

The Rise of E-Commerce: Manus AI Powered Product Generation Before Sales Execution

Dita Helmalia Suri ^{1*}, Nava Gia Ginasta ², Rahma Hanum ³

^{1*,2,3} Digital Bussines Study Program, Faculty of Business and Management School, Universitas Logistik dan Bisnis Internasional, Bandung City, West Java Province, Indonesia

Email: ditahelma92@gmail.com ^{1*}, navagia@ulbi.ac.id, ², rahmahanum@ulbi.ac.id ³

Article history:
Received May 28, 2026
Revised June 30, 2026
Accepted July 2, 2026

Abstract

Manus AI, an autonomous AI agent introduced in 2025, enables fashion businesses to generate product visualizations before physical production, supporting the sell-it-before-you-make-it approach. This study evaluates the implementation of Manus AI in pre-production fashion product development for e-commerce. A quantitative descriptive-explanatory approach was employed using two datasets: a survey of 70 fashion MSME owners to assess AI awareness and an evaluation of Manus AI-generated visualizations by 88 respondents using a five-point Likert scale. The results show that 58.6% of MSME owners had no prior knowledge of AI, indicating limited AI readiness. However, the visualizations generated by Manus AI were positively evaluated, with all indicators rated Good to Very Good (mean = 3.80–4.30). Respondents perceived that Manus AI produced realistic and market-oriented visualizations that support product validation before production while reducing prototype costs, development time, and material waste. These findings demonstrate that Manus AI can support more efficient and sustainable product development while emphasizing the importance of improving AI literacy among fashion MSMEs.

Keywords:

Manus AI; Generative AI; Fashion Product Visualization; E-Commerce; Industry 5.0.

1. INTRODUCTION

The rapid advancement of digital technology has reshaped consumer behavior, particularly in product development processes and promotional strategies. E-commerce has experienced substantial growth over the past decade (Yulianto & Wulandari, 2025) driven by the increasing adoption of digital platforms, innovations in electronic payment systems, and data-driven marketing strategies that are becoming increasingly adaptive to customer trends and preferences. According to data from (Bank Indonesia, 2025), the value of e-commerce transactions in Indonesia increased from IDR 205.5 trillion in 2019 to IDR 487.01 trillion in 2024. This remarkable growth positions Indonesia as one of the fastest-growing e-commerce markets in Southeast Asia while highlighting the significant potential of the country's digital economy (Rania, 2023). Furthermore, digital marketing strategies have been proven to play a crucial role in enhancing consumer engagement and strengthening business competitiveness in the digital era (Sudirjo et al., 2023).

Data reported by (WeAreSocial, 2024) indicate that approximately 59.3% of internet users in Indonesia engage in online shopping activities on a weekly basis. This finding is further supported by research conducted by (YouGov, 2025), which ranked Indonesia second among 55 countries in terms of online shopping preference, particularly for fashion and accessories products. Moreover, survey results reveal that 70.13% of Indonesians actively purchase fashion products online, with fashion-related transactions accounting for 22% of the total national e-commerce expenditure (Febian Araf, 2025). These findings suggest that the fashion industry plays a strategic role within the e-commerce ecosystem and is highly dependent on the quality of product visualization in attracting consumer interest.

Alongside these developments, Artificial Intelligence (AI) has emerged as a transformative technology across various industrial sectors. AI is no longer regarded merely as a supporting tool; rather, it has become an integral component of daily activities and business operations. According to the Indonesia AI Report, 97%

of respondents acknowledged the role of AI in their daily lives, with 37% perceiving its impact as highly significant and a further 60% considering it moderately influential (Binus University, 2025). This high level of adoption reflects the growing readiness of both consumers and businesses to integrate AI-driven solutions into their operational processes and strategic decision-making activities.

