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The adoption of digital fashion as an end product: A systematic literature review of research foci and future research agenda

Hazel Hoi Yau Chan (iD), Claudia Henninger (iD), Rosy Boardman (iD) and Marta Blazquez Cano (iD)

Department of Materials, University of Manchester, Manchester, UK

ABSTRACT

With the advancement of 3D design software, "digital fashion" has evolved from a retail and design tool for physical fashion to a virtual-only end-product sold to consumers in wholly digital form. As many brands are now developing digital fashion end products as a new revenue stream, given its potential to reduce some levels of overconsumption of physical clothing, it warrants academic attention. However, the literature has predominantly defined digital fashion as a tool rather than an end-product, resulting in an incomplete definition of digital fashion. This hinders scholars' ability to fully comprehend and explore this emerging product category. This article aims to synthesize the current marketing/management literature on digital fashion and investigate the theories, context, characteristics, and methodology of digital fashion as an end-product. This study contributes to the literature by providing a comprehensive industry-accepted definition of digital fashion within a conceptual framework, categorizing six different types of digital fashion end-products, and establishing a future research agenda that will lead to new research streams.

1. Introduction

With the advancements in 3D simulation and virtual technologies (Särmäkari, 2021), "digital fashion" has emerged as a trend that utilizing garment-specific 3D software to create digital-only fashion end-products (BOF, 2021). Consumers can virtually "wear" digital fashion, which is superimposed onto their photographed bodies or real-life surroundings, often in real time (Chrimes & Boardman, 2023; Särmäkari, 2021). This enables consumers to share new outfits on social media without the necessity of purchasing physical clothing, thereby exacerbating the issue of overconsumption in the fast fashion industry (BOF, 2021; Forbes, 2021).

In recent years, digital fashion gained significant industry attention (Research Reports World, 2022; Särmäkari, 2021; Vogue Business, 2021), with luxury brands

CORRESPONDENCE TO Hazel Hoi Yau Chan ✉ hoiyau.chan@postgrad.manchester.ac.uk 🖂 Department of Materials, University of Manchester, Oxford Road, Manchester M13 9PL, UK

like Gucci and Louis Vuitton entering the market in 2019 (BOF, 2021; Chrimes & Boardman, 2023). The global market value reached USD $120 million in 2021, projected to grow at a compound annual growth rate of 187.6% over the next five years (Research Reports World, 2022). Predictions by Morgan Stanley and Deloitte place digital fashion's net worth over USD $50 billion by 2030 (Deloitte, 2022; Forbes, 2022b). Despite these indications of its significance, scholarly focus has been modest (Baek et al., 2022).

The definition of "digital fashion" varies between industry and academic literature due to the quick-evolving industry's concept of digital fashion driven by advancements in 3D virtual technology (Vogue Business, 2021). Academically, "digital fashion" refers to "any overlapping fashion and Information and Communication Technologies (ICTs) fields" (Noris et al., 2020, p. 1). However, this broad definition does not encompass the latest developments in digital fashion, which involve a wide range of ICT applications across sectors (Baek et al., 2022; Noris et al., 2020), resulting in fragmentation of the existing state-of-the-art. This necessitates a systematic literature review to integrate the literature and conceptualize digital fashion (Baek et al., 2022; Noris et al., 2020).

Existing literature reviews have developed a comprehensive taxonomy of digital fashion (Baek et al., 2022; Lee & Xu, 2019; Nobile et al., 2021; Noris et al., 2020) yet omit its alignment with digital fashion as an end-product due to its recent emergence. Baek et al. (2022) and Noris et al. (2020) demonstrate the growing popularity of digital Namfashion while advocating for further field expansion to keep pace with developments (Baek et al., 2022; Noris et al., 2020). The extant literature defines digital fashion as an apparel design and sampling tool (Baytar & Ashdown, 2015; McQuillan, 2020; Papahristou & Bilalis, 2017; Särmäkari, 2021; Hwang Shin & Lee, 2020) and as a retail fitting experience enhancer (Baytar & Ashdown, 2015; Beck & Crié, 2018; Cho & Schwarz, 2012; J. Kim & Forsythe, 2008; Merle et al., 2012; Noris et al., 2020; Pantano et al., 2017; Plotkina & Saurel, 2019). To the authors' knowledge, no research explores digital fashion solely as a virtual end-product, except Särmäkari's (2021) study that describes it as both a tool and a digital end-product. This research gap results in an incomplete definition of digital fashion that is incongruent with industry, limiting scholars and practitioners from fully understanding its emerging potential. This article aims to bridge this gap by systematically synthesizing current marketing/management literature on digital fashion and investigate the theories, context, characteristics, and methods of digital fashion as an end-product. A conceptual framework will be developed to extend the definition and propose a future research agenda for scholars and marketers to explore digital fashion as an end-product. The aim is addressed by the following research questions:

RQ1: *In terms of theories, context, characteristics, and methods, what is the development of the current marketing/management literature on digital fashion as an end-product in the 3D virtual technology field?*

RQ2: *How does digital fashion as an end-product fit into the current definition of digital fashion?*

RQ3: *What are the research gaps and future research directions for digital fashion as an end-product?*

This article contributes to the emerging field of digital fashion by bridging the gap between academia and industry through a comprehensive definition of digital fashion. It also identifies research gaps, recommends future research agendas, and helps practitioners in assessing the feasibility of producing digital fashion and developing business integration strategies.

2. Research methodology

A systematic literature review (SLR) was adopted efficiently synthesize studies with specific research questions, solidify foundations, and expedite theory development (Snyder, 2019), while reducing selection and data extraction bias, ensuring article validity (Booth, 2016). It is relevant to reviewing digital fashion's recent advancements and categorization (Baek et al., 2022), providing a sturdy foundation for further analysis (Christofi et al., 2017). The analysis followed Seuring and Müller's process model (2008, p. 1700) based on Mayring's (2008) "Qualitative Inhaltsanalyse", comprising four steps:

(1) **Material collection**: Specified data parameters and unit of analysis, focused on digital fashion as an end-product.
(2) **Descriptive analysis**: Evaluated surface-level attributes of gathered materials, such as annual publication count, to facilitate subsequent content analysis.
(3) **Category selection**: Selected the structural dimensions and related analytic categories from collected materials that form the major topics of analysis, which are constituted by single analytic categories.
(4) **Material evaluation**: Analyzed the materials regarding the structural dimensions to identify issues and interpretation of results.

2.1. Preliminary search criteria (Step 1. Material collection)

To strengthen the validity and credibility of this review, two frameworks were employed: 1) the 6Ws framework, which informs the review protocol (Callahan, 2014; Xie et al., 2017) and 2) the TCCM (Theory, Context, Characteristics and Methods) framework, which helped to shape the findings in a structured manner (Paul & Rosado-Serrano, 2019). This SLR addresses the following research objectives (RO):

RO1: *To synthesize marketing/management literature on digital fashion as an end-product by applying the TCCM framework.*

RO2: *To develop a conceptual framework to provide a comprehensive definition of digital fashion by distinguishing the characteristics of digital fashion as an end-product.*

RO3: *To identify research gaps; suggest future research agendas and management implications to provide scholars and practitioners with theoretical and practical insights.*

This review followed the 6Ws framework for initial protocol setup (Table 1) and further explained in this section.

Table 1. Summary of 6W framework (Adapted from Callahan, 2014; Xie et al., 2017).

