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Agricultural Equipment Rental System

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Abstract: *Agriculture forms the backbone of Indian economy and there is always a need of supporting and improving it .As a part of which some of Indian NGO's are with an initiative of supporting the farmers by facilitating them with the modern agricultural equipment's on rental basis .Modern agricultural equipment's make farmers work more efficient and easy .As a part of which there are some organizations that are set up to help those farmers who are in need of such equipment's ,where the organization owns the equipment's and rent those on request of farmers at liable amounts. At present, farmers need to travel to a place to borrow all the essential needs, which is a tiresome and not a cost-effective work. So, a smart digital farming is listed as the highest-ranking technology opportunity in the latest Global Opportunity report in terms of its expected positive impact on society. This paper is on digitizing the process of renting the agricultural equipment's by the farmers .We aim at developing an application that farmers can use to get their equipment's on rent and also check the availability and renting .We also allow them to book the equipment's in advance .It also helps us to get the track of equipment's that are on rent .We also aim at developing analytic for the state heads to make better availability of equipment's and to keep track of the equipment's as well, which could help in providing better support for farmers.*

Keywords: Agriculture

I. INTRODUCTION

Agriculture forms the backbone of Indian economy and there is always a need of supporting and improving it .As a part of which some of Indian NGO's are with an initiative of supporting the farmers by facilitating them with the modern agricultural equipment's on rental basis .Modern agricultural equipment's make farmers work more efficient and easy .As a part of which there are some organizations that are set up to help those farmers who are in need of such equipment's ,where the organization owns the equipment's and rent those on request of farmers at liable amounts. At present, farmers need to travel to a place to borrow all the essential needs, which is a tiresome and not a cost-effective work. So, a smart digital farming is listed as the highest-ranking technology opportunity in the latest Global Opportunity report in terms of its expected positive impact on society. This paper is on digitizing the process of renting the agricultural equipment's by the farmers .We aim at developing an application that farmers can use to get their equipment's on rent and also check the availability and renting .We also allow them to book the equipment's in advance .It also helps us to get the track of equipment's that are on rent .We also aim at developing analytic for the state heads to make better availability of equipment's and to keep track of the equipment's as well, which could help in providing better support for farmers developing shortage of human labour. Indian farming is experiencing a progressive move from reliance on human power and creature capacity to mechanical power in light of the fact that expanding cost for upkeep of creature and developing shortage of human work. Along these lines there is a solid requirement for taking homestead automation. So, we are digitizing the agriculture equipment by the farmers.

The objectives this paper is:

- We aim at developing an application that farmers can use to get their equipment's on rent and also check the availability It reduces the cost of visiting the nodal centres to check the availability and renting.
- We also allow them to book the equipment's in advance.
- It also helps us to get the track of equipment's that are on rent
- We also aim at developing analytic for the state heads to make better availability of equipment's an to keep track of the equipment's as well which could help in providing better support for farmers

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II. RELATED WORK

Title of the work: Web-based Agricultural Rental System

Author: Seung-YeoubShin,Chang-Ho Kang,Seok-Cheol Yu, ByounggapKim,Yu-Yong Kim,Jin-Oh Kim, Kyou-Seung Lee Organization: International Journal of Invention in Electronics and Electrical Engineering

Description: This study was conducted to bring web-based system to maintain the efficient operation and management of agriculture equipment transparently. Users (farmers) may search the database of rental machinery and reserve them. A data base management system was made used for higher system compatibility and integrated work. This system was compatible with I.E 6.0 or later to ensure privacy and seamless internet operations.

High-level Design

Software development methodology

This application comprises mainly of two parts:

Front End: This part is responsible for interacting or conveying among the students and faculty of the same department.

Back End: This part is mainly responsible for the storage purpose. Oracle database is used for uploading or downloading data into or from back end using queries from front end respectively.

Detailed overview of Front End

The front end is based on Java platform where farmers can book the required machinery can be booked for a certain period of time.

