An automated intelligent assistant to present day farmers to maximize yield and streamline the process of buying and selling using IoT

#### Problem Statement:

We often read about the problems faced by present generation farmers such as lack of exposure regarding what, when and how to cultivate.

Mistimed cultivation leads to massive loss of resources and this quite common in India. Basic awareness regarding changing composition of soil before every crop, overview of expected rains and climate for coming months would avoid this and increase yield significantly. They even fall prey for greedy pesticide dealers who scare them into using more than required medicines for the expected diseases which will reduce the standard of the crop. It is also quite common that farmers find it difficult to make a good business model out of their cultivation. Addressing these issues we want to propose a possible solution which would be the front end for an IoT system which acquires the necessary soil and weather data from the fields.

##### Proposed Solution

This is a simple looking three-point solution based on **Internet of things(IoT)**  which could be very effective when it is genuinely implemented:

1. Know what grows best.

2. Grow what you can sell.

3. Sell what you have grown.

###### Know what grows best

To achieve this we use the data we’ve been given on soil nature, crops, climate and weather and train a machine learning model to predict which crops need to be grown on a given soil for maximum yield. To enable IoT functionality we will use NODE MCU to collect the various data on soil nature, soil humidity s measured by sensors such as Pycno soil sensors, the local weather conditions in the fields measured by weather sensors, relayed in real-time and supply the details to a machine learning model to get accurate results, thus automating the entire process. This weather data, combined with the particular soil parameters can give us a good estimate on what would work best in the favor of the farmers.

###### Grow what you can sell:

It's always better to know the standard your client expects before making the product. This platform can provide information of step by step procedure for cultivating a particular crop, possible diseases, and setbacks with the appropriate diagnosis based on soil, season and locality. By doing this a very likable product can be achieved which is more likely to be sold since it's meeting the requirements of a buyer.

###### Sell what you have grown:

We can affiliate with the big players of the market such as big basket, scrap the retail prices from an authentic source and allow farmers to make their bargain and send quotation. If they are going for low prices it will be by their choice to beat the competition but never because of ignorance again. Sending quotations should be easier than ever. When standard procedures are followed, it easier to get a loan or insured too which makes the whole deal foolproof.

Farmers would be able to maintain this cycle of three points within a mobile application supported by a array of IoT sensors..

###### Technology stack :

React Native

MeteorJS(nodeJS)

MongoDB

Python.

Flask.

##### Outcome:

An amateur farmer can choose the crop with best yield based on his soil composition and upcoming weather conditions which is achievable by use of IoT sensors and NODEMCU, Cultivate with best practices to obtain industry accepted standard and get exposed to right market.

###### Verification:

We can have the model tested against a cross validation set or have a expert in the field of farming predict the outcome given the parameters used and check if our prediction matches.

The platform which is a mobile application is self-verified.

###### Future scope:

Possible dual procedures for the same crop targeting a different set of buyers, Potential big players, loans, and insurance. We can even bring Weather Risk Management Services into the loop with IoT . During the early growth, identifying the disease with just a photo and suggesting diagnosis is also not farfetched by having bots that take images of plants controlled over the internet.

Let's bring farmers into the system and try to make farming a profitable business.