6W Framework		
Who	Who conducted the research for "data"	• Research team named on paper. • To ensure consistency majority of data collection conducted by lead-author. • Research conducted across 5 databases
When	When were the data collected	• Review conducted over 6 month period from August 2022 to January 2023
Where	Where were the data collected	• Across 5 databases (Google Scholar, Emerald, Scops, SAGE Journals, and ScienceDirect). • Further searches were conducted in database of major marketing and fashion conferences (Association for Consumer Research, the International Foundation of Fashion Technology Institutes, and the Global Marketing Conference).
How	How were the data found	• Inclusion and exclusion criteria as well as search strategies followed in line with existing reviews (e.g. Athwal et al., 2019; Baek et al., 2022; Noris et al., 2020) defining a clear keyword search string. • Inclusion and exclusion criteria were carefully designed and in line with past research.
What	What did you keep and what did you discard	• Due to the interest of different fields in the topic of "digital fashion" the focus was on a marketing/management perspective, which allowed us to narrow down the scope.
Why	Final selection criteria	• The final article selection went through multiple cycles that all research-ers involved performed a traffic light system review (red=not applicable, amber=matches some of the inclusion criteria; green=matches all inclusion criteria). • Any discrepancies were carefully discussed.

In terms of the *"who"* and *"when"* sections, the SLR spanned 6 months from August 2022 to January 2023, aiming to maintain broad article search. Time constraints (When articles are published) were not implemented as system boundaries, considering the recent emergence of "digital fashion" to ensure maximum exposure. Addressing the *"where"* section, diverse databases were employed to overcome limitations observed in Baek et al.'s (2022) review, which employed a narrow selection (Scopus and WoS) for searching materials. Utilizing multiple databases answers Baek et al.'s (2022) calls for future research to widen the search results. This article adopted databases such as Google Scholar, Emerald, Scopus, SAGE Journals, and ScienceDirect (Truong et al., 2014), as well as databases from major marketing and fashion conferences, including the Association for Consumer Research, International Foundation of Fashion Technology Institutes, and Global Marketing Conference (Athwal et al., 2019).

To address the objectives set for this SLR, a research strategy was carefully designed with clearly defined keywords and inclusion and exclusion criteria ("*how were the data found*"), as well as guidelines on cross-referencing articles from key authors in the field (Aleem et al., 2022; Loureiro et al., 2020). A structured keyword search was employed in the initial search drawing on Noris et al. (2020) and Baek et al.'s (2022) work. Both authors acknowledged limitations in their SLR strategies. For instance, Noris et al. (2020) narrowed results by using the keywords "digital" and "fashion" solely. They suggested using similar words relating to digital fashion to extend the search. Therefore, diverse keywords combinations were generated from synonyms, grammar forms, and broader/narrower terms based on online magazines and blogs about digital fashion, as well as Baek et al.'s (2022) summary of the keywords generated by their Twitter analysis, which helped to capture the latest developed subfield of digital fashion. This balances the

sensitivity and the specificity of the search. This article included papers containing a combination of keywords used in three of the following keywords in Sections A, B and C (Figure 1) Figure 2 by AND as a connection. An example of a search string is: "digital" AND "clothing" AND "design". Thus, multiple different search strings were performed across the five databases to ensure maximum search results.

The next step was to set up clear preliminary search criteria by providing specific inclusion and exclusion criteria (Seuring & Müller, 2008). Peer-reviewed journal articles in English were included as it is the most common research forum (language; Karaosman et al., 2016; Seuring & Gold, 2012). Publications in other languages were excluded. Further, considering digital fashion in the subfield of "virtual" is a newly emerging topic, this article included peer-reviewed articles, such as empirical studies, conceptual and review papers and conference papers, ensuring comprehensive coverage (Karaosman et al., 2016). To enrich the background and context, books and industrial reports were also included (Athwal et al., 2019).

In terms of "*what did you keep*", this review is specific to the marketing/management perspective as it aims to investigate the adoption of digital fashion focusing on either a consumer or industry perspective, or a combination of both, within the field of 3D virtual fashion, thus excluding papers that focus on technical aspects or those published in other fields, such as health. Further, we only included hyper-real three-dimensional (3D) digital fashion in the 3D virtual fashion sector for the purpose of virtual try-on and wear on social media, excluding articles on digital fashion in other industries, such as gaming avatar skins. This was since purchase intentions of virtual goods are associated with the activities and values in specific virtual environments (Jung & Pawlowski, 2014).

Inclusion and exclusion criteria were applied, and a traffic light system was implemented to address the "*why*" *(final selection of articles)*. The traffic light system denotes those articles, once selected, were screened; any articles that did not meet the inclusion
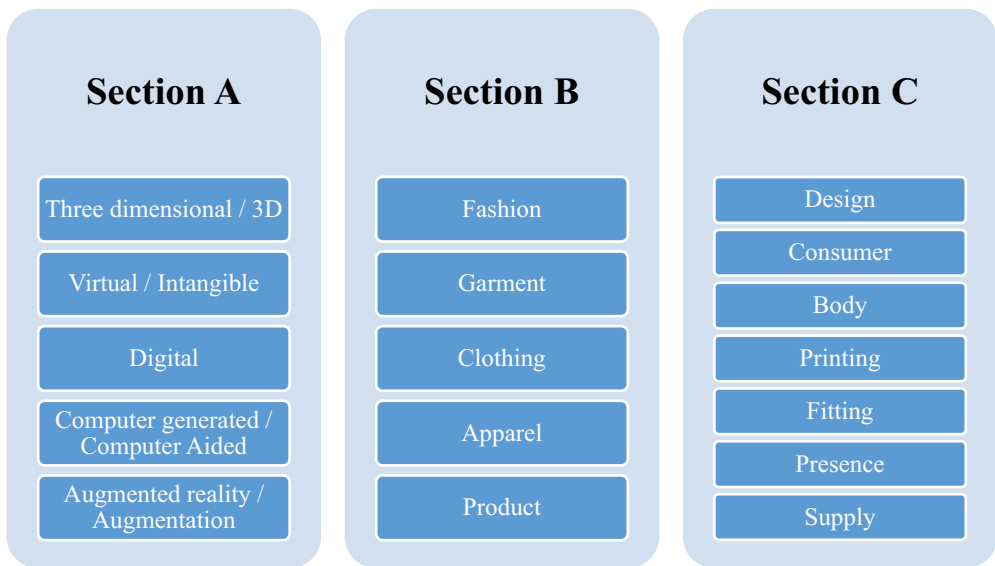

Figure 1. Structured keywords (Source: Author's elaboration).

criteria were marked red, those that partially met the criteria were highlighted in amber and discussed as a team regarding whether they should be included or not, and articles marked green met the inclusion criteria. This system enhances robustness and replicability. After initial content examination, papers were selected based on preliminary criteria. Information from selected sources was documented for a second content check by other researchers, reducing bias and maintaining research reliability.

3. Results

The initial search revealed 47 "hits". A comprehensive analysis was conducted, focusing on 30 matches (26 peer-reviewed journals and 4 conference papers) after removing 17 duplications. The low number of matches is attributed to the fact that the current literature has not kept up with the latest developments of digital fashion and lacks manuscripts relating to the adoption of digital fashion. Only articles with management/marketing perspectives were included (excluding design and technical papers). This maintains result reliability and fulfils the objective of identifying academic research gaps in digital fashion. To broaden the industry insights of this article, a high volume of online resources (magazines, newspaper, websites) was referenced to interpret and analyze the search results. This approach compensates for the under-researched nature of digital fashion as an emerging end-product trend.

The result reveals a research gap for digital fashion in the field of 3D and virtual products, which is essential to explore due to its current substantial growth (BBC, 2021; BOF, 2021). Although Noris et al. (2020) acknowledge the academic interest in digital fashion, there remains a lack of research that comprehends how consumers and industry perceive digital fashion. This further validates the rationale for this research synthesis.

