

Role of AI in Changing the Physical and Online Shopping Experience of Clothes and Fashion Products



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ABSTRACT: The study focuses on how AI may help with visual searches and personalised suggestions for online buying. To provide personalised apparel suggestions based on individual tastes, AI systems may analyse customer data and behaviour. Customers may use photographs as search queries to locate comparable fashion goods thanks to visual search capabilities driven by AI, which makes online shopping more effective and practical. The ethical and societal ramifications of AI in the fashion business are also covered in the research. In light of the volume of personal data that AI systems gather, it examines privacy and data security issues. It also examines the influence of AI algorithms' inclusion and prejudice on fashion suggestions. The study also looks at how AI may affect the workforce and traditional retail occupations, considering the automation of some processes and the demand for new skill sets. Another important component of background research is comprehending customer impressions of the adoption of AI in the fashion business. By accomplishing these objectives, the study intends to provide a comprehensive understanding of the role of AI in transforming the physical and online shopping experience of clothes and fashion products, including its benefits, challenges, and implications for consumers and the fashion industry as a whole. To evaluate whether AI systems can improve the shopping experience, researchers may create proof-of-concept models or prototypes. Virtual stylists, individualised product suggestions, virtual changing rooms, and tools for analyzing fashion trends based on AI are a few examples of these prototypes. research limitations highlight the complexities and evolving nature of studying the role of AI in transforming the shopping experience of clothes and fashion products. Researchers must acknowledge and address these limitations to provide meaningful and actionable insights for the industry. Researchers can improve the development and responsible application of AI technologies in the fashion sector by focusing on these areas, which will ultimately improve customers' overall purchasing experiences.

KEYWORDS: Artificial Intelligence, Online shopping, Fesion products

I. INTRODUCTION

Understanding the effects of AI technology on the fashion industry is the main goal of the background study on the function of AI in altering the physical and online shopping experiences for clothing and fashion items. It looks at how artificial intelligence is altering how people purchase clothing and fashion accessories, both offline and online. The research intends to offer insights into the various AI technologies being employed and their applications in improving the shopping experience by analysing the growth of AI in the fashion sector (Yeo, S. F., Tan, C. L., Kumar, 2022). The paper analyses the many AI technologies used, including machine learning, computer vision, natural language processing, and recommendation systems. It also acknowledges the historical usage of AI in the fashion sector. With the use of these technologies, AI systems can analyse enormous volumes of data, such as customer preferences, market trends, and inventory data, to deliver tailored suggestions, help with sizing, and enhance product discovery. The project explores the use of AI-driven smart mirrors and virtual changing rooms in the actual shopping experience. Customers may virtually try on items and see how different outfits will appear on them thanks to these technologies without really trying them on. It also looks at how augmented reality (AR) and virtual reality (VR) may be integrated into actual stores to improve the entire shopping experience and provide customers with engaging, immersive experiences (Kautish, P., & Khare, A. (2022).

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The study focuses on how AI may help with visual searches and personalised suggestions for online buying. To provide personalised apparel suggestions based on individual tastes, AI systems may analyse customer data and behaviour. Customers may use photographs as search queries to locate comparable fashion goods thanks to visual search capabilities driven by AI, which makes online shopping more effective and practical. The ethical and societal ramifications of AI in the fashion business are also covered in the research. In light of the volume of personal data that AI systems gather, it examines privacy and data security issues. It also looks at the influence of AI algorithms' inclusion and prejudice on fashion suggestions (Rahman, M. S., Bag, S., Hossain, M. A, 2023). The study also looks at how AI may affect the workforce and traditional retail occupations, considering the automation of some processes and the demand for new skill sets. Another important component of background research is comprehending customer impressions of the adoption of AI in the fashion business. It explores customer perceptions of AI-powered retail experiences and pinpoints the variables affecting the uptake of such technology. The report also looks at the difficulties and obstacles that must be overcome for mainstream AI adoption, including user experience, trust, and transparency. The background research concludes by giving an outline of the changing role of AI in the fashion sector and its effects on both in-person and online shopping for apparel and fashion items. The research intends to shed light on the transformational potential of AI in transforming the fashion retail sector by analysing AI technology, its applications, and the accompanying ethical and societal implications (Jin, B. E., & Shin, D. C. (2021).

