**CHAPTER - 3 REQUIREMENT ANALYSIS**

**3.1 Method used for requirement analysis –**

Requirements Analysis is the process of defining the expectations of the users for an application that is to be built or modified. It involves all the tasks that are conducted to identify the needs of different stakeholders. Therefore requirements analysis means to analyze, document, validate and manage software or system requirements.

The software requirements analysis process involves the following steps/phases:

1. Eliciting requirements
2. Analyzing requirements
3. Requirements modeling
4. Review and retrospective

**1- Eliciting requirements**

The process of gathering requirements by communicating with the customers is known as eliciting requirements. In this process of requirement analysis to understand what the customer want in software and communicating with the customer to gather information and understand the requirements that are required by the customer.

In our software we collect all the information and understand the requirement of the user by gathering the important requirements or needs.

**2- Analyzing requirements**

This step helps to determine the quality of the requirements. It involves identifying whether the requirements are unclear, incomplete, ambiguous, and contradictory. These issues resolved before moving to the next step. After the first process requirement gathering, the next step is to understand all the requirements that they are complete, clear and easily understandable or anything that find unclear, ambiguous or contradictory so that can be find or solve in these step before moving to the next step.

Analyzing requirement is a essential part of any requirement analysis, the analysis of all the requirement is needed for understanding the actual requirements.

**3- Requirements modeling**

In Requirements modeling, the requirements are usually documented in different formats such as use cases, user stories, natural-language documents, or process specification. Requirement modeling plays an important role in requirement analysis. In this process requirements are documented in various forms like use cases, diagrams, user stories to understand the actual view or goal or functions of any software system.

**4- Review and retrospective**

This step is conducted to reflect on the previous iterations of [requirements gathering](https://reqtest.com/requirements-blog/requirements-gathering-in-agile-2/) in a bid to make improvements in the process going forward.

This is the last step in this step, team members reflect on what happened in the iteration and identifies actions for improvement going forward.

Requirements analysis is a team effort that demands a combination of hardware, software and human factors engineering expertise as well as skills in dealing with people. Here are the main activities involve in requirement analysis:

* Identify customer's needs.
* Evaluate system for feasibility.
* Perform economic and technical analysis.
* Allocate functions to system elements.
* Establish schedule and constraints.
* Create system definitions.

For our software system to gather information or requirement analysis we completely follows the above process to understand the requirements of the user this can play a important role in any software development process.

**3.2 Data Requirements**

Data requirements definition establishes the process used to identify, prioritize, precisely formulate, and validate the data needed to achieve business objectives. When documenting data requirements, data should be referenced in business language, reusing approved standard business terms if available.

Data requirements means to collectively gather all the requirements that are useful and try to analyze how to achieve that all the requirements to make it possible in our software system. In our software system or application there is collected data requirements to know or understand how to achieve or approach all the requirements gathered from the user to make it implemented to solve the real world problems. Data requirements also helps us in understanding the required business goals that are essentially useful for proceeding to start further processes.

3.3 **Functional Requirements –**

Functional requirements defines the basic system behavior. Functional requirements usually define if/then behaviours and include calculations, data input, and business processes.

Functional requirements are features that allow the system to function as it was intended. Functional requirements are product features and focus on user requirements. A **Functional Requirement** (FR) is a description of the service that the software must offer. It describes a software system or its component. A function is nothing but inputs to the software system, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform. Functional Requirements are also called **Functional Specification**.

User module –

* User need to provide information which he/she wants to know that this information or news is fake or genuine, or if it is genuine than know the sentiment of that news by knowing the nature that it is positive, negative or neutral.
* And the user retrieves all the required information.

Admin –

* Admin do operation to know that the information or news given by user is genuine or fake.
* If it is genuine than admin finds that the sentiments of news or information is positive, negative or zero.

## Benefits of Functional Requirement-

Here, are the pros/advantages of creating a typical functional requirement document-

* Helps you to check whether the application is providing all the functionalities that were mentioned in the functional requirement of that application.
* A functional requirement document helps you to define the functionality of a system or one of its subsystems.
* Functional requirements along with requirement analysis help identify missing requirements. They help clearly define the expected system service and behavior.
* Errors caught in the Functional requirement gathering stage are the cheapest to fix.
* Support user goals, tasks, or activities

**3.4 Non-Functional requirements –**

Non-functional requirements specifies the quality attribute of a software system. They judge the software system based on responsiveness, usability, security, portability and other non-functonal standards that are critical to the success of the software system. Usability – These web based application has appropriate and adequate information to guide the user in order to use the application.

