependencies that our application will need to depend on in order to run properly and effectively.

* Maintaining a consistent internet connection is necessary for the application to stream tweets from Twitter
* Twitter.com needs to be up and constantly running

# Requirements Overview

BrickSquad is required to develop a program that will allow users to accurately search through Tweets on Twitter using keywords. These keywords are also known as regular expressions. The platform will use the regular expressions to pick out real-time, relevant (those consisting of one or more regular expressions) tweets from Twitter. This allows the user to obtain opinions as well as valuable information from a wide range audience (any Twitter account who tweets).

## Functional Requirements

The program required to be developed is a General Purpose Tweet Analyzer application that is able to seamlessly allow another class to be linked with the general purpose Tweet Analyzer to perform sophisticated analysis, as well as accept regular expressions written by any customer to perform a match analysis.

### General purpose

The development of the general purpose Tweet Analyzer requires that the program uses methods in the Tweet Analyzer class to analyze tweets.

### Regular Expressions Tweet Analysis

The development of the Tweet analyzer class must create a class that is able to read a file containing regular expressions (keywords). The text file containing the regular expressions must be read into an array of strings. The program must then apply the regular expression to tweets producing a list of tweet that match one or more of the regular expressions. When a match is found a Tweet Analyzer Class method (name to be determined) will be called and the JSON text for the Tweet, the actual character string of the Tweet, and the index into Regular Expressions of the first regular expression that matched must be passed as arguments. The format of the output list will be decided by BrickSquad, but is required to include the location, an index of matched regular expressions, as well as the actual character string of the corresponding tweet.

#### **Regular expression test**

To test the accuracy of our Tweet Analyzer class, the text file created must contain regular expressions that will aid the attempt in locating terroristic activity in the Continental United States.

### Weather Forecast Tweet Analysis

In order to test if the General Purpose Tweet Analyzer application is able to seamlessly allow another class to be linked with the general purpose Tweet Analyzer, BrickSquad is require to Development of a (proof of concept) very sophisticated Tweet Analyzer class that will analyze tweets from all over the Continental United States and produce a weather map for the country.

### Twitter Analyzer Software Development Kit

A Software Development Kit (SDK) must be created to assist the sophisticated customers that want to write their own Tweet Analyzer class. This should document all the methods that required by the Tweet Analyzer program and all required data structures.

### Well Documented Interface

The interface between the Tweet Analyzer Program and the Tweet Analyzer Class must be very well defined and documented to allow several different types of Tweet Analyzer Classes to be “plugged in” to the general purpose Tweet Analyzer Program.

## User Interface Requirements

BrickSquad is required to develop a Tweet Analyzer program. This program must use a user interface to display the following to the user:

### Weather Forecast Interface

The class that analyzes tweets from all across the Continental United States for the corresponding current weather must produce a graphical map of the US showing the weather in a fashion similar to the weather maps shown on national television news shows.

### Regular Expressions Interface

The class that is able to read a file containing regular expressions to apply the regular expression to tweets must produce an interface that displays a list of Tweet that match one or more of the regular expressions. The format of the output list will be decided by BrickSquad, but is required to include the location, an index of matched regular expressions, as well as the actual character string of the corresponding tweet.

## Usability

The application will be designed to support one user. The design will allow a range of users so that either a technically sophisticated customer could write their own class that would be linked with the general purpose Tweet Analyzer to perform a very sophisticated form of analysis or the non-technical customer could use a “team written” class that accepts regular expressions written by the customer to perform a simple match analysis of tweets.

## Manageability

### Interactive Operations

In this program, the regular expressions class must read in from a text file. In order to keep consistency the application needs a consistent directory. If a file fails to exist in said directory, there needs to be an error message thrown requesting the user to insert a text file and proceed, or exit the run time of the program.

### Unattended Operations

The program’s Weather Forecast Tweet Analysis class is required to display a map of the Continental United States and each areas real-time weather based on maps shown on national television news shows. This class does not require any user interaction.

## Security

### Authorization and Authentication

### Twitter uses OAuth to provide authorized access to its API. OAuth is an authentication protocol that allows users to approve application to act on their behalf without sharing their password. There are two forms of authentication in the new model:

### 4.5.2.1 Application-user authentication

### This is the most common form of resource authentication in Twitter's OAuth 1.0A implementation to date. Your signed request both identifies your application's identity in addition to the identity accompanying granted permissions of the end-user you're making API calls on behalf of, represented by the user's access token.

### 4.5.2.2 Application-only authentication

### Application-only authentication is a form of authentication where your application makes API requests on its own behalf, without a user context. API calls are still rate limited per API method, but the pool each method draws from belongs to your entire application at large, rather than from a per-user limit. API methods that support this form of authentication will contain two rate limits in their documentation, one that is *per user* (for application-user authentication) and the other is *per app* (for this form of application-only authentication). Not all API methods support application-only authentication.

