

Development of an Augmented Reality-Based Virtual Try-On Dress System for Promoting East Sumba Ikat Weaving

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Abstract

Advancements in information and communication technology are driving digital transformation across various sectors, including the fashion industry and the promotion of local culture. One such emerging technology is Augmented Reality (AR), which enables interactive virtual visualizations. When ordering dresses made from East Sumba (traditional woven fabric), consumers often struggle to visualize how a specific dress style will pair with a particular fabric pattern prior to the actual tailoring process. Furthermore, current promotional methods for remain conventional, failing to effectively capture public interest particularly among the younger generation. This study aims to design an Augmented Reality-based virtual dress try-on information system to serve as a promotional tool for East Sumba. The research employs the Research and Development (R&D) method, comprising stages such as data collection, system requirements analysis, system design, application development, and system testing. The designed system enables the virtual visualization of dresses on mobile devices, allowing users to realistically view the combination of dress styles and fabric patterns before the tailoring process begins.

Keywords: *Augmented Reality, Virtual Try-On, Information System, East Sumba Ikat Weaving, Promotional Media.*

1. Introduction

Developments in information and communication technology over the past few years have brought about significant changes across various sectors, including the fashion industry and digital marketing. The shift from conventional to digital systems has prompted businesses to leverage technology to enhance product appeal and reach a wider consumer base. One rapidly evolving innovation is the use of interactive visual technologies such as Augmented Reality (AR) which offer a novel way for consumers to interact with products digitally. In the realm of digital marketing, user experience is a crucial factor influencing purchasing decisions. Consumers seek not only product information but also an experience that closely mirrors reality prior to making a purchase. Augmented Reality technology enables users to view and virtually try on products, thereby boosting consumer engagement and satisfaction. Research indicates that AR-based virtual try-on technology provides an interactive experience, reduces uncertainty, and assists consumers in making more informed purchasing decisions [1].

Furthermore, virtual try-on technology has been implemented across various sectors, including cosmetics, accessories, and fashion. This technology allows users to try on products virtually without needing to visit a physical store. Research indicates that the use of Augmented Reality (AR)-based virtual try-on tools can enhance the user experience and positively influence consumer satisfaction in online shopping [2]. This demonstrates the significant potential of AR technology as a medium for interactive promotion within the fashion industry. However, in practice, consumers still face various challenges, particularly when ordering garments such as dresses. Many consumers are dissatisfied with the tailoring results because the finished dress does not match their expectations. Additionally, a mismatch between the desired design and the chosen fabric especially with traditional textiles like is a frequent issue. This stems from limited visualization capabilities prior to production, making it difficult for consumers to realistically envision the final product.

2. Literary Studies

2.1. Information System

Information systems are a crucial component of information technology development, playing a role in supporting the activities of both organizations and individuals. In today's digital era, information systems serve not merely as data processing tools but also as a means to enhance efficiency, effectiveness, and the quality of decision-making. Rapid technological advancements have made information systems an integral part of various sectors, such as business, education, healthcare, and the creative industries [3].

2.2. Augmented Reality

Augmented Reality (AR) is a rapidly evolving technology in today's digital era. This technology enables the integration of the real world with computer-generated virtual objects in real-time [4]. By utilizing devices such as smartphones or cameras, AR can display two-dimensional or three-dimensional objects within the real environment, thereby providing a more interactive and engaging visual experience for users [5].

2.3. Virtual Try-On

Virtual Try-On is a rapidly evolving digital technology innovation within the e-commerce and fashion industries. This technology enables users to try on products virtually without physically wearing or using the actual items [6]. Virtual Try-On typically utilizes Augmented Reality (AR) technology to display product simulations on the user's body in real-time, thereby providing an experience that is more interactive and closely resembles a real-life scenario [7].

2.4. East Sumba Ikat Weaving

Ikat weaving is an Indonesian cultural heritage possessing significant artistic, philosophical, and local identity value [8]. This textile is created by binding the threads prior to dyeing, resulting in distinctive patterns that carry specific meanings [9]. Each region in Indonesia boasts its own unique weaving characteristics; notably, ikat weaving from East Sumba is renowned for its unique motifs and symbolic significance. East Sumba ikat weaving is a traditional craft passed down through generations. Its production relies on traditional techniques and utilizes natural materials for both the threads and the dyes. Beyond serving as clothing, the fabric plays a vital role in the community's social and cultural life, featuring prominently in traditional ceremonies, acting as a symbol of social status, and serving as an expression of group identity [10].

2.5. Mobile Technology

Mobile technology represents a significant development in the field of information technology, having transformed the ways in which people interact, work, and access information. Mobile devices such as smartphones and tablets have become integral to daily life due to their ability to provide rapid, flexible, and real-time access to information [11]. Advancements in mobile technology are further supported by the expansion and increasing speed of internet networks, enabling users to stay connected anytime and anywhere.

