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Role of artificial intelligence in apparel and Fashion Industry

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Abstract

Artificial Intelligence (AI) is changing fashion industry by improving several processes including design, marketing, and production. This paper deals with various aspects of artificial intelligence application by enhancing consumer experiences, optimising supply chain, encourage sustainability and minimising wastage. Additionally, it offers future predictions, visual try on, as designer assistants and customised experiences. It explores various areas in which AI powered systems is applied. AI amalgamation in fashion textile industry enables creative colour schemes, patterns and producing exclusive goods that satisfy consumer desires. It plays a crucial role in various areas of creativity. Considering all benefits, artificial intelligence has drawbacks too, like lacks creativity, dependent on past limited data, trouble grasping cultural quirks etc. However, the apparel section is still being shaped and dependent on AI, which make it more customer focused, eco-friendly and efficient.

Keywords: Fashion, industry, artificial intelligence, creativity, data, customer

Introduction

Artificial intelligence is related to a branch of computers that can complete tasks which needs human intelligence to perform various operations like learning, thinking, problem-solving, and perceiving our skills of artificial intelligence.

Today the fashion industry has undergone a technological shift due to artificial intelligence. The various operations like production, marketing, conception, and fashion designs are all changing along with the revolutionary technology paving doors to future style. AI has brought this change which is more sustainable and efficient. Artificial intelligence is changing the fashion and textile industry in all prospects of improvising customer experience, automating supply chains and advocating sustainability. The fashion industry encompasses a wide range of activities, from high fashion couture garments to the mass production of everyday apparel. Today AI in the fashion industry is playing a significant role and shaping every passage of fashion. It is used in every arena of our day today life too.

Application of Artificial Intelligence in Fashion and Apparel Industry

Customised Shopping Experience: The use of artificial intelligence (AI) helps in ensuring and improving consumer shopping. The artificial intelligence-powered systems offer individualised purchasing behaviour by analysing data from past browsing purchase behaviour and consumer preferences. AI is used by various websites like Amazon, Flipkart, Myntra to develop personalized products for individuals. This technology helps in making life simpler for users to find things according to their requirements and desires. This helps in stimulating sales, client loyalty and enhancing customer happiness.

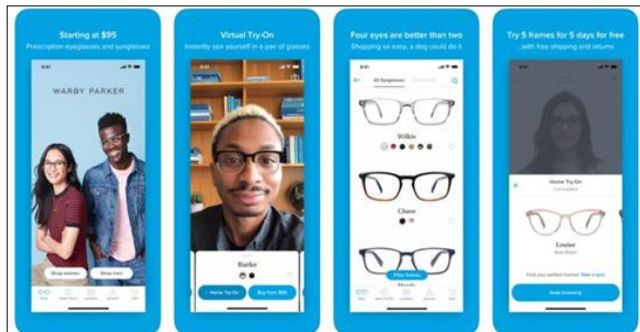
Visual Try-On Websites: AI-driven visual try-on has transformed the online shopping experiences for consumers as they can access these tools to virtually try on clothes and accessories to visualise how it will look on them. Cosmetics, accessories, dresses, home decors, watches are finalised by the customers using this technology. It helps in making online buying less certain and lower return rates for the websites. Thus, it helps in more immersive shopping experience for the clients

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Source: <https://www.aeologic.com>

Fig 1: Customised shopping



Source: <https://www.drip.com/blog>

Fig 2: Visual try

Forecasting Future Trends: Forecasting fashion trends have always been an outcome of combination of analysis and instinct. AI has proved to be a powerful tool in determining accurate needs and demands through reviewing data sets from various past fashion show, social media, websites sales numbers and other sources. It helps designers by assisting and making it enable to foresee trends to create looks that appeals to the consumers. Moreover, this forecast results in giving brand a competitive advantage by allowing them to market needs according to the future demands.



Source: <https://www.venuez.dk/>

Fig 3: Forecasting Future Trends

AI as Design Assistant: The Fashion designers are finding AI to be creative collaborators. As it utilizes past data and current trends to produce innovative patterns, colour combinations and unique palette designs. Artificial Intelligence offers designers with plethora of ideas and inspirations which helps them to enhance their imaginations. The system can generate an infinite number of design concepts with a few easy clicks, depending on the visualisation of photographs that the designer submitted.

This allows fashion firms to introduce a lot of new products each season eg. AiDA transforms fashion design processes, by simplifying the traditional and labour-intensive studio methods with agility, efficiency, and flexibility.