3.1. Descriptive analysis (Step 2: Descriptive analysis)

3.1.1. Paper distribution by year

Descriptive analysis was carried out to classify the paper distribution by year (Seuring & Müller, 2008). Figure 2 displays the chronology of publication from 2008–2022, showing an overall decline in digital fashion publications. This may be due to a shift in emphasis from tangible textile-based fashion to intangible image-based digital fashion made from pixels. Papers between 2008–2020 focused on digital fashion as a tool to optimize tangible product manufacture and marketing, such as 3D simulation tools that enable designers to preview and amend designs (McQuillan, 2020; Papahristou & Bilalis, 2017; Park & DeLong, 2009; Hwang Shin & Lee, 2020) and a virtual try-on tool as an add-on for e-commerce websites (Baytar & Ashdown, 2015; Beck & Crié, 2018; Cho & Schwarz, 2012; J. Kim & Forsythe, 2008; Merle et al., 2012; Noris et al., 2020; Pantano et al., 2017; Plotkina & Saurel, 2019).

Publications between 2020–2022 are predominantly review papers, with one study concentrating on digital fashion as an end-product (Särmäkari, 2021). This indicates an early stage for literature on digital fashion as an end-product, despite its rapid growth in industry (Forbes, 2022a; Särmäkari, 2021; Vogue Business, 2021). This attention offers an opportunity to analyze literature focusing on digital fashion as a tool for physical product
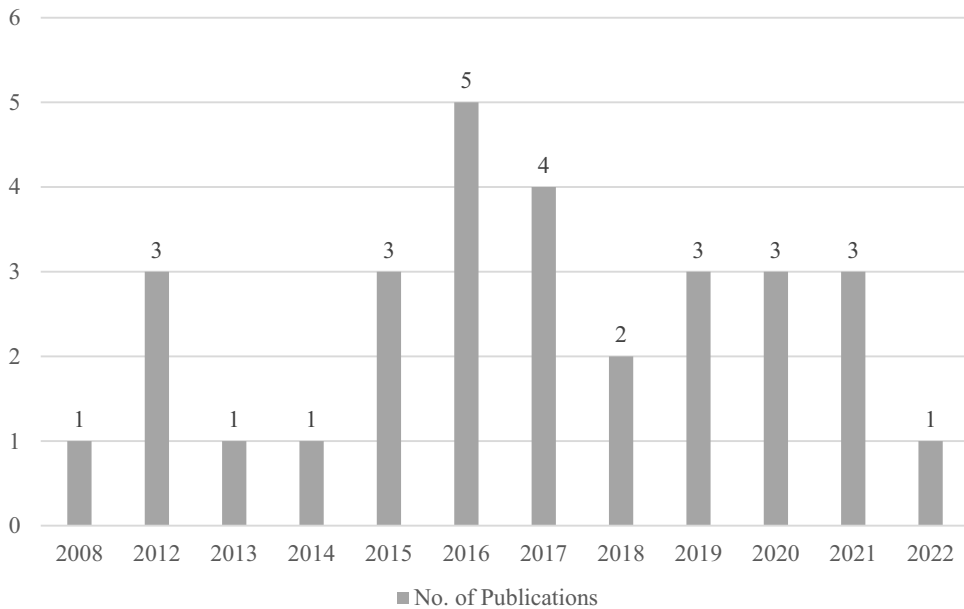
Figure 2. The distribution of the publication per year (Source: Author's elaboration).

manufacturing and marketing, providing insights into consumer behavior and industry adoption. This, in turn, guides research on digital fashion as a digital-only product, suggesting a future research agenda.

3.1.2. The methodology and research methods of the publications

Figure 3 shows the breakdown of methodologies and highlights that there were 4 conceptual studies (e.g. literature review, SLR), 13 quantitative studies (e.g. survey, experimental design), 6 qualitative studies (e.g. comparison studies, self-report, observation, interview) and 7 mixed methods studies, (e.g. experimental design, reflection, survey, interview, evaluation & fieldwork, case study). Most studies used quantitative methods (43%), followed by mixed methods, qualitative, and conceptual studies.

Quantitative methods are employed when there is an established theoretical literature and hypotheses can be tested through surveys (Creswell, 2017). Studies using quantitative methods investigated the consumer perspectives and intention to adopt digital fashion as a tool, focusing on the behavioural responses to virtual try-on (VTO) (Beck & Crié, 2018; Cho & Schwarz, 2012; Merle et al., 2012; Nam et al., 2016; Pantano et al., 2017; Perry, 2016; Qasem, 2021; Shin & Baytar, 2014; Hwang Shin & Lee, 2020; Yim & Park, 2019; Yu & Damhorst, 2015; Zhang et al., 2017). This indicates that the literature of digital fashion as a tool is established. Contrarily, the literature on digital fashion as an end-product has predominantly adopted qualitative methods, indicating a lack of research on the topic, as aspects need to be explored before they can be tested and generalized (Creswell, 2017). Thus, digital fashion as an end-product is in its infancy in terms of academic research, warranting further investigation.
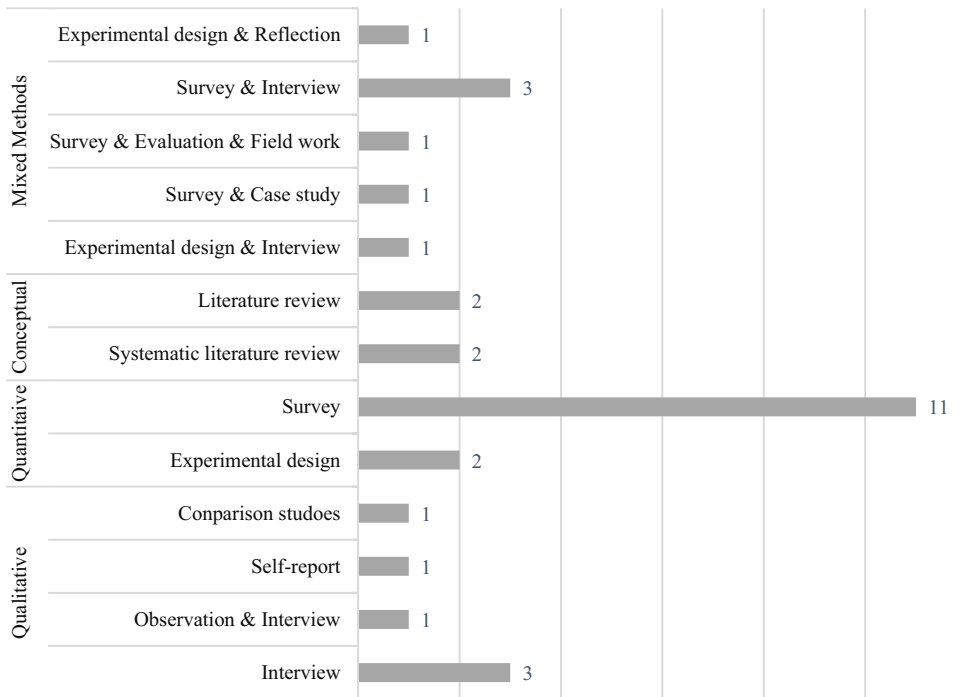
**Figure 3.** The methodology of the publication (Source: Author's elaboration).

4. Discussion (Step 3: Category selection & step 4: Material evaluation)

A thematic analysis (Step 3: Category Selection) was adopted to identify the research themes (Baek et al., 2022; Braun & Clarke, 2012). To ensure consistency, the authors independently coded parts of the dataset and discussed emerging themes as a team. A coding framework was established, in which any discrepancies were discussed and reviewed. To enhance reliability and validity, the lead author performed the majority of the thematic analysis based on this framework, promoting intercoder reliability to emerge (O'Conner & Joffe, 2020). After manually reading all papers that met the inclusion criteria, codes were generated and categorized into three main research areas: (1) Concept; (2) Consumer; (3) Industry, (Figure 4).