Non-functional Requirements allows you to impose constraints or restrictions on the design of the system across the various agile backlogs. Example, the site should load in 3 seconds when the number of simultaneous users are > 10000. Description of non-functional requirements is just as critical as a functional requirement.

* Portability – This is portable as it is online running web based application across the internet.
* Flexibility – It is very flexible in nature.
* Security – This is secured in various aspects to use the application.
* Maintainability – Maintenance is done in an efficient way that the data should secure and easily retrieve.
* Scalability – These application can be further modified in future.

## Advantages of Non-Functional Requirement

Benefits/pros of Non-functional testing are:

* The nonfunctional requirements ensure the software system follow legal and compliance rules.
* They ensure the reliability, availability, and performance of the software system.
* They ensure good user experience and ease of operating the software.
* They help in formulating security policy of the software system.

**3.5 System Specification**

Technology can be most broadly defined as the entities in the form of software and hardware. It created by the application of mental and physical effort in order to achieve some value. In this usage, technology refers to tools and machines that may be used to solve real-world problems. For this purpose, some software and hardware are required. The required ones are as follows.

**3.5.1 Hardware Specification**

* Ram: 2GB (minimum)
* Storage: 150GB
* Processor: Intel Core i3(minimum) or equivalent

**3.5.2 Software Specification**

Software is a set of instructions, data or programs used to operate computers and execute specific tasks. To performing this task following some specific software and technology are used for developing this application.

* Web browser: - A browser is software that is used to access the internet. A browser lets you visit websites and do activities within them such as post your selected news which you want to check.
* Internet access: **-** It is must require to perform this task.
* Python: -Python is a programming language. It is used on a server to create web applications.
* Flask: -Flask is a web framework. This means flask provides you with tools, libraries, and technologies that allow you to build a web application. This web application can be some web pages, a blog, a wiki or go as big as a web-based calendar application or a commercial website.
* Machine Learning:-A subset of [artificial intelligence (AI)](https://www.netapp.com/us/info/what-is-artificial-intelligence-ai.aspx), machine learning (ML) is the area of computational science that focuses on analyzing and interpreting patterns and structures in data to enable learning, reasoning, and decision making outside of human interaction. Simply put, machine learning allows the user to feed a computer algorithm an immense amount of data and have the computer analyze and make data-driven recommendations and decisions based on only the input data.
* Data Science: -Data science can be defined as a blend of mathematics, business acumen, tools, algorithms and machine learning techniques, all of which help us in finding out the hidden insights or patterns from raw data which can be of major use in the formation of big business decisions.
* HTML, CSS and Java Script: **- HTML** (Hyper Text Markup Language) is the most basic building block of the Web. It defines the meaning and structure of web content. Other technologies besides HTML are generally used in this application to describe a web page's appearance/presentation is [CSS](https://developer.mozilla.org/en-US/docs/Web/CSS) or for functionality/behavior is [JavaScript](https://developer.mozilla.org/en-US/docs/Web/JavaScript).

**4.1 Software Requirement Specification:**

A software requirements specification (SRS) is a comprehensive description of the intended purpose and environment for software under development. The SRS fully describes what the software will do and how it will be expected to perform.

An SRS minimizes the time and effort required by developers to achieve desired goals and also minimizes the development cost. A good SRS defines how an application will interact with system hardware, other programs and human users in a wide variety of real-world situations. Parameters such as operating speed, response time, availability, portability, maintainability, footprint, security and speed of recovery from adverse events are evaluated. Methods of defining an SRS are described by the IEEE (Institute of Electrical and Electronics Engineers) specification 830-1998.

Using the SRS helps an enterprise confirm that the requirements are fulfilled and helps business leaders make decisions about the lifecycle of their product, such as when to retire a feature.

**4.1.1 Glossary**

* **Pandas:**

Pandas is an open-source, BSD-licensed Python library providing high-performance, easy-to-use data structures and data analysis tools for the Python programming language.

* **SKlearn:**

scikit-learn is a Python module for machine learning built on top of SciPy and is distributed under the 3-Clause BSD license.

* **Matplotlib:**

Matplotlib produces publication-quality figures in a variety of hardcopy formats and interactive environments across platforms. Matplotlib can be used in Python scripts, the Python and IPython shell, web application servers, and various graphical user interface toolkits.

* **Passive Aggressive Classifier:**

Passive Aggressive Algorithms are a family of online learning algorithms (for both classification and regression) proposed by Crammer at al. The idea is very simple and their performance has been proofed to be superior to many other alternative methods like Online Perceptron and MIRA (see the original paper in the reference section).

