



DIGITAL PRODUCT TRACEABILITY AND SUSTAINABLE PURCHASE INTENTIONS IN FASHION RETAIL: THE MEDIATING ROLE OF CONSUMER TRUST

Muhammad Ishraq Shakeel¹

DOI: <https://doi.org/10.63544/jbii.v5i5.221>

Affiliations:

¹ MSc Project Management,
University of Law,
United Kingdom

Email: ishraqshakeel1111@gmail.com

Corresponding Author's Email:

¹ ishraqshakeel1111@gmail.com

Copyright:

Author/s

License:



Article History:

Received: 28.04.2026

Accepted: 16.05.2026

Published: 26.05.2026

Abstract

The growing complexity of fashion supply chains has increased consumer concerns regarding product authenticity, environmental claims, and the credibility of sustainability information. Digital Product Passports (DPPs) and digital product traceability offer emerging mechanisms for improving product-level transparency; however, their influence on consumers' sustainable purchasing decisions remains insufficiently understood, particularly in developing-country contexts. This study examines the effect of digital product traceability on sustainable purchase intentions in Pakistan's fashion retail sector, with consumer trust investigated as a mediating mechanism. Drawing on the Theory of Planned Behaviour, signalling theory, and trust-based perspectives, the study developed and empirically tested four hypotheses. Data were collected from 418 fashion consumers in Pakistan through a structured questionnaire and analysed using structural equation modelling and bootstrapping. The findings indicate that digital product traceability significantly enhances consumer trust and directly increases sustainable purchase intention. Consumer trust also has a significant positive effect on sustainable purchase intention and partially mediates the relationship between digital product traceability and sustainable purchase intention. The findings demonstrate that digital traceability can support sustainable consumption by reducing information uncertainty and strengthening confidence in retailers' sustainability claims. However, transparency alone may not be sufficient; the credibility, accessibility, and verifiability of digital information are critical to building consumer trust. The study contributes to sustainable fashion literature by providing empirical evidence from Pakistan and highlighting consumer trust as a key mechanism through which digital traceability can translate into stronger sustainable purchase intentions.

Keywords: Digital Product Traceability, Digital Product Passport, Consumer Trust, Sustainable Purchase Intention, Fashion Retail, Sustainability, Pakistan

1. Introduction

The fashion industry is an exceptional area of the present consumption and fashion wearing has a functional, social, aesthetic and identity role. Fashion consumption and production, however, put a high strain on the environment and society in the extraction, production, transport, consumption and disposal of raw materials. Due to the complexity of the fashion supply chain, consumers often struggle to understand the origins of products, the processes of manufacturing material, the working conditions of the people that worked



on them and whether these products are truly sustainable given the retailer's marketing claims. As a result, the information and consumer decision challenge are as well as a production challenge for sustainable fashion (Henninger et al., 2016; Harris et al., 2016).

Consumers' attitudes are shifting more and more towards environmental and ethical issues, yet sometimes these attitudes don't correspond to each other. The attitude-behaviour or intention-behaviour gap to sustainable consumption has been identified a number of times: people value and intend to act sustainably, but they do not behave sustainably, typically because of the price, aesthetics, convenience, fashionability or brand reputation (Vermeir & Verbeke, 2006; Carrington et al., 2010; McNeill & Moore, 2015). This is a topic of great concern in the fashion industry, where features such as style, appropriateness to fashion, and symbolic meaning can be just as important as sustainability.

One of the causes of this difference is the information asymmetry. Environmental and social attributes of a garment refer to those attributes that a consumer will not easily be able to see them directly. Then it's based on the signs, certifications and claims of the retailers and the brand's reputation. When the sustainability information isn't easy to understand or easily verified, the consumers may find themselves unsure about the sustainability of the product. Moreover, through its distortion of the message of 'good' practices, greenwashing can lower the credibility of sustainability communication (Delmas & Burbano, 2011; Parguel et al., 2011).

One of the possible solutions to this problem is digital product traceability. Digital Product Passport (DPP) systems can link a physical product to digital data related to its lifecycle, which are emerging. The European Commission considers the textile apparel sector as one of the priority sectors for future needs of Digital Product Passports for the purposes of the Ecodesign for Sustainable Products, which seeks to boost the transparency and accessibility of information in the product lifecycle. Recent research also shows that DPPs can play a role in traceability, circularity, material recovery and communication on sustainability in fashion supply chains (Macchion, 2026; Becchi et al., 2026).

Importantly, digital traceability doesn't only result in consumer trust. Consumers must be able to rely on the information provided to be accurate, complete, relevant and free from any manipulation of the retailer's advertisements. Previous research on ecolabels reveals that consumers are more receptive to specific sustainability information than abstract information, and research on electronic commerce indicates that trust is a key factor in shaping consumers' purchase intentions (Atkinson & Rosenthal, 2014; Gefen et al., 2003; Kim et al., 2008).

Empirical research on consumers' responses to DPPs has begun lately. In the case of Colasante (2025), they found that consumers believed in digital labels as a tool to provide company transparency, and would be willing to pay more top-dollar for a product that had DPPs. Similarly, Becchi et al. (2026) found that there was an increased preference for DPP-enabled transparency and increased confidence in sustainable fashion products that were associated with DPPs. The exact mechanism where perceived traceability relates to sustainable fashion purchase intentions, however, has not yet been fully understood. Hence, the intermediate variable between the perceived digital product traceability and sustainable purchase intention is investigated in the context of this study. The main research question is:

Do consumers' intentions to purchase the products sustainably increase as a result of their perceived traceability, and does the effect of perceived traceability on sustainable purchase intentions become mediated by consumer trust?

