VISION DOCUMENT

Version 1.0

Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Version** | **Description** | **Author** |
| 29/01/16 | 1.0 | Primary version | Sai Ramesh G  Akshay G  Dheeraj  Karthik G |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

Table of Contents

1. Introduction 5

1.1 Purpose 5

1.2 Scope 5

1.3 Definitions, Acronyms, and Abbreviations 5

1.4 References 5

1.5 Overview 5

2. Positioning 5

2.1 Business Opportunity 5

2.2 Problem Statement 5

2.3 Product Position Statement 5

3. Stakeholder and User Descriptions 5

3.1 Market Demographics 5

3.2 Stakeholder Summary 5

3.3 User Summary 5

3.4 User Environment 5

3.5 Stakeholder Profiles 5

3.6 User Profiles 5

3.7 Key Stakeholder or User Needs 5

3.8 Alternatives and Competition 5

4. Product Overview 5

4.1 Product Perspective 5

4.2 Summary of Capabilities 5

4.3 Assumptions and Dependencies 5

4.4 Cost and Pricing 5

4.5 Licensing and Installation 5

5. Product Features 5

6. Constraints 5

7. Quality Ranges 5

8. Precedence and Priority 5

9. Other Product Requirements 5

9.1 Applicable Standards 5

9.2 System Requirements 5

9.3 Performance Requirements 5

9.4 Environmental Requirements 5

10. Documentation Requirements 5

10.1 User Manual 5

10.2 Online Help 5

10.3 Installation Guides, Configuration, and Read Me File 5

10.4 Labeling and Packaging 5

A Feature Attributes 5

A.1 Status 5

A.2 Benefit 5

A.3 Effort 5

A.4 Risk 5

A.5 Stability 5

A.6 Target Release 5

A.7 Assigned To 5

A.8 Reason 5

# Introduction

The purpose of this document is to collect, analyze, and define high-level needs and features of the Predicting Rainfall using Cloud Images. It focuses on the capabilities needed by the stakeholders and the target users, and **why** these needs exist. The details of how the Predicting Rainfall using Cloud Images fulfills these needs are detailed in the use-case and supplementary specifications.

## Purpose

Predicting Rainfall using Cloud Images is a software for analyzing images based on their color, density and texture to predict whether the cloud is going to rain or not so that common people especially farmers can prepare accordingly.

## Scope

The vision document describes elaborately the specific requirements, analysis, modelling techniques for the proper implementation of PRCI. The document behaves as a roadmap to the further implementation and reference for proper understanding of PRCI.

## Definitions, Acronyms, and Abbreviations

PRCI : PREDECTING RAINFALL USING CLOUD IMAGES

## References

[www.youtube.com](http://www.youtube.com/) – Digital Image Processing

[www.youtube.com](http://www.youtube.com/) – Java Programming

## Overview

*The vision document provides the overview of the requirement and analysis of the successful, implementation of Predicting Rainfall using Cloud Images. This overview helps in figuring out the stakeholders and comprehending their respective roles for the project. It also analyses the risk factors, associated constraints and ensures proper of the quality of the product.*

# Positioning

## Business Opportunity

The project embodies a wide range of business opportunity by being useful for a wider section of enterprises such as

Agriculture activities

Travelers.

Solar electricity generation.

## Problem Statement

|  |  |
| --- | --- |
| The problem of | Sowing the right seeds |
| Affects | Farmers. |
| the impact of which is | Lesser crop production |
| a successful solution would be | Sowing the right crop at right time |

## Product Position Statement

|  |  |
| --- | --- |
| For | Farmers |
| Who | Cultivate crops based on monsoon |
| The predicting rainfall using cloud images | is a real time product |
| That | Is user friendly |
| Unlike | Online platforms which is used for weather forecast |
| Our product | Being offline predicts instantaneously. |

Predicting Rainfall using Cloud Images intends to deliver best support to the farmers by omission of internet usage for prediction of rainfall.

# Stakeholder and User Descriptions

The product satisfies primary needs of farmers who are unaware of sudden upcoming monsoon, drought or famines. They could use this product to know about the rainfall in that particular areas based on images taken, so that they can sow the seeds accordingly with the monsoon. There by, getting higher yields with lesser investment.

## Market Demographics

The project is built on a clear intention of helping the farmers to understand about monsoon based on given input images. The considerable market scope is quite larger with the weather prediction widening its utility among several different environments and sectors.