* **Confusion Matrix**

A confusion matrix is a table that is often used to describe the performance of a classification model (or “classifier”) on a set of test data for which the true values are known. It allows the visualization of the performance of an algorithm.

* **Count Vectorization:**

Count Vectorization involves counting the number of occurrences each word appears in a document (i.e distinct text such as an article, book, even a paragraph!).

* **TFID vectorization:**

In information retrieval, tf–idf or TFIDF, short for term frequency–inverse document frequency, is a numerical statistic that is intended to reflect how important a word is to a document in a collection or corpus.

* **Hash Vectorization:**

In machine learning, feature hashing, also known as the hashing trick (by analogy to the kernel trick), is a fast and space-efficient way of vectorizing features, i.e. turning arbitrary features into indices in a vector or matrix.

* **Numpy:**

NumPy is the fundamental package for scientific computing with Python. It contains among other things: useful linear algebra, Fourier transform, and random number capabilities. Besides its obvious scientific uses,

* **Flask:**

Flask is a lightweight WSGI web application framework. It is designed to make getting started quick and easy, with the ability to scale up to complex applications. It began as a simple wrapper around Werkzeug and Jinja and has become one of the most popular Python web application frameworks.

* **HTML:**

It stands for HyperText Markup Language. Hypertext means that the document contains links that allow the reader to jump to other places in the document or to another document altogether.

* **CSS:**

Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in HTML or XML (including XML dialects such as SVG, MathML or XHTML). CSS describes how elements should be rendered on screen, on paper, in speech, or on other media.

* **JavaScript:**

JavaScript attempts to convert the string numeric literal to a Number type value. First, a mathematical value is derived from the string numeric literal. Next, this value is rounded to the nearest Number type value.

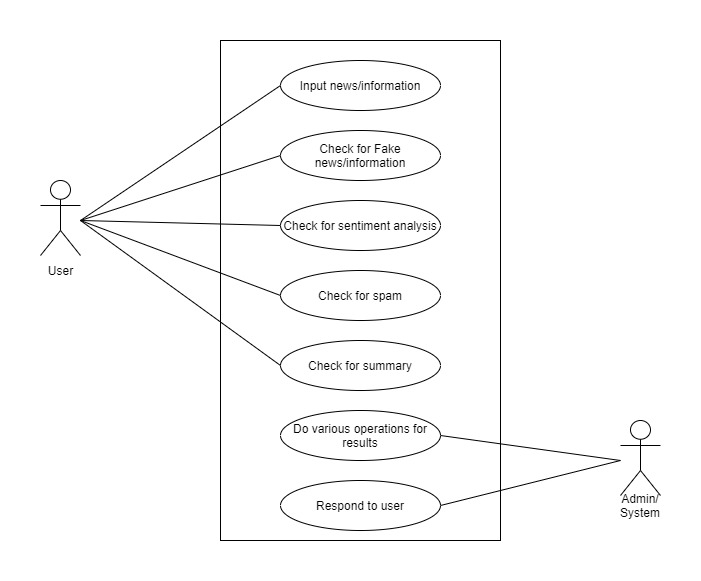
* **Machine Learning:**

Machine learning is a data analytics technique that teaches computers to do what comes naturally to humans and animals: learn from experience. Machine learning algorithms use computational methods to “learn” information directly from data without relying on a predetermined equation as a model.

**4.1.2 Supplementary Specification:**

* It is a web-based application, portable and can work on various operating systems.
* The system is reliable and atomic as it provides true information.
* We are required to tie up with top news sources to get the correct news information.
* In addition, the system requires various servers to store news information.
* The result predicted is based on a machine learning model which does provide accuracy but may be not true in some cases.
* The system predicts the percentage by which the news is true and, on that percentage, it is decided that news is true or false.
* The system also gives the sentiment analysis of the information, by the showing the nature of the information i.e. positive , negative or neutral.
* The system also gives the result for checking the spam activity and for getting the overall summary of the information or news with the help of spam classifier and summarizer.

**4.1.3 Use Case Model**

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**Fig – Use Case Diagram**

**Description:**

Enter website, enter news, press button to validate news result

Text Description:

**I.U1-Enter Website**

Using this the user get access to website

1.Scenario-Main line sequence

I. User-enter the right domain name or URL

ii. system-Click to enter the website

**II.U2-Enter News**

**Using this the user can enter the news**

1.Scenario-Main line Sequence

i.System-Enter the news in given Area

**III.U3-Press button to check news is fake/genuine or to check sentiment or to check for spam or to check for summary.**

1.Scenario-Main line sequence

i.user -Enters the news

ii.System-Click on button to proceed

**IV.U4:-Result**

1.Main line sequence

i.System-The result is ready for Fake/Genuine news or positive/negative/neutral sentiments or spam or for the summary of the news.

