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Business Model Design of a Digital-Based Outfit Recommendation Application for Fashion Personalization

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ABSTRACT

The rapid development of the digital fashion industry has increased the demand for personalization in outfit and makeup selection, particularly among Generation Z and millennial women who face time constraints and demonstrate growing awareness of sustainability. Common issues include difficulties in matching clothing according to personal characteristics, low self-confidence due to inappropriate outfit choices, and a tendency toward overconsumption influenced by fast fashion practices. This study aims to design a business model and develop a user interface prototype for the ColorMatch application as an AI-based outfit recommendation platform, utilizing the Business Model Canvas (BMC) framework and the Prototyping development method. A descriptive qualitative approach is employed to analyze the nine elements of the BMC, while the prototyping stages include requirement identification, wireframe design, mockup development, and feedback-based evaluation to produce a user-oriented UI/UX design. The results indicate that ColorMatch offers a value proposition in the form of outfit and makeup recommendations based on seasonal color analysis, mood-based styling, and personal wardrobe optimization. The integration of digital business model approaches, AI technology, and UI/UX design through prototyping results in a platform that is economically viable, responsive to user needs, and supportive of sustainable fashion practices.

1. INTRODUCTION

The digital transformation of the fashion industry has reshaped how individuals select and manage their personal style. Modern consumers not only consider trends but also demand solutions that provide recommendations tailored to their personal characteristics. Research indicates that the application of artificial intelligence in the fashion industry can enhance user experience and support more effective decision-making processes (Liu & Zhao, 2025). However, many individuals still face difficulties in determining appropriate outfit combinations, which can lead to decreased self-confidence and increased consumptive behavior driven by fast fashion. AI-based personalization approaches have been shown to contribute to higher user satisfaction and loyalty on digital fashion platforms (Deldjoo et al., 2025).

Furthermore, the growing awareness of sustainable fashion has increased the need for digital innovations that are not only style-oriented but also focused on efficient clothing utilization. The integration of technology with circular economy principles is considered capable of supporting more sustainable fashion practices (Nisa et al., 2025).

Although various studies have developed AI-based fashion recommendation systems, most primarily focus on technical aspects without examining their integration with digital business models and personal wardrobe optimization. This condition reveals a research gap in developing fashion platforms that holistically combine personalization, sustainability, and business strategy. Based on these issues, this study aims to analyze and design the business model of the ColorMatch application using the Business Model Canvas framework, supported by user interface and user experience design to ensure the application delivers both functional and emotional value optimally.

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2. LITERATURE REVIEW

The Business Model Canvas (BMC) is a widely used strategic framework for mapping the key components of a business, including value proposition, customer segments, channels, customer relationships, revenue streams, key resources, key activities, key partners, and cost structure. This approach enables organizations to comprehensively evaluate business feasibility. The development of fashion technology demonstrates that the utilization of artificial intelligence, machine learning, and data analytics can enhance the quality of consumer experience while accelerating decision-making processes.

One of the key aspects of fashion technology development is personalization, which refers to the ability of digital systems to tailor recommendations and user experiences based on individual characteristics. In the context of fashion, personalization considers style preferences, interaction history, situational context, and users' physical characteristics. Recent studies indicate that AI-based personalization contributes to increased user satisfaction, engagement, and loyalty on digital fashion platforms. Consumers tend to respond more positively to personally relevant recommendations compared to generic approaches, making personalization a strategic element in enhancing the competitiveness of fashion applications.

In addition, User Interface (UI) and User Experience (UX) design play a crucial role in ensuring that technology can be used effectively. An intuitive interface helps users quickly understand application features, while a well-designed user experience enhances engagement and promotes sustained use of digital platforms.

Although various fashion applications have offered recommendation features, there remains a research gap in integrating AI-based personalization with sustainability principles within a single digital business model. Therefore, this study seeks to address this gap through an analysis of the ColorMatch application's business model. Based on the literature review, this study views the problem of outfit and makeup selection as a multidimensional issue involving technological, psychological, and sustainability aspects. The use of digital technology through personalization-based recommendation systems is considered a relevant solution to assist users in making more effective and confident fashion decisions.

