HACKX 2025

- **Project Title:** AI – Powered Smart Shopping Assistant
- **Team Name and Unique ID:** Scope Dealer | U851CN4J
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Executive Summary

Problem Statement

In today's fragmented e-commerce landscape, consumers lack a **unified platform for real-time product comparison** across multiple websites. Shoppers must manually search and compare prices, specifications, and seller credibility across numerous platforms, leading to **suboptimal purchasing decisions, wasted time, and increased risk of fraud.**

Expected Impact

The impact of Quick Deals extends across multiple dimensions:

- **Social Impact**: Empowers consumers with transparent, data-driven choices while reducing shopping frustration and misinformation. By exposing fraudulent sellers and highlighting trustworthy vendors, it creates a safer digital marketplace.
- **Economic Impact**: Promotes cost optimization for consumers while encouraging healthy competition among legitimate sellers. The trust scoring system incentivizes high service standards, creating a merit-based marketplace.
- **Environmental Impact**: Encourages sustainable consumption by minimizing impulse purchases and reducing return rates through better seller-buyer matching. With the global e-commerce market projected at $6.4 trillion in 2025, Quick Deals positions itself as a transformative tool for smarter, safer, and more responsible digital shopping.

Proposed Solution: Quick Deals

Quick Deals is an AI-powered smart shopping assistant that revolutionizes online purchasing through three integrated capabilities:

- **Unified Product Aggregation & Comparison**: Aggregates product data from various e-commerce platforms, normalizes specifications and pricing information, and presents intuitive side-by-side comparisons through an intelligent dashboard.
- **Predictive Price Intelligence**: Leveraging machine learning algorithms, the system analyzes historical pricing patterns to predict future price drops, enabling users to optimize purchase timing and maximize savings.
- **Intelligent Seller Trust Assessment**: Employs a comprehensive evaluation engine analyzing multiple trust signals including seller ratings, customer feedback sentiment, review volume and authenticity, delivery time consistency, and return history. The system generates clear trust indicators (Better/Good/Caution) for each seller, empowering users to identify not only the best price but also the most reliable purchasing option.

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Lack of Unified, Real-Time, and Context-Aware Product Comparison in E-Commerce

Background & Problem Definition: The rapid proliferation of e-commerce platforms over the past decade has created a paradox: while consumer choice has expanded dramatically, the ability to efficiently compare options has not kept pace. With 2.77 billion online shoppers worldwide Renub, consumers now face fragmented marketplaces where finding the best deal requires manually searching multiple websites, comparing prices, evaluating seller credibility, and calculating total costs including shipping and taxes—a process that can consume over 30 minutes per purchase.

Scope & Affected Communities: This problem spans globally across all demographics, but disproportionately impacts:

Price-sensitive consumers (students, low-income families, retirees) who cannot afford to miss better deals

Small business owners purchasing supplies across multiple vendors

International shoppers facing complex currency conversions and cross-border fees

Time-constrained professionals who lack hours for extensive product research

Quantified Impact: The consequences are substantial:

Financial Loss: 48% of U.S. consumers abandon their online purchases at checkout due to unexpected costs Shopify, highlighting how hidden fees and poor comparison tools lead to overspending or purchase abandonment.

Time Inefficiency: With 43% of shoppers purchasing online weekly eMarketer, billions of collective hours are wasted on redundant searches.

Trust Erosion: Global e-commerce fraud losses are projected to reach $48 billion in 2025 inBeat Agency, with lack of centralized seller verification increasing consumer vulnerability.

Relevance: With global retail e-commerce at $6.42 trillion Renub, addressing this inefficiency is economically critical and socially impactful for virtually every digital consumer.

