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**Executive Summary**

This document will provide the brief introduction of document. The document covers information regarding all possible dimension regarding product which covers market opportunity and positioning, functionalities, problem statement and solution, assumptions and dependencies, cost and pricing, competitors, features, requirements of the proposed product. It will cover description regarding users, user-constraints and quality range of the product. Moreover the document also covers the analysis design and implementation information described using structural models and diagrams. Most of the information is in arranged tabulation form. The purpose of tables is to make information easy to understand and observe.

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# **Project Vision**

# **Introduction**

This section will provide you the brief introduction of IGAT. It includes problem statement that what type of problem exists around us while searching for the best game or search the game on basis of graphics, performance etc. After that it states that how **IGAT** will solve these problems. It covers information regarding all possible dimensions of project, purpose and scope, marketing opportunities and positioning, functionalities, assumptions and dependencies, expert features and requirements of project. This document also includes the business opportunity of our product. In the last, it includes stakeholders, users and constraints related to this project.

## **Purpose**

The main purpose of this document is to give basic outline about different aspects of our project. Secondary purpose is to define all the possible dimensions of it to entertain market oriented queries related to our project. Detailed description about the features, stakeholders and users also discussed briefly. It is a roadmap which provides high level and detailed technical requirements.

## **Scope**

This system will be designed for multiple users. Those people, who are interested in games. It entertain market and general information oriented queries about games. Our project is useful for business purposes as well as for providing reviews and rating for famous games. Primary focus of the project is to make market and feature oriented decisions about games.

## **Definitions, Acronyms or Abbreviations**

* IGAT Internet Gaming Analysis and Trends (Name of Project)
* GUI stands for Graphical User Interface

## **References**

* Project Vision templates is used which is available on Requirement engineering course site of University of Texas Dallas [1]
* Gaming trends 2015 [2]
* Digital Trends of Game Industry [3]

## **Overview**

This project vision document is written according to the functionality and scope of the project. It defines the vision of developing the system. It describes the problem statement, project description, opportunities, stakeholders, assumptions and dependencies, related requirements and constraints and so on.

Gaming is a growing trend in the 21st century learning paradigm. Digital and video games take up a big part of the lives of our digital natives, and of course, as is the case with every new technology doubtful and cynical voices are the first to be heard. Entertainment through games used to be treated as an activity specific to children not long ago. However users are finding it difficult to find the exact information about gaming trends that which game genre is famous among all games and which game have better graphics and which one have a better story. It is very difficult for a user to distinguish between a good story game and a fine graphics game because already available platforms informs only about gaming latest news and reviews in paragraph form but there are no rating or trends available to judge a game in less time without reading a stuffy reviews of thousands words.

Taking care of gaming industry and a video gamer needs we are aiming to make a web based portal which will provide a user gaming trends based on genre and gaming categories and sub-categories. A user can search a game and can see its rating based upon categories. He can see the information about game. Overall performance of game will also be shown there. Top games with respect to categories will be available. There will be recommendations of similar games based on user searches and interests. As accuracy of rating based on Sentiment analysis is the main issue for us in this project.

# **Positioning**

This section describes how the positioning helps us in business and marketing trends.

## **Business Opportunity**

There is a great opportunity we find in developing this project. Major focus of developing this project is lay man. They will find great interest in project because it is based on positive addition to online marketing trends and business aspects. Video games are a strong engine for economic growth. When windows 8 was released it generate 14 billion dollars revenue in a quarter while the GTA 5 game sold more 54 millions of copies and earned more than 1.2 billion dollars just in three days. [4]

In 2014, the industry sold over 135 million games and generated more than $22 billion in revenue. Fifty two percent of total game sales were generated by purchases of digital content, including online subscriptions, downloadable content, mobile applications, and social networking games. Computer and video game companies directly and indirectly employ more than 146,000 people in 36 states. In 2015, marketing mobile games was harder than ever. The lure of a $30 Billion industry has created an exponential increase in competition. With over a half million games available today, app marketing has become essential to the success of mobile games. [4] Keeping in view the interest of gaming industry and a video gamer needs we are aiming to make a web based portal which will provide a user gaming trends based on genre and gaming categories and sub-categories. A user can search a game and can see its rating based upon categories. He can see the information about game. Overall performance of game will also be shown there. Top games with respect to categories will be available. There will be recommendations of similar games based on user searches and interests. This project not only provides the business opportunities for game developers but also for the gamer lovers. [4]

## **Problem Statement**

This section discuss the problem statement of the project in given tables.

|  |  |
| --- | --- |
| **Basic Problem** | Whenever the user wants to find for the famous games, check the reviews of the games, rating and ranking of the games on the basis of graphics, performance, speed etc. |
| **Affects** | Pc-gamers, mobile gamers |
| **Impact** | The users who want to play famous games based on top ratings and ranking. |
| **Solution** | A web based portal for game players to choose best games. Rating based portal not only on the basis of user reviews but also on the basis of features of games like graphics, performance, storyline etc. |

Table Problem Statement

## **Product Position Statement**

This section describes the position of the project we will provide.

|  |  |
| --- | --- |
| **For** | Pc-gamers, mobile gamers |
| **Product (Name)** | Online portal IGAT (Internet Gaming Analysis and Trends) |
| **Features** | Portal provides rating of different games on the basis of reviews. Categorical evaluation or rating is also provided. Recommendation system provides top featured games to user. |
| **Unlike** | E-advertisement and review based portals are our competitors in market. |
| **Our Product** | System provide large pool of choice as our data set consists of data crawled from 3 different websites. System provide Sentiment based rating of product inferred from user comments. Rating is on the basis of different features like graphics, performance, storyline etc. |

Table Product Position Statement

# **Stakeholders and User Descriptions**

This section involves the market demographics, stakeholders and user summary, discussion about the competitors.

## **Market Demographics**

Video game culture is a worldwide new media subculture formed by video games. As computer and video games have exponentially increased in popularity over time, they have had a significant influence on popular culture. Video game culture has also evolved over time hand in hand with internet culture as well as the increasing popularity of mobile games. The main targets are PC-Gamers and mobile gamers. Major focus is on the gamer lovers. Today, the video games can be seen in social media, politics, television, film and music. [5]

### ***Target to Gender***

A recent study found that women are spending more time and money on mobile games than their male counterparts and that they're more loyal. Even more shocking is that female gamers surpassed males to the tune of 35% more time spent and spend 31% more on in-app purchases. The following tables show which game categories are skewed towards a particular gender.

|  |  |  |
| --- | --- | --- |
| **Male** | **Neutral** | **Female** |
| Action-RPG | Puzzle | Endless/Runner |
| Shooters | Racing | Brain/Quiz |
| Sports | Plat-former | Social Turn-Based |
| Strategy | Arcade | Casino/Poker |

Table Games played by Gender

Current demographics show that female gamers will be hot issue for the developers of game. Our project will definitely focus on the categories of the game. Rating based on the graphics, performance and storyline. [5]

### ***Target to Age***

Surprisingly, adults age 25-44 comprise a whopping 54% of mobile gamers. This data is likely skewed considering parents are usually responsible for choosing, purchasing and downloading games for their children. All things considered, developers should largely focus on the 25-44 year old age group. Games for children under ~12 will want to focus their marketing to parents and slowly shift towards kids during teenage years. [5]

## **Stakeholder Summary**

Summary of Stakeholders is given below in tabular form.

|  |  |  |
| --- | --- | --- |
| **Name** | **Description** | **Responsibilities** |
| Game Developers | Use to analyzing the market value of their product and competitors. | Companies representative will be in continuous contact to analyze their product |
| Game Players | Use to find best games | Provides reviews overall of the game as well as on the basis of different categories like graphics, performance etc. |

Table Stakeholders

## **User Summary**

This section describes the basic summary of the users.

### ***Admin***

Admin is responsible to update data about different games and keep track of records and users.

|  |  |  |
| --- | --- | --- |
| **Name** | **Description** | **Responsibilities** |
| Admin | Person which monitors the functionality of web crawling and game rating based on Sentiment analysis. The person is also responsible for the feedbacks response. | * Maintenance of data logs. * Updating. * Sentiment based rating * Exception or error handling * Response and feedbacks records control |

Table Admin

### ***User***

This section defines the original users of our project.

|  |  |  |
| --- | --- | --- |
| **Name** | **Description** | **Responsibilities** |
| User | Person who give feedback or rate the game. Search the top rated games. Search games on the basis of graphics, performances, storyline ranking. | * Search top rated games * Search on feature basis * Use recommendation * Give rating or feedback |

Table User

## **User Environment**

This section describes the working environment of target user. There are basic points mentioned that would be considered in user’s working environment. System will be operated by the user on mobile phone as well on PC. User just have a need to give feedback of game by login to his profile. The search environment involves the top rated games. Searching involves categorically searching like search a game that is top rated in graphics.

As accuracy of rating based on Sentiment analysis is the main issue for us in this project. User need the best game to play which is best rated by world users.

