# AI-Powered Product Authenticity Checker, Fake Product Detector & Price Comparator

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***Abstract-*** *The increasing cases of counterfeit products, fake sellers, and misleading pricing on e-commerce platforms have made online shopping risky for consumers. This paper presents an AI-based system that detects fake products, verifies authenticity, compares prices across platforms, and assists users via a chatbot. The system ensures transparency, enhances trust, and promotes informed decision-making in digital commerce.*

***Keywords***- Fake Product Detection, Product Authenticity, AI Chatbot, Price Comparison, E-Commerce Safety, Machine Learning.

## I. INTRODUCTION

With the rise of digital marketplaces, millions of products are sold daily via platforms like Amazon and Flipkart. While these platforms offer great convenience, they have also become a breeding ground for counterfeit products, fake brands, manipulated reviews, and price scams. According to industry reports, a significant percentage of consumers unknowingly buy fake goods, resulting in both financial and psychological distress.

This project introduces an AI-based system titled **"AI-Powered Product Authenticity Checker, Fake Product Detector & Price Comparator"**, which leverages machine learning and natural language processing to detect suspicious products and sellers, verify authenticity, provide price comparison, and guide users through a conversational AI chatbot. The goal is to reduce fraud, increase buyer confidence, and improve the overall online shopping experience.

The system is designed to:

- **Detect counterfeit products** by comparing product metadata and seller information against a database of flagged or blacklisted items.
- **Verify authenticity** using patterns in brand behavior, packaging consistency, review sentiment, and product descriptions.
- **Compare prices** across multiple platforms to highlight unusually low or high prices—both common indicators of scams or price manipulation.
- **Guide users interactively** through an integrated **AI chatbot**, capable of answering queries and suggesting safer alternatives.

The proposed tool not only empowers users to make informed decisions but also contributes to building a safer, more transparent e-commerce environment. By automating the detection process and integrating real-time user support, the system bridges the gap between technological capability and consumer protection. It also has the potential to scale across multiple domains and marketplaces, making it a valuable contribution to both the tech and consumer sectors.

## II. AIM

To develop an AI-powered system that can verify product authenticity, detect counterfeit listings, compare prices across platforms, and assist users using an intelligent chatbot to ensure safer and smarter online shoppig.

## III. WHAT IS FAKE PRODUCT DETECTION? [3], [4]

Fake product detection refers to the process of identifying counterfeit or unverified goods based on various digital footprints such as product metadata, seller behavior, price anomalies, user reviews, and known fraud indicators. The goal is to flag potentially dangerous or misleading listings before a purchase is made.

AI and machine learning models can learn patterns from historical data to detect abnormalities or inconsistencies in a product listing. When a user inputs a product URL, the system evaluates the data to determine its legitimacy.

### KEY MODULES OF THE SYSTEM

### 1. Fake Product Detection Engine

- Matches product URLs with a curated database of counterfeit products.

- Analyzes seller history, reviews, and return patterns.
- Detects red flags using AI models trained on fraud indicators.

**2. Product Authenticity Checker**

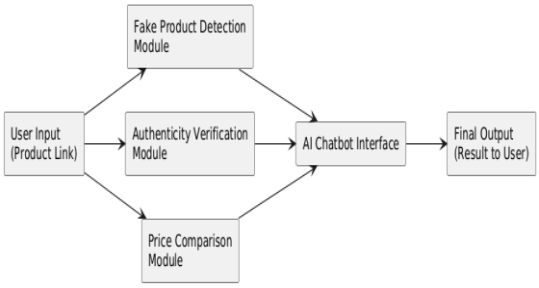
- Uses keyword analysis, brand data, and metadata validation.
- Examines product packaging, description quality, and mismatched product attributes.
- Compares against known verified listings.

**3. Price Comparison Engine**

- Web scrapes product prices from multiple platforms.
- Calculates average market value and highlights price discrepancies.
- Identifies underpriced (likely fake) or overpriced (exploitative) listings.

**4. AI Chatbot**

- Built using NLP models to interact with users.
- Answers queries like "Is this product real?" or "Are there better alternatives?"
- Assists in navigating through product data and system results.




**"Figure 1: Functional Modules – Detection, Verification, and Comparison Engines"**

**METHODOLOGY**

1. **Data Collection**: Product links, metadata, and seller profiles are collected via scraping tools from Amazon and Flipkart.
2. **Preprocessing**: The data is cleaned and labeled using real and fake product identifiers.
3. **Model Training**: Supervised models (e.g., decision trees, SVM) and unsupervised models (e.g., K-means) are trained on product classification and anomaly detection.
4. **Database Matching**: A real-time matching system flags links that appear in the blacklist.
5. **Chatbot Integration**: The chatbot is implemented using Hugging Face Transformers to enable natural conversations.

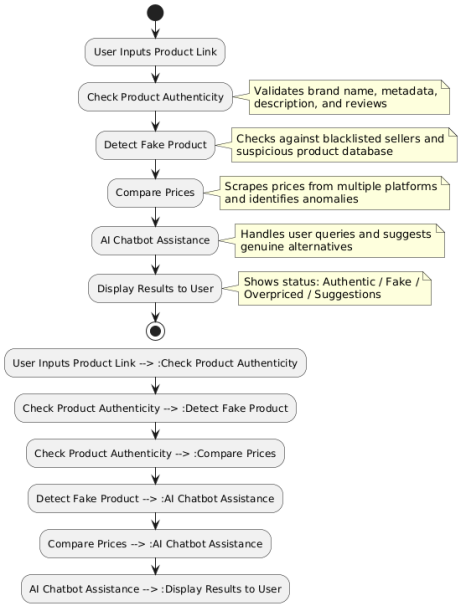



***Figure 2: System Architecture of the AI-Powered Fake Product Detection and Authenticity Checker"***

**FINDINGS**

- Fake product detection accuracy improved significantly with historical seller data.
- A majority of flagged listings had either extremely low or extremely high prices.
- Users found the AI chatbot useful for alternative recommendations and guidance.

## IV. FUTURE SCOPE

- Integration with browser extensions for real-time checking.
- Expansion to global e-commerce sites (eBay, Alibaba).
- Use of computer vision for detecting fake packaging.
- Multilingual chatbot for vernacular language support.

## V. CONCLUSION: [2],[3]

The proposed system effectively enhances trust in e-commerce platforms by enabling users to detect fake products, verify authenticity, compare prices, and interact with an intelligent chatbot. By preventing fraudulent purchases and misleading deals, it significantly improves the consumer shopping experience. This approach can be expanded with

image-based fake detection and multilingual support to reach a wider audience.

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