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Abstract: This study examines the influence of sustainability communication on consumer engagement throughout the fashion consumption cycle with attention to both pre- and post-purchase phases. Drawing on stakeholder theory, service-dominant logic, and regulatory engagement theory, a survey-based methodology employing descriptive statistics and inferential analyses (based on non-parametric statistical test) is used to assess consumer environment consciousness and responsiveness to sustainability-oriented marketing, including differences across gender. Methodologically, the study contributes by capturing post-consumption engagement intensity as a mediator linking digital sustainability communication and behavioural responsiveness. Findings reveal a persistent intention-action gap, while highlighting the behavioural potential of digital interfaces in promoting responsible, participatory consumption. The study informs sustainability-oriented marketing strategies that enhance brand credibility and bridge the intention-action gap. It emphasises lifecycle-based communication, particularly post-purchase, to embed sustainability into brand narratives, promoting repair, reuse, and responsible disposal, providing practical guidance for fashion SMEs to foster participatory, circular consumption via digital engagement.

Keywords: sustainable consumption; digital marketing strategies; sustainable customer behaviour; post-purchase engagement; sustainability communication; e-tailing; digital transformations; fashion companies.

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1   Introduction

The fashion industry is undergoing a profound strategic transformation, driven by two converging forces: intensifying sustainability imperatives and accelerating digital innovation. As one of the most resource-intensive sectors, fashion faces mounting pressure to adopt circular, energy-efficient, and socially responsible models (Li et al., 2024; Sahabuddin et al., 2023; Baranauskas and Raišienė, 2022). The transition toward

sustainability requires reconfiguring traditional production as well as rethinking marketing practices to mitigate overproduction, optimise resource use, and reduce waste.

Within this context, sustainability communication has become a key component of marketing strategy. A joint UNEP-UN Climate Change report (2023) highlights the need to dismantle the pervasive 'new-is-better' consumer narrative, urging brands to reorient storytelling toward ecological responsibility. Digital channels thus play a crucial role in creating emotionally resonant, value-driven campaigns that strengthen consumer-brand relationships and guide purchasing behaviour toward circular outcomes (Rainy and Mou, 2025; Alwani and Bhukya, 2025). Depending on communicative intent, digital infrastructures can either entrench unsustainable consumption or catalyse systemic behavioural change (Faludi, 2025; Ortegón Cortazar et al., 2025).

Achieving meaningful change requires redefining business models and customer value propositions that integrate ecological, social, and functional dimensions (Bachmann et al., 2025; Sheth, 2020). Promoting durable product narratives that emphasise longevity, emotional connection, and functional versatility plays a pivotal role in encouraging mindful consumption (Glogar et al., 2025; von der Assen, 2023; Taufiq, 2021). Such narratives embed circular economy principles (repair, reuse, and recycling) into brand systems, allowing consumers to derive ethical and identity-based value from sustainable choices. Incorporating circular practices into after-sales and e-tailing strategies further strengthens these outcomes (Owusu-Wiredu, 2024; McNeill et al., 2024). Within this evolving paradigm, sustainable consumption emerges as both a driver and an outcome of sustainable value creation, encompassing pre-purchase awareness, evaluation, and post-purchase behaviour (Iliashenko et al., 2025).

At the same time, digital transformation reshapes producer-consumer interactions, redefining how sustainability is communicated and experienced (Akram et al., 2022). Technologies such as virtual fitting rooms, co-design platforms, and in-app experiences enable interactive, personalised, and participatory engagement (Orisadare et al., 2025; Velasco et al., 2024; de Oliveira Santini et al., 2020). These innovations embed consumers within value co-creation processes, positioning them as active stakeholders in sustainability transitions (Tabas et al., 2025; Lehner et al., 2024).

Despite these opportunities, the sector continues to face the intention-action gap: while consumers express concern for sustainability, their purchasing behaviour often diverges from these values (Ray and Nayak, 2023; Papadopoulou et al., 2022). This misalignment underscores the need for further research on the effectiveness of digital sustainability communication in activating consumer responsiveness across the consumption cycle. Although recent studies acknowledge this gap, further empirical work is needed to assess consumers' awareness, understanding, and behavioural alignment with corporate sustainability efforts (Arias Puentes and Trujillo, 2025; Parray et al., 2024; Busalim et al., 2022). Bridging this gap is essential for enhancing the impact of sustainable consumption initiatives.

Applying a survey-based methodology, this study investigates consumer environmental consciousness and responsiveness to sustainability-related marketing practices from a digital perspective. The study offers a comparative view of how communication impacts consumer decision-making across online and offline environments. Particular focus is put on the in-app marketing strategies development, which have the potential to shape environmentally responsible behaviour and enable participatory brand relationships.

To reach this goal paper proceeds as follows: chapter two describes theoretical background, the third discloses methodological aspects of the study, the forth one introduces the descriptive and inferential analysis of survey results; the fifth provides discussion disclosing patterns of responsiveness to sustainability initiatives providing suggestions for the fragmented sustainable marketing strategy development, the sixth suggests conclusive statements, the seventh ends up with limitations and future developments. Taking into consideration the evolving role of the consumer as an active stakeholder, this research aims to contribute to a deeper understanding of sustainable value co-creation within a digitally mediated and environmentally accountable fashion ecosystem. Therefore, the study contributes to both theory and practice by identifying behavioural mechanisms that enhance consumer engagement with sustainability narratives, offering implications for sustainable marketing strategies and circular economy transitions.

2   Digital transformation and sustainable fashion communication: theoretical background

The interdependence between sustainable production and consumption is increasingly reinforced by the digital transformation of the fashion industry. Digitalisation is reshaping producer-consumer interactions and redefining how sustainability is communicated, perceived, and enacted across the value chain (Akram et al., 2022). Through digital interfaces, sustainability ceases to be a static informational claim and becomes an interactive, experiential construct. Technologies such as virtual fitting rooms, co-design applications, and mobile-based personalisation tools enable consumers to actively participate in fashion ecosystems, transforming them from passive buyers into engaged co-creators of value (Velasco et al., 2024; Lehner et al., 2024).

These developments are especially salient in the context of sustainability communication strategies, where how information is presented significantly shapes behavioural outcomes. Recent evidence demonstrates that clear, authentic, and emotionally resonant presentations of environmental information can strengthen consumer engagement and foster green purchasing behaviour (Kolacz and Bhaduri, 2024; Lee, 2025). In digital fashion contexts, this means integrating sustainability narratives within personalised, visually engaging, and emotionally meaningful in-app environments.

Understanding these dynamics requires a multidimensional theoretical lens that explains who participates in value co-creation (stakeholders), how value emerges and delivered (service-dominant logic) and why consumers respond behaviourally (regulatory engagement theory). Together, these frameworks illuminate the structural, relational, and motivational mechanisms underpinning consumer responsiveness to value-driven digital marketing strategies in sustainable fashion.

2.1   Stakeholder theory and sustainable value co-creation

Stakeholder theory offers a foundational perspective for conceptualising the distributed and co-creative nature of value in industries that faced challenge of the sustainability-driven transformation (Gazzola et al., 2024; Sinha et al., 2023). It redefines consumers not as end-points of production but as integral stakeholders who co-shape sustainability outcomes through their interactions and feedback (Saha et al., 2022). Within the digital

fashion ecosystem, mobile applications and online retail platforms extend this participatory logic, enabling firms to engage consumers in dialogues about environmental impact, ethical sourcing, and product longevity.

From this perspective, sustainability communication becomes a strategic interface for relationship building rather than mere information transmission. Digital channels facilitate transparency and traceability, allowing consumers to evaluate brand authenticity and alignment with their ethical values (Chaimae and Sara, 2024). Such participatory infrastructures foster trust and legitimacy, core dimensions of stakeholder-based value creation. However, such infrastructures become actionable only when consumers are not merely informed but actively engaged, underscoring the strategic role of sustainable marketing in shaping environmentally responsible behaviour and enhancing brand legitimacy in the digital era (Owusu-Wiredu, 2024; Verma and Diwan, 2024; Bailey et al., 2022). Therefore, embedding sustainability communication into e-commerce ecosystems helps to institutionalise environmental responsibility as a structural component of business models rather than an ancillary concern (Cutinha and Mokshagundam, 2024).