## **Stakeholder Profile**

This section defines the profile of stakeholders in the tabular form.

|  |  |
| --- | --- |
| **Representative** | **Game Developers** |
| Type | * Experience of using web engines * Experience of using online portals |
| Description | * Analyze the market value of their product * Use system for business analysis |
| Responsibilities | * View of classified comments about features of their product |
| Success Criteria | * Display of list of games matching the user search * Successful display of the list of games selected by user for rating and reviews * Display of comments or reviews or rating about each feature of the game * Recommendation system display top rated games to user |
| Involvement | * Feedbacks of user * Ignition of search process * Selection of games on the basis of features and their rating * Recommendation of top rated games |
| Deliverables | * Working of the user panel properly |
| Comments / issues | * Reviews should be in English language * Searching on the basis of unknown feature |

Table Stakeholder Profile

## **User Profile**

In this section the user profile is discussed. It is further divided into two categories admin and Game players. General user have the following profile.

|  |  |
| --- | --- |
| **Representative** | * **User** |
| Type | * Experience of using web engines * Experience of using online portals |
| Description | * Analyze the market value of different games * Search top rated games |
| Responsibilities | * View of classified comments about features of their product |
| Success Criteria | * Successful display of the list of top rated games to user. * User can choose top recommended games for playing |

Table User Profile

### ***Admin***

In this section we will discuss the admin profile of the system.

|  |  |
| --- | --- |
| **Representative** | **Admin** |
| Type | * Expert level understanding of programming languages * Understanding of web crawling * Understanding of data mining techniques * Understanding of recommendation systems. * Understanding of working of web portal |
| Description | * One who carries out the process of web crawling * Carries out the process of rating on the basis of Sentiment analysis * Person provides best recommendation to user * Person is responsible for errors and exception handling |
| Responsibilities | * View of classified comments about features * Web crawling and data mining * Sentiment analysis * Recommendation system * Maintenance and Updating of system * Exception handling |
| Success Criteria | * Success storage of crawled data * Successful storage of user comments and rating * Sentiment analysis on the basis of different features * Recommendation system provides the list of top rated games on the basis of features |
| Involvement | * Ignition of data crawling process * Ignition of data mining process * Data maintenance * Handling of exceptions and errors * Sentiment analysis |
| Deliverables | * Successful working of crawler * Successful working of recommendation system * Proper storage of data crawled * Sentiment analysis application over data stored * Games rating on the basis of features |
| Comments / Issues | * Change in structures of crawling websites * Comments in different languages * Exception and errors of the system |

Table Admin Profile

### ***User***

In this section we will discuss the user profile of the system.

|  |  |
| --- | --- |
| **Representative** | **User** |
| Type | * Experience of web portal * Understanding of games rating |
| Description | * User will give feedback and reviews about project * Search for top rated games * Top rated games list on the basis of features * User can view the classified games list |
| Responsibilities | * Insertion of requirement in search engine * Selection of game * Provide feedback on the basis of features * View classified list of games |
| Success Criteria | * Successful display of list of top rated games * Display of games on the basis of features * Classification of games * Recommendation system provides top rated games |
| Involvement | * Ignition of process of search * Selection of games on the basis of games features rating * Recommendation of games |
| Deliverables | * Proper working of user panel |
| Comments / Issues | * Search language is English * Unknown product search |

Table User Profile

## **Key Stakeholders or User Need**

Following things are important in fulfilling the tasks by user.

* Games have same features as per the requirement of user
* Reasonable rating of the games
* Recommendation of top rated games on the basis of each features

In order to get the best featured games comments or reviews web crawler is developed to properly populate the database with maximum percentile of user’s requirement matched with it. User can search games on the basis of features like graphics, performance etc. and to provide the best rated games on particular feature we will be doing Sentiment analysis on the collected data set. Sentiment analysis evaluates the comments of the users in sense of positive, negative and neutral. Rating is done on such evaluation of the game. Features will also be categorically rated so user can search the game on the basis of particular feature.

## **Alternatives and Competitions**

We have explored the different web portals for games reviews and comments and found different functionality provided by different portals. Sentiment analysis based rating like DeltaDNA [6] provides is the overall rating of the games. They built a model to predict what rating a reviewer will give based on the words in their review. Every time a reviewer uses the word terrible they will give on average one star less that they would have otherwise. Also from the graph you can see that people using “awsome” tend to rate slightly higher than people using “awesome” – maybe they are so excited about this game they don’t have time to spell check.

# **Project Overview**

This section will describes the overview of the project.

## **Project Perspective**

The system is totally self-determining and not a part of any other system. This project works for searching the best games to play. Games are categorically divided for the user search. User can search games on the basis of features like graphics, performance etc. and to provide the best rated games on particular feature we will be doing Sentiment analysis on the collected data set.

## **Summary and Capabilities**

This section describes the summary and capabilities of the system.

|  |  |
| --- | --- |
| **User Benefits** | **Supporting Features** |
| Vast variety of games in different genre | Data set collected by web crawler from different game review websites increases the options for user |
| User recommendations system | Games will be rated on the basis of Sentiment analysis over user’s comments and feedback on different websites. Categorical recommendation is provided |
| User search for games | Game search will allow the user to search wide variety of games matching the requirement of search. Top rated games list on the basis of different categories is provided |
| user feedbacks and rating | This will allow the user to give feedback for a game he played. Different top rated games list also provided on the basis of users rating. |

Table Summary and Capabilities

**Assumptions and Dependencies**

In this section we will discuss the assumption and dependencies of the system.

* Different websites will be crawled to maintain data set dealing with the comments and reviews of the games in different genre and different categories.
* Feedbacks/ reviews/ comments should be in English language. For other languages and unknown words we will maintain a dictionary.
* Search of the top rated games also in English language
* Updating and maintenance of the system is also important.
* Recommendation system will provide top rated games categorically like graphics, performance, story line etc.

## **Design and Implementation Constraints**

This section is about different constraints which will reduce the efficiency of the product. There are certain design and implantation constraints. These constraints are described below.

#### **Unknown Words**

If the user enters the wrong words that are not a part of dictionary this will be a constraint for our system. Reviews and feedback un-understandable will also decrease the efficiency of data crawling.

#### **Search Language**

Searching for a game user should choose English language. Other languages will not be supported by the system.

## **Help for User**

The system will be easy to understand for every user. As there will be simple user portal of our system, therefore understanding of it is not difficult. It will be a simple web portal user can login and check for the top rated games. User can search and rate the games. Top rated game list also provided to help the user for further exploration.

## **Cost and Pricing**

* The total cost of the project includes
* 3 laptops of amount Rs.120000(40,000\*3) each
* Web hosting Rs.35000 for more than three years
* Domain name Rs.5000 for more than three years
* Developers salary Rs.40,000 per developer

So the estimated cost of the project will be Rs.200, 000 approximately.

## **Packaging and License**

There will be no need of any license or packaging because the system is based on online portal.

# **Project Features**

This section describes the basic product features. Services and facilities provided by our system to user.

## **Web Crawling**

The web crawler gathers the data from different websites. It will be a preprocessing technique available over Admin panel. Data is gathered and stored in database. Maintenance and Updating of data set also remains in focus. Following steps should be followed to crawl the data related to games.

* Admin user will provide website name as an input. Website names panel available over the admin screen.
* Web crawler will crawl the data from specified website.
* Crawled data is stored or updated in respective field of database.
* Repository of data is maintained.
* Output of the updated or crawled data is saved to database.

## **Sentiment Analysis**

It is a preprocessing technique available over admin panel. The Sentiment analysis will be performed over the dataset maintained using web crawlers and to rate the games on the basis of the users reviews/ comments/ feedbacks. Following steps should be acquired for Sentiment analysis of the data set.

* Admin will start the process by using GUI medium.
* This functionality will perform Sentiment analysis on each comment/feedback/review stored as data set in database.
* The result of the analysis will be either positive, negative or neutral.
* Different categories also maintained so that particular category information of the game also maintain for example if user comment says “good story but graphics are not good” so the Sentiment analysis maintain the two categories of sentences: Story and graphics features.
* Output will be Sentiment based rating of games saved in database column.

## **Game Search**

This functionality is the part of the user panel. This is working similar to search engines. User enter the name of the game and rate the game. Search of the game is supported only by English language. List of the games provided on the search of genre of game that are top rated on the basis of graphics, performance, and story line etc. Following steps should be acquired for the game search engine.

* The user enter the name of game in search tab.
* Functionality will perform database query of finding data in the respect of requirement of users.
* Output contains the game and portal for user to give feedback for game.

## **Game Rating (Categories)**

The functionality of this part of the system is on the basis of Sentiment analysis of the different comments/ reviews gathered by web crawler. The rating of the game is in the sense of positive, negative and neutral. Different features of the game also rated categorically. For example if the comment says “good story but graphics are not good” so the Sentiment analysis maintain the two categories of sentences: Story and graphics features. Following steps should be followed by the user.

* The user search the game
* Rate it on his experience
* Categorical rating is maintained
* Output will be the overall rating of the game on the basis of Sentiment analysis

## **Recommendation System**

The functionality of the recommendation system is on the basis of the top rated games.

The user wants to search the rating of different games in different genre. Recommendation system provides the list of top rated games based on the requirements of the user search. Following steps should be adopted while searching for games.