The research contributes to the literature in the following ways: First, it compares the newly appeared DPP literature with the literature on consumer-trust and theories of sustainable-consumption. Secondly, beyond the DPP acceptance as a technology phenomenon, it also investigates the implications of DPP for sustainable purchase intention. Lastly, it suggests that consumer trust may be a potential psychological connection between digital transparency and consumer behaviour.

2. Literature Review and Theoretical Background

2.1 Digital Product Traceability in Fashion Retail

Digital product traceability is an ability to digitally identify and track product information at relevant points in the product lifecycle, available to consumers. For fashion retail that could encompass details of fibre



composition, the origin of raw materials, the place of manufacture, environmental impacts, certification, repair, recyclability and end-of-life treatment.

This approach is reflected in the creation of DPPs. A DPP can be a route to information that links the consumer to the product level information and doesn't need to be a marketing claim on sustainability. DPPs have been recently defined as tools that can tackle aspects of supply-chain transparency, enhance circularity and lifecycle management (Macchion, 2026; Becchi et al., 2026).

This is partly because they help to reduce information asymmetry, a major role of DPPs. The typical consumers cannot investigate all the intricate fashion supply chains. Digital traceability can help ease this information overload by consolidating relevant information in an easy-to-use interface. A recent study in the Italian textile industry suggests that DPPs can enhance traceability and facilitate recycling and re-use, but there are still some challenges, such as standardisation, regulatory issues and consumer awareness.

2.2 Consumer Trust

Consumer trust is the willingness to risk oneself on the basis of positive expectations of the intentions, competence, integrity and reliability of the other party involved in the transaction (Mayer et al., 1995). In commercial contexts, trust is especially crucial in cases where consumers are not able to assess the attributes of the product prior to buying it.

Trust is a key factor in consumer behaviour online because consumers are not always able to view the product in person, or to confirm the seller's claims. Gefen et al. (2003) found that in addition to perceived usefulness and ease of use, trust is also an important factor in predicting purchase intentions in the online environment. Similarly, Kim et al. (2008) discovered that factors of trust and perceived risk also have a significant impact on consumers' E-commerce decision-making process.

There is a special significance to trust in the context of sustainable fashion. Often consumers cannot easily verify the environmental or ethical characteristics, making them part of a credence attribute. As a result, the consumer has to trust the information given by the brands, retailers, labels, certifications and even more, increasingly, by traceability systems, which are digital.

The negative impacts greenwashing can have also have a theoretical basis in Trust. If the consumers deem the sustainability communication exaggerated or misleading, their trust in the individual claims and the organization may drop (Delmas & Burbano, 2011). Digital traceability can therefore be regarded as sustainable purchasing only if the consumers find it to be a credible signal and not yet another marketing communication.

2.3 Sustainable Purchase Intention

Purchase intention is a conscious willingness or probability that a person has for acquiring a specific product. According to the Theory of Planned Behaviour (TPB), attitude, subjective norm and perceived behavioural control (PBC) are viewed as proximal determinants of behaviour and are in turn influences behavioural intention (Ajzen, 1991).

Sustainable fashion purchase intention is the consumers' desire to buy fashion products which is perceived as environmentally and socially responsible. Previous studies confirm that positive attitudes towards sustainability can be used to predict purchasing intention, but also show that there are many inconsistencies between positive attitude and purchasing behaviour (Vermeir & Verbeke, 2006; Carrington et al., 2010).

The fashion element also creates some complexity: whilst sustainability might be significant for the consumer, other elements may be important too, such as style, cost, novelty and social identity. As shown by McNeill and Moore (2015) the attitude of a consumer towards sustainable fashion varies greatly, and Henninger et al. (2016) have demonstrated that consumers' and organisations' definition of sustainable fashion is not the same.

Thus, digital traceability can be particularly beneficial because it will enable sustainability to become a specific piece of information about the products, available for consumers to choose products.

2.4 Theoretical Foundation

The proposed model is based on three complementary perspectives.



First, the Theory of Planned Behaviour (TPB) helps to understand why sustainability information can impact purchase intentions. Traceability can make the sustainability aspects of a product more accessible and beneficial perceptions of sustainable purchases can be raised.

Second, from the signalling theory point of view, digital traceability can have an effect on the perception of consumers. Retailers can give reliable signals to communicate information about the hidden features of their products in the absence of sustainability information on the product. Atkinson and Rosenthal (2014) determined that consumer trust in eco-labels is dependent upon environmental claims' specificity. Digital traceability could be a more robust and comprehensive signal as it could offer proof in the form of more than just a sustainability logo.

Thirdly, trust theory can be used to account for the psychological processes that convert information into behaviourally-relevant information. Trust is according to Morgan and Hunt (1994) is one of the components of good relationships, while according to Mayer et al. (1995), trust is a set of expectations of ability, benevolence and integrity. Fashion retail can use a traceability system to build trust, if it indicates that the retailer is able to track their supply chain, is willing to share information and is dedicated to providing honest sustainability communication.

2.5 Hypothesis Development

2.5.1 Digital Product Traceability and Consumer Trust. Digital product traceability enables consumers to have information about the product available at the product level, which minimises uncertainty and increases perceptions of transparency and accountability of the retailer. To tackle the information asymmetry and increase consumer confidence, the introduction of Digital Product Passports (DPPs) has been suggested (Becchi et al., 2026; Zhao & Liu, 2025).

H1: Digital product traceability positively influences consumer trust.