II. OBJECTIVES

The objectives of the study on the role of AI in changing the physical and online shopping experience of clothes and fashion products can include:

1. **Assessing the impact of AI on the fashion industry:** The study aims to evaluate the influence of AI technologies on the fashion industry, including both physical retail stores and online platforms. It seeks to understand how AI is reshaping the way people shop for clothes and fashion items.
2. **Exploring AI technologies utilized in the fashion industry:** The study aims to explore the various AI technologies being employed in the fashion industry, such as machine learning, computer vision, natural language processing, and recommendation systems. It seeks to understand how these technologies are applied to enhance the shopping experience.
3. **Understanding the benefits of AI-powered personalization:** The study aims to examine how AI algorithms analyze consumer data and preferences to provide personalized recommendations for clothes and fashion products. It seeks to understand the advantages of AI-driven personalization, including improved customer satisfaction, enhanced product discovery, and reduced returns.
4. **Investigating AI-driven advancements in the physical shopping experience:** The study aims to explore how AI is transforming the physical shopping experience. This includes examining technologies such as smart mirrors, virtual fitting rooms, augmented reality (AR), and virtual reality (VR) applications that enhance interaction and engagement in physical retail stores.
5. **Analyzing the impact of AI on online shopping:** The study aims to analyze how AI is revolutionizing the online shopping experience for clothes and fashion products. It investigates the role of AI in visual search capabilities, chatbots, virtual assistants, and AI-powered product curation for personalized customer support and improved product discovery.
6. **Addressing ethical and social implications:** The study aims to address the ethical considerations and social implications of AI in the fashion industry. It explores topics such as privacy concerns, data security, bias and inclusivity challenges in AI algorithms and the impact of AI on traditional retail jobs and workforce.
7. **Examining consumer perceptions and adoption of AI:** The study aims to understand consumer attitudes towards AI in the fashion industry. It investigates factors influencing the adoption of AI-powered shopping experiences, such as user trust, transparency, and user experience. It also identifies challenges and barriers to widespread AI adoption.

By accomplishing these objectives, the study intends to provide a comprehensive understanding of the role of AI in transforming the physical and online shopping experience of clothes and fashion products, including its benefits, challenges, and implications for consumers and the fashion industry as a whole (Ikram, M. (2022).

III. RESEARCH QUESTIONS

The research questions for the study on the role of AI in changing the physical and online shopping experience of clothes and fashion products can include:

1. How has AI technology been adopted and integrated into the fashion industry to enhance the shopping experience both in physical retail stores and online platforms?

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2. What are the specific AI technologies utilized in the fashion industry, such as machine learning, computer vision, natural language processing, and recommendation systems, and how do they contribute to transforming the shopping experience?
3. What are the benefits and advantages of AI-powered personalization in the fashion industry, including improved customer satisfaction, enhanced product discovery, and reduced returns?

These study topics include both offline and online retail settings, and they attempt to dive into various facets of AI's involvement in revolutionising the clothing and fashion goods shopping experience. The study can shed light on the effects, advantages, difficulties, and consequences of AI adoption in the fashion sector by addressing these issues (Joy, A., Zhu, Y., Peña, C., & Brouard, M. (2022).

IV. AIMS OF STUDY

The aims of the study on the role of AI in changing the physical and online shopping experience of clothes and fashion products are as follows:

- To examine the impact of AI on the fashion industry: The study aims to assess the influence of AI technologies on the fashion industry, exploring how AI is transforming the way people shop for clothes and fashion items. It seeks to understand the extent to which AI is reshaping the fashion retail landscape.
- To understand the role of AI technologies in the fashion industry: The study aims to explore the specific AI technologies utilized in the fashion industry, such as machine learning, computer vision, natural language processing, and recommendation systems. It seeks to understand how these technologies are applied to enhance the shopping experience in both physical and online retail environments.
- To analyze AI-driven advancements in the physical shopping experience: The study aims to explore how AI is transforming the physical shopping experience. It investigates technologies such as smart mirrors, virtual fitting rooms, augmented reality (AR), and virtual reality (VR) applications that enhance interaction and engagement in physical retail stores. The aim is to analyze the impact of these advancements on customer experience and satisfaction.
- To examine the impact of AI on online shopping: The study aims to analyze how AI is revolutionizing the online shopping experience for clothes and fashion products. It investigates the role of AI in visual search capabilities, chatbots, virtual assistants, and AI-powered product curation for personalized customer support and improved product discovery. The aim is to understand the impact of AI on convenience, efficiency, and customer engagement in online retail.

By achieving these objectives, the research hopes to offer a thorough grasp of how AI is changing both offline and online buying for clothing and fashion items. It intends to advance information on the use of AI in the fashion sector and offer perceptions to researchers, policymakers, and industry stakeholders (Lee, Y. K. (2021).