* User enters the name of game for search
* While providing the rating a list of top rated games in required category will be displayed.
* User can check the list to choose similar genre game that are in top ranking.

# **Tools and Techniques**

Different tools and techniques used in our projects are discussed below.

|  |  |  |
| --- | --- | --- |
| **Tools** | **Technologies** | **Techniques** |
| Visual studio | C# | Web crawling |
| Microsoft SQL server | Asp.net | Sentiment Analysis |
|  |  | Recommendation System |

Table Tools, Technology and Techniques

# **Constraints**

Different constraints for our project involves

* Existence of different web portals for game reviews and rating like DeltaDNA.
* Frequent Updating of data set
* Frequent Updating of dictionary for new words
* Immature level of experience of user
* Reviews and comments not in proper format like English language.

# **Quality Range**

Quality of the system define as

* Ease of use of the portal
* Efficiency of searching is maximum
* Accuracy of rating and reviews
* Top rated game list Updating
* Maintenance of data set
* Exception handling

# **Precedence and Priority**

This section describes the priority of the features being done in the project.

|  |  |
| --- | --- |
| **Precedence & Priority** | **Features** |
| High | Web crawling and Sentiment analysis have the high priority for the accuracy of the games. Whole data set is depended on it.  Updating and maintenance of the data.  Rating of the game of different genre categorically. |
| Medium | Efficiency of game search is in this category.  Recommendation system should work properly. |
| Low | User panel interface and admin panel interfaces interaction. |

Table Precedence and priority

# **Precedence and Priority**

Following are the other project requirements.

## **System Requirements**

System requirement involves following objects

* Record keeping of the data set in database
* Operating system to run the system
* Web hosting and domain to run the system online

## **Performance Requirement**

Following are the basic performance requirements of the system

* The system should be independent of any other device.
* Independently working on browser and OS.
* System will be hosted over domain with maximum time.
* Updating and maintenance of the system should be working properly.
* Recommendation of the top rated games should be efficient.
* Data collection and rating accuracy.

## **Environmental Requirement**

The system is supported an online portal so the environmental requirements involves the availability of resources, maintenance, usage conditions, Updating, data gathering by web crawler, recovery and exception handling. Internet access point is necessary for the system.

## **Applicable Standards**

The project has to follow some standards of designing a portal and data collection defined by the organizations like IEEE, ISO and so on. We will be using universal design for the development of our system. Different network protocols should be adopted for development.

# **Documentation Requirement**

This section defines the documentation that must be developed to support the development of project successfully. It involves the Vision of project, use cases, SRS, different reports, user manual etc.

## **Online Help**

The system may involves some basic system tutorials available on the website.

## **User Manual**

Although the system is online so we don’t require any user manual. User interface will be much friendly and interactive. Some reports and SRS documents may be provided to the project developers for Updating or maintenance.

# **Feature Attributes**

Following are the feature attributes of the system.

## **Status**

In this we will discuss the status of the system.

|  |  |
| --- | --- |
| **Proposed** | The proposed system was basically to crawl the data from three websites and perform Sentiment analysis over it. The user panel will be a search engine which allows the user to search games. Rating will based on different categories also like graphics. Story line, performance etc. |
| **Approved** | We are now developing a system named as IGAT (Internet Gaming Analysis and Trends) for the search of best rated games in different genre. We will crawl three websites and perform Sentiment analysis over it. The user panel will be a search engine which allow the user to search games and rate it. Top rated games also provided by recommendation system. |
| **Incorporated** | There is an extension in websites (from 3 to 5) and system data set Updating. |

Table Status

## **Benefits**

In this section we will discuss the benefits of the system.

|  |  |
| --- | --- |
| **Critical** | * Crawling of data * Sentiment analysis * Rating of games * Classification of games in different categories * Recommendation system |
| **Important** | * Login portal for secure the system * User login portal for game search and rating |
| **Useful** | * Updating * Maintenance * Recommendation system |

Table Benefits

## **Effort**

This section describes the efforts required for different tasks. Development of different stages of the system require more time and effort. For example after crawling the data it is important to maintain a database of it to run Sentiment analysis over it. The Sentiment analysis divide the data set into three basic categories positive, negative and neutral. Further efforts would be required to maintain sub-categories of the games of different genre like graphics, performance etc. recommendation system accuracy requires the effort of providing top rated games of different genre.

## **Risk**

This section involves the risk we may face during the development of the project. There are some external risks involve that may be cause errors in designing phase of the project. Change in the structure of websites may cause the difficulty in data collection. There may be some health issues of team member during development.

## **Stability**

Stability of the feature is how much change can be modified on the basis of user reviews. How the system will work from starting of the development to the deployment phase.

## **Target Release**

This section describes the time span of each phase of the project. All such details will be discussed in work breakdown structure provided later.

## **Assigned To**

This section describes the general view of the responsible of the project development. The task distribution is given below

|  |  |  |
| --- | --- | --- |
| **Names** | **Tasks to Perform** | **Status** |
| Ms. Asma Sattar | Supervises and advice the project development | Supervisor |
| Ms. Kainat Shaikh | Requirement Gathering, Documentation, Designing, Implementation, testing | Developer |
| Mr. Ahmad Waseem | Requirement Gathering, Documentation, Designing, Implementation, testing | Developer |
| Mr. Muneeb Zia | Requirement Gathering, Documentation, Designing, Implementation, testing | Developer |

Table Work Distribution

## **Reason**

The whole document is for the ease of every stakeholder. We have tried to overcome all the issues in this document which can create confusion related to our project. We have described that why we are going to develop this product. Anyone can take an idea that why this product has been developed by reading this particular document.

1. **Project Deliverables**

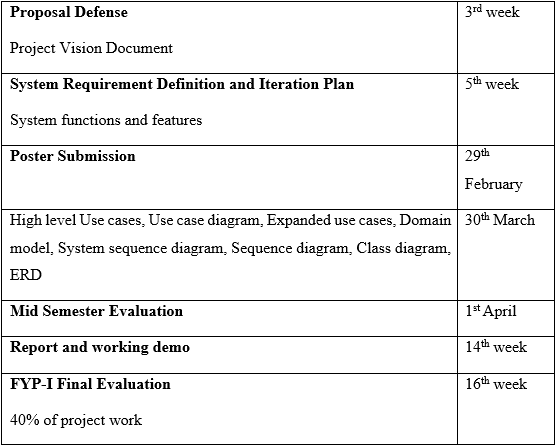


Table Project Deliverables

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# **Software Requirement Specification**

# **Introduction**

This section will provide you product requirements and scope. It includes overall function of the product and external interface requirements. In the last, it includes system features and non-functional requirements.

## **Purpose**

The main purpose of this document is to give detail description about different requirements of our project. Secondary purpose is to define all the possible functions of our project. Detailed description about the features, interfaces and requirements is given in this document. It is a roadmap which provides high level and detailed technical requirements.

## **Document Conventions**

The document conventions includes:

1. Main Heading size is 16
2. Sub heading size is 14
3. Font size is 11
4. Font Family is Times New Roman

## **Intended Audience and Reading Suggestions**

1. Section 1.0 gives the general overview of the document and the project. This section is recommended for the both technical and non-technical readers.

## **Project Scope**

This system will be designed for multiple users. Those people, who are interested in games. It entertain market and general information oriented queries about games. Our project is useful for business purposes as well as for providing reviews and rating for famous games. Primary focus of the project is to make market and feature oriented decisions about games

# **Overall Description**

This section describes the complete description of the project.

## **Project Perspective**

There is a great opportunity we find in developing this project. A web based portal for game players to choose best games. Rating based portal not only on the basis of user reviews but also on the basis of features of games like graphics, performance, storyline etc. The system will provide the user with viewer comment based rating portal. It consist of two basic technologies web crawler and Sentiment analyzer. The project crawl the different comments of game lovers from three websites and Sentiment analysis provides you the basic rating of the data set collected by web crawler. It provides you the featured based rating of different games like graphics, game play and performance of game. Recommendation system provides you a facility to find the top rated game with respect to top rated feature of it.

## **Project Functions**

This section discuss the basic functions of the project.

1. System will be a web based portal for game players to choose best games.
2. Rating based portal not only on the basis of user reviews but also on the basis of features of games like graphics, performance, storyline etc.
3. System will update or maintain the dataset by using web crawler.
4. The system will provide the user with top rated games in different features.
5. System will provide Sentiment based analyzed rating of games.
6. Games classification with different features are rated on the basis of user’s comments.
7. System will provide a recommendation of top rated games with respect to search features like graphics, game play and performance.

## **User Classes and Characteristics**

### ***Admin***

This section describes the characteristics of the Admin.

* Admin have an expert level understanding of the system.
* Adequate level of understanding of data mining techniques.
* Some knowledge of web crawling.
* Adequate level of understanding of different programming languages.

### ***User***

This section describes the characteristics of the User.

* User should have experience of using Web portal.
* Experience of using search engines.
* Adequate level of understanding of different online portals.
* Experience of rating the games or different apps.

## **Operating Environment**

There will be no restricted operating environment for the project as it is online portal so it can be accessed from mobiles, computers, PDAs having access to internet. There will be no need of browser, operating system or any other software application restriction on our project usage. No special hardware equipment is needed.