Amid these technological advancements, Manus AI, a generative AI technology developed by Monica.im, offers an innovative approach to fashion product development. Manus AI enables businesses to generate product design visualizations prior to the production stage. This capability has the potential to reduce prototyping costs, minimize material waste, and accelerate design innovation processes. Consequently, the technology creates new opportunities for improving operational efficiency and effectiveness within the e-commerce-based fashion industry.

However, the adoption of AI is also accompanied by several challenges, including the potential disruption of the workforce due to automation, risks related to data security and privacy, and dependence on the quality of training data, which may affect the accuracy and creativity of design outputs. Furthermore, the use of AI without proper integration may diminish creative value if it is not complemented by human involvement in the idea-generation and product development processes. Therefore, an appropriate approach to AI integration is essential to ensure that the technology supports, rather than replaces, human creativity.

Based on a survey involving 70 respondents, the majority of whom were digital fashion entrepreneurs, the level of understanding of AI technology was found to be relatively low. Nevertheless, most respondents expressed positive perceptions regarding the use of AI for improving operational efficiency, understanding market trends, and enhancing sales performance. These findings indicate substantial potential for leveraging AI technologies to support the development of digital businesses, particularly within the fashion micro, small, and medium-sized enterprise (MSME) sector.

Level of knowledge regarding AI (artificial intelligence) technology

70 responses

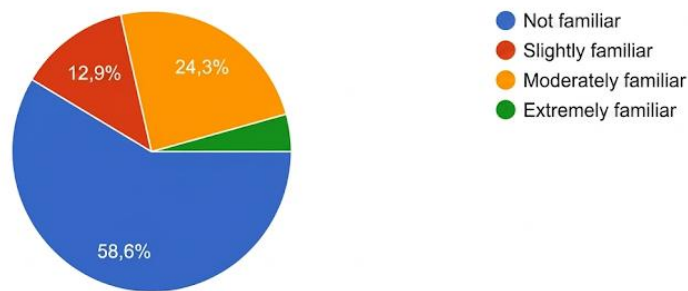


Figure 1. Level of AI Knowledge among MSMEs

The analysis results indicate that the primary challenges faced by fashion business owners include difficulties in identifying product designs that align with market preferences, the high costs and extended time required for prototype development, and production errors that may lead to material waste. According to (Arrijal Rachman, 2025), Dida Gardera, Acting Deputy for Tourism at the Coordinating Ministry for Economic Affairs, stated that “one indication that can be observed in the textile industry is that its technological capabilities still require upgrading and, in some cases, remain less competitive than textile products from other countries.” This observation highlights a gap between the technological needs of businesses and the current level of technology adoption, emphasizing the need for innovative solutions capable of improving efficiency during the early stages of product development.

In addition, survey respondents expressed strong interest in technologies capable of generating product visualizations prior to production. However, concerns regarding the complexity of implementation and usability remain significant barriers to adoption. These findings suggest that while demand for technology-driven solutions is increasing, the availability and effective utilization of such technologies remain limited among fashion MSMEs.

To address the challenges faced by digital fashion businesses, particularly those related to inefficiencies in design and production processes, this study, entitled “The Rise of E-Commerce: Manus AI-Powered Product Generation Before Sales Execution,” was conducted to explore a technology-driven solution. Based on the questionnaire findings, the study investigates the application of Manus AI in generating fashion product visualizations before the production stage. The research aims to enhance product development efficiency, reduce production costs and development time, and minimize material waste. Furthermore, the study seeks to contribute to the development of a collaborative model between Artificial Intelligence and human creativity, in line with the principles of Industry 5.0, which emphasize the integration of advanced technologies with human intelligence and creativity.

2. RESEARCH METHOD

This study employed a quantitative approach with a descriptive-explanatory research design to examine the influence of Manus AI utilization on the efficiency of fashion product visualization processes prior to marketing through e-commerce platforms. A quantitative approach was selected because it enables the objective measurement of relationships among variables through statistical data analysis. The descriptive design was used to describe the characteristics and perceptions of respondents, while the explanatory design aimed to explain the causal relationships between the variables under investigation (Baig & Yadegaridehkordi, 2026).