Source: <https://www.innovationhub.hk>

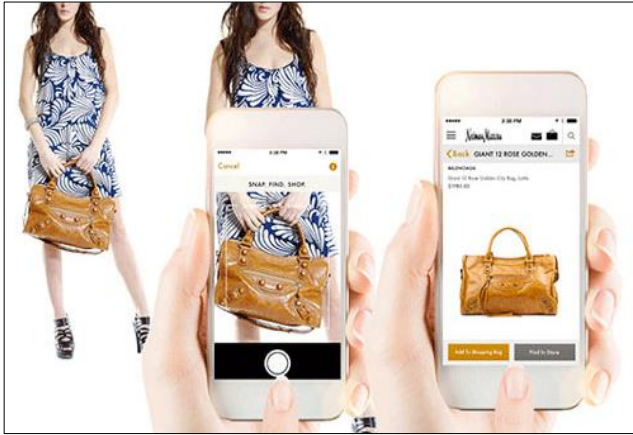
Fig 3: AI as Design Assistant

Inventory Control: AI plays a crucial role by improving prediction of demand and controlling the supply. It helps in reducing the over stock and stock out and maintaining the balance. This process involves the information which is based on past sales data, market trends, social media and fashion trends.

Sustainability: AI significantly contributes to fashion industry sustainability through waste reduction and resources optimisation. It helps in estimating raw material need, quantity through resource allocation, avoid hassle with unnecessary purchases and waste. It also helps in increasing energy efficiency by tracking and adjusting energy use. Moreover, it helps in avoiding over production excess material choices and improves supply chain transparency.

Sales and Marketing: Fashion section has been transforming with various sales and marketing strategies by providing highly customised and targeted marketing efforts. As with advanced data analysis artificial intelligence helps in for sighting the client's behaviour and allowing brands to develop relevant market. Today increased customer engagement has enhanced a more Taylor shopping experience. For example, Myntra employs AI to give its user a customised shopping experience. Such platform offers customised suggestions and entertains each user step by step, by evaluating data from several touch points to boost choices and purchases.

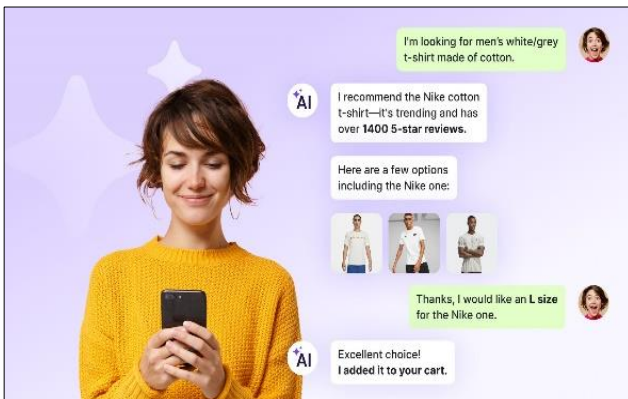
Visual search and image recognition: Artificial intelligence and better technology help in interacting with online shoppers along with the fashion items easily. This picture helps in shopping items in a more efficient and useful ways with available images instead of text. The artificial intelligence powered tool is very easy as it allows users to upload their images and find similar products. The process involves analysing patterns and colour styles to match the product in real time. It also helps in making distinctive recommendations for easier product discovery and reduced return rates. AI power application for marketing influence and social media analysis the available enormous volume of social media data. It helps in recognising the influences whose audience style and content match market value. AI also help in tracking and evaluating effectiveness of influencers efforts. It also helps in finding campaign success comprehend, audience responses and dated choices for future marketing plans.



Source: <https://pyxl.com/blog>

Fig 4: Image recognition

AI driven Customer Service / chat Box / Virtual Assistant: The fashion business has explored every bit with chatbot and virtual assistant which are commonly used for feedback purposes in every area. It responds the consumer enquiry 24 *7. AI chat box help in appropriate responses to frequently asked questions, availability of product, shipping details, sizing, colour, brands, and the returns. These chatbot are functional across a variety of platforms like social media applications websites, to create a balance between automation and customized guidance.



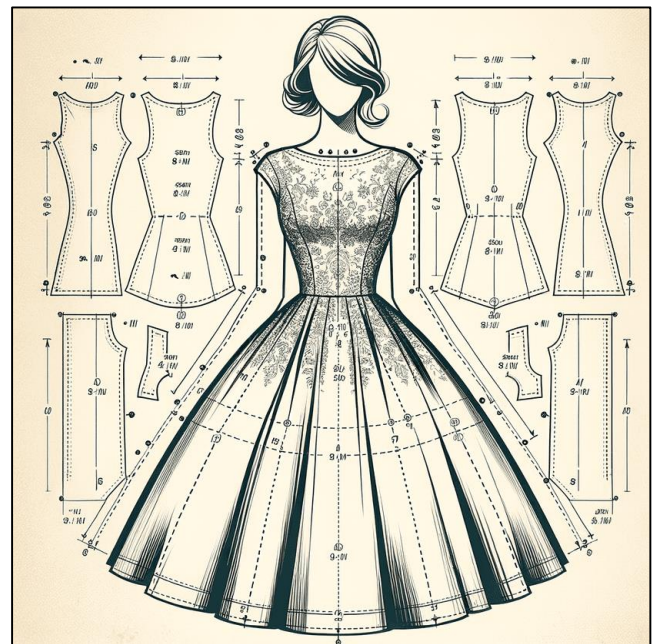
Source: <https://writesonic.com/blog/chatbot-automation>

Fig 5: AI driven Customer Service / chat Box / Virtual Assistant

Artificial Intelligence Powered Counterfeit Detection: In fashion sector AI powered counter for detection has evolved as an important tool for safeguarding company and consumer interests. This tool is used for checking many new variations in products, tags, designs, logos, by analysing an executing picture recognition. It feeds in price comparison as well. AI is integrated with blockchain technology that enables digital certification to track authentication and history of the product.