## **Design and Implementation Constraints**

The existence different game rating portals are normally provides you the general rating based on the most downloaded games from different portals. This section is about different constraints which will reduce the efficiency of the product. There are certain design and implementation constraints. These constraints are described below.

#### **Unknown Words**

If the user enters the wrong words that are not a part of dictionary this will be a constraint for our system. Reviews and feedback un-understandable will also decrease the efficiency of data crawling.

#### **Search Language**

Searching for a game user should choose English language. Other languages will not be supported by the system.

## **User Documentation**

This section defines the documentation that must be developed to support the development of project successfully. It involves the Vision of project, use cases, SRS, different reports, user manual etc.

#### **Online Help**

The system may involves some basic system tutorials available on the website.

#### **User Manual**

Although the system is online so we don’t require any user manual. User interface will be much friendly and interactive. Some reports and SRS documents may be provided to the project developers for Updating or maintenance.

## **Assumption and Dependencies**

In this section we will discuss the assumption and dependencies of the system.

1. Different websites will be crawled to maintain data set dealing with the comments and reviews of the games in different genre and different categories.
2. Feedbacks/ reviews/ comments should be in English language. For other languages and unknown words we will maintain a dictionary.
3. Search of the top rated games also in English language
4. Updating and maintenance of the system is also important.
5. Recommendation system will provide top rated games categorically like graphics, performance, story line etc.

# **External Interface Requirements**

This section involves the external interface requirements of our project.

## **User Interfaces**

User interface will be similar to the other online portal provided for rating the product. The user will enter the name of game in the search portal and display of game is provided with its rating and other information. The user can rate the game on his experience. Different features of the game also rated by the user.

## **Hardware Interfaces**

This project does not require any external hardware.

## **Software Interfaces**

This project requires two software interfaces

* + Admin Interface
  + User Interface

### ***Admin Interface***

The Admin interface will be used for preprocessing techniques. The preprocessing will consists of processes of web crawling of data from three different websites of games. The crawled data is stored in the databases after the redundancy removal. After maintaining the dataset in the database the Sentiment analyzer is used to analyses the collected data. The Sentiment analysis provides you a result in three categories that is positive, negative and neutral. Moreover our project includes additional feature if providing the results of the analyzer on the basis of three different categories of games that is graphics, game play and performances. This will further help to provide the user about the top rated games based on different features of games.

|  |  |  |
| --- | --- | --- |
| **Name** | **Description** | **Responsibilities** |
| Admin | Person which monitors the functionality of web crawling and game rating based on Sentiment analysis. The person is also responsible for the feedbacks response. | * Maintenance of data logs. * Updating. * Sentiment based rating * Exception or error handling * Response and feedbacks records control |

Table SRS Admin

### ***User Interface***

The User interface will be used for searching for the games according to the given requirement of the user.

|  |  |  |
| --- | --- | --- |
| **Name** | **Description** | **Responsibilities** |
| User | Person who give feedback or rate the game. Search the top rated games. Search games on the basis of graphics, performances, storyline ranking. | * Search top rated games * Search on feature basis * Use recommendation * Give rating or feedback |

Table SRS User

## **Communication Interfaces**

There is no specific requirement regarding the functionality of the communication. No special browser, protocol or formatting is required for the communication. User should be well familiar with the search engines. Recommendation system may provide a sort of communication between admin and user. The user will get a sort of recommendation by admin of top rated games on different features of the games like graphics, game play and performances.

# **System Features**

This section describes the basic features of the system.

## **Login**

This is access portal to the system.

### ***Description and Priority***

This functionality is to define the access points. It makes admin/user panel secure from noisy neighbors. A person with valid email ID and password can have access to admin/user panel only. So it has high priority as the whole data set and working depends on it.

### ***Stimulus Sequences***

The Admin/user will provide the input of Login ID and password to access the system. This system is necessary for the security of the system. The person with the password can log in the panel.

* Enter the Login ID
* Enter the password
* Click the Login button

### ***Functional Requirement***

This feature requires the following functional requirements

**REQ-1** Validation check for Login ID

**REQ-2** Validation check for Password format

**REQ-3** Validation check for the login button

## **Web Crawling**

Collection of the dataset is done by Web crawler.

### ***Description and Priority***

This functionality will be a preprocessing technique available over admin panel. This is used to crawl the data set from three different websites of games reviews. Updation and maintenance of the data set done by the crawling of reviews and comments by game players. Priority of this feature is high because rating is done after the collection of dataset from game related websites.

### ***Stimulus Sequences***

Following sequence should be followed for the collection of dataset.

* The admin will provide the name of the website to crawl the data.
* Web crawler will crawl the data from the specified website.
* After crawling it will save or update the data in the respective fields of the database.
* The output will be saved or updated data from website to data base.

### ***Functional Requirement***

This feature requires the following functional requirements

**REQ-1** Validation check for web crawler with respect to the website

**REQ-2** Validation check for avoiding redundant data.

**REQ-3** Web crawler supporting libraries.

## **Sentiment Analysis**

This feature provides the polarity of the data set collected from websites.

### ***Description and Priority***

This functionality will be a preprocessing technique available over admin panel. This functionality will be used to perform Sentiment analysis over the dataset maintained using web crawlers and to rate the game on the basis of the player comments or reviews.   
Priority of the feature is high as it will perform Sentiment analysis over dataset and defines the polarity of different game related to different genre. Polarity of the game will be divided in three basic categories that is positive, negative and neutral. Moreover games are also categorized by their features like graphics, game play and performance. Rating of the games also done by their respective features.

### ***Stimulus Sequences***

The Admin will do the following for the Sentiment analysis.

* The Admin will start the functionality by using GUI interaction medium
* This functionality will perform Sentiment analysis on the basis of sentence polarity over the user comments saved against a game
* After performing Sentiment analysis it will infer game rating categorically.
* The output will be Sentiment based rating of a product saved into a database column

### ***Functional Requirement***

This feature requires the following functional requirements

**REQ-1** Validation checks for avoiding redundant data

**REQ-2** System should have natural language processing support libraries

## **Game Search**

This feature provides the search portal.

### ***Description and Priority***

This functionality will be part of user panel .This will be similar to search engine, user will enter the requirements in to the search tab and on clicking search button it will show all possible match with respect to user requirements. Priority of the feature is medium as it will act user panel.

### ***Stimulus Sequences***

This functionality involves the following sequence.

* The input will be requirement entered by user in search tab
* This functionality will perform the database query of finding data from the database with respect to user requirement
* The output will be the game searched with its information of rating

### ***Functional Requirement***

This feature requires the following functional requirements

**REQ-1** System should have web browser

**REQ-2** System should have natural language processing support libraries

**REQ-3** Drop down tab for game search spelling handling

## **Game Rating (Categories)**

This feature provides the rating portal.

### ***Description and Priority***

The functionality of this part of the system is on the basis of Sentiment analysis of the different comments/ reviews gathered by web crawler. The rating of the game is in the sense of positive, negative and neutral. Different features of the game also rated categorically. For example if the comment says “good story but graphics are not good” so the Sentiment analysis maintain the two categories of sentences: Story and graphics features. Priority of this feature is high.

### ***Stimulus Sequences***

This functionality involves the following sequence.

* The user search the game
* Rate it on his experience
* Categorical rating is maintained
* Output will be the overall rating of the game on the basis of Sentiment analysis.

### ***Functional Requirement***

This feature requires the following functional requirements

**REQ-1** System should have stored rating of games on different features

**REQ-2** System should have natural language processing support libraries

## **Recommendation System**

This feature provides the recommendation of top rated games.

### ***Description and Priority***

The functionality of the recommendation system is on the basis of the top rated games.

The user wants to search the rating of different games in different genre. Recommendation system provides the list of top rated games based on the requirements of the user search. Priority of this feature is medium.

### ***Stimulus Sequences***

This functionality involves the following sequence.

* User enters the name of game for search
* While providing the rating a list of top rated games in required category will be displayed.
* User can check the list to choose similar genre game that are in top ranking.

### ***Functional Requirement***

This feature requires the following functional requirements

**REQ-1** System should have stored rating of games on different features.

**REQ-2** System should have natural language processing support libraries

# **Non-Functional Requirements**

Following are the non-functional requirements of our project.

## **Performance Requirements**

Following are the performance requirements of the system.

* The system will be independent of the browser and OS.
* The system will be independent of device.
* The System will be hosted over domain with maximum Uptime.
* The system Updating time will be decided on the basis of traffic manager result to maintain system access speed.

## **Safety Requirements**

The product is safe as runtime processing is minimum so chance of crashing will be minimum and for avoiding hardware failure we will be looking forward for cloud computing as a future endures.

## **Security Requirements**

Following are the security requirements of the system

* The separate admin and user login makes product more secure in term of accessibility.
* The system base repository will be saved from noisy neighbors.

## **Software Quality Attributes**

Following are the software quality attributes of our system

### ***Availability***

The system will be ubiquitously available to user as it will be an online portal accessible from everywhere depending upon the bandwidth of user. The system will be hosted over the domain with maximum uptime. The system Updation time will be decided on the basis of traffic manager result to maintain system access speed.