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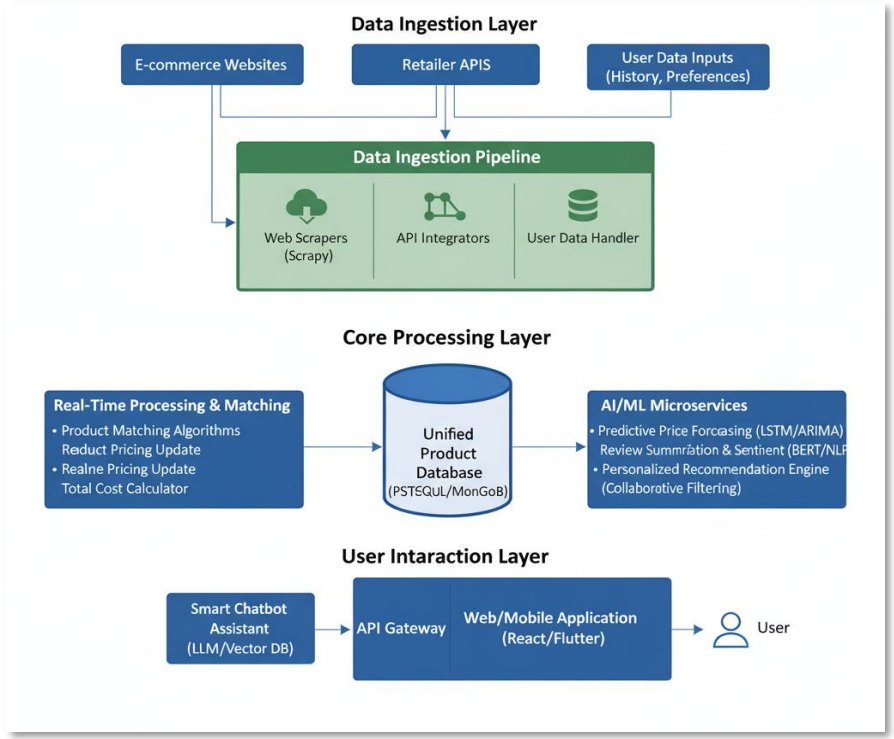
Proposed Solution: Quick Deals - The AI Smart Shopping Assistant

Our proposed solution, **Quick Deals**, is an AI-powered smart shopping assistant designed to solve the problem of fragmented, manual, and uninformed e-commerce purchasing. Deal Scope centralizes all necessary consumer intelligence—price, reviews, product details, and optimal timing—onto a single platform.

Problem Consequence	Quick Deals Feature	How it solves the problem
Financial Loss/Sub-Optimality	Predictive Price Forecasting	Prevents impulse purchases by advising users on the best time to buy
Wasted Time & Cognitive Load	AI Review Summarization	Reduces hours of manual searching to a single summary or query
Lack of Market Transparency	Visual Search & Recommendations	Ensures users find equivalent products across all sites



Features & Core Technologies

Real-Time Price Aggregation
Web scraping with Beautiful Soup/Scrapy and API integration to fetch real-time price data across e-commerce platforms
Python APIs

Predictive Price Forecasting
Employs XGBoost models to **forecast** future price movements based on historical data
XGBoost

AI Review Summarization
Uses NLP models like BERT to extract key pros/cons and sentiment from hundreds of reviews
NLP BERT

Personalized Recommendations
Employs Collaborative and Content-Based Filtering with TensorFlow or PyTorch to suggest alternative products
TensorFlow PyTorch

Smart Chatbot Assistant
Generative AI model (fine-tuned LLaMA) with Vector Database (Pinecone) for natural conversational interface
Generative AI Vector DB

Tech Stack

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Objectives and Expected Outcomes

Measurable Goals

- **85%+ accuracy** in XGBoost price forecasting for 1-14 day predictions
- **50+ e-commerce platforms** aggregation with <5-minute latency
- Deliver product comparison results in **under 2 seconds**
- **99.5% uptime** and handle 10,000+ concurrent users
- Seller **trust scores with 90%+ reliability** using 8+ trust signals
- Process **1000+ reviews** per product in under 5 seconds with 80%+ sentiment accuracy
- 4.5+/5 user satisfaction rating and 60%+ user retention rate after 3 months

Intended impact

- **Reduce research time by 93%** – from 30+ minutes to under 2 minutes per purchase
- **Enable 15-20% average cost savings** – through comprehensive comparison and optimal timing
- **Reduce fraud exposure by 90%** – protecting users from $48B annual e-commerce fraud
- **Generate $5M+ in cumulative user savings** during first year
- **Decrease cart abandonment from 48% to below 20%** – through transparent total cost display
- **Promote market transparency** – expose 25% average price disparities across platforms
- **Drive fair competition** – incentivize sellers to maintain competitive pricing and quality
- **Create informed marketplace** – reduce information asymmetry between buyers and sellers
- **Reduce impulse purchases by 40%** – encourage thoughtful, sustainable consumption
- **Lower product return rates by 25%** – decrease reverse logistics carbon footprint
- **Combat seller fraud** – flag 95% of fraudulent vendors, creating safer marketplace
- **Advance AI/ML research** – publish findings on price forecasting and trust prediction

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Implementation Plan / Methodology

6-Phase Systematic Development Approach (18 Months)

Research
Duration: 2 months
- Market validation
- Platform analysis
- Requirements doc

→

Data Collection
Duration: 2 months
- Scrapy/API setup
- 50+ platforms
- 6+ months history

