

Minor Project Report

KRISHI

“Taking agriculture forward”



Dr. B. R. Ambedkar National Institute of Technology,
Jalandhar

Academic Year: 2020-2021

Under the guidance of

Prof. Amritpal Singh, CSE Department, NIT Jalandhar

ACKNOWLEDGEMENT

It's rightly said that there are hundreds of people working behind the curtain to make a Play successful. The final result of our project- KRISHI required a lot of guidance and help from many people and we, Group 17, are extremely fortunate to have got this throughout the journey of our project. Whatever we are today is only due to such supervision and assistance and we would not forget to thank them from the bottom of our heart.

We are extremely thankful to Professor A L Sangal, Head, Department of Computer Science & Engineering who has provided all his direct and indirect support.

We are thankful to the In-charge, Minor Project Final Year, for providing us with mentors and all other support. We are extremely thankful to our mentor Dr. Amritpal Singh, Assistant Professor, who believed in our idea and suggested new ideas wherever required. She has supported us fully in giving solutions to our problems.

We are extremely thankful to have received constant encouragement and guidance from all the Faculties of Department of Computer Science & Engineering(CSE) who gave us their time and suggestions and then helped us in successfully completing our project work. Also, we would like to extend our sincere esteems to all staff in the laboratory for their timely support.

Thank you.

DECLARATION

We, Group 17, hereby declare that our Project titled- “KRISHI - *Taking Agriculture Forward*” being submitted by us in the Department Of Computer Science and Engineering is a project work carried by us under the noble supervision of Dr. Amritpal Singh and the project has not been copied from anywhere and has been made solely by us.

We will be solely responsible if some Plagiarism is found.

Thank You All.

Date: 24th May, 2021

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Problem Statement and Necessity

Agricultural industry is the backbone of our economy. Agriculture is the primary source of livelihood for about 58% of India's population. Without the agriculture industry, the entire system would collapse. There are farmers who are not able to afford tractors, labor, harvesters and inventory. Farmers can buy the equipment once they are stable but to reach that point, they need to continue working.

The above mentioned becomes a sort of vicious circle. The farmers need equipment for better growth and then can invest in equipment. This is the gap that needs to be addressed and someone needs to put a stop in this circle. Here is where our attention was needed.

The initial cost of these equipment is pretty high, especially tractors, thus increasing their effective fixed cost, hence many farmers cannot afford them.

Below is a case study of a town to show our findings:

Study of ownership pattern of tractors at farm level in district Muzaffarnagar (U.P.)

A.K. Singh* and Indra Mani ¹ Department of Agricultural Engineering,
C.C.R. (P. G.) College, MUZAFFARNAGAR (U.P.) INDIA

Table 2: Age group wise distribution of tractor (In per cent)

Tractor age group	Tractors used on own farms only (TOF)				Tractors used mainly on custom hiring(TCH)			
	<25hp	25-35 hp	>35 hp	Total	<25hp	25-35 hp	>35 hp	Total
0-5 years	0	6	3	9	6	14	3	23
5-10 years	9	6	6	20	14	23	6	43
10-15 years	9	11	6	26	6	9	0	14
15-20years	14	9	3	26	3	11	3	17
20-25 years	11	3	0	14	0	3	0	3
>25 years	6	0	0	6	0	0	0	0
Total	49	34	17	100	28	60	11	100
Average age (years)	17	12	13	14	7	10	12	9

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15-20years	14	9	3	26	3	11	3	17
20-25 years	11	3	0	14	0	3	0	3
>25 years	6	0	0	6	0	0	0	0
Total	49	34	17	100	28	60	11	100
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CONCLUSION

It was concluded from the study that farmers of land holding below two hectare were unable to own tractors for use on their own farms only. Farmers of small and semi medium land holding categories owned tractors for use on custom hiring. Farmers of higher land holdings did not own tractors for use on custom hiring due to socio-economic reasons. Average age of tractors used on farms only and that used mainly on custom hiring were 14 and 9 years respectively. Choice of new tractors was shifting towards a higher power size. In comparison to tractors used on their own.

Feasibility: Technical and Non-Technical

Before starting a project, it's crucial to have a know-how of its feasibility. The Various Kinds of Feasibilities can be summed up as follows:-

TECHNICAL

- Android & Java Application Supporting Devices as mobiles, tablets, desktops, laptops.
- Internet connectivity is required for the system.