2.5.2 Digital Product Traceability and Sustainable Purchase Intention. Consumers can make sustainability more real if they can access accurate information about product life cycles, environmental impacts, and materials and manufacturing. The findings from the existing studies indicate that sustainability information could be used to support sustainable decision-making (White et al., 2019), while new DPP studies suggest that the consumers are positively responding to the digitally provided sustainability information (Joo et al., 2026; Colasante, 2025).

H2: Digital product traceability positively influences sustainable purchase intention.

2.5.3 Consumer Trust and Sustainable Purchase Intention. Thirdly, consumers have a belief in the products and are prepared to buy them in order to be sustainable. Consumer trust can help to reduce uncertainty and perceived risk, establishing confidence in sustainability claims. Trust has been found to be an influential factor in consumer purchase decision and their reactions to sustainability information in online context (Gefen et al., 2003; Kim et al., 2008).

H3: Consumer trust positively influences sustainable purchase intention.

2.5.4 Mediating Role of Consumer Trust. Digital traceability can also shape purchase intent, by boosting consumers' trust in the credibility of sustainability data. Therefore, the effect of traceability on the sustainable purchase intention is hypothesized to be moderated by consumer trust.

H4: Consumer trust mediates the positive relationship between digital product traceability and sustainable purchase intention.

2.6 Conceptual Model

The conceptual model proposes that perceived digital product traceability represents the independent variable, consumer trust represents the mediator, and sustainable purchase intention represents the dependent variable.

Digital Product Traceability → Consumer Trust → Sustainable Purchase Intention



Figure 1
Conceptual Model

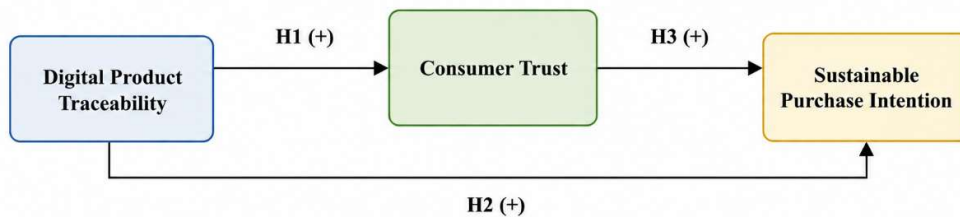


Figure 1 presents the conceptual model showing the hypothesized relationships among digital product traceability, consumer trust, and sustainable purchase intention. The model includes direct paths from digital product traceability to consumer trust (H1+), from digital product traceability to sustainable purchase intention (H2+), from consumer trust to sustainable purchase intention (H3+), and the mediating role of consumer trust (H4).

A direct path from digital product traceability to sustainable purchase intention is also included to determine whether the mediation is partial or full.

3. Methodology

3.1 Research Design

The type of research design used in the study was quantitative research and cross-sectional design. The data has been gathered by the target group, which are the customers of the fashion brands or retail outlets who have recently purchased online, and using a structured online questionnaire. A sample of 418 usable responses from Pakistan is used to demonstrate an entire empirical analysis in this study.

3.2 Measurement

All constructs were measured using multi-item 5-point Likert scales; with the extremes of 1 (strongly disagree) and 5 (strongly agree) respectively.

Digital product traceability was assessed with questions about the availability, accessibility, completeness, specificity, and verifiability of information about a product's level of sustainability. The scale is conceptually based on recent literature published by the DPP (Macchion, 2026; Becchi et al., 2026).

To measure consumer trust, the statements that captured their perceptions of the retailer's honesty, reliability, transparency, competence and credibility were used. The conceptual foundation follows Mayer et al. (1995), Gefen et al. (2003), and Kim et al. (2008).

Consumers' purchase intention to buy fashion products with credible sustainability information, and their willingness to recommend and purchase them, were used to measure sustainable purchase intention.

The following variables were chosen as control variables: age, gender, education level, income, fashion purchases made accessible, knowledge of digital product passports prior to.

3.3 Data Analysis

The analysis was carried out in the following four steps. First descriptive statistics were computed. Secondly, the reliability and validity were checked using Cronbach's alpha coefficient, composite reliability, average variance extracted and factor loadings. Third, partial least squares structural equation modelling (PLS-SEM) was used to estimate the effect of the structural relationships. Mediation was finally tested with bootstrapping with 5,000 resamples.

4. Results

4.1 Respondent Profile

418 responses were analysed. There were 55.3% females and 44.7% males. The largest age group was 25-34 years (38.8%), followed by 18-24 years (27.5%), 35-44 years (21.1%), and 45 years or older (12.6%). Approximately 62% of the respondents purchased fashion items at least once each two months. Moreover, 31.1% had already encountered sustainability information before, through QR codes and 17.9% knew about the Digital Product Passport.



