

AntiqCart: A Case Study on Revolutionizing the Antique Marketplace with AI Analytics

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Abstract- The increasing demand for ownership of authentic antiques, combined with persistent inefficiencies of a traditional physical marketplace, signals the necessary evolution of this industry. The traditional exchange of antiques through regular physical auctions, local exhibitions walk-in dealers' stores and manual valuations, all have limitations in efficiency, transparency, efficiency, bespoke personalization, and lack of global accessibility. AntiqCart will usher the antique trade into a new era with an artificial intelligence powered platform that studies the antique marketplace and new technologies, and creating new antique asset classes. Examples of important features through the platform consist of smart artifact identification, analytics driven product recommendations, secure digital purchases and sales, provenance checks, both real-time and historical Analysis of market trends, and bespoke seller-buyer focused interactions. AntiqCart has a solution that creates accessibility, trust, customer experience, and supports decision making on the boundaries of long-term historical research and preserves the antiquity of the trade and introduces both modern means and Artificial technologies because antiques from antiquity have been around longer than consumer or trade emergences of interest. These combined interests in the antique trade through AntiqCart present and connect traditional antique trading and business to modern digital experience through a highly connective environment to articulate the user experience. Ultimately, our goal is to create a holistic, safe, smart marketplace for collectors, enthusiasts, and sellers around the world.

Keywords: Antique marketplace, Artificial Intelligence, Provenance checks, Secure transactions, Real-time analytics, Automated product recommendations, user-centered design.

I. INTRODUCTION

The antique market has always depended on in-person auctions and exhibitions, and retail dealers. While these ensure the credibility of any transaction, they limit accessibility, transparency, and reach. Consequently, collectors and sellers experience challenges such as counterfeit risks, permissionable pricing, and limited access to buyers. Ultimately, even true artifacts are undervalued, and buyers have limited means of verifying authenticity and other specifications. Antiques are in demand internationally, and the specific challenges presented by an open marketplace indicate an urgent need for an antique-specific digital environment. Most typical e-commerce environments are designed around the retail model, with no frameworks for tracking provenance, artifact recognition, or enticing suggestions.

The difference is too vast between historical activities, and the expectations

of the modern, newest generation, tech-savvy user. AntiqCart proposes to fill in the gap by defining the antique marketplace through Artificial Intelligence (AI) and advanced analytics. The platform's design gravity, and particular layout include; secure digital transactions, real-time market information, and real-time AI artifact recognition and artifact specific new and used auction suggestions. For sellers, the platform affords sellers tools for pricing, promotion, and market observation. For buyers, the platform delivers collaborative experiences, trust assurance and greater access to information. In its innovation, AntiqCart merges heritage and technology to fashion a new thrift, collaborative-sharing ecology that is replicable, user-friendly, and borderless.

II. LITERATURE SURVEY

The Digital Transformation of the Antique Market (2023) report points out the absence of a unified digital platform in the antique market, which gives

rise to trust problems, restricted transparency, and the inability to verify authenticity. The report suggests that AI-based verification tools and better digital platforms can make access more convenient and secure while opening up the global marketplace. Artificial Intelligence in Art and Antique Authentication: Research (2024) explains how forgery and fake antiques lower the level of trust in online marketplaces. AI has been commonly used for authentication of high-value collectibles to detect fraud, but despite its effectiveness, issues remain such as the requirement for extensive datasets and human verification. Future research directions are integrating AI authentication with blockchain to ensure secure tracking of provenance.

The research on Market Dynamics and Antique Trade Pricing (2023) remedies the lack of standardized pricing, which tends to lead to manipulation, subjective valuation, and unstable demand. Machine learning models are suggested for predictive pricing based on historical sales records. AI-based pricing software can enhance transparency and equality, but expert verification and alignment with real-time market data are required for accuracy. Blockchain Provenance Tracking for Antiques Research (2023) targets unverifiable ownership history and authenticity issues as challenges. Restrictions include reluctance from conventional sellers, expensive implementation, and technical complexity. The research advocates combining smart contracts to ensure secure transfer of ownership. Blockchain provides a secure means of authenticating, but its success depends on mass acceptance.

Lastly, Consumer Trust in Digital Antique Marketplaces (2024) considers the hesitation of buyers in making online antique purchases from fear of fraud risks, untrustworthy sellers, and concerns about authenticity. The challenge found is the absence of standardized verification systems and secure payment platforms. Solutions include AI-powered seller credibility scoring, blockchain-based escrow payments, and rating systems driven by users. Safe transactional methods and sophisticated verification can greatly enhance

consumer trust and market reliability. These factors are behind the success of modern food delivery systems.