V. LITERATURE REVIEW

A fashion item and a fashion process, according to Sproles (1979), are the two primary components of a fashion system. A specific product, style, colour, shape, cutting-edge technology element, or fresh membership service can all be considered fashion objects. As opposed to a fashion procedure, its development from conception to public presentation, trendsetters, early adopters, acceptance or rejection by the majority, replacement with a newer item, and fusion with the next trend. We presume AI is capable of both, i.e., it can forecast the fashion item by examining the fashion process. AI techniques have been around since the 1930s, but with improvements in computer speed, data storage, data gathering, and data management, data retrieval operations have gotten faster and more dependable. The fashion industry is using AI systems in a variety of ways, including intelligent forecasting for clothing design, intelligent sales assistance to help customers make quick and informed decisions, manufacturing optimization, hyper-personalized marketing through micro-targeting, and improving fashion sales processing as well as consumer experience through intelligent fashion guided systems like chatbots (Aggarwal, S., Bhardwaj, P., & Arora, J. (2020). Customers may use AI-assisted e-commerce applications to snap a picture or capture a screenshot of a fashion item they like in a real world or virtual setting, then look for related products in that category. Using voice assistants and conversational interfaces like "Alexa," "Cortana," and "Google Home," large firms like Microsoft, Apple, and Google are assisting in improving the fashion purchasing experience. These interfaces offer interaction and help around the clock.

The art of fashion forecasting has been compared to using a butterfly net to catch the future. Forecasters are those who extract new and established trends from the news. They employ a variety of techniques, but they all seek out a tool that will enable them to foresee the attitudes, actions, and purchasing patterns of the public. Product designers, merchandisers, and managers continually search for short-term trend forecasts of colours, fabrics, shapes, and general fashion trends. While there are several methods and instruments for forecasting that may be used systematically, 'scanning' is one that is crucial. To determine the colour, fabric, style, silhouette, and overall appearance for the following season, forecasters use historical sales data,

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communication with supply chain partners, competitive analysis, environmental analysis, consumer analysis, and fashion analysis (Khare, A., Kautish, P., & Khare, A. (2023).

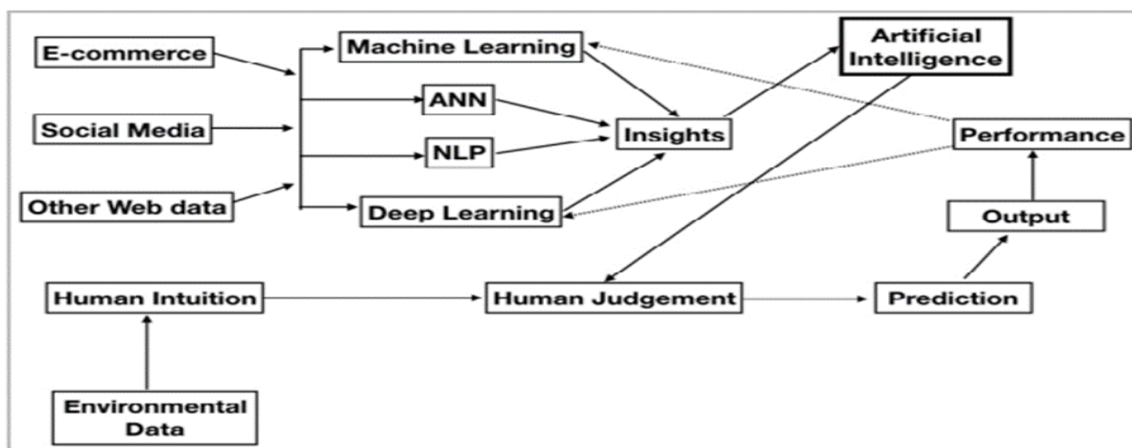


Figure 1: Artificial Intelligence Framework Of Fashion Forecasting

We detailed a case study of an AI company that employs machine learning and computer vision on e-commerce and social media data to forecast "what will sell" for its clients to verify our approach. Based in India, this business today provides services to clients who are located in both developed and developing nations. In just four years, this business has established a global niche market for AI applications in the fashion and lifestyle sectors, generating several success stories and utilising visual intelligence to address real-world issues in the fashion industry (Battisti, S., & Brem, A. (2020).

In little time, artificial intelligence has replaced several key positions in the fashion business. Starting, artificial intelligence (AI) plays a significant part in digital assistants by advising consumers to buy clothing and accessories depending on their body type, height, size, and the newest fashion trend. To ensure total client happiness and reduce the number of returns, which is one of the key problems when it comes to online shopping, all this data is gathered and then improved after analysing the feedback. Within physical and online retailers, AI is also employed to boost efficiency and sales. It is possible to determine which retailer will require which things by keeping track of all the sales data, projections, returns, and purchases. In order to meet local demands appropriately, it is also utilised to determine preferences for colour, size, and shape. Additionally, shoppers may take a picture of any chosen item and look for it online to get a lower price. In accordance with the data gathered it is also utilised to provide recommendations for similar kinds of products that fit a customer's preferences and budget. Everyone is aware of the enormous pollution rate produced by the clothing industry. Since the fashion sector alone is responsible for 10% of the world's carbon dioxide emissions, it is incredibly harmful to the environment. Due to this problem, a lot of companies and production facilities have started to move towards sustainability in terms of raw materials, products, and processes. AI may be applied on many levels to combat this issue by minimising inventory problems and forecasting sales (Micu, A., Capatina, A., Cristea, D. S., 2022).

