

Tractor Hiring Application for Farmers

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Abstract - Nowadays there are many online services which are on trend that give much benefit to user. This application named as tractor hiring application for farmers is a rental service in which the farmer arrives to request a hire of a rental unit. It is more convenient than carrying the cost of owning and maintaining the unit. There are several problems occur on farmer like they are not able to hire a tractor and equipment of agriculture for farming in nominal amount or they do not find tractor easily. In another case, sometimes farmers are unaware about the price of the tractor and other agricultural equipment; such that tractor owner misguide the farmers very easily and cheat them by taking extra money. The solution for solving such various problems occur on farmers regarding to agriculture can be overcome using this android application. This android application is an application that is accessed over a network such as internet or intranet. Therefore with this new method the process will be more efficient and safety of hiring tractor as well as equipment is secure. It is also the best way to increase the quality of agriculture management, productivity and can reduce the time constraints for farmers.

Key Words: Intranet.

1. INTRODUCTION

In this mobile application, farmer will hire tractors based on their needs and other mechanization at a normal price. In this application, we will choose for the demand of farmer based on his demand we will recommend hire tractor with other mechanizations. In this, we will use pin code to locate nearby tractors based on farmer's requirements. This application will provide full detail about the tractor so that the farmer can choose a type of tractor he need based on his requirements and can easily get familiar with it. To register the farmer, only mobile no and name will be required, after a successful registration the farmer will receive a pin for future use. In this android application farmer just need to register himself and then he'll able to book tractor at the appropriate price. User only need to select the number of hours for renting, the application will automatically calculate the renting price according to the total time selected by the farmer.

1.1 PROBLEM STATEMENT

Many farmers are not able to hire a tractor in normal amount or they do not find tractor easily. In another case, sometimes

farmers are unaware about the price of the tractor; so the tractor provider fools the farmers very easily, and cheat them by taking extra money. The Tractor Hiring Application can easily overcome such problems for farmers where they can find tractor and other mechanism for their use easily.

OBJECTIVE

- To create a mobile application that the farmers can use to hire tractors as well as other machineries related to agriculture at a normal amount using their mobile phones.
- To create an interface between farmers who want to hire and those who want to let out equipment.
- To save time and money of farmers.

1.2 PROPOSED SYSTEM

This system is develop to solve the problems that usually happen when farmer want to rent a tractor for their agriculture purpose. In this all activities are done manually and have done on mobile technology. We are going to develop an android application of tractor hiring system for farmers in which there are four main modules.

This module is responsible for the login purpose. In this module, the user will first have to enter mobile number so that an OTP can be generated. After getting the OTP, user will have to enter it correctly. If user is logging for the first time then the Registration page will be displayed in which the user have to enter details like name and address. If already registered, then user can proceed for the further process. In registration module, the user (farmer) have to enter his/her mobile number and other details, system will send the one time password (OTP) to the user, user just have to enter same OTP to the mobile for confirmation purpose.

In the store list module, there are numbers of stores present in which different types of tractor are available. Details like address, pin code and contact number of each store is present with the name of the store. In this module, user can select any store to hire a tractor. This module contains the equipment list module as well as the tractor list module. Equipment list module contains a list of equipment used for agriculture. User can select any of the equipment according to their agricultural requirement. The total number of equipment available in the store is also given in this module.

In this mobile application, user will hire the tractor according to his/her need. This tractor and equipment module helps to show the list of different tractors and other agricultural equipment. User just has to select the tractor and equipment. This module can take the input of number of hours according to the need of a user and calculate the total amount as well. This module contains a list of tractor for agriculture. To hire a tractor, user will have to book it by filling some information which comes under the booking module.

The booking module is responsible for the operations like hiring the tractor or hiring the equipment. To hire a tractor or equipment, the user will have to enter the number of hours, select date and time. After entering these details user will have to confirm booking. Then the user will get the total price of the tractor and equipment and hence the booking will be confirmed successfully. After the booking of the tractor and other agricultural equipment user needs to pay the rent for that. This module will show the total cost of the booked equipment and display the payment details.