III. METHODOLOGY

AntiqCart: Empowering the Antique Market Place with AI & Analytics is conceived as a modular full-stack web application that leverages cutting-edge technologies for its stability, security, as well as for the ease of use of the users. The stages covered by the implemented workflow are the collection of requirements, system design, technology choice, implementation, testing, and deployment.

Requirements Gathering:

The initial research involved the identification of the requirements of collectors, antique dealers, and auctioneers. User registration, antique browsing, AI-based valuation, bidding management, secure payment integration, real-time tracking, and fraud detection features were among the most important requirements discovered.

Technology Stack:

The application is developed using the MERN stack:

- MongoDB – A NoSQL database used to store user profiles, antique listings, bids, and transactions.
- Express.js – A backend framework running on Node.js, used for handling server-side logic and API routing.
- React.js – A JavaScript frontend library used to build an easy-to-use and responsive marketplace interface.
- Node.js – The server runtime environment where the backend application logic is developed.

System Design:

- **Frontend** – The user interface is dynamic and built using React.js, ensuring responsiveness across all devices. The interface includes antique display, bidding system, personalized recommendations, and secure login functionality.
- **Backend** – Developed with Express.js and Node.js, the backend handles user authentication, auction processing, and fraud

detection. An API interface manages communication between the client and server.

- **Database** – MongoDB is used to store application data in collections, including user information, antique items, bid history, and transaction records.

Core Functionalities:

- **User Authentication** – Users can securely register or log in with hashed passwords and JWT (JSON Web Token) authentication.
- **Antique Browsing & Valuation** – Users can browse antiques, which are valued using an AI-driven approach with detailed provenance records.
- **Bidding & Purchase** – Users can place live bids or purchase antiques directly.
- **Order & Transaction Management** – Purchases, ownership history, and related records are securely tracked.
- **Payment Gateway** – Secure payment APIs such as Razorpay or Stripe are integrated to handle online payments safely.
- **Real-Time Tracking** – Provenance tracking using blockchain technology along with order and delivery updates.
- **Admin Dashboard** – Provides administrators with tools to manage products, verify authenticity, and maintain transaction records.

Testing and Deployment:

Tests at the unit, integration, and acceptance levels were conducted by users to verify if the software is functional, easy to use, and secure. The release of this work is done on an AWS or Heroku backend platform and Vercel or Netlify frontend hosting.

IV. MODELING AND ANALYSIS

The modeling and analysis phase of AntiqCart: Revolutionizing the Antique Marketplace with AI & Analytics is all about capturing the system behavior, figuring out the main components, and setting up the data and interaction flow between buyers, sellers, auction houses, and the platform. This step is essential to guarantee the stability and scalability of the design before proceeding with the development stage.

Use Case Analysis:

The application is designed with multiple user roles, each defining specific interactions:

- **Collector/Buyer** – Browses antiques for sale, participates in auctions or places bids, makes payments, tracks order status, and receives updates on ownership and provenance.
- **Antique Seller** – Manages antique listings, updates availability, sets starting bids or fixed prices, and tracks sales.
- **Administrator** – Monitors overall platform activity, manages user data, verifies the authenticity of antiques, and ensures marketplace stability.
- **Delivery/Logistics Personnel** – Receives delivery tasks, updates delivery status, and ensures antiques are safely delivered to buyers.

System Workflow and Data Flow:

The Data Flow Diagram (DFD) outlines the essential logic and flow of the Antiqcart application, When a customer Selects an item, the information about the selection is passed on to the Add Product to Cart process. The process, in return, takes the product as a Cart item and stores it in the Shopping Cart data store, which is a collection of the customers selected items. Then, the Checkout process gets the Item information from the Shopping Cart to advance the purchase.

Afterwards, the Collect Payment process is handed the payment details via a Post to obtain the payment securely with the Credit Card Company and thus the money to be received. The system creates a receipt and sends it to the user.

Problems with payment cause the Order Issue process to be activated. Through this, the request for Shipping is sent to the Inventory data store to check the availability of the product and also the request is sent via the system to Accounting for financial records. Lastly, the Inventory sends the Ship product data to the Customer to complete the transaction.

This DFD is a successful representation of a neat and stepwise flow starting from the customer selecting an item to the final delivery thus ensuring smooth

coordination between all system components and external entities.

