ACROPOLIS
Enlightening Wisdom

AICTE Chhatra Vishwakarma Award

Identification of Plant Diseases

Application Number : VISH20193159
Team Name : Simplexity

The Tomorrow of fighting back...

Aim & Utility

- Linking farmers to the new age technology.
- Increasing the yield of the farmers by solving their plant disease problems.
- We aim to provide a basic entity through which a normal person can surf for the type of disease respective to the type of plant and a cure for it.

Introduction

- **Agriculture** is the main **occupation in India**.
- Two-third of population is dependent on **agriculture**, directly or indirectly.
- As per 2018, **agriculture** employed 50% of the **Indian** work force and contributed 17-18% to country's GDP.
- Lack of modern day knowledge farmers tends to suffer due to different plant diseases.

Problem Statement

- Plant disease reduces the production and quality of food, fibre and biofuel crops.
- Losses may be catastrophic or chronic, but on average account for 42% of the production of the six most important food crops.

Our main problem is how to connect farmers to the new age technology in order to increase their yield curing the disease related problems?

TABLE 1. Crop loss estimates for some economically important plant viruses in developing countries

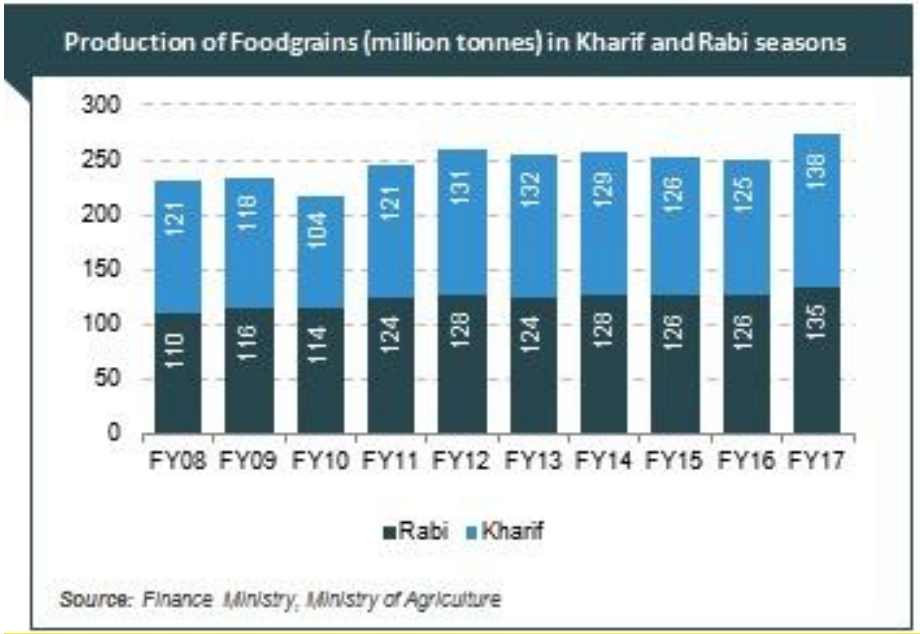
Crop	Region/Country	Disease(s)	Losses
Banana	Worldwide	Streak	82%
Cassava	Africa	Cassava mosaic	1200–2300 m
Cassava	India and Sri Lanka	Mosaic	13–31%
Cardamom	India	Mosaic	70–100%
Cereals (Barley, oat, and wheat)	Worldwide	Barley yellow dwarf and Cereal yellow dwarf viruses	11–12%
Cocoa	Africa	Swollen shoot	100%
Cotton	Asia	Leaf curl	68–71%
Groundnut/peanut	Africa	Rosette	100 m
Groundnut/peanut	India	Bud necrosis	89 m
Groundnut/peanut	India/W. Africa	Clump	38 m
Grapevine	France	Fanleaf	100 m
Maize	Africa	Streak	17–71%
Pigeonpea	India	Sterility mosaic	300 m
Potato	Worldwide	Leafroll	33–50%

Problem & Research Analysis

- Plant disease reduces the production and quality of food, fiber and biofuel crops.
- Losses may be catastrophic or chronic, but on average account for 42% of the production of the six most important food crops.
- The table shows economic losses faced by the farming community in near years due to lack of awareness of disease and not able to identify them on right time.
- In the latest reports of microsoft times, the need for AI in farming is the newest and biggest problem. It shows that about 30% disease are caused due to pests and can be detected easily using ML.
- Recent research by CGIAR shows that the in year 2012 about 10-12% farmers were using phones but by the year 2019 the rapid increase in sale of mobile phones landed for about 94% of the farmers having mobile phones with 55% having feature phones.
- Currently it is in nations need to identify an algorithm in order to help farmers using latest technologies.

