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*"Shopping for clothes online often feels overwhelming—not just for me, but for many of my friends as well. Browsing through multiple stores, comparing prices across platforms, and figuring out which clothes will actually fit or look good can be exhausting. The process is especially isolating when shopping alone, and I often hesitate to place an order because I'm unsure about the fit or how the clothes will look in real life. **Finding a solution to this problem would make a big difference for me.**"*

Why Solving this Problem is Critical ?

$1.7 Trillion global online apparel market (2024)

Low conversion rate: **2%** (vs. **30%** in offline retail)

35% return rate in online apparel

$150 - $200 Billion lost annually due to high return.
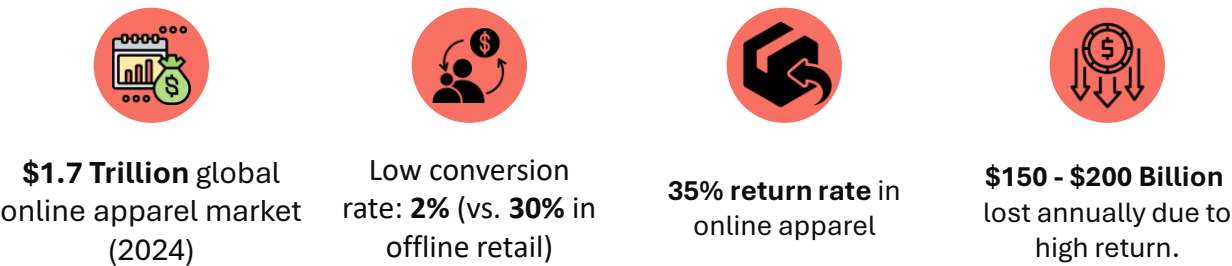
"High return rates are a major challenge. Around 20-30% of apparel orders are returned, costing us ₹100-₹300 per return in logistics and handling. A ₹1,000 product return can wipe out most of our margin, especially if the item can't be resold as new. Practices like bracketing, where customers order multiple sizes to try and return the rest, add to this issue, straining profitability. 99
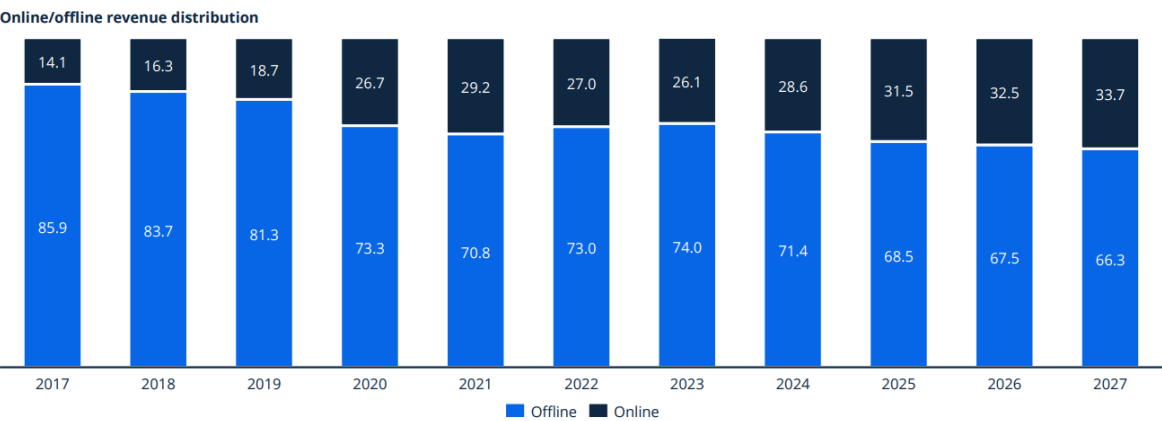
- Ashok Gupta, Online seller

Potential Impact upon solving

Reduce returns by **50%–60%,** saving around $80–$90 billion.

Enhance customer engagement by providing a more realistic shopping experience.

Encourage **impulsive buying** behaviors.

Increase online acceptance rates, driving higher customer revenue.

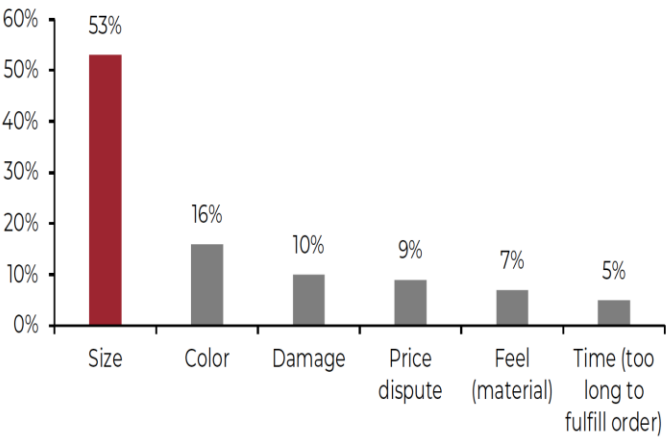## Online Sales Skyrocket, Signaling Rapid Growth Amid Offline Apparel Market Dominance.

Market Size: Worldwide (7/7)

Online/offline revenue distribution

Year	Online	Offline
2017	14.1	85.9
2018	16.3	83.7
2019	18.7	81.3
2020	26.7	73.3
2021	29.2	70.8
2022	27.0	73.0
2023	26.1	74.0
2024	28.6	71.4
2025	31.5	68.5
2026	32.5	67.5
2027	33.7	66.3

■ Offline ■ Online

Stakeholder Analysis

Ankita – Online Shoppers
Age – 25
- **Less clarity** over what she wants.
- **Hard to visualize clothes** on the body with the model sometimes.
- Hard to decide on size as **different brands have different size** measurements.
- Too many options create decision fatigue compared to offline .

If consumers better understood the **fit of an item**, it would reduce the likelihood of returns

Online VS Offline customer Journey

Online	Offline
Start browsing on app with unlimited options	Start browsing in store with limited option
Limited help available from friends via online chats (not feasible).	**Easily recommendation available by store staff and friends**
Cannot try clothes; rely on images, size charts, and reviews, making it hard to assess fit and look.	**Physically try clothes to check fit, comfort, and looks**
Self-decision mostly, but often based on incomplete or insufficient information.	Additional feedback from friends or self-decision
Order placed (**2% acceptance rate**)	Final purchase (**30 % acceptance rate**)
Return 35 times out 100 order	Only return 10 times out of 100

R e a s o n

This **Helps them clarify** what they want in offline, leading to easier decisions and more efficient purchases.
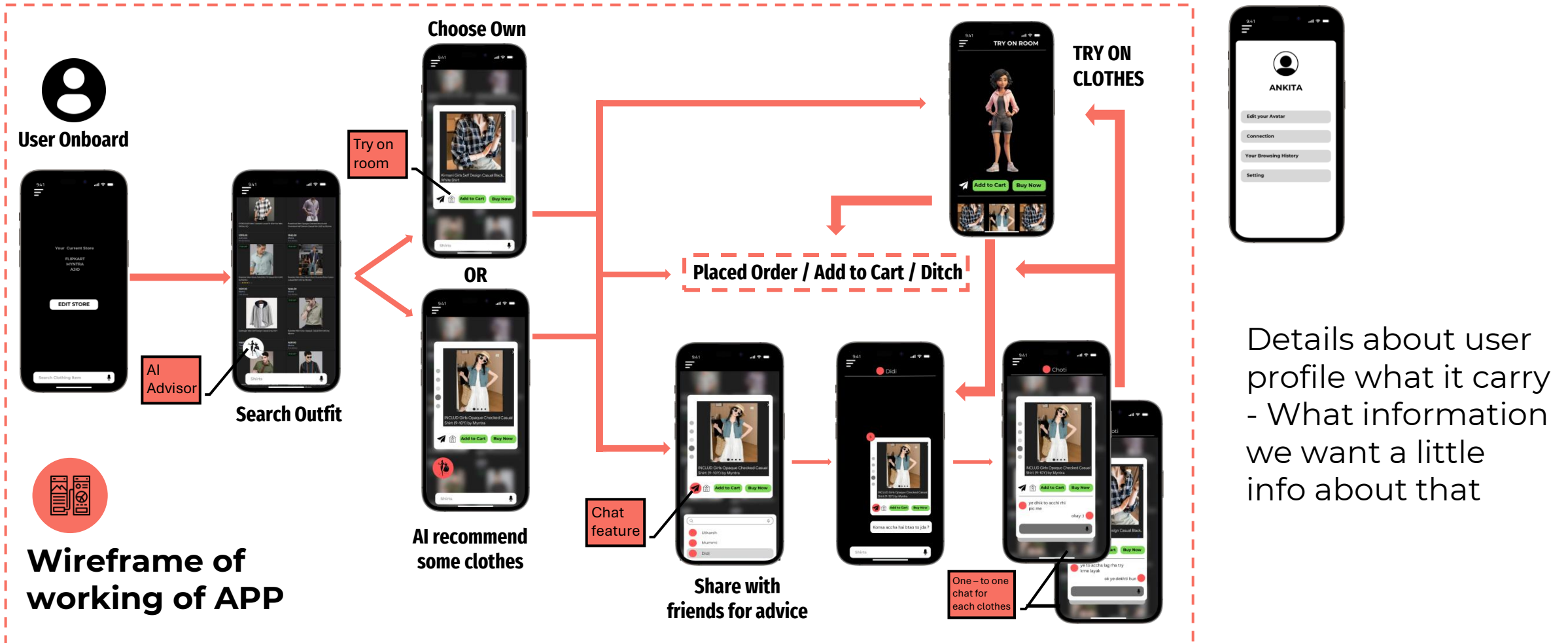
Root causes in Online
- Lack of personalized advice
- No way to try on clothes.
- Difficulty in understanding personal preferences or making confident choices

If we could solve this problem, then choosing clothes becomes fast, and shoppers can make a confident buy, which reduce return.
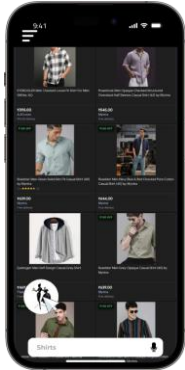
Solution – A personalized app

Solution: A personalized app integrated with online apparel stores, **featuring an AI advising system**, a **one-to-one chat feature** where users can share images and start threads to discuss specific items, and a seamless **try-on system for visualization** and fit check.

User Onboard

Choose Own

Try on room

OR

Search Outfit

AI Advisor

TRY ON CLOTHES

Placed Order / Add to Cart / Ditch

AI recommend some clothes

Chat feature

Share with friends for advice

One – to one chat for each clothes

Details about user profile what it carry - What information we want a little info about that

Wireframe of working of APP

How all features works ?

Selects and recommends the **top 10–15 clothing options** from the page for easy decision-making.

- Pre-trained with shopper-specific data:
  - **Skin tone** and **facial structure** for aesthetic matching.
  - **Body measurements** (size and fit).
  - **Past behavior** and **purchase history** for tailored recommendations.
- Enhances the shopping experience by reducing time and boosting confidence in purchase decisions.

#2 One to One Chatting and Sharing Feature : Allows users to start a **dedicated thread** to discuss and get feedback **on a specific apparel item**.

Enables focused conversations, **avoiding the confusion** that often arises when using general chat platforms like WhatsApp or Instagram.