The study population comprised individuals involved in the e-commerce ecosystem who were familiar with digital technologies and fashion-related products. A purposive sampling technique was employed to recruit respondents through an online questionnaire distributed via Google Forms. A total of 88 valid responses were collected from participants who met the predefined inclusion criteria, including involvement in fashion-related activities, experience in online shopping or online selling, and familiarity with digital technologies. The selected sample was considered appropriate for providing descriptive insights into the implementation of Manus AI for fashion product visualization within the context of e-commerce.

The research instrument was designed to measure several key variables, including Manus AI utilization, product design process efficiency, production cost reduction, and business decision-making quality. Responses were measured using a five-point Likert scale ranging from 1 to 5, representing the respondents' level of agreement with each statement. The collected data were subsequently analyzed to identify relationships among the variables and to draw conclusions relevant to the objectives of the study.

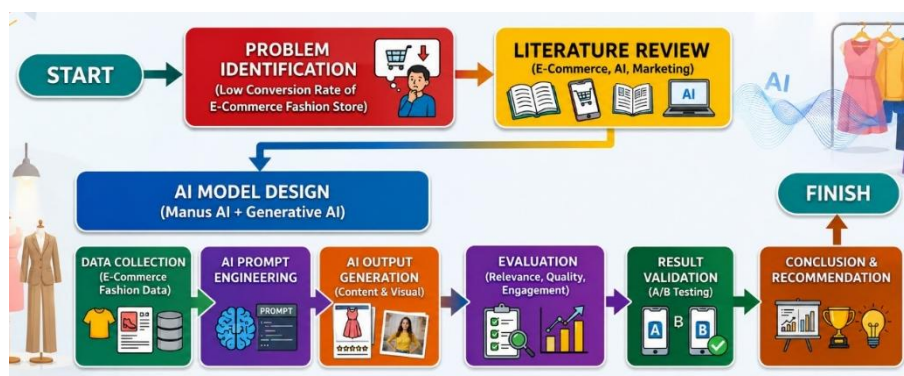


Figure 2. Research Methodology

In the evolution of digital marketing, particularly within the fashion industry, product sales activities are increasingly dominated by e-commerce platforms as the primary medium for commercial transactions. Along with ongoing modernization, the fashion industry in Indonesia has experienced significant growth. As a result, consumers have become more selective in their lifestyle choices and purchasing preferences, often seeking greater confidence before making purchase decisions (Kharina Permata Ayunda, 2023). Consequently, product visualization plays a crucial role in shaping consumer perceptions, enhancing trust, and influencing purchasing decisions.

The inability to provide high-quality product visualizations remains a significant challenge for fashion businesses, particularly micro, small, and medium-sized enterprises (MSMEs). In the digital era, consumers not only demand high-quality products but also expect personalized, flexible, and instant shopping experiences (Nurjaman, K., 2022). Conventional product prototyping processes require considerable time, financial resources, and operational effort. Furthermore, design errors may result in material waste and reduced production efficiency. These challenges highlight the need for innovative solutions that enable businesses to visualize products more effectively before entering the production stage.

One of the most rapidly evolving applications of Artificial Intelligence (AI) is generative AI, which enables systems to create visual content based on specific user inputs. In this context, Manus AI has emerged as an innovative technology capable of generating digital visualizations of fashion products prior to production. Through text-based prompts, the system can produce multiple design alternatives tailored to market preferences and consumer demands. This capability allows businesses to explore design concepts more quickly, flexibly, and efficiently, thereby supporting more informed product development decisions.

