



## Case Study: Analysis and Comparison with Existing Work

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**Submitted To:**

Dr. Shamim H Ripon

Professor

Department of Computer Science and Engineering

**Submitted By:**

**Group-10**

Student Name	Student ID
Md Saiful Islam	2022-3-60-045
Umme Mukaddisa	2022-3-60-317
Shanghita Naha Sristy	2022-3-60-311
Ayon Adhikary	2022-3-60-137

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# 1. Introduction

## 1.1. Background of the chosen topic

Online auction platforms have revolutionized how goods are bought and sold worldwide, transforming traditional auction models into digital marketplaces accessible to millions. These platforms enable real-time bidding, broader reach for sellers, and increased access to a diverse range of products for buyers. The auction model itself dates back centuries, but its digital transformation has created entirely new business opportunities and market dynamics.

In Bangladesh, the online auction landscape is still emerging, with several local platforms attempting to establish market presence while competing against the indirect influence of international auction giants. This creates a unique opportunity to examine how local auction platforms can evolve to better serve the Bangladesh market while implementing best practices from established international platforms.

## 1.2. Importance of the topic in the software industry

The study of auction platforms holds significant relevance to the software industry for several reasons:

**E-commerce Evolution:** Auction platforms represent a specialized form of e-commerce that requires distinct technical solutions for real-time bidding, time-sensitive transactions, and trust-building mechanisms.

**Technical Complexity:** These platforms demand sophisticated solutions for concurrent bidding, time synchronization, fraud prevention, and automated auction management, all presenting unique software engineering challenges.

**Market Opportunity:** According to a report by Technavio [1], the market is projected to expand by USD 3.98 billion between 2024 and 2029, accelerating at a 14% compound annual growth rate (CAGR) during the forecast period.

**Innovation Potential:** Auction platforms serve as innovation laboratories where advanced technologies like AI-based pricing, blockchain for verification, and mobile-first experiences are pioneered.

**Local Market Development:** For emerging markets like Bangladesh, developing robust auction software tailored to local needs represents an opportunity to create technological solutions that address specific cultural, economic, and technological contexts.

## 2. Objectives

### 2.1. Goals of the case study

1. Analyze and document the current state of online auction platforms both locally in Bangladesh and internationally.
- 2 . Identify key technological and functional differences between local and international auction platforms.
3. Determine critical gaps in local platform capabilities compared to international benchmarks.
4. Propose specific, actionable improvements that local platforms could implement to enhance competitiveness and user experience.
5. Create a strategic roadmap for technology enhancement that balances international best practices with local market realities.

### 2.2. Scope of the chosen project

**Platform Selection:** Five local Bangladeshi auction platforms and five international auction platforms, chosen to represent diverse approaches and market segments.

**Evaluation Areas:**

- Technical infrastructure and architecture
- User experience and interface design
- Trust and verification systems
- Payment processing capabilities
- Mobile strategy and implementation
- Auction mechanisms and bidding systems
- Community and engagement features
- Seller tools and capabilities

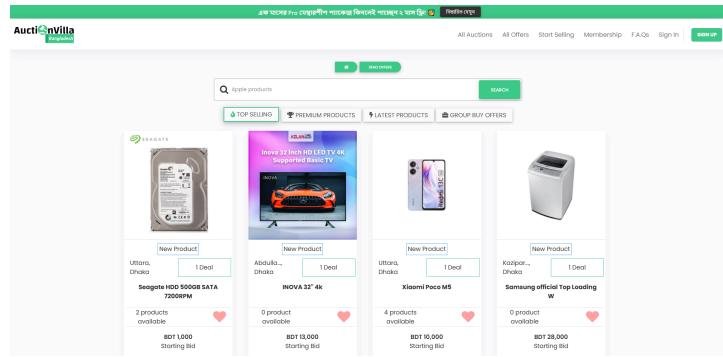
**Exclusions:** This analysis does not include detailed business model analysis, marketing strategies, or specific code-level examinations, focusing instead on platform features and capabilities from a user and functionality perspective.

