

The Role of Artificial Intelligence in Personalizing Online Apparel Retail: A Systematic Literature Review

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ABSTRACT:

Artificial intelligence is transforming online apparel retail through personalized recommendations, visual search, augmented reality, virtual try-on, and intelligent garment customization. Nonetheless, the degree to which such technologies support accessibility, disability inclusion, and inclusive digital participation remain insufficiently investigated. This systematic literature review examines the role of Artificial Intelligence in online apparel personalization that discussed the implications of the concept on user experience, accessibility, adaptive apparel, and disability-sensitive design. The review synthesized 17 studies published between 2020 and 2026 that used a PRISMA-guided approach. It was determined that there were five key themes, including intelligent recommendation systems, immersive personalization through augmented reality and virtual try-on, computer vision and deep learning applications, accessibility and adaptive apparel and consumer experience outcomes. The synthesis reveals that Artificial Intelligence personalization has the potential to enhance product discovery, decrease the level of decision-making uncertainty, enhance engagement, and facilitate individualized shopping experiences. Nonetheless, the majority of the currently available research is focused on commercial performance, such as the recommendation accuracy, customer engagement, purchase intention, and performance of the system, whereas accessibility and disability-inclusive personalization are relatively undeveloped. The results show that adaptive apparel data, accessible product descriptions, compatibility with assistive technologies, body representation, transparency, privacy policies, and algorithmic fairness should be incorporated in Artificial Intelligence powered fashion applications. The review summarizes that Artificial Intelligence has the potential to change online clothing retail where personalization is modelled as an inclusive, ethical, and disability-sensitive online activity that facilitates self-determination, independent living, and inclusive participation for persons with disabilities.

Keywords: Artificial intelligence; online apparel retail; personalization; digital accessibility; disability inclusion.

1. Introduction

Digital service and retail environments are increasingly influenced by artificial intelligence (AI), as AI enables automated, analytical, and customer-responsive interactions. In the modern service systems, AI is used in prediction, personalization, automation, and decision support, thus transforming the way organizations understand and respond to user needs (Huang and Rust, 2018). AI is also changing the way companies understand consumer behaviour, provide recommendations, and develop personalised approaches to engaging with customers in a marketing and retail setting (Davenport et al., 2020; Kumar et al., 2019). Such developments are particularly pertinent to the online apparel retail, where consumers tend to feel confused in respect to size, fit, colour, texture, styling, comfort and suitability of the product.

Compared to most categories of online e-commerce, online apparel retail is unique in the sense that clothing choices are intertwined with sense of identity, body confidence, mobility, self-expression, self-confidence, and social involvement. To people with disabilities, the clothing choice can be more profound as it might entail sensory comfort, self-dressing, adaptive fastenings, sitting fit, fitting assistive devices, self-esteem, and participation in everyday social and educational settings. Thus, personalization of apparel through AI must be viewed as a commercial retail approach, as well as an accessibility, inclusion, and independent participation issue.

One of the most developed applications of AI in online apparel retail is the recommendation systems. These systems rely on browsing behaviour, purchase history, product attributes, visual similarity and consumer preferences to give custom product recommendations. Within the realm of apparel, such systems are able to simplify the search process and increase product discovery involving a matching of users to clothing types that seem to be of interest to them in terms of preferences and behaviours. Whether

they can accommodate different bodies, disability-related clothing requirements, and adaptive apparel requirements, and accessibility preferences, however, determines whether they can provide inclusive value. When the personalization is anchored on mainstream purchasing patterns alone, then it might actually recreate the same exclusion as opposed to enhancing digital engagement.

Among the recommendation systems, immersive technologies, like augmented reality, virtual reality, and mixed reality, and virtual try-on, have broadened the definition of personalization in online shopping. The technologies enable users to view the products in a more interactive and experiential manner before they make purchases. The studies of immersive customer experience have demonstrated that the technologies of virtual reality, augmented reality, and mixed reality are redefining consumer evaluation of their product by bridging the gap between physical and digital experiences (Flavián et al., 2019). Higher fashion purchase intention has also been linked to experiential AR applications since they generate a more interactive online experience during shopping (Watson et al., 2020). However, these systems have the potential to generate issues of accessibility in the sense that they are so based on visuals, camera tracking, difficult gestures or body representations that do not reflect persons with disabilities.

The rise in application of computer vision, deep learning and image recognition has also enhanced the contribution of AI to personalization of apparel. The vision transformer models, convolutional neural networks, and intelligent garment systems are capable of classifying attributes of garments, discerning patterns of visual style, assisting in image-based product matching, and developing a design recommendation (Abd Alaziz et al., 2023; Chang et al., 2025; Wang et al., 2022). Although these developments enhance the sophistication of technicality, they also help in the issue of representational fairness. When trained on mainstream fashion classifications, typical body shapes or types, or users more likely to purchase,

AI systems will be deficient in serving disabled users, those with sensory needs, access to clothing related to mobility, and wearable preferences.