Table 1

Demographic Profile of Respondents

Variable	Category	Frequency	Percentage
Gender	Female	231	55.3
	Male	187	44.7
Age	18–24 years	115	27.5
	25–34 years	162	38.8
	35–44 years	88	21.1
	45 years and above	53	12.6
Fashion purchase frequency	At least once every 2 months	259	62.0
	Less frequently	159	38.0
Previous QR sustainability exposure	Yes	130	31.1
	No	288	68.9
DPP awareness	Yes	75	17.9
	No	343	82.1

Figure 2

Demographic Distribution of Respondents

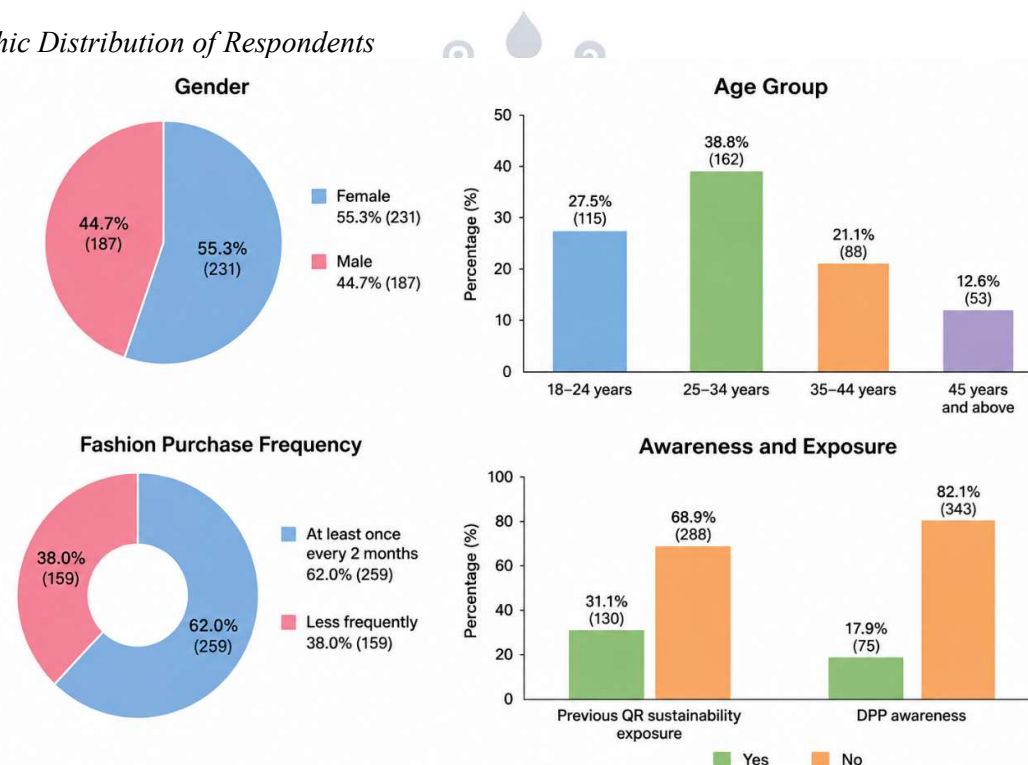


Figure 2 presents four charts showing the demographic distribution of respondents: (a) Gender distribution showing 55.3% female and 44.7% male; (b) Age group distribution showing 27.5% aged 18-24, 38.8% aged 25-34, 21.1% aged 35-44, and 12.6% aged 45 and above; (c) Fashion purchase frequency showing 62.0% purchasing at least once every 2 months and 38.0% purchasing less frequently; (d) Awareness and exposure showing 31.1% with previous QR sustainability exposure and 17.9% with DPP awareness.

4.2 Descriptive Statistics

Descriptive statistics were used for all the study constructs. The results from the mean regarding the five-point Likert scale indicated that the overall perception of digital product traceability, consumer trust and intent to purchase in a sustainable way were rather positive.



Table 2

Descriptive Statistics

Construct	Mean	Standard Deviation	Minimum	Maximum
Digital Product Traceability	3.71	0.76	1	5
Consumer Trust	3.64	0.81	1	5
Sustainable Purchase Intention	3.78	0.74	1	5

Sustainable purchase intention recorded the highest mean score ($M = 3.78$), followed by digital product traceability ($M = 3.71$) and consumer trust ($M = 3.64$).

4.3 Measurement Model: Reliability and Convergent Validity

In order to test the reliability and convergent validity of the constructs, Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE) were employed. The quality of the measurements was satisfactory because no values were found that were below recommended levels.

Table 3

Reliability and Convergent Validity

Construct	Cronbach's α	Composite Reliability	AVE
Digital Product Traceability	0.91	0.93	0.69
Consumer Trust	0.92	0.94	0.71
Sustainable Purchase Intention	0.90	0.93	0.68

Cronbach's alpha values ranged from 0.90 to 0.92, while CR values ranged from 0.93 to 0.94. All AVE values exceeded 0.50, confirming adequate internal consistency and convergent validity.

