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# AI Powered Fashion Sustainability Advisor

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**ABSTRACT:** An innovative web platform called the AI- Powered Fashion Sustainability Advisor is revolutionizing the fashion industry by offering individualized advice that prioritizes sustainability and elegance. It makes sustainable decision-making easier by providing thorough information about brands, materials, and production methods. It's like having a personal stylist with a conscience thanks to recommendations that are specifically tailored based on body shape, budget, and personal interests. It features style guides, fashion updates, and motivational tales to support sustainability while fostering individuality. It also cultivates a community of like-minded people to build a more fashionable and sustainable future. Come along as we transform fashion for a better future.

**KEYWORDS:** OpenCV, AI-powered platform, Fashion sustainability, Trend reports, Community engagement.

## I. INTRODUCTION

The development of the AI-Powered Fashion Sustainability Advisor is a result of the fashion industry's environmental effect, customer demand for sustainability, and the complexity of fashion decisions. This platform uses artificial intelligence (AI) and augmented reality to offer customized advice on sustainable fashion choices. In addition to providing outfit recommendations and brand and material education, it evaluates body shapes. It promotes sustainable fashion practices, teaches people, and improves the buying experience with virtual elements. The project's objectives are to empower people, transform fashion interaction, and have a beneficial effect on the industry.

The structure of the paper is as follows. Related work is covered in Section II, implementation is explained in Section III, database tables are shown in Section IV, Section V contains the GUI/Working module and the discussion is concluded in Section VI.

## II. RELATED WORK

Watson et al.[1] looked at how fashion purchase intention was affected by experiential augmented reality (AR) applications. Their analysis focused on the engaging and immersive experiences that augmented reality offered, allowing users to digitally try on clothes and see how they would seem. They discovered a strong positive correlation between purchase intention and augmented reality applications, suggesting that AR has the ability to favourably affect consumers' attitudes and perceptions of fashion goods.

The role of personalization in boosting consumer happiness and loyalty was examined by Srivathsan et al. [2] in their study on customization of the user experience in fashion technology. They emphasized the value of



customized product recommendations and recommendations, stressing the advantages of letting customers customize their experiences with fashion tech platforms and building a deeper emotional bond with the brand.

Gazzola et al.'s study [3] concentrated on fashion industry trends, namely how people view sustainability and the circular economy. They noted how consumers, especially younger ones, are becoming more interested in sustainability, and they stressed how adopting sustainable practices can improve a company's reputation and build client loyalty.

The growing use of augmented reality (AR) in India as a digital marketing tool was studied by Matta and Gupta [4]. They talked about how augmented reality (AR) technology can captivate customers with immersive and interactive experiences, resulting in more brand advocacy and loyalty. This is especially relevant given the expanding Indian e-commerce market.

Consumers' preparedness for artificial intelligence (AI) in the fashion business was examined by Liang et al. [5]. They acknowledged privacy and data security concerns while also examining the potential advantages of AI, such as improved shopping experiences and personalized recommendations. The study underlined how critical it is to solve these issues in order to guarantee the ethical and responsible application of AI technology in the fashion industry.

In his discussion of the revolutionary effects of artificial intelligence (AI) on the fashion business, Luce [6] highlighted a number of AI applications, such as supply chain optimization, trend forecasting, and customized suggestions. The study focused on how AI may stimulate innovation, increase efficiency, and streamline operations within the fashion value chain.

In the big data age, Thomassey and Zeng [7] investigated the application of artificial intelligence (AI) in the fashion sector. They talked about how artificial intelligence (AI) may glean insightful information from massive databases, guiding design, production, and marketing decision-making processes. The study emphasized how artificial intelligence (AI) may improve customer experiences and streamline supply chain operations in the fashion sector.

With an emphasis on smart fashion, Mohammadi and Kalhor [8] offered a thorough analysis of artificial intelligence (AI) applications in the clothing and fashion sector. They talked about several AI technologies and how they can affect marketing, production, design, and customer experiences. The study emphasized how AI has the capacity to completely change a number of facets of the fashion value chain.