**CHAPTER – 5 SYSTEM MODELING**

**5.7 Test Plans and Implementation images**

Test Plan –

A **Test Plan** is a detailed document that describes the test strategy, objectives, schedule, estimation, deliverables, and resources required to perform testing for a software product. Test Plan helps us determine the effort needed to validate the quality of the application under test. The test plan serves as a blueprint to conduct software testing activities as a defined process, which is minutely monitored and controlled by the test manager.

As per ISTQB definition: “Test Plan is A document describing the scope, approach, resources, and schedule of intended test

Making Test Plan document has multiple benefits -

* Help people outside the test team such as developers, business managers, customers **understand**the details of testing.
* Test Plan **guides** our thinking. It is like a rule book, which needs to be followed.
* Important aspects like test estimation, test scope,[Test Strategy](https://www.guru99.com/how-to-create-test-strategy-document.html)are **documented** in Test Plan, so it can be reviewed by Management Team and re-used for other projects.

|  |  |  |
| --- | --- | --- |
| **S. No.** | **Parameter** | **Description** |
| 1. | Introduction | Fake news detection and sentiment analysis is a web based application that predicts the information or news is fake or genuine and also analyze the sentiment of information is positive, negative or neutral and also help in finding spam classification and summary of the information. |
| 2. | Features to be tested | The feature that needs to be tested are fake news detection and sentiment Analysis of information or news. |
| 3. | Test schedule | It includes some variety of the phases. For ex. Requirement understanding, test plan creation, test cases, test execution in different environments.   * Firstly, team understands the requirements for implementation of the projects. * Then create the schedule for every phase or functionality. * Then test the every functionality of system that means buttons in application, output result or recommendation and then make test cases for the test results. * After the test cases system will check on every platform or device for the environment testing. * If all testing will complete successfully then system will ready for run and then we stop testing. |
| 4. | Environmental testing | We need some environmental requirements such as hardware, software, OS, network configurations, tools required that are system should have at least 4gb RAM, 500gb hard disk, windows 7,8,10 and 2mbps network connection. |
| 5. | Open risk/issue | In implementation we face some issues that are data accuracy, calculations. Some functionality which are left to implement and testing. System have also some bugs and error which we will resolve soon. |
| 6. | Exit criteria | When system has no bug/error and all functionality work properly and also system run on every platform then we will stop testing and system will ready for run. |

Test Cases –

A **TEST CASE** is a set of actions executed to verify a particular feature or functionality of your software application. A Test Case contains test steps, test data, precondition, postcondition developed for specific test scenario to verify any requirement. The test case includes specific variables or conditions, using which a testing engineer can compare expected and actual results to determine whether a software product is functioning as per the requirements of the customer.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **S.No.** | **Title** | **Input** | **Action** | **Expected Output** | **Actual Output** | **Status** | **Remark** |
| 1. | Verify whether application launched on local system or not. | Enter run commands | Open application on the local system. | Application should run on local system browser. | Application successfully run on local system | Pass |  |
| 2. | Verify that the application’s display is adapted to the screen and all the buttons and menus work properly. |  | Open application in browser and check screen size and buttons. | Application display should adaptable in screen size and all buttons and menu work properly. | Application display is adaptable in screen size and all buttons and menu work properly. | Pass |  |
| 3. | Verify user able to enter information or news. | Click on text area. | Enter some information or news link. | Application allows to enter the information or news. | Application allow to enter the information or news successfully. | Pass |  |
| 4. | Check application able to process or show result on the screen. | Click on proceed. | Enter some information or news link and proceed further. | Application shows the result on the screen. | Application shows the result on the screen successfully. | Pass |  |
| 4. | Check application able to process or show result on the screen. | Click on proceed. | Enter some information or news link and proceed further. | Application shows the result on the screen. | Application shows the result on the screen successfully. | Pass |  |
| 5. | Check application provides result that news or information is fake or genuine. | Click on proceed. | Enter some information or news link and proceed further. | Application shows the result that information or news is fake or genuine. | Application provides the result that information or news is fake or genuine successfully. | Pass |  |
| 6. | Check application provides result which shows sentiment of the news or information i.e. positive, negative or neutral. | Click on proceed. | Enter some information or news link and proceed further. | Application shows the result that information or news is either positive, negative and neutral. | Application provides the result that information or news is either positive, negative and neutral successfully. | Pass |  |