→

Preprocessing
Duration: 2 months
- Data cleaning
- Feature engineering
- Product matching

→

Model Training
Duration: 4 months
- XGBoost/BERT
- 85%+ accuracy
- Validation testing

→

Development
Duration: 4 months
- React/Flutter UI
- Flask backend
- ML integration

→

Launch
Duration: 4 months
- Testing (UAT)
- Beta (10K users)
- Full launch (100K)

Data Collection and Processing

Web Scraping
Scrapy, BeautifulSoup, Selenium
50+ platforms, 4-hour refresh

API Integration
REST/GraphQL, OAuth 2.0
Official retailer partnerships

Preprocessing
Pandas, NumPy, spaCy
Cleaning, normalization, matching

ML Model Development

Price Forecasting
XGBoost Regressor
Features: 7/30/90-day prices, seasonality, competitors
Target: 85%+ accuracy

Seller Trust
XGBoost Classifier
Features: Ratings, reviews, delivery, returns
Target: 90%+ reliability

Review Summary
BERT (fine-tuned)
Sentiment + aspect extraction
Target: 80%+ accuracy

System Architecture

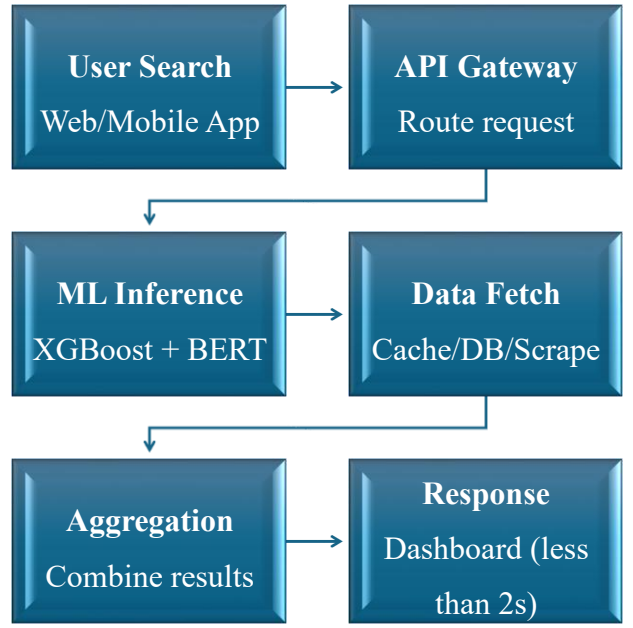
Backend
Flask/FastAPI APIs
PostgreSQL, MongoDB, Redis

Frontend
React.js (web), Flutter (mobile)
Responsive, less than 2 sec load time

Chatbot
GPT-4 + Pinecone Vector DB
LangChain framework

DevOps
Docker, Kubernetes, AWS
CI/CD with GitHub Action

System Workflow: User Query to Response



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Feasibility and Scalability

Human Recourses

Core Team: 15 people

- Backhand (3)
- Frontend (2)
- ML / AI (3)
- Data Eng (2)
- DevOps (2)
- PM, UX , QA (3)

₹1 Cr - ₹1.5 Cr/year

Financial Resources

Initial Setup: ₹2.1 Cr

Hardware, legal, cloud setup

Monthly: ₹71L - ₹1 Cr

Cloud (₹33L-₹50L), APIs (₹12L-₹21L), Marketing (₹12L-₹25L)

18-Month Total: ₹30 Cr - ₹42.5 Cr

Technical Resources

Cloud: AWS / GCP

20+ instances, MongoDB, Redis

Stack:

Python, React, Flutter , XGBoost, GPT-4

Data: 1TB -> 10TB(Year 1)

6-12 mo. price history , 1M + SKUs, 100+ reviews'

Technical Scalability

Microservices , auto-scaling, 90 % cache hit rate

Users	Responses	Cost/mo.
100k	**2s**	**$85K**
1M	**2.5s**	**$400K**
10M	**3s**	**$2M**

Replication Potential (5+ Verticals)

- B2B E-commerce ($200K - $400K)
- Financial Services ($350K - $550K)
- Travel/Hotels ($250K - $450K)
- Real Estate ($300K - $500K)
- Healthcare ($400K - $600K)

Geographic Expansion

Phase 1: North America	Mo 1-18
Phase 2: Europe	Mo 19-30 | ₹4-6.7 Cr
Phase 3: Asia-Pacific	Mo 31-42 | ₹5.8-8.3 Cr