Stakeholder interactions are thus multidirectional and dynamic: firms inform, consumers respond, and both co-evolve through feedback loops enabled by digital tools. This mutuality is critical for sustainable fashion, where shared accountability and continuous dialogue reinforce collective progress toward circularity. Furthermore, this theory underscores that value creation extends beyond economic metrics to include ecological and social dimensions, framing sustainability as a multi-stakeholder commitment to long-term well-being (Civera et al., 2025).

In practical terms, this theoretical framing implies that brands should use digital touchpoints to strengthen consumer inclusion in sustainability-related decisions, inviting feedback on production practices, offering transparency dashboards, or enabling participation in repair and resale programs. Approaching consumers as co-creators rather than targets, stakeholder-oriented communication enhances engagement quality and fosters moral legitimacy. Yet, to operationalise this participatory logic, it is necessary to understand the mechanisms through which stakeholders co-create value, a conceptual gap bridged by the service-dominant logic framework.

2.2 *Service-dominant logic and digital co-creation*

Service-dominant logic reconceptualises value creation as an interactive, processual exchange of resources between multiple actors within a service ecosystem (Stead et al., 2025; Zhang and Berghäll, 2021). In this view, value is not embedded in products but co-created through use, experience, and context. For the fashion industry, this perspective highlights the transformation from product ownership toward access-based and service-mediated consumption models such as rental, repair, and resale. These configurations exemplify 'green servitisation', wherein digital services, repair booking systems, traceability tools, or digital product passports, mediate sustainability practices and foster ongoing brand-consumer collaboration (Istiana and Ekowati, 2025; Galera-Zarco, 2022; Simanjuntak and Banjarnahor, 2021).

In digital ecosystems, apps and online platforms become spaces where co-creation unfolds continuously through feedback, customisation, and shared storytelling (Gambicorti, 2025; Dolphin et al., 2025). Consumers engage by interpreting and integrating sustainability information into their self-concept and everyday routines.

However, the effectiveness of these systems depends heavily on the quality and credibility of sustainability communication.

According to the insights from Kolacz and Bhaduri (2024) states that well-designed digital communication that authentically presents environmental information can amplify positive emotions, strengthen green engagement, and ultimately enhance behavioural responsiveness. This highlights the need for a balance between informative clarity and experiential resonance. Effective in-app marketing in sustainable fashion must therefore integrate transparent sustainability indicators, such as carbon footprint, recycled content, or certification, within engaging narratives that appeal to users' values and identity aspirations.

For SMEs, adopting service-dominant logic means designing digital touchpoints that foster continuous consumer involvement beyond the point of sale. Post-purchase features like repair scheduling, garment recycling programs, or resale options reinforce long-term value co-creation, transforming one-time buyers into participants in circular ecosystems. Thus, the service-dominant logic offers a conceptual foundation for understanding digital sustainability engagement as an ongoing relational process, yet it remains necessary to explain the motivational mechanisms that sustain such engagement, an analytical task addressed by regulatory engagement theory.

2.3   *Regulatory engagement theory and consumer responsiveness*

Despite rising environmental awareness, the fashion industry continues to face an intention-action gap: consumers endorse sustainability in principle but do not consistently act on it in practice (Mathew and Spinelli, 2025; Ray and Nayak, 2023). Understanding this discrepancy requires attention to how consumers experience engagement rather than merely what they know or believe. Regulatory engagement theory within the digitalised context provides this lens by explaining that the intensity and quality of engagement, more than cognitive agreement, determine behavioural persistence (Srivastava et al., 2025; Kaur et al., 2023). When sustainability messages align with an individual's motivational orientation, they evoke a sense of 'rightness', thereby enhancing the perceived value and encouraging sustained pro-environmental action. In digital fashion marketing, this alignment is achieved through the framing of sustainability communication. Promotion-focused consumers, motivated by ideals and aspirations, respond to narratives emphasising innovation, creativity, and positive societal transformation. Prevention-focused consumers, guided by responsibility and security, are more receptive to messages highlighting risk avoidance, durability, and ethical compliance (Cao et al., 2025). Integrating such regulatory framing into digital platforms can convert sustainability from abstract virtue into personally meaningful motivation.

Moreover, regulatory engagement theory explains why digital fashion apps serve as powerful vehicles for behavioural change. Providing interactive feedback, gamified sustainability rewards, or personalised sustainability tips, apps sustain regulatory fit and reinforce emotional attachment to sustainable practices (Lim et al., 2025). In doing so, they bridge the gap between sustainability awareness and actual behaviour, transforming consumer engagement into long-term participation in circular activities.

For instance, Lee (2025) demonstrates that flexible, contextually tailored sustainability communication, sensitive to consumer understanding and stakeholder knowledge, enhances engagement and behavioural alignment. When consumers perceive sustainability narratives as both credible and emotionally resonant, they are more likely

to act upon them. Accordingly, digital marketing strategies that harmonise transparency, emotional resonance, and regulatory fit are more effective in fostering sustained consumer responsiveness than those relying solely on rational persuasion.

In this integrated framework, communication becomes a co-creative process of motivational alignment. Stakeholder theory identifies the participants; service-dominant logic elucidates the interactional processes; and regulatory engagement theory clarifies the psychological mechanisms sustaining engagement. Together, these perspectives explain how value-driven in-app marketing strategies can bridge the cognitive-behavioural divide and transform consumers into active co-creators of sustainable value.

Synthesising these frameworks highlights that sustainable fashion in the digital age relies on a shift from transactional to relational, and ultimately to transformational, marketing paradigms. Digital sustainability communication is not merely about informing consumers, it is about co-creating shared meaning and motivational alignment. Effective digital sustainability strategies must therefore balance information credibility with emotional authenticity and contextual relevance. Integrating these perspectives suggests that consumer responsiveness to sustainability-oriented communication depends on three interrelated mechanisms:

- value co-creation (stakeholder and service-dominant logic) as the structural foundation of consumer participation

- communication engagement (regulatory engagement theory) as the psychological driver of behavioural activation

- digital mediation as the enabling infrastructure facilitating interactive, narrative-based sustainability communication.

Based on this integrative framework, the following research questions guide the empirical investigation:

- RQ1: Does digital sustainability communication has potential to enhance consumer responsiveness across pre- and post-purchase stages?

- RQ2: Is the effect of digital communication on sustainable behaviour mediated by consumer engagement intensity?

- RQ3: Do value co-creation mechanisms embedded in digital marketing strengthen the alignment between consumer attitudes and actions?

Operationalising these principles, SMEs can leverage digital tools to transform sustainability communication from an informational function into an ongoing process of co-created environmental and social value. This integrated approach aligns with the evolving consumer expectation that sustainability should not only be communicated but experienced, actively, interactively, and meaningfully, within the digital fashion ecosystem.

3 Research method

In this study, the survey method was employed to investigate how sustainability positioning strategies and digital sustainability-oriented marketing efforts are influenced

by sustainability-related consumer perceptions and responsiveness. Given the objective of assessing the degree to which consumers respond to sustainability initiatives communicated by fashion companies, this methodological approach enabled a structured examination of how digital tools shape environmentally responsible behaviour across different stages of the consumer journey. Survey-based methodologies are widely recognised in consumer research for their capacity to systematically collect self-reported data from diverse samples, making them particularly effective for exploring consumer attitudes, perceptions, and behaviours in relation to sustainability (D'Acunto and Weber, 2024). Although inherent limitations, such as non-response bias, are acknowledged, the self-administered questionnaire was selected as the primary data collection instrument, as it allows for the systematic capture of quantitative insights into consumer attitudes, awareness, and engagement with sustainability communication (Scheaf et al., 2023; Turk et al., 2018). Its broad applicability across sectors, including the fashion industry, underscores its relevance in capturing insights critical to the development of sustainability-oriented strategies (Maró et al., 2023).

The questionnaire was thus designed to capture key dimensions related to:

1 *Consumer sustainability consciousness* (purchasing behavioural profile and sustainability orientation): analysis of consumers' purchasing frequency and typology, with particular attention to the integration of the sustainability dimension in consumption choices – capturing the ways in which sustainability is embedded in habitual purchasing patterns.

2 *Sustainability-related information visibility* (perceived relevance of sustainability information): assessment of the degree of importance consumers attribute to sustainability-related information and their influence on decision-making processes.