### ***Maintainability***

In case of any failure the admin can take over the problem during dataset maintenance. Data set maintenance will be performed once in every 24 hours. The maintaining of system will be automated .The system updating time will be decided on the basis of traffic manager result to maintain system access speed.

### ***Portability***

The system will be portable as user can access it from any mean of internet and there is no restriction of browsers or OS, moreover the admin panel can be import to other system after maintaining an executable file.

## **Business Rules**

Following business rules should be adopted

* A person can search the product of his requirement.
* A person can overview the market of product on the basis of rating and views.
* A business personal can depict the market value of product.
* A company can depicts the drawback of their product.
* Company can have user feedbacks about their product

# **Other Requirements**

Following are some other requirements of our project

## **Logical Database Requirement**

Data base will exists in the product in the form of repository which will be built and maintained by using web crawling, Will be used as a dataset for Sentiment analysis. The result of Sentiment analysis will be saved in database. The validation checks will be maintained for empty entry and redundancy in database.

# **High Level Use Cases**

# **Login**

|  |  |
| --- | --- |
| Use Case : 01 | Login |
| Actors | User, Admin |
| Type | Primary |
| Description | Login portal provides the user to access. A person with valid email ID and password can have access to admin panel only. Login system is secure and related to the concern person. |
| Inputs | Basic inputs involve the user ID and password. |
| Processing | User Password and ID entered by admin is matched with the record in database by particular queries. |
| Output | Access to admin panel on the successful matching of record of admin. Error message will be prompted on screen if the user login ID and password are mismatched. |
| Flow | * User enter the login ID. * Enter password. * If login ID and password match with the record, access to admin panel. * Else re-enter login ID and password. |
| Error Handling | * Login ID and password pattern validation check. * Click button validation check. |

Table High Level Use Case Login

# **Web Crawling**

|  |  |
| --- | --- |
| Use Case : 02 | Web Crawling |
| Actors | Admin |
| Type | Primary |
| Description | This functionality will be a preprocessing technique available over admin panel. This functionality will be used to crawl available link from three website. |
| Inputs | The input will be the website name selected by admin from the website names panel available over the admin screen. |
| Processing | Web crawler will crawl the link from the specified website and save them with in the file. |
| Output | The output will be the links stored in queues |
| Flow | Open website main page.Start crawler.  * Discover all URLs present over the website. * Save the discovered link. * The links will be stored in queue structure. |
| Error Handling | The empty links will not be accommodated into file. |

Table High Level Use Case Web Crawling

# **Web Scraping**

|  |  |
| --- | --- |
| Use Case : 04 | Web Scraping |
| Actors | System |
| Type | Secondary |
| Description | This functionality will be a preprocessing technique. This functionality will be used to Scrap data from the links present over website. |
| Inputs | The input will be the link from the queue structure. |
| Processing | Web scraper will scrap the data from the link and save them with in database. |
| Output | The output will be the data stored in database. |
| Flow | System will fetch the links from file one by one.Crawl data from link.  * Store the data |
| Error Handling | The links with no data will not be accommodated into file. |

Table High Level Use Case Web Scraping

# **Data Parsing**

|  |  |
| --- | --- |
| Use Case : 05 | Data Parsing |
| Actors | System |
| Type | Secondary |
| Description | This functionality will be a preprocessing technique. This functionality will be used to parse data from the crawled data. |
| Inputs | The input will be the data present in the queue structure. |
| Processing | Parser will parse the data from the link and save them with in the database. |
| Output | The output will be the data stored in the database in respective fields. |
| Flow | System will fetch the data tags from file one by one.Parse data from the tags.  * Store the data in the database in respective fields. |
| Error Handling | The tags with no data will be accommodated with NULL into database. |

Table High Level Use Case Data Parsing

# **Sentiment Analysis**

|  |  |
| --- | --- |
| Use Case : 07 | Sentiment Analysis |
| Actors | Admin |
| Type | Primary |
| Description | This functionality will be a preprocessing technique available over admin panel. This functionality will be used to perform Sentiment analysis over the dataset maintained using web crawlers and to rate the product on the basis of the user comments. Classification of different games also maintained. |
| Inputs | The input will be a data set maintained using web crawlers. |
| Processing | This functionality will perform Sentiment analysis on the basis of sentence polarity over the user comments saved against a game and after performing Sentiment analysis it will infer its rating. The rating will be saved into database column. |
| Output | The output will be Sentiment based rating of a game saved into a database column. |
| Flow | * Select comments * Check polarity of sentences in comments. * Declare comments negative or positive or neutral on basis of greater number of positive or negative sentences in a comment. * Rate the game on the basis of percentile of positive and negative comments. |
| Error Handling | * The objective sentences will be removed from dataset before applying Sentiment Analysis. * The product-aspect relation anomaly will be handled |

Table High Level Use Case Sentiment Analysis

# **Categorization**

|  |  |
| --- | --- |
| Use Case : 8 | Categorization |
| Actors | Admin |
| Type | Primary |
| Description | This functionality will be part of admin. Admin can categorized the games on the basis of genre of game. Games will also be available as genre like fighting game, RPG game, puzzle game or board game. |
| Inputs | The input will be all available games. |
| Processing | This functionality will take all games and categorized them according to their genre taking from crawled links. |
| Output | All games will also be available in the list of genre. |
| Flow | * Search the game and genre in link * Insert the name of game. * Add it to the genre. * Display of game with genre. |
| Error Handling | Null |

Table High Level Use Case Categorization

# **Rating**

|  |  |
| --- | --- |
| Use Case : 9 | Rating |
| Actors | Admin |
| Type | Primary |
| Description | This functionality will be part of admin. Game rating and its feature rating will be available individually. |
| Inputs | The input will be the result concluded by the sentiment analysis. |
| Processing | This functionality will gather the data of sentiment analysis and set the rating accordingly. |
| Output | The output will be the game rating and its features, gameplay and graphics ratings. |
| Flow | * Gather the data from sentiment analysis. * Taking average of all data. * Make the rating limit out of ten. * Plot the data according to rating style. |
| Error Handling | Null |

Table High Level Use Case Rating

# **Game Search**

|  |  |
| --- | --- |
| Use Case : 10 | Game search |
| Actors | User |
| Type | Primary |
| Description | This functionality will be part of user panel .This will be similar to search engine, user will enter the name of game in to the search tab and on clicking search button it will show all possible match with respect to user requirement. |
| Inputs | The input will be requirement entered by user in search tab. |
| Processing | This functionality will perform the database query of finding data from the database with respect to user requirement. |
| Output | The output will be the game shown on the screen with its rating. |
| Flow | * Insertion of name of game in search tab by user. * Click on search button. * Display of all possible matching games with respect to requirement. * Selection of game by user. * Display of complete information of selected game along with Sentiment basis rating and features. |
| Error Handling | Empty tab validations |

Table High Level Use Case Game Search

# **Feature Favorites**

|  |  |
| --- | --- |
| Use Case : 11 | Feature Favorite |
| Actors | User |
| Type | Primary |
| Description | This functionality will be part of user panel. User can like the game on features like graphics, game play and performance. |
| Inputs | The input will be name of game entered by user in search tab. |
| Processing | This functionality will perform the database query of finding data from the database with respect to user requirement. Liking the game on the basis of user experience. Like involves the three basic categories like graphics. Game play and performance. |
| Output | The output will be the user liked game in the favorite list. |
| Flow | * Insertion of name of game in search tab by user. * Click on search button. * Display of all possible matching games with respect to requirement. * Selection of game by user. * Display of complete information of selected game along with Sentiment basis rating and features. * Allow the user to like the game on the basis of its features like graphics, game play and performance. |
| Error Handling | Null |

Table High Level Use Case Features

# **Recommendation**

|  |  |
| --- | --- |
| Use Case : 12 | Recommendation |
| Actors | User |
| Type | Primary |
| Description | This functionality will be part of admin panel. Game will be recommended to the user on the basis of Sentiment analysis provided results and also considering the features like graphics, game play and performance. |
| Inputs | The input will be name of game entered by user in search tab |
| Processing | This functionality will perform the database query of finding data from the database with respect to user searched game. Rating of the different games will be displayed in different categories based on the search of user. |
| Output | The output will be top rated games. |
| Flow | * Insertion of game name in search tab by user. * Click on search button. * Display of all possible matching games with respect to requirement on the basis of different categories like graphics, game play and performance. * Selection of game by user. * Display of complete information of selected game along with Sentiment basis rating and features. |
| Error Handling | Null |

