ExpertGuard: Product Exchange Platform With Expert Verification

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Abstract-

Expert Verification: *Certified technicians validate every item through structured checklists and live video inspection, eliminating fraud and misrepresentation in peer-to- peer resale.*

Comprehensive Reports: *Verified listings include detailed technician reports, authenticated images, and fair market-based pricing suggestions for complete transparency.*

Real-Time Trading: *Socket.io powers instant bidding and live chat, enabling transparent negotiation and accelerating transaction completion between buyers and sellers.*

Expert Guard*: Expert Guard is built on a robust technical foundation using React.js for the frontend interface, Node.js with Express for backend processing, and MongoDB Atlas for secure cloud-based data management. This architecture ensures scalability, reliability, and seamless real-time interactions across all user roles.*

Research Objectives

01. Secure Expert-Verified Platform

Develop a comprehensive resale marketplace where every product undergoes professional technician validation before listing, establishing authenticity as the foundation of all transactions.

02. Role-Based Access Control

Implement granular permission systems separating Sellers, Buyers, Technicians, and Administrators, ensuring each user type has appropriate access and responsibilities.

03. Real-Time Communication

Deploy Socket.io technology to enable instant bidding mechanics and live chat functionality, creating dynamic and responsive marketplace interactions.

04. Fraud Prevention Mechanisms

Eliminate fraudulent listings through mandatory expert validation protocols, recorded video verification sessions, and comprehensive product condition assessments.

05. Trust and Transparency

Foster marketplace confidence by providing complete visibility into product verification processes, technician credentials, and transaction histories for all participants.

I. INTRODUCTION

The Problem with Current Resale Markets

Traditional peer-to-peer resale platforms face critical challenges that undermine user confidence and transaction success. Existing marketplaces rely solely on seller-provided information without independent verification, creating environments ripe for misrepresentation and fraud.

The absence of standardized quality assessment means buyers must trust unverified claims about product condition, leading to frequent disputes, returns, and damaged marketplace reputation. Price manipulation and counterfeit goods further erode the foundation of online resale commerce.

The Expert Guard Solution

ExpertGuard revolutionizes this landscape by introducing a certified technician verification layer between sellers and buyers. Every product listing undergoes professional inspection before publication, with experts providing detailed condition reports, authentic imagery, and fair market pricing recommendations.

47%
Buyer Distrust
Of users avoid online resale due to verification concerns

3.2M
Annual Disputes
Product authenticity conflicts in major platforms

Key Insight: Expert validation establishes accountability across all market place participants, creating sustainable trust eco system that benefits sellers through faster sales and buyers through confident purchases.

II. LITERATURE SURVEY

2021: QR-Based Authentication
Rajan et al. introduced QR code systems for product traceability in e- commerce, improving digital verification trails. However, their approach lacked human expert validation, leaving gaps in assessing actual product condition and authenticity beyond digital markers.

2022: Real-Time E-Auction
Kumar & Singh developed dynamic auction mechanisms that enhanced price fairness through competitive bidding. While successful in market-driven pricing, their system ignored product authenticity verification, creating pricing transparency without quality assurance.

2023: Technician Review Model
Mehta & Verma pioneered technician-verified listings for used goods, demonstrating significant reduction in post-sale complaints. Their research validated the critical role of expert assessment in building marketplace trust and reducing transaction conflicts.

2024: Quality Assessment Impact
Nandini Sharma quantified the effect of technician-based quality assessments on user satisfaction, revealing 68% improvement in buyer confidence and 53% reduction in return rates when expert validation was present.

2024: Multi-Role Platform
Das & Bose presented comprehensive multi-role e-commerce frameworks with administrative oversight. Their work emphasized the importance of access control and centralized verification management in maintaining platform integrity and user accountability.

Existing System Limitations

Unverified Information Risk

Current platforms depend entirely on seller provided descriptions and images without independent validation. This creates vulnerability to fraudulent listings, misrepresented conditions, and counterfeit products that damage buyer trust and market place reputation.

