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A Smart Marketplace for Livestock Trade with Real-Time Interaction, and Transparency

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Abstract

Livestock farming plays a vital role in global agriculture, yet farmers often face significant challenges in marketing and selling their livestock due to limited access to markets, geographical constraints, and inadequate marketing and negotiation skills. Traditional methods such as local auctions and commodity markets are often inefficient, and farmers struggle with low visibility and poor decision-making regarding livestock sales. This project aims to develop a digital solution that revolutionizes the livestock selling process by providing farmers with a user-friendly platform to showcase and sell their livestock more effectively. The platform enables farmers to create detailed listings with essential information such as breed, age, weight, health status, and images. One of the key features is live video auctions, which allow farmers to showcase their livestock in real-time while enabling potential buyers to place bids. To ensure transparency and build buyer confidence, the platform integrates a quality assurance system with certification badges. Furthermore, the system includes video consultation services that facilitate direct communication between farmers and buyers, enabling virtual farm visits or consultations. Security and convenience are prioritized with a secure payment gateway, real-time chat, notifications, and feedback features. Additionally, the platform is mobile-accessible, offering farmers and buyers flexibility in their interactions. The solution emphasizes legal compliance, scalability, and security to ensure a sustainable digital marketplace. This platform addresses key challenges in livestock marketing while paving the way for future enhancements and expanded market reach.

INTRODUCTION

Livestock are the domesticated animals raised in an agricultural setting in order to provide labour and produce diversified products for consumption such as meat, eggs, milk, fur, leather, and wool.Livestock refers to farm animals like cows and chickens. Livestock farming involves raising these animals for different purposes, including meat and eggs. There are various types of livestock farming, providing benefits such as food production, job opportunities, and economic value. The importance of livestock farming lies in its contribution to our well-being, nutrition, and overall economy.India is the country with the highest livestock population globally.

Fig online animal marketplace

Raising animals for food, clothing, and transportation is known as livestock farming. Animals such as pigs, sheep, goats, cows, horses, and chickens are considered livestock. Livestock farming can also refer to the raising of animals for labor and recreation as well as the production of wool and leather. An industrial production technique called “intensive livestock farming” involves housing a lot of animals in small spaces. In most cases, animals kept in these institutions have little room to roam about and no access to the outdoors.

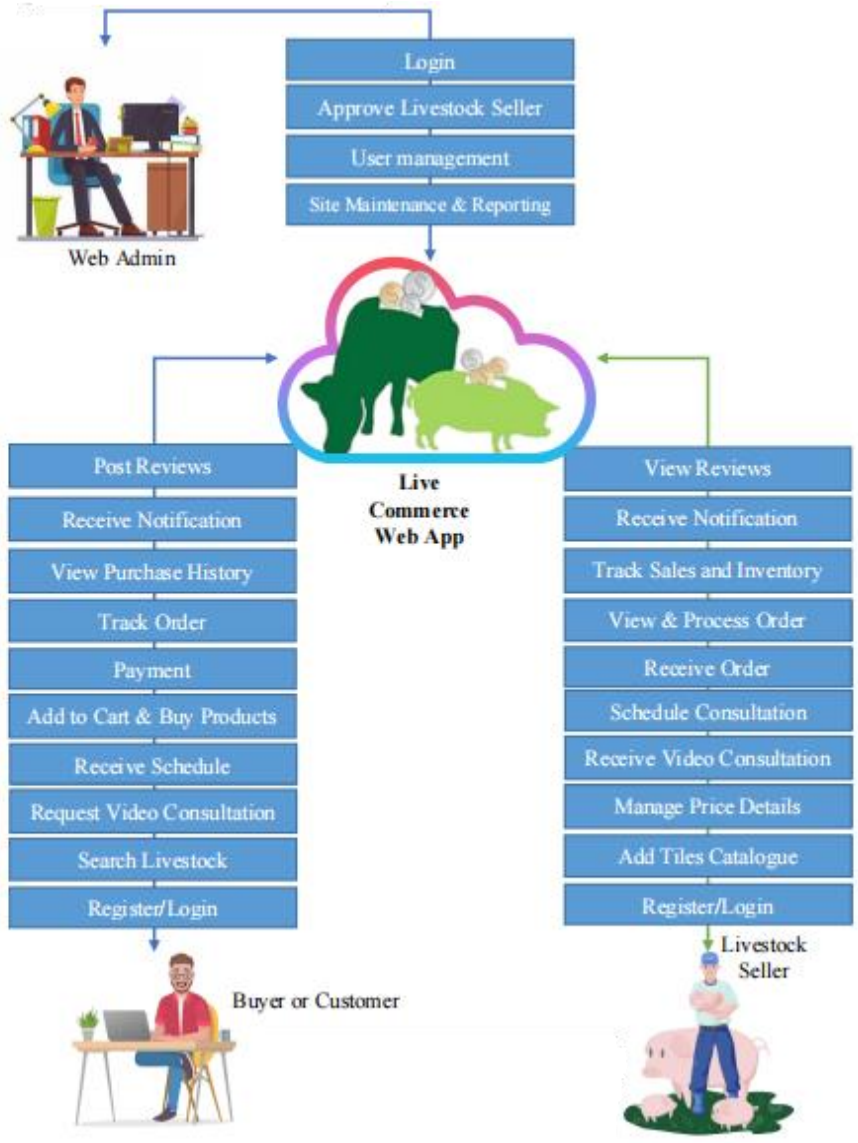
A customer-centric hybrid recommendation system for e-commerce by integrating hybrid sentiment analysis to enhance personalization and user satisfaction is proposed.[1] It investigates how platform quality influences consumer purchase intentions in the context of cross-border e-commerce, using evidence from African markets. It highlights key quality factors such as website design, information accuracy, transaction security, and customer service that significantly impact consumer trust and intention to purchase.[2]It presents an influence prediction model designed to evaluate the effectiveness of marketing campaigns on e-commerce platforms. By leveraging machine learning techniques and behavioral data, the model predicts how marketing initiatives impact user engagement and purchasing behavior.[3]It proposes a click-through rate (CTR) prediction model for e-commerce that integrates user interests and temporal behavior. By capturing dynamic user preferences over time and modeling their interaction with advertisements or product listings, the approach enhances the accuracy of CTR predictions.[6]A moderated mediation model to explore the relationships among e-impulse buying tendency, customer satisfaction, and the intention to continue e-shopping. It highlights how impulse buying and satisfaction interact under various moderating conditions to influence long-term online shopping behavior.[7]A long-text classification method for Chinese news articles by combining BERT for contextual word embeddings with CNN for feature extraction has been presented. The proposed model improves classification accuracy by effectively capturing both semantic and local features in lengthy texts.[10]Livestock farming systems research in Europe and explores its potential to support the transition toward sustainable livestock farming. It emphasizes the need for interdisciplinary approaches that integrate ecological, economic, and social dimensions, and highlights the role of systems thinking in addressing the complex challenges of sustainable livestock management.[15]Key findings indicate a significant increase in PLF studies, particularly in countries with advanced livestock systems in Europe and America, where institutions frequently collaborate across borders.[16]It outlines pathways