2. LITERATURE SURVEY

With the help of different papers, journals and websites we find out the working different renting systems. From this papers we learn how to manage the online equipment store as well as we learn from the research papers how to handle the requirements of the user. This survey helps us to identify the different problems which are occurring during hiring any online stuff. The websites gave us the basic idea of the general renting system.

Bike Sharing and Rental System, This paper is proved very helpful as it says about the bike rental system which shows us the complete working of bike rental system. The optimal distribution of bike sharing stations should first of all cover the stops of medium/long range transportation modes. We can say that most of the station is visible; the more effective is the location. This paper explains the complete bike sharing and rental system in which the user hires a bike from this system. The amount of rent is calculated by this system with respect to the time [1]

Web-based Agricultural Machinery Rental Management System (Research Article on Science Central Journal)

A user searches through the agricultural machinery database (set up by the administrator) and selects the desired equipment to rent, at which point the terms and conditions and the rental fee are confirmed and an online application form is submitted. The contents of the application are stored on the DB server, and the administrator queries the reservation list and manages the fleet of agricultural machinery.. This study was conducted to develop a web-based business management system to ensure the efficient operation and transparent management of government-subsidized agricultural machinery rental businesses. In this

article it is clear that the government will provide the agricultural machinery to the user. From this article we learn about the requirements of farmer's [2]

Online Car Rental System using Web based and SMS Technology, This paper described a notification-based content alert and web-based system using SMS technology. It was specifically developed for the alert notification to the customers about the car rental information, and the availability of the car reserved. The main purpose of developing SMS-based content alert for car rental system is to reduce the cost and time consumed, which is beneficial to the car rental agencies and customers. Therefore, the system was designed automatically to send an alert SMS to the customers about the availability of the car reserved [3]

2.1. System Requirement

This includes the hardware and software specification which is required to run an application on a device.

2.1.1 Software Requirement

This part includes the software tools that we used to make an application and the services which will be used by an application.

- **Android Studio** –Android Studio is the official Integrated Development Environment (IDE) for Android app development, based on IntelliJ IDEA. On top of IntelliJ's powerful code editor and developer tools, Android Studio offers even more features that enhance your productivity when building Android apps, such as: A flexible Gradle-based build system.
- A fast and feature-rich emulator.
- A unified environment where you can develop for all Android devices.
- Instant Run to push changes to your running app without building a new APK.
- Code templates and GitHub integration to help you build common app features and import sample code.
- Extensive testing tools and frameworks.
- Lint tools to catch performance, usability, version compatibility, and other problems
- C++ and NDK support.
- Built-in support for Google Cloud Platform, making it easy to integrate Google Cloud Messaging and App Engine.

Android Studio is Android's official IDE. It is purpose-built for Android to accelerate your development and help you build the highest-quality apps for every Android device.

Front End

- **XML**

The Android platform uses XML files in projects for many purposes, from providing basic configuration of the application in the Manifest File, to using XML Layout Files to define the user interface.

Elements uses these standard files in the same way they are used when working with the Java language, so Elements developers have access to the same controls and UI capabilities as all other Android developers, fully natively.

There are two ways for working with XML Layout files in your Android projects:

- You can edit the files in XML format using the regular code editor in Fire and Visual Studio. This option is favored by many Android developers, and gives you full control about your UI design down to the most minute detail.
- You can ask Fire or Visual Studio to launch Android Studio to design these files using Google's official visual designer, by right-clicking the project node in the Solution tree and choosing "Edit User Interface Files in Android Studio" (Fire) or "Open in Android Studio" (Visual Studio).

Any changes you make to your XML Layouts in Android Studio will automatically sync back into your project, and elements defined in your layouts and the other XML files will be available via the static R class in your project's default namespace.

Advantages of XML

- It supports Unicode, allowing almost any information in any written human language to be communicated.
- It can represent common computer science data structures: records, lists, and trees.
- Its self-documenting format describes structure and field names as well as specific values.
- The strict syntax and parsing requirements make the necessary parsing algorithms extremely simple, efficient, and consistent.
- XML is heavily used as a format for document storage and processing, both online and offline.

Back End

1) JAVA

Java is one of the most popular and widely used programming language and platform. A platform is an environment that helps to develop and run programs written in any programming language.