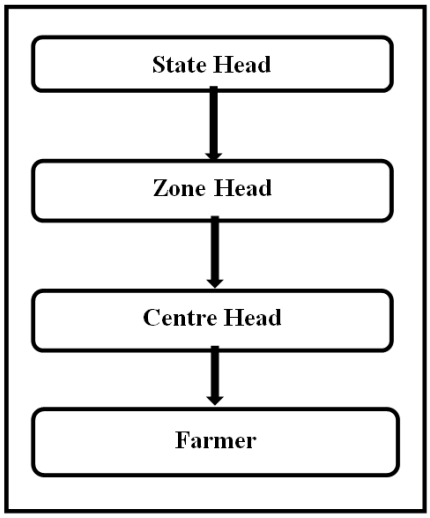

Figure 1: User hierarchy

III. FARMER SIDE OF THE APPLICATION

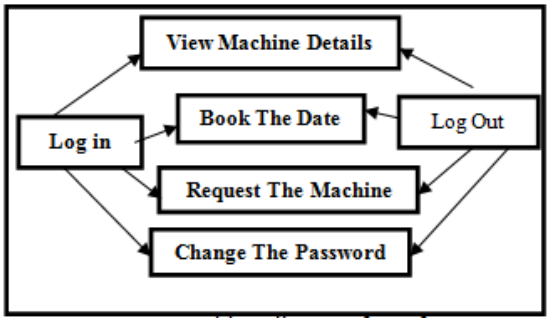

Figure 2: State Transition diagram for a farmer

Farmers has to register themselves by providing their Name, Mobile number. Upon registering successfully, each one of the will provided with an Id which will be useful for the further process. While registering, if a particular farmer is already registered with a mobile number, then an error message popup saying - this mobile number is already

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registered. Once successfully registered, farmers can login through their given Id and can choose the machine they want and can change their password also. Farmers can request the machinery, if its is not available at the centre, by filling details in the portal. They will log out at the end

Zonal Head side of the application

Zonal Head have to login to the application using the username and Password He/she can view the list of machineries ordered in a particular area.

They can perform the analytics and sanction the machineries based on the requirements

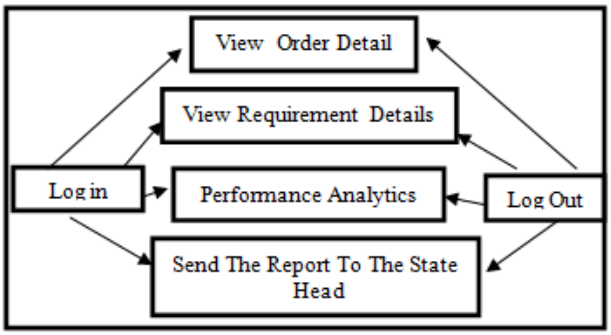

Figure 3: State Transition diagram for a Zonal Head

IV. ARCHITECTURE

Web Application Architecture

Web application architecture characterizes the collaborations between applications, middleware frameworks and databases to guarantee different applications can co-operate. At the point when a user writes the URL and press "enter", the browser loads that specific web page.

The server at that point reacts by sending information over to the browser. After that activity, the program executes those queries to the client. Presently, the client gets the chance to connect with the site. Obviously, these activities are executed inside a matter of seconds.

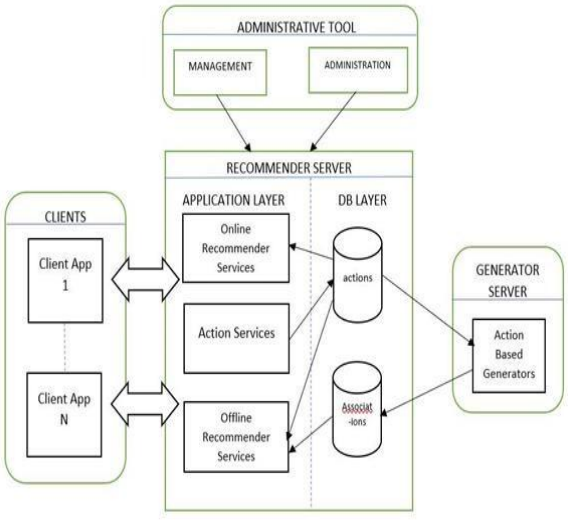

Figure 4: Web application architecture

Obviously, it is intended to work proficiently while meeting its particular needs and objectives. Web application engineering is basic since the larger part of world-wide system movement, and each and every application and gadget utilizes on-line correspondence. It manages scale, productivity, vigour, and security. In web application, there are two codes that run simultaneously:

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- One that run on browser and responds to user input.
- Other that run on server and responds to https requests.