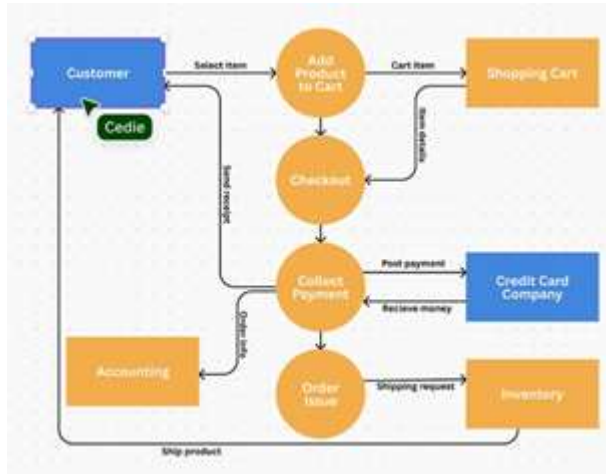


Fig. 1: Data Flow Diagram (DFD)

Database and Entity Modeling:

An Entity-Relationship Diagram (ERD) was created to define relationships among core data components:

- User Table: Stores user information including userId, username, email, passwordHash, and address; linked to orders and cart.
- Product Table: Contains productId, name, description, price, and stock; related to categories and carts.
- Order Table: Stores orderId, userId, orderDate, status, and totalAmount; linked to payments.
- Cart Table: Represents shopping cart with cartId, userId, createdAt; holds multiple products.
- Payment Table: Contains paymentId, orderId, paymentDate, amount, and paymentMethod; linked to orders.
- Category Table: Holds categoryId, name, description; organizes products.

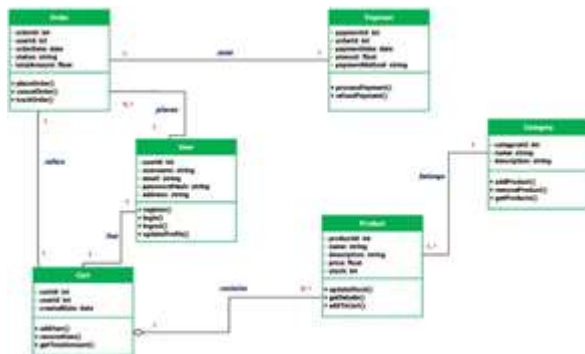


Fig. 2: Entity-Relationship Diagram (ERD)

System Architecture:

The web application is built using a three-layered architecture:

- Front-End Layer: Designed with HTML, CSS, JavaScript, and Bootstrap to ensure responsiveness and easy navigation.
- Back-End Layer: Powered by Node.js and Express.js, handling all server-side logic and API requests.
- Database Layer: Utilizes MongoDB for flexible and document-oriented data storage.