## Standards Compliance

Specify the requirements derived from existing standards, policies, regulations, or laws (e.g., report format, data naming, accounting procedures, audit tracing). For example, this could specify the requirement for software to trace processing activity. Such traces are needed for some applications to meet minimum regulatory or financial standards. An audit trace requirement may, for example, state that all changes to a payroll database must be recorded in a trace file with before and after values.

## Data Management

* Specify the requirements for any information that is to be placed into a database, including
* JSON decoder to parse tweet data
* types of information used by various functions
* retweet level
* comparing accounts
* data entities and relationships
* location reports
* follower count
* Twitter account type (verified or non-verified)
  1. *Standards Compliance*

Twitter maintains an open platform that supports the millions of people around the world who are sharing and discovering what's happening now. They want to empower our ecosystem partners to build valuable businesses around the information flowing through Twitter. At the same time, Twitter aims to strike a balance between encouraging interesting development and protecting both Twitter's and users' rights. So, twitter come up with a set of Developer Rules of the Road ("Rules") that describes the policies and philosophy around what type of innovation is permitted with the content and information shared on Twitter. The Rules will evolve along with Twitter’s ecosystem as developers continue to innovate and find new, creative ways to use the Twitter API. Don't do anything prohibited by the Rules and talk to twitter directly if they should make a change or an exception. If the application will eventually need more than 1 million user tokens, or you expect your embedded Tweets and embedded timelines to exceed 10 million daily impressions, you will need to talk to twitter directly about your access to the Twitter API as you may be subject to additional terms. Furthermore, applications that attempt to replicate Twitter's core user experience will need our permission to have more than 100,000 user tokens and are subject to additional terms.

# Risk

Risk is described as the potential of losing something of value, weighed against the potential to gain something of value. The table below will list the many risks that this application may come in contact with during implementation. The table will list the risks along with the type of risk, the probability of that risk happening, and along with the severity.

|  |  |  |  |
| --- | --- | --- | --- |
| **Risk** | **Risk Type** | **Probability** | **Severity** |
| No internet connection for real-time streaming tweets | Technical Risk | Moderate | Critical |
| Application does not stream tweets with internet connection | Technical / Process Definition Risk | Moderate | Critical |
| Application does not analyze tweets based off searches | Technical Risk | Moderate | Moderate |
| Unresponsive UI due to slow process | Technical Risk | Moderate | Critical |
| Tweet analyzer fails | Technical Risk | Moderate | Catastrophic |
| Weather map (proof of concept) does not present weather according to tweets analyzed | Technical Risk | Moderate | Catastrophic |
| Tweet analyzer recognizes tweets about weather but does not | Technical Risk | High | Critical |
| User cannot enter any regular expression/keywords into search bar | Technical Risk | High | Critical |
| User enters regular expressions and tweets do not produce the searched keywords | Technical Risk | High | Critical |
| User’s system has insufficient memory to efficiently execute application. | Development Environment / Product Size Risk | Moderate | Catastrophic |
| Customer: Changes requirements. | Customer Characteristics Risk | Moderate | Moderate |
| Customer: Application fails to meet expectations. | Customer Characteristics Risk | Moderate | Critical |
| Development Team: Unable to implement proposed features. | Staff Experience Risk | Moderate | Negligible |
| Development Team: Fail to meet deadline. | Staff Experience Risk | Moderate | Negligible |
| Development Team: Inexperienced staff. | Staff Experience Risk | Low | Negligible |
| Twitter unexpectedly crashes | Business Impact Risk | Low | Moderate |
| Deadlines Tightened | Business Impact Risk | Moderate | Critical |

# Change Configuration management

## Change Request Processing and Approval

The stakeholder will present the project team with a change request, enhancement request, or defect. The team will review with the customer in detail what new requirements the team would like to request. A Change Request, Enhancement Request, or Defect is proposed by a stakeholder.

### A Change Request, Enhancement Request, or Defect is proposed by a stakeholder.

The stakeholder will present the project team with a change request, enhanced request, or defect when the stakeholder sees fit.

### The CCB reviews impact on artifacts, costs, and schedule.

The CCB reviews impact on artifact, costs, and schedule. The CCB reviews must determine if it is rational to implement this new request. The CCB reviews must review its effect on the structure of the project. The cost of implementing the new request, how much man hours will be needed, must be determined as well as if it is in the budget. Scheduling the request must also be determined, if there is enough time to implement the change to the project.

### Responsibility for implementing changes is assigned to appropriate workers.

The team is responsible for implementing changes according to the works appropriate area.

### Changes are incorporated into a build and tested.

Changes are incorporated into a new build. This build will be tested for robustness and defects. All defects are reported to the programming team. The programming team will attempt to repair the defects and a new build for quality assurance to test again.