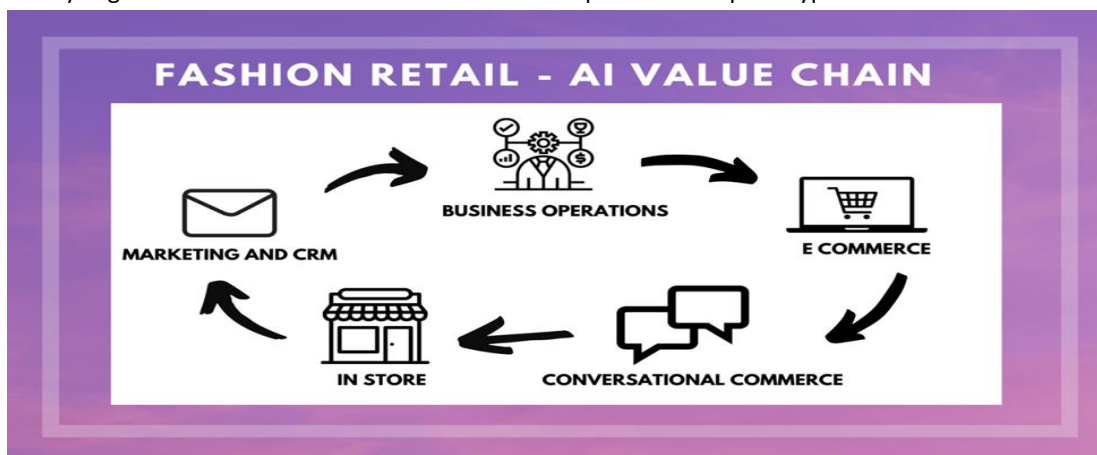
Before it is displayed in stores, a garment goes through many phases, often requiring the fabrication of roughly 10-15 prototypes only to evaluate different design and fit characteristics. To create 3D samples, AI has begun to play a significant role. This eliminates the need to physically produce these samples and instead relies on 3D models. Costs and unnecessary processes have both decreased as a result of this. Additionally, it creates samples considerably quicker than genuine samples do. AI may also be utilised to complete routine chores considerably more quickly and effectively. Consider how many repetitive tasks there are in manufacturing, such as cutting, sewing, finishing, and packing. AI is capable of completing all of these activities significantly more quickly and for less money overall. AI is capable of sewing clothes with constant quality (Watanabe, C., Akhtar, W., Tou, Y., & Neittaanmäki, P. (2021).

VI. METHODS

Numerous techniques and methodologies are used in the research on how artificial intelligence (AI) is affecting how people buy clothing and fashion items offline and online. Large databases comprising data on consumer preferences, purchasing patterns, and fashion trends are analysed by researchers. They find patterns, correlations, and insights that can guide the creation of AI systems using statistical approaches and machine learning algorithms. To acquire qualitative and quantitative information regarding consumers' experiences with and perceptions of artificial intelligence (AI) in the fashion sector, researchers undertake surveys or interviews with fashion merchants, industry experts, and customers. These techniques aid in comprehending

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consumer preferences, expectations, and worries regarding shopping experiences supported by AI. To assess the efficiency and usability of AI-powered retail interfaces, researchers create experiments or do user testing sessions. To gauge user pleasure, effectiveness, and overall experience, researchers watch how users engage with chatbots, virtual try-on tools, and recommendation systems based on artificial intelligence. To fully understand how AI is being used and affecting the fashion business, she may do in-depth case studies or ethnographic research. They may keep a careful eye on and record how the integration of AI technology affects supply chains, online platforms, and physical storefronts (Grewal, D., Gauri, D. K., Roggeveen, A. L., & Sethuraman, R. (2021). To evaluate whether AI systems can improve the shopping experience, researchers may create proof-of-concept models or prototypes. Virtual stylists, individualized product suggestions, virtual changing rooms, and tools for analyzing fashion trends based on AI are a few examples of these prototypes.



