

# **Software Design Description**

**for**

## **Movie Rating Analysis System**

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**Date : 28th January, 2018**

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# 1.Introduction

## 1.1. Purpose

The purpose of this document is to describe and visualise the software design and architecture of Movie Rating Analysis System. The software is designed to analyse the reviews of viewers of a movie.

## 1.2. Scope

The software is intended to analyse the comments on a particular movie by different people. The software will have a web interface, which will ask the user for any movie name. Then the software will scrape different websites on internet, will call various API's to gather information about the movie and comments on the movie from various users of different age groups, gender and location. Then the software will make excel sheet out of this details and will plot graphs to show all these details.

## 1.3. Intended Audience

The document is intended for the users of the software and the developer (designers, testers, maintainer).

## 1.4. Summary

This document briefly describes the abstraction of design and implementation of the software "Movie Rating Analysis System". In short this document is meant to equip the reader with a solid understanding of the inner workings of the application.

# 2. Definitions

Term	Definition
User	Someone who interacts with the web application.
UML Diagram	Unified Modelling Language (UML) is a standardised general purpose modelling language in the field of object oriented software engineering
SRS	Software Requirement Specification (SRS) describes the behaviour of the system to be developed and includes set of use cases that describes interaction of the user with the application
API	Application Programming Interface (API) defines the protocols for building softwares.

### **3. Conceptual model for software design descriptions**

In this section the conceptual model for the SDD will be presented. This model explains the context in which software is made and used.

#### **3.1. Basic Concepts**

SDD describes the software design and implementation details. The key life cycle of the software described by this software design is inspired by the SRS we've made. The SDD has influence on the whole implementation phase of the application. The content of SDD is taken into consideration by the developers for development purpose, as well as the testers for developing the test cases and test procedures. Verification of the software will be done with these test cases and all parts will be evaluated.

#### **3.2. Software Design In Context**

The movie rating analysis system will be build on top of object oriented concept using multi-layered system architecture.

With object oriented design and multi-layered architecture, portability and integrity between components will be improved.

#### **3.3. Design Stakeholders**

The design stakeholders are the developer team of the Movie Rating Analysis Software, who know and understand the software development.

## 4. Design viewpoints

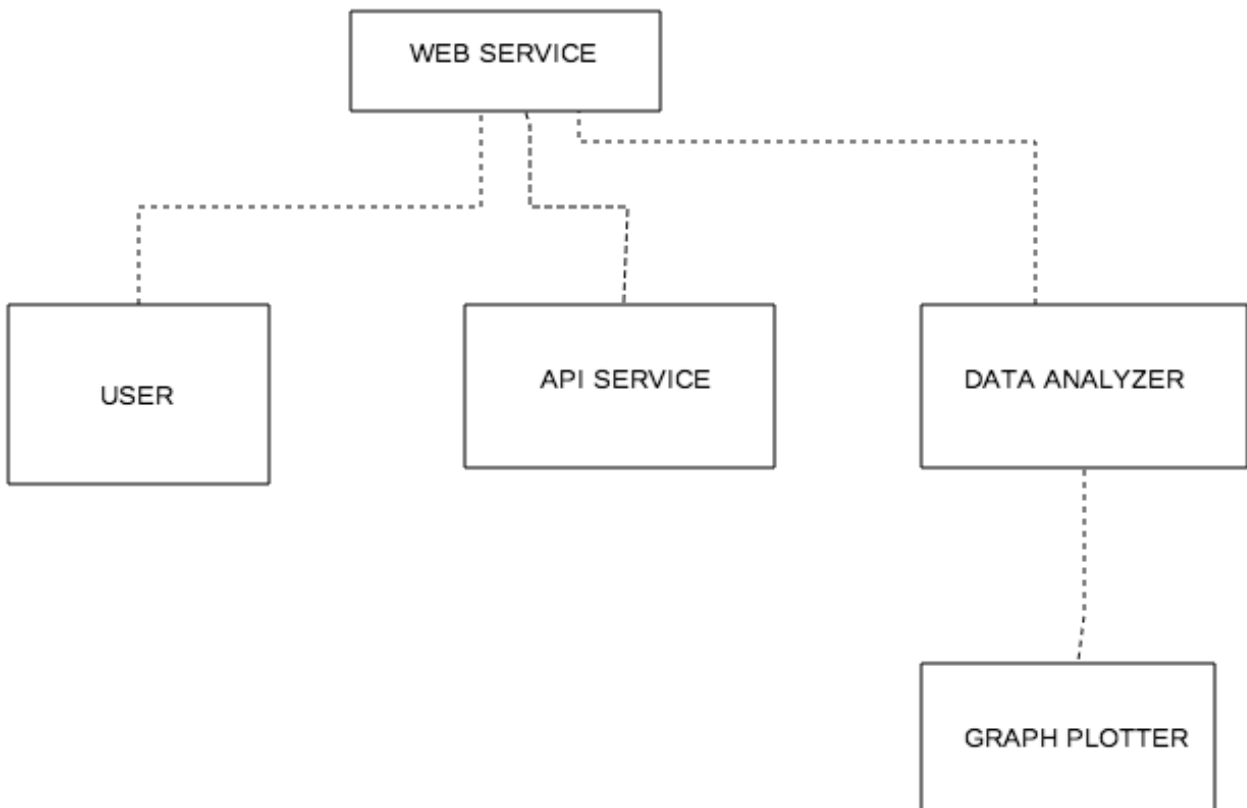
In this part, the viewpoints of the application is explained in detail. UML diagram will be used to explain and clarify viewpoints.