The conceptual framework of this research positions user needs, technology-based fashion recommendation systems, and sustainable fashion principles as key interconnected components. The ColorMatch application is designed not only as a tool for outfit and makeup recommendations but also as a platform that supports personal wardrobe utilization and a sustainable digital business model. Thus, this study is expected to provide both academic and practical contributions to the development of digital fashion applications that address the challenges of the modern fashion industry.

3. METHOD

This study employs a descriptive qualitative approach aimed at describing and evaluating the business model proposed by ColorMatch. The analysis is conducted in three stages: (1) a descriptive identification of the nine components of the Business Model Canvas (BMC), (2) a critical evaluation to assess the alignment among these elements, and (3) a holistic integration to understand the underlying business logic of the platform.

In addition to the business model analysis, this study applies the prototyping method for application interface development. This method is selected due to its ability to enable rapid design iteration based on user feedback. The prototyping stages include: (1) identifying user requirements through literature review and observation of target user behavior, (2) designing wireframes as the initial interface structure, (3) developing mockups as high-fidelity visual representations, and (4) evaluating the design based on user-centered design principles to ensure alignment between the proposed solution and actual user needs.

4. RESULT AND DISCUSSION

Business Model Canvas Analysis

The business model analysis of the ColorMatch application is conducted using the Business Model Canvas approach, which consists of nine key elements. The visual representation of the business model is presented in Figure 1.

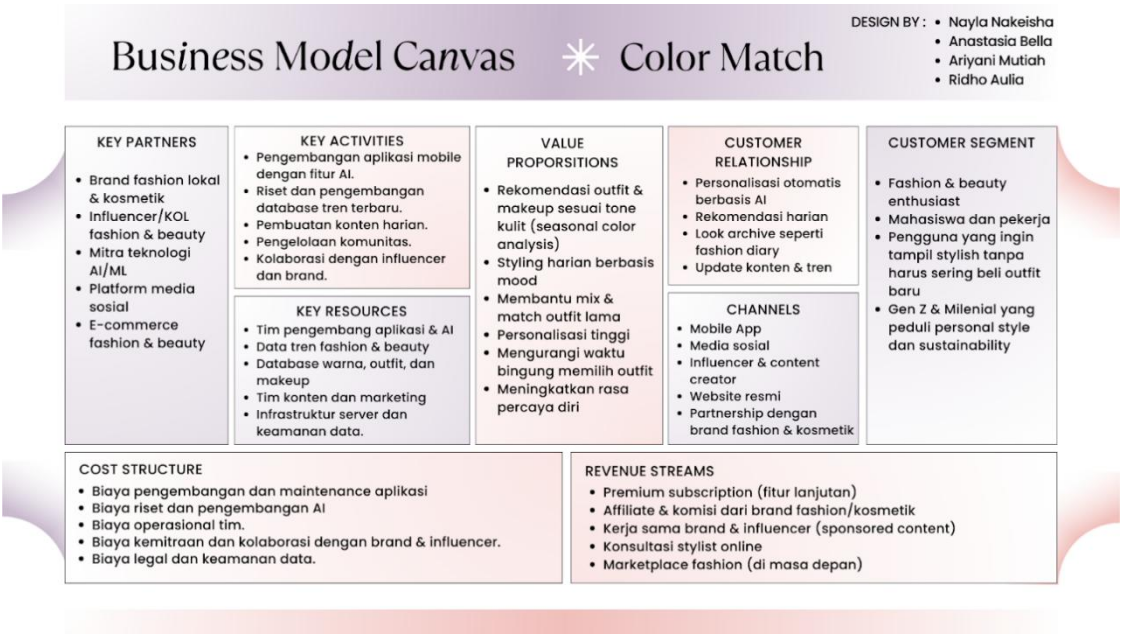

Figure 1. Business Model Canvas of the ColorMatch Application

Figure 1 illustrates the interrelationships among the nine elements of the Business Model Canvas, which collectively form the integrated business logic of ColorMatch. Each element is designed to support the core value proposition of technology-based fashion personalization while promoting sustainable practices.