Broadly speaking, mobile technology refers to the use of portable devices equipped with operating systems and applications that allow users to perform a wide range of activities from communication and data processing to accessing digital services. Common operating systems for mobile devices include Android and iOS, both of which offer various features and support for mobile application development [12]. Thanks to this technology, many activities that were previously performed manually can now be carried out digitally via mobile devices.

3. Research Method

3.1. Research Location

This research was conducted at Tahu Humba Boutique and Suma Souvenir Center, a facility dedicated to the production and sale of woven fabrics characteristic of East Sumba. This location was selected because it offers a wide range of fabrics featuring diverse motifs and characteristics, thereby meeting the study's data requirements. Furthermore, the site served as a venue for gathering data on production processes, motif varieties, and the promotional needs of businesses involved in weaving. The selection of this location aims to yield data that is relevant and reflective of actual field conditions, ensuring the research findings are practical and beneficial.

3.2. Research Flow



Fig. 1: Research Flow

The first figure illustrates the main workflow of the research or system development process, beginning with the "Start" stage and proceeding through Data Collection, System Construction, and User Testing. Once these stages are completed, the process concludes at the "End" symbol. The Data Collection stage is the initial phase for gathering the information required for system development. In the second figure, this stage encompasses activities such as observation, interviews, and literature review; however, in the first figure, these activities are consolidated into a single main component: data collection.

The next stage is System Construction. This stage depicts the process of building the system based on the data and requirements obtained earlier. In the second figure, this stage includes requirements analysis, system design, system development, content integration, and internal testing. In the first figure, all these processes are simplified into one main stage: system construction. Following this is the User Testing stage. This stage is conducted to determine whether the developed system functions effectively for users. In the second figure, this stage comprises test preparation, system trials, feedback collection, test result analysis, and system refinement. In the first figure, this entire sequence is summarized as a single main stage: user testing.

4. Results And Discussion

4.1. Application Home Page Interface



Fig. 2: Main Menu Interface of the AR Virtual Try-On Application

The image shows the main page (Welcome Screen) of the AR Virtual Try-On v1.0 application. This page serves as the initial interface upon opening the app, greeting users and providing direct access to the Dress Collection Gallery and the application's user guide.

4.2. AR Dress Collection Gallery Interface

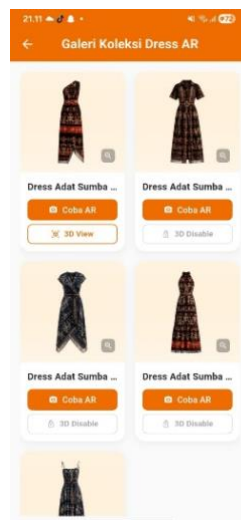


Fig. 3: AR Dress Collection Gallery Interface

The image shows the AR Dress Collection Gallery page within the application. This page displays a catalog of traditional Sumba woven garments available for users to select, featuring buttons to either try on the outfits virtually (AR Try-On) or view the 3D models (3D View).

4.3. User Guide Page Interface



Fig. 4: User Guide Page Interface

The image shows the "User Guide" page within the application. This page provides users with instructions and step-by-step guidance on how to use the app ranging from selecting outfits from the gallery and using the 3D View feature to operating the AR Try-On function to ensure optimal Virtual Try-On results.

4.4. 3D Dress View Page Interface



Fig. 5: 3D Dress View Page Interface

The image shows the "3D View Dress" page within the application. This page displays a detailed and interactive 3D visualization of the garment, allowing users to rotate the object with a single-finger touch and zoom in or out using two fingers.

4.5. Dress Model Preview Pop-up Interface

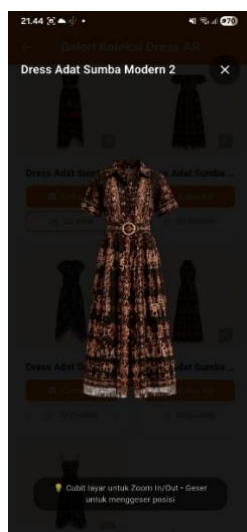


Fig. 6: Dress Model Preview Pop-up Interface

The image shows the "Dress Model Preview" pop-up page (Modern Sumba Traditional Dress 2) within the application. This page displays a close-up preview of the dress design details in a modal pop-up, allowing users to pan or pinch the screen to zoom in and out on the garment's visual representation before trying it on.

5. Conclusion

The interface design and implementation of the AR Virtual Try-On v1.0 application result in a system with an intuitive, systematic, and user-friendly workflow. The user experience begins at the Welcome Screen, which serves as the initial entry point to greet users and provide quick navigation buttons. From this screen, users can access the Usage Guide page—offering comprehensive instructions to ensure an optimal testing process—and the AR Dress Collection Gallery, which showcases a catalog of selected traditional Sumba woven garments. To provide a precise view of the products, the application features a Dress Model Preview pop-up for close-up inspection of garment details, as well as a 3D Dress View page that allows users to interact directly with 3D objects via rotation and zoom functions. Overall, the integration of these interface components successfully facilitates an interactive experience, enabling users to explore and select traditional Sumba attire using Augmented Reality technology.

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