VII. RESULTS

A database provides a mechanism for a machine to understand where to remember certain data. An item like a skirt, which has the qualities of colour variants and sizes, may be found in a product catalogue. The size attribute is made machine-readable in a database so that users may find it. Databases are used to store and process enormous volumes of data effectively. Although a database is essential for all types of programming, it is not a machine learning notion. Databases offer a basis for structured data, or data that is arranged so that a machine can comprehend it, and make information simple for machines to retrieve. This contrasts with unstructured data, which is harder to handle on a wider scale. A flat-file database is a type of fundamental database. The data in a flat-file database is organised into tables, which are collections of linked items. A flat-file database resembles a spreadsheet greatly. You may rearrange rows in a spreadsheet using different sorting methods, for example. Additionally, columns can be configured to include particular types of data or have the data in them subjected to mathematical calculations. Database tables include rows and columns, much like spreadsheets, but there are several key distinctions.

SKUs ← Name

id	style_description	category	season
1	silk bomber jacket	outerwear	ss_18
2	boyfriend jeans	pants	fw_18
3	slouchy tee	knit tops	ss_18
4	l/s button down	woven tops	fw_18
5	denim jacket	outerwear	ss_18
6	cardigan	sweaters	fw_18
7	fit and flare dress	dresses	ss_18
8	tank top	knit tops	ss_18

Attributes

Each column in a table has a specific data type that identifies the sort of data it contains, such as a number or string of characters. The rules that define the table are included in the schema. Although a database table may have additional rules, the fundamental workings are fairly similar to those of a spreadsheet. Each row in the table corresponds to one database record. Data about the record is stored in each column in some way. A text file with one row per line and data from each column

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separated by commas might be used to build a flat-file database. The figure illustrates an instance where each SKU contains some related properties. For instance, the term "boyfriend jeans" includes the categories "pants" and "fall winter 2018". Predictive analytics refers to a variety of methods, including machine learning and statistics. The utilisation of previous data to forecast future events is one of the distinctive features. People are excellent pattern recognizers. In general, having an "intuition" or "hunch" is more than just a secret skill. The principle behind predictive analytics is that by identifying patterns in previous occurrences, we can create a framework, or model, that will allow us to anticipate future events.

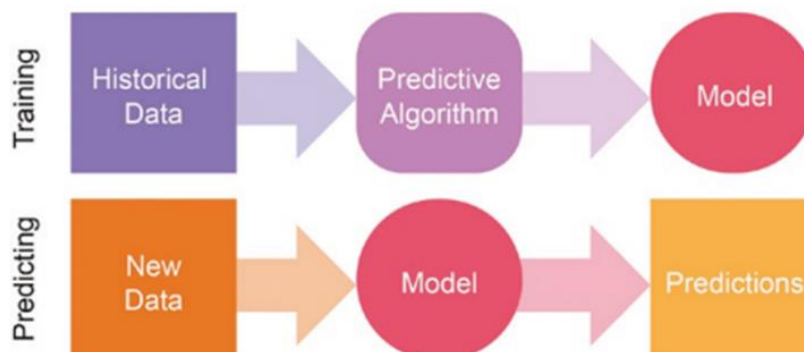


Fig 3. The Process Of Training A Model And Then Using It To Make Predictions About Future Events

A model is a prediction algorithm used to imitate real-world activities in predictive analytics, as well as other machine learning approaches. A predictive algorithm is a statistical technique that makes predictions based on past data. Training and prediction are the two separate phases of using a predictive model.

VIII. DISCUSSION

Gerardo decided to invest in this business since leather jackets were in style in Italy and he had learned how to wash leather in Switzerland for his shoes and bags. Gerardo was aware that Castel Nuovo di Conza was a small village for his store to expand. A larger space was necessary since cleaning leather coats necessitated the use of large equipment. As a result, in the early 1990s, Gerardo decided to relocate the company to the nearby town of Lioni, a slightly bigger town with a population of around 7,000, which served as the model town for several smaller local communities. Gerardo chose to engage in the manufacturing and sale of leather goods (mostly belts) as well as the machinery for cleaning leather coats when he realised that the new shop, which was close to the city centre, was large enough. In reality, the addition of cleaning services for leather jackets served as a significant point of distinction from the company's rivals (artisanal repair shops for leather goods), drawing in additional clients who also purchased leather accessories. La Bottega del Calzolaio was able to generate a maximum turnover (in lire) of € 60,000 throughout their seven years in Lioni, with 90% of their revenue coming from services and 10% from product sales.