1. Value Proposition

The value proposition of ColorMatch is built upon three main pillars. First, it provides outfit and makeup recommendations tailored to users' skin tones based on seasonal color analysis. AI technology analyzes an individual's skin tone and suggests the most suitable color palettes, helping users select clothing and cosmetics that enhance their appearance. Second, it offers mood-based daily styling, enabling users to receive outfit recommendations aligned with their emotions and daily activities. Third, the mix-and-match feature allows users to combine existing wardrobe items in new ways, maximizing the use of clothing they already own. Overall, ColorMatch delivers a high level of personalization, reducing the time spent deciding what to wear while enhancing user confidence.

2. Key Activities

The primary activities of ColorMatch include developing a mobile application with AI-powered features that are continuously improved based on user feedback. Research and development of up-to-date fashion trend databases ensure that recommendations remain relevant to both global and local trends. Creating engaging daily content helps maintain user interest and retention. Community management across multiple platforms fosters a sense of belonging among users. Collaborations with influencers and brands create opportunities for co-creation and mutually beneficial partnerships.

3. Key Resources

ColorMatch's key resources consist of technological assets and human resources. The development team and AI specialists serve as the technical backbone, ensuring the platform operates effectively and efficiently. Comprehensive and up-to-date fashion and beauty trend data form the foundation for accurate recommendations. A structured database of colors, clothing, and makeup supports the precision of AI algorithms. Content and marketing teams enhance audience engagement and brand awareness, while server infrastructure and data security systems ensure reliable and secure platform performance.

4. Key Partnerships

ColorMatch's partnership strategy involves multiple stakeholders. Local fashion and cosmetic brands act as key partners in product integration and affiliate programs. Influencers and Key Opinion Leaders (KOLs) in fashion and beauty expand reach and build audience trust. AI and machine learning technology partners contribute to technological advancement and continuous improvement. Social media platforms serve as channels for content distribution and user engagement. Additionally, collaborations with fashion and beauty e-commerce platforms enable seamless and convenient shopping experiences.

5. Customer Relationships

Customer relationships are established through several mechanisms. AI-driven personalization delivers tailored experiences for each user with minimal manual input. Consistent daily recommendations help build user habits and platform engagement. The archive feature functions as a personal style record, storing users' outfit history and preferences. Regular updates on content and trends ensure continued relevance. A premium subscription model fosters long-term relationships by offering exclusive features to users.

6. Customer Segments

ColorMatch targets customers with a strong interest in fashion and beauty, particularly students and young professionals within Generation Z and millennial groups. These users seek to appear stylish and confident in various activities but often face time and budget constraints, requiring practical solutions for outfit selection. Additionally, users are characterized by a desire to optimize their existing wardrobe through mix-and-match concepts without excessive purchasing. Another important characteristic is awareness of personal style and sustainability values, with users tending to support environmentally responsible fashion practices through digital solutions that enable efficient and personalized decision-making.

7. Channels

ColorMatch adopts a multi-channel approach to reach and serve its customers. The mobile application serves as the primary channel, offering a seamless and accessible user experience. Social media platforms are used to build brand awareness, foster interaction, and develop a community. Collaborations with influencers and content creators help expand reach and enhance credibility. The official website functions as an information hub and landing page for attracting new users. Partnerships with fashion and cosmetic brands open additional distribution channels and provide exclusive offers to users.