SOCIAL

It will reduce the exploitation of poor farmers by money lenders, bigger farmers and authorities. It will provide a low cost and more reliable solution to farmers. It will support the digitization movement started by the Honorable Prime Minister of India.

ECONOMICAL FEASIBILITY

This project doesn't require much cost in development. Only requires cost for database management.

SCOPE

The Krishi App will provide a one stop solution for farmers and their initial fixed cost problems of investment, thus he can bring together resources by renting them till the time they are required.

Identifying Stakeholders

1. Biggest stakeholders in the case of this agriculture industry are the new policies of the Government of India.
2. Another major stakeholder are apps already in the market working on the same business model but on another application.
 - a. Uber
 - b. Ola
3. Other stakeholders are the agricultural industries in India for example: **JK Agri Genetics Ltd**
 - a. Already participating in the seed market, these industries already have potential customers and spinning up another improvement is not a challenge for them
 - b. The application will not only bring more customers but also improve the overall agriculture industry in India which is the major goal of such industries
4. Other potential stakeholders can also be the stock market and other business people interested in making India better while also crunching money numbers

Detailed Solution

So here is our detailed solution of the problem we have identified.

1. Connecting tractors with local farmers.

Our system connects the farmers who could not afford a tractor on their own to the tractor owners who would let their tractors be borrowed by other farmers for a passive income, giving the low income farmers the opportunity to get most of their harvest for themselves, than feeding 30% of it to the cattle.

2. Connecting harvester and labor

As we know harvesters are too expensive to be used by any middle class farmer and labor is tricky and a time consuming process. So we are making the high end machines affordable to a greater range of farmers by providing them with a reasonable price to borrow such resources.

The people wanting to offer these services to the farmers are helping our society as a whole and themselves too.