Java is fast, reliable and secure. From desktop to web applications, scientific supercomputers to gaming consoles, cell phones to the Internet.

Advantages of Java

- **Java is easy to learn:** Java was designed to be easy to use and is therefore easy to write, compile, debug, and learn than other programming languages.
- **Java is object-oriented:** This allows you to create modular programs and reusable code.
- **Java is platform-independent:** One of the most significant advantages of Java is its ability to move easily from one computer system to another. The ability to run the same program on many different systems is crucial to World Wide Web software, and Java succeeds at this by being platform-independent at both the source and binary levels.

2) Firebase

Firebase is a mobile and web application development platform developed by Firebase, Inc. in 2011, then acquired by Google in 2014. As of October 2018, the Firebase platform has 18 products, which are used by 1.5 million apps.

Services Provided

- Firebase Analytics
- Firebase Authentication
- Real-time Database
- Firebase Hosting
- Firebase Storage

Google Play Services – These are the services which are provided by the Google. The application will use the services like Google Firebase

2.1.2 Hardware Requirement

This section includes the hardware required by an application and which type of hardware the application will use.

- **Smart android mobile phone**– The application is android application which will require a device to run an application.

3. SYSTEM DESIGN

Systems design is used to define the architecture, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. There are various diagrams that can be used to represent the process and flow of the system or project.

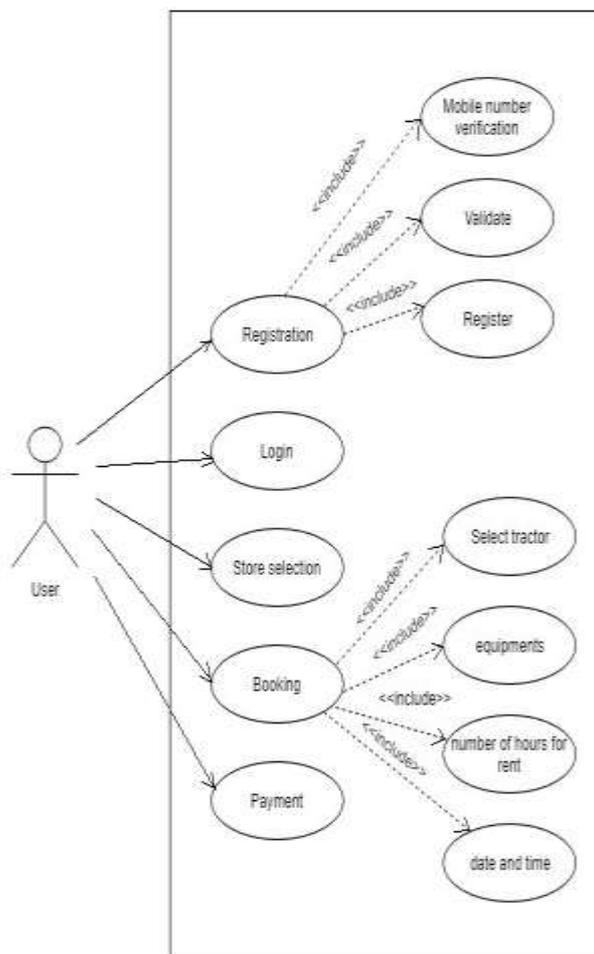
3.1 Use Case Diagram

A use case diagram is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved.

There are 3 users involve in this system –

- Actor
- Database

Figure 3.1: Use case diagram of tractor hiring application



There is a section of the user, every new user need to register first for using this system. If a user already registered then user would login and then user will be provided with various activities like store selection, while booking a tractor user can select type of tractor along with the equipment, number of hours for rent and date and time for booking. After booking tractor user will pay to the owner of tractor by using QR code or by cash.

3.2 Flow Chart

There will be only one login for the user who wishes to book the tractor. User has to register by using mobile number.

After login user can search the nearby stores, user can select the tractor along with the required equipment and user has to enter the number of hours for rent. After booking tractor user will receive the payment information.