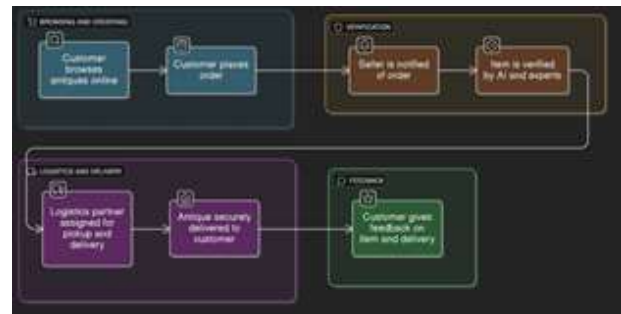


Fig. 3: Working of Antiqcart Web Application

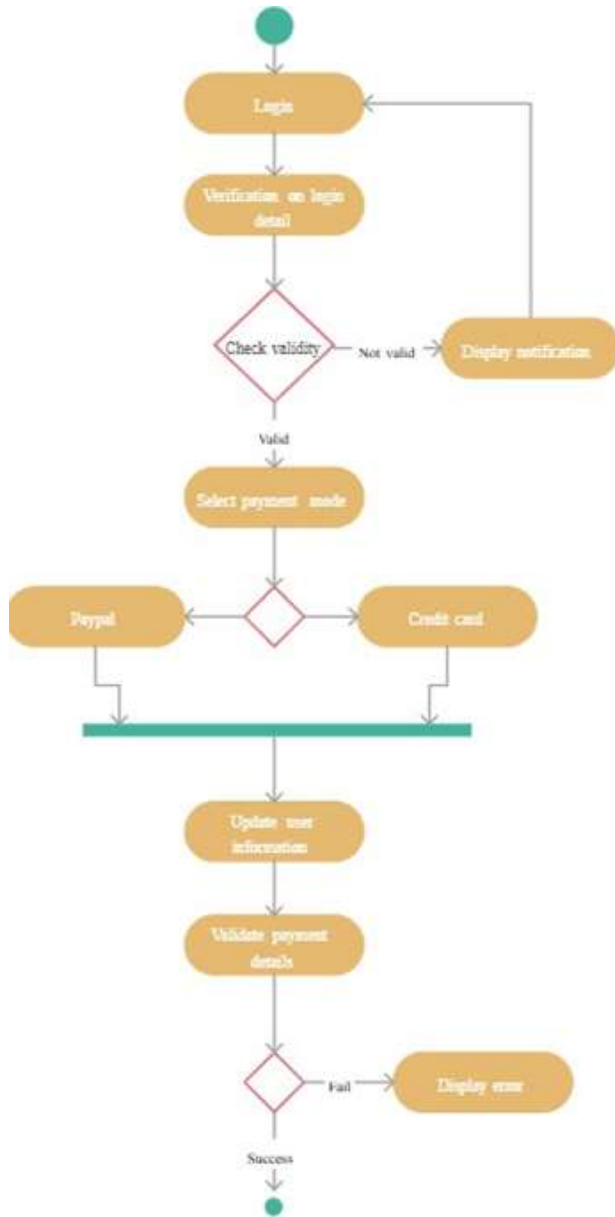


Fig. 4: The Mechanism From User End

V. RESULTS

AntiqCart Web Application is a platform idea that revolves around linking new antique buyers, the old collectors, and sellers, with an emphasis on trust, accessibility, and authenticity. By working with such a system, the users will be able to enjoy an AI-based product verification service, real-time inventory monitoring, and personalized recommendations as a result of their preference and browsing behavior. Intuitive seller dashboard that facilitates

management of listings, processing of orders, and following up on customer feedback is what sellers get as a benefit from the platform.

By having a modular design as the basis, the platform assures the extendibility and effortless updating with no interference with the daily routine. Protective measures, for instance, password hashing, token authentication, and encoded payment gateways, which provide security for the user data and transactions. Part of the technical issues that had been pointed out during the testing process were repaired through system optimization.

The users suggested various features that would be good for future updates, such as augmented reality preview of antiques, push notifications for new listings, and a separate mobile app for easy access. Likewise, it is basically the union of traditional antique trading with digital innovation that the platform conveys, which is the empowerment of buyers and sellers alike, and not only that, but also the establishment of trust and efficiency in the rapidly growing online antique marketplace.

VI. PROJECT SCREENSHOTS

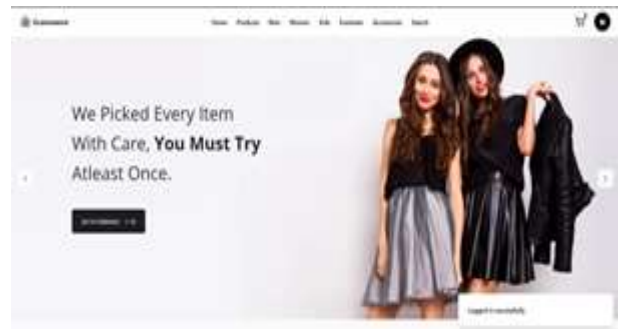


Fig. 5: User Home Page



Fig. 6: Admin panel



Fig. 7: sign up page

VII. FUTURE WORKS

The AntiqCart Web Application future updates will primarily revolve around widening their functionality and improving their user experience. Part of the objectives is to create a mobile app for both Android and iOS which will make the platform more accessible and to implement an AI-based recommendation system to offer antique suggestions that are more relevant to each user based on the preferences, browsing history, and collecting patterns. The company will also upgrade the platform with multilingual support so as to provide service to a wider user base. Further an exclusive seller and auction partner modules to facilitate better coordination, inventory management, and real-time bid and order updates.

The next features of the company will include virtual reality previews of the artifacts, AI-based chatbot for instant customer support, the use of intelligent feedback to provide better services, and AI-powered fraud prevention will be there to guarantee the authenticity of the artifacts and also reduce the number of counterfeited products. The purpose of the next developments is to turn AntiqCart into a complete, smart, and scalable platform that connects the old-fashioned antique trading with the trend of online analytics, thus, making both buyers and sellers at the online antique trade fair empowered.

VIII. CONCLUSION

Ultimately, the AntiqCart Web Application project significantly opens up possibilities in the modern antique market by effectively meeting the needs of

buyers and sellers through a reliable, transparent, and technology-driven platform. In fact, at a time when trust and authenticity are some of the major issues, AntiqCart is solving the problem by integrating the old-fashioned antique trading with the AI-based verification process, on-demand recommendations, and secure transaction management. Moreover, the real-time inventory tracking, seller dashboards, AI-driven authenticity checks, and intelligent feedback analysis features make the platform not only robust but also user-friendly.

While it does not only attract collectors and enthusiasts by presenting them with a curated, reliable marketplace, it also makes sellers and artists who operate on a small scale more powerful by providing them with a well-organized system to manage their listings and get them closer to more buyers. The initiative helps in modernizing the antique trade which is a mostly informal market by going digital for the old stuff, thereby maintaining the authenticity and cultural value of collectibles.

The AntiqCart is likely to grow and make a lasting impression both in the local and global antique markets with its upcoming advances such as mobile applications, augmented reality previews, AI-powered chat support, and multi-language accessibility. To sum up, the project lays down a scalable foundation for the revolution of buying, selling and experiencing of antiques.

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