Krushi Yantra - Farming Machinery Rental App

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ABSTRACT:

"Krushi Yantra" is farming machinery rental application using which farmers can easily find, choose, and rent machinery, making farming more modern. It also helps with money by giving options based on how much farmers know and can pay. Using technology, the app makes renting machines easier, solving problems and making farming smoother. By looking at things like how well farmers rented before and how much they might grow, it offers choices and help with money, making farming better and helping farmers more. This new app is like a big step forward for farming, using new ideas to help farms and small towns.

Keywords: Rental App, Sustainable Agriculture, Rural Development, Financial growth, Technology

Introduction:

Problems faced by farmers in agricultural marketing include transportation costs, inadequate market infrastructure, price fluctuation, lack of proper market information, and the role of exploiting local traders and middlemen. Lack of storage facilities in rural areas has been a limiting factor for post-harvest losses. Many farmers take finance from banks for buying agricultural machinery such as tractors, harvesters, etc. To overcome this, we have designed "Krushi Yantra" – A farming machinery rental app which will connect farmers to do farming in an effective way by making the right farm machinery available at the right time while also providing employment opportunities.

Benefits of "Krushi Yantra" includes :

- **Empowering Farmers:** By offering a diverse range of high-quality machinery without the burden of ownership, we level the playing field, ensuring that success in agriculture is within reach for everyone.

- **Benefits for Farmers and Machinery Owners**: For farmers, our platform offers cost-effective access to top-of-the-line equipment, enabling them to enhance productivity and efficiency while minimizing costs. Meanwhile, machinery owners can optimize the utilization of their assets by listing them on KrushiYantra, generating additional income and maximizing return on investment.

- **Sustainable Agriculture:** By facilitating machinery rental, we minimize resource wastage and reduce the carbon footprint associated with equipment ownership. we work for eco-friendly future in agriculture.

Review of Literature:

Many applications are in use by farmers which provides information on crop production, crop protection, smart farming, and relevant allied services.

Comparative study of some agricultural applications are as given below in Table 1 :

Sr. No	Name of Application	Description	Facilitate farming machinery on rental
1	Krishi Kisan	Promote effective natural resource management, and community development, and facilitate transboundary cooperation for the global public good.	No
2	Dehaat	Based on seed-to-exchange seeds	No
3	Kisan Suvidha	It provides quick and appropriate information regarding farming to farmers.	No

| 4 | AgriApp | AgriApp provides a personalized crop calendar of events for your planned crop for the entire set of operations on a real-time basis. | No |
| 5 | Sonalika Agro Solutions | Connects farmers with a range of machinery renters that offer high-tech agricultural implements on rent within their vicinity. | Yes |

Table 1: Comparative study of agricultural applications used by farmers

In rural India 75 to 80 percent of farmers use a smartphone. Farmers can easily carry a smartphone with them to the field to record field data and manage farm resources right at the field. Moreover, smartphone-based sensors such as microphone, camera, GPS, accelerometer, and several others can tremendously ease farm journaling and other farm management tasks In India, about 80 percent of farmers are small farmers, who need credit for cultivation and equipment's.

Methodology

Considering money crunch and need of equipment's by farmers, we have designed Farming equipment rental mobile app using Flutter and Firebase Module details as follows:

Frontend Modules :

1. User Interface (UI): The visual interface that users interact with, including screens, buttons, forms, and navigation elements.

2. Views and Screens: Individual screens or views within the app, such as the machinery catalogues, booking page, user profile, and messaging interface.

3. Components and Widgets: Reusable UI elements like buttons, input fields, lists, cards, and dialogs used throughout the app.

4. Routing and Navigation: Navigation components that manage the flow between different screens and views within the app, such as tabs, drawers, and navigation bars.

5. State Management: Components responsible for managing the state of the application, including user authentication state, data fetching/loading states, and form states.

6. User Input Handling: Components for handling user input, including form validation, error handling, and input sanitization.