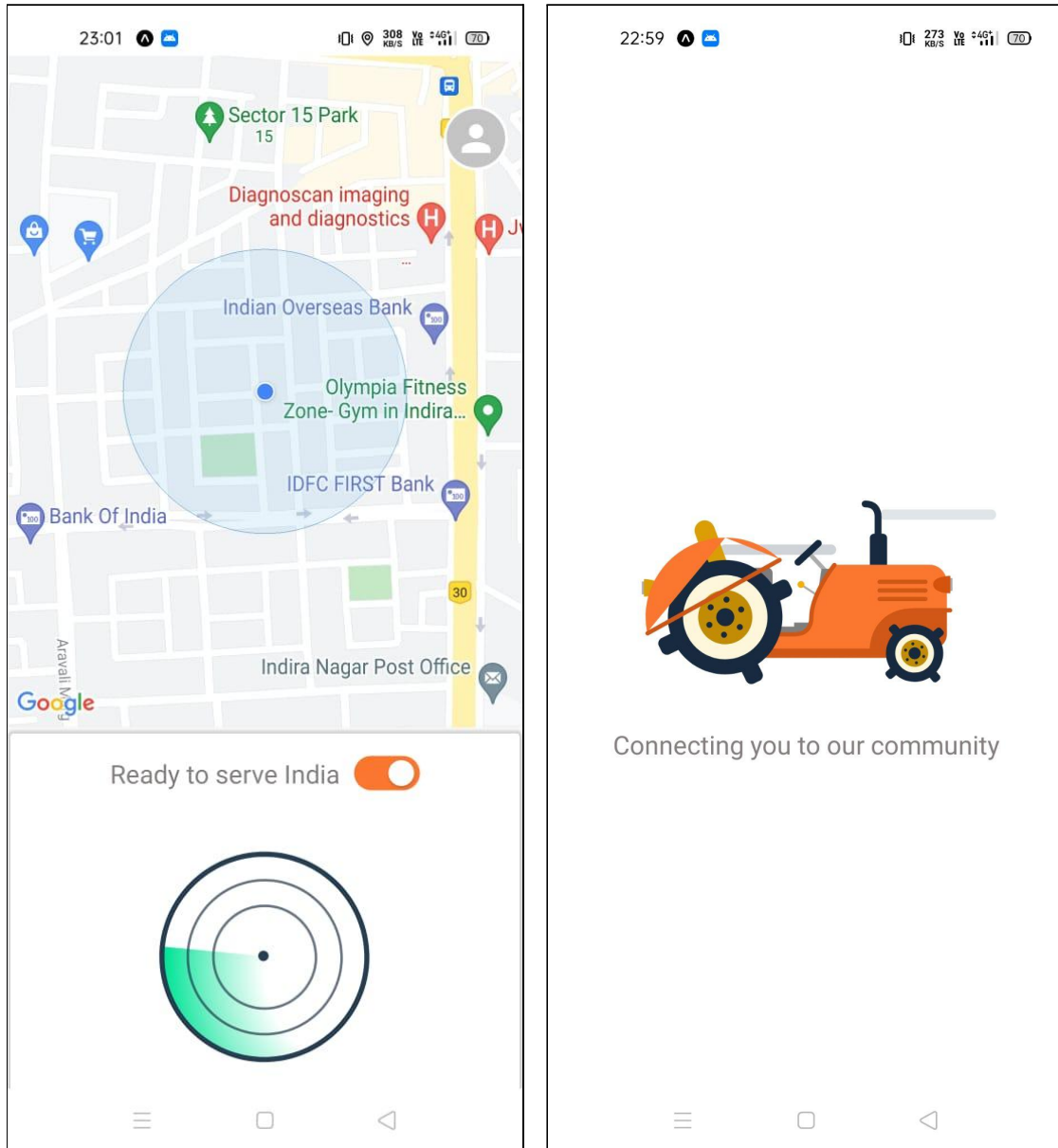
3. Rating the best services

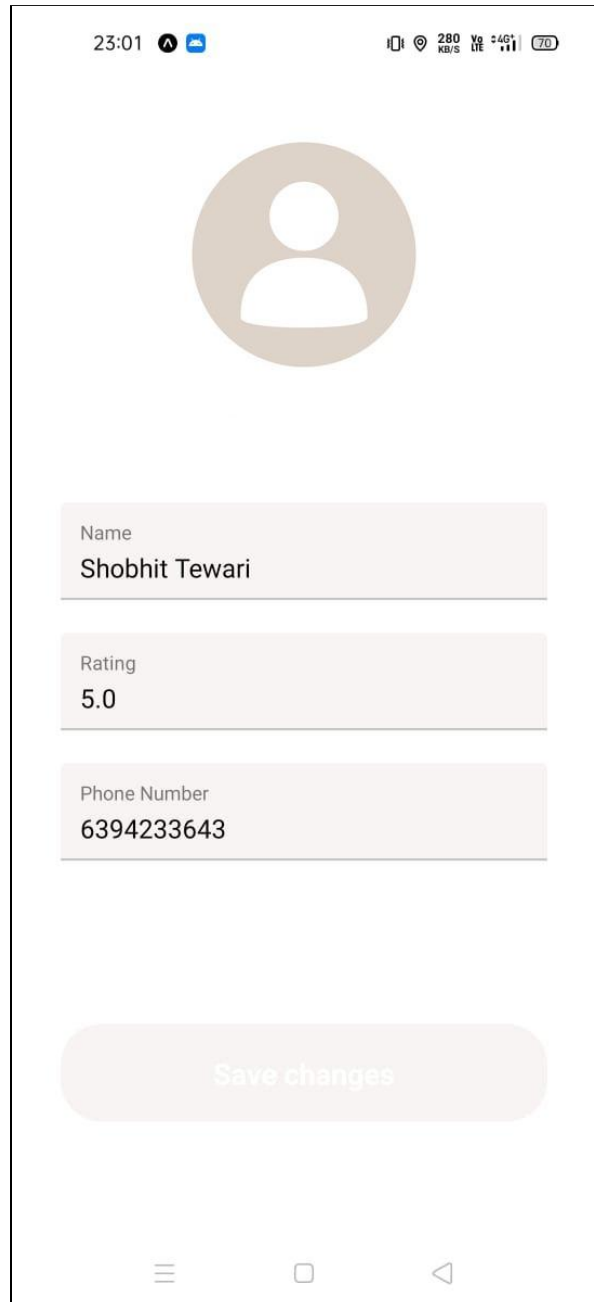
Our app will allow the farmers to choose the best from all the people willing to help. As they will be rating the providers for the services and the cost that they are charging them to use their resources. This will help others as well to choose the best over good.

This will result in the providers to improve their cost and services to gather more customers to them, benefitting both the provider and the consumer.