Pattern making and Colouration: Development of patterns through AI is growing as a step in the textile production process. AI and machine learning can be used by textile machinery to guarantee that garments or various products are cut accurately with minimum wastage of the fabric. AI can produce new combinations, patterns, and styles to automate and accelerate the design process. Moreover, it fosters the creation of virtual prototypes by reducing the time and cost associated with real samples. The textile industry employs the artificial intelligence to match colours. In the past, making a dye combination to match a

specific colour was done visually, necessitating multiple colour correction stages but today dye matching and colour formulations can be reached to any level.



Source: <https://easy-peasy.ai/ai-image-generator>

Fig 5: Pattern making

Quality Control: Artificial intelligence (AI) driven computer vision systems can reliably and precisely detect defects in textiles or apparel industries. Better quality control is guaranteed and the likelihood of faulty products making it to market is reduced. Such advancement in the garment industry minimises the defects and loopholes. It can be used at various stages of yarn manufacturing, yarn spinning, yarn weaving, checking yarn and fabric quality and defects.

Limitations of Artificial Intelligence

1. **Lacks creativity and unproductivity of mind:** AI uses the available data and pattern analysis which is already established. It has limited access of data bank; thus, it has no match with human mind and creativity.
2. **Data dependent:** The working pattern of artificial intelligence is based on the limited data available, but fashion industry is very vast which is quite difficult in analysing the customer needs. Therefore, for addressing a specific trend or market need the information available is not enough.
3. **Contextual Misinterpretation:** As artificial intelligence operates past data, which is not diverse, thus it may fail to understand the context behind cultural symbols, traditions etc. The designers are aware about the inborn sensitivity towards respected cultural boundaries which AI lacks. Artificial intelligence generalisation is based on a level data which is old and limited. Sometimes, it can be troublesome in fashion industry as there are minute variations in cultural expressions. Very often it may fail to recognise the distinctiveness of a specific regional attire.
4. **Global Marketing Nuisance:** To avoid hustle, there is a need to understand the cultural quirks to connect with a wide range of customers. The potential for cultural differences in consumer behaviour, interests and sensitivities does not exist with AI-driven technology.

Need of Artificial Intelligence

Today the transformation of traditional designs has been replaced with the advent of artificial intelligence. Earlier designers were dependent on previous fashion shows, market research and instinct for future prediction which was a very slow process. But AI can analyse data to predict future fashion trends. It can predict colour, fabric, pattern, style for the upcoming season. AI can generate designs in coordination with consumer needs which can lead to the extent of failure of designs along with the target audience. Clothing is not only an aspect of fashion, but it is a form of representation with strong roots in cultural tradition and societal norms. Every culture has its own peculiarities, like symbols, designs and use patterns that may have some specific significance. Sometimes colours are also linked with happiness, but in other cultures it represents sadness.

As textile industry is one of the oldest industries in India that contributes 14% of the value addition and provides full gained employment and has substantial economic influence on the Nation. Over the past years innovations which were found in science fictions have become reality today. Technology has revolutionized the way we work, live and perform various task that is everything has become possible through artificial intelligence. It performs functions like product designing, marketing, education etc which completes work quickly and with comparatively less errors. The various fields like healthcare, education, business, entertainment, personal help, transportation, agriculture industries have included AI Power technology, which has greatly impacted the life of the people the way they learn and communicate. And today society heavily rely on them which has revolutionized every facet of day-to-day life by increasing convenience, productivity in a sustainable way.

AI has become a crucial part of contemporary life progressing in many areas by improving the efficiency as well as personalization of everyday routine. It has helped customers dwell and work in a smarter way being more connected and in a sustainable manner.

Conclusion

Future prediction of AI in textile and fashion sector has proved to be a game changer in terms of design manufacturing and retail sectors. As it will promote efficiency and design innovations by empowering designers for better than setting forecast. Collaboration of AI can be seen in one of the most developed areas of smart textiles that can help in producing adaptive apparels that reacts to environmental factors in industries like healthcare and sports. It will also help the fashion industry in the customisation process of the availability of a range of size issues. As AI technology will improve better and flexible business models. By the implementation of AI technology in fashion forms will gain improved consumer satisfaction and profitability therefore the future of textile and fashion industry will be inventive, successful and customer centred because of the collaboration.

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