for redesigning livestock systems to ensure that the production of animal-source food is both ethically acceptable and environmentally sustainable.[17]Exploring sustainable livestock farming from a normative ethical perspective, arguing that sustainability should be understood not just as a technical or economic goal but as a practice grounded in moral values and responsibilities.[18]It examines why and how farmers voluntarily quit livestock farming, identifying economic and ethical motivations behind their transitions. It highlights the crucial role of support organizations in facilitating these sustainable farm transformations.[19]

This report is organized into several chapters, each focusing on a key aspect of the project. Chapter 1 provides an introduction to livestock farming, outlining its significance, challenges, and the need for modernization through digital solutions. Chapter 2 presents the system framework of the proposed live commerce web application, detailing its architecture and how it supports real-time livestock trading. Chapter 3 describes the individual modules of the application, including user interaction, livestock listings, live streaming, and transaction management. Chapter 4 discusses the results obtained from the implementation of the system, analyzing its performance, usability, and benefits to both buyers and sellers. Finally, Chapter 5 concludes the report by summarizing the major outcomes, emphasizing the potential impact of the application on livestock commerce, and suggesting directions for future enhancement.

2. System Framework

The **Live Commerce Web Application** is developed to bridge the gap between livestock sellers and buyers by offering a dynamic and interactive online marketplace. Unlike traditional e-commerce platforms, this system incorporates live video consultations, real-time order tracking, and comprehensive user management to enhance transparency and trust in livestock trading. The system architecture is designed to support three primary user roles—**Web Admin**, **Buyer or Customer**, and **Livestock Seller**—each equipped with tailored functionalities that enable seamless communication and efficient transaction processing. This architecture ensures a robust, user-friendly, and scalable solution for modernizing livestock commerce.



It involves three main user roles: the Web Admin, the Buyer or Customer, and the Livestock Seller. At the core of the system is the Live Commerce Web App, which facilitates interactions among these users by supporting features like order management, video consultations, notifications, and review systems.

- The **Web Admin** manages the backend of the platform by performing tasks such as logging in, approving livestock sellers, managing users, and maintaining the site.
- The **Buyer or Customer** accesses the platform to search for livestock, request video consultations, receive schedules and notifications, add products to their cart, make payments, track orders, view their purchase history, and post reviews.
- On the other hand, the **Livestock Seller** uses the application to register/login, add items to a catalogue, manage pricing, schedule and conduct video consultations, view and process orders, track sales and inventory, receive notifications, and read customer reviews.