3 *Digital engagement and purchasing preferences*: examination of consumers' interaction with digital platforms and the relevance that digital engagement holds in purchasing preferences, with a focus on sustainability-related information available in online environments.

The analysis is provided from a gender perspective. In this way the analysis is able to identify potential significant differences between men and women regarding the above-mentioned aspects, verifying whether gender constitutes a relevant discriminating variable.

These insights are critical to informing the development of effective, data-driven, and strategically aligned sustainability marketing strategies in the fashion sector and this framework aligns with contemporary marketing needs to better understand and activate consumer segments for circular fashion models. Questions were primarily closed-ended, employing Rating scales to measure agreement or frequency (South et al., 2022). The design was informed by existing literature on sustainable consumption and digital consumer behaviour to ensure content validity. Data collected from the survey was subjected to descriptive analysis to identify patterns and tendencies in sustainability-related behaviours and attitudes. The survey was administered online through digital platforms to ensure broad accessibility and engagement across diverse consumer profiles.

Regarding data collection methodology, a convenience sampling approach was adopted, it represents the most widely used non-probability sampling technique, and it is focused on gathering information from participants who are readily accessible to the

researcher. Compared with probability sampling methods, this approach does not require random selection based on predetermined criteria such as demographic factors. Rather, it allows researchers to subjectively identify and approach individuals who are available and willing to participate in the study, offering flexibility and practical advantages in terms of time and resource efficiency (Golzar et al., 2022).

While sustainability encompasses both environmental and social dimensions, the study focused empirically on the environmental aspect. This choice reflects three core rationales:

1   environmental concerns (e.g., material use, durability, recyclability) are more readily observable and measurable (Su and Teo, 2025; Salonen, 2024; Rathee and Milfeld, 2024)

2   digital communication tools predominantly focus on general environmental metrics (e.g., carbon footprints, traceability) (Lee, 2025; Mallick et al., 2024)

3   global policy discourse currently prioritises environmental sustainability due to the sector's ecological impact (Niinimäki et al., 2020).

This is especially salient in light of the rapid growth of fast fashion and the proliferation of unsustainable digital marketing practices (Li et al., 2024; Rosely and Syed Ali, 2023).

Moreover, the survey was geographically focused on consumers within the Italian fashion context, in recognition of the country's distinctive intersection of local craftsmanship tradition and exposure to fast fashion dynamics (Piancazzo et al., 2024). Therefore, engaging participants embedded in the socio-cultural ecosystem of Italian fashion, the research aims to generate empirically grounded insights into consumer responsiveness, thereby informing the development of strategically aligned sustainability communication approaches for Italian SMEs. Hereby, the sample is based on Italian respondents, to try to have a picture of this reality.

Hence, the study seeks to generate practical insights for sustainability-oriented marketing strategies, particularly in enhancing brand credibility, fostering consumer engagement, contributing to mitigation of the intention-action gap through digitally mediated value co-creation, focusing on a gender perspective in the Italian context.

4   Results

4.1   Descriptive analysis

The sample comprises 228 respondents (no respondents were excluded), distributed as follows: 148 females (65%), 75 males (33%), and 5 individuals who preferred not to disclose their gender. The sample skews relatively young, with a mean age of 24 years, which aligns with the convenience sampling methodology employed. Age distribution reveals that 84% of respondents fall within the 18-25 age bracket, 9% belong to the 25-40 range, and 6% are over 40 years old.

From an occupational perspective, the majority (85%) are students, 2% are working students, and 12% declared full-time employment status. Notably, two respondents identified as retirees.

The analysis subsequently examines typical purchasing frequency (based on a scale from 1 to 5) and preferred channels, as presented in Table 1.

Table 1   Purchasing frequency and preferred apparel shopping channels

Channel	Female (mean)	Male (mean)
Physical store	3.973	3.973
Website	2.642	2.311
Mobile app	2.284	1.946
Social media	1.372	1.243
Other	1.297	1.081

Despite their presumed digital nativity, physical stores emerged as the dominant purchasing channel, with 82% of respondents expressing a preference for offline shopping. This finding appears somewhat anomalous given the young age profile of the sample. Digital channels exhibited relatively low engagement rates: 31% of respondents had never used brand websites for purchases, 28% had never used mobile applications, and a substantial 75% had never completed a purchase via social media platforms. This pronounced preference for traditional retail channels suggests that tactile product evaluation and immediate gratification remain critical factors in fashion purchasing decisions, even among younger consumers.

Table 2 presents the mean purchase frequency across various fast-fashion brands, measured on a frequency scale from 1 (never purchase) to 5 (always purchase).

Table 2   Purchase frequency across various fast-fashion brands

| Brand	Female	Male	Difference
PRIMARK	2.16	1.53	0.62
ZARA	2.64	2.07	0.58
H&M	2.55	2.01	0.53
SHEIN	1.89	1.23	0.67
TEMU	1.17	1.09	0.08
BOOHOO	1.05	1.01	0.03
ASOS	1.24	1.08	0.16
MISSGUIDED	1.04	1.01	0.03
TRENDYOL	1.04	1.03	0.01
CIDER	1.09	1.01	0.08

Clear gender differences emerge across brands, with females consistently reporting higher usage frequencies. Notably, all mean values fall below 3 (the midpoint), indicating no dominant brand preference within the sample. However, ZARA, H&M, and PRIMARK demonstrate relatively higher engagement rates, suggesting moderate brand loyalty among respondents.

In terms of purchasing motivations, product quality (28% 'most important', 55% 'important') and alignment with personal style (48% 'most important', 49% 'important') were the dominant decision drivers. These preferences correspond to style-oriented consumption patterns and align with prior research emphasising the aesthetic and experiential dimensions of fashion. Price sensitivity, return policy, and product variety held moderate influence, while entertainment-based strategies such as gamification and social media buzz were rated largely unimportant. Notably, sustainability-related

attributes such as B-Corp certification exerted limited influence: only 3% identified it as a most important factor, and 8% as important. Indicators such as use of eco-materials and product origin were acknowledged, but not prioritised, suggesting limited integration of environmental considerations into the evaluative framework of fashion consumers, suggesting low responsiveness to environmental components of value.

Environmental indicators were further scrutinised (Figure 1). Although textile composition was actively considered by 81% of participants, other key sustainability metrics such as organic raw material sourcing (68%) and pollution generated during production (60%) were generally not considered during purchasing.

Figure 1 Shopping sustainability issues (see online version for colours)
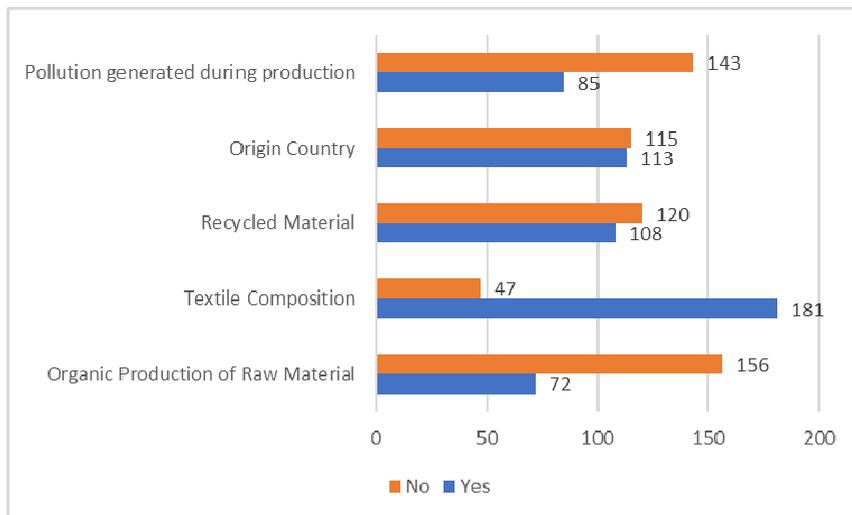
Source: Developed by authors

To complete the descriptive component of the analysis, respondents were asked to identify at which stage of the purchase process they encounter sustainability information. Within this framework of recycling and reuse philosophy, the study sought to understand respondents' awareness of fashion companies' take-back initiatives, whereby customers return used garments for recycling purposes, and the perceived relevance of such programs.

