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The Potential of Generative AI in Fashion Design: 'Bangau oh Bangau' Collection

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ABSTRACT

This study explores the application of artificial intelligence (AI) in the fashion industry, focusing on its benefits to the design process. AI is defined as the ability of a computer to mimic human intelligence, including data collection, analysis, and response using algorithms and data processing. By incorporating AI, the design process becomes more efficient, allowing fashion designers to create more innovative and complex designs. The study employs three stages of the art-making process: (1) creation, (2) design, and (3) exploration as its main method. As part of the research, a collection inspired by the traditional folk song "Bangau Oh Bangau" compares manual and computer-assisted approaches. The findings of this comparison show that using generative AI in the fashion design process speeds up the overall process, making digital approaches more effective and efficient. In addition to accelerating the process, generative AI also expands the scope of creativity by allowing designers to explore various new concepts that may be difficult to achieve through manual methods. This not only enhances the creative diversity in fashion collections but also helps the fashion industry continue to grow by introducing fresh and exciting designs to the market. In conclusion, the application of artificial intelligence in fashion design offers numerous advantages, including increased productivity and creativity. This technology gives the fashion industry powerful tools to create designs that meet market demands and push traditional creativity's boundaries.

Keywords: Artificial Intelligent, Fashion Design, 'Bangau Oh Bangau' Collection

INTRODUCTION

The 21st century has brought significant changes across various aspects of human life. This era is marked by rapid technological advancements, increasing globalization, and pressing environmental and social issues that demand solutions. The global community has witnessed a dramatic increase in the proliferation of new types of digital technology (OECD, 2020). The COVID-19 pandemic has acted as a catalyst for significant changes in the daily lives of Malaysians. Digital adaptation, initially expected to take place over several years, was rapidly accelerated (Woo, 2020). Before the COVID-19 outbreak, there was a gradual shift towards digital technology in various aspects of life. However, the onset of the pandemic created an urgent need to adapt to this new reality, compelling society to take swift and drastic steps in embracing digital technology. Recently, the paradigm of technological advancement and digitalization has experienced an AI boom that can transcend physical, digital, and social realms.

LITERATURE REVIEW

Looking back to 1956, an American computer scientist named John McCarthy first coined the term "AI" or Artificial Intelligence to refer to the field of engineering and science focused on creating computers that could function like humans, with the ability to solve problems and make intelligent decisions. By introducing this term, McCarthy paved the way for developing and studying artificial intelligence as we know it today. According to Pongtambing et al. (2023), the term "Artificial Intelligence" refers to a computer's ability to mimic human activities, including the capacity for learning, problem-solving, and performing tasks in ways that resemble human behaviors. Using algorithms and data processing, AI technology enables computers to absorb, analyze, and act on information, much like humans' decisions.

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Additionally, Chen (2023) defines AI as a multidisciplinary field that focuses on automating tasks by considering and being inspired by human intelligence. In its efforts to create systems that can mimic human intelligence, this field spans various disciplines, including computer science, engineering, mathematics, cognitive psychology, linguistics, and neuroscience. By integrating these aspects, AI aims to create systems capable of learning, problem-solving, planning, and interacting with the environment as if they were human. This definition aligns with Verma (2022), who explains that artificial intelligence involves applying technology and computing to replicate behavior and critical thinking like human capabilities. Therefore, AI can be described as the process of building intelligent machines from vast amounts of data to perform tasks just like humans. It enhances the speed, accuracy, and efficiency of human efforts. AI utilizes complex algorithms and methods to construct machines capable of making decisions independently.

Indirectly, the development of AI has transformed the fashion industry landscape entirely, opening new opportunities, diversifying benefits, and presenting new challenges. The effectiveness of the future fashion industry will greatly depend on its ability to merge technology with creativity. Fashion design using artificial intelligence (AI) is a rapidly growing field within the fashion industry. With AI's assistance, fashion designers can quickly and efficiently create innovative and inspiring works based on generated prompts. Additionally, generative AI technology accelerates the labor-intensive and time-consuming fashion design process by creating fashion models, fabric designs, jewelry, and clothing (Yilmaztekin, 2022). Based on the data provided, generative fashion design enables the creation of new designs, such as patterns, silhouettes, and styles. This process can expand creativity and innovation by drawing inspiration from AI models.

