1 SmartAgri

1.1 Overview

The application will help the farmers to improve their profit and yield by understanding the yields of different crops in different areas.

1.2 Purpose

The purpose of this document is to cover the main features, usecases, high level design approach and pending items for “completeness” of the product initiative.

1.3 USP – Unique Features

Feature name	**Description or Value Add**
Chatbot	Supports Natural language conversation Informal communication and followup. Helps improve troubleshooting and handling queries better. Can be interfaced with SMS or Facebook or Gmail for followups
Crop Recommendations	Better productivity for farmers based on facts and past data/performance
Data visualizations related to crops	Helps the farmer understand which crops have more cost of cultivation and which gives more yield depending on the conditions
Responsive web app	Supports responsiveness – Can be used in mobile, PC, laptops, other hand held devices seamlessly.

1.4 Use Cases

1.4.1 Login

Name	Login
Description/ Purpose	This covers the login functionality into SmaRtAgri product
Inputs	Username, Password; Can support gmail login
Outputs	Pass or fail based on validity
Errors	• Invalid username • Invalid Password
Interfaces	

required	
Other dependencies	- Registration Usecase - Auditing usecase

1.4.2 Registration

Name	Registration
Description/ Purpose	An user of the SmARtAgri product should register himself/herself by proving some inputs to be able to identify self accurately and provide authenticate verification documents
Inputs	Full name, Age, DOB, Contact number, email id, Role name Upload one of the identity documents – Aadhar card, Drivers license etc
Outputs	Success or Failure based on the input validation
Errors	If Aadhar validation or email id validation or mobile number validation fails, error will be returned.
Interfaces required	- Aadhar validation interface - Mobile number validation (using SMS) - OTP validation for email id
Other dependencies	- Auditing usecase

1.4.3 Auditing

Name	Auditing
Description/ Purpose	All transactions should be logged, as traceability is very important in any product to ensure data security and confidentiality
Inputs	This is a technical activity and conform to Govt standards that will be defined.
Outputs	This is a technical activity and conform to Govt standards that will be defined
Errors	If Auditing fails for any reason, an emergency should be raised to the appropriate person. This should be configured into the system.
Interfaces required	Separate database can be planned to maintain performance and scalibility
Other dependencies	

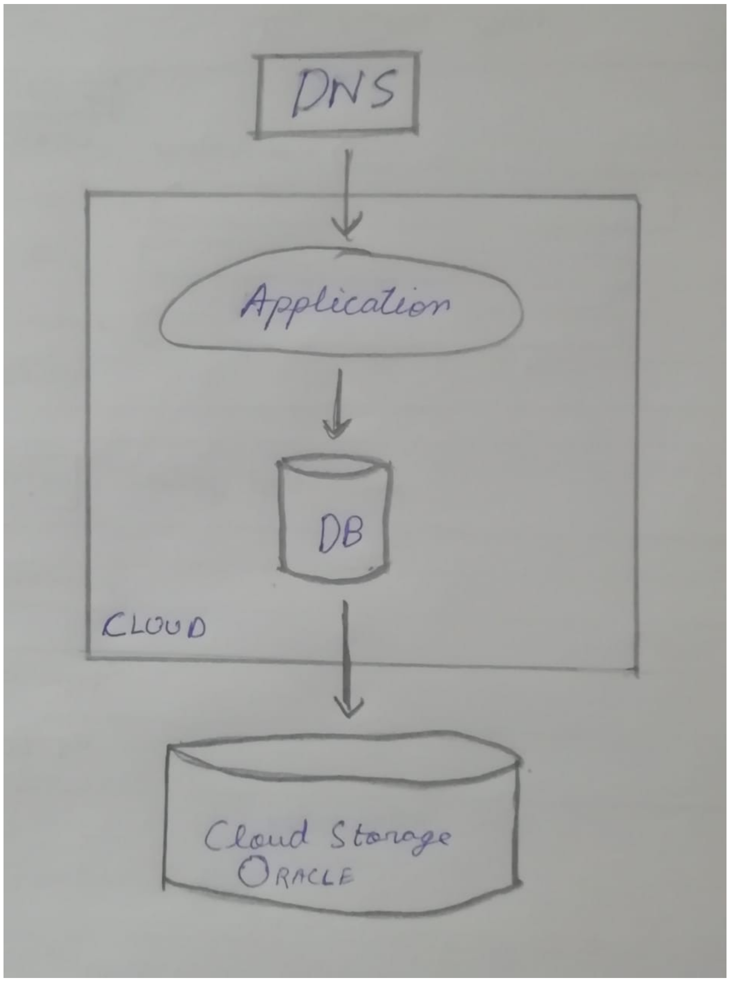
1.5 Completed Features that will be Demo'd

Feature name	Status/Comments/Pending items
Secure login system	The login system is secure as it uses a very optimal and incredible feature by Django which is the Django-Crispy-Forms, which creates a user-friendly environment for users to register as-well-as login.

1.6 Main pending items to achieve Completeness

- Python based Rest API to fetch the results from the model to the User interface in a secure manner
- Authentication and Authorization to have the facility of managing roles for more security and preferences that can be configured
- NLP support for the chatbot for more valuable conversations and insights
- Extending authentication with gmail or facebook logins
- Including more data analytics viz...

1.7 High Level Design



UI – Interaction between User and application.

Data – Existing in csv format from Kaggle website.

ML – Algorithms take charge of the data to provide particular results in their respective formats.

Oracle Cloud Platform – Deployment of the Django Single-Page web application

1.7.1 Technologies and ML Algorithms used

Django, Dialog flow (for chat bot functionality), Google translate API, Python and machine learning libraries like pandas, scikit-learn and visualization libraries like Matplotlib.

The ML Algorithm used is the K-nearest neighbor because it is a classification algorithm, helps us to suggest the type of crop with more yield, with more accuracy than other classification algorithms.

1.8 Conclusion

From our perspective, the application will help the farmers by helping them to select a proper crop which is lower in terms of investment and more in terms of yield and profit.