### 3. Analysis of Existing Projects

#### 3.1. Local Projects

##### AuctionVilla Bangladesh

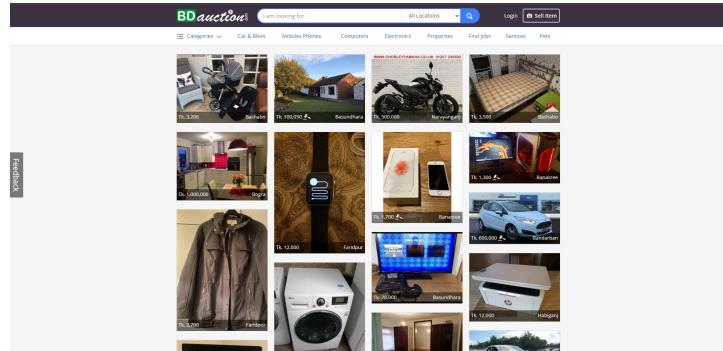
**AuctionVilla Bangladesh [2]** is the country's first consumer-focused online auction and offer-based marketplace, designed to provide a secure and user-friendly platform for real-time bidding and direct negotiations. It features web-based auction listings, a "Send Offers" option, user account management, and a mobile-responsive interface tailored to Bangladeshi users.



The platform stands out for its clean design, intuitive navigation, and dual transaction system, allowing both bidding and offer submissions. Its mobile optimization supports convenient, on-the-go access. However, AuctionVilla is limited to the local market, has a developing user base, fewer integrated payment options, and lower traffic compared to global competitors like eBay.

##### BDAuction

**BDAuction [3]** is a locally-focused online auction platform in Bangladesh that offers a simple, category-based structure for users to buy and sell through competitive bidding. Designed with ease of use in mind, it provides basic functionalities such as user registration, category browsing, bid placement, and auction monitoring.



Its strengths lie in its clear market focus, user-friendly interface, and alignment with local buying behaviors. The platform's straightforward design ensures a low learning curve, making it accessible to a wide range of users. However, BDAuction is limited by its outdated user

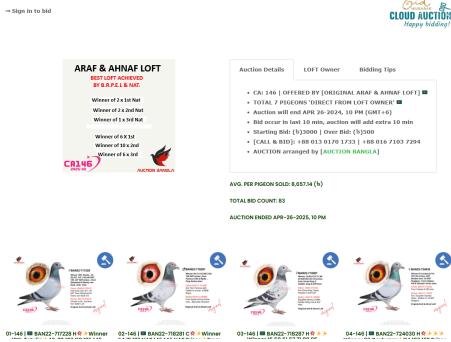
interface, lack of advanced features like real-time bidding or chat, and minimal appeal beyond the Bangladeshi market. Its static interface may also result in lower user engagement compared to more interactive platforms.

## Auction Bangla

**Auction Bangla** [4] is a Bangladesh-based online auction platform that sets itself apart through its real-time, live bidding system supported by a scalable cloud infrastructure. It offers a dynamic, event-driven auction experience designed to engage users with time-sensitive bidding sessions.

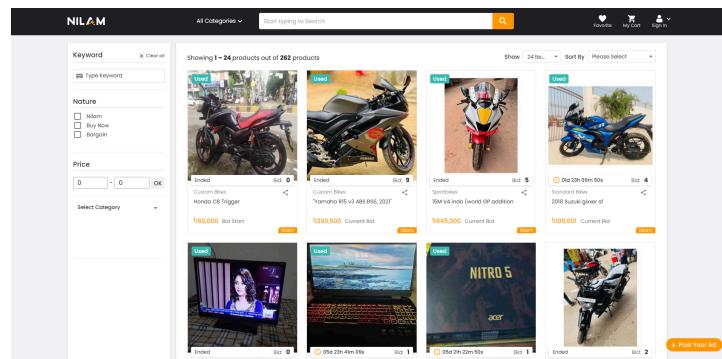
Core functionalities include real-time bid updates, instant notifications, and synchronized participation, creating a fast-paced and transparent auction environment. Its cloud-based system ensures smooth performance during large-scale auctions, while the live format adds excitement and urgency.

However, the platform relies heavily on stable internet connectivity, which may limit accessibility for some users. Auctions are typically scheduled, restricting continuous engagement and limiting the ability to browse past or upcoming listings. Additionally, its event-centric and tech-reliant design may pose challenges for less digitally proficient users.



## Nilam

**Nilam** [5] is a minimalist, Bangladesh-based auction platform named after the Bengali word for "auction," offering strong cultural resonance and immediate recognition among local users. The platform focuses on delivering a clean and functional experience tailored to everyday buyers and sellers.