Agriculture: Our Pride

- Agriculture is the primary source of livelihood for about 63 per cent of India's population.
- Gross Value Added by agriculture, forestry and fishing is estimated at Rs 18.53 trillion (US$ 271.00 billion) in FY18.
- The Indian food and grocery market is the world's sixth largest, with retail contributing 70 per cent of the sales.



IPD : Identification of Plant Diseases

A Revolutionary technology to support producers, in order to detect plant diseases and suggest it’s cure.

Our Proposed Solution

- We propose that we will detect the plant disease through video processing.
- Our interface will basically ask user to bring the affected part of the plant in front of the camera.
- We will process the image in order to index it in our database.
- Finally we will give the details about the disease and the cure for it.

Process for detection of disease

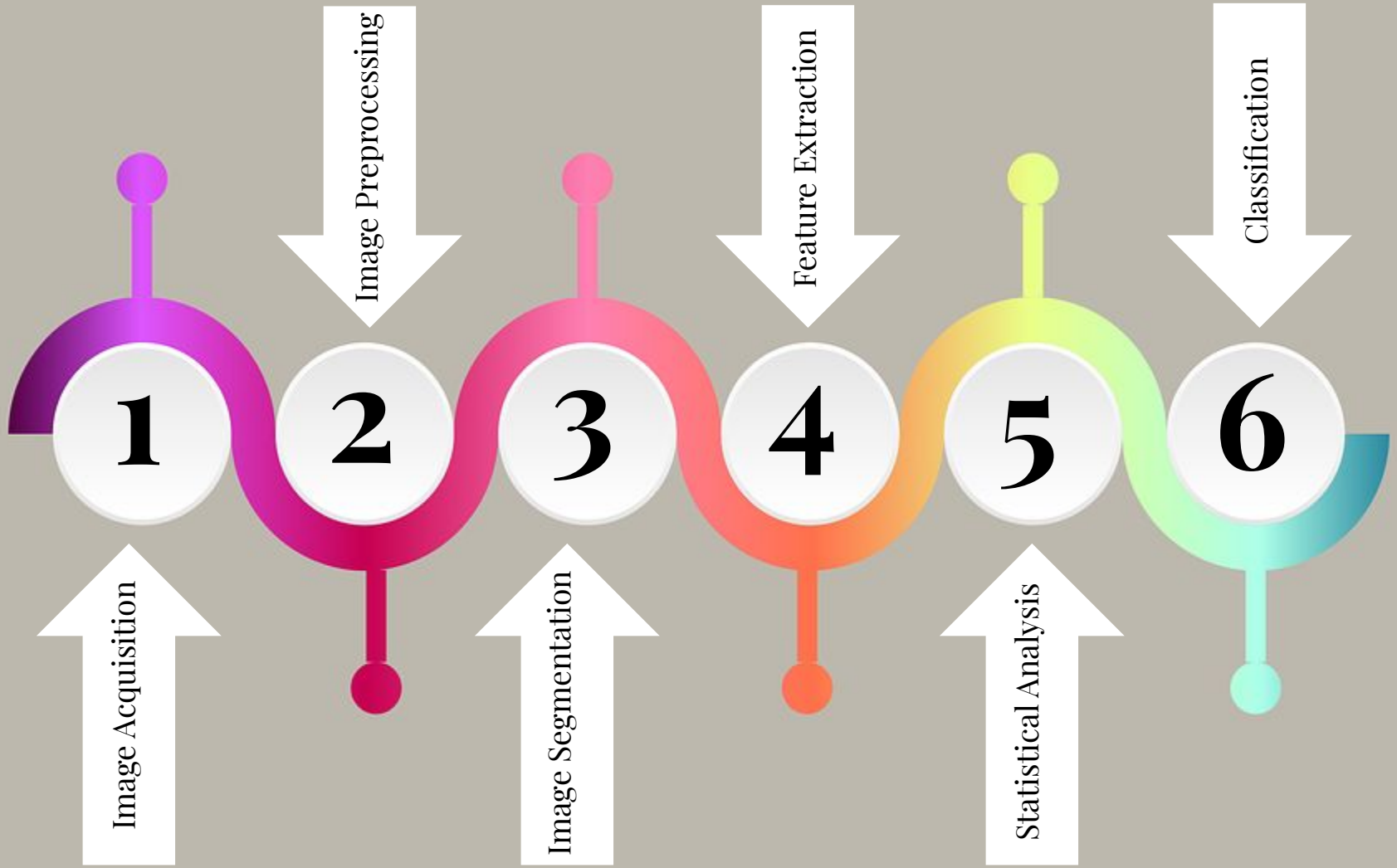

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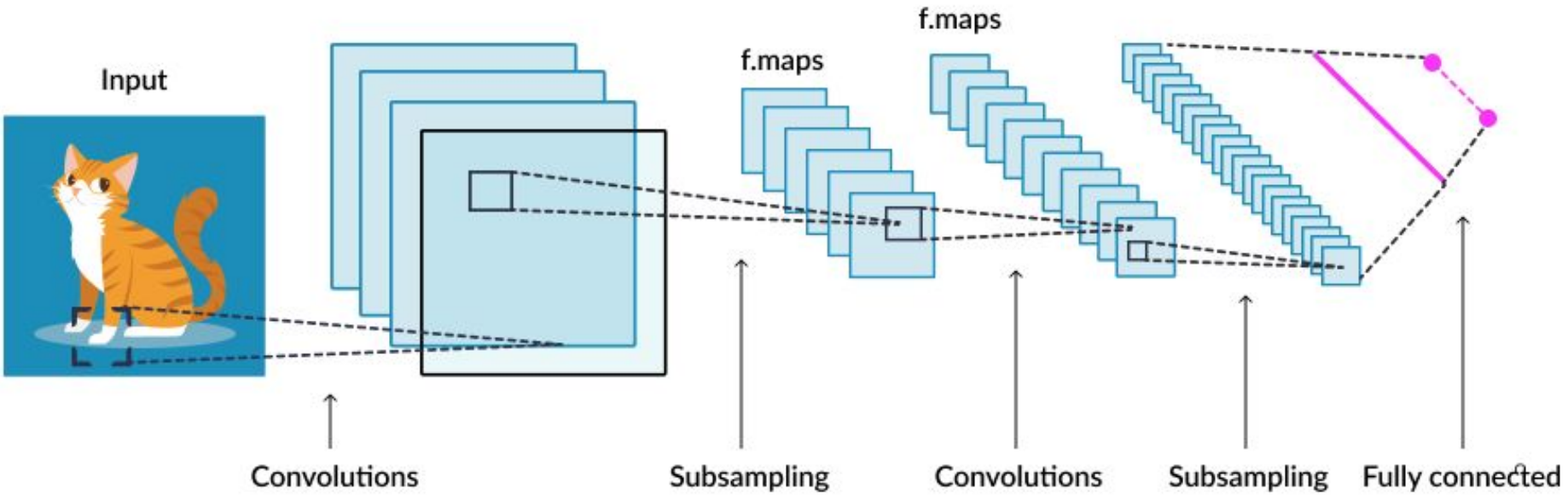
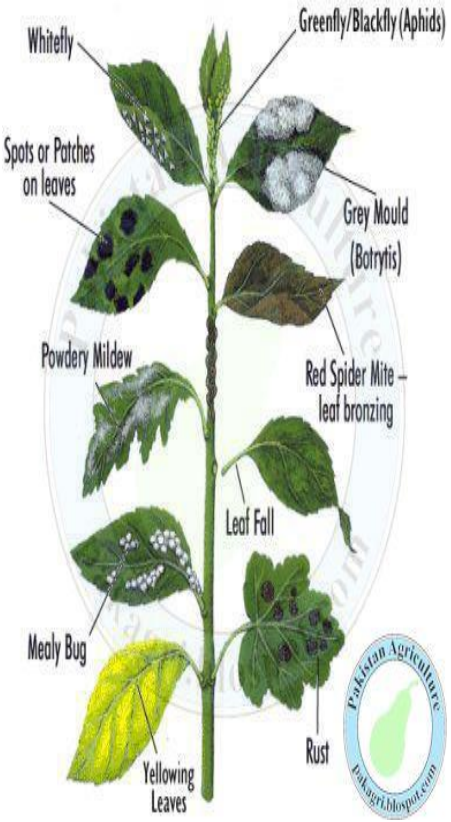
Image Acquisition
Image Preprocessing
Image Segmentation
Feature Extraction
Statistical Analysis
Classification