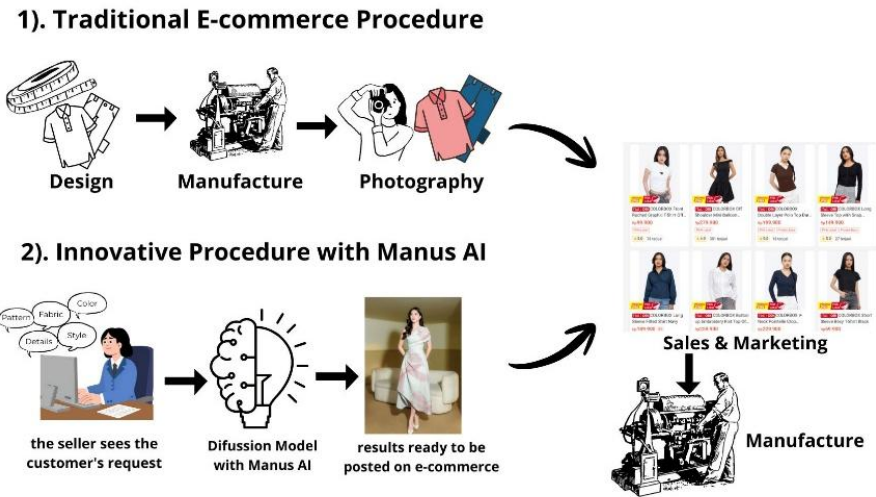


Figure 3. Illustrations of traditional and innovative procedures using Manus AI

As technology continues to advance, Artificial Intelligence (AI) offers the capability to process and analyze data rapidly while identifying patterns and anomalies that may be difficult for humans or traditional systems to detect (Novica Handayani Sinaga et al., 2024). The application of AI technologies in the fashion industry presents significant opportunities to enhance product relevance and deliver more personalized shopping experiences (Eloy et al., 2024). One notable application is generative AI, such as Manus AI, which can generate digital visualizations of fashion products prior to production through text-based prompts. This technology enables businesses to explore design alternatives more quickly, flexibly, and efficiently.

A previous study entitled “From Mind to Machine: The Rise of Manus AI as a Fully Autonomous Digital Agent” demonstrated that Manus AI has evolved as an autonomous digital agent capable of independently performing a wide range of complex functions, including data processing and decision-making based on user requirements. The findings indicate that AI has progressed beyond a supportive tool and has become a system capable of representing certain aspects of human cognitive processes within digital business activities (Shen et al., 2025)

Furthermore, the study “Sell It Before You Make It: Revolutionizing E-Commerce with Personalized AI-Generated Items” revealed that the use of AI technologies to generate product visualizations before the production stage can improve operational efficiency and reduce the risk of market failure. This approach also enables a higher degree of personalization aligned with consumer preferences, thereby enhancing product attractiveness and increasing sales potential (Lin et al., 2025)

Based on the literature reviewed, it can be concluded that the integration of AI technologies, particularly Manus AI, has significant strategic potential for improving the efficiency of product visualization processes within the e-commerce-based fashion industry. The utilization of this technology not only accelerates the design process but also assists businesses in making more accurate, data-driven decisions. Therefore, this study focuses on analyzing how the adoption of Manus AI can enhance product visualization efficiency as part of the ongoing digital transformation of the fashion industry.

3. RESULTS AND DISCUSSION

3.1. Implementation of Manus AI in Product Visualization

To enhance the effectiveness of the fashion product design process, this study utilizes Manus AI, a generative AI technology, to generate product visualizations during the pre-production stage. The process begins by transforming product specifications and design concepts into text-based prompts, which are subsequently processed by the AI system to produce visual representations that align with user requirements. This study adopts two approaches: the use of textual prompts as the primary input and the integration of textual prompts with reference images as additional inputs. The incorporation of reference images provides more specific visual guidance regarding shape, style, and design details, enabling the generated outputs to more accurately reflect the intended design concepts.

A comparative analysis of these approaches was conducted to examine the influence of visual references on output quality and design accuracy. The application of AI in the design process facilitates faster, more flexible, and more efficient exploration of product concepts than conventional design methods while supporting creativity, product personalization, and market-oriented product development (Purnawirawan, 2025) Furthermore, this approach is consistent with user-centered digital system

development principles, which emphasize usability, effectiveness, and the overall quality of user experience in achieving desired objectives (Laksana et al., 2024).

