**1.Introduction**

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Even though the online fashion retail sector has grown significantly, many customers are still hesitant to buy clothing online because they are unsure about the fitness, size, and style. Effective visualization tools are absent from traditional e-commerce platforms, which results in high return rates and unhappy customers. Current alternatives, such augmented reality (AR) try-ons, frequently fall short of offering realistic clothing fitting, which makes them untrustworthy for consumers. Due to complicated processes and expensive prices, small businesses also find it difficult to incorporate high-tech solutions into their online storefronts.

To overcome these obstacles, we present **FitON**, a smartphone application that uses **deep learning-based image processing** to enable users to visualize how clothing fits on their bodies. FITON supports local shops and customers by enhancing the online shopping experience with social media-inspired interfaces, tailored suggestions, and realistic AI-generated try-ons.

**1.2 Definition of the Problem**

Client satisfaction and shop profitability are hampered by several issues facing the online fashion business. Customers' inability to precisely picture how clothes will fit and seem on them before making a purchase is one of the main problems. Expectations and reality frequently diverge since standard size charts and static product representations do not take into consideration differences in body form, skin tone, and personal preferences. Because of this, a lot of consumers steer clear of online clothing purchasing, and those that do frequently return products because they don't fit properly.

**1.2.1. Problems in Existing Systems**

* **Absence of Realistic Visualization**: Size charts and generic models are the mainstays of current online fashion platforms, which fail to offer a customized or precise depiction of how apparel will seem on specific customers.
* **High Return Rates**: Online merchants frequently receive returns because of incorrect size and fit expectations, which results in monetary losses and inefficient logistics.
* **Limited Personalization**: AI-driven clothing recommendations based on a user's body type, preferences, and previous purchases are not often available on e-commerce platforms.
* **Unfavorable to Small Shops**: Small and smaller fashion firms find it challenging to compete with larger brands due to the high cost and complexity of implementing high-tech solutions like AR-based try-ons.
* **Unengaging User Experience**: Online purchasing is less engaging than in-store encounters due to the lack of an interactive and user-friendly interface in many current systems.

**1.2.2. Problems with Different User Roles**

* **Customers:** Struggle to choose the appropriate size and style, which causes discontent and canceled orders.
* **Retailers**: Face challenges with low conversion rates, high return rates, and a dearth of reasonably priced technology.
* **Fashion influences**: Lack the resources to digitally display clothes try-ons, which limits interaction prospects.

By providing an AI-powered virtual try-on system that offers precise garment visualization, lowers return rates, improves customization, and benefits both customers and merchants, FitON seeks to address these issues.

**1.3 Project Objectives**

* To improve the online shopping experience by offering virtual try-ons that help customers see how garments fit, and match based on body measurements and skin tone.
* To come up with a true AI-based solution that will help customers who don't want to buy clothes online without seeing how they look on them in the first place.
* To use BERT4Rec to create a personalized recommendation system that gives clothing ideas based on the user's watching history and personal tastes.
* To use the Flutter framework to make a cross-platform app that works smoothly on both mobile and web devices with the same codebase.
* To build a social-sharing tool for virtual try-ons, allowing users to share try-on results with others, expanding the brand's reach and attracting more users.
* To collaborate with local retailers, creating a platform for clothing brands to reach their target audience and showcase their goods with accurate size and fit information.

**1.4 Scope of the Project**

By offering **AI-powered virtual try-ons**, **tailored suggestions, and an intuitive user interface**, FitON aims to improve the online fashion buying experience. To assist consumers in making well-informed shopping selections, the technology enables them to submit their photos and virtually test on clothing.