Accessibility is therefore central to any inclusive evaluation of AI-powered apparel personalization. Clothing platforms can cause obstacles in the case of poor description of product images, inaccessible navigation structures, poor screen-reader compatibility, or the inability of garments information to provide responses to functional requirements. The concerns are especially critical to users with visual, motor, sensory or cognitive disabilities, whose ability to independently shop might rely on the availability of accessible product information, and compatibility with assistive technology. Broader work on digital accessibility highlights the significance of inclusive design, the assistive compatibility, and equal engagement in the digital realm.

User control, trust, and transparency are also essential in the AI mediated apparel personalization. AI-enabled service systems reshape human-technology interaction and make the user acceptance and human-technology fit the primary point of the service design (Wirtz et al., 2018). The importance of trust cannot be underestimated since users should be capable of comprehending and trusting AI-generated recommendations in meaningful decision contexts (Glikson and Woolley, 2020). The reactions of consumers to AI are subject to not just technical accuracy but also perceived control, the quality of the experience, and the perception that the consumers attribute to the interaction with AI (Puntoni et al., 2021). Moreover, online support, chatbots, and online assistants can be used to aid in the search of the product, interact with customers, and provide customer-friendly navigation when created with a focus on inclusion, privacy, and user autonomy (Pantano and Pizzi, 2020; Balakrishnan and Dwivedi, 2024).

According to current bibliometrics literature, the area of AI in retail marketing is constantly

growing, and focus on automation, individualization, consumer interaction, and future research focuses are gaining steam (Haque et al., 2024). Although this has increased, the discussion of AI-based apparel personalization is not very cohesive. Technical papers tend to focus on the accuracy of the recommendation, visual classification, customer segmentation, virtual try-on, and purchase performances, but the accessibility-oriented papers concentrate on the hindrance of disability, adaptive apparel, inclusive design, and compatibility with assistive technologies. There has been a paucity of synthesis tying these two streams of research.

This systematic literature review fills that gap by reviewing how AI can be used to personalize online apparel retail with specific focus on accessibility, inclusive design, user experience, adaptive apparel and disability sensitive digital participation. The review brings an understanding of online apparel personalization that is more socially responsive by incorporating the research on AI personalization with the issues of disability inclusion and accessible apparel. It also reveals the necessity to create AI-enabled apparel systems as welcoming, ethical and accessibility-sensitive digital spaces capable of facilitating autonomy, self-expression and involvement among a variety of users.

2. Methodology

2.1 Review Design

This study adopted a systematic literature review design to explore how artificial intelligence contributes to personalization of online apparel retail, focusing on accessibility, inclusivity, consumer engagement and user experience, as well as disability-sensitive digital participation. A systematic literature review was suitable since the study of AI-enabled personalization of apparel is spread across computer science, e-commerce, consumer behaviour, human-computer interaction, studies on accessibility, and inclusive digital technology studies.

The PRISMA 2020 framework guided the review, as it offers a transparent reporting flow diagram and a checklist to achieve the identification of the

study, screening, evaluation of eligibility, and inclusion decisions (Page et al., 2021).

2.2 Review Protocol and Research Questions

The screening process was preceded by formulation of a review protocol. The protocol outlined the review questions, databases, search terms, inclusion and exclusion criteria, the screening procedure, the quality appraisal criteria, data extraction fields and the thematic synthesis strategy. The protocol aimed to minimize the selection bias and ensure consistency in the review process.

It further made sure that the study was consistent with the overall purpose of the synthesis of evidence on AI-based personalization in online clothing sales and whether the literature is focused on accessibility, inclusion, and diversity of users, as well as on disability-sensitive digital experiences.

The review was guided by the following research questions:

- What AI technologies are used to personalize online apparel retail?
- What are the effects of AI-based systems of apparel personalisation on consumer experience and engagement?
- How far have the current studies gone in terms of accessibility, adaptive clothes and disability inclusion?
- What ethical, privacy, transparency, and fairness issues arise in personalization of apparel through AI?

2.3 Search Strategy

Major academic databases of interest in the field of artificial intelligence, online retail, fashion technology, and the topic of accessibility, inclusion of disabled, and user experience were searched to find relevant literature. The databases were IEEE Xplore, Web of Science, ScienceDirect and Google Scholar. Technical literature about machine learning, computer vision, recommender systems, chatbot-based support, and virtual try-on technologies were identified in the IEEE Xplore. To find

interdisciplinary studies about fashion e-commerce, consumer experience, AI personalization, accessibility, and inclusive digital design, Web of Science and ScienceDirect were searched. Google Scholar was used as a supplementary source to determine some other relevant studies that might not have been found during the primary database searches.

In order to achieve some consistency, Google Scholar screening was narrowed down to the most relevant results retrieved based on title, abstract, and keyword relevance. Included papers also had their reference checks done manually to determine relevant studies. This action aided in retrieving related literature on adaptive clothing, disability integration, and AI-assisted personalization, which might not be found using the primary search query.

In spite of the fact that the chosen databases were covering the technical, interdisciplinary, and consumer-oriented literature, Scopus and ACM Digital Library were not searched as independent database sources. Such a scope of the database was taken into consideration when interpreting it since studies of interest might not have been included unless they were found either via Google Scholar or reference checking although they were only visible in these two databases.