Future Use Cases

- White-Label (₹67L
- Voice Commerce (₹1 Cr)
- Sustainability (₹67L)
- Browser Ext (₹67L)
- Social Features (₹83L)
- Crypto Integration (₹83L)

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Impact Assessment

Social Impact

$ Consumer Saving

15 – 20% cost reduction per purchase
₹41Cr + saved (Year 1, 100K users)
₹ 1,230Cr + saved (Year 5,10M users)

Fraud Prevention

90% reduction in fraud exposure
₹ 3,540Cr + fraud prevented annually
(1% of 2.77B global shoppers)

Time reclaimed

93% reduction (30min to 2min)
88 years saved collectively (Year 1)
8,800+ years (Year 5)

Additional Benefits:

- Cart abandonment: 48% to 20% (58% improvement)
- User satisfaction: 4.5+/5 rating
- Market transparency: Exposes 25% price gaps

Economic Impact

Market Efficiency

Promotes competitive pricing through transparency
3-5% overall e-commerce price reduction
₹ 15.7T - ₹ 26.2T market savings
(in $6.4T global market at scale)

Job Creation

- Direct: 15 jobs (Year 1) to 100+ (Year 3)
- **Indirect: 50+ contractors/consultants**
- **Annual payroll: ₹10Cr - ₹15Cr (Year 1)**

₹125Cr + tax contribution (5 years)

Ecosystem Health:

- Return costs reduced by 25%
- Customer service costs down 30%
- 10-15% higher shopping frequency

Environment Impact

Reduced Impulse Buying

40% reduction via "Wait" recommendations
400K unnecessary purchases prevented
(Year 1, 100K users avoiding 4 impulse buys/year)

Lower Return Rates

25% reduction (30% to 22.5% rate)
250K fewer returns (Year 1)
25M fewer returns (Year 5)

Carbon Savings:

- 21,000 tons CO2/year (Year 1)
- 2.1M tons CO2 (Year 5)

Packing Waste Reduction

60% fewer reductant shipments
180 tons/year (Year 1)
18,000 tons (Year 5)

E-Waste Prevention:

- 35% longer product lifespan (quality focus)
- 100 tons/year | 10,000 tons (5 years)

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Challenges and Mitigation Strategies

CHALLENGES	MITIGATION STRATEGY
Website Anti-Scrapping & API Rate Limits	**Multi-Approach** Rotate Proximus/user agent, implements respectful scraping delays, use official APIs where available. fallback caching mechanisms
Limited Historical Price Data	**Data Strategy** Partner with price tracking services, leverage public datasets (Kaggle) , implement continuous data collection from day one.
Model Accuracy & Forecast Reliability	**ML Optimization** Ensemble models (LSTM + ARIMA OR XGBOOST), continuous retraining , A/B testing predictions, confidence intervals for recommendations.
Real-Time Processing Latency	**Infrastructure** Cloud-based serverless architecture (AWS Lambda), Redis caching, CDN integration, load balancing for peak traffic

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Conclusion

The Problem Today

- 30+ minutes wasted per purchase across 50+ platforms
- ₹4 lakh crore lost annually to e-commerce fraud
- 48% cart abandonment due to hidden costs
- Massive carbon footprint from returns and impulse buying

Our Solution: Quick Deals

- **Predictive AI:** 85% accuracy forecasting when to buy
- **Trust Scoring:** 90% reliability protecting from fraud
- **Total Cost:** True comparison including all fees
- **AI Insights:** BERT summaries + GPT-4 guidance

5-Year Impact (10 Millions Users)

₹150M+	2.1M	8,800+	90%
Consumer Savings	**Tons CO2 Prevented**	**Years Reclaimed**	**Fraud Reduction**

Uniquely Intelligent

Beyond price lists—we tell you WHEN to buy, WHO to trust, and WHAT the total cost really is.

No Competitor Offers:
Predictive timing + Trust scoring + Context awareness in one platform

Proven Feasible

Built on mature tech with clear path to profitability and measurable milestones.

Investment: ₹30-42.5 Cr (18 months)

Break-even: Month 18

ROI: 600% over 5 years

Scalability: 100K to 10M users

Massively Impactful

Measurable transformation across social, economic, and environmental dimensions.