**1.4.1. System Boundaries – What FitON Can and Cannot Do**

* **What FitON Can Do:**
* Make it possible for people to visually try on clothing by using realistic visuals created by AI.
* Using BERT4Rec AI models, make tailored fashion suggestions based on user preferences and previous purchases.
* Provide a swipe-based interface modeled like TikTok to facilitate browsing and interaction.
* Give consumers the option to tell friends and social media followers about their try-on findings.
* Provide a platform that makes it simple for local businesses to post their clothes photos and sizing information.
* Assist clients in making more educated purchasing decisions to lower return rates.
* **What FitON Cannot Do:**
* Users are required to manually input their bodily dimensions after being physically measured.
* Because fabric, stretch, and actual garment fitting vary, we guarantee a 100% correct fit.
* It creates AI-based static try-on pictures rather of processing real-time 3D augmented reality (AR) projections.
* Provide opportunities for direct payments or purchases within the app (but it may send users to the websites of retailers).

**1.4.2. Users of FitON**

* **Customers (Online Shoppers):** People who wish to purchase clothing online but have trouble with visualization and size.
* **Retailers and neighborhood fashion shops:** Companies who wish to use virtual try-on capabilities to display their apparel ranges.
* **Fashion Influencers & Enthusiasts:** People who like using digital try-ons to explore and share fashion trends.

**1.4.3. Problems with FitON Solves for These Users**

* **Customers (Online Shoppers):** enables people to see how clothing will fit and appear before making a purchase.
* **Retailers:** Offers a user-friendly platform for product display, lower return rates, and more online sales.
* **Fashion Influencers**: Enables them to interact with their followers by posting virtual try-ons and style advice.

**1.5 Chapter Summary**

We covered the issue, the solution, and the main players in the FitON project in this chapter.  
  
 **1.5.1. Problem:**

Online customers have trouble purchasing clothing since they can't see how the items will fit and complement their bodies. Realistic virtual try-on capabilities are lacking in current e-commerce platforms, which results in high return rates and unhappy customers. Adopting high-tech solutions is another challenge for small merchants.

**1.5.2.** **Solution:**

Before making a purchase, consumers can assess how clothing fits thanks to FitON, a smartphone application that uses artificial intelligence to create realistic virtual try-ons. By providing a straightforward platform for local shops to display their goods, FitON supports them while improving their online shopping experience using deep learning (CNN) for AI try-ons and BERT4Rec for tailored suggestions.

**1.5.3. Participants/Users:**

**Consumers (online shoppers):** Get tailored fashion advice and virtually test clothing with the app.

**Retailers & Local Fashion Stores:** Upload their clothing items to the platform, reducing returns and increasing online sales.

**Fashion Influencers and Enthusiasts**: Share virtual try-on outcomes and style inspiration to interact with their audience.

**References**

* *Transform Online Shopping with Virtual Try-On Technology - Bambuser* (no date).

[https://bambuser.com/article/try-before-you-buy-how-virtual-try-on-is-reshaping-online-shopping**.**](https://bambuser.com/article/try-before-you-buy-how-virtual-try-on-is-reshaping-online-shopping.)

(*Transform Online Shopping with Virtual Try-On Technology - Bambuser*, no date)

* *Online-Journals.org* (no date).

Available at:<https://online-journals.org/index.php/index.>

(*Online-Journals.org*, no date)

* *Virtual Try-On Technology: Enhancing online shopping experience to drive sales in eCommerce* (no date).

[Available at :https://tuplestrategy.com/blog/virtual-try-on](%20https:/tuplestrategy.com/blog/virtual-try-on)

(*Virtual Try-On Technology: Enhancing online shopping experience to drive sales in eCommerce*, no date)

* Yang, C. (2021) 'Why TikTok is Addictive: A Product Design and UX Analysis,' *Medium*, 16 December.

Available at :<https://chougeena.medium.com/why-tiktok-is-addictive-a-product-design-and-ux-analysis-149f429d55c3.>

(Yang, 2021)

* Sun, F. *et al.* (2019) *BERT4Rec: Sequential Recommendation with Bidirectional Encoder Representations from Transformer*.

Available at :<https://arxiv.org/abs/1904.06690?utm_source.>

(Sun *et al.*, 2019)