Regarding information accessibility throughout the purchase journey, 61 respondents indicated they are either uninterested in or do not encounter sustainability-related information. Approximately 18% actively seek such information before making purchases, while 9% become aware of sustainability aspects only after completing their purchase. The remaining portion (103 respondents, representing 45%) discovers sustainability information accidentally, typically through product labels or packaging after purchase. Concerning fashion companies' recycling and reuse initiatives, 60% of respondents demonstrated awareness of such programs. Among those familiar with these initiatives, 89% (123 respondents) consider them important, suggesting positive reception despite limited proactive engagement.

Nonetheless, receptivity to sustainability information improved when delivered through digital, pre-purchase channels (Figure 2). Mobile-integrated eco-scores, lifecycle

insights, and in-app pollution metrics were perceived more favourably. For instance, pollution, often overlooked in offline contexts, was rated as important (39%) or most important (18%) when presented in digital form. Similarly, textile composition gained higher relevance with 41% rating it important and 29% as most important under the conditions of mobile applications access. Recycled material usage also showed an uptick in perceived value when digitally contextualised (37% important, 12% most important). Country of origin and organic material sourcing demonstrated comparable improvements. While B-Corp certification remained less influential (46% neutral, 17% not important, 7% most important), approximately 30% of participants recognised its potential value, contingent on improved visibility and clarity of messaging. These results point to the efficacy of embedding sustainability content into mobile apps and other digital decision-support environments that are transparent, intuitive, and accessible.

These results underscore the importance of digital tools application in advancing sustainability-oriented behaviour at the point of purchase. This demonstrates that sustainability data that are presented effectively through mobile applications (for instance, via improved labelling, storytelling formats, intuitive interfaces and integrated sustainability narratives within digital platforms), implying substantial perceived consumer responsiveness potential, could thus facilitate more informed decision-making and foster greater alignment between sustainability values and actions, reinforcing consumer participation in circular fashion practices. These patterns align with prior research which states that environmental apparel knowledge and green self-concept positively influence green apparel purchase intention (Abrar et al., 2021).

Figure 2   Perceived importance of sustainability factors presented via digital application (pre-purchase) (see online version for colours)
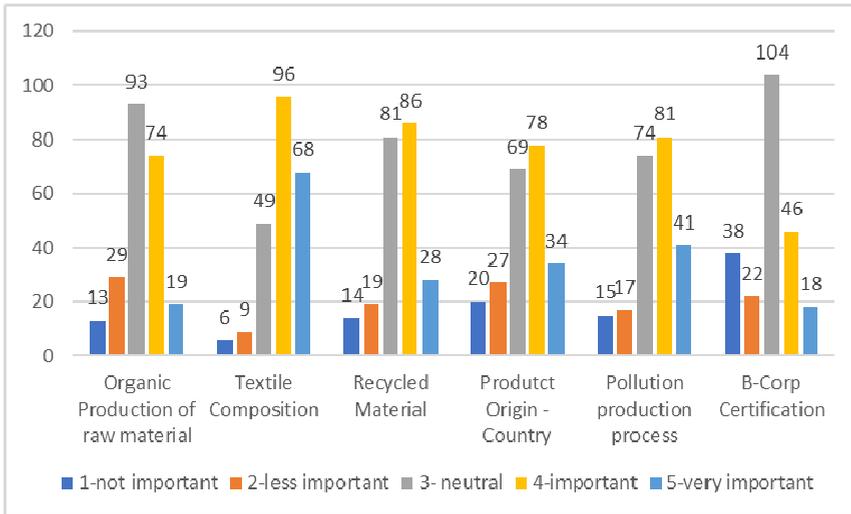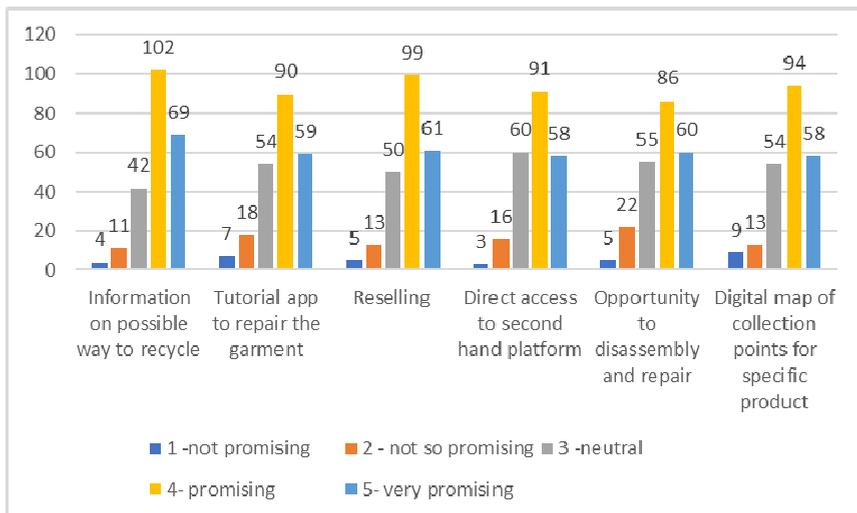

Source: Developed by authors

In addition to pre-purchase behaviours, the study assessed consumer receptivity to post-purchase services designed to extend product life and mitigate environmental impact. The results show high levels of support for a range of digital and service-based interventions revealing a high degree of consumer receptiveness to post-purchase sustainability

services (see Figure 3). The most positively rated initiative was guidance on how to recycle specific garments, considered 'quite promising' by 44% and 'significantly promising' by 30%. Digital tutorials for garment repair were similarly well received (39% and 24%, respectively), suggesting readiness among digital natives to engage in repair practices when supported by accessible educational content. The digitally-mediated mapping of resale and rental options also attracted strong interest (43% 'quite promising', 27% 'significantly promising'), indicating a shift in attitudes toward alternative ownership and access-based models. Direct access to second-hand platforms integrated within brand ecosystems also was viewed positively (39% and 25%), as were professional disassembly and repair services (37% and 26%). Digital mapping of garment recycling points was also favourably rated (41% and 24%), reflecting demand for logistical clarity in facilitating responsible disposal. This suggests that consumers actively seek digitally-mediated guidance on responsible garment disposal and are open to brand-led facilitation in this area. Therefore, digitalised services aimed at lifecycle extension, particularly those offered within brand-controlled ecosystems, can enhance consumer participation in circular practices, thus underscoring the latent potential for brands to foster more circular consumption practices through the service-based e-tail marketing strategies development. Thereby, these findings demonstrate that post-purchase engagement is a significant, yet underutilised from the digitalised perspective, vector for sustainability promotion strategy in the fashion industry that, from one hand, strengthen consumer-brand relationships while advancing environmental objectives and, from other hand, as aligns digital marketing strategies with long-term sustainability goals (Beikverdi et al., 2024; Bashar et al., 2024).

Figure 3 Level of perceived potential of after-purchase services (see online version for colours)

Source: Developed by authors

To evaluate responses more rigorously regarding factors influencing clothing purchase decisions, willingness to accept price premiums for sustainable products, and app usage patterns for both purchasing and accessing pre-purchase sustainability information, the analysis proceeds to hypothesis testing through gender-based inferential statistics.

4.2   Inferential analysis

The inferential analysis examines the importance of various factors influencing clothing purchase decisions through a rating scale ranging from 1 (not important) to 5 (very important). The analysis examines gender differences across ten attributes: product quality, alignment with personal style, production origin, use of eco-friendly and recyclable materials, return options, lowest price, product range, engaging shopping experience, social media buzz, and B-Corp certification. This analytical approach allows for the identification of potential gender-based differences in the perceived relevance of each attribute, providing insights into whether male and female consumers prioritise different factors when making clothing purchasing decisions. The examination of these attributes encompasses both traditional purchase drivers (quality, price, variety) and contemporary considerations (sustainability credentials, digital engagement, social proof), trying to have an overall understanding of the decision-making process of consumers.

The results of the Mann-Whitney U test are shown in Table 3. This test, suitable for non-parametric datasets, evaluates whether two independent groups differ significantly in their distributions (MacFarland and Yates, 2016).