Table 2. Company Turnover Trend (1985 And 1994)

Year	City	Total turnover	Product %	Service %	Note
1985	Castel nuovo	20.000,00 €	5%	95%	Value converted into euro
1994	Lioni	60.000,00 €	10%	90%	Value converted into euro

The ambition to expand his firm never goes away, and after around 10 years, the Lioni village also outgrew its potential as a site and a market. Confident in the chance the Internet provided for online selling, Orazio and Luca attempted to relaunch the father's vision for the firm to scale: this time, scalability will be secured electronically and digitally through online selling! Together, they made the difficult decision to persuade Gerardo. Despite being an inventor, Gerardo was not very comfortable using the internet and digital technology because he was then around 50 years old. He had a really difficult time envisioning how they might have sold their goods or services online. The two brothers decided to abandon offering repair services as the initial phase of their digital plan, concentrating solely on selling the product (the belts). Orazio did rely on the fact that trying to sell a product online didn't come with a lot of expenses and, more importantly, didn't run the danger of undermining the reputation of the "La Bottega del Calzolaio" brand. On his own, Gerardo had a lot of reservations, but he also had a lot of confidence in his kids, and after several conversations with them, he decided to give it a shot. He was aware that his boys were more savvy about

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current trends than he was. With the selling of belts branded "La Bottega del Calzolaio" and made by subcontractors, "La Bottega del Calzolaio's" "online" journey officially started in January 2011. Accessing the eBay e-commerce website as a seller was the first step in selling online because of the development of sales on the eBay site and he regularly requested it was simple to use and relatively affordable.

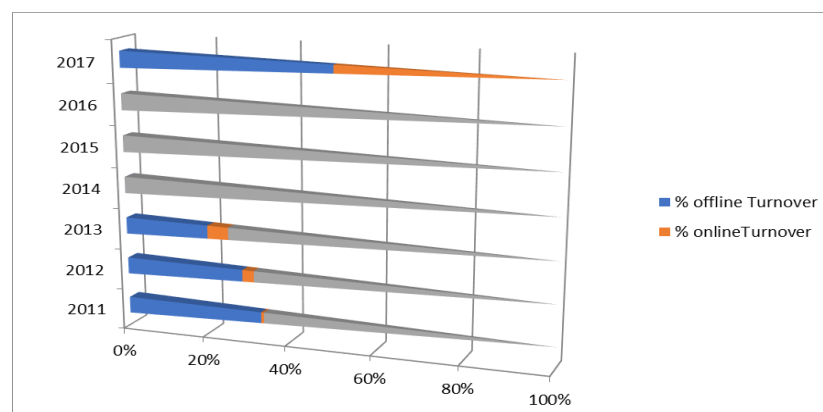
Once online, Gerardo was eager to get information from his sons. However, in the initial months, there were no sales and the Internet market did not respond favourably. The two brothers were resolute and did not give up on one another; they rarely felt their father's trust and were aware that the internet market changed over time from the physical one. The initial sales started to come in after approximately five months and increased gradually but steadily over the following months. With a final revenue of €150,630.00 for the year 2011, about 2% of that figure was attributed to internet sales.

Table 3. Percentage Trend of Turnover by "Offline" and "Online" Activities (2011–2017)

Years	% offline Turnover	% online turnover
2011	98%	2%
2012	82%	8%
2013	80%	20%
2014	75%	25%
2015	65%	35%
2016	55%	45%
2017	50%	50%

Online sales were regarded as a successful experiment at the end of 2012 since they accounted for 8% (more than € 10,000) of the entire turnover. Given the reduction in sales, which in 2012 fell by 15% from the prior year, the potential of the Internet business was even more crucial. Orazio and Luca were aware that they were unable to continue to oversee both the administration of online sales and the workload in the workshop. The Del Vecchio family saw the need to change their business approach to manage and develop the Internet business.

Artificial intelligence (AI) is still essential for managing contemporary organisations since it has a significant impact on an organization's economic and cognitive development outcomes. According to Forbes 2019, almost 80% of senior executives believe that investing in AI would have the greatest impact and be the most disruptive. Numerous sizable corporations speed up investment in AI, either directly or indirectly. However, an oligopoly of centralised mega-corporations that prioritise the interests of its stakeholders currently controls the market. Despite its widespread use, artificial intelligence offers many academics and practitioners a complex conceptualization (Daugherty, P. R., & Wilson, H. J. (2018)). A small number of experts claim that we are at the cusp of an era where AI is pervasive due to the convergence of various computational, machine-learning, technological, statistical, analytics, and research trends. I agree with Poole and Mackworth's definition of AI as "computational agents that act intelligently" (2010, p. 3). However, Paschen et al. (2019) have abandoned the notion that AI is solely about devices that can exhibit intelligence comparable to that of humans. The concept of AI centres on acting intelligently, which is defined as carrying out the aforementioned procedures to engage in any goal-directed conduct. This perspective is in line with Russell and Norvig's (2016) analysis, which judged AI performance in terms of a desirable performance referred to as rationality.