The thematic analysis was structured according to the TCCM framework. Three codes were created based on the paper's context/focus: consumer, industry, and concept. Consumer and industry codes were linked to context (C), while the concept code was linked to theory (T) and characteristics (C). The TCCM framework is also adopted to identify research gaps and establish a future research agenda for researchers. Further details are provided in Table 2.

4.1. Theme 1 - Concept (Theory (T) & Characteristics (C))

The "Concept" theme focuses on papers that are related to categorizing and defining digital fashion. Existing literature's definition of digital fashion as the intersection of ICT fields (Noris et al., 2020) remains broad and fragmented due to diverse ICT applications
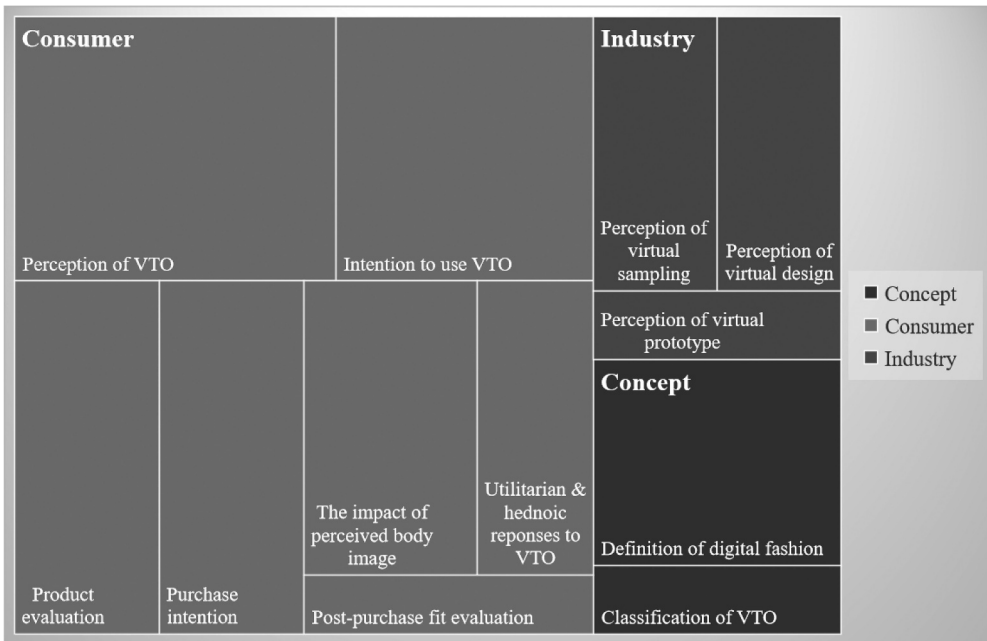
Figure 4. The result of thematic analysis (Source: Author's elaboration).

across sectors (Baek et al., 2022; Noris et al., 2020). Furthermore, it is not reflecting the latest developments of digital fashion (Vogue Business, 2021), resulting in limited review papers that integrate the fragmented literature by defining, classifying, and conceptualizing digital fashion (Baek et al., 2022; Lee & Xu, 2019; Nobile et al., 2021; Noris et al., 2020).

Lee and Xu (2019) conducted the earliest review in this field, focusing on digital fashion as a VTO tool, enhancing shopping experiences by enabling consumers to virtually try and preview product fits (Beck & Crié, 2018; D. E. Kim & LaBat, 2012; Perry, 2016; Porterfield & Lamar, 2017; Qasem, 2021; Shin & Baytar, 2014; Yim & Park, 2019). They identified seven categories within VTO (full body scanner, 3D avatar, 3D customer model, photo accurate 3D customer model, robotic mannequin, augmented reality fitting room, virtual reality fitting room) based on consumer experience variables (accuracy, attractiveness, and interactivity). However, Lee and Xu (2019) limited their review to papers published before 2019, excluding coverage of digital fashion as an end-product. As mentioned in Section 3.1.1, papers published before 2019 focused solely on digital fashion as a tool for tangible product optimisation (Baytar & Ashdown, 2015; Beck & Crié, 2018; Cho & Schwarz, 2012; J. Kim & Forsythe, 2008; D. E. Kim & LaBat, 2012; McQuillan, 2020; Merle et al., 2012; Miell et al., 2017; Moroz, 2019; Noris et al., 2020; Pantano et al., 2017; Park & DeLong, 2009; Perry, 2016; Plotkina & Saurel, 2019; Porterfield & Lamar, 2017; Qasem, 2021; Ross & Harrison, 2016; Shin & Baytar, 2014; Hwang Shin & Lee, 2020; Yim & Park, 2019), potentially attributed to the fact that digital fashion did not garner attention until 2019 (Särmäkari, 2021). This also highlights the need for further research and expansion in this area.

Table 2. Identified research areas based on TCCM framework (Source: Author's elaboration based on TCCM framework from Paul & Rosado-Serrano, 2019).

TCCM Framework components	Codes	Descriptions	Indicative articles
Theory (T)	Concept	• Include papers that discuss the key concepts and theoretical foundations related to digital fashion	Baek et al. (2022), Lee and Xu (2019), Noris et al. (2020), and Nobile et al. (2021).
Context (C)	Consumer	• Include papers that discuss the contextual factors of consumer that influence the development and adoption of digital fashion as an end product, including the customer perception and behavioural responses to digital fashion as end products.	Baytar and Ashdown (2015), Beck and Crié (2018), Cho and Schwarz (2012), D. E. Kim (2016), J. Kim and Forsythe (2008), D. E. Kim and LaBat (2012), Miell et al. (2018), Moroz (2019), Nam et al. (2016), Noordin et al. (2018), Pantano et al. (2017), Perry (2016), Plotkina and Saurel (2019), Porterfield and Lamar (2017), Qasem (2021), Ross and Harrison (2016), Shin and Baytar (2014), Yu and Damhorst (2015), Zhang et al. (2017), and Yim and Park (2019).
	Industry	• Include papers that discuss contextual factors of industry that influence the development and adoption of digital fashion as an end product, including the drivers and challenges of adoption	Park and DeLong (2009), Papahristou and Bilalis (2017), McQuillan (2020), Hwang Shin and Lee (2020), and Sarmarkari (2021).
Characteristics (C)	Concept	• Include papers that discuss different types of digital fashion end products, their features and properties.	McQuillan (2020), Papahristou and Bilalis (2017), Park and DeLong (2009), Särmäkari (2021), and Hwang Shin and Lee (2020).
Methodology (M)	No code, discussed in section 3.1.3	• Include all papers' research methodology and methods used to investigate digital fashion.	All articles

Nobile et al. (2021) and Noris et al. (2020) conducted SLRs to categorize and define digital fashion. Noris et al. (2020) proposed a taxonomy focusing on Communication and Marketing (C&M), Design and Production (D&P), and Culture and Society (C&S). Nobile et al. (2021) expanded Noris et al. (2020) focus, encompassing marketing, communication, tangible and intangible products, industry advancement, process development, implementation, and societal effects. Both studies offer a holistic perspective, providing a comprehensive taxonomy for researchers to understand digital fashion's state-of-the-art (Baek et al., 2022). However, Noris et al. (2020) study used only "digital" and "fashion" as keywords, without applying filters in the material collection process. This could lead to missing relevant papers due to the non-standard definition of digital fashion, limiting the results (Baek et al., 2022). For instance, digital fashion also encompasses virtual clothing, VTO, and NFTs in the industry. Baek et al. (2022) addressed this by conducting another literature review, incorporating a Twitter hashtag analysis of #digitalfashion for keyword selection. They identified six themes: design, consumer, body, virtual, printing and supply. Through content analysis, they defined digital fashion as "the virtual creation, production and representation of one's identity via computer-generated design" (Baek et al., 2022, p. 8). This

standardized definition represents various aspects of the fashion value chain. Compared to previous definitions, Baek et al.'s (2022) definition is more specific and aligned with industry, contributing to knowledge in the field.