### 4.1. Composition Viewpoint

Composition viewpoint describes the components and sub components inside it of the software. It helps to manage the software process and allocate responsibilities to different components

The Software consist of four independent components :

- 1. User :** The user communicating with the web interface of the application.
- 2. API Service :** The application will query API services for collecting data.
- 3. Data Analyser :** The application will request the data analyser component to examine the data returned by the numerous API services.
- 4. Graph Plotter :** The user can request the application for visualisation of data, in return application will call the graph potter service for plotting graphs using data from data analyser.

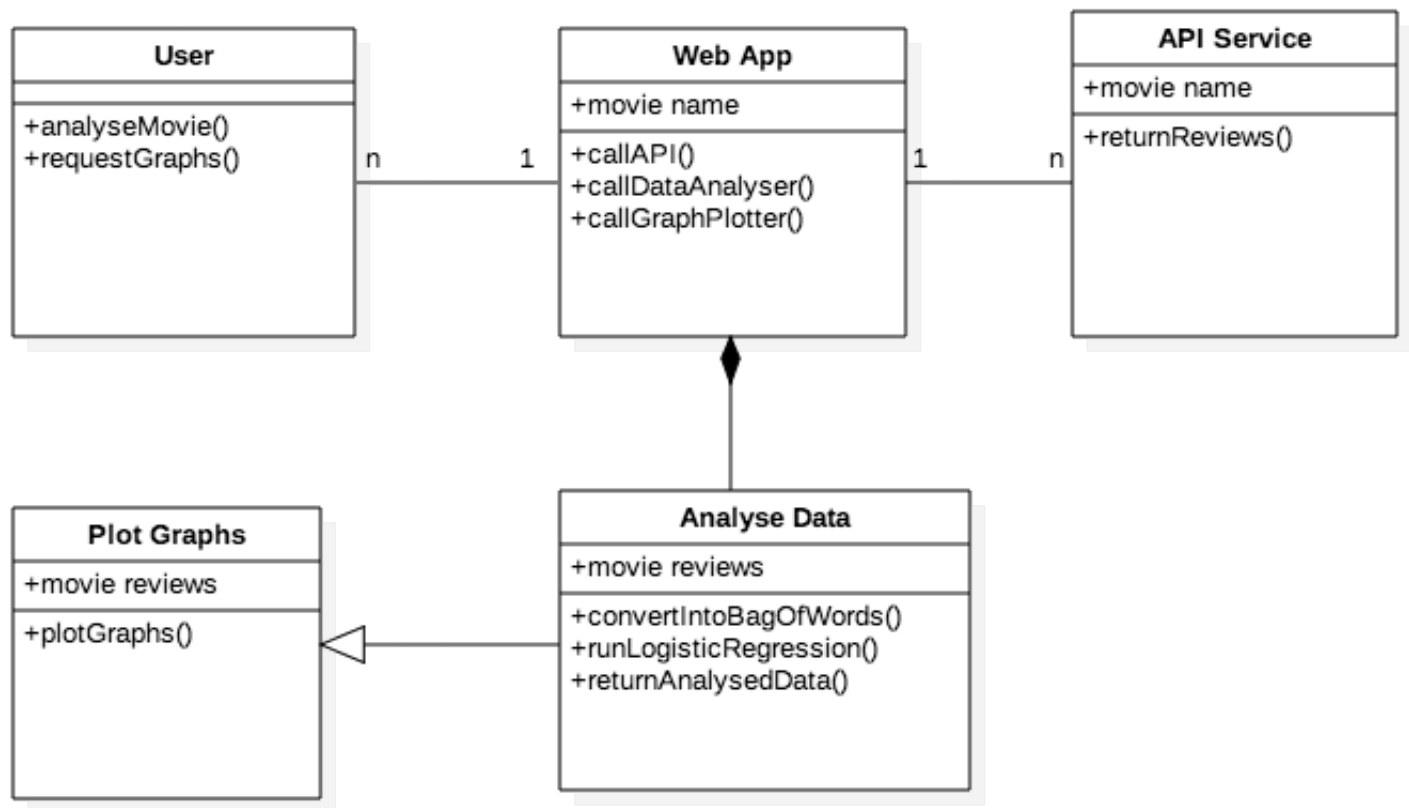


Hierarchical Composition Diagram

All the components mentioned previously are composed together to construct the 'Movie Rating Analysis System' application.

## 4.2. Logical Viewpoint

Logical Viewpoint identifies all the classes and relation between them. It helps to clarify and simplify the system design.



### User Class

Method/Field	Definition
analyseMovie	Return the analysed data for the input movie name
requestGraph	Return the graphs for the input movie name

## Web App

Method/Field	Definition
movie name	Takes the movie name from user as input
callApi	Returns movie reviews for the give movie name
callDataAnalyser	Return the analysed data
callGraphPlotter	Plots the graph for the analysed data

## API Service

Method/Field	Definition
movie name	Takes the movie name from user as input
returnReviews	Returns reviews for the requested movie