With core features such as item listing, bid management, user account controls, and auction monitoring, Nilam is designed to be accessible, especially for casual bidders and small-scale sellers. Its simplified interface lowers the barrier to entry, making it appealing to users new to online auctions.

However, Nilam may face limitations due to its smaller scale and lower traffic compared to more established competitors. It lacks advanced or innovative features like real-time bidding, which may affect long-term engagement and retention. The limited scope of listings could also restrict competitiveness and variety on the platform.

## Customs Auction(Bangladesh Customs Authority)

**Customs Auction** [6] is a government-operated platform in Bangladesh designed for the sale of seized, unclaimed, or duty-unpaid goods. Rather than serving as a place, it functions primarily as an official liquidation channel. With features such as IP-based access (indicating government affiliation), customs-specific inventory, and a structured auction process, the platform ensures a highly regulated and transparent environment.



Key functionalities include the listing of government-held items, a controlled bidding process, and formal documentation for all purchases, providing legal assurance and ownership clarity. The platform's strengths lie in its credibility, access to rare or undervalued items like vehicles and electronics, and the official transfer of goods with proper paperwork.

However, the site has notable limitations. The user interface is often outdated and less intuitive, making navigation difficult for casual users. Participation is limited to customs-related auctions with strict registration requirements. Auctions are held on a scheduled basis rather than offering continuous listings, and the formal nature of the process may deter less experienced or non-professional buyers.

## **3.2. Key features, functionalities, and limitations of Local Projects**

Key features, functionalities, and limitations of the Local Bangladeshi platform or Projects are given below:

### **Key Features:**

- Local market focus and cultural alignment
- Support for Bangladesh-specific payment methods
- Simplified interface design for varied technical literacy
- Lower barriers to entry for local sellers
- Understanding of local customer preferences and behaviors

### **Core Functionalities:**

- Basic account creation and management
- Standard listing and bidding processes
- Category-based browsing and basic search
- Fundamental payment processing
- Simple seller tools and inventory management

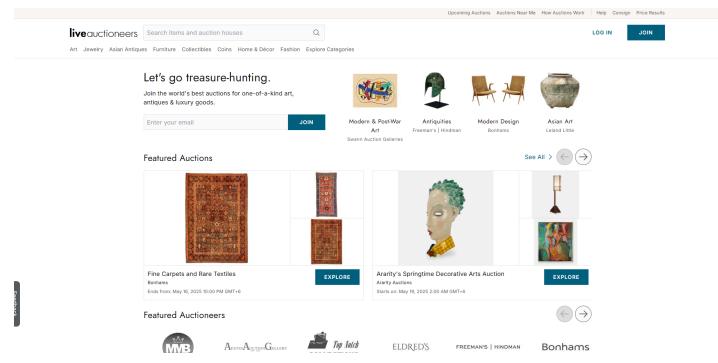
### **Notable Limitations:**

- Limited verification and trust systems
- Basic mobile implementations (primarily responsive websites)
- Minimal community engagement features
- Simplified search and discovery capabilities
- Limited payment options and processing sophistication
- Basic auction mechanisms without advanced bidding options
- Minimal analytics and reporting tools for sellers
- Limited scalability and performance optimization

### 3.3. International Projects

#### LiveAuctioneers

**LiveAuctioneers** [7], established in 2002, is a leading global online auction platform connecting bidders with over 5,000 auction houses worldwide. It specializes in high-value items like fine art, antiques, jewelry, and collectibles, offering live streaming auctions, advanced search tools, detailed item descriptions, and bidder history tracking. Users can bid in real-time, place absentee bids, set alerts, and save searches.

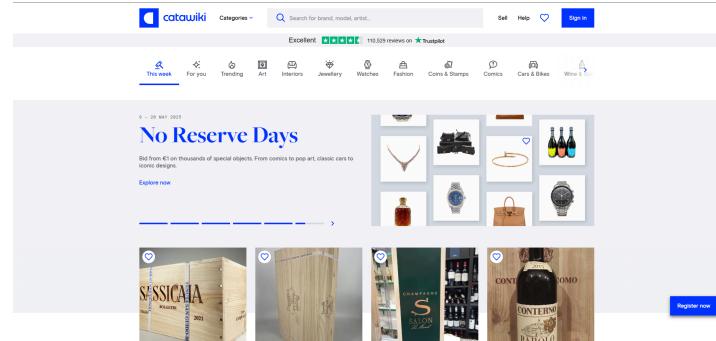


The platform's strengths include a vast international network, strong industry reputation, professional item presentation, and robust mobile apps for bidding and account management. It also provides access to a searchable price database for market insights.