8. Revenue Streams

ColorMatch's revenue model is designed with multiple income streams to ensure financial sustainability. Premium subscriptions provide a consistent and predictable primary revenue source, offering access to advanced features such as in-depth analysis and unlimited recommendations. Affiliate marketing and commissions from fashion and cosmetic brands generate scalable income without inventory risk. Sponsored content collaborations with brands create opportunities for revenue through marketing campaigns. Online stylist consultations offer premium personalized services. Future plans to develop a fashion marketplace are expected to introduce additional revenue through transaction fees.

9. Cost Structure

ColorMatch's cost structure reflects the nature of a technology-driven business, requiring significant initial investment but offering scalability in the long term. Application development and maintenance represent the largest cost components, including feature development, bug fixing, and performance optimization. Research and development costs for AI aim to improve recommendation accuracy and personalization. Operational costs include salaries for developers, data scientists, content creators, and marketing teams. Partnership and collaboration expenses with brands and influencers support campaign and content creation. Legal and data security costs ensure compliance with data protection regulations and safeguard user privacy.

UI/UX Design of the Application

The user interface (UI) and user experience (UX) design of the ColorMatch application are developed using a user-centered design approach to ensure ease of use and optimal support for personalization services. The interface design emphasizes simplicity in navigation, clarity of information, and efficiency of interaction, enabling users to obtain outfit recommendations more quickly and intuitively.

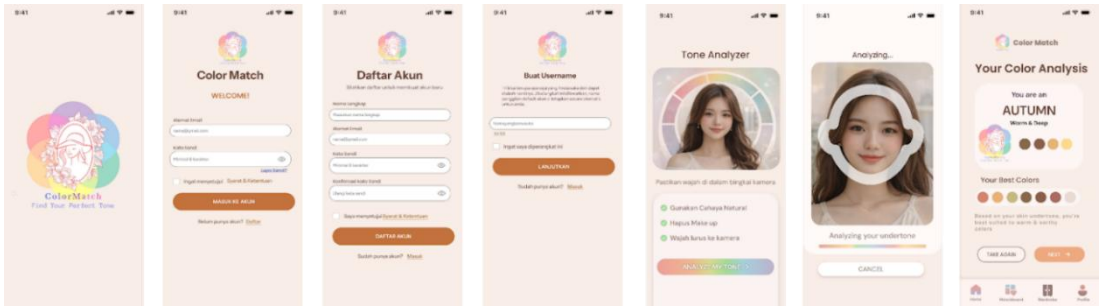

Figure 2. User Registration and Initial Analysis Flow in the ColorMatch Application

The initial stage of user interaction begins with an onboarding process that includes login, account registration, user profile creation, and color analysis. This flow is systematically designed to help users understand the core functions of the application from the first use while accelerating their adaptation to the system. The integration of color analysis at this early stage plays a crucial role in establishing the personalization mechanism. The data collected enables the system to generate recommendations aligned with users' visual characteristics, thereby enhancing the relevance of the services provided. This registration flow reflects the principle of visibility of system status, as each step clearly displays progress to the user, reducing confusion and increasing trust in the system from the very first interaction.