2.4 Search String

The search strategy involved combinations of keywords that involved artificial intelligence, retailing of clothes online, personalization, customer experience, accessibility and inclusion. The Boolean search query was formulated into four broad concept categories: AI technologies, apparel-retail context, customization results, and accessibility/inclusion-relevance. The search term was the following one:

("artificial intelligence" OR "machine learning" OR "deep learning" OR "recommender system*" OR "computer vision" OR "conversational AI" OR chatbot* OR "virtual try-on" OR "augmented reality") AND ("online apparel retail" OR "fashion e-commerce" OR "online fashion" OR "apparel e-commerce" OR "digital fashion retail") AND (personalization OR

personalisation OR recommendation OR "size prediction" OR "fit recommendation" OR "customer experience" OR "user experience") AND (accessibility OR inclusion OR inclusive OR disability OR "assistive technology" OR "universal design" OR "inclusive design")

Firstly, a broad search was used to get the pertinent studies on AI-enabled personalisation in apparel retail. The relevance of accessibility, inclusion, engagement and consumer behaviour was then determined more intimately in terms of title, abstract and full-text screening. This method minimized the chance of omitting the technically-relevant AI personalization studies without losing the central focus of the review of inclusive and disability-sensitive digital apparel experiences.

2.5 Eligibility Criteria

The inclusion criteria were that the studies had to be peer-reviewed journal articles, conference papers, or review papers in English, and published predominantly between 2015 and 2026. The articles must have been about artificial intelligence, machine learning, recommendation systems, computer vision, virtual try-on, chatbot-based support, e-commerce involving the purchase of apparel or fashion, personalization, consumer experience, accessibility, adaptive apparel, or inclusive digital design. Qualified studies were included as either empirical, conceptual, technical or review-based studies as long as they answered at least one of the review questions.

Studies were excluded based on the exclusion of blogs, editorials, non-academic reports, studies offline-only and apparel retail, general retail stores and studies that did not involve AI-based personalization. Also excluded were studies that did not have a clear connection to consumer engagement, consumer behaviour, accessibility, user experience, disability inclusiveness, or online retail of apparel. The studies that did not have full-text were not included since there is no

possibility to evaluate their methodological quality and results.

2.6 Screening Process

The PRISMA 2020 process was used in the selection of the study. In all, 227 records were found. Among these, 207 records were found by searching databases in IEEE Xplore, Web of Science, ScienceDirect database and Google Scholar, and 20 more records were found by performing manual reference checks. On eliminating 43 duplicate records, there were 184 records which were left to undergo title and abstract screening.

The level of exclusion at this step was 139 records which failed to pass the review criteria. This was followed by an evaluation of 45 full-text records to determine their eligibility. At this point, 28 exclusions were made due to certain reasons. Seven studies were filtered out due to irrelevance to AI personalization, six were not apparel-specific, five did not demonstrate a clear engagement link, four lacked a consumer behaviour focus, three were not used due to the unavailability of the entire text. Lastly, the qualitative synthesis was done on 17 studies.

The author used predefined criteria to screen and appraise the articles to ensure consistency throughout the review process. The fact that the screening and appraisal was done by a single reviewer meant that there was no need to undergo any inter-reviewer disagreement resolution process. Nevertheless, the decision of eligibility was cross-verified with the review questions, inclusion criteria and exclusion criteria to minimize subjective selection bias.

The single-reviewer procedure was also viewed as a methodological limitation since the screening reliability would have been further enhanced with the independent reviewer verification procedure. The entire study selection procedure is shown in PRISMA flow diagram.