The potential of virtual style assistants (VSAs) in the fashion business was examined by Luce [9], who emphasized the tools these assistants may offer in terms of tailored fashion advice, sustainability, and improving customers' overall fashion experiences. The report covered issues including data security and privacy concerns and emphasized the significance of implementing AI responsibly.

Huo, Tang, and Kim's [10] study looked into the potential uses of artificial intelligence (AI) technology in the apparel sector. Along with discussing the difficulties associated with data privacy and ethical considerations, they also talked about the potential advantages of AI in design, production, supply chain management, and consumer experiences. The study underlined how crucial it is to use AI wisely in order to boost consumer happiness and efficiency in the apparel sector.

### III. METHODOLOGY

**Requirement Gathering:** During the first stage, stakeholder interactions, workshops, and interviews are used to collect all of the requirements. Understanding the requirements and preferences of stakeholders as well as potential users is the goal of this step. A precise development roadmap is then created by carefully documenting the information that has been gathered. To make sure the project meets user expectations and



improves the user experience overall, strategies like user stories, personas, and path mapping are used.

**Design and Prototyping:** The phase of design and prototyping starts when requirements are gathered. To depict the user interface (UI) and user experience (UX) of the web platform and mobile app, wireframes and interactive prototypes are made. By facilitating stakeholder feedback and iterations, these prototypes make sure that the finished product successfully satisfies user needs.

**AR Development:** The right AR/VR development framework, such as ARCore, ARKit, or Unity, is chosen for the project's augmented reality (AR) component. In order to analyze the user's body shape and proportions in real time using the device's camera, computer vision algorithms are built. The app's functionality is improved through integration with AR/VR software development kits (SDKs), enabling features like interactive AR-based fashion tutorials and virtual wardrobe visualization.

**Web development:** To build a responsive and user-friendly web platform, web development technologies including HTML, CSS, and JavaScript frameworks (such as React.js, Angular, and Vue.js) are used. Interfaces for virtual wardrobe management, fashion article browsing, and tailored recommendation access are designed to offer a uniform user experience across platforms. The platform's usefulness is enhanced through the integration of external APIs that retrieve fashion-related data, trends, and social media information.

**Database Management:** To ensure effective data storage and management, database management entails choosing the right database technology, creating the database schema, and implementing CRUD (Create, Read, Update, Delete) operations into practice. The database contains user profiles, information about clothing items, and other pertinent data. Throughout the application, data synchronization and consistent data access are guaranteed by integration with backend development.

**Machine learning (ML) and artificial intelligence (AI) models** are built to improve the project's capabilities, including style analysis and recommendation systems. Appropriate machine learning algorithms and frameworks (such as TensorFlow and PyTorch) are utilized to train models on pertinent datasets. ML models are used for tailored suggestions and real-time prediction, seamlessly integrating with the overall system architecture.

**Cloud Services Integration:** Scalable and dependable infrastructure is provided for hosting the backend system by using cloud platforms such as AWS, GCP, or Azure. User data, photo files, and video assets are efficiently stored and retrieved with the help of cloud storage services. Serverless computing systems optimize resource utilization and cost by enabling automatic scaling of backend activities based on demand. Solutions for logging and monitoring are used to keep tabs on app performance, spot bugs, and comprehend user behaviour.

**Testing and Quality Assurance:** Unit, integration, and user acceptability testing are just a few of the phases of development when thorough testing is carried out. Testing for usability and functionality guarantees that all features and functionalities perform as planned and offer a flawless user experience. Regression testing is conducted with greater consistency and efficiency when automated testing frameworks such as Selenium or Appium are used.