Limitations include a focus on high-end collectibles rather than general goods, buyer's premiums of 15–30% that increase costs, a learning curve for new users, and varied payment and shipping processes handled by individual auction houses.

#### Catawiki

**Catawiki** [8], based in the Netherlands, is a curated online auction platform specializing in collectibles, art, and luxury goods. With over 250 in-house experts vetting each item, it offers a trusted environment for buyers and sellers. Key features include expert-curated weekly themed auctions, international shipping, multilingual support, professional appraisals, and authentication services.

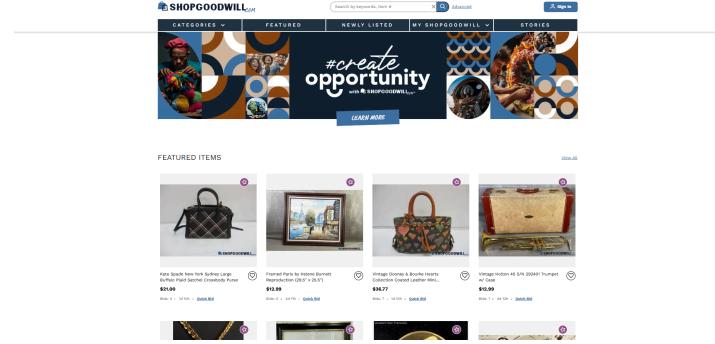


Users can bid on weekly auctions, submit items for expert review, and benefit from secure payments and international logistics coordination. Catawiki's strengths lie in its expert verification, user-friendly platform with a mobile app, strong European presence, themed auctions for collectors, and secure transaction processes.

Limitations include commission fees (9% for buyers, 12.5 %+ for sellers), a selective approval process that may exclude casual sellers, long settlement times of 3–6 weeks, minimum listing values typically around €75, and a focus primarily on high-end and collectible items.

## ShopGoodwill

**ShopGoodwill** [9], operated by Goodwill Industries, is the first nonprofit online auction platform in the U.S. It offers donated secondhand items, with all proceeds supporting job training and employment programs. The site combines auction and fixed-price sales, features a wide variety of goods, and organizes browsing by category, aligned with its educational and employment mission.

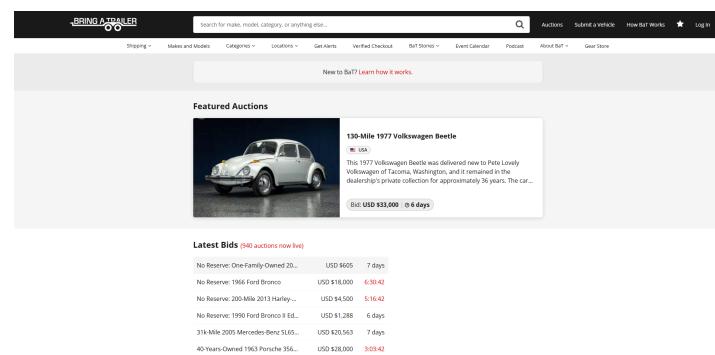


Users can bid on auctions, use buy-it-now options for some items, choose regional pickup, and manage their accounts easily. ShopGoodwill's strengths include full proceeds supporting nonprofit programs, generally lower prices than commercial sites, no seller fees since items are donated, a broad range of products including rare finds, and frequently refreshed inventory across multiple U.S. regions.

However, item quality and condition vary greatly, product photos and descriptions are sometimes inconsistent, shipping is limited mostly to the U.S., handling fees can make small purchases costly, and return policies are limited.

## Bring a Trailer (BaT)

**Bring a Trailer (BaT)** [10] is a curated online auction platform specializing in classic, collector, and enthusiast vehicles. Renowned for its engaged community and meticulous listing standards, BaT offers a unique automotive auction experience. Key features include specialized vehicle auctions, comprehensive histories with documentation, active comment sections, curated daily



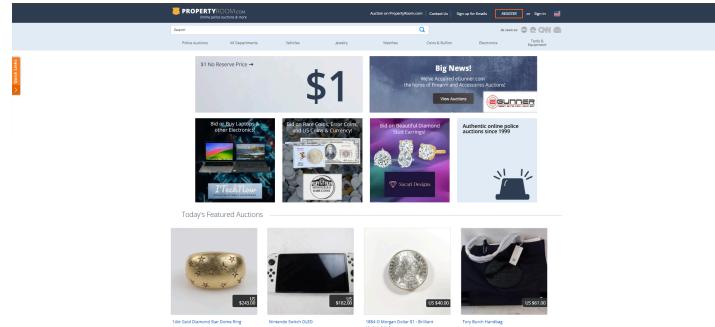
listings, and mostly no-reserve formats. Users can bid, interact with sellers through comments, set auction alerts, create watchlists, and track results.