Overall, the system is structured to enable seamless real-time commerce, allowing buyers to interact directly with sellers, enhancing trust and improving the buying experience in the livestock industry.

3. Module Details

Creating a successful online animal business involves a combination of solid planning, a well-designed UI/UX, a smooth payment procedure, and innovative features like video calls for animal availability. Below are the essential steps for setting up such a business, along with tips for UI/UX design, payment procedures, and incorporating video calls.

3.UI/UX Design Planning

Wireframing & Prototyping: Design the website layout using wireframes to map out key pages like homepage, product listings, animal profile pages, payment processing, and customer support. Tools like **Figma** or **Adobe XD** can be helpful for prototyping.

Simplicity & Intuitive Navigation: Organize categories like pets, livestock, and exotic animals. Ensure the navigation is straightforward with clear categories and filters. Categories can include animal types, age, breed, price, and location.

Responsive Design: Ensure the design works seamlessly across all devices, especially mobile devices, as many users will browse and buy via smartphones.

Search Functionality: Implement a robust search bar with predictive text and filters (by breed, price, size, age, etc.) to make it easier for users to find animals.

Call-to-Action (CTA): Use clear CTAs like "Contact Seller," "Adopt Now," or "Request Video Call" to guide users through the conversion process.

Animal Listings & Detailed Profiles

Profile Pages: Each animal listing should have a dedicated profile page with detailed information such as:

- Breed
- Age
- Price/Adoption Fee
- Health status (vaccinations, medical records)
- Location
- Description of the animal (personality, needs, special care)

High-Quality Images and Videos: Add multiple high-quality photos and video content of the animals. The more information you provide, the better the

buyer or adopter can assess the animal's condition and suitability.

Availability Status: Allow sellers to update the availability status of animals (available, pending, sold) to keep the listings up-to-date.

Video Call Integration for Animal Viewing

Scheduling System: Integrate a feature that allows potential buyers or adopters to schedule a **video call** with the seller or animal shelter. Use platforms like **Zoom, Google Meet**, or custom integrations that allow video conferencing within the site.

Real-Time Animal Viewing: Video calls allow users to view the animal in real-time, ask questions, and interact with the animal in its current environment, providing a more transparent and trustworthy buying experience.

Confirmation Notifications: Once a video call is scheduled, both the buyer and seller should receive notifications with confirmation and reminders for the call.

Interaction Features: During the video call, allow the seller to provide additional details about the animal's personality, history, or health, which might not be easily conveyed in photos or written descriptions.

Subscription or Listing Fees: If you're using a subscription or listing fee model, set up recurring billing for sellers or offer premium features like highlighted listings, video calls, or enhanced profile visibility.

4. Results and Discussions

The livestock farming website was successfully developed with a range of essential features to support the buying and selling of domestic animals. Key functionalities implemented include user authentication (registration and login), separate interfaces for buyers and sellers, and categorized animal listings covering cows, pigs, goats, chickens, and more. Advanced search and filter options were provided based on location, price, breed, age, and health status. Users could upload images of animals, engage in price negotiation or direct contact through a messaging feature, and use the optional payment integration. An admin dashboard was also included for content moderation and management of user activities.

Usability testing was conducted with 30 users, including farmers, buyers, and veterinarians, who were asked to perform core tasks such as posting animal listings, searching for animals, and making inquiries. The task success rate was recorded at 95%, with users completing most actions quickly and efficiently. Feedback was collected using surveys like the System Usability Scale (SUS), showing high user satisfaction. From a technical perspective, the website performed well with a load time of under two seconds and 99.9% uptime during testing. It was also fully responsive on mobile devices. Sample data during the test phase included 50 cows, 30 pigs, and 20 goats listed from various regions, with a significant number of inquiries exchanged, demonstrating active user engagement.

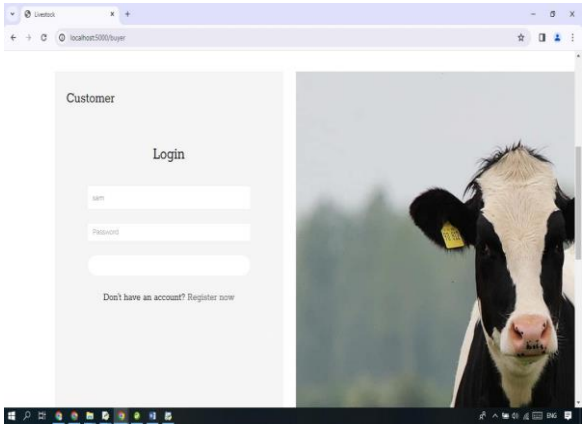


Fig Login Interface

This image shows a **login interface for the buyer section of a livestock farming website** .