Prior literature reviews on digital fashion predominantly focus on its role as a business tool, overlooking its role as an end-product. Särmäkari (2021) stands as an exception, exploring its impact on fashion designers. However, differences in its role between tangible and intangible product businesses remain unclear, indicating a significant research gap. As an emerging field, digital fashion holds promising potential for fashion business transformation and retail opportunities (BOF, 2021; Vogue Business, 2021).

4.1.1. Proposed conceptual model of digital fashion

As digital fashion lacks a conclusive definition, this article synthesizes its current state by analyzing academic literature, industry publications, and relevant sources (Baek et al., 2022). This process involves researching digital fashion-related keywords, identifying repeating themes, trends, and knowledge gaps, and culminates in the creation of a conceptual framework (Figure 5) and a classification table (Table 3) for digital fashion. Following the completion of the initial review, the data were synthesized to establish the conceptual framework, which involved identifying and arranging the key concepts, variables, and relationships that are pertinent to digital fashion. Figure 5 and Table 3 were then constructed to represent the multidimensionality of digital fashion in a more accessible way. As a result, the following definition of digital fashion is generated: Digital fashion refers to the overlap of 3D virtual technologies and fashion. The 3D CAD rendered garment is a virtual creation, production, and representation of identity. It serves as a tool to elevate tangible product development, for example, in aspects of design and production (D&P), enabling retailers/manufacturers to preview designs virtually during the design and sampling stages. In terms of communication and marketing (C&M), it is a VTO tool that enables shoppers to preview the fit and style virtually before purchase. On the other hand, digital fashion can be sold as a tangible end-product that only exists digitally. Table 3 presents the characteristics of different forms of digital fashion end-products, including digital skins for gamified environments, digital skins for virtual influencers, superimposed image-based, AR filter-based, Fashion NFTs, and Digital twins.
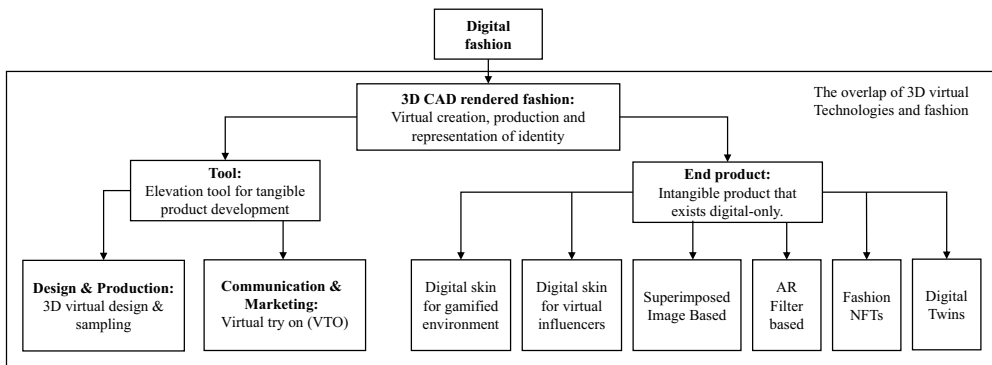

Figure 5. Definition of digital fashion in the 3D virtual technologies field (Source: Author's elaboration).

Table 3. Characteristics of the six forms of digital fashion end products (Source: Author's elaboration).

Types	Description	Purchase Process	Interface	Purpose	Price Range	Industry Examples	Image References
Digital Skin for Gamified Environment	Digital fashion companies create skins that are either virtual only skin or an identical virtual replica of an actual fashion item for gamers to purchase (FashionUnited, 2022b).	Vary from spending actual money to virtual money on the game server or completing gamified tasks to gain digital fashion (FashionUnited, 2022b).	Avatar body	Use in gamified environment	Free - £10k+	Louis Vuitton designed skins for League of Legends (Fashion united, 2022b)	Skin designed in collaboration with Louis Vuitton. Source: Riot Games (FashionUnited, 2022b)
Digital Skin for virtual Influencers	Digital skin is designed for computer-generated social media influencers. They worked with fashion businesses by wearing their digital fashion skins and posting on social media. Some retailers also designed their own virtual influencers for marketing purpose (Vogue, 2021, 2022).	Virtual influencers seldom buy digital fashion; instead, businesses partner with them to build a skin for social media.	Avatar body	Social media content creation/ advertisements	N/A	Virtual influencer Miquela is partnering with teen retailer Pacsun (Vogue Business, 2022).	Courtesy of Miquela (Vogue Business, 2022)

Table 3. (Continued).

Types	Description	Purchase Process	Interface	Purpose	Price Range	Industry Examples	Image References
Superimposed Image Based	This type of digital fashion is mainly for social media, it is usually sold as a video or photo with virtual fashion products superimposed on the consumer's photographed body for social media content creation (Forbes, 2020a; Kiplinger, 2022; Särmäkari, 2021)	Consumers may pick the digital fashion they wish to "wear". After buying the item, customers will submit a picture of themselves and get a photo with the digital clothing on them (Forbes, 2020a; Kiplinger, 2022; Särmäkari, 2021).	Human photographed body	Social media content creation	£2-£200	Carling's Neo Ex collection;The fabricant's digital fashion collection. Forbes (2020a), Kiplinger (2022) and Särmäkari (2021)	Fido Pants by Tribute Brand. Photograph: Tribute Brand (The Guardian, 2021)
AR-filter Based	AR-based digital fashion is typically accessible for customers to purchase They can capture images or videos to post on social media. (Dezeen, 2021). AR-based digital fashion is also utilised for virtual try-ons.	Consumers simply download a specific AR app for AR filter-based digital fashion, purchase the digital fashion filter, then apply it to the in-app camera to create images or videos. (Dezeen, 2021).	Human photographed body	Social media content creation	Free-£20	Gucci's virtual sneaker (The Guardian, 2021), DressX AR wardrobe (DressX, 2022), Bershka x DressX digital fashion collection (FashionUnited, 2022a)	Bershka x DressX digital fashion collection, Going Out. Image: Bershka (FashionUnited, 2022a)

Table 3. (Continued).