## Analyse Data

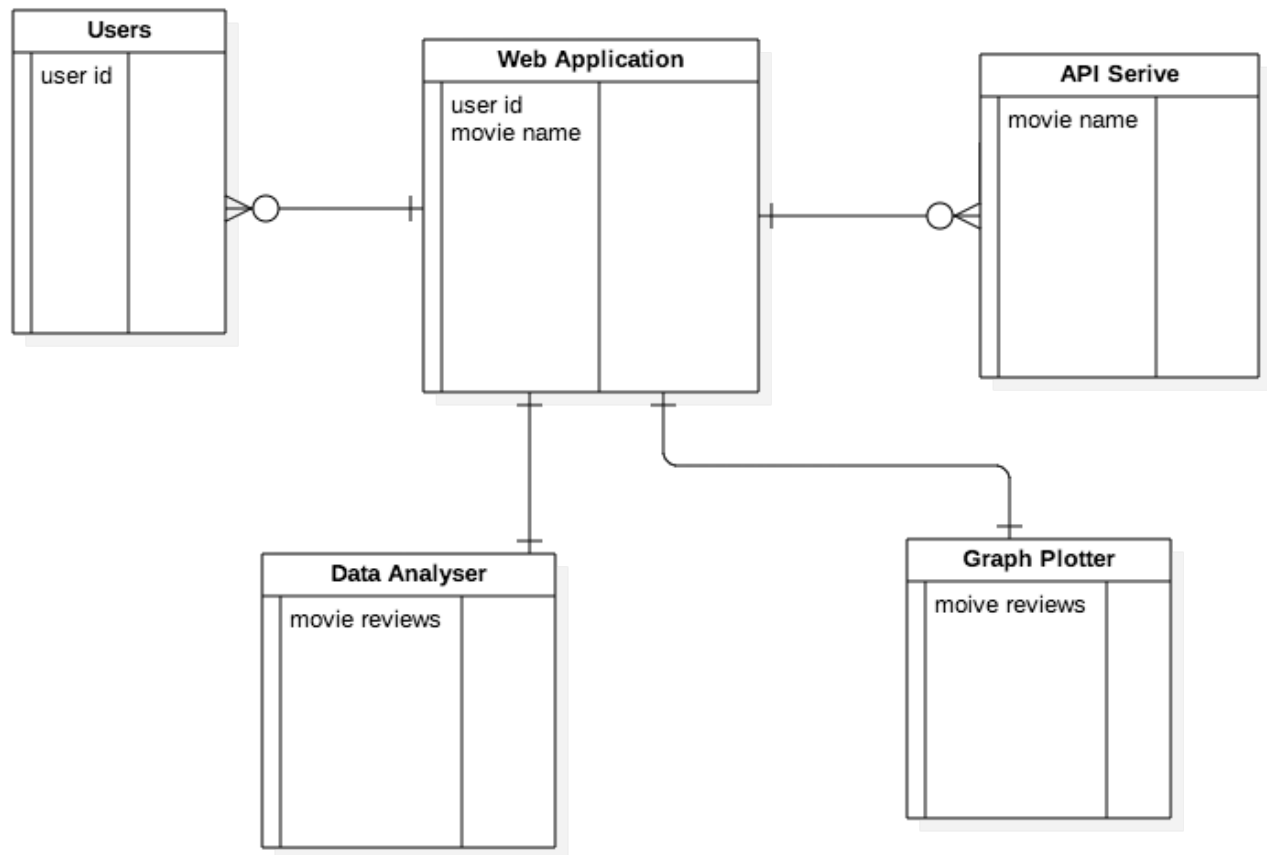
Method/Field	Definition
movie reviews	Stored movie reviews taken from different sources
convertIntoBagOfWords	Return bag of words conversion for the data
runLogisticRegression	Runs the logistic regression algorithm for the data
returnAnalysedData	Returns the analysed data by above algorithm

## Plot Graphs

Method/Field	Definition
movie reviews	Stored movie reviews taken from different sources
plotGraphs	Plots the graph for the movie review data

### 4.3. Information Viewpoint

In this section, reactions of different classes are explained using ER- Diagram. Main purpose of ER-Diagram is to explain the relation between the class diagram without confusing between the attributes.



### 4.4. Algorithm Viewpoint

In this section the detailed analysis of algorithms used in the application is provided in regard to time-space performance.

#### Movie Rating Analysis Algorithm :

This algorithm is used to analyse the data obtained by different sources on the internet to get the general trend on the movie. The algorithm uses a standard bag of words. Let  $\{f_1, f_2, \dots, f_m\}$  be a predefined set of  $m$  features that can appear in the reviews, examples include the words 'entertaining', 'enjoying' etc. Let  $n_i(d)$  be the number of times  $f_i$  occurs in the document  $d$ . Then each document is represented by the document vector :

$$d = (n_1(d), n_2(d), \dots, n_m(d))$$



Then using **logistic regression** algorithm is used to predict the orientation of the review (positive or negative) using the feature vector  $\{d\}$ .

Algorithm	Time Complexity	Space Complexity
Bag of Words	$O(m)$	$O(m)$
Logistic Regression	$O(1)$	$O(m)$