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IMPLICATIONS

Studying how AI is affecting how people purchase clothing and fashion items both offline and online can have substantial academic ramifications. Research can look into how customer behaviour and preferences are impacted by AI-driven technology in the context of clothing and fashion products. This could entail researching how elements like customised recommendations, digital try-on experiences, and AI-powered styling ideas affect how consumers make decisions. It is critical to comprehend how consumers view and use AI-driven technology in the clothing and apparel industry. To find obstacles or enablers to technology adoption, research can look at elements including user interface design, usability, trust, privacy issues, and overall user experience. AI has the promise of providing highly individualised and tailored buying experiences. Research can look into how recommendations, sizing, styling, and product suggestions can be efficiently tailored to specific customers using AI algorithms. This could entail looking into the application of machine learning strategies, data collection approaches, and user feedback mechanisms. Investigation is necessary since the use of AI in the fashion business presents ethical and social issues. Data privacy, algorithmic bias, sustainability, and the possible effects on employment and labour practises in the fashion sector are all topics that might be researched. It's crucial to make sure AI technologies are created and applied in a just and responsible way. It is crucial to investigate how AI can close the gap between offline and online purchasing experiences given the advent of multichannel retail. To improve the whole shopping experience, research can look into ways to seamlessly integrate AI technologies across many touchpoints, such as chatbots powered by AI, smart mirrors, augmented reality (AR) applications, and virtual showrooms(Lee, H., & Xu, Y. (2020). AI has the potential to significantly improve inventory management, demand forecasting, and logistics in the fashion industry. Research can examine how supply chain process optimisation, waste reduction, sustainability enhancement, and general operational efficiency can be improved using AI approaches like machine learning and predictive analytics.

Pattern creation, trend forecasting, and other creative aspects of the fashion industry can benefit from AI algorithms. Understanding the interaction between human designers and AI systems, as well as how AI may enhance human creativity and push the limits of design innovation in the fashion sector, might be the main areas of research. These research ramifications demonstrate how interdisciplinary it is to investigate how AI is transforming the clothing and fashion product buying experience. Numerous disciplines, including consumer behaviour, human-computer interface, data science, ethics, supply chain management, and fashion design, may be covered by the research.

LIMITATIONS

While researching the role of AI in changing the physical and online shopping experience of clothes and fashion products, there are several limitations that researchers may encounter. Here are some common research limitations in this area:

- **Data Availability and Quality:** The effectiveness of AI algorithms heavily relies on the availability and quality of data. Researchers may face limitations in accessing comprehensive and representative datasets that cover diverse fashion styles, sizes, and preferences. Additionally, ensuring data quality, accuracy, and relevance can be challenging, as fashion data often involves subjective attributes that are difficult to quantify.
- **Algorithmic Bias and Fairness:** AI systems can inherit biases from the data they are trained on, potentially leading to biased recommendations or exclusion of certain demographics. Researchers must be aware of these biases and strive to mitigate them through appropriate data preprocessing, algorithmic design, and fairness evaluation methods. However, eliminating bias is a complex challenge that may require ongoing research and development.
- **Interpretability and Explainability:** Many AI algorithms, such as deep learning models, are often considered black boxes, making it difficult to understand and interpret their decision-making processes. This lack of interpretability poses challenges when attempting to explain the rationale behind AI-generated recommendations or styling suggestions. Researchers may need to explore techniques for enhancing the interpretability and explainability of AI systems in the fashion context.
- **User Acceptance and Adoption:** While AI technologies offer potential benefits, user acceptance and adoption can be uncertain. Consumers may have concerns about privacy, trust, and reliance on AI algorithms for fashion-related decision-making. Researchers should consider investigating user perceptions, attitudes, and acceptance of AI-driven shopping experiences to understand adoption barriers and design strategies to address them.

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- **Contextual and Cultural Factors:** Fashion preferences and shopping experiences are highly contextual and influenced by cultural, regional, and individual factors. AI algorithms developed in one context may not generalize well to other contexts or cultures. Researchers need to account for these contextual variations and conduct studies across diverse populations to ensure the effectiveness and cultural appropriateness of AI-driven fashion solutions.
- **Real-world Implementation Challenges:** Transitioning AI research findings into real-world implementations in the fashion industry can present practical challenges. Factors such as scalability, cost-effectiveness, integration with existing systems, and industry regulations need to be considered. Researchers may encounter limitations in conducting large-scale, longitudinal studies in real-world retail environments due to resource constraints or access restrictions.
- **Dynamic Nature of Fashion Trends:** Fashion trends are constantly evolving, making it challenging for AI algorithms to keep up with the latest styles and consumer preferences. Research findings may have a limited shelf life, and continuous updates and adaptations to AI models may be required to ensure their relevance and effectiveness over time.