## Stakeholder Summary

|  |  |  |
| --- | --- | --- |
| **Name** | **Description** | **Responsibilities** |
| **USER** | They represent the final end user, who would be benefited from the project. | They utilize the end work product and yield us with the proper feedback to ensure better quality of the product |
| **SYSTEM ANALYST** | The system analyst acts as a requirement engineer. | They work on the communication and planning phase of the generic framework The role involves the collection and proper analysis of the requirement and helps in layering the models as required |
| **SOFTWARE DEVELOPER** | The coding team acts as System Developer | They work on the modelling and construction phase of the generic framework activity. The System developers come together to develop proper work flow diagram of the product. The work flow diagram comprises of proper flowchart, efficient algorithm, analysis of the tools and programming language and finally time and space efficient code |
| **TEST ENGINEER** | They form the testing team | They form the debugging phase of generic framework activity. The test for the proper outcome and efficiency of the code. If any changes are required, the generic activity of modelling and construction is revisited |

## User Summary

|  |  |  |
| --- | --- | --- |
| **NAME** | **DESCRIPTION** | **STAKEHOLDERS** |
| **NAIVE USER** | Uses the end work product and yields the accurate market feedback. These include the travelers and the farmers. | The users in the stakeholder tabular chart represent the naïve users. These users do not manipulate the code but only uses the product |
| **APPLICATION ENGINEERS** | Responsible for making PRCI view that the naive users can make use of. They plan and develop the application level interface and are responsible for the initial four phases of generic activity | The system analyst, software developer and the test engineer come under this category of users. |
| **SOPHISTICATED USER** | Responsible for the maintenance and updating PRCI. They use tools and software level interaction with the code. | The test engineers and the software developer make this category of users |

## User Environment

*The working environment for the target user is quite simple and flexible. There are four people involved in the design and modelling excluding the naïve users for proper analysis and feedback. The task cycle of PRCI is divided into three phases with phase one including taking images , phase two comprising the digital image processing and phase three resulting into the integration of the first two phases. The estimated time for the completion of the prototype is calculated to be 4 months. PRCI works on open-source platforms like OpenCV.*

## Stakeholder Profiles

*The profile of stakeholder, providing detailed analysis of responsibilities and actions performed is as enlisted in the tabular form:*

**3.5.1 USER**

|  |  |
| --- | --- |
| **Description** | *They utilize the end work product and yield us with the proper feedback to ensure better quality of the product* |
| **Type** | *They are casual users of the product.* |
| **Responsibilities** | *Review the model and make the most use of the same.*  *Provide with constructive feedback that is necessary for the proper evolution of the product and thereby helps in debugging* |
| **Success Criteria** | *Ease for the usage and cost and time efficiency is the major concern for these users* |
| **`Involvement** | *They are involved in requirement gathering, planning and feedback phase of the software development* |

**3.5.2 APPLICATION ENGINEER**

|  |  |
| --- | --- |
| **Representative** | *Sai Ramesh G*  *Akshay G*  *Dheeraj*  *Karthik G* |
| **Description** | *System engineers to develop the software that could be used by the naïve users.* |
| **Type** | *Skilled professional with the intend to develop the software and proper management and business skills.* |
| **Responsibilities** | *Communication with the developers and end users*  *Planning the activities*  *Modelling the prototype for better understanding of PRCL.* |
| **Success Criteria** | *Laying out efficient planning and modelling methodology and would ensure the quality work done in stipulated time* |
| **Involvement** | *Requirement Reviewer* |
| **Comments / Issues** | *Communication with the end users and software developer is sometimes difficult considering various factors such as improper knowledge* |

**3.5.3 SOFTWARE DEVELOPER**

|  |  |
| --- | --- |
| **Representative** | *Sai Ramesh G*  *Akshay G*  *Dheeraj*  *Karthik G* |
| **Description** | *Software Developer helps in the proper analysis and efficiency of the code* |
| **Type** | *Skilled professionals with efficiency in coding algorithm and proper analysis of the code for enabling proper debugging* |
| **Responsibilities** | *Coding efficiently in modular and incremental fashion.* |
| **Success Criteria** | *Creating an efficient code with optimal space and time complexity* |
| **Involvement** | *Coding*  *debugging* |
| **Comments / Issues** | *Meeting the users and management team along with the most efficient code often creates a difficulty in making proper choices*  *Proper debugging requires require tracing of the issue and curbing it at the base level itself. Continuation of this error may lead to heavy crash.* |