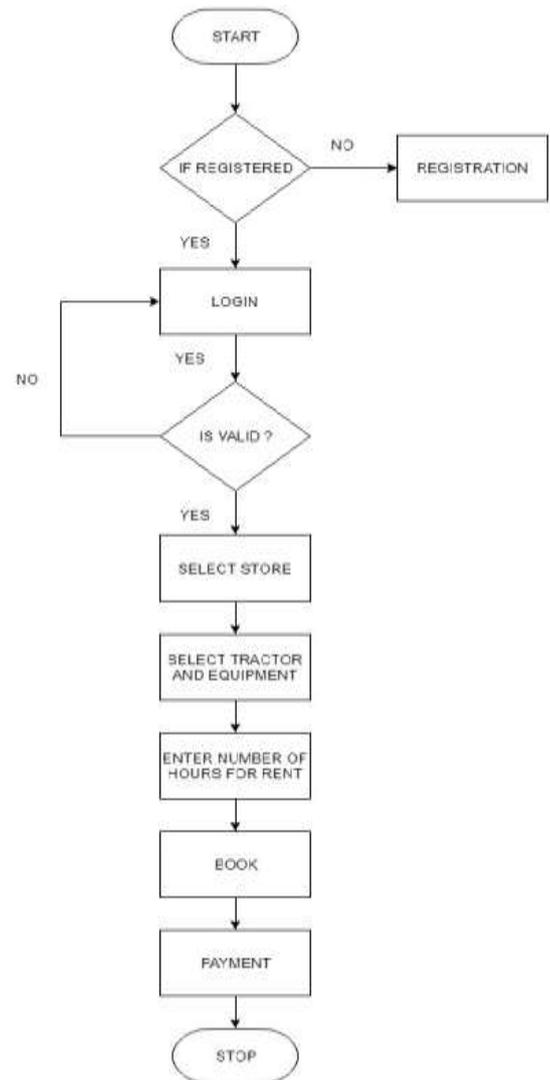


Figure 3.2 Flow chart

4.1 DESIGN MODULES

Tractor Hiring Application has the following modules:

Modules:

- Login Module
- Store List Module
- Equipment List Module
- Tractor List Module
- Booking Module

Login Module:

This module is responsible for the login purpose. In this module, the user will first have to enter mobile number so that an OTP can be generated. After getting the OTP, user will have to enter it correctly. If user is logging for the first time then the Registration page will be displayed in which the user have to enter details like name and address. If already registered, then user can proceed for the further process.

Store List Module:

In the store list module, there are numbers of stores present in which different types of tractor are available. Details like address, pin code and contact number of each store is present with the name of the store. In this module, user can select any store to hire a tractor. This module contains the equipment list module as well as the tractor list module.

Equipment List Module:

This module contains a list of equipment used for agriculture. User can select any of the equipment according to their agricultural requirement. The total number of equipment available in the store is also given in this module.

Tractor List Module:

This module contains a list of tractor for agriculture. User can select any type of tractor from the store according to their agricultural requirement. To hire a tractor, user will have to book it by filling some information which comes under the booking module.

Booking Module:

The booking module is responsible for the operations like hiring the tractor or hiring the equipment. To hire a tractor or equipment, the user will have to enter the number of hours, select date and time. After entering these details user will have to confirm booking. Then the user will get the total price of the tractor and equipment and hence the booking will be confirmed successfully.

5. TESTING

Testing - Software testing is the process of evaluation a software item to detect differences between given input and expected output. Testing assesses the quality of the project. Software testing is a verification and validation process.

5.1 Types of Testing**Manual Testing**

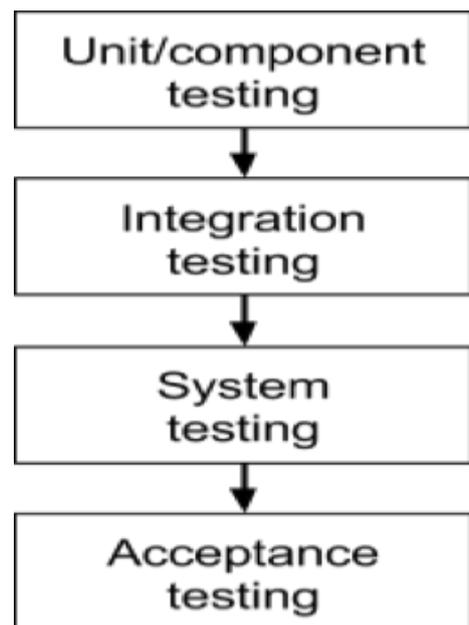
Manual testing includes testing a software manually, i.e., without using any automated tool or any script. In this type, the tester takes over the role of an end-user and tests the

software to identify any unexpected behavior or bug. There are different stages for manual testing such as unit testing, integration testing, system testing, and user acceptance testing.