Working of CNN



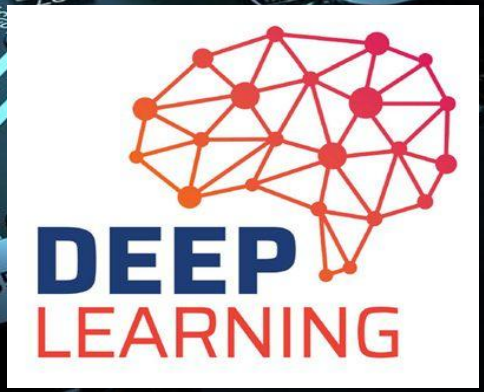
Clips and Pictures

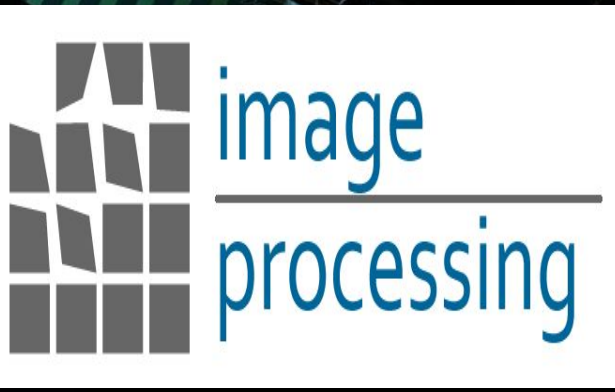


Technology to be Used

DATA ANALYTICS

python™
+
django





Economic Perspective

- Our interface can create a large boost up in economics.
- Currently 16-18% crop fails occurs due to diseases which detains a large chunk of money.
- In India about 2/3rd population will get adversely affected by this, resulting in increase in GDP for subsequent years.

Lean Canvas Model

PROBLEM	SOLUTION	UNIQUE VALUE PROPOSITION	UNFAIR ADVANTAGE	CUSTOMER SEGMENT
• Plant Diseases • Cure of Diseases • Crop Failure • Crop Planning	• Android Application • Machine & Deep Learning • Research • Datasets	• Video Processing • Cure • Less user interaction	• Cure & Symptoms on single click	• Farmers or any Producer
	KEY METRICS • Accuracy • Dataset - 10000 • Weather Report • 5 Common Species		**CHANNEL** • Radio • TikTok, Like, Hago • Mandi's • Local Meetups • Play Store	

COST STRUCTURE	REVENUE
Ads, Meetups, Research, Datasets, Data Storage, Manpower, Server, furniture	Ads, Commission, Downloads, Membership, Premium Doc's, Govt. Schemes, Maintenance