Types	Description	Purchase Process	Interface	Purpose	Price Range	Industry Examples	Image References
Fashion NFTs	Fashion Non-Fungible-Tokens (NFTs) are limited collectibles that may be resold. Some comprise the digital file of a digital fashion that can be worn in the metaverse. Fashion NFT may be included in a digital artwork, worn or not worn by a human or avatar in a picture or video (Vogue, 2021)	On blockchain platforms, buyers swap their money for crypto currency and then acquire the NFT from an existing owner or on a fashion NFT retailer's mint day (launch day). Coinbase (2022)	Avatar/Human photographed body	Collectibles/Digital skin for gamified environment	Free - £370000+	World's first digital only Haute-Couture dress Iridescence (Forbe, 2020a; Sarmakari, 2021); The Impossible Tiara" from Dolce & Gabbana (The New York Times, 2021; UNXD, 2021)	The Impossible Tiara, a digital creation, was built by UNXD, based on Dolce & Gabbana sketches (The New York Times, 2021).
Digital Twins	Digital twins are duplicates of genuine clothing that customers receive in addition. Some digital twins are NFTs and may be used in metaverse or gamified scenarios. (Vogue Business, 2022a; Vogue Business, 2022b)	The digital twin is normally included with the physical garment/digital twin combo, however vendors vary. (Vogue Business, 2022b). Metaverse digital counterpart can be purchased in metaverse and transported to the buyer's house (Vogue business, 2022c)	Avatar	Collectibles/Digital skin for gamified environment	Free - £370000+	Nike's Crypto kicks digital twin sneakers; Gucci's bags in Roblox metaverse (Vogue business, 2022c), Burberry Launches Exclusive Virtual Handbag Collection On Roblox (Elle, 2022)	Courtesy of Buberry (2022)

4.2. Theme 2 - Consumer (C-Context)

The "Consumer" theme is the most dominant (72% of included articles), focusing on adoption factors of digital fashion as VTO tools, the derived product evaluation and purchase intention (Beck & Crié, 2018; Cho & Schwarz, 2012; D. E. Kim, 2016; J. Kim & Forsythe, 2008; Kim & Labat, 2013; Lee & Xu, 2019; Merle et al., 2012; Nam et al., 2016; Noordin et al., 2018; Noris et al., 2020; Pantano et al., 2017; Plotkina & Saurel, 2019; Qasem, 2021; Ross & Harrison, 2016; Shin & Baytar, 2014; Yim & Park, 2019; Zhang et al., 2017). Notably, none studied consumer perspectives specifically on digital fashion as an end-product, unveiling a research gap.

4.2.1. Adoption-based factors with the Technology Acceptance Model (TAM)

Table 4 highlights articles adopting Davis (1989) Technology Acceptance Model (TAM) for VTO acceptance (e.g. J. Kim & Forsythe, 2008; Pantano et al., 2017; Perry, 2016; Plotkina & Saurel, 2019; Ross & Harrison, 2016). TAM is renowned for examining consumer acceptance of informational technology (Chau, 1996; Davis, 1989). Perceived enjoyment, perceived usefulness and perceived ease-of-use are the key variables used to examine the acceptance of VTO (J. Kim & Forsythe, 2008; Pantano et al., 2017; Perry, 2016; Plotkina & Saurel, 2019; Ross & Harrison, 2016). However, TAM hasn't been adopted to study consumer adoption of digital fashion as an end-product, indicating a research gap.

4.2.1.1. Perceived enjoyment

Perceived enjoyment is crucial for examining the VTO's perceived entertainment value (Baytar & Ashdown, 2015; J. Kim & Forsythe, 2008; Moroz, 2019; Pantano et al., 2017; Qasem, 2021). Scholars have highlighted that VTO is perceived as fun and enjoyable, hedonically drives consumers' intentions to use VTO (Baytar & Ashdown, 2015; Kim & Forsythe, 2008; Moroz, 2019; Pantano et al., 2017; Qasem, 2021) and leads to lingering behaviour, as consumers tend to spend more time on retail platforms when experiencing pleasurable interaction with VTO (Baytar & Ashdown, 2015). While the perceived enjoyment of digital fashion as an end-product remains underexplored, it is conceivable that consumers might find wearing digital fashion end products enjoyable, akin to the enjoyment of virtual try-on. Moreover, superimposed and AR filter-based digital fashion enables enjoyable self-expression on social media platforms (Dell, 2022).

Table 4. Characteristics of the six forms of digital fashion end products (Source: Author's elaboration).

Authors	Model Used	Variables
J. Kim and Forsythe (2008)	TAM	Technology anxiety; Innovativeness; Ease of use; Usefulness; Atitude; Behavioural intention
Perry (2016)	TAM	Social influence variable (Subjective norm); Personality trait (Technology optimism); Product feature (Aesthetics); Ease of use; Usefulness; Atitude; Behavioural intention
Ross and Harrison (2016)	TAM	Design features; Perceived usefulness; Peived ease of use; Atitude toward me; Actual system use
Pantano et al. (2017)	TAM	Quality of information; Aesthetic quality; Interactivity; Response time; Ease of use; Usefulness; Attitude; Behavioural intention
Plotkina and Saurel (2019)	TAM	Perceived hedonic value (Enjoyment); Utilitarian value (Convenience, Ease of use; Usefulness); Attitude and Behavioural intention

4.2.1.2. Perceived ease-of-use and perceived usefulness

Perceived ease-of-use and perceived usefulness are important utilitarian variables for assessing the performance value and usability of technology (Moroz, 2019; Qasem, 2021). The level of technical advancement and accuracy of garment fit are vital determinants of VTO's perceived utilitarian value (D. E. Kim, 2016; J. Kim & Forsythe, 2008; D. E. Kim & LaBat, 2012; Miell et al., 2018; Moroz, 2019; Nam et al., 2016; Qasem, 2021). J. Kim and Forsythe (2008) claimed that the perceived usefulness of VTO is low due to its inadequate representation of garment fit on avatars that hinders the ability to visualize the clothing on one's body. D. E. Kim and LaBat (2012) note that while VTO captures the overall appearance, it overlooks critical aspects like fabric wrinkles, garment tension, and body shape during online fitting evaluation. They highlight the challenge of accurately modifying body scanned images to depict garment tension, constraining VTO's effectiveness in early fit evaluation for size range selection rather than exact sizing (D. E. Kim & LaBat, 2012). As a result, VTO primarily assists consumers in the preliminary fit assessment, aiding the choice of an appropriate size range rather than precise sizing (D. E. Kim & LaBat, 2012). Enhancements in garment simulation technology are thus necessary to enhance the shopping experience. In contrast, Pantano et al. (2017) discover that virtual try-on significantly supports purchase decisions by providing product information and aiding customers in visualizing product appearance on themselves.

To the authors' knowledge, no research has examined the perceived usefulness and perceived ease-of-use of digital fashion as an end-product. It is used for creating authentic-looking images on social media, with users needing to adhere to specific photo guidelines to ensure authenticity, such as avoiding shade, oversized clothing, and low-quality images (DressX, 2022). As a result, the perceived ease-of-use and usefulness of digital fashion end-products remain unknown.

4.2.1.3. Self-image satisfaction

Self-image satisfaction is one of the most commonly discussed factors that affects the adoption and the effectiveness of VTO tools (Cho & Schwarz, 2012; Plotkina & Samuel, 2019; Shin & Baytar, 2014; Yim & Park, 2019; Yu & Damhorst, 2015). Lower body satisfaction is associated with a greater intention to use VTO tools (Shin & Baytar, 2014; Yim & Park, 2019), addressing concerns about garment fit and reducing the risk of purchasing ill-fitting clothes (Shin & Baytar, 2014). Yim and Park (2019) found that lower body satisfaction is associated with valuing augmented reality's psychological benefits, while discomfort with body-scanning technology is more common among those with low body satisfaction, particularly females (Baytar & Ashdown, 2015; D. E. Kim & LaBat, 2012). Satisfied consumers are more likely to share images (Baytar & Ashdown, 2015), while those with a positive body image utilize virtual products to enhance their appearance and positively evaluate their bodies (Yim & Park, 2019). Lower body satisfaction increases intention to use VTO privately, but discomfort arises when others see the body-scanned image (Baytar & Ashdown, 2015). Higher self-image satisfaction results in positive behavioural responses towards VTO, including greater enjoyment, favourable product evaluation, and higher purchase intention (Cho & Schwarz, 2012; Yu & Damhorst, 2015). The effect of body satisfaction on digital-only fashion with photo-based tailoring is unexplored.

