Digital Transparency in Fast Fashion Retail: The Impact of Digital Product Passports on Consumers' Buying Decisions

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Abstract

The European Commission has proposed mandatory implementation of Digital Product Passports (DPPs) for all textile and apparel products sold in the EU by 2030. Similar to traditional passports, DPPs will act as unique digital identifiers, offering detailed information about a product's lifecycle, including its origin, materials, environmental impact, and retail distribution. Drawing on signaling theory, a pilot and a main experimental study were conducted to understand how DPPs can signal a brand's commitment to product transparency and ethicality and influence consumer purchasing behavior. Moderated-moderation results show that perceived ethicality strengthens the positive impact of DPPs on willingness to pay only when perceived brand transparency is high, although it does not significantly affect purchase intentions. Overall, this research provides valuable theoretical and managerial insights into the transformative potential of DPPs as track-and-trace tools in enhancing product transparency and traceability within omnichannel fashion retail and how they can influence consumer purchasing decisions.

Keywords: *Digital Product Passport (DPP); brand transparency-ethicality; purchasing behaviors*.

Track: *Retailing & Omni-Channel Management*

1. Introduction

The fashion industry is one of the largest global industries, valued at over 1.7 trillion US dollars in 2023 (Statista, 2024). Yet, along with these numbers lies a dark reality. Environmental harm, excessive resource use, and labor exploitation—although unethical and unsustainable practices—are all common in this sector's supply chains (Carter & Rogers, 2008). Fast fashion drives significant issues, promoting a throwaway culture with low prices and quick trend shifts (Niinimäki et al., 2020).

In response to the numerous challenges facing the fast fashion supply chain, including retail, digital technologies have emerged as promising tools to increase transparency and accessibility (Heim, 2022). One of the most innovative solutions to address the sector's information asymmetry was introduced in March 2022 as part of the EU Strategy for Sustainable and Circular Textiles (European Commission, 2024). At the core of this strategy lies the implementation of Digital Product Passports (DPPs), which will become mandatory for textile and apparel products sold in the European Union by 2030 (Walden et al., 2024). Each DPP will serve as a unique product identifier and comprehensive digital repository of the product's life cycle, including information on materials and methods used in manufacturing, distribution, and retail networks, carbon footprint, and environmental impact (Heim, 2022). This innovative approach aims to enable authorities to carry out more effective checks and controls, empower consumers to make more informed purchasing decisions, and facilitate the repair and recycling of products (Götz et al., 2022). Ultimately, DPPs have the potential to revolutionize transparency, standardization, and data sharing in the sector (Walden et al., 2021).

Previous research has explored the technical aspects and requirements of the DPP system, including its digital infrastructure and industry-specific content (Jansen et al., 2023). However, there is still a gap in understanding how DPPs affect consumer purchasing behaviors, particularly purchase intentions (PI) and willingness to pay (WTP) in retail and omnichannel contexts. This is especially important in fast fashion, where consumer awareness of environmental and social impacts drives demand for transparency and traceability, influencing their PI and WTP (Lin et al., 2017; Mol, 2015). Drawing on Signaling Theory, this study investigates how a DPP can influence consumer PI and WTP and how this relationship is

moderated by consumer perceptions of the brand's transparency and consumer perceived ethicality.

2. Theoretical Background

2.1.1. Fashion Supply Chains

Supply chains are a major concern for sustainability in fast fashion due to their complexity and fragmentation from globalization, leading to a loss of control and accountability for companies (Rzyczycki, 2023). While many companies are adopting vertical integration, outsourcing further fragments these chains (Bubicz et al., 2021). Fast fashion involves sourcing raw materials from one region, manufacturing in another, and global distribution (Turker & Altuntas, 2014). Traceability is crucial for monitoring a product's supply chain, with emphasis from the UN Global Compact. At its core is the implementation of Digital Product Passports (DPPs), a new Eco-design for Sustainable Products Regulation (ESPR). This rule will apply to all products in the EU market, whether produced inside or outside the EU. Since most supply chains operate globally, the EU DPP rules will likely be felt worldwide, pushing the various suppliers, producers, and retailers to collect and report the required data. This tool promises a new era of transparency and accountability in assessing a product's life cycle through retail and omnichannel management. But what exactly is a DPP, and what information does it encapsulate?