Working Model

```
/usr/local/lib/python3.6/dist-packages/keras_preprocessing/image/utils.py:104: UserWarning: grayscale is deprecated. Please use color_mode = "grayscale"
  warnings.warn('grayscale is deprecated. Please use '
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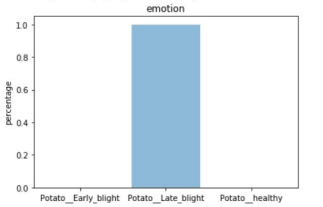

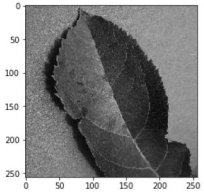

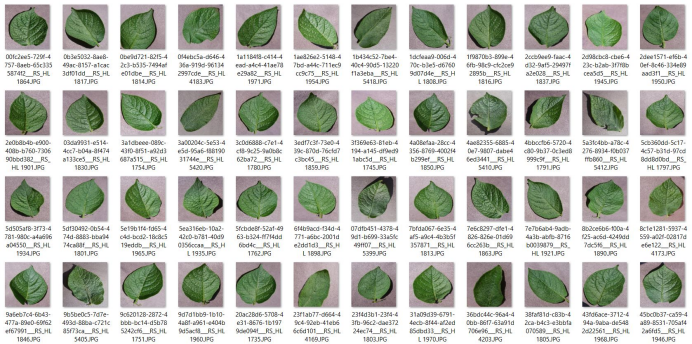

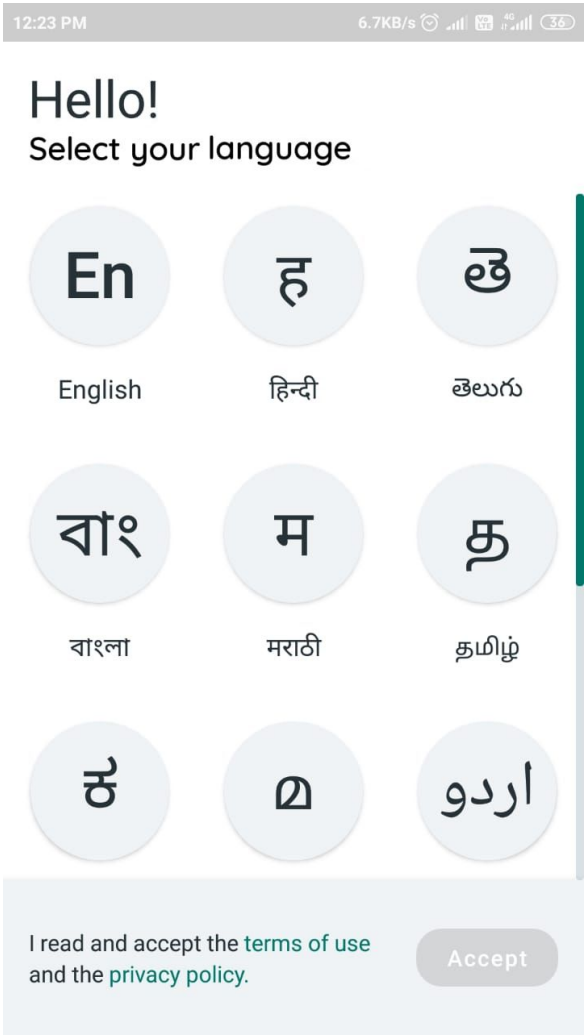
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6.7KB/s
Hello!
Select your language
En
English
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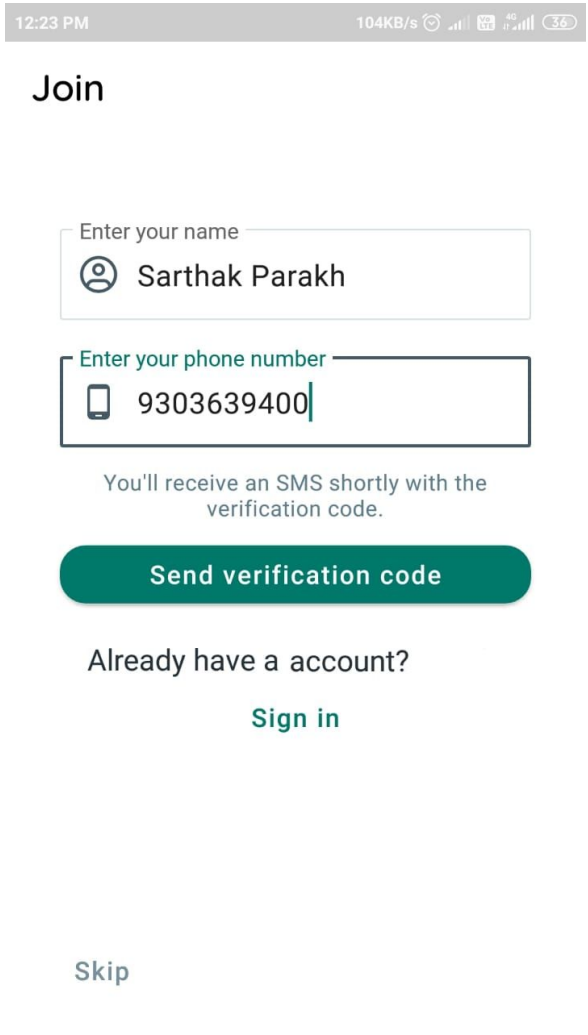
I read and accept the terms of use and the privacy policy.
Accept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Join
Enter your name
Sarthak Parakh
Enter your phone number
9303639400
You'll receive an SMS shortly with the verification code.
Send verification code
Already have a account?
Sign in
Skip

12:25 PM 17.4KB/s

Choose what describes you best

I grow crops in my home garden

I grow crops in fields

I grow crops in pots

Skip question

Continue

12:24 PM 1.1KB/s

Find out what's happening to your plant

Take a picture of your plant and we will provide you with instant solutions.

Next

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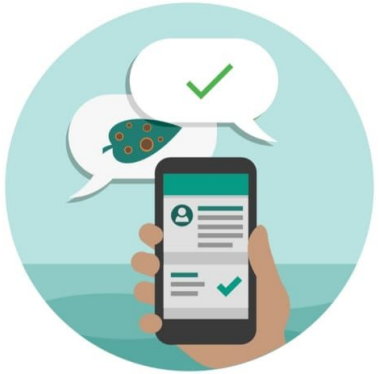
Get in touch and exchange with your experts



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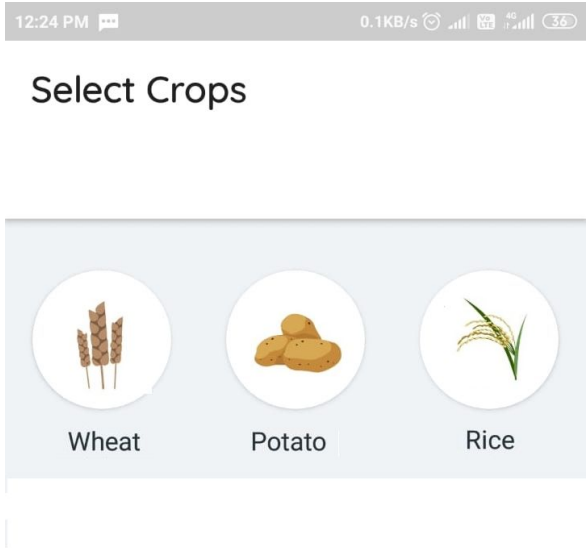
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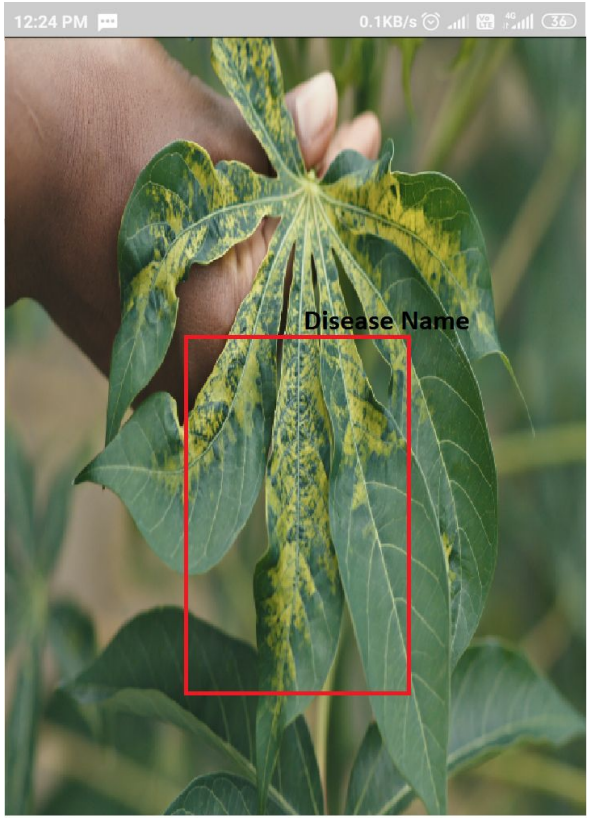
Select Crops
Wheat
Potato
Rice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Disease Name