4.3. Industry (C-Context)

The industry's perspective on digital fashion as a tool, focuses on the adoption of 3D virtual aided design and virtual garment fitting tools for optimizing virtual sampling process (McQuillan, 2020; Park & DeLong, 2009; Hwang Shin & Lee, 2020); and garment design process (Papahristou & Bilalis, 2017; Särmäkari, 2021). However, only limited research focuses on digital fashion as an end-product. Understanding the industry's viewpoint is crucial, given the involvement of design simulation and previewing in digital fashion end-products and the growing demand for digital fashion adoption due to its benefits of elevating the design and sampling process (McQuillan, 2020; Papahristou & Bilalis, 2017; Hwang Shin & Lee, 2020) and reducing fabric waste (McQuillan, 2020). Leading fashion retailers such as Adidas, Gap, Nike, Ralph Lauren, and others, are optimistic about integrating 3D design and virtual sampling into their business models (Papahristou & Bilalis, 2017; Särmäkari, 2021; Hwang Shin & Lee, 2020). This optimism extends to the expectation that manufacturers, sourcing agents, and contractors will embrace virtual try-on technology to enhance garment fit, sizes, and quality (Papahristou & Bilalis, 2017; Hwang Shin & Lee, 2020). The trend also highlights the growing acceptance of 3D technology among suppliers, indicating potential adoption of digital fashion as an end-product by both large retailers and smaller enterprises (SMEs).

The adoption of 3D design and virtual sampling offers advantages, including reduced production lead time (Papahristou & Bilalis, 2017; Särmäkari, 2021; Hwang Shin & Lee, 2020). Designers can preview garments digitally, minimizing physical samples and logistical interactions (Särmäkari, 2021; Hwang Shin & Lee, 2020). High-quality 3D visuals improve communication and reduce defects (Papahristou & Bilalis, 2017; Hwang Shin & Lee, 2020), while cost-effective design experiments decrease reliance on physical prototypes (Papahristou & Bilalis, 2017). While there are also challenges, including technical limitations, costs, and a lack of practitioners (Papahristou & Bilalis, 2017; Särmäkari, 2021; Hwang Shin & Lee, 2020), with virtual try-on potentially requiring physical samples for precise fit assessments (Papahristou & Bilalis, 2017; Hwang Shin & Lee, 2020). Enhancing avatar precision may boost reliability and adoption (Porterfield & Lamar, 2017).

The literature on digital fashion as an end-product is limited to 3D design and virtual sample tools for physical fashion. The adoption of digital fashion design and fitting software is hindered by high time and acquisition costs (Papahristou & Bilalis, 2017; Hwang Shin & Lee, 2020), and limited information on usage and implementation costs (Särmäkari, 2021). This has led certain manufacturers to favor conventional garment fitting methods (Hwang Shin & Lee, 2020), resulting in a lack of understanding on the costs and challenges of adopting digital fashion. Such challenges encompass the absence of materials within the 3D library and the requisite technical proficiency among conventional fashion practitioners (Papahristou & Bilalis, 2017).

5. Future research agenda & implications

After analyzing the outcomes of each theme, the TCCM framework is applied to highlight the research gaps and future research agenda as a guide for researchers focusing on theory development, context, characteristics, and methodology. The research areas,

research questions and research agenda are summarised in Table 5 and elaborated on in the following section.

5.1. Theory

Literature on digital fashion as an end-product is in its infancy, despite the industry's growth (Forbes, 2022; Särmäkari, 2021; Vogue Business, 2021). Currently, the research focus of digital fashion has switched from tools to end-products (Baek et al., 2022; Särmäkari, 2021), necessitating further exploration on digital fashion end-products. Future studies are recommended to use the framework as a guide to plan their research and extend the definition of digital fashion to increase clarity in academic literature. Researchers are also encouraged to examine the effectiveness of the framework (Figure 5) in defining and categorising digital fashion. This would involve conducting research to evaluate how well the framework performs in identifying and classifying different types of digital fashion products. Researchers could refine the framework by incorporating feedback from industry experts, designers, and consumers, as the growth of digital fashion accelerates, different forms of end-products may be created; thus, it is vital for researchers to stay up with the development.

5.2. Context

5.2.1. Consumer

Consumer adoption of digital fashion as an end-product is under-explored. As mentioned in 4.1.1, while VTO and digital fashion end-products serve different purposes, it remains worthwhile to assess VTO research for insights into studying digital fashion end-products due to their similarities. For instance, both AR filter based VTO and digital fashion involve overlaying simulated product filters on the consumer's augmented body, capturing real-time motions. The main difference is that VTO previews physical product fittings, while digital fashion is purchased as a virtual product for social media content creation (Särmäkari, 2021). The TAM theory prevails in examining the acceptance of digital fashion as a tool (J. Kim & Forsythe, 2008; Pantano et al., 2017; Perry, 2016; Plotkina & Saurel, 2019; Ross & Harrison, 2016).

Understanding consumer acceptance of digital fashion end-products is crucial due to retailer interest and insufficient research in this area (Forbes, 2022b). Researchers are recommended to examine consumer acceptance of digital fashion as an end-product using the TAM variables, perceived enjoyment, perceived ease-of-use and perceived usefulness to fill this research gap. It is assumed that digital fashion end-products contain enjoyment features, but it is also lacking emotional and embodied attachment associated with physical garments in the digital realm raises doubts about their ability to evoke emotions and drive widespread consumption (Särmäkari, 2021), future research should explore the perceived enjoyment of digital fashion end-products, particularly among GenZ consumers who are familiar with digital environments and interested in digital-only products.

For perceived ease-of-use and perceived usefulness, future research could explore the impact of the realism levels of the simulation and fitting accuracy of AR filter-based digital fashion on perceived ease-of-use or perceived usefulness with the AR filter-based VTO studies. It will be interesting to compare whether the AR filter-based digital fashion product will have the same effect on the consumer experience by examining its hedonic

Table 5. Future research agenda (Source: Author's elaboration based on TCCM framework from Paul & Rosado-Serrano, 2019).

TCCM Framework Components	Research Area	Research Questions	Research Agenda
Theory (T)	Definition of digital fashion	• How effective is the proposed framework in defining and categorizing different aspects of digital fashion? • Do the definition of digital fashion align with the industry-accepted definition?	• Explore the effectiveness of the proposed framework (Figure 5) in defining and categorizing digital fashion • Further refined the framework by incorporating feedback from industry experts, designers, and consumers.
Context (C)	Consumer acceptance	• What are the consumer acceptance towards digital fashion as end products?	• Examine the consumer acceptance of digital fashion as end products by applying TAM adoption based variables: Perceived enjoyment, Perceived usefulness and Perceived ease of use.
		• How does the body fitting realism levels of digital fashion end products affect consumer acceptance towards it	• Investigate the relationship between the level of body fitting realism in digital fashion end products and consumer acceptance towards it.
		• To what extend the consumer body satisfaction affect the consumer acceptance of digital fashion as end products	• Examine the effect of the consumer body satisfaction on their acceptance of digital fashion as end product
	Industry acceptance	• What are the fashion industry perceptions towards implementing digital fashion end products as a new product category?	• Investigate the industry acceptance of digital fashion as end product as a new product category.
		• Investigate the industry acceptance of digital fashion as end product as a new product category. How can digital fashion end product be integrated into the broader fashion industry, and what are the implications for traditional manufacturing and retail models?	• Examine what digital fashion implies to traditional fashion industry by identifying potential challenges and opportunities that may arise from the integration of digital fashion into production, distribution, and sales of the traditional fashion industry.
Characteristics (C)	Characteristics of the Six forms of digital fashion end products	• What are the consumer perceptions towards superimposed image based and AR filter based digital fashion that are mainly for social media content creation?	• Identify the factors that influence consumers' acceptance and adoption of superimposed image based and AR filter based digital fashion in social media content creation.
Methodology (M)	Research Methodology	• What are the recommended research methodology and research methods for studying digital fashion as end product?	• Qualitative research is recommended at this stage to explore digital fashion as end products to ground the theory for future quantitative research, such as in-depth interview, focus group, case studies, participant observation and content analysis.

and utilitarian variables, despite its different purpose. Additionally, the influence of body satisfaction on digital fashion end-products, which involve submitting personal photos for digital tailoring, remains unexplored. It is recommended to investigating the relationship between self-image satisfaction and adoption of digital fashion end-products.