BaT's strengths lie in its community-driven approach, fostering trust and transparency, along with high-quality presentations featuring detailed photography and vehicle records. The transparent bidding process, enriched by expert commentary, often leads to strong realized values. While primarily U.S.-focused, BaT is expanding international accessibility.

Limitations include its exclusive focus on vehicles, a \$99 listing fee with selective seller acceptance, a 5% buyer's fee capped at \$5,000, premium pricing due to competition and quality inventory, and a predominantly U.S.-centric user base despite allowing international bidders.

## PropertyRoom

**PropertyRoom** [11] partners with over 4,400 U.S. police departments and municipalities to auction seized, recovered, and surplus property, offering buyers access to a unique selection of goods with verified provenance. The platform specializes in police and government surplus items, featuring authentication and verification processes, diverse product categories, and secure chain-of-custody documentation. Users can bid on seized and surplus goods, filter items regionally, and obtain authentication certificates for select products.



Key strengths include a direct pipeline from law enforcement and public agencies, opportunities to purchase confiscated or unclaimed items at potentially lower prices, official verification ensuring legitimacy, and a 100% guarantee on jewelry authentication. The platform also offers rare or unusual goods not commonly found elsewhere.

Limitations involve a primarily U.S.-based buyer market with limited international shipping, variable item condition due to minimal inspection, restricted or no returns depending on item category, auction timelines that may extend because of late bids, and inventory availability that depends on government surplus schedules.

### **3.4. Key features, functionalities, and limitations of International Projects**

Key features, functionalities, and limitations of the worldwide international platform or Projects are given below:

#### **Key Features:**

- Sophisticated trust and verification systems
- Advanced mobile applications with extensive functionality
- Rich community and social features
- Specialized focus on specific categories or market segments
- Global reach with multi-language support
- Comprehensive seller tools and analytics

#### **Core Functionalities:**

- Advanced search with multiple filtering options
- Detailed item cataloging with rich media support
- Sophisticated bidding mechanisms with anti-sniping protections
- Comprehensive payment processing supporting multiple methods
- Real-time notifications and bidding updates
- Seller dashboards with performance analytics
- User reputation systems and detailed feedback
- Robust customer support infrastructure

#### **Notable Limitations:**

- Less adaptation to the local Bangladesh market is needed
- Higher complexity creates steeper learning curves
- More expensive fee structures than local platforms
- Less integration with local payment methods
- Cultural misalignments with local buying/selling behaviors
- Often less specialized for Bangladesh-specific categories
- Language barriers in customer support and documentation

## 4. Comparative Analysis

### 4.1. Comparison between local and international projects

#### Market Reach & Scale

Local platforms in Bangladesh mainly serve the domestic market with smaller user bases and focus on local goods and services. Their expansion and logistics are limited, though they often support both Bengali and English.

In contrast, international platforms operate globally, serve millions of users, offer diverse inventory with global shipping, and support multiple languages, typically dominated by English.

#### Technical Infrastructure

Local platforms use simpler hosting and database systems, with minimal scalability and limited use of advanced tech. Development teams are small and generalist.

International platforms run on enterprise-grade infrastructure with global CDNs, robust databases, load balancing, redundancy, and large specialized teams.

#### User Experience & Design

Local interfaces are functional but basic, with inconsistent mobile responsiveness and limited personalization.

International platforms offer refined UX/UI, consistent cross-device design, advanced search, and strong personalization features.

#### Payment & Trust Systems

Local platforms focus on domestic payment methods (e.g., bKash), basic verification, and simple rating systems with minimal buyer/seller protection.

International platforms support global payments, implement fraud detection, multi-layer verification, and robust trust and protection systems [12].

#### Business Model & Monetization

Local platforms feature low commissions (5–15%), smaller transactions, and limited premium services. Monetization is typically single-stream.