While writing the code it is up to developer to decide how to relate these two codes.
For the server side, usually used languages JAVA
For the client side, usually used languages are XML etc.

Features of web application:

- Sending data via http which can be understandable by client-side interface and vice versa.
- Making sure request contain valid data.
- Limits the visibility of users based on permission.
- Offers authentication to users.
- Creates, modify and delete data.

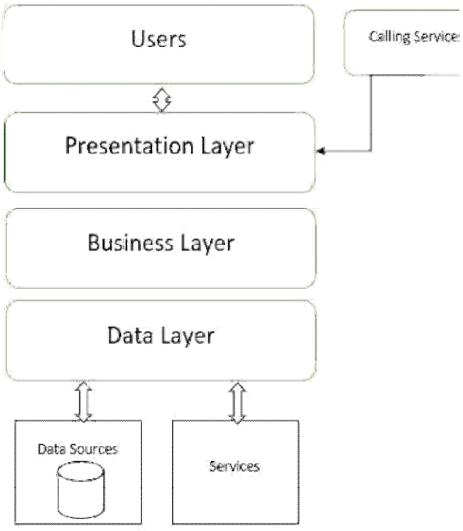

Figure 5: Mobile application architecture

Mobile application architecture

Application engineering is a lot of advancements and models for the improvement of completely organized portable projects dependent on industry and merchant explicit gauges. As you build up the design of your application, you likewise consider programs that deal with remote gadgets, for example, cell phones and tablets. Mobile app architecture design usually consists of multiple layers, including:

- **Presentation Layer** - contains UI components as well as the components processing them.
- **Business Layer -** composed of workflows, business entities and components.
- **Data layer -** comprises data utilities, data access components and service agents.

V. EXECUTION RESULTS AND DISCUSSIONS USER

Interface representation:

In order to make user interface more attractive and user friendly, many controls are used. Some of which are as follows:

- **Input field:** This allows the user to input the data into the web application. This can be used anywhere such as while entering username, password and other details to the portal.
- **Image view:** This is required to insert images (logo, pictures, etc.) to the webpages to make it more attractive.
- **Button:** This is used to submit the user details to the database. It has a clickable horizontal bar like interface.
- **Dropdown menu:** it is used to group similar functionalities under one name. When user clicks on the heading, a sub menu is dropped for user to choose from.
- **Paragraph:** This is used to simply show the necessary details to the users. Users can only read the details which are written using paragraph tag.

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Brief Description of Various Modules:

- **Register:** Farmers have to visit the centres and they have to provide their details to the centre head. These details will be dynamically added to the db. by the respective heads and farmers will be given a username and password.
- **Login:** Login module will verify if user exists and registration has been done for farmers. A separate credentials will be given for Centre, Zonal and State heads.
- **Assign equipment's:** equipment requested by the farmers will be provided by the centre Head based on the approval by the Zonal head.
- **Request machineries:** Farmers have to request the machineries if the desired equipment is not available for that date. This will be reviewed by Zonal and state Head.
- **Getting notified:** When the farmer requests for a equipment, respective Zonal head will be notified in his portal.
- **Generate reports:** Centre Head can generate reports based on the equipment's rented i.e. weekly wise, monthly wise and yearly wise and submit them to Zonal Head
- **Perform analytics:** State Head can view the graphs which are generated which shows him, in which season which equipment has been rented more in that centre and take the proper measures if the demand is more.

VI. CONCLUSIONS AND FUTURE SCOPE

The online administration framework for Agri-Equipment rental framework was made to guarantee the productive task and straightforward administration of a government-upheld farming hardware rental business

It reduces the manual work. It reduces the paper work, thus supporting the sustainable environment. It saves time also. Moreover, the proper documentation of whole project is also provided so that any-one can understand the project and can do the necessary changes if required. This application can be improved in many ways and can be extended to support multiple devices. Following are some of the possible extensions:

Analytics can be extended in such a way that State head can view, in which region which machinery is required and move to that location in prior. Inclusion of crops and fertilizers to the list. Inclusion of GPS and maps which can help in identifying the current locomotion state of

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