In this article, fashion design is typically created manually using paper, pens, and markers or through computer applications such as Procreate, Adobe Illustrator, and Adobe Photoshop. These methods have been used for a long time and involve a lengthy process for generating visual design ideas. By leveraging the advancements in AI, fashion designs can now be created using several prompts or keywords, which speeds up the process of generating desired design ideas.

RESEARCH METHOD

According to Gustami (2007) as cited by Agustin (2023), there are three stages in the creation of art or design: (1) the exploration stage, (2) the design stage, and (3) the creation stage. In stage (1), the initial exploration of ideas related to the required information is generated through exposure to fashion forecasts, current fashion trends, and references related to the subject matter being studied. This stage involves field research to gather information from the current environment. In stage (2), the design process is developed from the stage (1) analysis, which is then visualized through 2D or 3D sketches. This stage is crucial for ensuring that the best design choices can be made systematically. Two approaches are used in the design process: manual and digital AI. Aspects such as elements and principles, aesthetics, functionality, ergonomics, materials, and financial considerations are emphasized in stage (2). Stage (3) is the actual creation stage, where the design results are realized in 3D. However, the limitations of this research focus on stage (2), the design stage. The approach used for generating product results involves Microsoft Power Bing, which is easily accessible, user-friendly, and meets the desired end results, especially for beginners or students in the field of fashion.

RESULT AND DISCUSSION

Manual Versus Digital Fashion Design Process

The traditional fashion design process involves several key steps. First, the initial design is usually sketched using a pencil to depict the clothing's idea, shape, and cut. Following this, details and colors are emphasized using markers, pens, or watercolors to provide a more vivid visual effect. Various types of fabrics and patterns can also be created with these methods. Additionally, collage techniques, such as adding different fabric textures and patterns to the design, are used to give a more unique dimension. This process requires careful selection of fabrics and materials to achieve the desired results.

All these methods demand creativity, attention to detail, and a deep understanding of fashion. It also requires patience and technical skill in using drawing tools to produce an appealing and high-quality result.

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Fig.1 Manual design using pen and markers (left), and digital design using Adobe Illustrator and Adobe Photoshop (right). Image courtesy of Nurul Izzah Nazri, 2023

The image above illustrates a design idea inspired by the song "Bangau Oh Bangau," a popular folk song in Malaysia. The song features important subjects such as the heron, fish, buffalo, frog, and snake, which have been transformed into design motifs. The designer has created a casual design incorporating these motifs from the song, adding color, and detailing the expected materials for the final design. According to Kamis (2014), design knowledge encompasses elements and principles such as proportion, unity, emphasis, silhouette, line, color, pattern, and texture to ensure that the design is suitable for an individual. Design knowledge is fundamental and essential in the field of fashion. Understanding design, creativity, and innovation are crucial aspects for visualizing a two-dimensional (2D) clothing design into a three-dimensional (3D) form during the design process.

The design shown in Figure 1 (left) has been created using mediums such as pen, marker, colored pencils, and watercolors on paper. This process provides a fun effect and enhances creativity. However, this method can be challenging to correct if mistakes occur, requiring the entire design to be redone.

On the other hand, in the design shown in Figure 2 (right), the designer has refined the design by using stamping, vector design, and coloring within Adobe Illustrator and Adobe Photoshop software. This digital method requires technological proficiency and demands time and precision in completing a design. The advantages of this method include the ability to duplicate designs and make color and design changes more efficiently, saving time and materials, and it is paperless.

The Potential of AI in Fashion Design: Microsoft Power Bing

Kim and Johnson's (2007) prediction that technological advancements would significantly impact the fashion world has proven to be accurate. The enhancement of functionality, practical comfort, and quality assurance increasingly meet current market demands. The fashion design process using modern methods involving software, applications, and artificial intelligence (AI) allows students and fashion designers to perform various design tasks efficiently.

The explosion of AI has been effectively leveraged in the design and learning processes. The use of Microsoft Power Bing Image has indirectly transformed the design landscape. With the appropriate use of verbs, designs can be generated in seconds. The need for sketching and coloring is eliminated. By using prompts (several keywords), images can be created based on the provided information.

The following showcases Microsoft Power Bing in the design generation process based on the song "Bangau Oh Bangau."