International platforms use tiered commissions (up to 25%), offer premium features, and generate revenue from ads, subscriptions, and more.

## 4.2. Implementation Differences

- **Technology Stack**

- Local: Basic hosting, minimal redundancy, modest databases, limited use of AI/ML.
- International: Enterprise-grade infrastructure, global CDNs, advanced databases, heavy use of caching, AI-driven features.

- **Development Teams**

- Local: Small, generalist teams often multitask across features.
- International: Large, specialized teams with deep expertise in performance, UX, data, and security.

- **Mobile Strategy**

- Local: Mobile-first potential but often lacks polish or offline optimization.
- International: Evolved mobile experiences with responsive, optimized, and cross-device consistency.

## 4.3. Design Differences

- **User Interface (UI)**

- Local: Simple and functional, often lacking polish, with inconsistent visual quality.
- International: Visually refined, modern design systems, strong attention to detail, and branding.

- **User Experience (UX)**

- Local: Basic navigation, limited personalization, few filters, or user-centric flows.

- International: Seamless UX with personalized recommendations, advanced search, intuitive flows, and accessibility support.

- **Language & Localization**

- Local: Bilingual (Bengali + English), culturally familiar layouts and flows.
- International: Primarily English with scalable multilingual support; not always locally contextualized.

## 4.4. Performance Differences

- **Scalability & Load Handling**

- Local: Handles thousands of users with basic performance tuning; struggles under high load.
- International: Designed to support millions of users with robust scaling, global traffic balancing, and uptime guarantees.

- **Speed & Responsiveness**

- Local: Slower performance on low bandwidth or older devices; limited optimization.
- International: Optimized for speed globally, including low-bandwidth and mobile-first contexts.

- **Data Utilization**

- Local: Basic analytics, mostly operational.
- International: Deep data mining for personalization, trend prediction, dynamic pricing, and behavioral insights.

## 5. Gap Analysis and Proposed Improvements

### Executive Summary

The **Aucsy Online Auction System** has established a robust foundation for digital auctions. However, a comparative gap analysis of Bangladesh's auction platforms reveals several critical improvement areas. This document presents those gaps alongside strategic, innovative solutions to strengthen Aucsy's overall functionality, user trust, and market competitiveness.

### Trust & Verification Systems

#### Current Gaps

Aucsy currently supports basic user authentication but lacks comprehensive mechanisms to foster trust. There's no product verification system, and fraud prevention measures remain limited.

#### Proposed Improvements

A multi-layered **TrustScore system [13]** is recommended, involving phone, NID, and social verification, integrated with the Bangladesh Bank's e-KYC system. Visual trust indicators will be added across user profiles, and trust will dynamically evolve with transactional behavior. For products, category-specific verification processes (e.g., serial number checks for electronics), AI-powered counterfeit detection, and authenticity certificates will ensure product legitimacy.

### Mobile Experience Enhancement

#### Current Gaps

While Aucsy is built using Flutter for cross-platform development, it lacks specific mobile optimizations, including offline support and data-efficient features. The notification system is also underutilized for mobile engagement.

#### Proposed Improvements

Offline browsing, background bidding synchronization, and lightweight UI design will improve performance on low-bandwidth mobile networks. Mobile-specific features like one-tap bidding, vibration alerts, and smart auction notifications will enhance the user experience. Adaptive image loading and compressed data protocols will support users with limited internet access.

## **Payment System Integration**

### **Current Gaps**

Aucsy currently relies solely on bKash, with no support for alternative payment methods or automation in verification. Fraud detection in payment processing is minimal.

### **Proposed Improvements**

Payment gateway integration [14] should expand to include Nagad, Rocket, credit cards, and bank transfers. Features like QR payments, saved payment methods, and installment plans will offer flexibility. Real-time payment verification and failure recovery logic will boost security and user confidence.

## **Search & Discovery Enhancement**

### **Current Gaps**

Aucsy offers only basic search capabilities, with limited filtering, no personalization, and a basic category system.

### **Proposed Improvements**

The search engine will be upgraded with NLP [15] for natural language understanding, typo correction, and synonym recognition. Multi-modal search options—such as voice, image, and barcode search—will be introduced. A personalized recommendation engine using browsing and bidding history will help users discover relevant products more effectively.

## **Community & Engagement Features**

### **Current Gaps**

The platform's interaction model is transaction-centric, lacking community features like messaging, user engagement tools, and enriched notifications.