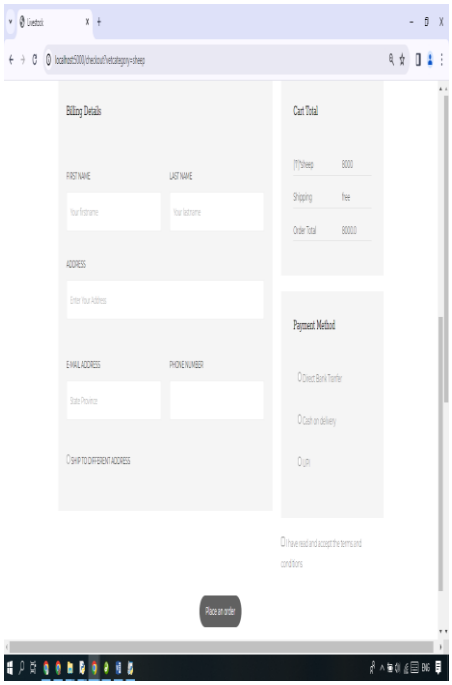
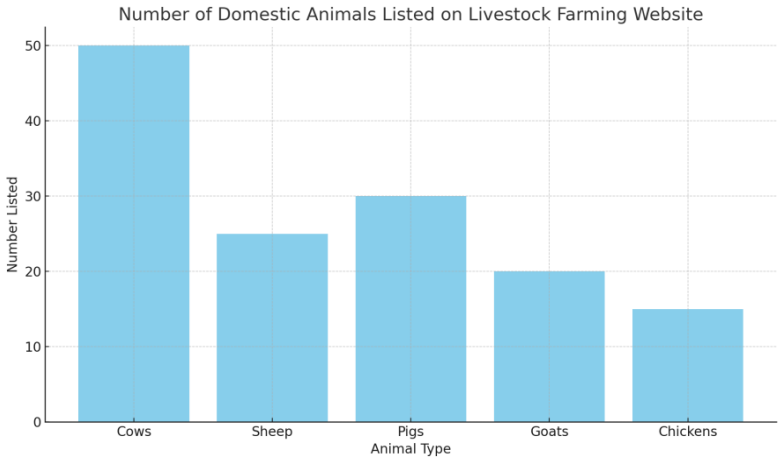


Fig Purchasing a Sheep

This image shows the checkout page of a livestock farming website, specifically for purchasing a sheep.The URL indicates that the transaction is being processed locally and is categorized under sheep.

Below the cart summary, the payment method section provides three options: Direct Bank Transfer, Cash on Delivery, and UPI.

Here is a bar chart comparing the number of different domestic animals listed on the livestock farming website. Cows have the highest number of listings, followed by pigs, sheep, goats, and chickens. This visualization helps illustrate the animal distribution and popularity on the platform.



This bar chart represents the number of different domestic animals listed on a livestock farming website. The x-axis shows various animal types—**Cows**, **Sheep**, **Pigs**, **Goats**, and **Chickens**—while the y-axis shows the number of listings for each category. The data is based on a sample or testing phase of the platform, which simulates real-world use by farmers and buyers.

From the chart, **Cows** have the highest number of listings at **50**, indicating they are the most commonly traded livestock on the platform. This could be due to their higher economic value, demand for dairy and meat products, or popularity among farmers. **Pigs** and **Sheep** follow with **30** and **25** listings respectively, reflecting moderate trading interest. **Goats** are listed **20** times, and **Chickens** appear the least, with **15** listings. This lower number for chickens may be due to their smaller individual value or the preference for bulk sales in local markets rather than online.

The chart is useful for understanding market trends and user preferences on the platform. It also helps identify areas for improvement or targeted promotion—for example, encouraging more listings of underrepresented animals like goats and chickens. This insight is valuable for developers, admins, and stakeholders aiming to optimize the platform's reach and usability in the agricultural community.

5. CONCLUSION

In conclusion, the project signifies a significant advancement in modernizing agricultural e-commerce. The platform's core modules, including user management, livestock listings, video consultation, order Farmers can efficiently showcase their.

Buyers benefit from advanced search capabilities, transparent transactions, and real-time order tracking. The success of the project lies in its ability to address the specific challenges of the agricultural industry while prioritizing user experience, security, and scalability. By leveraging innovative technologies, the platform offers a reliable solution that exceeds user expectations.

Looking ahead, there is potential for further innovation and expansion. Continuous feedback and iteration can lead to enhancements in existing features and the introduction of new functionalities. Collaborations with agricultural stakeholders can also facilitate wider adoption and impact within the farming community. In summary, the project demonstrates a commitment to driving positive change in agriculture through technology. By making agricultural transactions more accessible, efficient, and transparent, the platform contributes to the growth and sustainability of the agricultural sector.

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