Table 1. The use of Manus AI in visualizing designs

Prompt	Reference Image	Generated Output
<p>A professional full-body fashion photography of a woman in elegant modest wear. She is wearing a structured deep espresso brown wrap vest with sharp lapels and a delicate waist tie, layered over a matching dark brown slim-fit turtleneck. Paired with premium ivory-white wide-leg tailored trousers. She is wearing a perfectly styled light silk hijab in soft pearl white. Accessories: a structured taupe leather tote bag and pointed white kitten heels.</p> <p>Setting: Standing gracefully against a rustic weathered wood pillar and a minimalist concrete floor. Beside her is a large, textured antique clay urn.</p> <p>Aesthetic & Lighting: Warm earth-tone palette, soft natural daylight with subtle shadows, clean editorial look, minimalist "Old Money" aesthetic, shot on 35mm lens, high-end fashion magazine quality, 8k resolution.</p>	<p>N/A</p>	
<p>A high-quality, professional full-body photograph of the young woman from image_4.png, maintaining her exact pose, smile, and warm expression. She is standing at the entrance of a contemporary, upscale cafe, identical to the one in image_4.png, with its dark metal and wood-framed floor-to-ceiling windows, showing the detailed and warmly lit interior with wooden ceiling beams, shelves, and blurred patrons. Her entire outfit is identical: the same beige turtleneck-collar ribbed cardigan with a dark brown shirt collar layered underneath, the high-waisted dark brown wide-leg cargo-style trousers, and the multi-colored Onitsuka Tiger sneakers. She is holding the same black Coach shoulder bag with its colorful patches, including the number '4'. One hand is in her pocket, the other holds the bag, and her feet are slightly crossed, matching image_4.png. The lighting is warm natural light from the cafe and soft ambient light, creating a clear, sharp, and inviting image with depth. The focus is sharp on the woman and the immediate cafe facade, with a pleasant background blur. Shot on a Sony A1 with a 35mm f/1.4 lens. The perspective and framing capture the full figure.</p>	<p>N/A</p>	

Professional fashion editorial shot of a handsome Asian male model wearing the exact shirt from *kemeja tenun kombinasi.jpg*. The shirt is a short-sleeved navy-blue button-up featuring a prominent horizontal band of traditional grey and black ethnic 'tenun' ikat patterns across the chest. The model is posing elegantly in an outdoor setting with soft natural sunlight, perhaps in a modern urban garden or a clean minimalist architectural background. High-quality fabric texture, sharp details on the weave pattern, realistic skin tones, 8k resolution, cinematic lighting, neat and clean look.



The generated visual outputs indicate that Manus AI can produce a wide range of design alternatives that are highly responsive to the input prompts and reference images provided. This capability allows businesses to explore and refine design concepts more quickly, flexibly, and cost-effectively without the need for physical production. As a result, the utilization of Manus AI enhances product development efficiency, accelerates innovation cycles, and reduces dependence on conventional prototyping practices.

3.2. Respondents' Evaluation of Visual Results

3.2.1. Assessment of Realism and Design Appropriateness

According to (Suib & Habsari, 2022), the application of Artificial Intelligence (AI) in digital business environments can support data processing, product development, and operational efficiency within e-commerce systems. The visual outputs generated by Manus AI were subsequently evaluated by 88 respondents, consisting of university students, consumers, online business owners, and participants from other demographic groups. The evaluation was conducted based on several indicators, including the ability of the visualizations to accurately represent fabric materials and textures, the quality of lighting and model proportions, the consistency of clothing designs, the clarity of garment details, alignment with current fashion trends, and the overall accuracy of product visualization prior to the production stage.