2.1.1. Digital Product Passports for Clothing

The concept of a Digital Product Passport has been defined and expanded upon by various scholars and institutions, each adding details to its utility and implementation. The European Parliamentary Research Service (EPRS) defines a DPP as a data collection summarizing a product's components, materials, and chemical compounds, providing information on reparability, replacement parts, and disposal instructions (European Commission, 2024). From a technical perspective, Götz et al. (2022) explain that a DPP integrates a unique product identifier with data collected by various value chain actors, linking the product to its data via physical tagging. It also includes material traceability and sustainability data, offering standardized insights into production and retail impacts such as recyclability, carbon footprint, resource efficiency, and energy usage. This information will be linked to a unique digital data carrier, easily accessible via a QR code (Quick Response code),

RFID tag (Radio Frequency Identification tag), or other scannable technology at the point of sale.

1.2.2. Brand Transparency and Ethicality

Transparency can be broadly defined as the disclosure of information (Mol, 2015), reducing information asymmetry between stakeholders and promoting informed decision-making. Past research suggests that the key factor in brand transparency is not how the organization views it but how stakeholders perceive that transparency (Albu & Wehmeier, 2014; Taiminen et al., 2015). Other scholars add another dimension to this perception: the quality of the information. According to Foscht et al. (2018), transparency is fundamentally evaluated by the information's clarity, accuracy, and trustworthiness. This perspective emphasizes that transparency goes beyond mere information availability; it includes information credibility and reliability as consumers perceive it.

The fast-fashion industry encounters major challenges that require innovative solutions to improve transparency and traceability. Further, research by Jin and Lee (2019) also supports the idea that ethical perceptions influence consumer behavior. Despite the importance of these past studies, limited research has examined how a fashion brand's perceived ethicality and transparency interact when assessing product-related evaluation tools, such as detailed product descriptions (DPPs), and their impact on purchasing decisions.

Product transparency and traceability are vital indicators of a brand's commitment to ethical practices (Kim et al., 2019; Lin et al., 2017). By providing detailed supply chain information, brands can reduce information gaps and differentiate themselves in a competitive market. This aligns with signaling theory, which explores how informed parties communicate hidden information through signals (Spence, 1973). Signaling theory is important in retail as it explains how these signals influence consumer behavior (Erdem & Swait, 1998). DPPs can effectively convey product attributes like quality and sustainability, thereby signaling a brand's commitment to transparency and impacting consumer purchasing decisions. Thus, the presence of a DPP in a fast fashion product is expected to positively impact the predictive factors of consumer purchasing decisions, as outlined in the following hypotheses:

H1: A Digital Product Passport presence (vs. absence) in fast fashion products positively influences consumer purchasing decisions, so that: **H1a:** It enhances purchasing intentions; **H1b**: It increases willingness to pay.

Further, this research examines the moderating role of perceived brand transparency on the impact of DPPs on purchasing decisions. Kim et al. (2019) found that production transparency positively impacts purchase intentions, particularly when perceived as ethical. Additionally, Reck et al. (2022) suggest that perceptions of a brand's ethicality influence views on its transparency. This highlights the importance of understanding how perceived brand transparency and consumer perceived ethicality (CPE) interact to shape the effectiveness of DPPs in influencing purchasing behavior. Thus, it is hypothesized that the impact of DPPs on purchasing behavior will be moderated by perceived brand transparency, with CPE further strengthening this effect. As such, the strength of both perceived brand transparency and CPE will amplify the positive impact of DPPs on consumer behavior. The second set of hypotheses is thus proposed:

H2: The impact of perceived brand transparency on the relationship between the presence (vs. absence) of a Digital Product Passport label in fast fashion products and consumers' purchasing behaviors (purchase intention and WTP) is moderated by consumer-perceived brand ethicality., so that: **H2a:** This moderating effect will be stronger when consumer-perceived brand ethicality is high rather than low.

