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Introduction



At first, our goal was to create a simple website focused on product reviews and user experiences not an e-commerce platform, but a space where people could share honest opinions about products.



Over time, we discovered that many online reviews are actually written using artificial intelligence, not by real users.

This led us to ask an important question: How can we tell the difference between a genuine review and a fake one?



And more importantly can we use the same AI technology that's causing the problem... to actually solve it.

That's where the idea for our project started: BuyWise.

Problem Statement

Online reviews are critical in e-commerce, with ~60% of shoppers relying on them for purchase decisions.

These deceptive reviews mislead buyers, reduce confidence, and hurt business reputations.

However, the rise of computer-generated reviews some studies report up to 43% of Amazon reviews are unreliable has eroded user trust.

3 BuyWise addresses this issue by combining smart AI-based fake review detection with a gamified reward system.

Over 75% of consumers express concern about encountering fake reviews, especially those created using advanced AI tools.

Literature Review

Leading platforms like Yelp,
TripAdvisor, and Trustpilot use AI and
user reporting to detect fake reviews,
but often fall short in several key areas.



Common gaps include:

- Lack of meaningful gamification and rewards
- Incomplete Arabic and RTL support
- Limited transparency in sponsored content labeling
- No focus on local product promotion



- Real-time AI-powered fake review detection
- Full bilingual (Arabic–English) support with RTL layout
- A structured reward system with points, badges, and vouchers
- Transparent sponsorship labeling and local product engagement

Objectives



To implement real-time fake review detection using a fine-tuned RoBERTa model.



To introduce a points, levels, and badges system to boost genuine engagement.



To allow users to redeem points for company-sponsored rewards.



To provide a bilingual, RTL/LTR responsive interface (Arabic & English).



To support likes, replies, reports, and real-time notifications.



To enable companies to register, manage products, and handle reward claims.

Methodology



Adopted the Scrum Agile Methodology for iterative and collaborative development.

Sprint Highlights:

Sprint 1: Core user/ admin functionality: Authentication, dashboards, product/category management

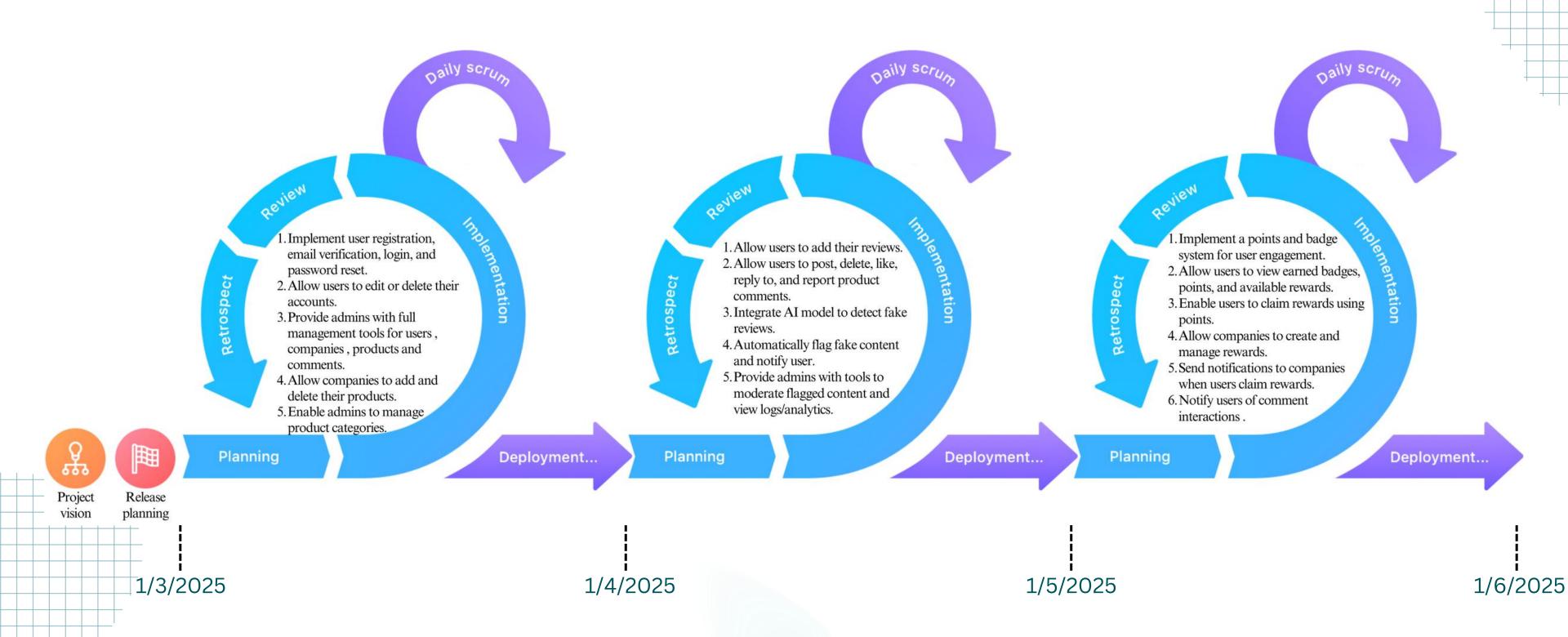
Sprint 2: Review system, comment interaction, AI model fake review detection, admin moderation

Sprint 3: Gamification (points, badges, rewards), company reward tools, real-time notifications

Execution Process:

- Daily Scrums: ~87 standups ensured alignment and quick problem-solving
- Sprint Planning: Selected and estimated tasks from the backlog
- Development: Iterative design, coding, testing, and integration
- Sprint Reviews: Demoed features and gathered supervisor feedback
- Retrospectives: Reflected on performance and identified improvements

Scrum Framework



Tools & Technologies



Backend:

PHP & MySQL for secure server-side logic and data storage

Python (Flask) to serve the AI model and process real-time review analysis



Frontend:

HTML, CSS, JavaScript, Bootstrap for a responsive, interactive and bilingual interface



AI Model:

Fine-tuned **RoBERTa** for classifying real vs. fake reviews Integrated via **Flask API** with high accuracy (97% F1 score)

Computer-Generated Review Detection



Model Used: Fine-tuned RoBERTa (Robustly Optimized BERT Pretraining Approach)



Purpose: Detects computer-generated reviews in real-time with high accuracy



Training: Fine-tuned on a balanced dataset of 40,000 reviews (real vs fake)



Inputs: User-submitted review text



Outputs: Authentic or Fake label / Confidence score /

Dynamic trust badge displayed next to the review



Why RoBERTa?

Outperformed traditional models (Logistic Regression, SVM, Random forest)

Strong contextual understanding of natural language

Ideal for short text classification tasks

Model Evaluation

- Accuracy: 96.9%
- Model Chosen: RoBERTa most robust and accurate
- F1-Score: 96.8% (Best among 6 models tested)
- Precision: 99.5% Accurately flags fake reviews
- Recall: 94.3% Captures majority of deceptive content
- AUC-ROC: 98.7% Exceptional class separation

Feasibility Study



Effort Estimation (Function Point Analysis):

- Unadjusted Function Points (UFP): 179
- Value Adjustment Factor (VAF): 1.12
- Adjusted Function Points (AFP): 180
- Estimated Effort: ~12 person-months (based on 16 FP/month)



Operational Feasibility:

- supports 3 roles (User, Company, Admin)
- Features include profile management, review system, notifications, rewards
- Admins can manage reports, users, products with full control



Technical Feasibility:

- Developed using PHP, MySQL, JavaScript, Python (Flask)
- Supports AI, multilingual UI, real-time actions
- Runs on local XAMPP, with responsive design
- Uses open-source tools, no paid licenses



Economic Feasibility:

Total estimated real cost: 2,467 JD

- Hardware: 800 JD
- Hosting + Domain: 217 JD
- Development & AI integration: 1,300 JD
- No dataset cost (used free sources)

Testing

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Unit Testing: Conducted per sprint to validate individual features

(e.g., user registration, comment submission).



Integration Testing: Confirmed seamless interaction between modules

(e.g., reviews triggering AI detection and admin moderation).



User Acceptance Testing (UAT):

20 participants, 11 evaluation areas: Average Score: 4.3/5

Highest: Language Switching (4.5), Usability (4.45)

Lowest: Error-Free Experience (3.95) – Minor issues resolved during sprints



Key Features



AI-Powered Review Validation

Detects computer-generated or suspicious reviews in real-time using a fine-tuned RoBERTa model.



Gamified User Engagement

Encourages authentic contributions with points, badges, and levels for trustworthy participation.



Reward Redemption System

Allows users to redeem earned points for company-sponsored vouchers.



Interactive Review Experience

Supports likes, replies, nested comments, content reporting, and real-time notifications



Future Work



Arabic AI Model for Fake Review Detection

Develop and train an AI model using authentic Arabic-language reviews to improve detection accuracy for regional users.



Official Product Verification

Integrate with regulatory bodies (e.g., Chamber of Commerce) to verify local products and issue certification badges.



Marketplace & Payment Integration

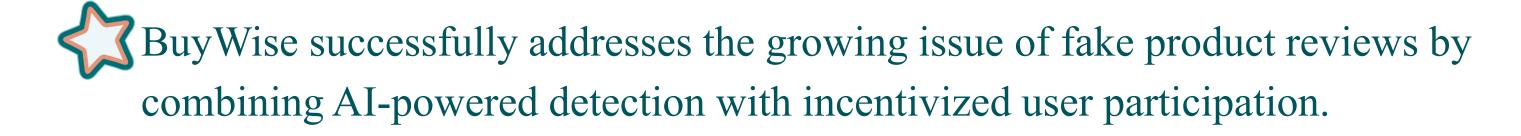
Connect with platforms like Amazon or PayPal to support in-app purchases, transactions, and order tracking.



AI-Based Fake Product Authenticity Detection

Develop and integrate an AI model to identify counterfeit or non-original products based on product data, improving trust and reducing manual admin work.

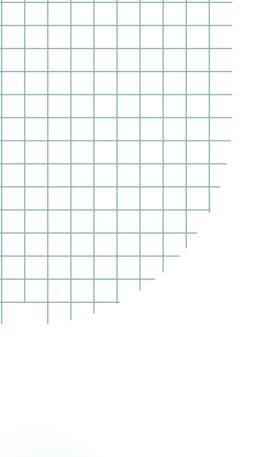
Conclusion



The platform promotes authentic feedback, enhances consumer trust, and empowers users and companies to interact transparently.

Through features like real-time moderation, gamification, and community engagement, BuyWise establishes a credible and user-driven review environment.

With a solid foundation, BuyWise is well-positioned for expansion into mobile apps, Arabic-language AI models, and official product verification systems paving the way for broader adoption and impact.



In a world filled with computer-generated reviews,

Buy Wise brings honesty, and puts trust back in your hands.