Table High Level Use Case Recommendations

# **Use Case Diagram**

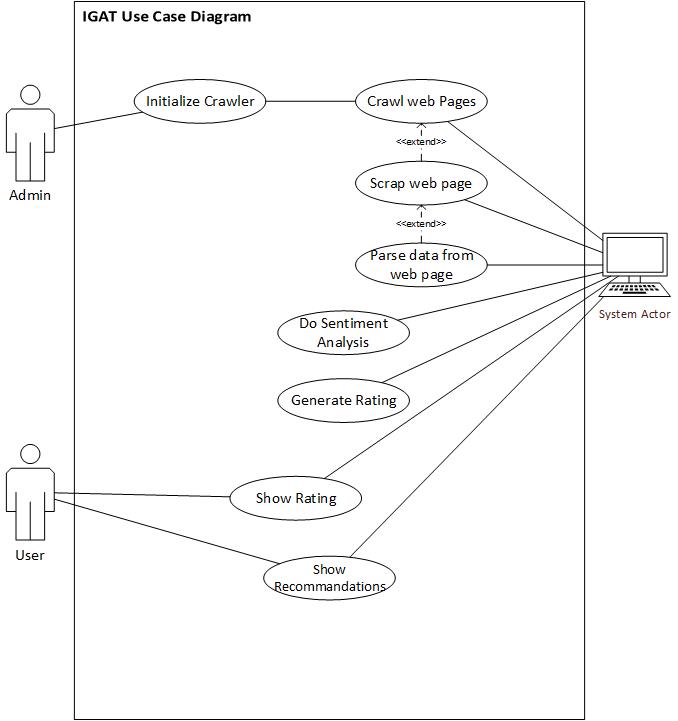


Figure Use Case Diagram

# **Expanded Use Cases**

# **Login**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 1 | | |
| Use Case Name: | **Login** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors | User, Admin | | |
| Type | Primary | | |
| Description | Login portal provides the user to access. A person with valid email ID and password can have access to admin panel only. Login system is secure and related to the concern person. | | |
| Trigger: | The event will be initiated by the admin/user by providing login and password. | | |
| Preconditions: | 1. Properly working on premise system 2. Access for the premise system. | | |
| Post Conditions: | 1. Access to admin/user after successful login. | | |
| Inputs: | Basic inputs involve the user ID and password. | | |
| Processing: | User Password and ID entered by admin is matched with the record in database by particular queries. | | |
| Output: | Access to admin panel on the successful matching of record of admin. Error message will be prompted on screen if the user login ID and password are mismatched. | | |
| Flow: | 1. User enter the login ID. 2. Enter password. 3. If login ID and password match with the record, access to admin panel. 4. Else re-enter login ID and password. | | |
| Alternative Flow: | 1. If the login ID and password is invalid by the provider re-enter Login ID. 2. Enter password 3. Click Login Button | | |
| Exceptions: | 1. Invalid Entry 2. Caps Lock On 3. Corruption of Login Table | | |
| Includes: | No | | |
| Frequency of Use: | Usage depends on Admin/User | | |
| Special Requirements: | Proper working of premise system | | |
| Assumptions: | 1. User/admin have complete understanding of whole system. | | |
| Notes and Issues: | More functionality of system should be added or not. | | |
| Error Handling | 1. Login ID and password pattern validation check. 2. Click button validation check. 3. In case of corruption of login table the admin/user ID and password will never be matched. | | |

Table Expanded Use Case Login

# **Web Crawling**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 2 | | |
| Use Case Name: | **Web Crawling** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors | Admin | | |
| Type | Primary | | |
| Description | This functionality will be a preprocessing technique available over admin panel. This functionality will be used to crawl available link from three website. | | |
| Trigger: | The event will be initiated by the admin. | | |
| Preconditions: | 1. Availability of internet connection 2. Provision of correct URL of website. | | |
| Post Conditions: | 1. Discover all URLs present over the first page. 2. Saving of links in data structure. | | |
| Inputs: | The input will be the website name selected by admin from the website names panel available over the admin screen. | | |
| Processing: | Web crawler will crawl the link from the specified website and save them with in the file or database. | | |
| Output: | The output will be the links stored in queues. | | |
| Flow: | 1. Open the website and start crawler. 2. Discover all the links. 3. Discover all the URLs present on first page of website. 4. Save the links | | |
| Alternative Flow: | If the website URL is invalid   1. Open the main page of website. 2. Go to step 2 | | |
| Exceptions: | 1. Link is invalid 2. Link is down of requested website. | | |
| Includes: | No | | |
| Frequency of Use: | Once a day | | |
| Special Requirements: | Selection of websites with maximum uptime. | | |
| Assumptions: | 1. Admin have complete understanding of whole system. 2. Valid URLs | | |
| Notes and Issues: | Functionality of providing the URL of website or Website name to crawler. | | |
| Error Handling | 1. The empty links will not be accommodated into file. 2. In case of link down the crawler will return a pop-up message and ask for next instruction. | | |

Table Expanded Use Case Web Crawling

# **Web Scraping**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 4 | | |
| Use Case Name: | **Web Scraping** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors | System | | |
| Type | Secondary | | |
| Description | This functionality will be a preprocessing technique. This functionality will be used to scrap data from the links present over website. It will scrap the tags data from links. | | |
| Trigger: | The event will be self-triggered. | | |
| Preconditions: | Availability of valid links. | | |
| Post Conditions: | File contains data discovered from links. | | |
| Inputs: | The input will be the link from the queue structure. | | |
| Processing: | Web crawler will crawl the data from the link and save them with in database. | | |
| Output: | The output will be the data stored in database. | | |
| Flow: | 1. System fetch the links from file one by one. 2. Scrap the data. 3. Store the data. | | |
| Alternative Flow: | If the link file is empty   1. Discover the links 2. Save the links in file 3. System traverse the link 4. Scrap data 5. Store data | | |
| Exceptions: | Empty link | | |
| Includes: | No | | |
| Frequency of Use: | Once a day. | | |
| Special Requirements: | Link file always contain some data related to links. | | |
| Assumptions: | 1. Admin have complete understanding of whole system. 2. Scraping is system triggered. | | |
| Notes and Issues: | No. | | |
| Error Handling | In case of empty link, the system will traverse to the next link. | | |

Table Expanded Use Case Web Scraping

# **Data Parsing**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 5 | | |
| Use Case Name: | **Data Parsing** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors | System | | |
| Type | Secondary | | |
| Description | This functionality will be a preprocessing technique. This functionality will be used to parse data from the scraped data. | | |
| Trigger: | The event will be system triggered. | | |
| Preconditions: | Availability of valid data file or database. | | |
| Post Conditions: | 1. Data is arranged in respective fields. 2. Database contained the parsed data. | | |
| Inputs: | The input will be the data present in the data structure. | | |
| Processing: | Parser will parse the data from the link and save them with in the database. | | |
| Output: | The output will be the data stored in database. | | |
| Flow: | 1. System fetch the data from file. 2. Parse the data. 3. Store the data. | | |
| Alternative Flow: | If the data file is empty   1. Crawl data from links 2. Traverse the data 3. Parse the data 4. Store data in database. | | |
| Exceptions: | Empty data file. | | |
| Includes: | No | | |
| Frequency of Use: | Once a day. | | |
| Special Requirements: | Data file always contain some crawled data. | | |
| Assumptions: | 1. Admin have complete understanding of whole system. 2. Data parsing is system triggered. 3. System is working fine. | | |
| Notes and Issues: | No. | | |
| Error Handling | The file with no data will be accommodated with NULL into database. | | |

Table Expanded Use Case Data Parsing

# **Sentiment Analysis**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 7 | | |
| Use Case Name: | **Sentiment Analysis** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors: | Admin | | |
| Type: | Primary | | |
| Description: | This functionality will be a preprocessing technique available over admin panel. This functionality will be used to perform Sentiment analysis over the dataset maintained using web crawlers and to make a percentile of the game on the basis of the user comments. Classification of different games also maintained. | | |
| Trigger: | The event will be initiated by Admin. | | |
| Preconditions: | Non-redundant dataset should be available. | | |
| Post Conditions: | Declaration of polarity of sentences as positive, negative, neutral. | | |
| Input: | The input will be a data set maintained using web crawlers. | | |
| Processing: | This functionality will perform Sentiment analysis on the basis of sentence polarity over the user comments saved against a game and after performing Sentiment analysis it will infer its rating. The rating will be saved into database column. | | |
| Output: | The output will be Sentiment based rating of a game saved into a database column | | |
| Flow: | 1. Select comments 2. Check polarity of sentences in comments. 3. Declare comments negative or positive or neutral on basis of greater number of positive or negative sentences in a comment. 4. Give percentile of the game on the basis of positive and negative comments. | | |
| Alternative Flow: | 1. Updating of dataset. 2. Admin start Sentiment analyzer. 3. Check the polarity of sentences in comments. 4. Declaration of sentences as positive, negative or neutral. 5. Rating the game on the basis of declaration. 6. Declaration of sentences on the basis of features discussed in sentences. | | |
| Exceptions: | Ire-regular language (non-English) and unknown words. | | |
| Includes: | No | | |
| Frequency of Use: | Once a day. | | |
| Special Requirements: | Comments should in English language. | | |
| Assumptions: | Comments should in in standard English language. | | |
| Notes and Issues: | Presences of multiple noun phrases in the sentence. | | |
| Error Handling | 1. The objective sentences will be removed from dataset before applying Sentiment Analysis. 2. The game-aspect relation anomaly will be handled. | | |