7. Booking System Interface: Components for browsing available machinery, selecting rental dates, and completing the booking process, including calendars, search filters, and booking confirmation dialogs.

8. User Profile Management: Components for managing user profiles, including profile editing, viewing booking history, and managing Favourites.

Backend Components:

1. Server Application: The backend application is responsible for handling requests from the front end, processing data, and executing business logic.

2. API Endpoints: Components that define endpoints for handling various operations, such as fetching machinery listings, processing bookings, sending messages, and managing user accounts.

3. Database: A database system for storing and managing data, including user accounts, machinery listings, bookings, messages, and application logs.

4. Authorization Middleware: Middleware components for verifying user permissions and restricting access to certain endpoints or resources based on user roles.

5. Business Logic: Components for implementing the core business logic of the application, including machinery rental rules, pricing calculations, and availability checks.

6. External Integrations: Components for integrating with external services and APIs, such as payment gateways, geolocation services, and messaging platforms.

7. Error Handling and Logging: Components for handling errors gracefully, logging application events, and monitoring system health and performance.

These frontend and backend components work together to create a seamless and efficient farming machinery rental app, providing users with a smooth and intuitive experience while ensuring the security, reliability, and scalability of the application.

Results

KrushiYantra's user-centric approach extends beyond the frontend interface to encompass robust backend infrastructure and support systems. With efficient booking and reservation systems, the platform ensures a smooth and hassle-free experience for users at every step of the rental process.

Figure 1 : KrushiYantra -Home Screen   Figure 2: - Login Page

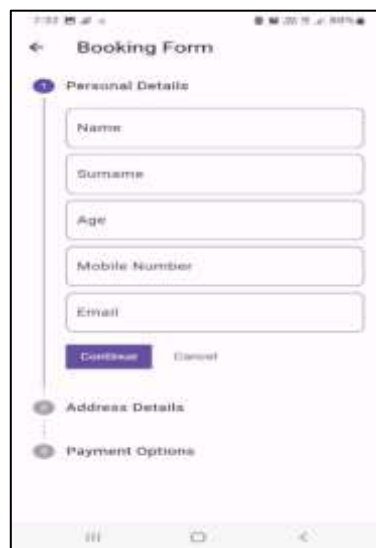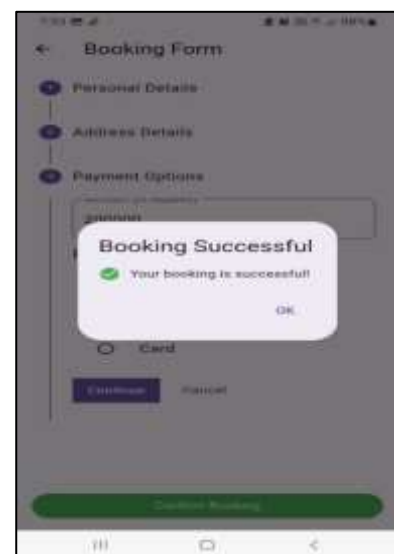Figure 3 : Machinery Catalogue   Figure 4 : Booking Form   Figure 5 : Booking Confirmation

After Booking Successful notification , user can contact equipment owner and track equipment delivery status through system .

Conclusion:

In conclusion, KrushiYantra represents a pivotal advancement in the agricultural sector, offering farmers a transformative solution to access modern machinery without the burden of ownership. Through its comprehensive catalog, user-friendly interface, and commitment to sustainability, KrushiYantra has revolutionized the way farming machinery is rented and utilized. By bridging the gap between farmers and machinery owners, KrushiYantra fosters collaboration, efficiency, and innovation within the agricultural community. As the platform continues to evolve and adapt to the changing needs of farmers, it stands poised to drive positive change and empower agricultural stakeholders worldwide. KrushiYantra's impact extends far beyond the confines of a digital platform, shaping the future of agriculture and paving the way for a more sustainable and prosperous industry for generations to come.

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