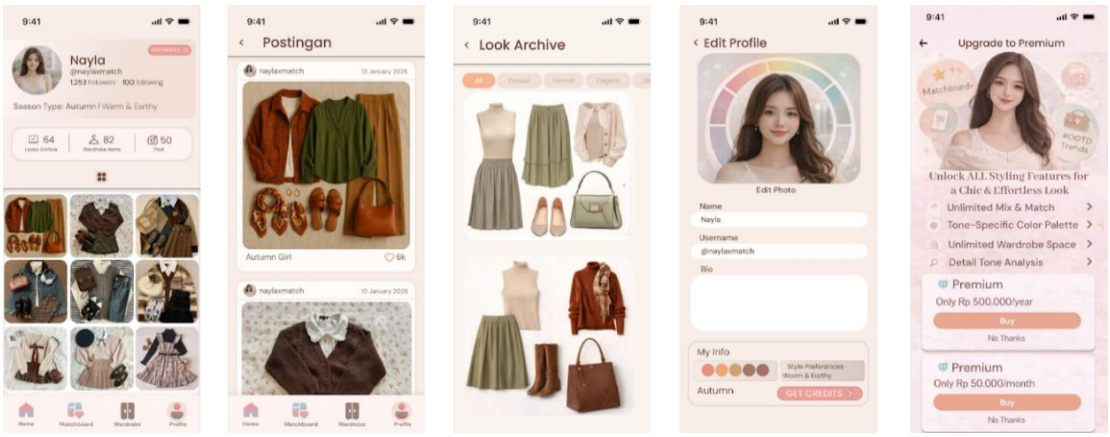

Figure 3. Display of the main features of the application

After completing the registration process, users can access various main features, including the profile, outfit inspiration posts, look archive, profile settings, and account upgrade options. The profile page serves as a digital identity hub that stores users' color preferences and style history, enabling the system to maintain consistency in its recommendations. The posting feature provides visual references that help users translate color analysis results into real outfit combinations. Meanwhile, the look archive allows users to save favorite outfits for future reference, making the process of planning their style more structured. The availability of profile settings offers flexibility for users to update personal information and style preferences, aligning with the principle of user control in user experience design. Furthermore, the presence of profile settings and the look archive reflects the principle of user control and freedom, as users have full control to update their preferences and manage their style history independently without relying entirely on automated systems.

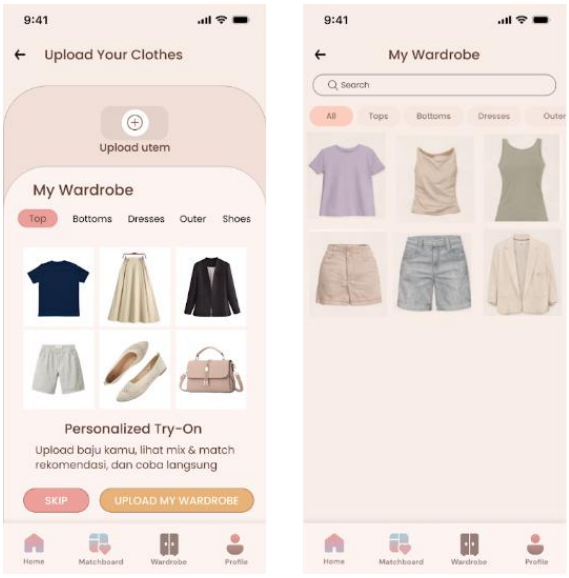

Figure 4. Clothing Upload Feature and Digital Wardrobe Management

The application provides a digital wardrobe that allows users to upload and manage their clothing collections systematically. The categorization of items such as tops, bottoms, and accessories is intended to enhance searchability and support a more efficient outfit combination process. This feature strengthens the concept of personalization, as the recommendations generated are not only based on color theory but also consider the actual clothing owned by the user. In addition to improving practicality, the digital wardrobe encourages optimal utilization of existing clothing, thereby potentially reducing excessive purchasing. The categorization of clothing items (tops, bottoms, and accessories) in the digital wardrobe aligns with the principle of consistency and standards, as a consistent navigation structure enables users to locate items quickly without needing to relearn the interface patterns.