5.2.2. Industry

There is a research gap pertaining to the industry's acceptance of digital fashion as an end-product, as the current literature mainly focuses on digital fashion as a tool. Future research can analyse the industry implications of adopting digital fashion end-products by exploring challenges and opportunities in production, distribution, and sales. This review identifies drivers derived from feedback from the industry on digital fashion as a tool, such *as flexibility, quick production lead time, and cost reduction*, as well as challenges including *technical limitations, garment fit inaccuracies, long lead time, high acquisition cost, and a shortage of skilled 3D fashion designers*. These factors can guide researchers in investigating the industry's adoption of digital fashion end-products, given its similar production process and digital-only nature. From an industry standpoint, dressing shoppers digitally with digital fashion end-products is time-intensive, taking around two days, due to challenges in body recognition technology, hindering scalability (Forbes, 2020). By combining the perspectives of drivers and drawbacks, future research can summarize the opportunities and challenges in adopting digital fashion as an end-product and explore the industry's intentions, providing valuable insights for retailers considering investments in this area.

5.3. Characteristics

This review identified six different forms of digital fashion end-products and their characteristics (Table 3). The lack of clarity in the existing literature regarding different types of digital fashion creates ambiguity when using the term "digital fashion". Future researchers are advised to utilize Table 3 to clarify the specific types of digital fashion end-products they are studying. It can be argued that certain types of digital fashion end-products could help foster more "sustainable practices" in that they can contribute by partially decelerating physical fashion consumption triggered by the purpose of posting outfits on social media (BBC, 2021), warranting further research attention.

5.4. Methodology

Quantitative research predominates the exploration of digital fashion as a tool, indicating familiarity and limited need for further investigation. Conversely, qualitative research is predominantly employed to study digital fashion as an end-product, revealing a research gap that necessitates exploration before generalization (Creswell, 2017). To establish a robust foundation, future studies should employ qualitative methods to delve into digital fashion as an end-product, grounding theory, generating hypotheses, and deepening understanding before conducting extensive surveys (Creswell, 2017). Qualitative research can evaluate the effectiveness of the proposed framework (Figure 5) by gathering feedback from industry experts, designers, and consumers to align the definition with industry standards. Participant observation and in-depth interviews allow participants to

directly experience various forms of digital fashion end-products, as mere knowledge may not be sufficient for expressing opinions, while case studies and in-depth analysis of specific examples of digital fashion products or companies can be conducted to identify best practices and key success factors. Future research could also conduct focus groups and interviews to investigate industry's perception of adopting digital fashion end-products as a new product category, and to identify the implications for traditional manufacturing and retail models.

6. Theoretical and managerial implications

This is one of the first reviews to clearly define digital fashion; distinguish its role as a tool versus an end-product and identify six different forms of digital fashion end-products. This classification aids future researchers in understanding and categorizing digital fashion, facilitating standardized terminology and communication within the field. Additionally, the review identifies the most used TAM adoption variables to investigate the acceptance of digital fashion, enabling researchers to design more effective studies and formulate comprehensive research questions and hypotheses. Furthermore, the identification of drivers and challenges in the adoption of digital fashion as a tool serves as a foundation for further research on its adoption as an end-product due to their similar production process. Researchers can build upon these findings to have a deeper exploration and cross-context analysis on digital fashion end- products. Moreover, the review provides valuable methodological guidance for investigating digital fashion as an end-product, assisting researchers in structuring their research design and highlighting areas for further exploration.

From a managerial standpoint, this review helps fashion retailers and manufacturers understand the concept and characteristics of different digital fashion end-products; the adoption opportunities and challenges as a new product category; as well as the factors that influence consumer adoption. This insight empowers companies to integrate digital fashion, make informed investments, as well as gaining competitive edge by appealing to a broader customer base, and differentiate themselves from competitors who have not yet embraced digital fashion.

7. Conclusion

As he virtual economy and 3D technologies surge, digital fashion transforms from tool to end-product. This trend shapes the focus of fashion research in the 3D virtual technology field, highlighting digital fashion as an end-product an important topic. Firstly, by synthesizing the marketing and management literature on digital fashion as an end-product using the TCCM framework (RQ1/Objective 1), this research delivers a comprehensive SLR, identifying key themes, trends, and research gaps within the field. A foundation for further research is established by a thorough understanding of its theoretical underpinnings, contextual factors, distinct characteristics, and use of methodology. Secondly, this review pioneers a conceptual framework, provides a comprehensive definition of digital fashion, and distinguishes six types of digital fashion end-products and their characteristics (RQ2/ Objective 2). This review has defined digital fashion as the integration of fashion and 3D virtual technologies, where 3D CAD rendered garments are created and

produced virtually. It can be used as a tool to enhance tangible product development for design and production and facilitate communication and marketing by enabling virtual previews for shoppers. It can also be sold as a digital end-product, such as digital skins for gamified environments, digital skins for virtual influencers, superimposed image-based, AR filter-based, Fashion NFTs, and Digital twins. The framework helps to clarify the distinctions between digital fashion as an end-product and digital fashion as a tool and bridges academia and industry by providing a more comprehensive definition of digital fashion that is aligned with the industry-accepted definition and standardized way to define and categorize different types of digital fashion, which can help researchers develop a common language and understanding of the field. This fosters greater clarity in research findings and efficient communication among scholars.

Finally, this study addresses the research gaps and outlines the future research directions, as well as the managerial implications (RQ3/Objective 3), offering valuable insights for scholars and practitioners regarding the challenges and opportunities presented by digital fashion as an end-product. This research has highlighted the need for future research on digital fashion as an end-product, utilizing qualitative research methods to ground the theory of examining digital fashion end-product. It also suggests refining the proposed framework through industry and consumer feedbacks. The acceptance of digital fashion as an end-product needs to be examined from a consumer perspective, with the use of the TAM, exploring the relationship between body-fitting realism and consumer acceptance, and the impact of consumer body satisfaction on their acceptance of digital fashion. Additionally, the integration of digital fashion into the fashion industry's production, distribution, and sales of physical garments, and factors that influence industry acceptance, need to be examined. These research agendas aim to fill gaps in knowledge and provide a better understanding of digital fashion as an end-product.

In terms of limitations, the fast-paced development of digital fashion makes this a challenging topic to study and provide a clear definition. However, the definition of digital fashion that the present study has created provides an accurate reflection of the state-of-the-art of digital fashion today and much-needed clarity and simplification of the topic in the literature. Future studies can refine this definition based on industry and consumer feedback and update it as it evolves over time. Overall, this study has helped to advance the understanding of digital fashion as an end-product and provided a foundation for further research in this exciting and rapidly evolving field.

Disclosure statement

ORCID

Hazel Hoi Yau Chan http://orcid.org/0000-0003-3095-0632
Claudia Henninger http://orcid.org/0000-0002-9978-5340
Rosy Boardman http://orcid.org/0000-0002-8340-5438
Marta Blazquez Cano http://orcid.org/0000-0001-9956-9050

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