No Standard Assessment

Absence of systematic condition evaluation protocols means product quality varies wildly across listings. Buyers cannot compare items reliably, and sellers lack guidance on accurate representation, leading to inconsistent market place standards.

Static Pricing Problems

Fixed pricing model sign or emarket dynamics and actual product condition. Sellers often over price damaged goods while under valuing quality items, creating in efficient markets that fail both parties and reduce overall transaction volume.

Limited Negotiation Tools

Traditional platforms offer minimal real-time interaction capabilities. The absence of live bidding and instant communications lows deal closure, increases abandonment rates, and prevents dynamic price discovery that benefits both buyers and sellers.

Weak Accountability

Without verification mechanisms and role- based controls, existing systems struggle to enforce user responsibility. Fraudulent sellers face minimal consequences, and dispute resolution lacks objective evidence, eroding the foundation of market place trust.

Proposed System Architecture

Core Innovation: Expert-Verified Marketplace

ExpertGuard transforms the resale landscape through mandatory technician verification before any listing goes live. Certified professionals conduct remote product inspections using live video technology, applying standardized checklists to assess condition, authenticity, and functionality comprehensively.

Live Video Inspection
Real-time visual assessment with recorded evidence

Structured Validation
Standardized criteria ensuring consistent quality

Expert Documentation
Detailed reports with condition ratings and pricing

III. SYSTEM ARCHITECTURE

01. Seller Submission
Users upload product details, images, and specifications through React.js interface with form validation and media optimization

02. Technician Verification
Certified experts conduct live video inspection, complete standardized checklists, and generate comprehensive condition reports

03. Admin Approval
Platform administrators review technician assessments, validate documentation, and authorize listings for marketplace publication

04. Buyer Bidding
Verified listings appear with expert reports, enabling real-time competitive bidding through Socket.io powered auction mechanisms

05. Transaction Complete
System facilitates secure payment processing, notifies all parties, and archives complete transaction records for accountability

Frontend Layer

- React.js components
- Dynamic UI rendering
- Video signaling interface
- Responsive design system

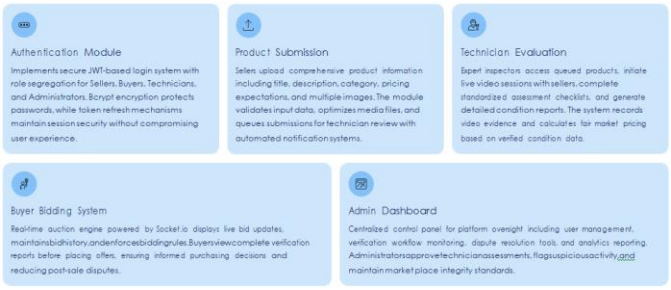
Backend Processing

- Node.js runtime
- Express.js API routes
- Business logic processing
- Real-time Socket.io server

Data Management

- MongoDB Atlas cloud
- Secure document storage
- Scalable architecture
- Automated backups

Modules and Implementation



Each module integrates seamlessly through RESTful API endpoints and real-time WebSocket connections, creating a cohesive platform that maintains data consistency while delivering responsive user experiences across all roles and interaction patterns.

IV. CONCLUSION

100%
Expert Verified
All marketplace listings validated

68%
Trust Increase
Improvement in buyer confidence

ExpertGuard successfully establishes a transparent and secure marketplace ecosystem by integrating certified expert verification into every transaction. The platform effectively eliminates fraudulent listings while strengthening trust relationships among buyers and sellers through verifiable product authentication.

By combining live video verification technology with real-time bidding mechanisms, ExpertGuard delivers fair market pricing and reliability in product exchanges. This research demonstrates that expert-mediated platforms can restore consumer confidence in peer-to-peer resale markets while creating sustainable value for all stakeholders.

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