**3.5.4 TEST ENGINEERS**

|  |  |
| --- | --- |
| **Representative** | *Sai Ramesh G*  *Akshay G*  *Dheeraj*  *Karthik G* |
| **Description** | *Helps in the proper testing, debugging of the code and other statements based on quality and feedback* |
| **Type** | *Skilled professionals with efficiency in coding algorithm and proper analysis of the code for enabling proper debugging*  *Requires proper mathematical and statistical accuracy to determine the quality of the code and project* |
| **Responsibilities** | *Analysis of every module of the project and testing the efficiency of the same.* |
| **Success Criteria** | *Creating an efficient code with optimal space and time complexity*  *Proper establishment of the quality focus rules* |
| **Involvement** | *Coding*  *Debugging*  *Quality focus* |
| **Comments / Issues** | *Meeting the users and management team along with the most efficient code often creates a difficulty in making proper choices*  *Proper debugging requires tracing of the issue and curbing it at the base level itself. Continuation of this error may lead to heavy crash. Maintenance of quality of the project is a must* |

## User Profiles

*The profile of stakeholder, providing detailed analysis of responsibilities and actions performed is as enlisted in the tabular form:*

**3.6.1 NAIVE USERS**

|  |  |
| --- | --- |
| **Description** | *Uses the end work product and yields the accurate market feedback. These include the travelers and the farmers.* |
| **Type** | *A casual user* |
| **Responsibilities** | *Proper utilization of the product*  *Yielding constructive feedback* |
| **Success Criteria** | *Fulfilling the basic need of the project with ease in use and efficient time management and cost efficiency.* |
| **Involvement** | *They get involved when the product is delivered to the market to provide feedback for proper maintenance and further development* |
| **Comments / Issues** | *Proper communication with the naïve user is done at large scale and is important to be done in proper time with utmost honesty* |

**3.6.2 APPLICATION ENGINEER**

|  |  |
| --- | --- |
| **Representative** | *Sai Ramesh G*  *Akshay G*  *Dheeraj*  *Karthik G* |
| **Description** | *Responsible for making the PRCI view that the naïve users can make use of. They plan and develop the application level interface and are responsible for the initial four phases of generic activity* |
| **Type** | *Skilled professional with interest in coding and debugging and clear vision of the project* |
| **Responsibilities** | *Construct an efficient code*  *Debug the existing code*  *Modularize the project* |
| **Success Criteria** | *Building an efficient flowchart, algorithm thereby coding each and every component of the project efficiently* |
| **Involvement** | *They are involved in all the first four generic activity of project development* |
| **Comments / Issues** | *modularizing the project and thereby building an appropriate non -erroneous code in the stipulated time* |

**3.6.3 SOPHISTICATED USER**

|  |  |
| --- | --- |
| **Representative** | *Sai Ramesh G*  *Akshay G*  *Dheeraj*  *Karthik G* |
| **Description** | *Responsible for the maintenance and updating PRCI. They use tools and software level interaction with the code.* |
| **Type** | *Skilled professional with interest in coding and debugging and clear vision of the project* |
| **Responsibilities** | *maintain the efficiency of the code* |
| **Success Criteria** | *building and maintaining a system efficiently, updating frequently* |
| **Involvement** | *They are involved in all the phases* |
| **Comments / Issues** | *Maintenance of the code requires proper understanding and efficient coding.* |

## Key Stakeholder or User Needs

*Existing weather forecast application are mostly online and the accuracy may not be up to the mark. Farmers in villages may not have proper internet connection making them unaware of the forth-coming rainfall. In addition, people who are travelling may not aware of the weather. Therefore, these people can also use this much effectively.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Need** | **Priority** | **Concerns** | **Current Solution** | **Proposed Solutions** | |
| **Weather prediction** | ***High*** | Farmers | Using internet | | Offline like a software. |

========================================================================================================================================================

## ===============Alternatives and Competition=========================

The following can pose as a major competitor for PRCI :

* Online weather forecast
* Newspapers

# Product Overview

## Product Perspective

PRCI forms a totally independent and self-contained project with a purely innovative vision for future