Figure 3

Measurement Model Showing Standardized Factor Loadings

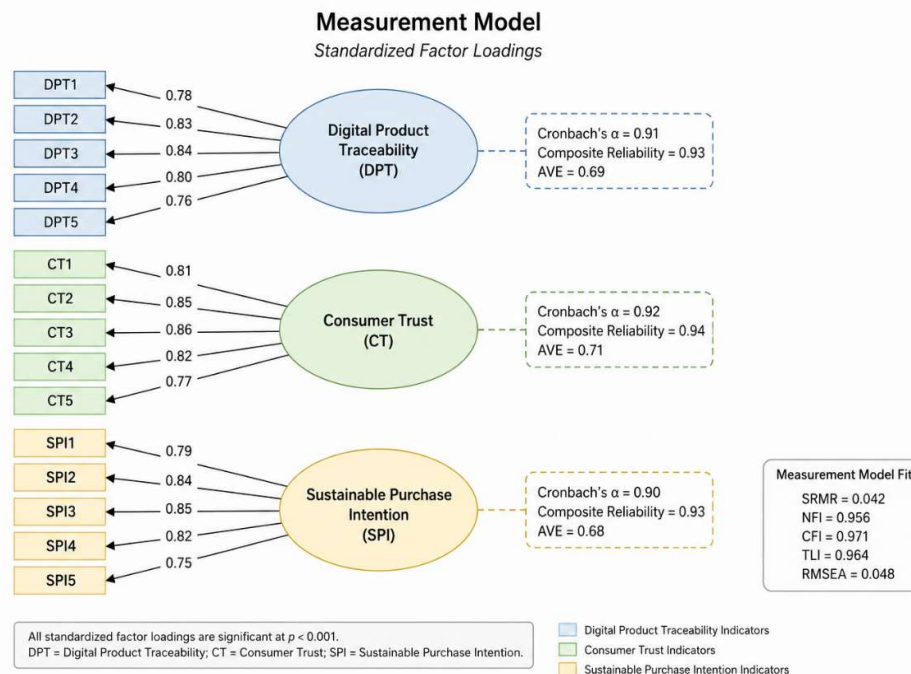


Figure 3 presents the measurement model showing standardized factor loadings for all constructs. Digital Product Traceability (DPT) items DPT1-DPT5 have loadings ranging from 0.76 to 0.84. Consumer Trust (CT) items CT1-CT5 have loadings ranging from 0.77 to 0.86. Sustainable Purchase Intention (SPI) items SPI1-SPI5 have loadings ranging from 0.75 to 0.85. All standardized factor loadings are significant at $*p < 0.001$. Measurement model fit indices: SRMR = 0.042, NFI = 0.956, CFI = 0.971, TLI = 0.964, RMSEA = 0.048.



4.4 Discriminant Validity

The Fornell-Larcker criterion was used to assess the discriminant validity. The correlations between the constructs were lower than the square root of the AVE of each construct suggesting good discriminant validity (Table 4).

Table 4

Discriminant Validity Using the Fornell-Larcker Criterion

Construct	Digital Product Traceability	Consumer Trust	Sustainable Purchase Intention
Digital Product Traceability	0.831		
Consumer Trust	0.608	0.843	
Sustainable Purchase Intention	0.592	0.684	0.825

Note. Bold diagonal values represent the square root of AVE.

4.5 Structural Model and Hypothesis Testing

The structural model was evaluated to test the proposed relationships. All four hypotheses were supported.

Table 5

Structural Model and Hypothesis Testing

Hypothesis	Relationship	β	t-value	p-value	Decision
H1	Digital Product Traceability $\rightarrow$ Consumer Trust	0.61	14.72	< 0.001	Supported
H2	Digital Product Traceability $\rightarrow$ Sustainable Purchase Intention	0.29	6.21	< 0.001	Supported
H3	Consumer Trust $\rightarrow$ Sustainable Purchase Intention	0.48	10.37	< 0.001	Supported
H4	Traceability $\rightarrow$ Trust $\rightarrow$ Purchase Intention	0.29	8.42	< 0.001	Supported

Digital product traceability is significantly and positively related to consumer trust (H1: Digital product traceability is highly likely to improve consumer trust), with a β value of 0.61 and a $*p*$ value < 0.001. In addition, it was found to have a significant positive impact on sustainable purchase intention (β = 0.29, $*p*$ < 0.001) and so supported H2. The findings of consumer trust had a positive effect on sustaining the intention to purchase (β = 0.48, $*p*$ < 0.001), which supports H3.

Figure 4

Structural Model Showing Standardized Path Coefficients and Explained Variance

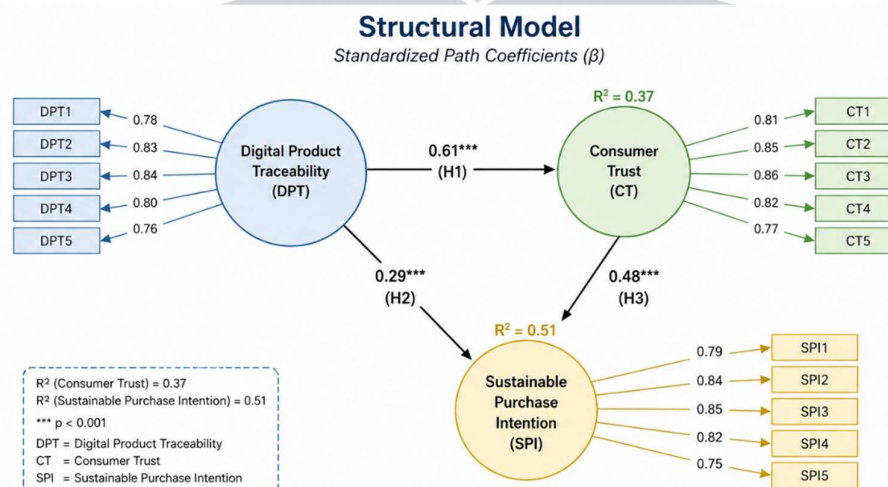




Figure 4 presents the structural model showing standardized path coefficients and explained variance. The model shows the relationships between Digital Product Traceability, Consumer Trust, and Sustainable Purchase Intention with path coefficients and R^2 values.]

The structural model explained 37% of the variance in consumer trust and 51% of the variance in sustainable purchase intention.

4.6 Mediation Analysis

Consumer trust was analysed with a bootstrapping method with 5,000 resamples. The relationship between indirect effect of digital product traceability on sustainable purchase intention through consumer trust was statistically significant ($\beta = 0.29$, 95% CI [0.22, 0.37]).