Save

CURE

Future Action Plan

1. Implementation of pilot project
2. Defining economic perspective
3. Development of management organization
4. Advancements/research additives
5. Launching
6. Maintenance
7. Detection of diseases via stem, fruit and root.
8. Call and visit facility with Agri-Scientists.
9. Online Ordering of fertilizers, manures, pesticides,etc.
10. Open Community for users.
11. Live Weather conditions.
12. GPS Area prone disease detection.
13. Live crop rates and govt. Policies.
14. Bulletins.
15. Crop Advisors and Planner.
16. Crop failure schemes.

Latest Technology & Future

- Data scientists are working hard in image processing and data science field i.e., new technologies are adversely created.
- The latest trend follows on the TensorFlow of google.
- The disease pathogens as quoted by american scientists are also to be released in the coming future.

Shortcomings

- A deep study of the diseases is to be done.
- There isn’t data available for a large variety of plants.
- The total process depends on the image processing i.e., image quality is a big factor too.

Conclusion

The facts mentioned in the project reveal how disease identification can be used to fill major loopholes in the plant agriculture systems used in the country.

Despite the drawbacks, this system can be a major break through in the crop/plant sector. Even in the worst condition, with a few minor modifications, it will enable the Agriculture to reduce the obstacles that come their way.

In short, Identification of Plant Diseases is a step forward towards technology, Agriculture and hence overall growth.

Thank You