### The change requests are validated and closed.

The changes made to the project will be thoroughly tested by quality assurance. Once it is deemed that the changes meet specification and has been tested for robustness then the request is deemed validated.

### Change Control Board (CCB)

The Change Control Board describes the membership and procedures for processing change requests and approvals to be followed by the CCB.

The CCB is a group composed of various technical and managerial stakeholders. The CCB assesses the impact of changes, determines priorities, and approves changes.

### Change Control Manager (Devon Hawkins, Project Manager, Hampton University)

The change control manager role oversees the change control process. This role is usually played by a Configuration (or Change) Control Board (CCB) and consists of representatives from all interested parties, including customers, developers, and users. In a small project, a single team member, such as the project manager or software architect may play this role.

The change control manager is also responsible for defining the [Change Request Management Process](file:///C:\Users\User\AppData\Local\Microsoft\Windows\INetCache\Documents%20and%20Settings\aaa\Desktop\CSC%20405-01\Iteration1\Second%20Life\Projects\Composite\Program%20FilesRationalRationalUnifiedProcessprocessworkflowconf_mgtco_revno.htm), which is documented in the [CM Plan](file:///C:\Users\User\AppData\Local\Microsoft\Windows\INetCache\Documents%20and%20Settings\aaa\Desktop\CSC%20405-01\Iteration1\Second%20Life\Projects\Composite\Program%20FilesRationalRationalUnifiedProcessprocessartifactar_cmpln.htm).

### Project Manager (Devon Hawkins, Project Manager, Hampton University)

The Project Manager is responsible for the configuration management plan, one of the components of the overall software development plan. The project manager is also the recipient and use of the status and measurement reports.

### Stakeholders (Dr. Muhammad & Bruce Chittenden, Stakeholder, Hampton University)

The stakeholders are the ones who propose the change requests to BrickSquad.

## Project Baseline

|  |  |  |
| --- | --- | --- |
| Iteration | Description | Deadline |
| **One** | Evaluate the assigned project, determine requirements, create an initial plan and develop use cases and class diagrams. | February 4, 2014 |
| **Two** | Complete requirements, Use Cases and Class Diagrams. Develop sequence, activity, data-flow, and state diagrams. Branch out design issue and plan architecture design. Start on initial prototype development. | February 25, 2014 |
| **Three** | Update requirements and plan. Refine timeline. Continue developing sequence, activity, data flow, and state diagrams. Continue on Architecture design and Class design. Develop initial component diagrams. Work on a useful prototype interface and component implementation | March 20, 2014 |
| **Four** | Review requirements and plan. Refine timeline. Continue developing sequence, activity, data flow, and state diagrams. Continue on Architecture design and Class design. Refine component diagrams. Prototype interface is mostly completed. Continue Prototype implementation | April 8, 2014 |
| **Five** | Review requirements and plan. Final refinement timeline. Finalize developed sequence, activity, data flow, and state diagrams. Finalize Architecture design and Class design. Refine component diagrams. Prototype interface is mostly completed. Continue Prototype implementation | April 28, 2014 |

# Milestones

|  |  |  |  |
| --- | --- | --- | --- |
| **Tasks/Artifacts** | **Description** | **Start Date** | **End Date** |
| **Requirement Managements Plan(RMP)** | This document sets out guidelines for establishing the requirement documents, types, attributes, and traceability in order to manage the project requirements. | 01/13/2014 | 04/28/2014 |
| **Project Plan** | The Project Plan identifies the project estimates and risks that are involved with creating the application. | 01/23/2014 | 04/28/2014 |
| **Analysis** | The Analysis document provides a basis for understanding the content to be delivered by BrickSquad. The function to be provided for the user, and interaction that each class of user will require throughout the system. | 02/07/2014 | 04/28/2014 |
| **Design** | The Design document will consist of two basic approaches. The focuses are the technical ideal of the system and the engineering ideal of solving the problems and requirements given by the stakeholders. | 02/19/2014 | 04/28/2014 |
| **Use-Case Model(s)** | Use Case (UC)- documented in RSA | 04/11/2014 | 04/28/2014 |
| **Test Specification** | The Test Specifications document shows the testing methodologies, schedules, and log of errors that occur during the testing process. | 03/03/2014 | 04/28/2014 |
| **Prototype** | The Prototype Script document shows the progress of the working prototype which includes screen shots and descriptions. | 03/22/2014 | 04/28/2014 |

# Revision History

| **Version** | **Date** | **Name** | **Description** |
| --- | --- | --- | --- |
| **1.0** | **1/13/2014** | **Requirements Doc** | **First Document** |
| **2.0** | **2/17/2014** | **Requirements Doc** | **Second Document** |
| **3.0** | **3/20/2014** | **Requirements Doc** | **Third Document** |
| **4.0** | **4/8/2014** | **Requirements Doc** | **Fourth document** |
| **Final** | **4/28/2014** | **Requirements Doc** | **Final document** |