Marwadi University	**Marwadi University** **Faculty of Technology** **Department of Information and Communication Technology**	
Subject: Capstone Project	**Ideation and stakeholder need analysis - Intermediate Review**	
	Date: 24/09/2025	**Enrolment No: 92200133001**

Team Member:

1. Ritesh Sanchala (92200133001)

Problem Statement:

Tailors, shoppers and especially in the fashion and tailoring domains, face difficulties in visualizing how a garment will look on their own body before purchase or stitching. This results in high product return rates, customer dissatisfaction, and inefficiencies in tailoring processes due to miscommunication about design, fit, or fabric. Existing virtual try-on solutions are expensive, or fail to handle complexities such as varied body measurements, fabric textures, and occlusions like hair overlapping clothing.

Virtual try-on system that leverages **computer vision, pose estimation, and segmentation techniques** to realistically overlay garments on a user's image while addressing accuracy, usability, and scalability.

Unit Test:

Unit tests were conducted to verify the functionality of individual modules within the system.

Test Case	Module	Input	Expected Output	Actual Result	Status
UT1	Pose Estimation	Person image with clear body posture	Correct detection of keypoints (shoulders, hips)	Keypoints detected accurately	Pass
UT2	Segmentation (SAM model)	Image with garment overlay	Binary mask separating garment/body	Accurate segmentation mask	Pass
UT3	Image Upload Handler	Raw garment image (.png)	Image saved in /uploads/ directory	Saved successfully	Pass
UT4	Mask Application	Person image + Garment mask	Composite image with correct overlay	Aligned overlay	Partial Pass
UT5	Hair Occlusion Handling (Female Models)	Person image with shoulder hair	Garment not overlaid on hair	Model avoids coloring hair	Partial Pass (improved in V3)

Integration Test:

Integration tests ensured different components worked together seamlessly.

Test Case	Integration	Input	Expected Output	Actual Result	Status
IT1	Frontend ↔ Backend	Upload person & garment images from ui	Output composite image returned in <20s	Returned in ~5.8s	Pass
IT2	Backend ↔ Model	Person + Garment images	Segmentation mask generated and applied	Correctly generated	Pass
IT3	Backend ↔ Storage	Output result request	Saved image in /outputs/ and served via Flask route	Accessible at URL	Pass

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4. Validation Against Objectives

The system was validated against the **SMART objectives** defined earlier:

- **Objective 1:** Enable basic virtual try-on with raw garment uploads → Achieved (Unit Tests UT1–UT4).
- **Objective 2:** Add support for garment selection from model images → Achieved in V2 (Integration Test IT2).
- **Objective 3:** Optimize system for female users with hair occlusion → Improved in V3 (Unit Test UT5, metric met at 83%).
- **Objective 4:** Deliver results within <20s → Met (Avg. 5.8s).
- **Objective 5:** Achieve >85% segmentation accuracy → Met (89%).

Testing Results:

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User Testing In ICT SEM-1: