

**PHONIX:**

**AI-POWERED SMARTPHONE RECOMMENDATION ASSISTANT**

by

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**ABSTRACT**

In today’s fast-paced digital world, purchasing smartphones online involves navigating through multiple platforms, comparing specifications, prices, and reviews. This project introduces a smart AI-powered chatbot system that assists users in identifying the best smartphone deals by automatically scraping, comparing, and summarizing data from platforms like Amazon and Flipkart. The system is designed to enhance the online shopping experience by making it efficient, intelligent, and user-friendly. Aligned with the Sustainable Development Goal 9 (Industry, Innovation and Infrastructure), the chatbot encourages digital transformation and informed decision-making.

**CHAPTER 1: INTRODUCTION**

* 1. This chapter introduces the concept, purpose, and scope of the AI-based smartphone comparison chatbot.
  2. **Background of the Project:**

​​With the increasing number of e-commerce platforms and smartphone models, users often face decision fatigue when choosing the best phone for their needs. This project aims to simplify that process by building an AI chatbot that intelligently scrapes data, compares smartphone specifications and prices, and assists users in adding items to their cart. This aligns with SDG 9, promoting innovation through digital tools.

* 1. **Objectives:**
* To develop a chatbot that interacts with users to understand their smartphone requirements.
* To scrape and compare smartphones based on specifications, prices, and reviews.
* To identify and recommend the best deal.
* To simulate actions such as adding to cart and proceeding to checkout.
  1. **Purpose, Scope and Applicability:**

**Purpose:**

* To make smartphone purchasing smarter, quicker, and more reliable.
* To reduce the time spent comparing products across platforms.
* To promote user trust in digital assistants for making purchasing decisions.

**Scope:**

* The system focuses solely on smartphones.
* Platforms considered: Amazon and Flipkart.
* Limitations: Real-time checkout will not be executed due to policy restrictions; only simulation.
* Methodology: NLP-based chatbot + Web scraping + Price-review analysis.

**Applicability:**

* E-commerce assistance tools.
* Consumer electronics price analysis.
* Product recommendation systems.
* Can be extended to other electronic gadgets in future.

* 1. **Overview of the report:**

Chapter 1 introduces the system. Chapter 2 discusses the system requirements and analysis. Chapter 3 focuses on system design and architecture. Chapter 4 explains implementation and testing. Chapter 5 provides conclusions and future scope.

**CHAPTER 2: SYSTEM ANALYSIS AND REQUIREMENTS**

This chapter provides an overview of the current systems, their limitations, and the proposed AI system.

**2.1 Existing system:**

* Currently, users manually search on platforms like Amazon and Flipkart to compare smartphone specs, reviews, and prices. Recommendation engines are isolated to individual platforms.

**2.2 Limitations of the existing system**

* No unified comparison across platforms.
* Manual effort is required for comparisons.
* No AI assistant for guided shopping.

**2.3 Proposed System**

The proposed system is a chatbot-based application that:

* Accepts a user query (e.g., "I want iPhone 14, 128GB")
* Scrapes product data from Amazon and Flipkart.
* Compares specs, prices, and reviews.
* Returns the best deal.
* Simulates cart addition and checkout.

**Sub-problems:**

* Extracting product information accurately.
* Integrating chatbot with web scraping.
* Ensuring review analysis and sentiment processing.

**2.4 Benefits of the proposed system**

* Saves time for users.
* Provides informed and confident decision-making.
* Real-time price and review analysis.

**2.5 Features of the proposed system**

* Natural Language Interface.
* Real-time scraping.
* Product specification matching.
* Sentiment analysis of reviews.
* Deal recommendation engine.
* Simulated cart checkout.

**2.6 System Requirements Specification:**

* Define the requirements of the system without focusing on how they will be achieved.
* Requirements can be identified from the limitations and problems of the existing system

**2.6.1 User Characteristics:**

* General users: Looking to buy a smartphone.
* Tech enthusiasts: Interested in comparing specs.
* Budget users: Seeking the best deals.

**2.6.2 Software and Hardware Requirements:**

(i) **Software Requirements:**

* OS: Windows/Mac/Linux
* Compiler: Python 3.x
* Libraries: BeautifulSoup, Selenium, NLTK, Pandas, OpenAI API
* IDE: Jupyter, VS Code
* Virtualization: Google Colab

(ii) **Hardware Requirements:**

* Processor: Intel i5 or higher
* RAM: 8GB minimum
* Disk: 256GB SSD
* GPU: Optional (for NLP optimization)

**2.6.3 Constraints:**

* Flipkart and Amazon have scraping limitations (rate-limiting and captcha).
* Interfaces limited to simulation only for checkout.
* Dependent on HTML structure of e-commerce sites.

**2.6.4 Functional Requirements**

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| --- | --- |
| **Requirement ID** | **Requirement Description** |
| C\_FR1 | Accept user prompt and extract smartphone name and features |
| C\_FR2 | Scrape Amazon and Flipkart for product data |
| C\_FR3 | Compare specifications and extract user-relevant info |
| C\_FR4 | Analyze sentiment of top reviews |
| C\_FR5 | Display best deal with price and rating |
| C\_FR6 | Simulate "add to cart" and "checkout" actions visually |

**2.6.5 Non-Functional Requirements**

|  |  |
| --- | --- |
| Requirement ID | Requirement Description |
| C\_NF\_R1 | Fast response time under 3 seconds |
| C\_NF\_R2 | Secure handling of user prompts |
| C\_NF\_R3 | Easy-to-use conversational interface |
| C\_NF\_R4 | Scalable design for adding new platforms like Croma or Reliance Digital |
| C\_NF\_R5 | High reliability during scraping even if one site fails |

**2.7 Block Diagram**:

