**SYNOPSIS**

**on**

**AR ACCESSORIES**

**Try-on APP**

**by**

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### ABSTRACT

The "AR Accessories Try-On App" is an innovative augmented reality application designed to transform online shopping by enabling users to virtually try on fashion accessories, including clothes, shoes, and watches. By leveraging AR technology, the app overlays digital images of selected items onto the user's physical environment, providing a realistic and interactive preview in real-time. Users can browse a catalog, select an accessory, and use their smartphone camera to visualize how the item looks on their body or in their surroundings. This functionality helps users make informed purchasing decisions, saving time and reducing the need for physical store visits. Additionally, the app enhances the shopping experience by allowing users to experiment with different styles, colors, and textures, and share their virtual try-on results on social media. Developed using Unity, AR Foundation, and Vuforia for robust AR capabilities and QR code recognition, the app showcases the potential of AR technology in revolutionizing the fashion industry. As AR continues to advance, this AR Accessories app or other AR application sets the stage for more immersive and engaging shopping experiences in the future.

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# Introduction

The AR Accessories Try-On App represents a groundbreaking advancement in the online shopping landscape, leveraging the power of augmented reality (AR) to provide a more interactive, immersive, and personalized shopping experience. With the increasing shift towards e-commerce, consumers often face challenges in assessing the suitability and appearance of accessories such as clothes, shoes, watches, and other fashion items. This app addresses these challenges by allowing users to virtually try on these items, visualizing how they would look in a real-world context before making a purchase decision.

The application works by utilizing marker-based AR technology to detect and recognize QR codes or visual markers. Once a marker is identified, the app overlays a 3D model of the selected accessory onto the user's physical environment. This technology not only enhances the user experience but also provides retailers with a powerful tool to engage customers, reduce return rates, and increase sales conversion rates. By integrating cutting-edge AR functionalities with a user-friendly interface, the AR Accessories Try-On App aims to revolutionize the way consumers shop online, making it a valuable addition to the modern retail ecosystem.

The "AR Accessories Try-On App" is an innovative augmented reality application designed to transform online shopping by enabling users to virtually try on fashion accessories, including clothes, shoes, and watches. By leveraging AR technology, the app overlays digital images of selected items onto the user's physical environment, providing a realistic and interactive preview in real-time. Users can browse a catalog, select an accessory, and use their smartphone camera to visualize how the item looks on their body or in their surroundings. This functionality helps users make informed purchasing decisions, saving time and reducing the need for physical store visits. Additionally, the app enhances the shopping experience by allowing users to experiment with different styles, colors, and textures, and share their virtual try-on results on social media. Developed using Unity, AR Foundation, and Vuforia for robust AR capabilities and QR code recognition, the app showcases the potential of AR technology in revolutionizing the fashion industry. As AR continues to advance, this AR Accessories app or other AR application sets the stage for more immersive and engaging shopping experiences in the future.

# Project Objective

Augmented reality has been a subject of extensive research and development, particularly in the context of enhancing consumer engagement and improving decision-making processes in retail. Various studies have explored the potential of AR to transform the shopping experience by bridging the gap between the digital and physical worlds.

**AR in Retail and Consumer Behavior**

Several researchers have highlighted the effectiveness of AR in increasing customer satisfaction and engagement. Azuma (1997) provided one of the earliest comprehensive surveys of augmented reality, detailing the potential applications and future directions of the technology. Building on this foundation, Billinghurst, Clark, and Lee (2015) offered an updated overview of AR developments, emphasizing its application in interactive systems and user experience enhancement.

Javornik (2016) examined consumer responses to AR applications in retail, finding that AR can significantly influence affective, cognitive, and behavioral responses. The study demonstrated that consumers are more likely to engage with AR applications that provide realistic and immersive experiences, which in turn can lead to increased purchase intentions and customer loyalty.

Poushneh and Vasquez-Parraga (2017) focused on the tangible impact of AR on the retail customer experience, satisfaction, and willingness to buy. Their research indicated that AR applications could provide a competitive edge to retailers by offering unique and engaging shopping experiences that are not possible through traditional online or in-store shopping methods.

**Technological Advancements in AR**

Rauschnabel, Felix, and Hinsch (2019) explored how mobile AR applications can enhance brand perception and consumer inspiration. Their findings suggested that AR technology, when integrated effectively, can create a memorable and engaging brand experience that drives consumer behavior positively.

Pantano and Servidio (2012) modeled innovative points of sales through virtual and immersive technologies, highlighting the potential of AR to transform retail environments. Their research emphasized the importance of creating interactive and engaging points of sale that can attract and retain customers.

Huang and Liao (2015) proposed a model for the acceptance of AR interactive technology, identifying cognitive innovativeness as a key moderating factor. Their study underscored the need for AR applications to be user-friendly and aligned with consumer expectations to achieve widespread acceptance.

**Impact on Shopping Behavior**

Beck and Crié (2018) investigated the role of virtual fitting rooms in increasing exploratory behavior, patronage, and purchase intentions both online and offline. Their research found that virtual fitting rooms could significantly enhance the shopping experience by allowing consumers to try on items virtually, thereby increasing their confidence in the purchase.

Javornik, Marder, and Gountas (2021) focused on the impact of AR on repurchase intentions, demonstrating that immersive AR experiences can lead to higher levels of customer satisfaction and loyalty. Their study highlighted the long-term benefits of integrating AR into the retail strategy.

McLean and Wilson (2019) examined customer engagement through AR mobile applications, finding that these applications could drive significant engagement and interaction. Their research emphasized the need for AR applications to be seamlessly integrated into the overall shopping experience to maximize their impact.

The AR Accessories Try-On App is designed to achieve several key objectives that collectively aim to enhance the online shopping experience and provide value to both consumers and retailers. The primary objective is to develop a robust AR application that allows users to virtually try on accessories in real-time, thus bridging the gap between online and in-store shopping experiences.

**Enhancing User Experience**

One of the core objectives is to create a user-friendly interface that simplifies the process of selecting and trying on accessories. The app should be intuitive and easy to navigate, ensuring that users can quickly find and try on items without any technical difficulties. This involves designing a seamless and engaging user journey that keeps users engaged and satisfied.

**Accuracy and Realism**

Another critical objective is to ensure high accuracy in image recognition and 3D model overlay. The app must be able to accurately detect and recognize QR codes or visual markers and overlay 3D models that are lifelike and responsive. This involves leveraging advanced image recognition algorithms and high-quality 3D modeling techniques to create realistic and immersive virtual try-on experiences.

**Customization and Personalization**

The app aims to offer extensive customization options for users, allowing them to modify accessories according to their preferences. This includes features like changing colors, sizes, and styles, as well as providing personalized recommendations based on user behavior and preferences. The goal is to create a personalized shopping experience that caters to individual tastes and preferences.

**User Interaction and Engagement**

Enhancing user interaction is another key objective. The app should provide smooth and intuitive controls for rotating, scaling, and moving the 3D models, allowing users to interact with the virtual accessories in a natural and engaging way. Additionally, integrating social media sharing functionalities will enable users to share their virtual try-on experiences with friends and family, further enhancing engagement and creating a social shopping experience.

**Seamless Shopping Experience**

The ultimate objective is to provide a seamless and engaging shopping experience that bridges the gap between online and in-store shopping. By allowing users to try on accessories virtually, the app aims to reduce the likelihood of returns and increase customer satisfaction. This, in turn, can lead to higher sales conversion rates and greater customer loyalty.

# Research Methodology

The development of the AR Accessories Try-On App follows a structured research methodology comprising several phases. Each phase is designed to ensure that the app meets the highest standards of functionality, usability, and performance.

**Requirement Analysis**

The first phase involves gathering and analyzing user requirements and market trends. This is achieved through a combination of surveys, focus groups, and market research. The goal is to identify the key features and functionalities that users expect from an AR try-on app. This phase also involves analyzing the competitive landscape to identify opportunities for differentiation and innovation.

**Design**

Once the requirements are defined, the design phase begins. This involves creating wireframes and prototypes to visualize the user interface and interaction flow. The design process is iterative, with multiple rounds of feedback and refinement to ensure that the final design is user-friendly and aligned with the project objectives. During this phase, key design elements such as navigation, layout, and visual aesthetics are finalized.

**Development**

The development phase involves implementing the app using the Unity game engine and Vuforia SDK for AR functionalities. This phase includes coding, integrating 3D models, and developing image recognition algorithms. The development team works in an agile framework, with regular sprints and milestones to track progress and ensure that the project stays on schedule. Key development tasks include:

* Setting up the project environment and configuring the necessary tools and libraries.
* Developing the image recognition module to detect and recognize QR codes or visual markers.
* Integrating 3D models and ensuring that they are accurately overlaid onto the recognized markers.
* Implementing customization options and user interaction functionalities.
* Conducting unit testing to identify and fix any issues early in the development process.

**Testing**

Testing is a critical phase that involves several types of tests to ensure the app's functionality, usability, and performance. This includes:

* **Unit Testing**: Testing individual components and modules to ensure that they function correctly in isolation.
* **Integration Testing**: Ensuring that different modules and components work together seamlessly.
* **User Acceptance Testing**: Conducting tests with real users to gather feedback on the app's usability and functionality.
* **Performance Testing**: Ensuring that the app performs well under different conditions and on various devices.

Feedback from testing is used to make necessary improvements and refinements to the app.

**Evaluation**

The final phase involves evaluating the app based on user feedback and performance metrics. This includes analyzing user feedback to identify areas for improvement and making any necessary adjustments. The goal is to ensure that the app meets the highest standards of quality and provides a satisfying user experience. The evaluation phase also involves preparing the app for deployment and conducting final quality assurance checks.

# Project Outcome

The expected outcome of the AR Accessories Try-On App project is a fully functional application that provides users with an immersive and interactive shopping experience. The app will enable users to select accessories from a catalog and virtually try them on using their smartphone camera. Key outcomes include:

**Immersive Virtual Try-On Experience**

Users will be able to see how accessories look on them in real-time, with high accuracy in image recognition and realistic 3D model overlay. The app will provide a lifelike representation of accessories, allowing users to rotate, scale, and move the 3D models to get a better view from different angles.

**Customization Options**

The app will offer extensive customization options, enabling users to modify accessories according to their preferences. This includes changing colors, sizes, and styles, as well as providing personalized recommendations based on user behavior and preferences. The customization options will enhance the user experience and make the app more engaging.

**Enhanced User Interaction**

The app will provide intuitive controls for interacting with the 3D models, making it easy for users to try on accessories and make adjustments. The social media sharing functionality will allow users to share their virtual try-on experiences with friends and family, creating a social shopping experience that enhances engagement.

**Improved Shopping Decisions**

By providing a realistic and interactive way to try on accessories, the app will help users make more informed purchasing decisions. This can reduce the likelihood of returns and increase customer satisfaction. The app aims to bridge the gap between online and in-store shopping, providing a seamless and satisfying shopping experience.

**Benefits for Retailers**

The AR Accessories Try-On App will provide retailers with a powerful tool to engage customers and increase sales conversion rates. The app can help reduce return rates by allowing customers to see how accessories look on them before making a purchase. Additionally, the app can provide valuable insights into customer preferences and behavior, helping retailers tailor their offerings to meet customer needs.

# Proposed time duration

The proposed time duration for the project is approximately six months, divided into the following phases:

**Requirement Analysis and Planning: 1 Month**

During this phase, the project team will gather and analyze user requirements and market trends. This involves conducting surveys, focus groups, and market research to define the key features and functionalities of the app. The team will also develop a detailed project plan, including timelines, milestones, and resource allocation.

**Design and Prototyping: 1 Month**

The design phase involves creating wireframes and prototypes to visualize the user interface and interaction flow. The design process will be iterative, with multiple rounds of feedback and refinement. Key design elements such as navigation, layout, and visual aesthetics will be finalized during this phase.

**Development: 2.5 Months**

The development phase involves implementing the app using the Unity game engine and Vuforia SDK for AR functionalities. The development team will work in an agile framework, with regular sprints and milestones to track progress. Key development tasks include setting up the project environment, developing the image recognition module, integrating 3D models, and implementing customization options and user interaction functionalities.

**Testing and Evaluation: 1 Month**

The testing phase involves conducting unit testing, integration testing, user acceptance testing, and performance testing to ensure the app's functionality, usability, and performance. Feedback from testing will be used to make necessary improvements and refinements. The evaluation phase involves analyzing user feedback and performance metrics to ensure that the app meets the highest standards of quality.

**Final Refinements and Deployment: 0.5 Month**

The final phase involves making any necessary adjustments based on the evaluation results and preparing the app for deployment. This includes conducting final quality assurance checks and ensuring that the app is ready for release to the public.

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