Table 3   Gender relevance tests

Gender	Quality	Personal style	Origin	Ecomaterial	Product return
Male – mean	4.09	4.15	2.89	2.87	3.27
Female – mean	4.06	4.36	3.09	3.1	3.69
Z-score	-0.461	1.884	1.087	1.317	2.454
P-value	0.645	0.06	0.276	0.187	0.014
Gender	Low price	Product range	Shopping experience	Social media	B Corp certification
Male – mean	3.53	3.44	2.17	1.71	2.03
Female – mean	3.72	3.66	2.54	1.86	2.32
Z-score	1.99	1.598	2.069	1.194	1.818
P-value	0.047	0.11	0.038	0.234	0.069

The Mann-Whitney U test reveals significant gender differences in several purchasing factors. Female consumers demonstrate significantly higher importance ratings for product return policies ($p = 0.014$), low prices ($p = 0.047$), and shopping experience ($p = 0.038$), suggesting that women place greater emphasis on purchase flexibility, value considerations, and the experiential dimension of shopping. Conversely, no significant differences emerge for product quality and production origin, indicating these factors hold comparable importance across genders. Interestingly, personal style preferences approach significance ($p = 0.060$), with females showing slightly higher mean ratings (4.36 vs. 4.15), suggesting a potential trend towards greater style consciousness among female consumers. Similarly, B-Corp certification trends toward significance ($p = 0.069$), with females displaying marginally higher concern for corporate sustainability credentials. Eco-materials, product range, and social media buzz show no significant gender-based variations.

Moreover, the questionnaire tries to examine consumer willingness to accept price premiums for environmentally sustainable clothing. The analysis is structured in two parts: first, measuring the general level of agreement with price increases aimed at incentivising production methods with reduced environmental impact; second, quantifying the specific percentage price premium consumers would be willing to accept for garments produced entirely through eco-friendly methodologies. This dual approach allows for distinguishing between abstract acceptance of sustainability-driven pricing and concrete financial commitment, providing insights into the potential gap between stated environmental values and actual purchasing behaviour. The gender-based analysis explores whether male and female consumers differ in their willingness to pay for sustainable fashion, contributing to understanding the economic viability of eco-conscious business models.

In Table 4, the results of the Mann-Whitney U test are provided.

Table 4   Price and willingness to pay tests

Gender	*Agreement on price increase*	*Willingness to pay (%)*
Male	3.25	7.30
Female	3.13	7.39
Z-score	−0.845	0.214
P-value	0.395	0.834

The Mann-Whitney U test reveals no significant gender differences in either general agreement with sustainability-driven price increases ($p = 0.395$) or willingness to accept specific price premiums ($p = 0.834$). Both males and females demonstrate moderate agreement levels (approximately 3.1–3.2) and similar acceptable price increases (7.3–7.39%), suggesting gender-neutral attitudes toward sustainable fashion pricing across the sample.

The final section of the investigation examines consumer knowledge and usage of fashion industry applications, analysing frequency of use, number of apps installed, and availability of sustainability-related information within these platforms. The analysis maintains a gender-comparative perspective to identify potential differences between men and women regarding app adoption intensity, usage frequency, and perceived importance of sustainability information. Respondents were asked about their shopping app usage frequency, number of fashion apps on their smartphones, experience with digital technologies, and rated the importance (1–5 rating scale) of having pre-purchase information about organic raw materials, textile composition, recycled materials usage, country of origin, production pollution, and B-Corp certification available within the apps.

Female consumers demonstrate significantly higher fashion app adoption rates, with 75% owning at least one app compared to 51% of males. Notably, 15% of females possess than four apps versus only 4% of males, indicating substantially greater digital engagement and on the other side 49% of males report zero fashion apps that represents a double than the female rate (25%).

The outcomes of the hypothesis testing examining the significance of factors influencing fashion purchase behaviour and sustainability-related features within the application are presented in Table 5.

Table 5   Testing of fashion and sustainability purchase factors

Gender	Organic raw materials	Textile composition	Recycled materials	Country of origin	Production pollution	B-Corp certification
Male – mean	3.23	3.83	3.17	3.19	3.45	2.81
Female – mean	3.24	3.98	3.52	3.4	3.53	3.01
Z-score	-0.484	0.470	2.050	0.907	-0.046	0.899
P-value	0.631	0.638	0.04	0.363	0.96	0.368

The Mann-Whitney U test reveals that gender significantly influences only one sustainability information preference: recycled materials usage ($p = 0.040$), with females attributing higher importance (3.52 vs. 3.17). Moreover, all other sustainability attributes show no significant gender differences, suggesting relatively uniform preferences across genders for organic production, textile composition, country of origin, production pollution, and B-Corp certification. In this context, both genders demonstrate moderate-to-high interest in sustainability information within fashion apps (mean values ranging 2.81–3.98), with textile composition receiving the highest ratings overall. These findings indicate that while sustainability information accessibility matters universally, females show particularly heightened concern for circular economy practices.

Nonetheless, receptivity to sustainability information improved when delivered through digital, pre-purchase channels (Figure 2). Mobile-integrated eco-scores, lifecycle insights, and in-app pollution metrics were perceived more favourably. For instance, pollution, often overlooked in offline contexts, was rated as important (39%) or most important (18%) when presented in digital form. Similarly, textile composition gained higher relevance with 41% rating it important and 29% as most important under the conditions of mobile applications access. Recycled material usage also showed an uptick in perceived value when digitally contextualised (37% important, 12% most important). Country of origin and organic material sourcing demonstrated comparable improvements. While B-Corp certification remained less influential (46% neutral, 17% not important, 7% most important), approximately 30% of participants recognised its potential value, contingent on improved visibility and clarity of messaging. These results point to the efficacy of embedding sustainability content into mobile apps and other digital decision-support environments that are transparent, intuitive, and accessible.

Therefore, the survey results reveal a marked gap between the perceived potential of digital sustainability tools and their current usage. Pre-purchase decisions continue to be shaped primarily by aesthetics, price, and convenience. However, when sustainability information is embedded into digital environments, particularly mobile applications, its perceived relevance increases significantly. Moreover, consumer receptivity is notably higher in the post-purchase phase, where actions such as recycling, repair, and resale are viewed through the lens of ownership responsibility rather than pre-emptive moral choice. This temporal dimension suggests that motivational mechanisms vary across the consumption cycle: pre-purchase decisions are driven by emotional gratification and perceived utility, while post-purchase engagement reflects a growing sense of personal accountability. The data thus illustrate that sustainability responsiveness among young consumers is highly context-dependent, mediated by timing, content format, and digital delivery channels. While current behaviours may not fully reflect sustainability ideals, the findings point to a substantial opportunity for fashion brands, especially Italian SMEs, to recalibrate their communication strategies. Leveraging mobile applications alongside

robust post-purchase ecosystems could align branding efforts with evolving consumer expectations, driving meaningful behavioural change and fostering more responsible, digitally mediated fashion consumption practices.

5 Discussion

The findings provide nuanced insights into consumer responsiveness to value-driven in-app marketing strategies in sustainable fashion. As fashion consumption increasingly unfolds through digital interfaces, understanding how consumers evaluate and respond to sustainability-related value propositions becomes central to designing effective pre- and post-purchase engagement strategies. The empirical evidence supports the proposed framework linking digital sustainability communication, consumer engagement intensity, and value co-creation mechanisms in shaping responsiveness to sustainable fashion initiatives. The discussion is organised around the three guiding research questions.

Regarding RQ1, results indicate that while consumers, particularly those aged 19–25, show strong environmental awareness, purchasing decisions remain largely influenced by convenience, aesthetics, and brand affinity rather than sustainability criteria. This behavioural inertia confirms the persistence of the intention-action gap and suggests that sustainability messaging alone does not drive behavioural change (Arévalo-Tuesta et al., 2025). Previous studies reinforce that the effectiveness of circular strategies depends on the communicative resonance of sustainability narratives and their alignment with consumers' values and lifestyles (Ray and Nayak, 2023; Papadopoulou et al., 2022; Agarwal, 2022). Price sensitivity, brand loyalty, and scepticism toward sustainability claims continue to hinder behavioural conversion (Mathew and Spinelli, 2025; Arias Puentes and Trujillo, 2025).