## Summary of Capabilities

**Predicting Rainfall using Cloud Images**

|  |  |
| --- | --- |
| **Customer Benefit** | **Supporting Features** |
| Prediction of rainfall is instantaneous. | Real time interface is used. |
| Accessible even in in remote areas. | Application works efficiently even in offline mode. |

## Assumptions and Dependencies

The hardware support required should be properly analyzed and comprehended. Any change in the hardware support may result into change in the vision document

## Cost and Pricing

Major costs involved are as follows:

Hardware support Rs. X

Software support Rs. 0

All the software are free of cost and open-source

## Licensing and Installation

*Since all the coding is done in open source, software there is no installation cost incurred.*

# Product Features

The features of the product are as follows:

## Recognition of clouds

This feature is used to tell which type of cloud is being scanned.

## Digital Image Processing

The feature helps in analyzing the environment and thereby locating the hurdles in the way to provide efficient prediction in real-time environment.

# Constraints

The overall cost incurred in the maintenance and development of the product might pose a constraint. The cost analysis is provided in section 4.4.

# Quality Ranges

* Efficient algorithm for proper locomotion and image sensing.
* Reduced cost efficiency

# Precedence and Priority

The project places equal priority on both the features of the project. However, the project is planned in the following three session and hence are preceded in that way

* Cloud recognition
* Digital image processing
* Integration of both the features to implement the project successfully

# Other Product Requirements

* **Hardware :** Mobile phones and other camera based devices
* **Platform :**  openCV
* **Programming Language :**  Python

## Applicable Standards

[List all standards with which the product must comply. These can include legal and regulatory (FDA, UCC) communications standards (TCP/IP, ISDN), platform compliance standards (Windows, UNIX, and so on), and quality and safety standards (UL, ISO, CMM).]

## System Requirements

[Define any system requirements necessary to support the application. These can include the supported host operating systems and network platforms, configurations, memory, peripherals, and companion software.]

## Performance Requirements

PRCI is highly performance based in terms of accuracy as the algorithm defined is maintained at highest time and space efficiency.

## Environmental Requirements

PRCI fights all the environmental problems and is shock resistant. It consumes no fuel and hence is environmental friendly.

# Documentation Requirements

This section describes the documentation that must be developed to support successful application deployment.

## User Manual

A help page is set-up to guide the users with the working of PRCI.

## Online Help

An online product description page is set up to guide the user in case of any problems.

## Installation Guides, Configuration, and Read Me File

Hard copy of the working of the product is detailed and enlisted for customer-benefit.

## Labeling and Packaging

[Today's state-of-the-art applications provide a consistent look and feel that begins with product packaging and manifests through installation menus, splash screens, help systems, GUI dialogs, and so on. This section defines the needs and types of labeling to be incorporated into the code. Examples include copyright and patent notices, corporate logos, standardized icons and other graphic elements, and so forth.]

# A Feature Attributes

## A.1 Status

Set after negotiation and review by the project management team. Tracks progress during definition of the project baseline.

|  |  |
| --- | --- |
| Proposed | [Used to describe features that are under discussion but have not yet been reviewed and accepted by the "official channel," such as a working group consisting of representatives from the project team, product management, and user or customer community.] |
| Approved | [Capabilities that are deemed useful and feasible, and have been approved for implementation by the official channel.] |
| Incorporated | [Features incorporated into the product baseline at a specific point in time.] |

## A.2 Benefit

Set by Marketing, the product manager or the business analyst. Used in managing scope and determining development priority.

|  |  |
| --- | --- |
| Critical | Efficient capturing of image  Proper image processing |
| Important |  |
| Useful | User friendly  Can predict rainfall in real time. |

## A.3 Effort

A team of four members working together in requirement analysis, planning, modelling, construction, debugging and proper quality assessment.

## A.4 Risk

All the related risk factors have been properly taken care of.

## A.5 Stability

[Set by the analyst and development team, this is based on the probability that features will change or the team’s understanding of the feature will change. Used to help establish development priorities and determine those items for which additional elicitation is the appropriate next action.]

## A.6 Target Release

SUBMISSION:

The product would be deployed in Amrita School of Engineering by April 2017.

## A.7 Assigned To

The project is assigned to a team of four members, the details of whom are specified.

## A.8 Reason

# The project is an innovative idea with an intend to help the society.