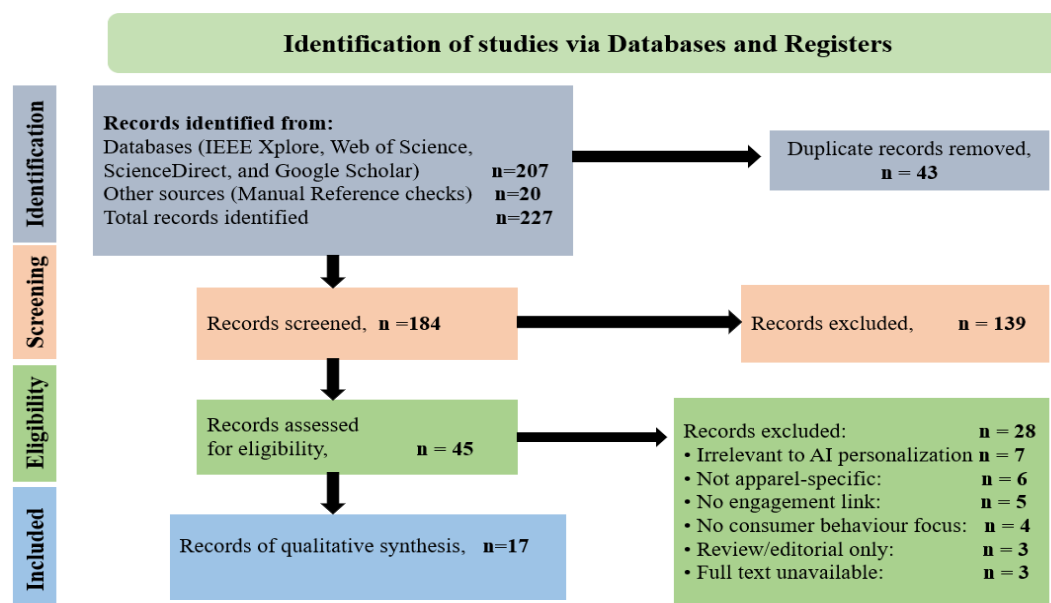


Figure 1. PRISMA Flow Diagram for Study Selection

2.7 Quality Appraisal

The relevance and methodological strength of the included studies were evaluated with the help of a quality appraisal checklist. Empirical, conceptual, technical, and review-based studies were considered in the review thus a flexible appraisal framework was used. All studies were evaluated based on articulating the purpose of the research, methodological clarity, applicability in the context of AI personalization, applicability in the context of online retail clothes, consideration of user experience, consideration of accessibility or inclusion, clear explanation of the results, and description of limitations. Each appraisal criterion was rated as low concern, moderate concern, or high concern. The exclusion of the studies was not based only on the principle of appraisal rating as the objective of the review was to integrate a wide and interdisciplinary base of evidence. The appraisal however, played part in informing the interpretation of evidence strength and assisting to differentiate between technically robust and more accessible studies or those that are more relevant to disability inclusion or user-experience.

2.8 Data Extraction

Structured data extraction matrix was used to extract the data. The information was extracted

as author and year, country or region, type of study, AI technique that was utilized, personalization feature, apparel retail setting, user population, accessibility or inclusion dimension, key outcomes, ethical or privacy concerns, major findings, limitations, and future studies. This structure of extraction gave an opportunity to use consistent comparisons across studies and also to recognize whether the concept of AI as personalization is rather considered as a commercial instrument or more as a wide-scale mechanism of enhancing inclusive, accessible, and user-sensitive digital shopping experiences.

2.9 Data Synthesis

The data that were extracted used synthesis based on themes since the studies included were different in terms of design, methods, technologies, populations, and outcome measures. Thematic synthesis was chosen as it enabled the interpretation of patterns across technical, empirical, conceptual and review-based studies in connection to the review questions. The synthesis concentrated on six key areas, which include AI personalization, consumer experience and behavioural impacts, accessibility and inclusive design, adaptive apparel and disability inclusion, trust, privacy and transparency, and bias, fairness/ future research gaps. This synthesis strategy allowed the review

to transcend a limited commercial view of personalization and explore the possibility of AI-enabled online apparel retail to facilitate inclusive and equitable online activities among different users.

3. Results

3.1 Characteristics and Distribution of Included Studies

The final review included 17 studies that had been published within 2020-26 years. The papers included analyzed AI-powered personalisation in online apparel retail via recommendation systems, augmented reality (AR), virtual try-on, computer vision, intelligent garment customisation, customer segmentation, accessibility, disability inclusion and adaptive apparel. The evidence base was methodologically diverse that covered systematic reviews, empirical studies, qualitative studies, technical model-development studies, bibliometric reviews and conceptual contributions. The literature that was included reflected a gradual shift from commercially oriented personalization toward more inclusive personalization and user-sensitive

approach. In a few studies, the accuracy of the recommendations, visual recognition, engagement, and purchase intention were examined, whereas a less but no less significant set of studies dealt with the barriers of accessibility, adaptive clothing requirements, assistive compatibility, and inclusive digital participation. This trend suggests that the research on AI-enabled customization of garments has received attention as a retailing innovation and as a new area of concern of inclusive digital access.

3.2 Publication Trends and Evolution of Research Focus

Table 1 provides the chronological distribution and the focus of key research of the studies included. The number of research activity has increased after 2022, with 12 out of the 17 studies being published in 2023-2026. This tendency demonstrates that the personalization of apparel through the use of AI is a new research field that can be influenced by the advancements in machine learning, computer vision, immersive technology, digital access, and adaptive apparel.

Table 1. Publication Trends and Major Research Focus of Included Studies

Publication period	Included studies	Number of studies	Major research focus
2020	Baytar et al. (2020); Watson et al. (2020)	2	Augmented reality, virtual try-on
2021	Chakraborty et al. (2021); Wald (2021)	2	Fashion recommendation systems, disability inclusion
2022	Wang et al. (2022)	1	Intelligent garment design and personalization
2023	Deldjoo et al. (2023); Abd Alaziz et al. (2023); Alluqmani et al. (2023); Yıldız et al. (2023)	4	Recommender systems, computer vision, accessibility barriers, customer segmentation
2024	Chen et al. (2024); Chemnad and Othman (2024); Maestre-Matos et al. (2024); Rana et al. (2024)	4	Virtual try-on, machine learning recommendation, digital accessibility, adaptive apparel
2025	Kim et al. (2025); Chang et al. (2025)	2	Disability-inclusive fashion, image-recognition-based recommendation

2026	Lu (2026); Zhang and Liu (2026)	2	Deep learning customization, AI-driven consumer research
Total	All included studies	17	Five major research domains identified

The chronological trend indicates the changes in terms of the research priorities. Previous research were primarily concerned with AR, virtual try-on and recommendation technologies. Subsequent research included more and more aspects of deep learning, image recognition, digital accessibility, adaptive apparel, and disability inclusive design. This development demonstrates that personalization is also not solely considered a commercial role but as a wider socio-technical concern; accessibility, autonomy and diversity of users.