### **Proposed Improvements**

An integrated in-app messaging system will allow secure communication between buyers and sellers, supported by templates and image sharing. A dynamic activity feed, smart alerts, and

verified review systems will increase engagement. User trust will be further reinforced with visible reputation scores and seller feedback loops.

## **Seller Tools & Analytics**

### **Current Gaps**

There is no dedicated dashboard for sellers, no inventory management system, and limited analytics or promotional tools.

### **Proposed Improvements**

A comprehensive seller dashboard will be built, supporting template-based listings, bulk uploads, and mobile-optimized interfaces. Inventory management will include stock tracking, auto-relisting, and cross-platform sync. Performance analytics will offer insights into bids, views, and conversion rates, empowering sellers with actionable data.

## **6. Implementation Plan**

### **6.1. Steps to incorporate the proposed solutions**

#### **Trust & Verification System**

To build user credibility, integrate multi-factor verification using NID, phone number, and social media logins. Develop a dynamic TrustScore that grows based on transaction success, reviews, and platform activity. Display trust indicators such as badges or verified icons on profiles. For added security, connect with Bangladesh Bank's e-KYC API to verify identities officially.

#### **Product Authentication**

Introduce product validation methods tailored to item categories—for example, requiring serial numbers for electronics. Use AI-based image analysis to detect counterfeit products and maintain a verified item database. Sellers should be able to generate and attach digital authenticity certificates to their listings, helping buyers make confident decisions.

## **Escrow & Payment System**

Expand the current payment options to include Nagad, Rocket, and card payments alongside bKash. Implement an escrow system to hold payments until transactions are confirmed. Offer support for installments and deposits for higher-value auctions, and automate transaction verification, refunds, and failure recovery for smoother financial handling.

## **Mobile Optimization**

Optimize the mobile experience by enabling offline browsing, background syncing for bidding updates, and low-data design. Add mobile-centric features like one-tap bidding, haptic feedback, and responsive layouts. Smart notifications should be introduced to alert users about bidding activity and auction deadlines.

## **Search & Discovery**

Enhance the search engine with typo correction, natural language support, and multi-modal options like voice, image, and QR/barcode search. Build a discovery engine that recommends items based on a user's past behavior, interests, and bidding activity to improve engagement and relevance.

## **Community & Engagement Features**

Enable secure in-app messaging between users and add activity feeds to show bidding trends and product updates. Reviews should be verified and allow seller responses. Push notifications should alert users to price changes, messages, or auction events, creating a more connected experience.

## **Seller Tools & Analytics**

Develop a seller dashboard with product performance metrics, sales tracking, and listing management tools. Add bulk product uploads using spreadsheets and automate inventory syncing and re-listing of unsold items, giving sellers more control and efficiency.

## 6.2. Tools & Technologies

- Authentication & Trust: Firebase Auth, Firestore, e-KYC API, Google/Facebook Login SDKs
- Product Verification: Firebase Storage, Firestore, TensorFlow Lite or ML Kit, PDF generation tools
- Payment & Escrow: bKash SDK, SSLCommerz, Nagad/Rocket APIs, Cloud Functions, Firestore, QR Code APIs
- Mobile Features: Hive/shared\_preferences, connectivity\_plus, flutter\_offline, local\_notifications
- Search & Discovery: Algolia or ElasticSearch, ML Kit, TensorFlow Lite, Firestore
- Engagement: Firestore, Realtime DB, flutter\_chat\_ui, FCM, Cloud Functions
- Seller Tools: Firestore, Firebase Storage, Google Charts/Chart.js, CSV/XLS packages
- Auction Formats: Firestore, Firebase Functions, custom countdown logic
- Analytics: BigQuery, Looker Studio or Power BI, TensorFlow Lite, Firebase Analytics

## 7. Conclusion

The proposed improvements to the auction system aim to transform it into a secure, intelligent, and user-centric platform tailored to the needs of the Bangladeshi market. By addressing key gaps—such as limited trust verification, weak product authentication, and restricted payment options—this case study offers a comprehensive blueprint for building a more reliable and engaging auction experience. With the integration of modern technologies like AI-powered verification, escrow-based payment systems, mobile-first design, and advanced search capabilities, the system not only improves user satisfaction but also encourages greater participation from both buyers and sellers. These changes collectively lay the foundation for a more transparent, scalable, and competitive digital marketplace, ensuring long-term sustainability and trust in the platform.

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