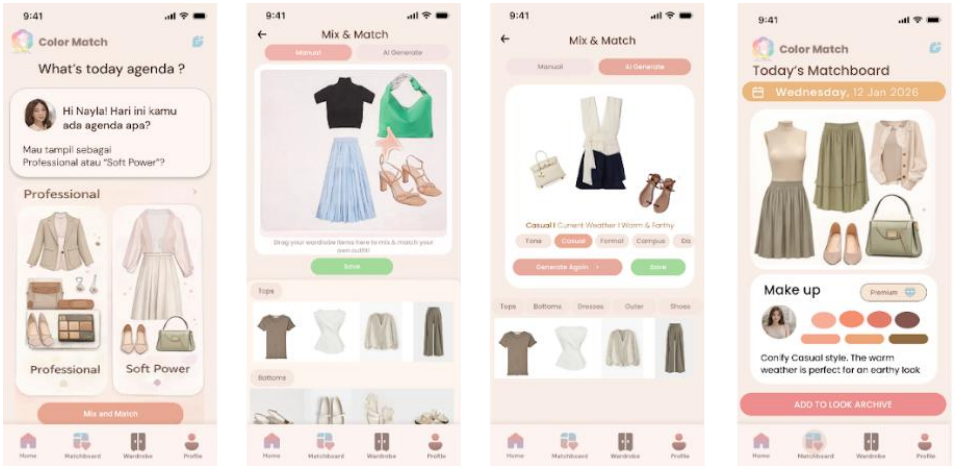

Figure 5. Matchboard Feature for Generating Outfit Combinations

The application also features a matchboard that allows users to create outfit combinations either manually or automatically through artificial intelligence technology. The manual mode provides users with full control to express their creativity, while the AI-generated feature helps produce harmonious combinations based on color data, clothing categories, and user preferences. The generated combinations can be saved in the look archive as style references, creating a sustainable personal styling ecosystem. The integration of user control and system automation reduces the complexity of outfit selection while increasing users' confidence in the resulting combinations.

The matchboard feature represents the core innovation of the application, as it combines wardrobe personalization with AI support to generate contextual and practical recommendations. The presence of two modes (manual and AI-generated) reflects the principle of flexibility and efficiency of use, where novice users can rely on automated recommendations, while more experienced users can express their creativity through full manual control.

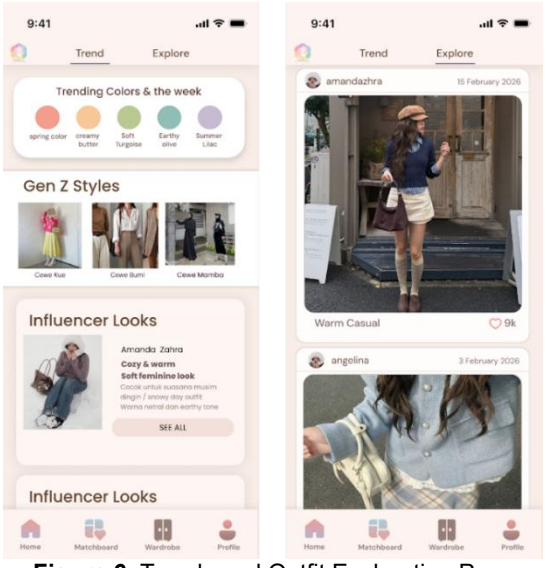

Figure 6. Trends and Outfit Exploration Page

To maintain the relevance of recommendations, the application also provides a trends feature that displays popular colors, current fashion styles, and references from fashion influencers. This information helps users align their personal preferences with the continuously evolving dynamics of fashion. In addition, the explore feature allows users to view outfit combinations from other users, creating a community-based environment that encourages the exchange of inspiration. The integration of personalization with trend references demonstrates

that the system is designed to be adaptive to changing market preferences. The trends and explore features, which present references from other users and influencers, reflect the principle of recognition rather than recall, as users are assisted in directly recognizing visual inspiration without needing to remember or search for it independently.