#### IV. DATABASE TABLES

TABLE 1: CATEGORIES

Field	Type	Default
<b>Id</b>	Serial	Not null
<b>Name</b>	VarChar(255)	
<b>Created_At</b>	Timestamp with time zone	Current_Timestamp
<b>Updated_At</b>	Timestamp with time zone	Current_Timestamp



Table 2: Product Categories

Field	Type	Default
Category_Id	Integer	Not null
Product_sku	VarChar(255)	
Created_At	Timestamp with time zone	Current_Timestamp
Updated_At	Timestamp with time zone	Current_Timestamp

Table 3:Sessions

Field	Type	Default
Id	VarChar(255)	Not null
Data	text	
Created_At	Timestamp with time zone	Current_Timestamp
Updated_At	Timestamp with time zone	Current_Timestamp

Table 4:Tags

Field	Type	Default
Id	Serial	Not null
Name	VarChar(255)	
Created_At	Timestamp with time zone	Current_Timestamp
Updated_At	Timestamp with time zone	Current_Timestamp

## V. GUI/WORKING MODULES

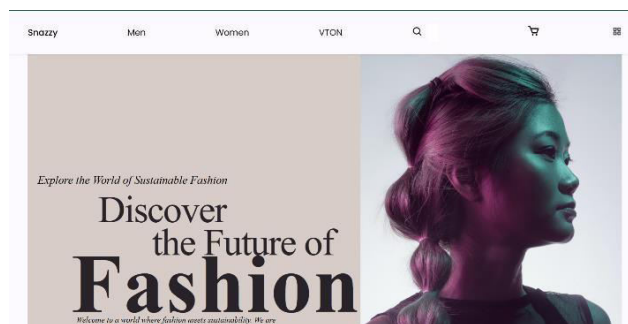


Figure 1: Home Page

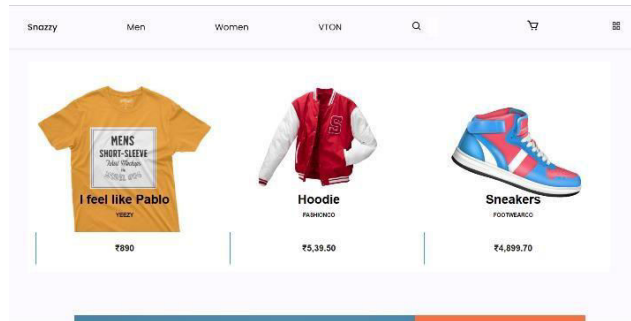


Figure 2: Home Page 2

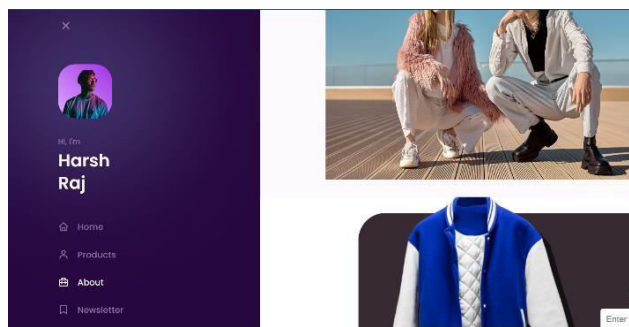


Figure 3: Home Page 3

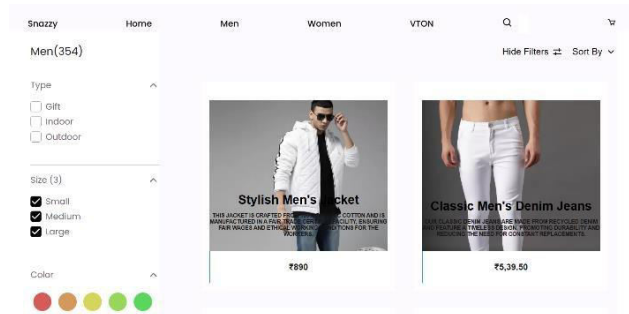


Figure 4: Product Page

## VI. CONCLUSION

Conclusively, the AI-Powered Fashion Sustainability Advisor project marks a noteworthy advancement at the nexus of fashion and technology. By utilizing advanced database management, augmented reality, and artificial intelligence, this cutting-edge technology not only transforms the way consumers interact with fashion, but it also advances sustainability in the sector. Users are enabled to make eco-conscious fashion decisions through immersive virtual wardrobe experiences and personalized recommendations powered by machine learning algorithms. The project's user-centered design and scalable infrastructure open the door to a more technologically advanced and sustainable fashion industry in the future.



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