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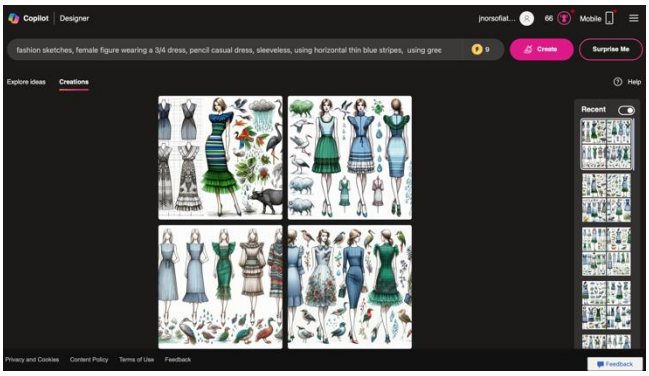

Fig.2 Microsoft Power Bing (MPB) interface, keyword usage (prompt), and design output

Attempts with various prompts have produced a collection resembling the original, incorporating motifs, colors, cuts, and materials. This process takes a very short time, generating several design ideas and suggestions.

Fig.3 “Bangau Oh Bangau” design collection using AI (MPB)

Fig.4 Final results refined using Canva software

The use of artificial intelligence (AI) in fashion design has significantly streamlined the design process. AI allows for the efficient analysis of fashion trends, the creation of prototypes, and the prediction of market tendencies. This capability greatly aids in producing more innovative and relevant designs.

The impact of AI includes enhanced creativity in design, improved alignment with market demands, and an expanded perspective on current fashion trends. AI also helps develop analytical and technical skills pertinent to the fashion industry, leading to more responsive, innovative, and competitive designs. By leveraging this technology, designs are better targeted to the market, reducing waste in garment production, and contributing to

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ongoing innovation in the fashion industry. The time required for design creation can also be minimized with AI assistance.

Figure 5 below compares manual, digital, and AI-generated designs in creating the “Bangau Oh Bangau” collection.

Process	**Design Output**
Manual Method. Completion Time: 2 hours	 Description: The design idea, drawn manually using pencil, pen, and markers, is based on motifs derived from the lyrics of the traditional Malay song "Bangau Oh Bangau."
Digital Method: Adobe Illustrator & Adobe Photoshop. Completion Time: 1-3 hours	 Description: The design is then enhanced using Adobe Illustrator and Photoshop software. The resulting design at this stage can proceed to the garment production process.
Digital Method: AI Generated, Microsoft Power Bing Completion Time: Less than 5 minutes	 Description: Alternatively, the initial design idea can be started directly using Microsoft Power Bing (without manual sketching) by providing appropriate prompts. This allows the software to generate designs based on the given keywords.
Digital Method: Canva Completion Time: 10 minutes	 Description: The designs generated by Microsoft Power Bing can then be refined with final touches by adding stickers from the Canva application.

Fig.5 The overall process of idea generation for the “Bangau Oh Bangau” collection

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The use of artificial intelligence (AI) in fashion design may appear straightforward, but it requires in-depth knowledge and experience to master fully. The initial phase of using AI can be challenging for beginners as they need to learn how to handle this technology efficiently. In the beginning, newcomers may struggle to understand how AI can enhance the design process and produce work that meets standards of creativity and originality. However, with continuous practice and exposure, individuals will become more skilled and comfortable using AI in all aspects of their design work. In addition to Microsoft Bing, many other applications and software can be utilized to generate AI-assisted creative ideas. These tools can help fashion designers, and beginners explore new possibilities in their designs.

CONCLUSION

In conclusion, the use of artificial intelligence (AI) in fashion design has a profound impact on the industry. AI plays a crucial role in simplifying the design process, making previously complex and time-consuming tasks more efficient and faster to complete. With AI, fashion designers and beginners can reduce the time required to create designs, allowing them to focus on their work's creative and innovative aspects. Additionally, AI offers a broader space for designers to explore creative ideas that might be challenging to achieve through traditional methods. This technology does not limit creativity; instead, it enables designers and beginners to test and combine various concepts and styles within a short period. This opens new opportunities for producing more diverse and engaging designs and helps the fashion industry continue to evolve by introducing dynamic and progressive trends and styles.

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