AI for Bharat Hackathon

Powered by **aws**

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Problem Statement : Modern fitness platforms quantify progress but fail to visualize it which creates a critical gap between measurable effort and personally perceivable physical transformation.

Brief about the Idea:

Many people begin their fitness journey to improve their body and groom themselves better, but over time they lose motivation because they cannot clearly visualize what they will realistically look like after months of effort. Most fitness apps focus only on numbers like weight or calories, without showing a clear picture of the final outcome.

My solution uses AI to generate a realistic preview of a person's future upper-body physique — whether lean, athletic, or muscular — while maintaining their identity. Instead of comparing themselves to unrealistic social media standards, users can see a personalized visual of their future self and define their fitness and grooming goals with clarity.

How different is it from any of the other existing ideas?

Unlike traditional fitness apps that only track numbers or provide generic body templates, our solution generates realistic, identity-preserving visual simulations of the user's own future physique. It does not create avatars or fantasy bodies instead, it transforms the user's real image into a believable future version of themselves.

How will it be able to solve the problem?

By converting abstract fitness goals into realistic visual previews, the platform eliminates uncertainty and helps users clearly define what they are working toward. This visual clarity bridges the motivation gap between effort and expected outcome, improving commitment and goal alignment.

USP of the proposed solution

Our USP is an identity-preserving, photorealistic upper-body transformation engine powered by GenAI, built specifically to simulate achievable fitness progression. It combines realistic transformation, controlled AI modeling, and scalable AWS architecture that is something no current fitness platform offers.

List of features offered by the solution

- Photorealistic, identity-preserving upper-body transformation simulation

- Goal selection (Lean / Athletic / Bulky) with controlled progression logic

- Real-time AI-generated future physique visualization

- Facial identity preservation using embedding comparison

- AWS-powered scalable backend architecture

- Side-by-side comparison of current vs future physique

- AI-generated short fitness direction summary

For visual representation in the presentation, we are currently experimenting with various art styles and character design approaches to ensure a realistic yet consistent transformation output. The final visual style is in the refinement and finalization stage to maintain high realism and identity accuracy.

Process flow diagram or Use-case diagram

1. User Input
2. Image Validation & Preprocessing
3. Identity Encoding (Face Embeddings)
4. Goal-Based AI Transformation Engine
5. Similarity & Consistency Validation
6. Result Rendering & Comparison View
7. User Output + AI Guidance

Architecture diagram of the proposed solution:

Frontend Layer
React-based user interface hosted on AWS Amplify, where users upload their image and select their fitness goal.

API Layer
Amazon API Gateway handles secure communication between the frontend and backend services.

Backend Layer
AWS Lambda (Python/Node.js) processes requests, manages transformation logic, and coordinates AI services.

AI & Processing Layer
Amazon Rekognition performs face detection and identity embedding extraction.
Amazon Bedrock (Stable Diffusion – Image-to-Image) generates the photorealistic, identity-preserving physique transformation.

Storage Layer
Amazon S3 stores original and transformed images.
Amazon DynamoDB stores user metadata and goal selections.

Output Layer
Displays side-by-side comparison of current vs transformed physique along with AI-generated fitness guidance.

Technologies to be used in the solution:

Frontend:

React.js & AWS Amplify (Hosting & Deployment)

Backend:

Python (FastAPI) / Node.js, AWS Lambda (Serverless Compute) & Amazon API Gateway

AI & Machine Learning:

Amazon Bedrock (Stable Diffusion – Image-to-Image Transformation), Amazon Rekognition (Face Detection & Identity Embeddings) & Amazon Bedrock LLM (for AI-generated fitness guidance)

Database & Storage:

Amazon S3 (Image Storage) & Amazon DynamoDB (User Data & Metadata)

Estimated implementation cost :

- Hackathon Prototype: Minimal cost using AWS free tier credits.

- Scalable Model: Pay-per-use based on inference and storage usage.