Testers use test plans, test cases, or test scenarios to test a software to ensure the completeness of testing. Manual testing also includes exploratory testing, as testers explore the software to identify errors in it.

Following are the testing techniques that are performed manually during the test life cycle:

- Acceptance Testing
- White Box Testing
- Black Box Testing
- Unit Testing
- System Testing
- Integration Testing

5.2 Levels of testing -

There are four level of testing -

1. Unit Testing
2. Integration Testing
3. System Testing
4. Acceptance Testing

1. Unit Testing -

This type of testing is performed at the earliest stages of the development process and it is also known as component testing. Various components in the project are tested.

After developing each component in project, as application progresses each component are need to be tested. Projects

usually are built in the components and each component must need to be tested so that overall objective of the project must need to be achieved.

2. Integration Testing -

Integration testing is testing in which a group of components are combined to produce output. Also, the interaction between software and hardware is tested in integration testing if software and hardware components have any relation. It may fall under both white box testing and black box testing.

This type of testing is performed when clicking on the scan in application, the camera should be open and also scan the marker of department, after scanning the detected marker must retrieve the notices and then shown to the user. After viewing the notices, it can be saved or downloaded.

3. System Testing -

System testing is the testing to ensure that by putting the software in different environments it still works. System testing is done with full system implementation and environment. It falls under the class of black box testing.

We deployed our application in different vendor's android mobile phone and also on various android operating system or platform with different versions.

4. Acceptance Testing -

Acceptance testing is often done by the customer to ensure that the delivered product meets the requirements and works as the customer expected. It falls under the class of black box testing.

RESULT AND DISCUSSION

Figure 6.1.1 is the welcome page where users have to select language Hindi/English to be logged in.



Figure 6.1.1 - Home page

Figure 6.1.2 in this we have to enter mobile number in order to enter constant OTP.



Figure 6.1.2 - Enter Mobile no.

Figure 6.1.3, in this page user will have to enter OTP to be successfully logged in.

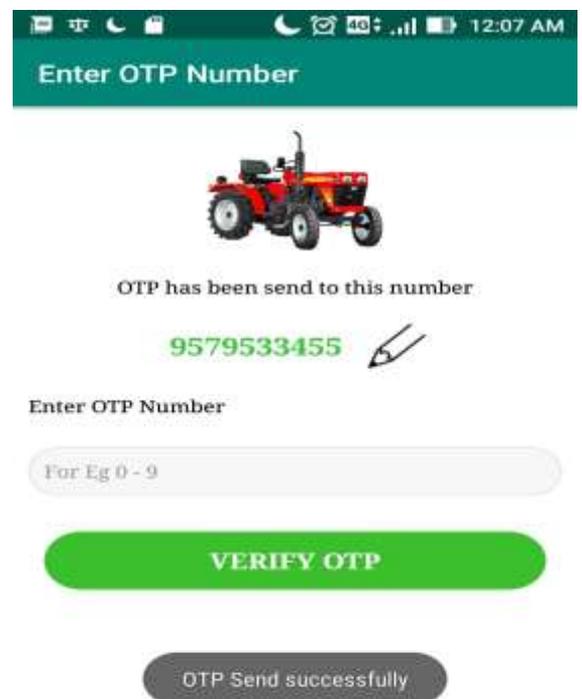


Figure 6.1.3 - Enter OTP

Figure 6.1.4 shows the list of store where user can hire tractor and equipment in normal amount.