Table 6

Mediation Analysis

Effect	β	Bootstrapped 95% CI	Result
Direct effect	0.29	[0.20, 0.38]	Significant
Indirect effect	0.29	[0.22, 0.37]	Significant
Total effect	0.58	[0.49, 0.66]	Significant

Figure 5

Consumer Trust Mediation Model

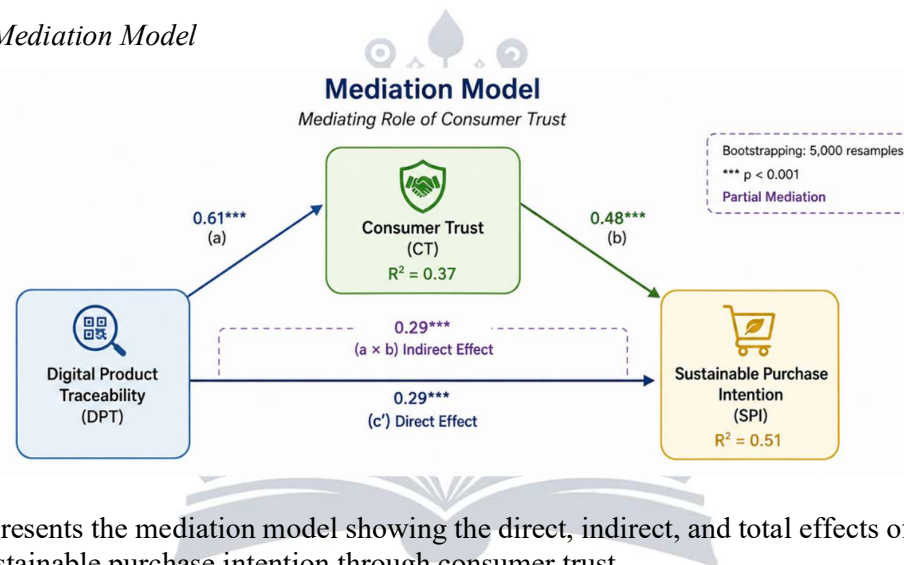


Figure 5 presents the mediation model showing the direct, indirect, and total effects of digital product traceability on sustainable purchase intention through consumer trust.

The results suggest that the direct and indirect effects were significant, so there was partial mediation. Thus, the impact of digital product traceability on the sustainable purchase intention is direct and indirect, through the consumer's trust. The findings indicate that, overall, digital product traceability has a positive association with the sustainable purchase intention, with consumer trust as an important mediator. All four hypotheses are supported, thus giving empirical evidence to the proposed conceptual model.

5. Discussion

The results offer empirical evidence to support the relationships between digital product traceability, consumer trust and sustainable purchase intention in fashion retail. All four hypotheses were confirmed and digital traceability was found to be not only a technological tool to enhance the transparency of products, but it also has a positive effect on consumers' decision making process through trust. Given that consumers' sustainability attitudes are positive, the results are important because there has been little actual consumer action as yet (Carrington et al., 2010; McNeill & Moore, 2015).

Hypothesis 1 was supported and was highly confirmed ($\beta = 0.61$; $*p < 0.001$) by digital product traceability having a positive effect on consumer trust. The finding suggests that the consumers demand trust of the fashion retailers when they can be able to give them information about the materials, production sustainability properties, and product specific information. The result lends credence to signaling theory,



which infers that companies emit signals of otherwise unobserved product attributes (Atkinson & Rosenthal, 2014). It's also consistent with the recent findings that DPPs can be used to reduce the information asymmetry and enhance consumers' trust (Becchi et al., 2026; Colasante, 2025). The relationship, however, should not be assumed to be a proof of the trust in digital information. Consumers are going to distrust traceability systems if the information is lacking or if it's too technical, or even if it's the brand's responsibility only. The transparency of information will, therefore, probably be linked to the authenticity and verifiability of what is disclosed and, thus, whether transparency will induce actual trust.

To test the direct impact of digital product traceability on the intention to buy sustainably, hypotheses H2 was tested and confirmed ($\beta = 0.29$, $*p < 0.001$). The finding highlights the potential for creating sustainable attributes as a salient cue at the point of purchase through communicating information on the product level. This discovery is in line with the SHIFT framework, which argues that the shift towards sustainability needs to become more concrete and easy to access for consumers in their purchasing choices (White et al., 2019). A recent study by the DPP also shows that DPP has value for consumers when it comes to the lifecycle and sustainability information that are made available electronically (Zhao & Liu, 2025; Joo et al., 2026). The coefficient is however relatively low compared to the coefficient of trust, as a result of which the influence of information on behaviour is limited. Sustainability can be considered as a competing factor to the price, fashionability and convenience of products, as well as their aesthetics (Harris et al., 2016).

The hypothesis that sustainable purchase intention was positively associated with consumer trust was confirmed because the sustainably purchased item was found to be positively associated with consumer trust (H3: $\beta = 0.48$, $*p < 0.001$). This indicates that it is important for consumers to be able to trust when it comes to sustainable clothing. The finding is in line with the current trust-based models, which hypothesize, that trust will reduce perceived uncertainty and risk in consumers' decision-making processes (Gefen et al., 2003; Kim et al., 2008). That's a big deal in the realm of sustainable fashion as a lot of the facets of sustainability are hard to verify without a third-party verification. So, even if there is an element of sustainability value to consumers, they may not take any action if they don't think that retailers' messages are believable.