3.3 Thematic Synthesis

The analysis resulted in five themes that are interrelated: intelligent recommendation systems, accessibility and adaptive apparel, immersive personalization, computer vision and deep learning, and consumer experience outcomes. The theme of accessibility is brought out at the beginning of the review since it is the focal point of the inclusive theme.

3.3.1 Intelligent Recommendation Systems as the Foundation of Apparel Personalization

One of the most prominent themes of the literature included was the AI-driven recommendation systems. These systems personalize online apparel retail based on their consumer preferences, browsing behaviour, purchase history, product attributes, customer segmentation, and visual similarity. Studies of fashion recommendation indicate that fashion recommendation has emerged out of the traditional collaborative and content-based filtering towards hybrid, context, and visually informed models (Chakraborty et al., 2021; Deldjoo et al., 2023).

The reviewed studies indicate that the recommendation systems make searching simpler and enhancing the process of product discovery

by matching the users to the appropriate items. Hyper-personalized systems leverage customer segmentation to narrow down their recommendations, whereas image-recognition-based systems take personalization a step further and classify images and detect similarities (Chang et al., 2025; Yildiz et al., 2023). The majority of the studies assessed the recommendation systems based on commercial or technical measures, e.g., the accuracy, relevance, engagement, and the intention to purchase. Less research looked into the availability, explainability, or responsiveness of the output of recommendations to users with disabilities. This reveals a gap between technical personalization and inclusive personalization.

3.3.2 Accessibility, Disability Inclusion, and Adaptive Apparel

Accessibility and disability inclusion came out as a major theme. Investigations on this related to identifying obstacles faced by the disabled users when using online clothing websites. The barriers were such as the lack of access to navigation, providing inadequate image descriptions, less product information, weak assistive technology compatibility, and less information about adaptive apparel (Alluqmani et al., 2023; Chemnad and Othman, 2024).

The synthesis suggests that adaptive apparel is still not fully integrated into AI-enabled personalization systems. The current systems mostly give more importance to style, similarity of products, customer behaviour or probability of purchase. Conversely, the needs related to disability clothing can be those associated with the independence of dressing, sensory comfort, fastening, mobility, seating, fit, compatibility with assistive devices, and body confidence. The existing studies on disability-inclusive fashion and adaptive apparel reveal that clothing is related not just by its functional aspect but also by identity,

dignity, and involvement (Kim et al., 2025; Rana et al., 2024). This result is applicable to the areas of inclusive education and disability studies since accessible clothing platforms are related to autonomy, self-expression, and daily engagement. Personalization of AI has the potential to enhance the inclusion of disability when systems are created to meet the needs of various users, assistive technologies, and functional clothing needs (Wald, 2021). Nonetheless, the analyzed evidence demonstrates that this potential is yet to be used. The concept of accessibility was frequently one design consideration, and not a fundamental element of personalization reasoning.

3.3.3 Immersive Personalization Through Augmented Reality and Virtual Try-On

The third theme is related to AR and virtual try-on. These systems enable customers to see the garments prior to buying them and minimise confusion on what the garment will look like, how to wear, colour and the compatibility of garment style. AR-based garment evaluation can make the online shopping of clothing making it interactive and more experience-driven (Baytar et al., 2020). Digital garment assessment that is further supported by virtual try-on systems is body-based visualization (Chen et al., 2024). The articles under review imply that immersive technologies have the potential to enhance consumer confidence, engagement and purchase intention. There is an association between experiential AR application and greater fashion purchase intention due to the bonds that it establishes between consumer and products (Watson et al., 2020). The accessibility of immersive technologies, nevertheless, was still an issue in the literature reviewed. AR and virtual try-on systems can be based on visual interfaces, camera-based interaction and tracking the body. When the principles of inclusive design are not incorporated in the systems development, these requirements might hinder users with visual impairments, motor and cognitive accessibility requirements.

3.3.4 Computer Vision and Deep Learning as Enablers of Advanced Personalization

Another theme that was important was computer vision and deep learning. Researchers in this category relied on convolutional neural networks, vision transformers, image-recognition models, and intelligent personalized-garment design systems to aid in apparel classification, visual search, style recognition and personalized garment design. The performance of fashion classification and recommendation has been enhanced with vision transformer and deep visual models (Abd Alaziz et al., 2023). AI-driven fashion design models also demonstrate the ability of AI to aid in customized design suggestions (Wang et al., 2022). The evidence suggests that visual AI is becoming central of the next-generation apparel personalization. They are able to handle garment images, determine product attributes and facilitate automatic recommendations on a scale. Another example of how AI can be used to relate user preferences and automated garment designing can be found in deep learning-based customization (Lu, 2026). The studies that were reviewed also suggest that the breadth of inclusiveness of these systems is contingent on the diversity of datasets. When the source of training data largely consists of standard body models, mainstream types of fashions or commercially dominant users, AI systems may be less relevant for users with disabilities or adaptive clothing requirements.