Gender-based patterns add further nuance: female consumers assign greater importance to return policies, low prices, and engaging shopping experiences, suggesting that responsiveness to in-app sustainability communication is shaped by both functional and hedonic value dimensions. This aligns with Zhao et al. (2021), who note that women exhibit stronger pro-environmental purchasing tendencies. Thus, effective digital strategies should combine transparent utilitarian information (e.g., flexible returns, eco-impact data) with emotionally resonant storytelling and interactive pre-purchase tools (Vassalo et al., 2024). Integrating clear sustainability indicators, such as CO_2 savings, water usage, or circularity scores, into visual formats like infographics or QR-linked dashboards fosters trust, transparency, and informed decision-making. This supports the growing consumer request for transparency while enhancing cognitive engagement with sustainability claims (Tolegenov et al., 2024).

Conversely, the absence of gender differences regarding product quality or production origin suggests these are baseline expectations rather than differentiating motivators in digital contexts. However, slightly higher female concern for B-Corp certification and personal style implies that authenticity, social proof, and ethical transparency are crucial for building brand congruence and emotional attachment. The consistent but moderate willingness to pay (≈7%) for sustainable clothing across genders shows that cognitive acceptance of sustainability often lacks corresponding behavioural commitment unless symbolic or experiential value is reinforced.

Informational asymmetries further amplify this misalignment: sustainability content is often encountered passively rather than actively sought. Therefore, communication must evolve from declarative to experiential, embedding lifecycle-oriented narratives that emphasise care, reuse, and circularity (Almeida et al., 2021). Moreover, inconsistent online and offline messaging reduces credibility (Putra, 2024). A harmonised omnichannel strategy that integrates immersive visuals, traceability dashboards, and interactive eco-indicators contributes to reducing perceptual asymmetries and strengthening consumer trust and cognitive engagement (Weber et al., 2023). Consequently, interactive and data-driven communication enhances consumer responsiveness to sustainability initiatives throughout the digital consumption journey.

Concerning RQ2, results show that digital engagement intensity, rather than environmental awareness alone, predicts behavioural responsiveness. Female consumers, who report higher app adoption (75% vs. 51% of males) and interaction frequency, display stronger responsiveness to sustainability information, particularly regarding recycled materials. This highlights the mediating role of engagement intensity in transforming sustainability messaging into concrete actions.

However, sustainability-focused app features, such as repair tutorials or recycling maps, remain underused, revealing a gap between digital literacy and perceived utility. To close this gap, brands should implement context-sensitive personalisation aligned with user motivations and purchase histories. Adaptive algorithms that tailor sustainability narratives through micro-interactions or gamified participation can enhance emotional relevance and sustained engagement.

Post-purchase engagement also emerges as a critical mediator of long-term responsiveness. Digital interfaces that facilitate repair, reuse, or recycling transform consumption from a linear to a participatory lifecycle (Thanasi-Boçe and Al-Issa, 2025). Tracking behavioural metrics, such as tutorial completion or eco-content dwell time, offers valuable insights for refining communication strategies (Ortiz-Avram et al., 2024; Kufile et al., 2022). Thus, engagement intensity acts as a key mechanism linking digital communication to sustainable behaviour.

Addressing RQ3, results underscore value co-creation as the process through which consumer attitudes evolve into sustainable behaviours. When consumers become active participants, digital marketing serves as a platform for collaborative sustainability impact (Balasubramanian and Sheykhmaleki, 2024; Cruz and da Cruz, 2023). Post-purchase interactions, such as repair, resale, and recycling through apps, demonstrate the strongest co-creative potential. Consumers showed greater receptivity to initiatives such as repair tutorials, recycling services, and take-back schemes when these were well-integrated into mobile platforms. Yet, fashion SMEs still lack structured digital tools to capture post-purchase engagement dynamics (Freitas and Santos, 2019). Developing lifecycle-integrated e-tailing strategies, including embedded repair guides, garment care tutorials, and take-back schemes, would align with the service-dominant logic, emphasising co-created value through product use and care (Wang et al., 2024).

These post-purchase services, often peripheral within fast fashion, constitute strategic opportunities for competitive differentiation. Through the integration of service-based digital ecosystems, fashion SMEs can enhance competitiveness by establishing localised collaborations with repair workshops, recycling networks, and resale platforms (Narayanaswamy and Heiens, 2025; Kumar et al., 2024). Such partnerships cultivate proximity, authenticity, and trust, positioning sustainability as a shared value that appeals

to individual ecological responsibility by emphasising the tangible impacts of everyday consumption choices (Madruga et al., 2024; Sahabuddin et al., 2023; Zhuo et al., 2022).

At the same time, maintaining clarity in sustainability communication remains essential. Although consumers acknowledge eco-labels as potentially influential in their decision-making, they often struggle to interpret these labels accurately, which undermines the perceived credibility of sustainability claims. Certification schemes such as B-Corp also remain insufficiently recognised, indicating that these instruments are not yet fully embedded within brand identity. Integrating certifications into identity-driven narratives and educational storytelling (e.g., "What does B-Corp mean for You as a consumer?") can enhance comprehension, trust, and emotional engagement (Cheruvallil, 2025; Sobuj et al., 2021; Morris et al., 2020). Such an approach reframes eco-certifications as relational signals of shared purpose rather than bureaucratic markers of compliance, thereby narrowing the attitudinal-behavioural gap and strengthening relational loyalty.

Within this framework, digital marketing becomes a participatory infrastructure for co-created sustainability, where consumers contribute to circularity through informed decisions and ongoing engagement. Responsiveness strengthens when sustainability is experienced not merely as information but as an interactive and relational process embedded in brand interaction.

Therefore, findings confirm that digital sustainability communication, when conceived as an interactive, omnichannel, and value-oriented process, enhances consumer responsiveness. This effect is strengthened by engagement intensity across digital touchpoints and further reinforced through co-creation mechanisms that position consumers as active contributors to circular ecosystems. Collectively, the results highlight the need for a paradigm shift from transactional to relational marketing, emphasising lifecycle-oriented strategies that integrate sustainability throughout the digital consumer pathway, from initial awareness to post-use reintegration. Thus, sustainable fashion in the digital era depends not only on technological innovation but also on the strategic orchestration of authenticity, engagement, and co-creation, transforming digital fashion platforms, particularly mobile applications, into ecosystems of shared value and long-term behavioural transformation.

6 Conclusions

This study contributes to the evolving discourse on sustainable fashion consumption investigating peculiarities of the consumer engagement with sustainability initiatives communicated by fashion companies, with particular emphasis on the distinction between pre- and post-purchase phases and across digital and physical channels. Using a survey-based methodology, the research examines consumer environmental consciousness and responsiveness to sustainability-related marketing practices, focusing on the role of in-app strategies in shaping responsible behaviour and facilitating participatory brand relationships. The findings are structured across three core dimensions:

1   *Consumer sustainability consciousness.* The research reveals a marked disparity between consumer sustainability awareness and behavioural engagement, particularly during the pre-purchase stage. While sustainability information is often acknowledged, it is inconsistently integrated into purchasing decisions. However, a

higher responsiveness is observed post-purchase, where consumers demonstrate increased willingness to engage in circular practices such as repair, reuse, and take-back programs. This indicates a latent potential for behavioural alignment with sustainability values following product acquisition. Gender-based tendencies further nuance these findings: female consumers assign greater importance to return policies, low prices, and engaging shopping experiences, indicating that responsiveness to in-app sustainability communication is shaped by both functional and hedonic considerations. This highlights the importance of tailoring digital strategies to gender-specific motivations to enhance behavioural alignment with sustainability values.

2   *Sustainability-related information visibility.* The study reveals inconsistencies in sustainability communication across digital and physical channels, limiting message clarity and behavioural impact. Although currently underutilised as a communication tool, mobile applications demonstrate strong potential for enhancing responsiveness through interactive, emotionally-resonant, and data-rich formats. Thereby, digital applications can complement and enhance traditional sustainability-related marketing approaches. Moreover, the study finds that while sustainability labels and data are present and visible, they often lack prominence and persuasive impact, limiting their effectiveness in guiding decision-making, especially in physical retail environments. Effective integration of sustainability indicators and storytelling frameworks across channels is essential to reduce information asymmetry, strengthen message retention, and align consumer behaviour with sustainability goals.

3   *Digital engagement.* Digital platforms, particularly in-app features, offer promising avenues for strengthening participatory brand relationships. Consumers show a growing readiness to interact with sustainability-related content digitally, especially in post-purchase contexts. While pre-purchase responsiveness to in-app sustainability prompts remain moderate, post-purchase digital tools are more effective in activating behavioural intentions such as garment care, repair, and circular participation.

