**MAKERERE UNIVERSITY**

**COLLEGE OF COMPUTING AND INFORMATION SCIENCES**

**DEPARTMENT OF NETWORKS**

**BACHELOR OF SCIENCE IN SOFTWARE ENGINEERING (YEAR 2)**

**RECESS TERM 2**

**COURSE CODE: BSE 2301**

**PROPOSAL FOR YOUTUBE TRENDING STATISTICS**

**GROUP NUMBER: G-09**

|  |  |  |
| --- | --- | --- |
| NAME | REG.NO | STUDENT NO. |
| SEMPA ETHAN IAN | 16/U/11403/PS | 216004900 |
| KWESIGA PETER | 16/U/6411/EVE | 216002578 |
| NABAGIDDE GRACE DIANA | 16/U/8005/PS | 216012180 |
| BWIRE IVAN | 16/U/4522/PS |  |

**SUPERVISOR: NOAH KANGE**

**PROJECT LEADER: KWESIGA PETER**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE SOFTWARE ENGINEERING RECESS PROJECT BSE 2301

**Software Requirements**

**Specification**

**For**

**YouTube Trending Statistical System**

Version 1.0 approved

Prepared by Nabagidde Grace Diana, Kwesiga Peter, Sempa Ethan Ian, Bwire Ivan

24th June, 2018

Table of contents

[1. Introduction 4](#_Toc517791272)

[1.1 Purpose 4](#_Toc517791273)

[1.2 Intended Audience and Reading Suggestions 4](#_Toc517791274)

[1.3 Product Scope 4](#_Toc517791275)

[1.4 References 4](#_Toc517791276)

[2. Overall Description 4](#_Toc517791277)

[2.1 Product Perspective 4](#_Toc517791278)

[2.2 Product Functions 4](#_Toc517791279)

[2.3 User Classes and Characteristics 5](#_Toc517791280)

[2.4 Operating Environment 5](#_Toc517791281)

[2.5 Design and Implementation Constraints 5](#_Toc517791282)

[2.6 User Documentation 6](#_Toc517791283)

[2.7 Assumptions and Dependencies 6](#_Toc517791284)

[3. External Interface Requirements 6](#_Toc517791285)

[3.1 User Interfaces 6](#_Toc517791286)

[3.2 Hardware Interfaces 6](#_Toc517791287)

[3.3 Software Interfaces 6](#_Toc517791288)

[3.4 Communications Interfaces 6](#_Toc517791289)

[4. System Features 6](#_Toc517791290)

[4.1 Functional Requirements 6](#_Toc517791291)

[5. Other Non-Functional Requirements 7](#_Toc517791292)

[5.1 Performance Requirements 7](#_Toc517791293)

[5.2 Safety Requirements 7](#_Toc517791294)

[5.3 Security Requirements 7](#_Toc517791295)

[5.4 Software Quality Attributes 7](#_Toc517791296)

[5.5 Business Rules 7](#_Toc517791297)

# Introduction

## 1.1 Purpose

The purpose of this document is to provide a complete description of all functions and specifications of an online R implemented YouTube Trending Statistical System.

## 1.2 Intended Audience and Reading Suggestions

This project is useful for the YouTube management team as well as its channel owners.

## 1.3 Product Scope

The YouTube Trending Statistical System is based on given datasets for the USA, Great Britain, Germany, Canada and France regions with up to 200 trending videos daily. Refer to the concept paper for the objectives and goals. The purpose of this online system is to classify opinions through the number of comments, likes and dislikes and provide feedback to concerned parties and statistical analysis on the feedback.

Benefits

The individuals or organizations with accounts/channels that upload content will receive and better understand the feedback of their viewers in order to better develop the delivery of their product.

It will help YouTube identify main influencers through what or who is trending in a particular time frame through the spikes in sentiment.

## 1.4 References

IEEE Software Engineering Standards Committee, (1998, October. 20) “IEEE Std 830-1998, IEEE Recommended Practice for Software Requirements Specifications”,

Belitsoft (2016, Aug.08) Belitsoft blog [Online]. Available: <https://belitsoft.com/blog>

Karlsson J, 1997 “A Cost-Value Approach for Prioritizing”, Norges Teknisk-Naturvitenskapelige Uni

# Overall Description

## 2.1 Product Perspective

A YouTube Trending Statistical System uses the internet to fetch and display the following information: video description, comment count, video ID, channel, views, likes, dislikes, title.

* Video description: Includes a brief explanation, URL link that can be shared on various social media accounts like twitter, instagram, and snap chat.
* Video details: Includes title, channel title, video ID, publish time, thumb nail, tags, and trending date.
* Video remarks: Includes comment count, likes, views, dislikes.

The system also analyzes factors that make a video popular and hence categorize them.

Our system interacts with the YouTube API in order to ease the process of getting statistics.

