# SmartFit: AI-Powered Virtual Try-On System for Fashion MSMEs

## Theme

Innovation in Adoption of Industry 4.0 & 5.0 in MSME Ecosystem

## Sector

Services, Design, Wellness, and E-Commerce

## Concept and Objectives

The proposed innovation, SmartFit, is an AI-powered virtual try-on system designed for MSME clothing brands. It allows users to visualize how garments will look and fit on their own body using just a smartphone camera. By integrating AI-based body scanning, pose estimation, and augmented reality, the system creates a realistic virtual trial room experience for online shoppers.  
  
This technology empowers small fashion businesses to adopt Industry 4.0 practices without needing expensive equipment or infrastructure. It enhances user confidence during purchases, reduces product return rates due to size and fit issues, and contributes to a sustainable shopping model by minimizing logistic waste.  
  
Objectives:  
- Provide MSMEs with an affordable AI solution for virtual try-ons.  
- Offer a realistic and personalized clothing preview using camera-based body tracking.  
- Reduce returns by improving fit accuracy and purchase satisfaction.  
- Promote eco-friendly e-commerce by cutting down unnecessary shipments.  
- Boost customer engagement and sales conversion in online fashion platforms.

## Newness/Uniqueness of the Innovation

The proposed innovation introduces a SmartFit AI-based virtual try-on system that allows users to visualize how clothes will look and fit on their real body using just their smartphone camera. Unlike traditional size charts or mannequin previews, this system creates a personalized 3D fitting experience using AI-powered body scanning, pose estimation, and augmented reality.  
  
What makes this idea unique is its focus on MSME apparel brands, enabling them to adopt advanced Industry 4.0 technologies without heavy investments. It bridges the gap between online and in-store shopping by offering a trial-room-like experience at home, which is currently available only in premium platforms like Lenskart or Myntra for specific product types.  
  
The system not only enhances customer satisfaction but also reduces return rates, minimizes waste, and supports low-carbon, sustainable e-commerce practices — making it both technologically and environmentally impactful.

## Problem Statement

Most online fashion customers face issues with size, fit, and style confidence, resulting in high return rates. MSME apparel brands lack access to advanced try-on technologies used by larger platforms, leading to reduced conversions and poor customer retention.

## Solution Approach

SmartFit uses AI-based body scanning and AR to provide a virtual trial room experience using just a smartphone camera. It helps users visualize fit and style before purchase and allows small brands to integrate try-on features without large infrastructure or cost.

## Technology Stack

- AI/ML Models: Pose Estimation (MediaPipe, OpenPose), Body Measurement Estimation  
- AR/Visualization: Three.js / Unity / WebAR  
- Frontend: Streamlit / React  
- Backend: Python, Flask  
- Storage: Cloud-based image & product databases  
- Optional: ChromaDB for recommendations

## Potential Area of Application in Industry/Market

Fashion retail, online clothing stores, tailoring services, digital kiosks, virtual fashion events.

## Market Potential

The global virtual fitting room market is projected to reach $12 billion+ by 2028, driven by rapid growth in online fashion retail and demand for personalized shopping experiences. With over 65% of customers unsure about fit and size when shopping online, this innovation addresses a major pain point.  
  
MSME clothing brands and online retailers can leverage this affordable solution to reduce return rates, increase sales conversions, and improve customer satisfaction. As digital adoption rises among small businesses, SmartFit has strong potential for wide-scale implementation across the fashion e-commerce sector, both in India and globally.