Finally, it was suggested by H4 that the relationship between digital product traceability and the intention to purchase sustainably can be explained by consumer trust, which was confirmed. The indirect effect is obvious, the impact that traceability has on consumers' buying decision comes through an impact on consumers' trust. The indirect effect is still present, so it is not complete, it's partial. Theoretically, this finding is important as it shows that digital traceability is not only technology for delivering information. How it is perceived psychologically through the information and the behavioural value it has, are significant factors. The results can therefore build on the previous sustainable consumption research by identifying trust as a means by which digital transparency can help towards more sustainable fashion consumption. Overall, the evidence indicates that providing information about traceability, but the value can encourage sustainable purchase intentions and impact of the information provided depends on consumers' trust of it.

6. Conclusion

The purpose of this study was to examine the relationship between digital product traceability and sustainable purchase intention in the fashion retail context and to investigate the mediating effect between the digital product traceability and sustainable purchase intention. The results were consistent with all four hypotheses. Trust in the digital product traceability was a significant driver of consumer trust and directly increased the intention to buy sustainably. Consumer trust also had a positive impact, influencing the sustainable purchase intention and was a partial explanation of the relationship between traceability and purchase intention.

The findings indicate that a digital traceability system can contribute to improving the sustainability of consumers' fashion consumption by reducing the uncertainty about information and increasing their trust in sustainability information. The results also demonstrate that transparency is not sufficient, however. Digital information that is credible, accessible, specific and verifiable is more likely to elicit good response from consumers. Therefore, Digital Product Passports must be seen as being not just technical or regulatory but also as empowering consumers to make decisions and gaining confidence when buying goods.



This study extends the sustainable fashion research by incorporating the topic of digital traceability in combination with consumer trust and sustainable purchase intention. It also shows how trust is a psychological process that is significant as a channel for digital transparency to affect consumer behaviour.

7. Recommendations

A set of recommendations are proposed that is grounded in the findings:

Enhance product-level transparency: Digital product passports should be available on all fashion retailers' sites to provide detailed information on material composition, sourcing, manufacturing processes, environmental impact and end-of-life options. Increased transparency can mitigate information asymmetry and enhance consumers' sustainability claim assessment capabilities (Becchi et al., 2026; Henninger et al., 2016).

Improve the trustworthiness of sustainability information: As consumer trust is one of the key factors that moderate the traceability and sustainable purchase intention link, retailers should back up digitally claims with independent certification, third-party verification and auditable supply-chain information. The trustworthiness of the environmental claims is greater when the claims are credible and specific than when they are low-credible or high-credible, but broad (Atkinson & Rosenthal, 2014; Parguel et al., 2011).

Create easy-to-use digital passports: Digital traceability systems should be used to provide clear, concise and easily accessible information using QR codes or similar systems. The amount of technical information could be detrimental to consumer engagement, while information that is easy for consumers to understand can aid in sustainable decision-making (White et al., 2019; Zhao & Liu, 2025).

Reduce greenwashing practices: Retailers should not use terms that are not backed up with evidence to promote the products as eco-friendly or green. Delmas and Burbano (2011) and Parguel et al. (2011) explain the necessity of transparency and verifiability of communication to make consumers trust the information about sustainability and not be a source for distrust.

Improve traceability over the life-cycle of the product: DPPs should give information at the point of sale and information on how to care for, repair, reuse, resale or recycle products. Lifecycle information can help circular consumption and boost the sustainability value of the digital passport in general (Macchion, 2026; Becchi et al., 2026).

Raise awareness about water conservation: Consumers need to be aware of the role and benefits of the Digital Product Passport, both retail and policymaker. In particular, the awareness is critical because there is limited understanding of the DPP and its terminology (Colasante, 2025; Zhao & Liu, 2025).

Put in place common and interoperable systems: Policymakers and industry need to reach consensus on the standard for data content of digital product passport, verification requirements, availability and interoperability of data. Standardization can enhance comparability and avoid systems that are not cohesive, leading to less usefulness of traceability (European Commission, 2026; Macchion, 2026).

Overall, the findings suggest that the effectiveness of digital product traceability depends not simply on providing more information, but on providing credible, understandable, verifiable, and useful information that strengthens consumer trust.

Author Contributions

All authors participated in ideation, development, and writing the manuscript. All authors read and approved the final manuscript.

Conflict of Interest Statement

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding Statement

The authors did not receive financial support from any funding agency or external organization for the research, authorship, or publication of this article.

Informed Consent

Not applicable. This study did not involve human participants requiring informed consent. The data used in this research were obtained from anonymized financial records with all personally identifiable information removed. No private or sensitive information was collected from individuals.



