



POLITECNICO
MILANO 1863

DREAM

Data-driven Predictive Farming in Telengana

RASD

Requirement Analysis and Specification Document

Version 1.0 - 29/11/2021

Fateme Hajizadekiakalaye - 10831743

Reza Paki - 10832693

Table of Contents

1. Introduction	4
1.1. Purpose	4
1.1.1. Goals	4
1.2. Scope	5
1.2.1. World Phenomena	5
1.2.2. Shared Phenomena	5
1.3. Definitions, Acronyms and Abbreviations	6
1.3.1. Definitions	6
1.3.2. Acronyms	6
1.3.3. Abbreviations	6
1.4. Revision history	
1.5. Reference Documents	
1.6. Document Structure	
2. Overall Description	
2.1. Product perspective	
2.2. Product functions	
2.3. User characteristics	
2.4. Assumptions, dependencies and constraints	
3. Specific Requirements	
3.1. External Interface Requirements	
3.1.1. User Interfaces	
3.1.2. Hardware Interfaces	
3.1.3. Software Interfaces	
3.1.4. Communication Interfaces	
3.2. Functional Requirements	
3.3. Performance Requirements	
3.4. Design Constraints	
3.4.1. Standards compliance	
3.4.2. Hardware limitations	
3.4.3. Any other constraint	
3.5. Software System Attributes	
3.5.1. Reliability	
3.5.2. Availability	
3.5.3. Security	
3.5.4. Maintainability	
3.5.5. Portability	
4. Formal Analysis Using Alloy	
5. Effort Spent	
6. References	

1. Introduction

1.1. Purpose

One of the most important sectors in each countries' economy is agriculture. Thus, the governments should keep it alive. On the other hand, many issues such as global warming, population increase and COVID-19 pandemic may have negative impacts on this vital sector. Scientists have predicted a significant loss in food supply by the end of century.

It was like a warning to the Telengna's government to come up with the idea of "DREAM". This idea is about designing and implementing a system which can prevent the mentioned disaster with the help of stakeholders, policy makers, farmers, market analysts, agronomists and even normal citizens.

First, in order to achieve the goals of the system, some specific data about Telengna's state have been collected. For example, meteorological forecasts, humidity of the soil, amount of water which use for irrigation, type of products and amount of products which produced by farmers. Then, with respect to this data, the DREAM system should allow policy makers to identify farmers with good performance and poor performance. Also the system should allow farmers to access to collected data and use them to improve their performance. The farmers should be allowed to share their problems with others and request for help.

This document focuses on **Requirements Analysis and Specification Document (RASD)** of the system and describes the main goals, the domain assumptions, the scenarios which may happen, the uses cases, the list of functional and non-functional requirements which system should fulfill and finally the diagrams to visualize the interactions between components and performance of the system.

1.1.1. Goals

Goals	Description
G1	Allow policy makers to identify farmers who are performing well.
G2	Allow policy makers to identify farmers who need help.
G3	Allow policy makers to see the result of the steering initiatives.
G4	Allow farmers to see weather forecast.
G5	Allow farmers to see humidity of soil.
G6	Allow farmers to see suggestions relating to specific crop to plan or specific fertilizer to use.
G7	Allow farmers to insert their type of products and produced amount per product.
G8	Allow farmers to insert their problems.
G9	Allow farmers to request for help and suggestion.
G10	Allow farmers to create discussion forums.

1.2. Scope

1.2.1. World Phenomena

World Phenomena	Description
WP1	Farmer plans crops.
WP2	Farmer irrigates crops.
WP3	Farmer uses fertilizers.
WP4	Sensors measure the humidity of soil.
WP5	Irrigation system measures the amount of water used by each farmer.
WP6	Meteorological adverse events such as flood, storm, lightening fire, etc. happen.
WP7	Farmer faces problems.

1.2.2. Shared Phenomena

Shared Phenomena	Description	Control
SP1	Farmer selects to see weather forecast.	World
SP2	System shows weather forecast to farmer.	System
SP3	Farmer selects to see humidity of soil.	World
SP4	System shows humidity of soil to farmer.	System
SP5	Farmers selects to see suggestions relating to specific crop to plan or specific fertilizer to use.	World
SP6	System shows suggestions relating to specific crop to plan or specific fertilizer to use.	System
SP7	Farmer inserts his/her type of products.	World
SP8	Farmer inserts his/her produced amount per product.	World
SP9	Policy maker selects to see a farmer's detailed info.	World
SP10	System shows farmer's detailed info to policy maker.	System
SP11	Policy maker identifies that the performance of farmer is good or not, based on produced amount, humidity of soil, water consumption.	World
SP12	Farmer inserts his/her problem.	World
SP13	Farmer requests for help or suggestion.	World
SP14	Farmer creates discussion forum.	World
SP15	Policy maker selects to see the result of the steering initiatives.	World
SP16	System shows the result of the steering initiatives.	System