Based on the descriptive analysis, the majority of respondents selected either "Agree" or "Strongly Agree" for most of the evaluation indicators. Regarding visual realism, most respondents perceived that Manus AI was capable of representing fabric materials and textures in a sufficiently realistic manner. Through advanced algorithms, AI can rapidly analyze large volumes of data, identify patterns, and extract relevant information to generate more accurate visual outputs (Christian Anggrianto et al., 2024). Furthermore, the lighting conditions and model body proportions were generally perceived as natural, resulting in visualizations that closely resembled professional fashion catalog photography.

For the indicator assessing the consistency between clothing designs and model representation, the majority of respondents also provided positive evaluations. This finding suggests that the generated visualizations were able to maintain coherence between the intended clothing concept and the characteristics of the selected model. Furthermore, details such as stitching, fabric folds, and accessories were generally perceived as sufficiently clear, enabling respondents to better understand the product's design and overall appearance.

Regarding model poses, most respondents agreed that the poses effectively highlighted key product features and details. This finding indicates that the generated visualizations not only emphasize the appearance of the garments but also incorporate visual presentation elements that enhance product attractiveness and communication effectiveness (Zhang & Liu, 2024)

In terms of alignment with market trends, the majority of respondents reported that the clothing designs generated by Manus AI reflected contemporary fashion trends and current consumer preferences. This perception was particularly evident among university students and online business owners, who considered the generated designs to be modern, appealing, and relevant to the demands of the digital marketplace.

Moreover, most respondents indicated that the visualizations helped them imagine how the garments would appear when worn in real-life situations. The generated images provided a clear representation of product appearance and fit, making them a valuable preliminary reference before the production stage. Nevertheless, a small proportion of respondents expressed neutral or negative opinions regarding certain evaluation criteria, particularly those related to the consistency of garment details and the accuracy of product representation. These findings suggest that AI-generated visualizations still require further refinement in specific aspects to achieve a more accurate representation of the final product.

Table 2. Mean Scores of Respondents' Evaluation of Manus AI-Generated Visualizations

Indikator	Mean	Kategori
Q1 Detail bahan realistik	4,28	Sangat Baik
Q2 Pencahayaan alami	4,27	Sangat Baik
Q3 Konsistensi desain	3,92	Baik
Q4 Detail jahitan	4,28	Sangat Baik
Q5 Pose model	3,90	Baik
Q6 Sesuai tren fashion	3,84	Baik
Q7 Ketertarikan membeli	4,10	Baik
Q8 Membayangkan produk	4,15	Baik
Q9 Gambaran bentuk pakaian	3,80	Baik
Q10 Acuan produksi	4,30	Sangat Baik
Q11 AI inovasi bermanfaat	4,14	Baik

Overall, the findings suggest that Manus AI-generated visualizations provide realistic and market-relevant representations of fashion products. Consequently, the technology has significant potential to support business decision-making prior to production, particularly in the evaluation of design concepts, product feasibility, and market opportunities within the e-commerce-based fashion industry.

Despite the positive findings, several challenges remain in implementing Manus AI for fashion product development, particularly among MSMEs. The quality of AI-generated visualizations depends largely on the clarity and specificity of user prompts, while the generated outputs may still require manual refinement to align with product specifications and market preferences. Furthermore, limited digital competencies, financial constraints, and inadequate digital infrastructure may hinder wider AI adoption among MSMEs. Therefore, Manus AI should be viewed as a complementary tool that supports human creativity and decision-making rather than replacing designers' expertise. These findings are consistent with previous studies emphasizing that successful AI adoption depends on technological capability, organizational readiness, and digital competencies (Oldemeyer et al., 2025).

3.2.2. Visual Appeal and Commercial Potential

In addition to realism and design consistency, respondents were also asked to evaluate the visual appeal and commercial potential of the visualizations generated by Manus AI. Based on the evaluation results, the majority of respondents expressed positive perceptions of the product visualizations, particularly regarding their aesthetic quality and ability to attract consumer interest. This finding is consistent with the study by (Muhammad Naufal Mubarak & Wiyadi, 2024), which reported that consumers' perceptions of digital fashion product presentations have a positive influence on purchasing decisions.