3.3.5 Consumer Experience, Trust, and Behavioural Outcomes

The fifth theme is related to consumer experience, trust, engagement and behavioural results. The analyzed literature reveals that AI-based personalization can enhance products finding, lessen decision ambiguity, boost satisfaction, and enhance the purchase intent. Personalized recommendations and machine learning-driven clothes systems have the potential to decrease the search intensity and aid in more effective choices in online clothing shopping (Maestre-Matos et al., 2024). AR applications also contribute to the increase in

engagement in the form of online garment evaluation being more interactive (Watson et al., 2020). The synthesis also reveals that the results of personalization are dependent on trust, transparency and control as perceived. When the system can be easily understandable and when the user is able to control the preferences, there is a higher likelihood that users will use AI systems. Recent fashion-related AI-based consumer research also argues that the ethical, behavioural, and user-centred issues and challenges, as well as the technical performance, have to be taken into the account (Zhang and Liu, 2026). These considerations are particularly significant to users

with disabilities as systems that cannot be accessed or are opaque are likely to decrease confidence and involvement.

3.4 Quality Appraisal and Risk of Bias Assessment

The studies included in the Table 2 these were evaluated by the criteria that are applicable to mixed evidence sources. The appraisal took into account methodological transparency, relevance to the AI personalization, relevance to online apparel retail, relevance to accessibility, relevance to the user experience, relevance to the clarity of findings, and reporting of limitations.

Table 2. Study-Group Quality Appraisal and Risk of Bias Assessment

Study group	Methodological concern	Accessibility relevance	Overall appraisal
Recommendation system studies	Low to moderate	Low to moderate	Moderate
AR and virtual try-on studies	Low to moderate	Moderate	Moderate
Disability and adaptive apparel studies	Low	High	Strong
Deep learning and computer vision studies	Moderate	Low to moderate	Moderate
Consumer research and bibliometric studies	Low to moderate	Moderate	Moderate

On the whole, the articles were relevant enough to support thematic synthesis. Nonetheless, there was a significant imbalance on the appraisal. Technical studies tended to be good in either model development, classification or system design, although often with little consideration paid to accessibility and inclusion of disabled people. Conversely, studies of disability and adaptive clothing were highly inclusive but seldom explored in-depth the advanced AI personalization processes. This disparity adheres to the conclusion that AI personalization and disability-inclusive apparel research are not well incorporated yet.

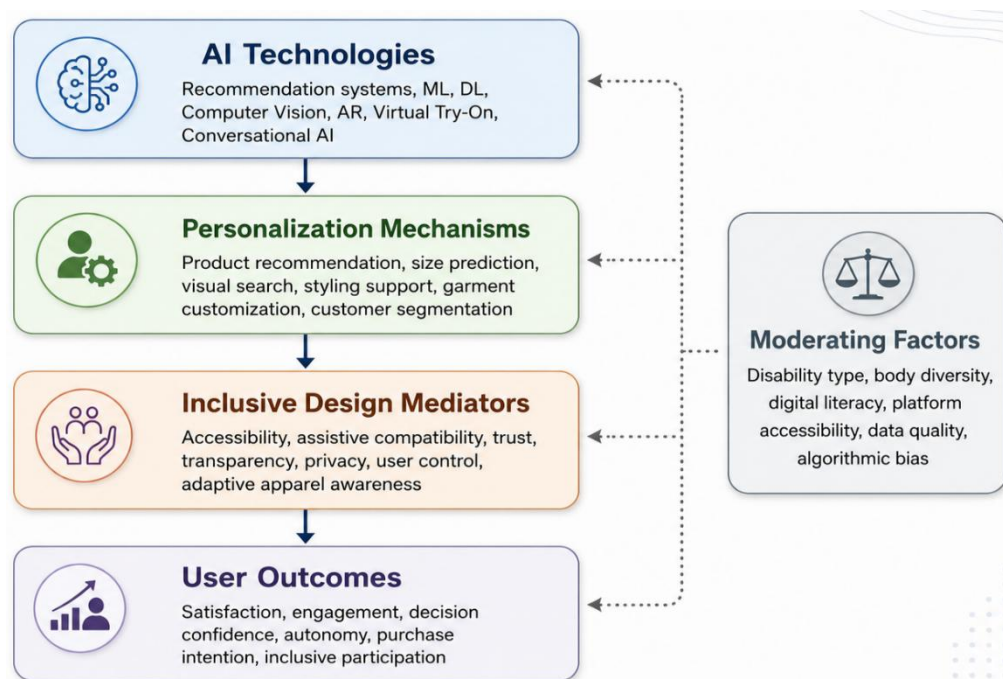
3.5 Integrated Framework of AI-Enabled Inclusive Apparel Personalization

The thematic synthesis justifies a integrated framework that relates the activity of AI technologies to the outcomes of a user due to personalization mediators and inclusive design mediators. The technical assistance is provided by AI technologies, such as recommendation systems, machine learning, deep learning, computer vision, AR, virtual try-on, and conversational AI. The technologies allow the recommendation of products, forecasting their size, search image, styling service, tailoring of garments and segmentation of customers.