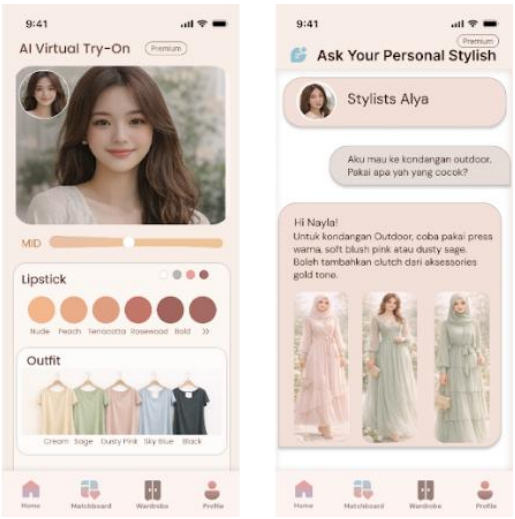

Figure 7. Premium Services: Virtual Try-On and Personal Stylist Consultation

As part of service development, the application offers premium features that provide advanced personalization. The virtual try-on feature allows users to digitally test various makeup shades, helping them visualize color compatibility more accurately. The application also provides personal stylist consultation services through interactive conversations, enabling users to receive outfit recommendations tailored to their specific needs. This feature delivers an experience to direct fashion consultation in a digital format. From a business perspective, these premium features indicate that the application not only focuses on functional aspects but also considers platform sustainability through monetization strategies. The virtual try-on and personal stylist consultation services represent the principles of aesthetic and minimalist design as well as a human-centered approach from Design Thinking, where premium features are designed to meet users' needs for a more personalized experience without increasing overall interface complexity.

To measure the effectiveness of the UI/UX design, evaluation can be conducted using indicators based on the ISO 9241-11 usability framework, which includes three main dimensions: (1) effectiveness, referring to users' ability to complete key tasks such as uploading clothing, creating outfit combinations, and accessing daily recommendations; (2) efficiency, referring to the time and steps required to achieve these goals; and (3) satisfaction, referring to users' subjective level of satisfaction with the interface and ease of use, which can be measured using instruments such as the System Usability Scale (SUS) or the User Experience Questionnaire (UEQ). The application of these evaluation indicators in the prototype testing phase will strengthen the empirical validity of the designed system.

Overall, the UI/UX design of the ColorMatch application demonstrates the integration of color analysis, digital wardrobe management, AI-based outfit recommendations, trend information, and premium services within a single ecosystem. This approach emphasizes that the system is designed not only to support personalization but also to adapt to the needs of modern users, thereby delivering a relevant, interactive, and sustainable user experience.

5. CONCLUSION

This study demonstrates that designing a business model using the Business Model Canvas provides a comprehensive overview of ColorMatch's value creation strategy. The integration of AI-based personalization with sustainable fashion principles results in a business model that is market-relevant and has strong potential for long-term sustainability. In addition, the support of UI/UX design enhances service quality by improving user experience, ensuring that the application is not only economically viable but also competitive within the digital fashion industry.

6. RECOMMENDATIONS

Based on the analysis conducted, several recommendations can be proposed to enhance the development of ColorMatch:

1. Focus on user acquisition: Implement growth hacking and viral marketing strategies to reduce customer acquisition costs. Leverage user-generated content and referral programs to support organic growth.
2. Continuous improvement of AI capabilities: Invest in machine learning to enhance recommendation accuracy. Collect and analyze user feedback to enable iterative improvements.
3. Strategic partnerships: Establish collaborations with fashion brands for exclusive collections and early access to new products. Partner with fashion schools and stylists to create content and build credibility.
4. Data monetization: Explore business-to-business opportunities by offering anonymized trend insights to fashion brands for product development and marketing strategies.
5. Community building: Strengthen social and community features to increase user engagement and retention. User-generated styling ideas and collaborative features can further enhance platform interaction.
6. Sustainability certification and recognition: Obtain certifications and recognition from sustainability organizations to reinforce positioning as an environmentally responsible fashion platform. Transparency in sustainability impact can serve as a strong differentiator.

7. REFERENCES

Deldjoo, Y., Rafiee, N., & Ravanbakhsh, M. (2025). Agentic Personalized Fashion Recommendation in the Age of Generative AI: Challenges, Opportunities, and Evaluation. *ACM Transactions on Recommender Systems*, 1(1), 17 pages. https://doi.org/10.1145/nnnnnnn

Sarkar, R., Bodla, N., Vasileva, M.I., Lin, Y.L., Beniwal, A., Lu, A., & Medioni, G. (2023). OutfitTransformer: Learning Outfit Representations for Fashion Recommendation. *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pp. 3601–3609. https://doi.org/10.1109/WACV56688.2023.00359

Ding, Y., Lai, Z., Mok, P.Y., & Chua, T.S. (2023). Computational Technologies for Fashion Recommendation: A Survey. *ACM Computing Surveys*, 56(5), 1–45. https://doi.org/10.1145/3627100

Liu, Y. J., & Zhao, L. (2025). *Understanding Fashion AI Evolution: A Systematic Literature Review of AI Research in the Fashion Industry*. Proceedings, ITAA.