## 2.2 Product Functions

Channel owners will only access their functions while management will access administrative functions.

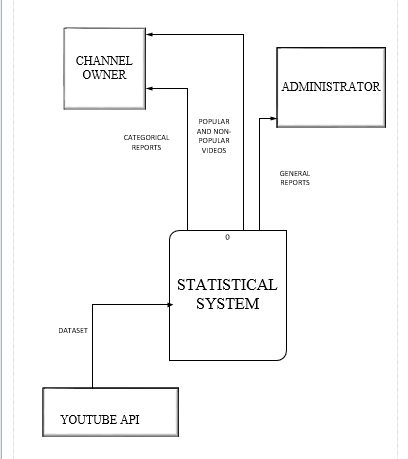
1. Channel owners’ functions include: - Request for popular and non-popular videos on their respective channels.

Request for categorical reports over a certain time frame.

1. Management functions include: - Request for general reports for various channels over a certain period of time.

This is illustrated below:

CONTEXT DIAGRAM



## 2.3 User Classes and Characteristics

Users of the system should be able to retrieve statistics of trending videos in any region. The system will support two types of user privileges, YouTube management and channel owners. Both these user classes are very important for this product though YouTube management will interface with it more.

## 2.4 Operating Environment

Operating system: Windows

Platform: Computer

## 2.5 Design and Implementation Constraints

Language requirements: Since we are going to implement this system using R language, the YouTube IT team need to be well acquainted with this language. There might also be a hindrance in system changeover incase the new system is not compatible with the existing system.

Hardware limitations: This system will run on computers i.e. desktops, laptops as opposed to mobile devices etc.

## 2.6 User Documentation

References listed follow IEEE formatting guidelines in order to allow anyone reading your work to identify and find the material to which you have referred.

## 2.7 Assumptions and Dependencies

This system depends on R language.

# External Interface Requirements

## 3.1 User Interfaces

There will be several user interfaces and the user will be able to select which interfaces he/she will be able to see based visual representations of data analyzed he/she wishes to see. These include a chart that portrays the categories with the highest number of trending videos, most viewed categories per region, another that portrays the relationship between views and likes, regional analysis that is to say which categories of videos that are popular according to datasets provided, most disliked categories per region and so on. These visual representations can be displayed to the user through the user interface definition of a **Shiny** applicationwhich is a library in R that enables one to build user interfaces.

## 3.2 Hardware Interfaces

The system generates output on a screen based on input from the keyboard in form of commands and data from datasets available on the host computer which the system uses to train itself. The supported device types are all devices with a RAM of minimum 2GB as RAM should at least be thrice the size of the dataset. The system doesn’t need a lot of storage and thus nearly modern computers can handle its storage requirements. On top of this, the system is an online system thus it will require an Internet connection that uses the HTTP protocol.

## 3.3 Software Interfaces

The R application will communicate with the Shiny Server over the Internet.

## 3.4 Communications Interfaces

The system will use the HTTP Protocol for communication between the Internet and the application on top of the TCP/IP protocol suite. The rest of communication will be handled by the underlying operating system.

The project supports all types of web browsers.

# System Features

## 4.1 Functional Requirements

REQ-1: Visual representation of statistical feedback

This will be done through graphs, charts for example histograms, pie charts that will breakdown the statistical analysis of viewer’s opinions through likes, dislikes and comment count of a particular sector and region.

REQ-2: Popularity classification of trending videos

Through the analysis of viewer’s opinions (likes and dislikes) and the category the video is in we can determine which videos are popular and those that are not. If the likes are greater than the dislikes and also 100k, then the video is popular.

# Other Non-Functional Requirements

## 5.1 Performance Requirements

The system should generate reports on performance and statistical progress on a daily basis. At the end of the week, these daily reports should be used to come up with a weekly report and the same should be done for the month and year to continuously monitor the progress of the various YouTube channels.

## 5.2 Safety Requirements

In case of loss of data due to damage to software (disk crash) or hardware (fire), there should be back up.

## 5.3 Security Requirements

A maximum of 100 channel owners can access the system to check on the categorical progress at a time in a given region.

## 5.4 Software Quality Attributes

Availability: The statistics should be available for various periods of time and different regions all over the world.

Correctness: The statistics should be depicting real and accurate data of trending videos.

Maintainability: The administrators should maintain correct details of the trending videos.

Usability: The statistics should satisfy a large number of videos from various regions.

Testability: The system is going to be based on and trained using a given dataset of actual statistics that includes several months (and counting) of data on daily trending YouTube videos. Data is included for the US, GB, DE, CA, and FR regions (USA, Great Britain, Germany, Canada, and France, respectively), with up to 200 listed trending videos per day.

## 5.5 Business Rules

YouTube management team is allowed access to all channel related data to ease statistical management.