Table 3. Integrated Framework of AI-Enabled Inclusive Apparel Personalization

Framework component	Main elements	Function in AI-enabled apparel personalization
AI technologies	Recommendation systems, machine learning, deep learning, computer vision, AR, virtual try-on, conversational AI	Provide the technical foundation for personalization
Personalization mechanisms	Product recommendation, size prediction, visual search, styling support, garment customization, customer segmentation	Translate AI capability into user-specific apparel support
Inclusive design mediators	Accessibility, assistive compatibility, trust, transparency, privacy, user control, adaptive apparel awareness	Determine whether personalization is inclusive and usable
User outcomes	Satisfaction, engagement, decision confidence, autonomy, purchase intention, inclusive participation	Represent the practical effects of AI personalization
Moderating factors	Disability type, body diversity, digital literacy, platform accessibility, data quality, algorithmic bias	Influence the strength and fairness of personalization outcomes

As demonstrated in the framework as shown in tabular form in the Table 3, AI technologies are not bound to bring inclusive results and flow work can be proceed with Figure 2. Their comprehensive worth is linked to its accessibility, assistive compatibility, adaptive apparel sensitivity, user control, openness and protection of privacy. Such mediators are particularly valuable to the users with disabilities since they determine whether personalization is beneficial in terms of autonomy or enhancers of exclusion.

**Figure 2. Conceptual framework linking AI technologies, personalization mechanisms, inclusive design mediators, and user outcomes in digital fashion and apparel platforms**

3.6 Summary of Findings

The findings indicate that AI-supported personalization of apparel has evolved into a multidimensional area that involves technical innovation with new issues regarding accessibility. It was confirmed that five key themes existed: intelligent recommendation systems, accessibility and adaptive apparel, immersive personalization, computer vision and deep learning and consumer experience outcomes. In these themes, AI has progressed on the accuracy of recommendations, visual analytics, virtual try-on, and customization, whereas personalization, which is inclusive of disability, is underdeveloped as compared to other aspects. The evidence indicates that there is less integration between the AI personalization studies and the research on the accessibility of apparel, especially in regard to adaptive apparel knowledge, inclusive datasets, assistive compatibility, transparency, and user control.

4. Discussion

This systematic review examined artificial intelligence (AI) use in online apparel retail personalization with particular focus on accessibility, inclusion, disability-sensitive design, and user experience. The results show that personalization, supported by AI, has come to encompass more than just the traditional recommendation systems, encompassing computer vision, deep learning, and augmented reality (AR) and virtual try-on systems, garment customization, and adaptive apparel. In line with the wider AI literature, the technologies can enhance the accuracy of the recommendations, customer interactions, shopping effectiveness, and personalized service provision. Nevertheless, AI-enabled retail research and practice are still underrepresented in the area of accessibility and disability inclusion (Dwivedi et al., 2021; Kaplan and Haenlein, 2019). One of the key findings of this review is the difference between the commercial personalization and inclusive personalization. The majority of the AI solutions used in online apparel retail are aimed at generating more engagement, purchase intent,

customer retention and recommendation relevance by using predictive analytics and recommender systems. These are desirable goals, yet do not always consider the wide range of user needs with disabilities. Inclusive personalization requires that AI systems need to take into consideration the appropriate accessibility, usability, trust, and functional clothes features in addition to aesthetic needs. Personalization models should include features like adaptive fastenings, sensory-friendly fabrics, designs that fit on the seat, dressing easy, mobility assistance, and being compatible with assistive devices to facilitate equal shopping opportunities.

4.1 Implications for Special and Inclusive Education

Though online clothing retail is not a traditional special education environment, results have direct implications for special and inclusive education. Autonomy, development of life-skills, and self-determination are related to independent clothing choice, online shopping, self-expression, and confidence in people with disabilities. Accessible AI-enabled apparel platforms can be used to assist users to find clothes that address sensory, mobility, comfort, dressing, and assistive-device requirements. In this sense, AI personalization may be perceived as part of a broader inclusive digital ecosystem, which promotes the involvement outside of classrooms. Such relevance is significant in that inclusive education is not just about the access to academics. It also comprises daily and functional skills, social inclusion, and digital confidence, as well as autonomous decision making. Fashion selections affect the self-presentation, comfort, identity, mobility, and other activities in school, work and community environments. Thus, availability and disability-sensitive AI clothing systems can have an indirect positive impact on the development of inclusive life-skills and help decrease digital exclusion and foster independent consumer decision-making.

4.2 Accessibility Barriers and Inclusive Design Requirements

The review highlights persistent barriers to accessibility in online apparel retail, such as inaccessible product images, insufficient alternative text, lack of compatibility with a screen-reader compatibility, complicated navigation, and the lack of information about adaptive clothing features. Such obstacles may diminish autonomous shopping, and limit digital engagement of people with disabilities. The accessibility research notes that accessibility must be considered in the design phase of digital platforms as opposed to an added functionality (W3C, 2023). Thus aspects of accessibility must be included in product information, interface design, recommendation systems, and evaluation systems. Another pattern of the findings is that information about adaptive garments needs to be included in the AI personalization logic. Provided that the personalization systems are more focused on the style, brand, browsing behaviour, or purchase probability, they can fail to consider the functional needs of clothing. Personalization of inclusive apparel must thus consider the type of fasteners, fabric comfort, sitting fit, dressing autonomy, mobility, sensory comfort and compatibility with assistive devices. Such a change would turn AI personalization into a commercially oriented model to a disability-specific model of computer assistance.

