

Geoponics: An E-Commerce Application to Leverage Farmer’s Income

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Abstract - The accumulation of agricultural waste if properly managed could be considered an important bio-resource for enhancing food security and which will cut the use of expensive harmful fertilizers. If we feed soil healthy, the soil will feed crops which in turn will feed humans health. As the Organic crops have a higher demand in current market which can fetch high prices for villagers/farmers and also promote organic farming.

So here is a solution proposed through which users can buy or sell products for Agriculture or Gardening and can also sell Organic Waste- mainly leftovers of vegetables or fruits and spoiled/rotten vegetables/fruits and garden waste in exchange of virtual currency called Green Points on our portal, Geoponics. Now, this rotten/spoiled vegetables or Geo-waste is again converted into Organic Fertilizers by our team which is mainly required for organic crops and can fetch great prices for leveraging farmer’s income creating Win-to-Win strategy for users and us.

Key Words: agriculture, fertilizers, organic, waste, Green points, Geo-waste, crops, virtual currency

1. INTRODUCTION

Currently, the garden waste is collected by the Municipal Corporation itself wherein the waste collecting vehicle comes to specific areas for collecting waste. The owners are requested to separate out waste for more convenience which is shredded into fine powder and dumped on ground. The dumped waste is later on converted into Manure. The major problems faced include that the waste is generally not collected and segregated by the owner and kept at a convenient place for garbage collectors to collect. All parts of the city are not covered by garbage collector vehicles as well as lack of space for dumping garbage. To resolve this problem, we have introduced a solution wherein our application will promote selling or buying of agriculture/gardening products and vegetables on the same platform. In the second part the module will further grant permission to sell rotten vegetables/ fruits which will in turn be converted into organic fertilizer in future without getting treated as waste. The third part is meant for the access to green points by the user which will be acquired on the basis of the user’s participation in providing rotten veggies while getting converted into organic fertilizer.

1.1 User Classes and Classification

There will be four types of users for Geoponics application. One is a normal user who just wants to sell / buy fresh fruits and veggies; whereas the second type of user are the users who wish to sell rotten fruits and veggies over our application. The farmers also play a third important role wherein they buy the rotten fruits/ veggies thereby converting it into organic fertilizer and resulting in fetching great prices after selling it. The Geoponics team is also meant to handle all these processes accordingly.

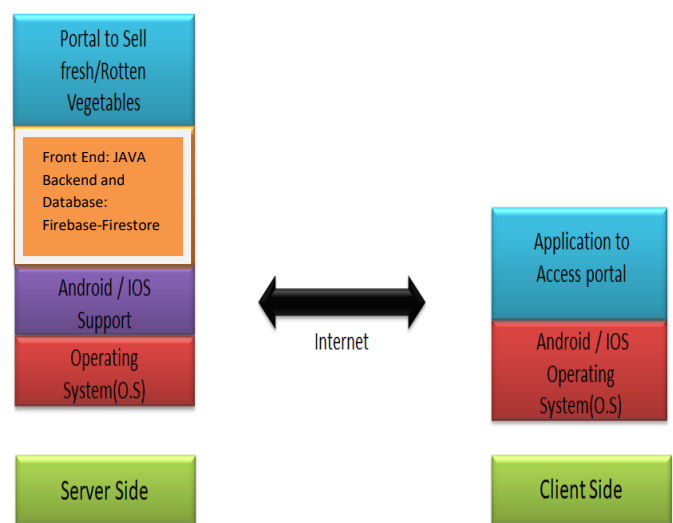
1.2 Assumptions and Dependencies

The quality of the QR code should be proper for scanning purposes when the user gets to the green bank (place where green deposits- leftover waste in the form of spoiled veggies will be acquired) for gaining green points in future.

Since this application is totally dependent on the user module and farmer module, there is a need for verification of all the required documents according to the user types (for example: User, user sold fresh or rotten, farmer).

2. Technology Used

At server side, Android (JAVA) is used at front end and Firebase for backend.



The main motive of this application is to build a platform where Organic Waste can be sold i.e. leftovers of spoiled veggies in exchange of virtual currency called Green Points. After this exchange, this rotten waste will be converted into Organic Fertilizers by our team which is a huge requirement for organic crops. This indeed will fetch great prices and the profit generated can lead to create Win-to-Win strategy for both users and us.

Plant's health. This Feature uses Machine Learning to identify diseases of plants and also tells user which disease it has. ML Model is trained using Kaggle Plant Diseases Data Set.

