Rural Cultivation & Atmospheric Emulation Application (RCAEA) URS document

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| **Creation Date:** | 16/09/16 |
| **Last Revised:** | 21/09/16 |
| **Group Name:** | Tanks & Co.™ |
| **Version:** | 0.1 |

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# INTRODUCTION

## Purpose of URS

This document is the definitive specification of the user requirements for RCAEA Project to be developed by Tanks & Co.™The application allows the user to simulate cultivating specific crop(s) in an area of land during a certain length of time. By using this application they can determine when, where, and what crops to place in a specified piece of land. It will help to select a certain area of land based on real land data. It considers regions factors such as weather whereby the user can select which outdoor agricultural crops to place in an area. The simulation will use real data on the crop and simulate its growth based on external and internal determinate factors. RCAEA will take all these factors into account and determine an estimated cost and production outcome. Data will be saved in a file which the user can load or keep for their own records.

# PRODUCT DESCRIPTION

## Background Information

SIM Software Inc. is interested in adopting simulation applications and has asked for project proposals. Tanks & Co™ has a simulation proposal and they met with A representative from SIM Software’s board of management, Mr. Johnson. He has accepted their proposal for “Rural Cultivation and Atmospheric Emulation Application”.

Mr. Johnson will be the mediator and ultimately make the decision software.

## Performance

In this project we will create an application to simulate cultivating specific crop(s) in an area of land during a user determined time period. This application will allow users to grow selected crops in a simulated field that will factor multiple variables producing approximated cost and produce over the inputted time period.

## Users

This application can be used by individual production planners as well as by multi-national enterprises, primarily to strategically plan layout, control logic and dimensions of large, complex production investments. Farmers can also use this application for deciding which crop is more beneficial for them before cultivation.

## Assumptions

Following are some assumptions for this project made by us:

* Fields for cultivation are already bought by users, therefore land costs/rent will not be accounted for.
* Crop diseases will not be factored
* We assume that the weather will follow recent years’ patterns.
* We assume that crop/water and fertilizer costs although seasonal will follow most recent prices.

## REQUIREMENTS

In the table below you can find the MOSCOW for every requirement during the project.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Requirement name | Must | Should | Could | Will Not |
| Add crops | V |  |  |  |
| Remove crops | V |  |  |  |
| Update fertilizer | V |  |  |  |
| Update water resources | V |  |  |  |
| Profit/loss report | V |  |  |  |
| Soil selection | V |  |  |  |
| Save Statistics |  | V |  |  |
| Growth simulation | V |  |  |  |
| Set Date | V |  |  |  |
| Save Simulation |  | V |  |  |
| Load Simulation |  | V |  |  |
| Buying/selling land |  |  |  | V |
| Renting land |  |  |  | V |
| Encounter crop diseases |  |  |  | V |

## Functional requirements

//Description for at least all MUST requirements

## Non-Functional requirements

Platform compatibility

* Application should work most optimally in the Windows environment. This application should work best on the Windows platform as it was designed for such.

Usability

* The application should be user friendly and incorporate elements of good user interface design. For example, the buttons are easily recognizable and familiar to the user in terms of expressing what function the button serves easily accessible to the user.
* Program is simplified and allows the user to reach his goal withouth any problems. User must be able to access the program withouth registration , account etc.

Performance

* The application should respond as swiftly as possible to the user actions. Application response time may depend on the PC the user uses the application on. However, the software design attempts to maximize the throughput time for all the processes and computations in the application. Running on a machine with processor greater than 1Ghz, program will have a response time less than a second.

Reliability

* In case of exception or error, the program displays info messages without crashing , allowing user to continue his work.

## Use cases

All use cases have the system and user as the only actors involved. Furthermore, all the use cases are of the sea-level.

### Adding crops

**Pre-condition:** The user has the main form of the RCAEA app open on his/her PC.

**Trigger:** User clicks on one of the button, representing the crop type they would like to add.

**MSS:**

1. User selects field where he wants to cultivate.
2. User clicks on one of the crop buttons, representing the crop type which the user would like to add.
3. User then selected the piece of empty land to cultivate.
4. System updates land space with the type of crop.

**Extensions:**

3a. Land space is already occupied by another crop.

1. System warning box appears to user, to confirm space replacement.

1a. User click yes; system replaces the land space with current selected crop

1b. User clicks no

1. Use case ends

### 

### Removing crops

**Pre-condition:** The screen must have at least one field, cultivated with crops.

**MSS:**

1. User willselect a field, where he wants to remove crops.
2. User will right click on the selected land space.
3. System will show right click menu with appear with the option to delete.
4. User clicks on the delete option from the menu.
5. System deletes the crop from the space.

### Updating water resources

**Pre-condition:** The screen must have at least one field, cultivated with crops.

**MSS:**

1. User willselect a field, where he wants to update water.
2. User will click on water numeric up/down.
3. System will update water resources of selected field.

**Extensions:**

4.a User clicks on upper button.

1: System will increase water resources of that field

2: Continue from step 3 in MSS.

4.b User clicks on lower button.

1: System will decrease water resources of that field.

2: Continue from step 3 in MSS.

### Updating fertilizers to crops

**Pre-condition:** The screen must have at least one field, cultivated with crops.

**MSS:**

1. User willselect a field, where he wants to update amount of fertilizer.
2. User will click on fertilizer numeric up/down.
3. System will update amount of fertilizer of selected field.

**Extensions:**

4.a User clicks on upper button.

1: System will increase fertilizer of that field.

2: Continue from step 3 in MSS.

4.b User clicks on lower button.

1: System will decrease fertilizer of that field.

2: Continue from step 3 in MSS.

### Simulating growth of crop:

**Pre-condition:** The screen must have at least one field, cultivated with crops. Start Date and end date are filled.

**MSS:**

1. User clicks start simulation.
   1. System runs simulation from beginning to end
2. User scrolls on the timeline bar.
   1. System actively runs simulation according to the timeline bar position.

### Retrieving profit/loss report

**Pre-condition:** The screen must have at least one field, cultivated with crops.

**MSS:**

1. User will select field, for which he wants to retrieve report.
2. User will click Report button from right side of form.
3. System will show report with calculated profit/loss.

### Exit application

**Pre-condition:** The user has the main form of the RCAEA app open on his PC.

**Trigger:** User will click on the close button of the main form.

**MSS:**

1.System prompts users asking if he wants to quit the application.

2.System closes application.

### Save statistics

**Pre-condition:** The screen must have at least one field, cultivated with crops.

**MSS:**

1. User selects a field

2. System displays statistics for the selected field on panel located on the left side of app.

**Extensions:**

1. User clicks on an empty field
2. Exit the use case

# APPROVALS

## 

## Sign-off Sheet