Table Expanded Use Case Sentiment Analysis

# **Categorization**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 8 | | |
| Use Case Name: | **Categorization** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors: | Admin | | |
| Type: | Primary | | |
| Description: | This functionality will be part of admin. Admin can categorized the games on the basis of genre of game. Games will also be available as genre like fighting game, RPG game, puzzle game or board game. | | |
| Trigger: | The event will be initiated by Admin. | | |
| Preconditions: | Availability of game in system or database. | | |
| Post Conditions: | Display of selected game with its genre and in genre list. | | |
| Inputs: | The input will be all available games. | | |
| Processing: | This functionality will take all games and categorized them according to their genre taking from crawled links. | | |
| Output: | All games will also be available in the list of genre. | | |
| Flow: | 1. Search the game and genre in link 2. Insert the name of game. 3. Add it to the genre. 4. Display of game with genre. | | |
| Alternative Flow: | 1. If genre not found search the game in game dictionary. 2. Find the genre of game. 3. Add game according to genre in list. | | |
| Exceptions: | Availability of genre according to game. | | |
| Includes: | No | | |
| Frequency of Use: | Every game needs a genre and also every day once. | | |
| Special Requirements: | User need to know about genres. | | |
| Assumptions: | Every game has its category. | | |
| Notes and Issues: | Games must available to make list. | | |
| Error Handling | Null | | |

Table Expanded Use Case Categorization

# **Rating**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 9 | | |
| Use Case Name: | **Rating** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors: | Admin | | |
| Type: | Primary | | |
| Description: | This functionality will be part of admin. Game rating and its feature rating will be available individually. | | |
| Trigger: | The event will be initiated by Admin. | | |
| Preconditions: | Data needs to be available from sentiment analysis. | | |
| Post Conditions: | Every game and its available features will show a rating bar. | | |
| Inputs: | The input will be the result concluded by the sentiment analysis. | | |
| Processing: | This functionality will gather the data of sentiment analysis and set the rating accordingly. | | |
| Output: | The output will be the game rating and its features, gameplay and graphics ratings. | | |
| Flow: | 1. Gather the data from sentiment analysis. 2. Taking average of all data. 3. Make the rating limit out of ten. 4. Plot the data according to rating style. | | |
| Alternative Flow: | 1. If data not available wait for it. 2. If data is in incorrect format parse the data into float. | | |
| Exceptions: | Data is in string. | | |
| Includes: | No | | |
| Frequency of Use: | Every day at least once. | | |
| Special Requirements: | Data needs in form of digits. | | |
| Assumptions: | Data availability in float or in percentage. | | |
| Notes and Issues: | Rating will be out of ten. | | |
| Error Handling | Null | | |

Table Expanded Use Case Rating

# **Game Search**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 10 | | |
| Use Case Name: | **Game Search** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors: | User | | |
| Type: | Primary | | |
| Description: | This functionality will be part of user panel .This will be similar to search engine, user will enter the name of game in to the search tab and on clicking search button it will show all possible match with respect to user requirement. | | |
| Trigger: | The event will be initiated by Admin. | | |
| Preconditions: | Insertion of name of game in search tab. | | |
| Post Conditions: | Display of selected game and information related to it. | | |
| Inputs: | Input will be requirement entered by user in search tab. | | |
| Processing: | This functionality will perform the database query of finding data from the database with respect to user requirement. | | |
| Output: | The output will be the game shown on the screen with its rating. | | |
| Flow: | 1. Insertion of name game in search tab by user. 2. Click on search button. 3. Display of all possible matching games with respect to requirement. 4. Selection of game by user. 5. Display of complete information of selected game along with Sentiment basis rating and features | | |
| Alternative Flow: | 1. Insert the name of game. 2. Click search button. 3. Display of game. | | |
| Exceptions: | Search tab entry check validation. | | |
| Includes: | No | | |
| Frequency of Use: | Depends on number of users. | | |
| Special Requirements: | User have adequate experience of using search engines. | | |
| Assumptions: | Search words in English | | |
| Notes and Issues: | No experience of user of online search portals. | | |
| Error Handling | Empty tab validations | | |

Table Expanded Use Case Game Search

# **Feature Favorites**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 11 | | |
| Use Case Name: | **Feature Favorites** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors: | User | | |
| Type: | Primary | | |
| Description: | This functionality will be part of user panel. User can like the game on features like graphics, game play and performance. | | |
| Trigger: | The event will be initiated by User. | | |
| Preconditions: | Insertion of name of game in search tab. | | |
| Post Conditions: | Display of selected game and information related to it (rating). | | |
| Inputs: | The input will be name of game entered by user in search tab. | | |
| Processing: | This functionality will perform the database query of finding data from the database with respect to user requirement. Liking the game on the basis of user experience. Like involves the three basic categories like graphics. Game play and performance. | | |
| Output: | The output will be the user liked game in the favorite list. | | |
| Flow: | 1. Selection of game by user. 2. Display of complete information of selected game along with Sentiment basis rating and features 3. Allow the user to like the game on the basis of its features like graphics, game play and performance. | | |
| Alternative Flow: | 1. Insert the name of game. 2. Click search button. 3. Display of game. 4. Select game 5. Required information is along with the game 6. Rate the game | | |
| Exceptions: | Search tab entry check validation. | | |
| Includes: | No | | |
| Frequency of Use: | Depends on number of users. | | |
| Special Requirements: | User have adequate experience of liking games. | | |
| Assumptions: | Rating is done on true experience of user. | | |
| Notes and Issues: | No experience of user of game rating or any other app rating. | | |
| Error Handling | NULL | | |

Table Expanded Use Case Feature Favorite

# **Recommendation**

|  |  |  |  |
| --- | --- | --- | --- |
| Use Case ID: | 12 | | |
| Use Case Name: | **Recommendation** | | |
| Created By: | F12-8155  F12-8241  F12-8209 | **Last Updated by:** | No |
| Date Created: | 06-03-2016 | **Last Revision Date:** | No revision |
| Actors: | User | | |
| Type: | Primary | | |
| Description: | This functionality will be part of system. Game will be recommended to the user on the basis of user favorite’s games that he likes, Sentiment analysis provided results and also considering the features like graphics, gameplay and performance. | | |
| Trigger: | The event will be initiated by User. | | |
| Preconditions: | Like a game from searched list. | | |
| Post Conditions: | Display of selected game and information related to it (rating). | | |
| Inputs: | The input will be name of game entered by user in search tab and like it. | | |
| Processing: | This functionality will perform the database query of finding data from the database with respect to user searched game. Rating of the different games will be displayed in different categories based on the search of user. | | |
| Output: | The output will be top rated games. | | |
| Flow: | 1. Insertion of name game in search tab by user. 2. Click on search button. 3. Display of all possible matching games with respect to requirement. 4. Selection of game by user. 5. Display of complete information of selected game along with Sentiment basis rating and features 6. Display of top rated games with respect of the search of user. | | |
| Alternative Flow: | 1. Insert the name of game. 2. Click search button. 3. Display of game. 4. Select game 5. Required information is along with the game 6. Display of top rated list of games with respective features. | | |
| Exceptions: | Search tab entry check validation. | | |
| Includes: | No | | |
| Frequency of Use: | Depends on Updating of dataset | | |
| Special Requirements: | Different rating of features. | | |
| Assumptions: | Rating is done on true experience of user. | | |
| Notes and Issues: | No | | |
| Error Handling | NULL | | |