Customers :	The customer will place an order for fruits or vegetables directly from the farmers. They can give spoiled biodegradable waste and earn green points with the help of QR code.
Admins :	The admins will manage the orders and the waste collected. Take decision based on the amount of waste generated in specific cluster.
Bot :	The waste will be exchanged with virtual currency i.e. "Green Points".The bot will do the work of calculation of points for every customer and will provide offers respectively.
Delivery Boy :	The delivery boy will collect the waste from customer and deliver it to the respected farmers of the respective cluster villages.
Farmer :	The farmers will be playing the main role and hence gain the main benefit. The farmer will convert the biodegradable waste collected, convert it into organic fertilizer, Sell the vegetables grown and also the organic fertilizers into the markets and also on our platform.

Chart -1: Context table

2.1 Modules

Firstly, there will be an authentication module which will show *Login* and *Signup*. The Login will authenticate user already having the application whereas the Signup will create a new account for users by entering all details and create a wallet to store points. Secondly, we will have a *sell* section where user can sell rotten vegetables, fruits and garden waste. The *buy* section allows each user to buy Agricultural and Gardening products.

We have also included *My Cart* section wherein user can see what products are added in the cart and make use of points they earned by selling garden waste. The *Wallet* section can show the users total points and allow them to scan valid QR code to earn points. There is also a section which shows