Social: ₹150M+ saved, 90% fraud reduction

Economic: ₹192B market efficiency

Environmental: 2.1M tons CO_2 prevented

Real-World Transformation

Single Mother, Mumbai
Saves ₹8,000/year -> Invest in daughter's educations

College Student, Delhi
Avoid ₹50,000 fraud-> Protected identity & Savings

Small Startup, Bangalore
30% Cost reduction -> Hires second employee

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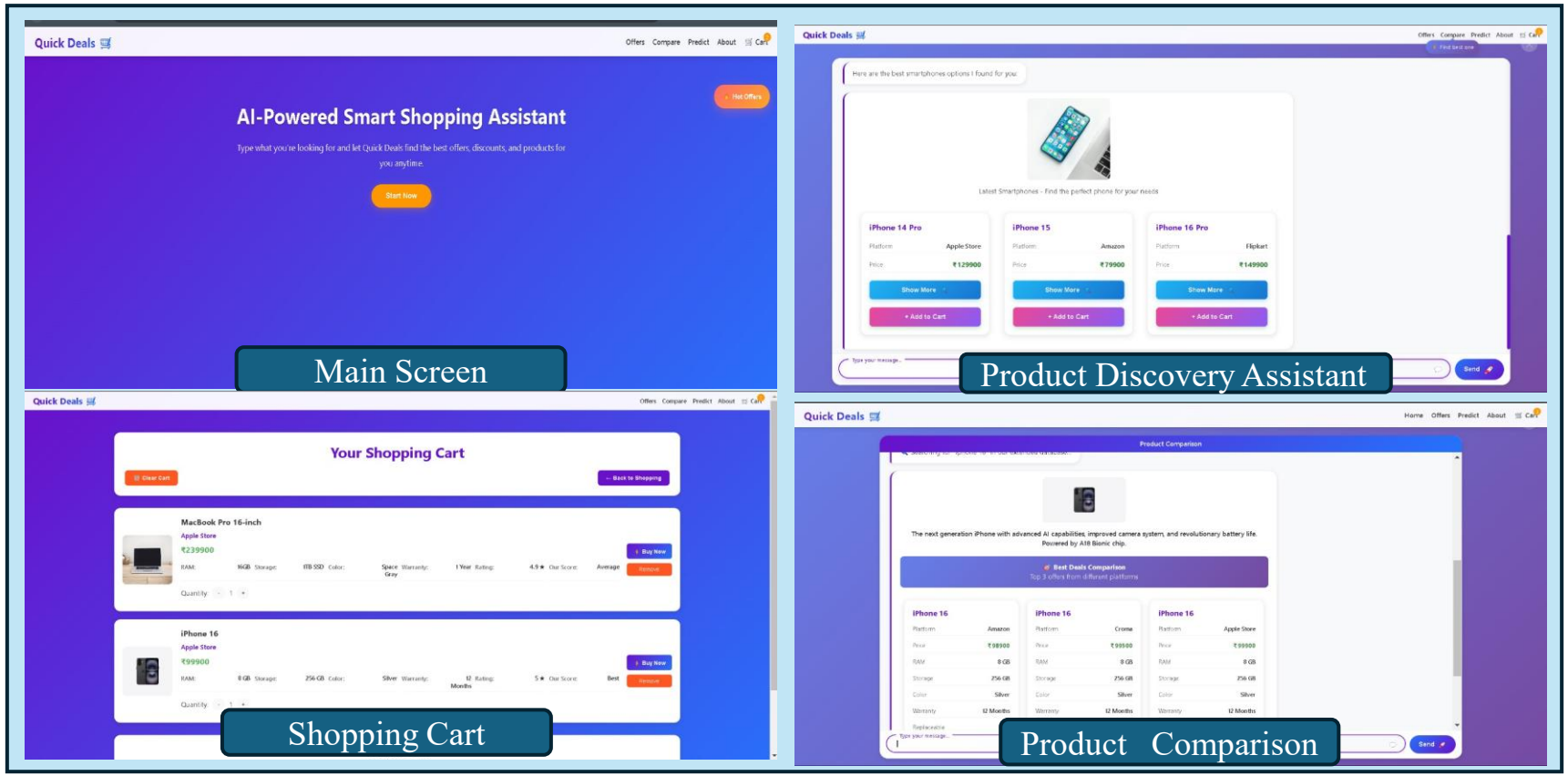
Annexure



Summary

The **AI-Powered Smart Shopping** model is an intelligent e-commerce platform designed to enhance the online shopping experience using artificial intelligence. It allows users to browse, search, and purchase products easily while receiving personalized recommendations based on their preferences. The system integrates smart filtering, price comparison, and efficient cart management to simplify decision-making. It also supports secure user authentication and order processing. Overall, the platform combines modern web design with AI features to deliver a smarter, faster, and more engaging shopping experience.

Model link 🔗 : (Works only for Desktop) https://quick-delas-ai-powerd-smart-shopping-ivks.onrender.com/