The insights inform the development of integrated sustainability-oriented marketing strategies that enhance brand credibility while bridging the intention-action gap. For fashion, especially SMEs, tailoring communication strategies to consumer receptivity across the lifecycle and platforms is essential to operationalise sustainability and foster responsible consumption.

Integrating stakeholder theory, service-dominant logic, and regulatory engagement theory, this study develops a multidimensional framework where consumer responsiveness to sustainability communication emerges from the interplay of value co-creation, motivational engagement, and digital mediation. Theoretically, the research positions consumers as active participants in co-creating sustainable value, with digital tools (for example mobile applications) playing a pivotal role in enabling lifecycle-oriented messaging and circular practices like repair, take-back, and resale. These interventions simultaneously deepen consumer-brand relationships grounded in shared environmental responsibility, advancing understanding of how sustainability-oriented digital marketing influences consumer behaviour and brand perception in fashion.

From a managerial perspective, these findings provide practical guidance for fashion SMEs in implementing digital sustainability strategies and lifecycle engagement models.

Embedding transparency mechanisms throughout the customer journey enables consumers to visualise environmental impacts prior to purchase while maintaining access to sustainability initiatives and feedback channels afterward. Strategically, a segmented and phase-specific communication framework is essential. In the pre-purchase phase, clarity and visibility of sustainability attributes enhance informed decision-making, whereas post-purchase initiatives, such as repair tutorials, personalised care advice, and take-back logistics, empower consumers to participate actively in circular practices.

Lifecycle-oriented digital features, including repair tutorials, recycling maps, resale platforms, and post-purchase care guides, reinforce circular behaviour and extend garment longevity. Integrating sustainability communication across departments, from product design to post-sales services, aligns corporate conduct with external narratives, ensuring coherence and credibility. Embedding service-based models, such as repair-as-a-service, rental programs, and product subscription systems, transforms sustainability from a product attribute into a continuous experiential relationship that strengthens loyalty and long-term engagement.

Integrating eco-certifications such as B-Corp into brand identity further enhances transparency and trust, particularly when presented through accessible digital formats and educational storytelling. The digital communication of sustainability indicators, combined with in-app customisation, enables differentiated consumer experiences aligned with motivational and psychographic profiles. Segment-specific strategies, supported by adaptive algorithms, behavioural insights, and gender-sensitive approaches, enhance inclusivity, emotional resonance, and message relevance. Community-based initiatives and participatory storytelling additionally cultivate authenticity, social proof, and emotional attachment to the brand's sustainability ethos.

Operationalisation of these strategies relies on linking engagement indicators and KPIs, such as tutorial completion rates, recycling participation, take-back usage, or dwell time on sustainability content, to digital dashboards that inform managerial decision-making. This evidence-based approach supports resource allocation, behavioural monitoring, and demonstration of progress to stakeholders. Emerging technologies, including AI-driven analytics, mobile engagement platforms, and blockchain-enabled traceability, enhance data reliability, transparency, and accountability in sustainability reporting. Effective implementation depends on SMEs' ability to integrate these tools within existing resource constraints through gradual adoption, employee capacity building, and partnerships with technology providers and sustainability experts.

Longitudinal monitoring of engagement data facilitates continuous learning and adaptive refinement of communication strategies, while sustainability-oriented consumer recognition policies strengthen the alignment between individual actions and the brand's environmental objectives. Collectively, these strategies establish a holistic framework for embedding circularity, transparency, and digital engagement into sustainable business models, positioning digital sustainability communication as a relational and transformative lever for circular value creation and competitive advantage in the fashion industry.

In conclusion, the study advances valuable implications that contribute to theoretical understanding, managerial application, and policy design in the field of sustainable fashion. From a theoretical standpoint, it enriches the understanding of digital sustainability communication by integrating stakeholder theory, service-dominant logic, and regulatory engagement theory into a coherent behavioural framework that explains how consumers respond to sustainability-oriented marketing. At the managerial level, the

research offers practical insights for fashion SMEs, emphasising the need to design lifecycle-based communication strategies that embed transparency, utilise digital engagement to strengthen brand loyalty, and promote consumer participation in circular practices. At the policy level, the findings highlight the relevance of establishing standardised and credible sustainability communication frameworks, as well as enhancing digital traceability systems for fashion products, to support informed consumer decision-making and foster broader adoption of sustainable and circular models across the industry.

7   Limitations and further developments

Regardless the constraints related to its reliance on self-reported data and a geographically limited sample, the study, the study provides valuable insights for fashion SMEs which offer a strategic opportunity, leveraging the service-based, sustainability-oriented e-tailing marketing approaches, transform post-purchase consumer engagement into a scalable pathway for competitive advantage and long-term brand value creation. Despite the robustness of the empirical approach, several methodological limitations must be acknowledged. The study's survey-based design is subject to sampling bias, particularly due to the overrepresentation of female respondents, which may have influenced the observed gender-based differences in digital engagement and sustainability responsiveness. This imbalance constrains the generalisability of findings across the broader consumer population and limits the possibility of conducting intergenerational comparison, as age cohorts were unequally represented. Consequently, the results should be interpreted with caution, recognising that the behavioural patterns identified may reflect the preferences of a digitally active, sustainability-aware female demographic rather than the full spectrum of fashion consumers. Future research should extend the present study by broadening its cultural and demographic scope and incorporating gender-sensitive perspective to capture more nuanced patterns of sustainable consumption. Further investigation could employ larger, cross-national samples and mixed-method or longitudinal designs to assess the long-term effects of digital sustainability interventions on consumer behaviour. Additionally, future studies should develop multi-variable models exploring the intersection of economic capacity, digital engagement, and sustainability orientations, thereby providing a more comprehensive understanding of the mechanisms driving sustained behavioural change in digitalised fashion markets. Moreover, further inquiry into digital communication's role in shaping norms around product ownership, use, and disposal will be essential to advancing more inclusive and effective sustainability strategies. Therefore, effective sustainability positioning in digital fashion marketing demands an integrated approach that aligns technological innovation with behavioural insight to support regenerative, stakeholder-responsive business models.

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Declarations

All participants of the survey have granted the permission for the data generated from this survey to be used in the researcher's publications on this topic as an obligatory condition to have access to questionnaire.

All authors declare that they have no conflicts of interest.

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Appendix A

Questionnaire

General information

1. Please indicate Your gender: *

   Mark only one oval.

   ⬭ Male

   ⬭ Female

   ⬭ Prefer not to specify

2. Please Indicate Your age: *

   _____

3. Please indicate Your residence *

   Mark only one oval.

   ⬭ North of Italy

   ⬭ Central Italy

   ⬭ South of Italy

   ⬭ Island

   ⬭ Abroad

4. What is Your occupation? *

   Mark only one oval.

   ⬭ Student

   ⬭ Employee

   ⬭ Manager

   ⬭ Retired

   ⬭ Self-employed

   ⬭ Unemployed

   ⬭ Other

Evaluation of general consumer behaviour

Questionnaire (continued)

5. Which way of shopping do You usually chose when You want to buy clothes   *
    (please assign the index of frequency from 1 to 5, where 1 is never, 5 is
    always):

Mark only one oval per row.

	1 - never	2 - few times	3 - sometimes	4 - in the majority of cases	5 - always
Store	○	○	○	○	○
Fashion company website	○	○	○	○	○
Mobile app	○	○	○	○	○
Social media	○	○	○	○	○
Other	○	○	○	○	○

6. If You feel it is necessary to specify other forms of purchase, we ask You to enter
    a brief description in this text box.

    _____

7. How often do You buy clothing from these companies (please assign the index   *
    of frequency from 1 to 5, where 1 is never, 5 is always):

Mark only one oval per row.

	1 - never	2 - few times	3 - sometimes	4 - in the majority of cases	5 - always
Primark	○	○	○	○	○
Zara	○	○	○	○	○
H&M	○	○	○	○	○
Shein	○	○	○	○	○
Temu	○	○	○	○	○
Asos	○	○	○	○	○
Boohoo	○	○	○	○	○
Missguided	○	○	○	○	○
Trendyol	○	○	○	○	○
Cider	○	○	○	○	○

Questionnaire (continued)

8. On a scale from 1 to 5, how important are the following factors when choosing to *
   purchase an item of clothes?

Mark only one oval per row.

