Software Engineering FYP-24-SE-A-04 Proposal: AI-Powered Product Recognition, Price and Reviews Comparison from Images

Problem Statement:

With the rise of online shopping, users frequently come across products they wish to purchase but often find it time-consuming to search for these products across various platforms to compare prices, specifications, and reviews. While some visual search tools exist, they tend to lack features that facilitate identifying products, comparing specifications, or finding the best deals across multiple platforms. Users still need to manually search, browse, and compare product options, which can be inefficient and tedious.

Key Observations and Gaps:

1. **Search Products by Image Extension**
   Link to Platform
   This browser extension allows users to right-click on images and search for similar products on platforms like AliExpress, eBay, and Amazon. While simple and convenient, it lacks mobile functionality and integration with multiple marketplaces.
2. **ProductSearch.app**
   Link to Platform
   This web-based tool allows users to upload images for product searches across eBay, Amazon, AliExpress, Alibaba, and Walmart. However, it lacks real-time object recognition and more advanced AI features, limiting its capabilities.
3. **Google Lens**
   Link to Platform
   While Google Lens excels in identifying real-world objects and linking users to purchasing options, it is not primarily designed for multi-platform price comparisons or detailed product specification reviews.

The challenge we aim to address:

We propose developing an AI-powered mobile app and browser extension that can recognize products from an image or screenshot and provide the user with links to relevant products online. The system will also perform **price, specification, and review comparisons** across various online platforms, enabling users to make informed purchasing decisions quickly and effortlessly. By streamlining the comparison process, the solution will help users make quicker decisions and drive higher conversion rates, ultimately **increasing sales** for businesses.

Proposed Solution:

We propose developing an AI-powered **web app**, mobile app, and browser extension that can recognize products from an image or screenshot and provide the user with links to relevant

products online. The system will also perform **price, specification, and review comparisons** across various online platforms, enabling users to make informed purchasing decisions quickly and effortlessly. By streamlining the comparison process, the solution will help users make quicker decisions and drive higher conversion rates, ultimately **increasing sales** for businesses.

Key Features Include:

- **Mobile App Functionality**:
    - The app will **scan the current screen in the background** and instantly search for matching products across platforms like Amazon, AliExpress, Daraz, eBay, and Walmart. Results will include **price comparisons, detailed specifications, and comprehensive reviews**.
    - Additionally, users will have the option to **upload images** for product search.
- **Browser Extension Functionality**:
    - On the web, users can crop a specific part of a webpage or video to initiate a search. This extension will return similar products and reviews across **multiple marketplaces**, including smaller or niche platforms not covered by existing tools like **Search Products by Image**.
- **Web App Functionality:**
    - The web app will allow users to upload product images or screenshots and instantly search for similar products across multiple e-commerce platforms. It will offer **price, specification, and review comparisons**, similar to the mobile app and browser extension, but optimized for a desktop experience. This will provide users with an additional platform to access the service, ensuring seamless access across all device types.

Technologies to Be Used:

1. **API Integration for Image-Based Product Search**:
    - **Google Cloud Vision API**: For advanced image recognition and object detection, enabling product search based on images with high accuracy.
    - **eBay Image Search API**: Provides the ability to search eBay listings using images, returning relevant product matches with price information.
    - **Bing Visual Search API**: Allows users to perform visual searches for products and retrieve detailed information, including pricing from various platforms.
2. **Next.js**: For building server-rendered React applications with excellent performance.
3. **React.js**: For building the dynamic user interface of the web and browser extension.
4. **Firebase**: For backend services such as user authentication, real-time data management, and hosting.

5. **Tailwind CSS**: For efficient styling of the app and web interface, ensuring a sleek and responsive design.
6. **Flutter**: For cross-platform mobile app development, enabling seamless experiences on both iOS and Android.

Expected Outcome:

By the end of this project, we will develop a fully functional **web app, mobile app, and browser extension** capable of recognizing products from images or screenshots and providing users with detailed **price, specification, and review comparisons** from multiple e-commerce platforms. This comprehensive comparison will not only simplify the buying process for users but also **increase sales for businesses** by reducing friction in the decision-making process and encouraging faster purchasing actions.

Conclusion:

This project will leverage AI and deep learning to transform the online shopping experience. Users will benefit from the **convenience of instant price, specification, and review comparisons** with a single tap or a simple crop of an image, significantly improving product search efficiency. Additionally, businesses will see an **increase in sales** as users can make quicker, more informed purchasing decisions based on comprehensive product data.

By combining **cutting-edge AI techniques** with seamless integration across multiple marketplaces, this project offers a comprehensive solution that fills the existing gaps in the current visual search tools, making it a valuable asset in the e-commerce industry.