

The AI Revolution in Product Design

Design plays a pivotal role in shaping our world, influencing everything from our clothing to the buildings we inhabit. Every design starts with creative imagination, followed by functional adaptations to meet daily needs, and is infused with a high aesthetic value. Therefore, designers require a continuous creative spark to keep their ideas fresh and responsive to customer demands.

Ideas evolve into the best designs through the iterative design process. The design process is a series of steps designers follow to create a product. It's like a journey designers undertake to bring their envisioned ideas to life for market-ready. This process is time-consuming as each step demands thorough designer research and customer approval.

However, this process can be expedited and streamlined with the advent of Artificial Intelligence (AI). AI's remarkable ability to perform human tasks has made it increasingly popular and widely accepted for daily work tasks. In the design context, AI can generate design ideas faster and more efficiently. It can also optimise product designs, focusing on aesthetics and product quality.

Generative AI Technology

One of the trending AI technologies today is generative AI. It acts as a creative partner capable of producing images, text, or music based on specific inputs. Notable generative AI technologies include Midjourney, which can generate unique ideas; ChatGPT, enabling communication and text generation according to user preferences; and Soundful, which can create music from simple text input.

According to The Edge, art created by generative AI is challenging to distinguish from original designer works due to its equivalent aesthetic value. Moreover, with the assistance of generative AI, the creative content creation process can be expedited and simplified.

Recent research from the University of Pennsylvania found that generative AI can reduce workloads by up to 15% without compromising the quality of work. For instance, letter writing no longer needs to be done manually; AI assists in producing complete and engaging notes. Similarly, with poster production, there's no need to worry about image copyright issues because AI can create attractive posters and unique images not found elsewhere.



"Design is not just what it looks like and feels like. Design is how it works." — Steve Jobs

AI-Enhanced Design

While Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM) are familiar terms, AI-enhanced design is a relatively new concept in the design process. Generative AI technology, in particular, is regarded as a catalyst for introducing fresh and creative ideas to designers. It can also adapt designs to real-world environments.

With AI's assistance, designers can quickly and easily explore various design ideas. For instance, interior designers need only imagine their preferences and requirements, and generative AI technology can transform those visions into several design variations.

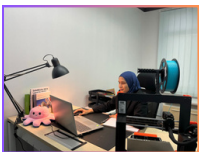
Author Profile



ASSOCIATE FELLOW

Ts. Dr. Nooraziah Ahmad
Product Engineering
Email: nooraziah@umk.edu.my
Phone: +6013-2668656

Ts. Dr. Nooraziah Ahmad, a Research Fellow at the University of Malaysia Kelantan's Institute for Artificial Intelligence and Big Data, is a leading expert in Artificial Intelligence, particularly in Industrial Design. Her academic journey began with a Bachelor's degree in Computer-Aided Design and Computer-Aided Manufacturing from the University of Malaya in 2006. She pursued further education, earning a Master's degree in Plastic Product Design from London Metropolitan University in 2009 and a Ph.D. in Industrial Science from Universiti Tenaga Nasional in 2017. Before entering academia, Dr. Nooraziah gained practical experience at Panasonic Sdn Bhd as a Product Development and Design Engineer. Now, as a senior lecturer, she shares her extensive knowledge in Industrial Design and conducts research in CAD/CAM, Engineering Design, and Artificial Intelligence. Her research spans various areas, from optimizing manufacturing with AI to enhancing product design through smart manufacturing. Dr. Nooraziah also excels in Computer-Aided Design and Manufacturing, with expertise in 3D modelling software and 3D printing.



Fellow's Message



Whether you desire a beautiful bedroom with specific furniture arrangements, colour schemes, and lighting, generative AI can help generate ideas that reflect all these desires. The same principle applies to product creation. Ideas provided to generative AI can enhance real-world product conditions with the combination of colours and textures as specified by the designer.

Designers can harness the generation of ideas through generative AI through prompt engineering. Prompts used in generative AI include design problem statements, design criteria, and customer demographics. AI attempts to understand the given prompts and adapts the best solutions through image generation.

The generated ideas result in various product variations that designers may have yet to considered creating. Designers can experiment with these ideas, test each variation, and refine the concepts produced without limitations. This process continues until a design aligns with customer demands and meets the design criteria. This process indirectly trains AI to learn the designer's preferences through provided prompts.

In the testing process, using simulated virtual environments for product designs is a cost-effective and time-saving approach. It eliminates the need for repeated physical production and practical testing. AI simulations accurately replicate real-world product performance and rapidly analyse results for key insights. Designers can address design issues and enhance complex designs before creating a physical prototype of the product.

Are Designers Losing Jobs?

As generative AI is seen to assist designers in various stages, it has raised concerns about job security in the creative industry. According to a survey conducted by Harris Poll, 50% of designers express concerns about the potential for generative AI to replace their jobs in the creative industry.

Generative AI, however, still has limitations and can partially replace humans, especially in the creative industry. Compared to professional designers, AI-generated designs lack emotional value and cannot solve unique problems. Furthermore, no AI can function without human input. Generative AI requires feedback from humans to produce work. By using generative AI as a tool in design, designers can expand their creativity, explore new ideas, and create more innovative work. Designers must balance their understanding of generative AI and use this technology wisely.

In conclusion, generative AI streamlines the design process by generating, adapting, and exploring design diversity according to current trends and customer demands. However, AI-enhanced design still cannot replace aesthetic judgment, critical thinking, and the designer's ability to produce creative ideas. It is more about supporting and enhancing the designer's creativity and exposing designers to the latest technology to be integrated into the conventional design process.