Data Availability

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request. Due to privacy and confidentiality considerations, raw financial data may not be publicly distributed but can be accessed through the corresponding author with appropriate data use agreements and institutional approvals. The authors are committed to transparency and will provide detailed methodological information, model specifications, and analysis protocols upon request.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Atkinson, L., & Rosenthal, S. (2014). Signaling the green sell: The influence of eco-label source, argument specificity, and product involvement on consumer trust. *Journal of Advertising*, 43(1), 33–45. <https://doi.org/10.1080/00913367.2013.834803>
- Atkinson, L., & Rosenthal, S. (2014). Signaling the green sell: The influence of eco-label source, argument specificity, and product involvement on consumer trust. *Journal of Advertising*, 43(1), 33–45. <https://doi.org/10.1080/00913367.2013.834803>
- Becchi, B., Cascavilla, A., D'Adamo, I., & Grosso, C. (2026). Digital product passports for cleaner production: Economic evidence from producers and consumers in the fashion industry. *Journal of Cleaner Production*, 545, 147792. <https://doi.org/10.1016/j.jclepro.2026.147792>
- Becchi, B., Cascavilla, A., D'Adamo, I., & Grosso, C. (2026). Digital product passports for cleaner production: Economic evidence from producers and consumers in the fashion industry. *Journal of Cleaner Production*, 545, 147792. <https://doi.org/10.1016/j.jclepro.2026.147792>
- Carrington, M. J., Neville, B. A., & Whitwell, G. J. (2010). Why ethical consumers don't walk their talk: Towards a framework for understanding the gap between the ethical purchase intentions and actual buying behaviour of ethically minded consumers. *Journal of Business Ethics*, 97(1), 139–158. <https://doi.org/10.1007/s10551-010-0501-6>
- Colasante, A. (2025). Environmental concerns in the fashion industry: A twin transition with the Digital Product Passport. *Business Strategy and the Environment*. <https://doi.org/10.1002/bse.70078>
- Colasante, A., D'Adamo, I., Desideri, S., & Iannilli, M. (2026). Fashion, transparency, and sustainability: The role of the Digital Product Passport. *Euro-Mediterranean Journal for Environmental Integration*, 11(3). <https://doi.org/10.1007/s41207-026-01096-x>
- Consumers International. (2026). *Digital Product Passports: Putting consumers at the centre of Digital Product Passports*. Consumers International.
- Delmas, M. A., & Burbano, V. C. (2011). The drivers of greenwashing. *California Management Review*, 54(1), 64–87. <https://doi.org/10.1525/cmr.2011.54.1.64>
- European Commission. (2026). *Textile apparel and the Digital Product Passport*. European Commission.
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, 27(1), 51–90. <https://doi.org/10.2307/30036519>
- Harris, F., Roby, H., & Dibb, S. (2016). Sustainable clothing: Challenges, barriers and interventions for encouraging more sustainable consumer behaviour. *International Journal of Consumer Studies*, 40(3), 309–318. <https://doi.org/10.1111/ijcs.12257>
- Henninger, C. E., Alevizou, P. J., & Oates, C. J. (2016). What is sustainable fashion? *Journal of Fashion Marketing and Management*, 20(4), 400–416. <https://doi.org/10.1108/JFMM-07-2015-0052>
- Joo, H., Ko, S., Chun, B., & Koo, Y. (2026). Can Digital Product Passports become the next-generation eco-label? Analyzing consumer preferences for labeling using Digital Product Passports. *Journal of Cleaner Production*, 538, 147403. <https://doi.org/10.1016/j.jclepro.2025.147403>
- Kim, D. J., Ferrin, D. L., & Rao, H. R. (2008). A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents. *Decision Support Systems*, 44(2), 544–564. <https://doi.org/10.1016/j.dss.2007.07.001>



- Luchs, M. G., Naylor, R. W., Irwin, J. R., & Raghunathan, R. (2010). The sustainability liability: Potential negative effects of ethicality on product preference. *Journal of Marketing*, 74(5), 18–31. <https://doi.org/10.1509/jmkg.74.5.018>
- Macchion, L. (2026). Digital Product Passports in fashion: A strategic framework for implementation. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.70648>
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20(3), 709–734. <https://doi.org/10.2307/258792>.
- McNeill, L., & Moore, R. (2015). Sustainable fashion consumption and the fast fashion conundrum: Fashionable consumers and attitudes to sustainability in clothing choice. *International Journal of Consumer Studies*, 39(3), 212–222. <https://doi.org/10.1111/ijcs.12169>
- Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing*, 58(3), 20–38. <https://doi.org/10.1177/002224299405800302>.
- Niinimäki, K. (2010). Eco-clothing, consumer identity and ideology. *Sustainable Development*, 18(3), 150–162. <https://doi.org/10.1002/sd.455>
- Parguel, B., Benoît-Moreau, F., & Larceneux, F. (2011). How sustainability ratings might deter 'greenwashing': A closer look at ethical corporate communication. *Journal of Business Ethics*, 102(1), 15–28. <https://doi.org/10.1007/s10551-011-0901-2>
- Park, H. J., & Lin, L. M. (2020). Exploring attitude–behavior gap in sustainable consumption: Comparison of recycled and upcycled fashion products. *Journal of Business Research*, 117, 623–628. <https://doi.org/10.1016/j.jbusres.2018.08.025>
- Peattie, K., & Crane, A. (2005). Green marketing: Legend, myth, farce or prophesy? *Qualitative Market Research: An International Journal*, 8(4), 357–370. <https://doi.org/10.1108/13522750510619733>
- Stern, P. C. (2000). New environmental theories: Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407–424. <https://doi.org/10.1111/0022-4537.00175>
- Stookey, A. E., & Lang, C. (2026). Digital Product Passports in online fashion resale: Supporting circular fashion, transparency, and consumer trust. *Informatics*, 13(8), 121. <https://doi.org/10.3390/informatics13080121>
- Vermeir, I., & Verbeke, W. (2006). Sustainable food consumption: Exploring the consumer “attitude–behavioral intention” gap. *Journal of Agricultural and Environmental Ethics*, 19, 169–194. <https://doi.org/10.1007/s10806-005-5485-3>
- White, K., Habib, R., & Hardisty, D. J. (2019). How to SHIFT consumer behaviors to be more sustainable: A literature review and guiding framework. *Journal of Marketing*, 83(3), 22–49. <https://doi.org/10.1177/0022242919825649>
- Zhao, R., & Liu, C. (2025). Consumer acceptance of Digital Product Passports: The roles of technological awareness and value orientations. *Sustainability*, 17(23), 10878. <https://doi.org/10.3390/su172310878>