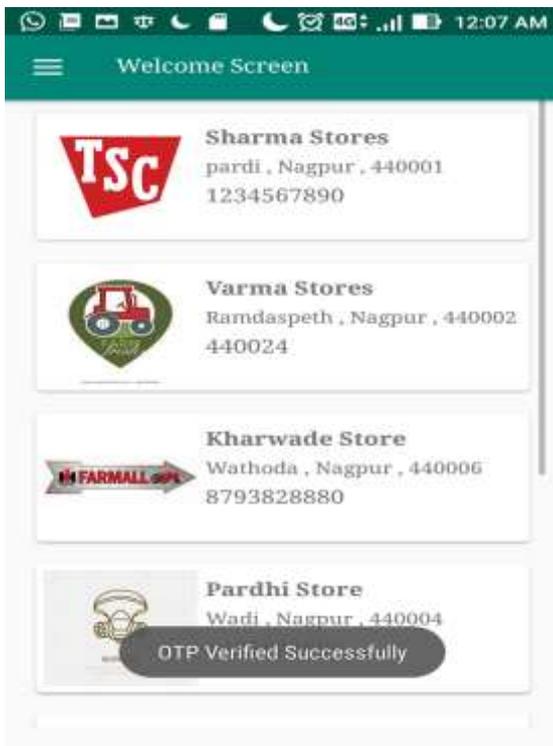


Figure 6.1.4 – Store List

Figure 6.1.5 shows a list of equipment so that a user can hire any type of equipment for agricultural purpose

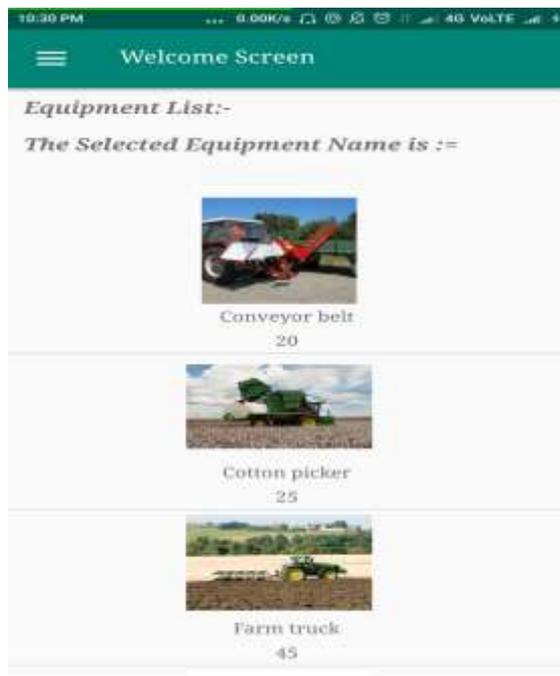


Figure 6.1.5 – Equipment List

Figure 6.1.6, this shows the price details of booked tractor and equipment to the user.



Figure 6.1.6 –Booking View

Figure 6.1.7, in this page user will have to select a particular date on which he/she wants to hire a tractor.

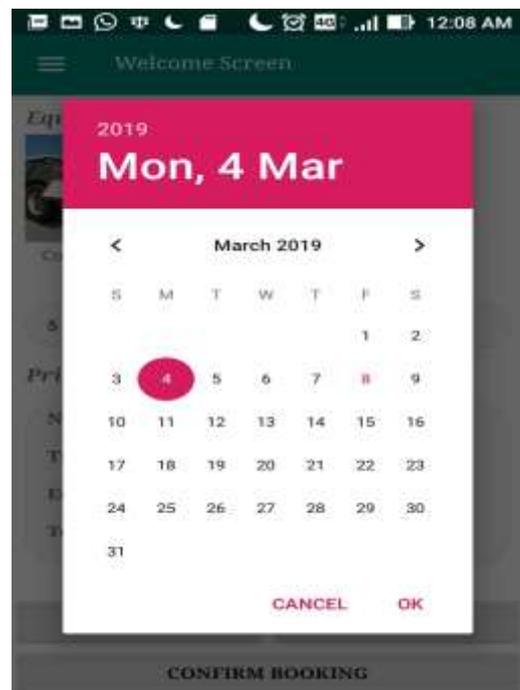


Figure 6.1.7 – Calendar View

Figure 6.1.8, in this page user will have to select a particular time on which he/she wants to hire a tractor.