- **Keeps all discussions** about an item **organized** in one place for easy reference.
- **Enhances decision-making** by offering a seamless and **quick feedback** channel with loved ones.
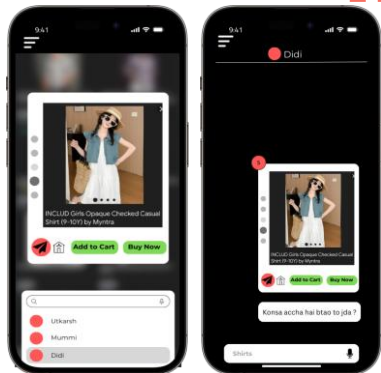
Technology Involved

- The AI system personalizes clothing recommendations using **machine learning algorithms** like **collaborative filtering**, **content-based filtering**, and neural networks, tailored to user profiles, preferences, and past behavior.
- It adapts continuously with **reinforcement learning** and leverages **NLP technologies like BERT and GPT** for understanding user feedback, along with **sentiment analysis** and entity recognition.
- This advanced integration ensures dynamic, evolving fashion advice that aligns with individual preferences.

How all features works ?

- Pre-designed 3D models are assigned to each shopper based on their profile, including size, height, and fit.
- The system allows users some flexibility to modify dimensions if needed.

Technology involved

- Utilizes WebSocket for seamless two-way messaging and RESTful APIs for efficient message delivery.
- Leverages NoSQL databases (e.g., MongoDB, Firebase) for dynamic chat data storage and fast retrieval.
- Integrates image recognition tools for sharing clothing images and securely stores them using cloud solutions like AWS S3.
- Uses 3D modeling (Blender 3D/Unity) and pose estimation (OpenPose) to create lifelike avatars and align clothing with body posture in real-time.
- Employs AR technologies (ARKit/ARCore) to overlay clothing on avatars via mobile devices, ensuring a seamless virtual try-on experience.
- Leverages cloud infrastructure (AWS/Google Cloud) for 3D rendering and real-time simulations, ensuring smooth performance.

Metrices

North Star metrics : **Return rates** should be reduced by at least 40%.

HEART	Goal	Signal	Metrics
Happiness	Improve customer satisfaction	Positive feedback and recommendations, High user ratings	NPS, Average Ratings & Reviews
Engagement	Increase user interaction	Frequent usage of features, High interaction with AI advisor	D/M Active Users, Session Duration, Feature Usage Rate
Adoption	Boost user acquisition	Increase in new sign-ups, Users engaging with the product	Number of New Users, Activation Rate
Retention	Enhance user loyalty	Low churn rate, High return rate of users	Churn Rate, Repeat Usage Rate, Retention Rate
Task Success	Maximize successful transactions	High completion of purchases, Low return rate of purchased items	Conversion Rate, Return Rate

Pitfall and Mitigations

Processing Speed – The system could experience slowdowns due to the complexity of simulating virtual try-ons and accurate clothing fits, but advancements like quantum computing could mitigate this in the future.

Technical Glitch
PITFALLS
➤ AI may sometimes offer inaccurate recommendations, negatively affecting user experience, particularly with sizing or outfit suggestions
MITIGATIONS
• Will add block chain and quantime proof security

Privacy Concerns
PITFALLS
➤ Users need to share sensitive personal data (e.g., body measurements) online, raising concerns about data security and potential misuse.
MITIGATIONS
• Will add block chain and quantime proof security

Future Projections

➤ **Fashion NFTs**: Designers can create unique NFT outfits that shoppers can purchase for their digital twins, allowing for exclusive digital fashion ownership and sharing on social media platforms.

➤ **In-Game Integration**: Gamers can use their digital twins in video games, customizing them with NFT outfits for a unique appearance in various gaming worlds, enhancing their gaming experience and personal expression.

➤ **Metaverse Engagement**: As virtual worlds grow, users can interact using their digital twins, showcasing personalized outfits and participating in virtual events, fashion shows, or social gatherings.

➤ **Augmented Reality Experiences**: Users can participate in AR fashion shows or events where they can showcase their digital twin outfits in real-time, interacting with other users and brands in immersive environments.