4.3 Immersive Technologies and the Risk of Digital Exclusion

AR and virtual try-on technologies have tremendous potential since they can alleviate the lack of confidence in the physical fit and look, thus enhancing consumer assurance and decision-making. Nevertheless, these technologies can have the unintended negative effect of excluding users with visual, motor, or cognitive impairments as they tend to be interacted with visually, tracked by camera, scanned by body, and use complicated gestures in their interfaces. Multi-modal interface, voice-assistance, readable navigation, descriptive garment feedback, and a variety of body

confidence should be included in future development to ensure a wider range of individuals can use the product. This observation is significant since immersive technologies are commonly positioned as the sophisticated personalization solutions that do not focus on the aspects of accessibility. A system can be technically innovative but not accessible when it is not accessible to users to use it in the absence of somebody able to use it or interpret its outputs. Therefore, engaging, realistic, and purchasing intention must not be considered as the only key features and means of immersive personalization since accessibility, usability, autonomy, and inclusive participation are also important.

4.4 Trust, Transparency, Privacy, and User Control

The need to trust, be transparent, and have control over the AI became essential contributors to ethical AI personalization. The way in which recommendations are created should be explained to the users but allow them to control preferences, discard inappropriate recommendations and control their own data. Since personalization in apparel might touch upon the sensitive data about the body, disability needs, size, mobility, and comfort (among other aspects), high privacy standards and algorithmic fairness will be critical (European Commission, 2021).

Transparency is particularly important to people with disabilities. The recommendation is more helpful when the users are aware of whether the recommendation is made based on style, fit, adaptive features, accessibility needs or previous behaviour. Opaque recommendations can cause diminished trust and undermine effective decision-making. Hence, explainable AI and easily accessible privacy settings can be regarded as the key aspects of disability-inclusive personalization.

4.5 Conceptual Contribution, Limitations, And Future Research

In theory, the conceptual framework of this review suggests that AI technologies can lead to inclusive outcomes only under the condition of

being supported by the accessibility, awareness of adaptive apparel, transparency, privacy, and user autonomy. To this end, the AI systems must be assessed not only based on the technical performance criteria but also on the aspects of accessibility, fairness, inclusion, and empowerment of the user. This contribution alters the assessment of AI personalization from commercial efficiency to an inclusive digital involvement. This review also has shortcomings due to the heterogeneity of the studies included and the scarcity of research that focuses on disability. The one-reviewer screening and appraisal process is also a limitation to the review as it can cause a selection or appraisal subjectivity although pre-determined criteria are used. Future research needs to encompass various disability categories such as visual, motor, sensory, cognitive and mobility impaired users. Future studies need to evaluate the availability of AI-based recommendation system, AR technology, virtual try-on, and adaptive apparel recommender system. Other studies that need to be done in the future are the ability of AI models to reproduce bias during body type, disability, gender, age, or assistive-device use. Overall, AI has significant potential to revolutionize the retail of clothes over the internet, yet its advantages will be unrealized until accessibility and disability inclusion become the key considerations in designing, implementing and assessing. In the case of special and inclusive education, this overview indicates that AI-based apparel personalization must be perceived as the considerations of an overall inclusive digital economy that promotes autonomy, self-determination, and equitable participation for persons with disabilities.

5. Conclusion

This systematic literature review studied how artificial intelligence can be used to personalize online retailing of apparel, specifically accessibility, inclusion, user experience and digital participation as aspects of disability sensitivity. The review indicates that AI-driven

personalization has emerged as a important force in online apparel retail by offering an online recommendation system, machine learning, computer vision, augmented reality, virtual try-on, deep learning, customer segmentation, and intelligent garment customization. The technologies can enhance product discovery, decrease decision uncertainty, enhance the engagement, and promote more personalized shopping experiences. The synthesis also shows that the benefits of AI personalization remain uneven. A wide part of the literature is on commercial outcomes such as accuracy of the recommendation, purchase intention, customer interaction and the performance of the system. There is a relatively smaller amount of research on the question of the accessibility of AI-personalized apparel platforms, their inclusiveness, transparency, or responsiveness to the needs of people with disabilities. This gap is paramount since the choices of apparel are not aesthetic or commercial only. They are even associated with comfort, autonomy, identity, mobility, independence in dressing, body confidence and social participation. The review thus claims that the AI personalization should move beyond product-matching logic and adopt the principles of inclusive design. The adaptive apparel information, accessible product descriptions, compatibility with assistive technologies, multiple representations of the human body, user control, privacy protection, and algorithmic fairness should be implemented in future online apparel systems. The framework proposed makes accessibility a mediator between the AI technologies and user outcomes. Altogether, AI holds a high potential to revolutionize online apparel retail, yet the complete usefulness of such a solution can be achieved only when personalization is planned as an inclusive, ethical, and disability-sensitive digital practice. In the case of special and inclusive education, these findings are significant because accessible AI-enabled apparel platforms can help individuals with disabilities to achieve self-determination, autonomy, and inclusion.

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