Respondents further indicated that the visualizations generated by Manus AI helped them better imagine how the products would appear when worn in real-life situations. Most participants agreed that the garment shapes and overall appearance were represented clearly, providing a more informative understanding of the products than text-based descriptions alone. Such visual representations can enhance consumer perceptions of digital fashion products and positively influence purchasing intentions (Suib & Habsari, 2022).

From the perspective of online business owners, the generated visualizations demonstrated considerable potential for use as digital promotional materials and product catalog images on marketplaces and social media platforms. Several respondents noted that the visual outputs closely resembled professional product photography, thereby reducing the need for costly and time-consuming product photoshoots during the initial stages of marketing. According to (Indawati et al., 2025), digital product visualizations contribute to promotional effectiveness and enhance consumer attraction in online marketing environments.

These advantages provide significant benefits in terms of cost and time efficiency throughout the fashion product development process. Furthermore, most respondents agreed that the generated visualizations were sufficiently accurate to serve as a reference prior to mass production. Since purchasing decisions are often initiated by consumer curiosity and initial product impressions (Shop et al., 2026), the ability to evaluate products through realistic visualizations can support more informed decision-making. These findings suggest that AI technologies can assist businesses in validating design concepts before production, thereby minimizing the risk of production errors and improving overall development efficiency.

3.3. Research Implications

The findings indicate that the utilization of Manus AI as a generative Artificial Intelligence (AI) technology has a positive impact on the fashion product development process within e-commerce environments. Based on evaluations conducted by 88 respondents, the majority of assessment indicators achieved mean scores within the good to very good categories. The indicator "the visualization is sufficiently accurate as a reference before production" received the highest mean score of 4.30, while the indicator "stitching details, fabric folds, and accessories are clearly visible" obtained a mean score of 4.28, both classified as very good. These results suggest that Manus AI-generated visualizations can effectively support businesses in evaluating product designs prior to production.

The findings further demonstrate that AI-driven product visualization can improve the efficiency of fashion product development, particularly during the design planning and digital marketing stages. By utilizing AI-generated visualizations, businesses can obtain realistic representations of products without the need for physical production in the early development phase. Consequently, the risks associated with design errors, product revisions, and material waste can be substantially reduced.

Furthermore, the implementation of the sell-before-you-make concept in this study indicates that digital visualizations can serve as an effective tool for testing market interest before products enter mass production. This observation is supported by respondents' evaluations of the indicator "interest in purchasing products through e-commerce platforms," which achieved a mean score of 4.10 and was categorized as good. These findings suggest that Manus AI-generated visualizations possess considerable potential to enhance consumer attraction toward fashion products in digital marketplaces.

The generated visualizations were also perceived as effective in helping consumers imagine how products would appear when worn in real-life situations, as reflected by a mean score of 4.15. This result indicates that AI-generated visualizations function not only as design prototypes but also as valuable digital marketing assets and product catalog images for marketplaces and social media platforms. Through realistic and visually appealing representations, businesses can accelerate product promotion activities without waiting for the completion of physical production.

Despite these positive outcomes, several challenges were identified in the implementation of AI technology. Some respondents provided neutral evaluations regarding design consistency and the accuracy of garment appearance when worn. These responses indicate that the quality of generated visualizations remains highly dependent on the quality of prompts and instructions provided to the AI system. In addition, limited user knowledge and experience in operating generative AI technologies remain significant barriers to adoption, particularly among fashion MSMEs. Therefore, improving digital literacy and developing practical AI usage guidelines are essential to maximize visualization quality and ensure alignment with market requirements.

From a practical perspective, this study contributes to the understanding of how fashion MSMEs can leverage AI technologies as part of their digital business strategies within e-commerce ecosystems. The adoption of Manus AI can assist businesses in reducing initial production costs, improving marketing efficiency, and accelerating business decision-making based on market responses to product visualizations. From a theoretical perspective, the study reinforces the concept of integrating advanced technologies with human creativity within the framework of Industry 5.0. In this context, AI does not replace human capabilities but rather functions as a complementary tool that supports creative processes and product development activities. The findings demonstrate that collaboration between human creativity and AI technologies can generate innovative approaches to digital fashion product development.

Nevertheless, this study has several limitations. First, the sample was limited to 88 respondents, which may affect the generalizability of the findings. Second, the research focused exclusively on the e-commerce-based fashion sector. Future studies are therefore encouraged to involve larger and more diverse samples, apply more advanced analytical methods, and investigate the implementation of generative AI technologies across other creative industry sectors to obtain more comprehensive insights.

Moreover, AI-generated visualizations may still require manual refinement to ensure consistency with product specifications, brand identity, and market preferences. Therefore, Manus AI should be regarded as a complementary tool that supports, rather than replaces, human creativity and professional judgment in fashion product development.

4. CONCLUSION

This study aimed to analyze how the utilization of Manus AI technology can improve the efficiency of fashion product visualization processes on e-commerce platforms, particularly for micro, small, and medium-sized enterprises (MSMEs). The findings reveal that businesses continue to face several challenges in product development, including difficulties in identifying designs that align with market preferences, the substantial costs and time associated with prototype development, and the risk of material waste resulting from production errors. Nevertheless, respondents expressed positive perceptions regarding the use of Artificial Intelligence (AI) as a solution for enhancing business efficiency.

The results demonstrate that the implementation of Manus AI as a generative AI technology is capable of producing realistic, market-relevant, and visually appealing fashion product visualizations. The generated outputs can serve not only as design prototypes but also as product catalog images suitable for publication on e-commerce platforms. Consequently, Manus AI supports the implementation of the sell-before-you-make approach, enabling businesses to assess market interest prior to mass production. This capability contributes to improved time efficiency, reduced production costs, and the minimization of material waste throughout the product development process.

From a practical perspective, the findings indicate that Manus AI has significant potential as an AI-assisted tool to support product development during the pre-production stage for fashion MSMEs. By enabling

businesses to visualize product concepts before manufacturing, Manus AI can reduce design uncertainty, minimize prototype development costs, accelerate product development, and support more effective production decision-making. Unlike the conventional application of AI, which has primarily focused on marketing, customer service, and business process automation, this study demonstrates the strategic potential of Manus AI in supporting product generation prior to sales execution. Therefore, fashion MSMEs are encouraged to strengthen their digital competencies and integrate AI technologies into product development through continuous training and capacity-building initiatives.

Despite these contributions, this study has several limitations, including the relatively small sample size and its exclusive focus on the fashion MSME sector. Future research is recommended to evaluate the effectiveness of Manus AI in comparison with other generative AI platforms in supporting product visualization, design quality, and product innovation. Further studies may also examine the influence of AI-assisted product visualization on consumer purchase intention, product development performance, and business competitiveness across different industrial sectors using larger samples and more comprehensive research designs.

Overall, the findings indicate that the adoption of Manus AI for fashion product visualization offers substantial potential to enhance efficiency, stimulate innovation, and support sustainability within digital business processes. Accordingly, the integration of advanced technologies with human creativity represents a key factor in addressing the challenges and opportunities of the industry 5.0 era.

ACKNOWLEDGEMENTS

The author would like to express sincere gratitude to their beloved Mr. & Mrs. for their unwavering prayers, encouragement, support, and unconditional love throughout the completion of this study. Their continuous motivation and sacrifice have been invaluable in achieving this accomplishment.

The author also extends sincere appreciation to the research supervisor for the guidance, constructive feedback, and valuable insights provided throughout the research process. The support and knowledge shared have significantly contributed to the successful completion of this study.

Furthermore, the author gratefully acknowledges all respondents, particularly fashion micro, small, and medium-sized enterprises (MSMEs) and friends who generously participated in the questionnaire survey. Their contributions were instrumental in obtaining the data necessary for this research. Finally, the author would like to thank all individuals and organizations who contributed, directly or indirectly, to the completion of this study.

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