Figure 6.1.8 – Time View

Figure 6.1.9, this is the payment page in which user will have to scan the QR code given to pay for the tractor.



Figure 6.1.9 – Payment

Figure 6.1.10, this page shows the history of orders.

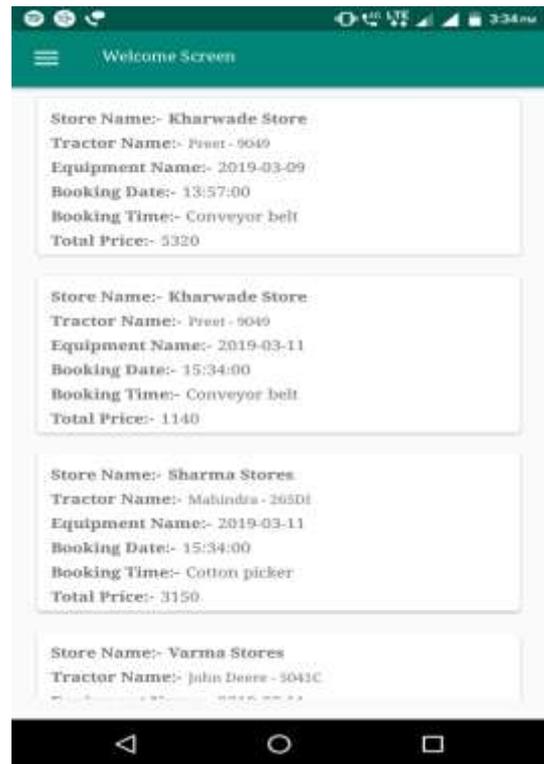


Figure 6.1.10 –Order History

7. ADVANTAGES AND APPLICATION

7.1 ADVANTAGES

There are various advantages of this application –

- **Enhance Business Processes:** To be able to use internet technology to improve the process of demand and supply of tractor.
- **Online Tractor Reservation:** A tool through which a user can reserve available tractor online prior to their expected using date or time.
- **Availability:** Tractor can be booked instantly without even going out of the home.
- **Transparency:** Users will get information about tractor and equipment and will get prior information about the rent he/she has to pay according to hour of service.
- **User friendly:** We have used two languages in this app. One is English other one is Hindi. It will make it easy for farmers to use this application.
- **Flexibility:** The farmer can choose long term or short term hire depending upon their needs and can choose any type of tractor and equipment they need.

7.2 APPLICATIONS

- Can be used as a general renting service for farmers.
- Can be used as an interface between farmers who want hire and those who want to let out equipment.
- Can be used for large scale agriculture (corporate farming).

8. CONCLUSION AND FUTURE SCOPE

8.1 CONCLUSION

By implementing the project which is ' tractor hiring application', we conclude that the problem statement is totally being eliminated through the deployment of this project. And the objective is achieved through the android application.

Firstly, we did problem analysis and we recognize the problem of farmers regarding renting a tractor and agriculture equipment for the various agriculture purposes and using our engineering knowledge we discussed and design the solution for the problem by developing an android application. While working on solution, various problems were faced for which we conduct investigation on problems of our project like gathering information on various agriculture equipment used by farmer so that we can efficiently serves the requirement of farmer. We used Hindi language to make the application easy to use for farmer. This application can be used by farmer, by maintaining the ethics of application usage. This application is developed through teamwork and it is environment friendly as it doesn't exist in physical form. We followed software engineering concepts to design and develop this project. We used the concepts algorithm and programming languages like java. We followed software development life cycle to develop our project. After performing all these tasks and completing all the processes we have learned the valuable aspects of working in a team.

8.2 FUTURE SCOPE

Future scope of this project will include deployment of this application on a larger scale, by making it compatible with other applications and various other platforms.

This project is first deployed on sub area of in a city. Then for future scope, it can be deployed in various other areas depending upon the demographics and agriculture requirement of that area.

Various other features can also be provided to the users depending on requirement and work area of project. Also apart from farmers, the owner of tractor can also register and make changes in their profile. In the future there will be more regional languages will be included.

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