	1 - Not important	2 - Low important	3 - Neutral	4 - Important	5 - Highly important
Offers higher quality	◯	◯	◯	◯	◯
Higher probability to find design of clothes that suites Your tastes	◯	◯	◯	◯	◯
Production origin	◯	◯	◯	◯	◯
Ecomaterials and recycclble materials usage	◯	◯	◯	◯	◯
Possibility to return the product	◯	◯	◯	◯	◯
Offers the lowest prices	◯	◯	◯	◯	◯
Offers a broad range of products	◯	◯	◯	◯	◯
Has a fun and gamified shopping experience	◯	◯	◯	◯	◯
Is creating a buzz in social media	◯	◯	◯	◯	◯
B-Corp certification of company	◯	◯	◯	◯	◯

Questionnaire (continued)

Consumer awareness on Sustainability

9. How important are the following factors when choosing an item of clothes? *

    Mark only one oval per row.

	1 - not important	2 – less important	3 – neutral	4 – quite important	5 - highly important
Organic production of raw materials	◯	◯	◯	◯	◯
Textile composition (organic elements or chemical composition)	◯	◯	◯	◯	◯
Use of recycled materials	◯	◯	◯	◯	◯
Country of product origin	◯	◯	◯	◯	◯
Pollution generated during production	◯	◯	◯	◯	◯
B-Corp certification of company	◯	◯	◯	◯	◯

10. When shopping, do you consider the following information related to sustainability?

    Mark only one oval per row.

	Yes	No
Organic production of raw materials	◯	◯
Textile composition (organic elements or chemical composition)	◯	◯
Use of recycled materials	◯	◯
Country of product origin	◯	◯
Pollution generated during production	◯	◯
B-Corp certification of company	◯	◯

Questionnaire (continued)

11. Please assign the level of agreement with following statement from 1 to 5 *
    where the 1 express complete disagreement and 5 indicates full agreement:

    *! In the following questions notion "eco label" is generalized notion that
    is used to indicate the eco-friendly and sustainable way of product
    production of product (garment, textile) composition*

    "I consider eco label like a bonus while shopping rather than obligatory
    demand."

    Mark only one oval.

	1	2	3	4	5	
Disa	◯	◯	◯	◯	◯	Agree

12. Have ever an eco label been a decisive factor when You have to choose *
    between two items of clothes:

    Mark only one oval.

    ◯ Yes
    ◯ No

13. Have ever the B-corp certification been a decisive factor when You to choose *
    fashion company:

    Mark only one oval.

    ◯ Yes
    ◯ No

14. Would You agree with an increase in clothing price with the aim of encouraging *
    production methods that have a less negative impact on the environment?
    Please indicate the level of agreement with the proposal.

    Mark only one oval.

	1	2	3	4	5	
Disa	◯	◯	◯	◯	◯	Agree

15. What percentage increase in price would You be willing to accept to purchase *
    a garment made entirely with eco-green methods?

    Mark only one oval.

    ◯ 0%
    ◯ Less than 5%
    ◯ 5 - 10%
    ◯ 10 - 15%
    ◯ 15 - 20%
    ◯ More than 20%

16. If You know for sure that the colour which suits You required the use of *
    chemicals and a significantly more negative environmental impact than other
    colours, would this knowledge influence Your decision to purchase clothes in
    that colour.

    Mark only one oval.

    ◯ Yes, for sure
    ◯ Rather Yes than No
    ◯ 50 - 50
    ◯ Rather No than Yes
    ◯ No, it doesn't matter

Questionnaire (continued)

17. At what stage of the purchasing process do you usually find the sustainability-   *
    related information?

    Mark only one oval.

    ○ Intentionally from very beginning

    ○ Intentionally after choosing a set of clothes

    ○ Accidently (just because because it mentioned on product label

    ○ I do not find such type of information

18. Have You ever heard of initiatives by fashion companies that suggest   *
    customers to return their brand's used clothes for recycling?

    Mark only one oval.

    ○ Yes

    ○ No

19. Do You think such initiative is relevant? *

    Mark only one oval.

    ○ Yes, for sure

    ○ Rather Yes than No

    ○ Indifferent

    ○ Rather No than Yes

    ○ No, it doesn't matter

Digital nature of communication with consumers

20. Where do you usually look for information on the sustainability (green   *
    production, recyclable materials) of company or product:

    Mark only one oval.

    ○ Website of company

    ○ Mobile App

    ○ Product label at store

    ○ Social media

    ○ Nowhere

21. In Your opinion are You more likely to come across information on sustainability *
    issues while shopping offline or online?

    Mark only one oval.

    ○ offline (store, magazine, etc.)

    ○ online (mobile app, website, etc.)

Questionnaire (continued)

22. Please indicate Your level of agreement with the following statement: "If sustainability information were easier to find, it would have a greater impact on the decision to purchase a certain item of clothing." *

    Mark only one oval.

    ◯ Yes, for sure
    ◯ Rather Yes than No
    ◯ 50 - 50
    ◯ Rather No than Yes
    ◯ No, it doesn't matter

23. How often do You use mobile apps to buy clothes? Please indicate the frequency: *

    Mark only one oval.

	1	2	3	4	5	
Nev	◯	◯	◯	◯	◯	Always

24. How many clothing shopping apps do You have on Your smartphone? *

    Mark only one oval.

    ◯ 0
    ◯ 1
    ◯ 2
    ◯ 3
    ◯ 4
    ◯ more than 4

25. Do You have experience of following digital technologies usage: *

    Check all that apply.

    ☐ Scan-body (digital service for generating 3D body avatars based on photos taken with a smartphone)
    ☐ Virtual Try-On or Virtual Fitting Room (allows you to see online how a piece of clothing would look on you virtually, without having to visit a physical store, through software that superimposes the item of clothing onto the user's photo)
    ☐ AI assistant
    ☐ Virtual wardrobe (the ability to create personal wardrobes online based on clothes already purchased)
    ☐ Other

Questionnaire (continued)

26. On a scale from 1 to 5, information on which of the following factors would You *
consider as important to have in app before buying clothes.

Mark only one oval per row.

	1- Not important	2 - Low Importance	3 – Neutral	4 – Important	5 – Highly important
Organic production of raw materials	⬭	⬭	⬭	⬭	⬭
Textile composition (organic elements or chemical composition)	⬭	⬭	⬭	⬭	⬭
Use of recycled materials	⬭	⬭	⬭	⬭	⬭
Country of product origin	⬭	⬭	⬭	⬭	⬭
Pollution generated during production	⬭	⬭	⬭	⬭	⬭
B-Corp certification of company	⬭	⬭	⬭	⬭	⬭

27. Which of the following options would You prefer to have in app after buying: *

Mark only one oval per row.

	1 – Not useful	2 – Less useful	3 – Neutral	4 – Quite useful	5 – Definitely useful
Information on possible ways to recycle	⬭	⬭	⬭	⬭	⬭
Tutorials app on possibilities to repair the garment	⬭	⬭	⬭	⬭	⬭
Space for rent or resell Your old item	⬭	⬭	⬭	⬭	⬭
Direct access for second-hand platform	⬭	⬭	⬭	⬭	⬭
The offer of disassembly and repair	⬭	⬭	⬭	⬭	⬭
Digital map of collection points for particular type of products.	⬭	⬭	⬭	⬭	⬭

Sustainability-oriented services of the fashion companies

Questionnaire (continued)

28. What kind of suggested additional service options that could be launched by the fashion company in Your opinion would have greater potential to reduce consumption? *

Mark only one oval per row.

	1 – Not promising	2 – Less promising	3 – Neutral	4 – More promising	5 – Highly promising
Information on possible ways to recycle	◯	◯	◯	◯	◯
Tutorials app on possibilities to repair the garment	◯	◯	◯	◯	◯
Space for rent or resell Your old item	◯	◯	◯	◯	◯
Direct access for second-hand platform	◯	◯	◯	◯	◯
The offer of disassembly and repair	◯	◯	◯	◯	◯
Digital map of collection points for particular type of products.	◯	◯	◯	◯	◯

Thank You for Your time and kind assistance!