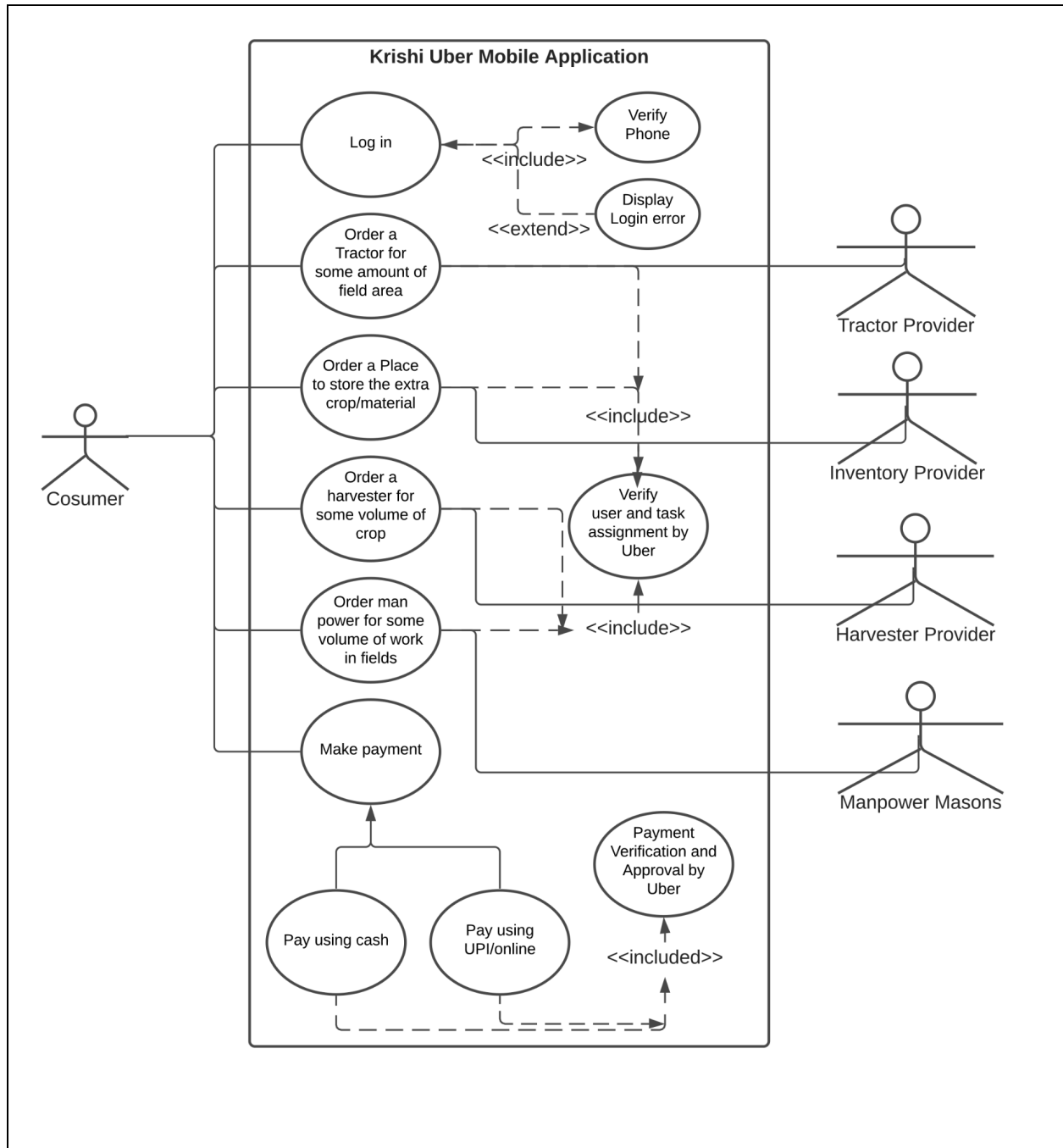
4. Service at farmers' fingertips

We provide a very user friendly interface to our customers providing them with the services at their fingertips.





UML Diagram



Tech Stack Analysis

In order to achieve various solutions, we have used a variety of Tech Stacks. All these technologies have been chosen on the basis of the following few criteria: -

1. Ease of Usage and Ease of Learning
2. Time Required to build
3. Efficiency
4. Security

On the basis of the above mentioned criteria the Technologies used are:-

Front-End	Back-End	Services
1. HTML5	1. NodeJs	1. Position Stack
2. CSS	2. Express	2. Twilio SMS
3. React.JS	3. MongoDB	3. Google Maps
4. React Native	4. Android/iOS	4. Push Notifications

React Native

Usage : Mobile Application Development.