Hejmady, C., Maurya, T., Magadum, S., Goyal, H., Muttal, C., & Giri, C. (2025). Leveraging Deep Learning Models for Multimodal Fashion Recommendation Systems. In Sharma, H., Shrivastava, V., Tripathi, A.K., Wang, L. (eds) *Communication and Intelligent Systems. ICCIS 2024. Lecture Notes in Networks and Systems*, vol 1373. Springer, Singapore. https://doi.org/10.1007/978-981-96-5729-2_30

Nisa, H., Van Amber, R., English, J., Islam, S., McCorkill, G., & Alavi, A. (2025). *A Systematic Review of Reimagining Fashion and Textiles Sustainability with AI: A Circular Economy Approach*. *Applied Sciences, 15*(10), 5691.

Mate, N., Nangare, S., Banchhor, C., Patil, A., Kulkarni, O., & Pandit, P. (2026). Personalized AI-Based Outfit Recommendation System. In Shrivastava, V., Bansal, J.C., Panigrahi, B.K. (eds) *Power Engineering and Intelligent Systems. PEIS 2025. Lecture Notes in Electrical Engineering*, vol 1459, pp. 75–88. Springer. https://doi.org/10.1007/978-981-96-9716-8_7

Aliyu, H., Abdulsalam, A., Musa, J., Emmanuelanorue, G.O., Bello, U.M., Agada, P.J., Yusuf, A.A., & Rukuna, A.L. (2026). Machine Learning for Personalized Fashion Recommendation Systems: A Review. *International Journal of Innovative Science and Research Technology (IJISRT)*. https://www.ijisrt.com/machine-learning-for-personalized-fashion-recommendation-systems-a-review

Gazzola, P., Pavione, E., Hillebrand, R., Vota, V., & Rosa, R. (2025). The Circular Economy and the Role of Technology in the Fashion Industry: A Comparison of Empirical Evidence. *Sustainability*, 17(7), 3104. https://doi.org/10.3390/su17073104

Ramos, L., Rivas-Echeverría, F., Pérez, A. G., et al. (2023*). Artificial intelligence and sustainability in the fashion industry: A review from 2010 to 2022.* Discover Applied Sciences, 5*, 387. https://doi.org/10.1007/s42452-023-05587-2*

Kumar, N., Sapariya, J. M., Ansari, A., et al. (2025). Sustainable fashion through AI: Predictive waste reduction and eco-friendly material optimization. *ShodhKosh: Journal of Visual and Performing Arts, 6*(4s), 626–635. https://doi.org/10.29121/shodhkosh.v6.i4s.2025.6942

Jeong, D., & Kim, Y. S. (2025). Generational differences in AI adoption among fashion curation platform users. *Fashion and Textiles, 12*, 41. https://doi.org/10.1186/s40691-025-00448-5

K. P. Jaheer Mukthar, C. Nagadeepa, D. P. Selvaratnam, A. Pushpa, and N. Shukla, (2024). Sustainable wardrobe: Recycled clothing towards sustainability and eco-friendliness. *Discover Sustainability, 5*, 151. https://doi.org/10.1007/s43621-024-00358-4

B. Xin, Y. Song, H. Tan, and W. Peng, (2025). Sustainable digital fashion in a metaverse ecosystem. *Journal of Retailing and Consumer Services, 82*, 104099. https://doi.org/10.1016/j.jretconser.2024.104099