These research limitations highlight the complexities and evolving nature of studying the role of AI in transforming the shopping experience of clothes and fashion products. Researchers must acknowledge and address these limitations to provide meaningful and actionable insights for the industry.

POTENTIAL FUTURE DIRECTION

Future study on the impact of AI on altering the physical and online clothing and fashion goods shopping experience has a wide range of interesting prospective possibilities. Building consumer trust and acceptance requires improving the interpretability and explicability of AI algorithms in the fashion industry. The development of explainable AI models that offer clear justification for style ideas, fashion recommendations, and virtual try-on experiences can be the focus of future studies. Fashion buying requires a variety of sensory elements that are difficult to duplicate in online interactions, such as touch, texture, and fabric drape. To create more immersive and realistic virtual retail environments, future research can investigate the integration of multimodal technologies including haptic feedback, virtual reality (VR), and augmented reality (AR). An important field of research involves modifying AI algorithms to take into account user preferences, cultural quirks, and shifting fashion trends. Future studies could concentrate on creating artificial intelligence (AI) systems that continuously adapt to new fashion trends, user input, and personalisation needs. Further research should be done on the ethical implications of AI in the fashion sector. Methods to address challenges like algorithmic bias, data privacy, sustainability, and the societal impact of AI systems can be explored in future studies. Fairness, transparency, and sustainability in the fashion sector can be ensured by developing frameworks and rules for responsible AI implementation.

AI tools can help fashion designers by enhancing their creativity and creative process. Future studies could examine how human designers and AI systems work together, as well as how AI can inspire new ideas and automate tedious jobs while still maintaining the aesthetic and handcrafted elements of fashion design (Banerjee, S. S., Mohapatra, S., & Saha, G. (2021). When buying clothes, people frequently engage in emotional and social activities like seeking approval, expressing their thoughts, and getting feedback. Future studies can look at how AI systems can comprehend and react to social cues and human emotions more effectively, allowing for more engaging and sympathetic interactions in virtual shopping settings. As AI-driven fashion experiences use personal data more frequently, protecting data privacy and security is essential. The goal of future research is to create decentralised AI architectures, safe data exchange protocols, and privacy-preserving AI approaches that preserve consumer data while providing personalised and frictionless shopping experiences. A global industry with many different cultural influences is fashion. Cross-cultural studies might be explored in future studies to see how AI-driven fashion experiences can be customised for various geographies, demographics, and cultural situations. This includes examining how sizing variances, cultural conventions, and preferences affect AI-powered fashion solutions.

Social influences including trends, influencers, and peer recommendations frequently have an impact on people's fashion choices. Future studies can look into how AI algorithms might incorporate social influence analysis and collaborative filtering approaches to deliver more precise and customised fashion suggestions based on social connections, user-generated content, and community interaction. These prospective options for the future demonstrate the numerous avenues for investigation into how AI is changing how people shop for clothing and other fashion-related items. Researchers can improve the development and responsible application of AI technologies in the fashion sector by focusing on these areas, which will ultimately improve customers' overall purchasing experiences.

V. CONCLUSIONS

The study focuses on how AI may help with visual searches and personalised suggestions for online buying. AI systems may analyse customer data and behaviour to provide personalised apparel suggestions based on individual tastes. Customers may

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use photographs as search queries to locate comparable fashion goods thanks to visual search capabilities driven by AI, which makes online shopping more effective and practical. The ethical and societal ramifications of AI in the fashion business are also covered in the research. In light of the volume of personal data that AI systems gather, it examines privacy and data security issues. It also looks at the influence of AI algorithms' inclusion and prejudice on fashion suggestions. The study also looks at how AI may affect the workforce and traditional retail occupations, taking into account the automation of some processes and the demand for new skill sets. Another important component of background research is comprehending customer impressions of the adoption of AI in the fashion business. By accomplishing these objectives, the study intends to provide a comprehensive understanding of the role of AI in transforming the physical and online shopping experience of clothes and fashion products, including its benefits, challenges, and implications for consumers and the fashion industry. To evaluate whether AI systems can improve the shopping experience, researchers may create proof-of-concept models or prototypes. Virtual stylists, individualized product suggestions, virtual changing rooms, and tools for analyzing fashion trends based on AI are a few examples of these prototypes. research limitations highlight the complexities and evolving nature of studying the role of AI in transforming the shopping experience of clothes and fashion products. Researchers must acknowledge and address these limitations to provide meaningful and actionable insights for the industry. Researchers can improve the development and responsible application of AI technologies in the fashion sector by focusing on these areas, which will ultimately improve customers' overall purchasing experiences.

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