React Native is an open-source mobile application framework created by Facebook, Inc. It is used to develop applications for Android, Android TV, iOS, macOS, tvOS, Web, Windows and UWP by enabling developers to use React's framework along with native platform capabilities.

HTML5, CSS, ReactJs

Usage : Web Development

HTML (the Hypertext Markup Language) and CSS (Cascading Style Sheets) are two of the core technologies for building Web pages. HTML provides the structure of the page, CSS the (visual and aural) layout, for a variety of devices. React is an open-source front-end JavaScript library for building user interfaces or UI components

NodeJs

Usage : Backend Server Development

Node.js is an open-source, cross-platform, back-end JavaScript runtime environment that runs on the V8 engine and executes JavaScript code outside a web browser.

MongoDB

Usage : Database Management

MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas. MongoDB is developed by MongoDB Inc. and licensed under the Server Side Public License

Express

Usage : Rest APIs development at Back-End

Express.js, or simply Express, is a back end web application framework for Node.js, released as free and open-source software under the MIT License. It is designed for building web applications and APIs. It has been called the de facto standard server framework for Node.js

Twilio SMS Service

Usage : OTP Verification and SMS Notification.

Twilio's Programmable SMS API helps you add robust messaging capabilities to your applications. Using this REST API, you can send and receive SMS messages, track the delivery of sent messages, and retrieve and modify message history.

Google Maps

Usage : Graphical representation of position of different Users.

Google Maps is a web mapping platform and consumer application offered by Google. It offers satellite imagery, aerial photography, street maps, 360° interactive panoramic views of streets, real-time traffic conditions, and route planning for traveling by foot, car, air and public transportation.

Push Notification

Usage : Notifying users for different activities.

Push technology, or server push, is a style of Internet-based communication where the request for a given transaction is initiated by the publisher or central server. It is contrasted with pull/get, where the request for the transmission of information is initiated by the receiver or client.

Position Stack

Usage : Accurate Forward & Reverse Batch Geocoding API

The positionstack API was built to offer a straightforward and reliable solution for forward and reverse geocoding, covering more than 2 billion places and addresses worldwide. Features include batch geocoding, multi-language support, embeddable map URLs, and more. API results can be delivered in JSON, XML or geocode-specific GeoJSON.

App Usage Instruction

1. Enter your mobile number and login is always from the mobile number as we don't expect farmers to keep track of their passwords
2. After that as a user you can edit your picture and set up your basic information. Location is being accessed for better service and fraud detection.
3. You can then choose your location and then on the next screen you'll be asked about the service that you want to take. Services include tractor, harvester and others.
4. After that, a request would be made to all available service providers near you. We have kept the distance to be 5000m or 5km for optimal reach.
5. After the service provider, say a tractor, accepts your request, you'll be shared with the accepted screen.
6. You'll be shared the location, phone number, picture, name and the vehicle number of the provider.
7. After your work is done you can make payment with cash or online UPI and enjoy one of the easiest ways to get your farming going.
8. You can cancel the service anytime if you think that the driver is doing some fraud or wrong we'll take it from there.

Coming to the tractor app:

1. Similar to the app user, service provider users will have to login with a phone number only.
2. Basic information will be taken and then ready to go.
3. The service provider will have the incoming request which he may or may not accept.
4. After accepting the request the service provider will automatically be directed to the location and after completing the task he/she may take the money and report it in the app.

A rating system is being employed and it is auto adjusted every time when you rate the provider or consumer. You may also file a complaint against the service or consumer and make the ecosystem secure.

Deployment and Testing Status

1. The deployment is made on the heroku server of the backend service and the application is made available on the expo go store.
2. Heroku provides decent support to host service and get the application going for the testing phase.
3. After this basic deployment, for the testing phase, we employed it within communities of testers on telegram and general public. In this lockdown it was not feasible to get this going in the actual market. The test and deployment is done.
4. For the phone number verification there is a paid service which we haven't bought. The only thing we have done is make a testing account and then manually add a testing phone number to receive an OTP.

Conclusion

Our Project- Krishi Application is complete and fully functional. The aims have been achieved to a great extent. The Trial Run has been highly successful and was well accepted by all the Stakeholders.

We are happy with the Positive response of the Farmers as well as the concerned authorities. Conclusively, what we have achieved is:-
To provide an easy to use, economically feasible solution that could cater to the problems faced by farmers.

This is in-line with the pathway to Digitization where everything can be done. We have learned a lot both- technically as well as non-technically(including teamwork, hard work , etc).