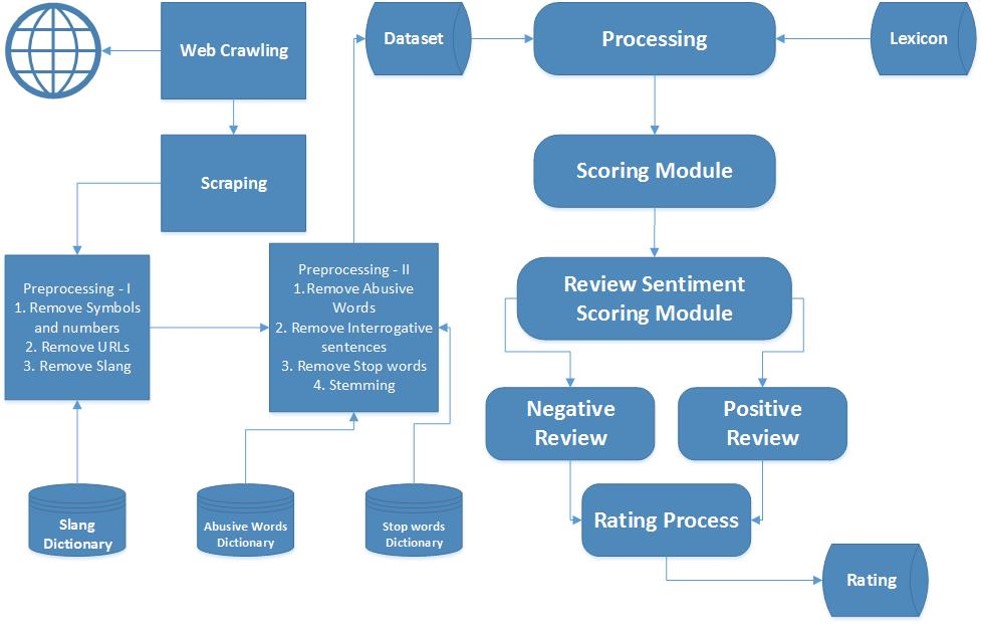
Table Expanded Use Case Recommendation

# **Domain Model**



Figure Domain Model

# **Architectural Diagram**



# **System Sequence Diagram**

1. **Login**

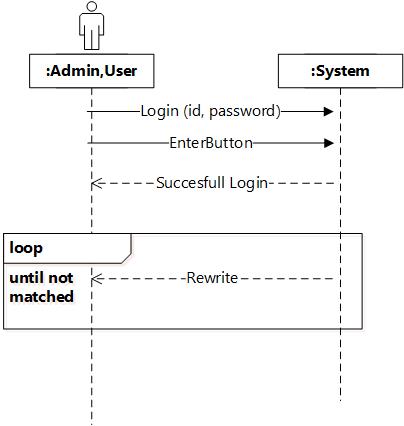
****

Figure SSD Login

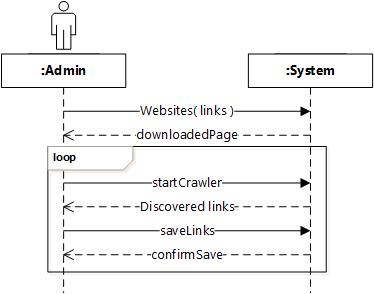
1. **Web Crawling**

Figure SSD Web Crawling

1. **Web Scraping**

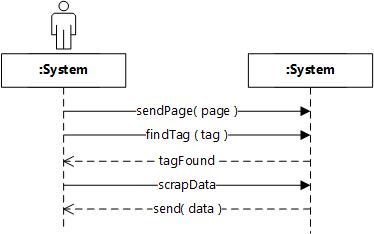
****

Figure SSD Web Scraping

1. **Data Parsing**

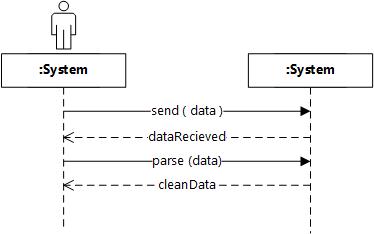
****

Figure SSD Data Parsing

1. **Sentiment Analysis**

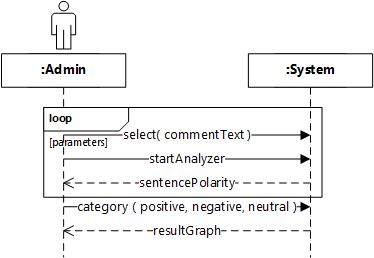
****

Figure SSD Sentiment Analysis

1. **Categorization**

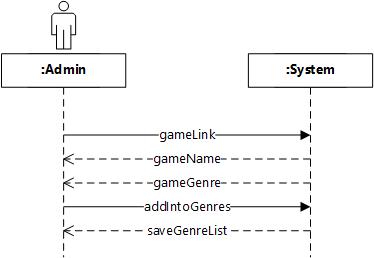
****

Figure Categorization

1. **Rating**

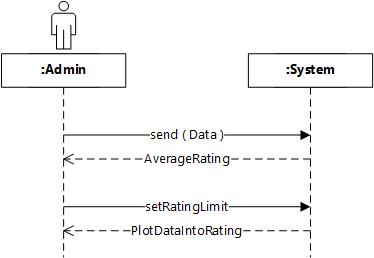
****

Figure SSD Rating

1. **Search**

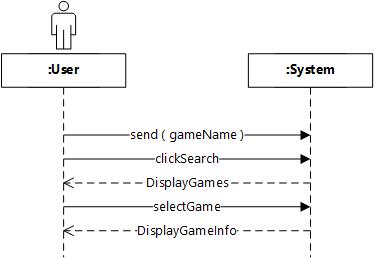
****

Figure SSD Search

1. **Favorites**

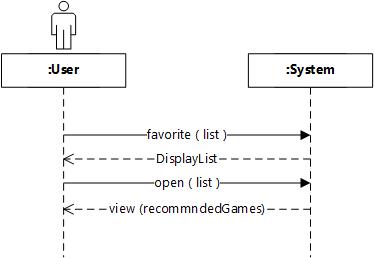
****

Figure SSD Favorites

1. **Recommendation**

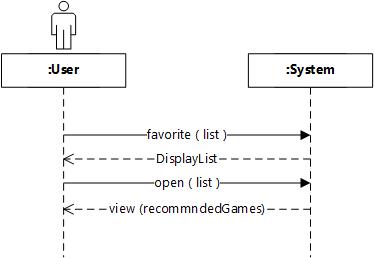
****

Figure SSD Recommendations

# **Operation Contracts**

# **Authentication**

|  |  |
| --- | --- |
| Name | Authentication |
| **Responsibilities** | Verify that it’s a admin of the system |
| **Cross Reference** | Login |
| **Exception** | Invalid Input of User ID and password |
| **Precondition** | Enter User ID and password |
| Post Condition | Login portal of admin |

Table Authentication Operational Contract

# **Game Search**

|  |  |
| --- | --- |
| Name | Game Search |
| **Responsibilities** | User Search the games |
| **Cross Reference** | Login |
| **Exception** | Invalid entry by user |
| **Precondition** | User enter the valid name |
| Post Condition | List of games to related search |

Table Game Search Operational Contract

# **Web Crawler**

|  |  |
| --- | --- |
| Name | Web Crawler |
| **Responsibilities** | Crawl the available links from three websites |
| **Cross Reference** | Login |
| **Exception** | Invalid link or the link is down of requested website |
| **Precondition** | Availability of internet connection and valid website name. |
| Post Condition | Discover all URLs present over first page of website and saving links in data structure |

Table Web Crawler Operational Contract

# **Web Scraping**

|  |  |
| --- | --- |
| Name | Web Scraping |
| **Responsibilities** | Scrap data from the links present over website. |
| **Cross Reference** | Web crawler |
| **Exception** | Empty file of link |
| **Precondition** | Availability of valid links |
| Post Condition | File contains the data discovered from links |

Table Web Scraping Operational Contract

# **Data Parsing**

|  |  |
| --- | --- |
| Name | Data Parsing |
| **Responsibilities** | Parse the data from scraped data. |
| **Cross Reference** | Web crawler |
| **Exception** | Empty file |
| **Precondition** | Availability of valid data file or database record |
| Post Condition | Data is arranged in respective field |

Table Data Parsing Operational Contract

# **Sentiment Analysis**

|  |  |
| --- | --- |
| Name | Sentiment Analysis |
| **Responsibilities** | Classification of the game reviews |
| **Cross Reference** | Data parsing and web crawling |
| **Exception** | Non-English or unknown words |
| **Precondition** | Non-redundant data available |
| Post Condition | Declaration of polarity of sentences as positive, negative and neutral |

Table Sentiment Analysis Operational Contract

# **Categorization**

|  |  |
| --- | --- |
| Name | Categorization |
| **Responsibilities** | Categorized the game on the basis of genre of game. |
| **Cross Reference** | Sentiment analysis |
| **Exception** | genre list is not provided |
| **Precondition** | Availability of game is database record |
| Post Condition | Display of selected game with its category. |

Table Categorization Operational Contract

# **Game Rating**

|  |  |
| --- | --- |
| Name | Game Rating |
| **Responsibilities** | Game rating and its feature rating |
| **Cross Reference** | Sentiment analysis |
| **Exception** | game list is not provided |
| **Precondition** | Data is available by the Sentiment analysis |
| Post Condition | Game and its available features rating show up |

Table Game Rating Operational Contract

# **Favorite Features**

|  |  |
| --- | --- |
| Name | Favorite Features |
| **Responsibilities** | Feature list provided for user like graphics, performance and game play. |
| **Cross Reference** | Sentiment analysis |
| **Exception** | Non-English or unknown word in search tab |
| **Precondition** | Search of game |
| Post Condition | Display of games features rating |

Table Feature Favorite Operational Contract

# **Recommendation System**

|  |  |
| --- | --- |
| Name | Recommendation |
| **Responsibilities** | Different games recommendation will be provided on the basis of rating and search of user |
| **Cross Reference** | Game Search and Rating |
| **Exception** | Non-English words or Unknown words |
| **Precondition** | Like a game from searched list |
| Post Condition | Display of selected game and information related to it |

Table Recommendation Operational Contract

# **Sequence Diagram**

# **Class Diagram**



Figure Class Diagram

# **Entity relationship Diagram**



Figure Entity Relationship Diagram

# **Conclusion**

During the previous semester we implemented our Final Year Project Phase 1 that included the crawling of the gaming websites to get the user reviews and comments. Furthermore, we implemented multiple data pre-processing techniques that include stop words removal, HTTP tag removal, Stemming of words. We plan to implement the core steps for Negation Feature, Aspect Based Sentiment Analysis, Aspect Term Extraction, Aspect Term Polarity, Aspect Category Detection & Aspect Category Polarity that will further help us implement Tips for Improvement, Feature based comparison, Product recommendation & feature based rating in FYP-Phase II. Recommendation system provides the facility of top rated games according to user’s search and interest.