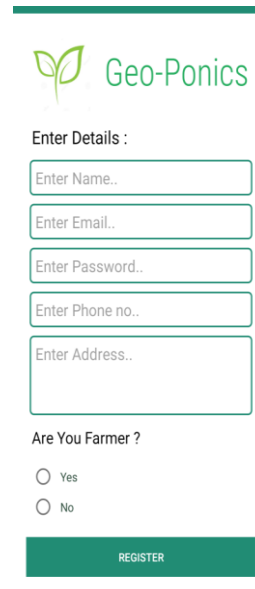


Fig -1: Signup

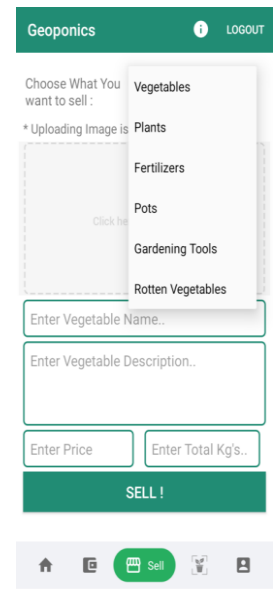


Fig -2: Sell

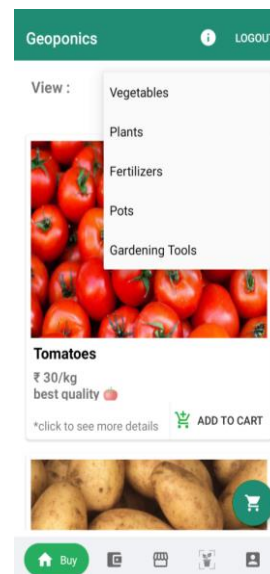


Fig -3: Buy

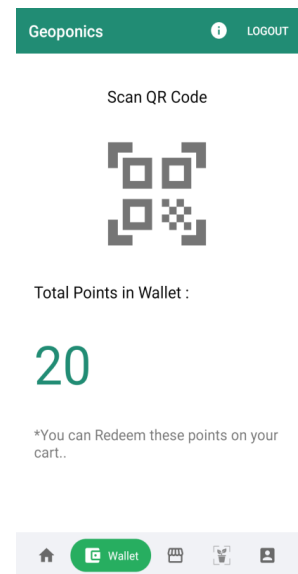


Fig -4: Wallet

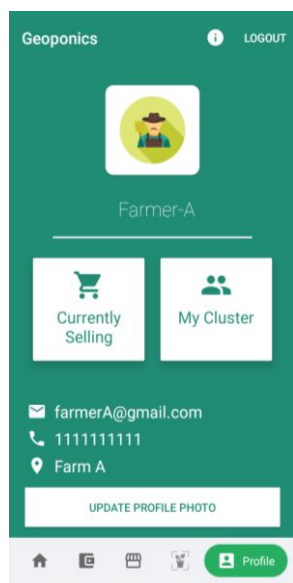


Fig -5: Farmer section

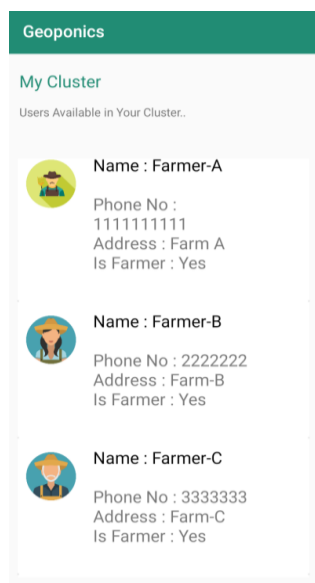


Fig -6: Cluster

3. DESIGN

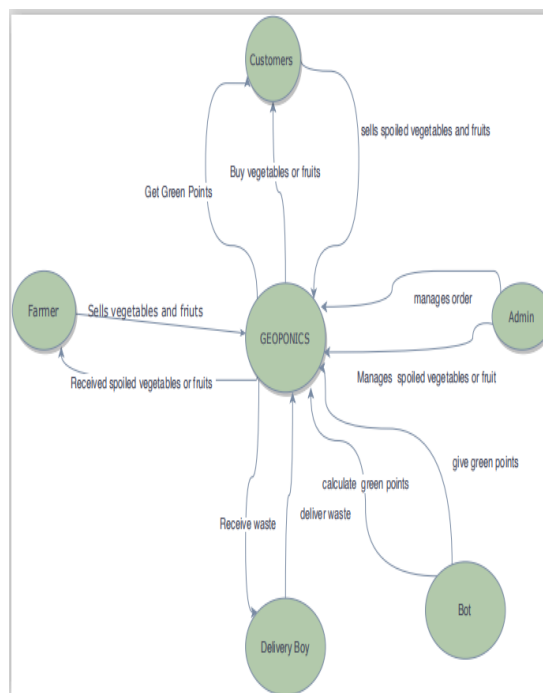


Fig -5: Interrelation of entities

This flowchart type describes interrelated relationships between entities in our system. The entities in our solution include Team Geoponics, Admin, Farmer, Delivery boy, Bot and the Customers.

4. NON-FUNCTIONAL REQUIREMENTS

- a. **Performance:** The Important aspect of Geoponics is engagement of citizens/ users. Since users need to participate actively for selling rotten veggies/ fruits, it will be their responsibility to not let spoiled vegetables go in waste or the dustbin. Instead they should use our applications to get engaged with the farmers to generate Organic Fertilizer.
- b. **Security:** Login module will let every type of user like User/ Customer, Geoponics team, Farmer login through the authentication module while maintaining the security.

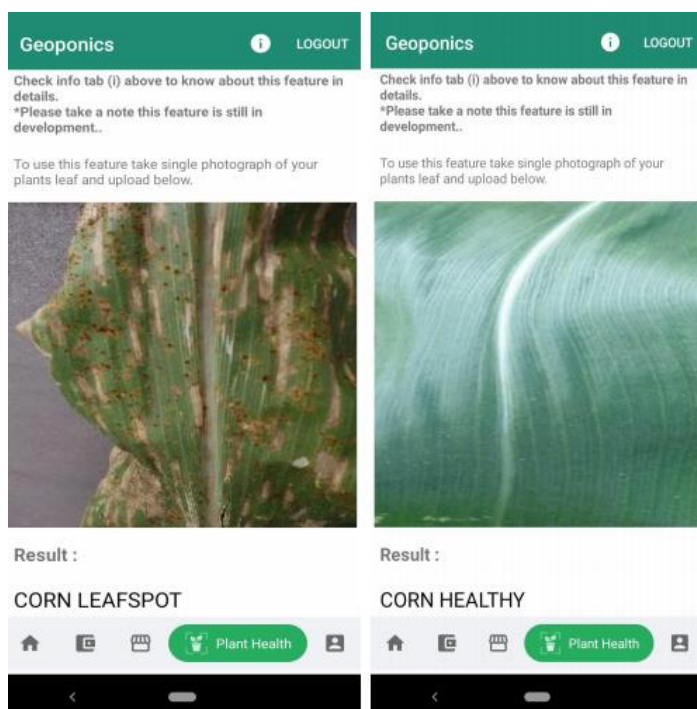


Fig -7: Plant health using Auto-ML

c. Software Quality Attributes:

- (1) Adaptability
- (2) Availability
- (3) Correctness
- (4) Interoperability
- (5) Maintainability
- (6) Usability

5. CONCLUSION

A very less capital investment is required to make organic fertilizers which are in high demand. Thereby, by selling it we can ensure our Win-to-Win strategy for farmers and us. Waste generated by the urban areas shall be reused effectively and hence shall provide gain to the users. Our idea ensures that the waste generated through rotten / spoiled Veggies and fruits would be converted to "Low cost and feasible Organic Fertilizers".

6. REFERENCES

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