3. Methodology

3.1.1. Design and Procedure

Two experimental studies were conducted using the online platform Qualtrics, a pilot study and a main study, which followed a 2 (Digital Product Passport: no, yes) between-within-subjects design, with participants randomly assigned to one of the two conditions. The objective was to investigate how the presence or absence of the Digital Product Passport (DPP) label affected consumer purchasing decisions, specifically purchasing intentions and willingness to pay. Each scenario displayed one of the two possible labels affixed to that garment. The 'No DPP' scenario presented a label directly sourced from ZARA's website, representing a typical label that participants might encounter in real-life shopping situations. It included standard label information such as composition, care instructions, and country of origin. The DPP scenario featured a detailed fictitious label inspired by existing prototypes in the fashion industry, resembling ZARA's style. It included information like water consumption and CO2 emissions during the t-shirt's production, enhancing transparency and traceability.

3.1.2. Main Study Measures

All dependent variables were measured on seven-point scales.

Digital Product Passport presence was manipulated (no vs. yes).
Purchase intentions for a ZARA T-shirt were measured using a seven-point Likert scale (1 = Definitely would not buy; 7 = Definitely would buy).
Willingness to Pay (WTP) was assessed by asking how much respondents would pay (0 to 100 euros) for the T-shirt.
Perceived brand transparency was measured as the brand's accountability and clarity on a seven-point scale (1 = Strongly disagree to 7 = Strongly agree), adapted from Lin et al. (2017).
Consumer-perceived ethicality (CPE) was assessed with a six-item scale by Brunk (2012), such as "The company/brand respects moral norms," also on a seven-point scale (1 = Strongly disagree to 7 = Strongly agree).

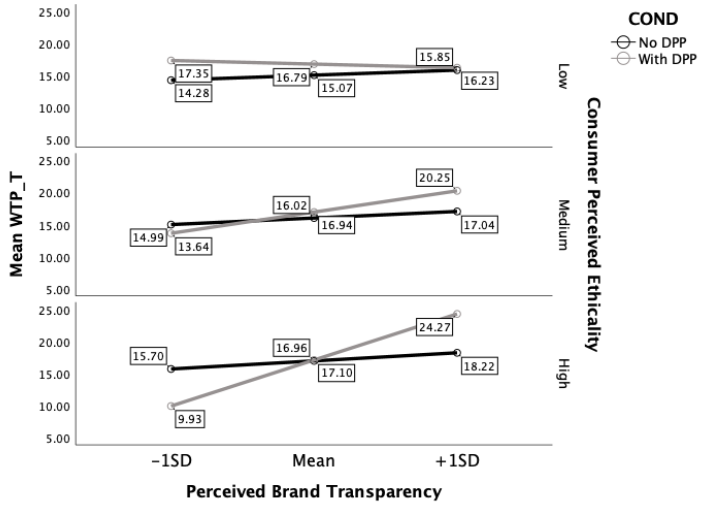
3.1.3. Main Study Results

A total of 176 participants (57.7% female and 42.3% male) participated in the main study. Manipulation checks worked as expected. To test hypothesis 1, the results revealed a statistically significant main effect of DPP presence on willingness to pay ($M_{No\ DPP\ Label}$ = 16.06, SD = 10.42; $M_{With\ DPP\ Label}$ = 20.33, SD = 13.04, $F(174) = 5.79$, $p < .05$), showing that participants were more willing to pay for products with a DPP label than for those without, fully supporting H1b. However, a statistically non-significant main effect of DPP presence (no vs. yes) on purchasing intentions ($M_{No\ DPP\ Label}$ = 4.76, SD = 1.49; $M_{With\ DPP\ Label}$ = 4.65, SD = 1.78, $F(174) = .178$, $p > .05$), rejecting hypothesis H1a.

To test the second set of hypotheses, a multiple regression analysis was conducted using Hayes' Process Macro software for SPSS, Model 3, to test for moderated-moderation. Results showed a non-significant two-way DPP label (no, yes) x Perceived Brand Transparency interaction effect (B = 1.58, SE = 2.10, $t(168) = .75$, $p > .05$, 95% CI = [-2.56 to 5.73]) and a non-significant two-way DPP label (no, yes) x CPE interaction effect (B = .68, SE = 1.59, $t(168) = .81$, $p > .05$, 95% CI = [-4.82 to 3.69]) on WTP. However, and more importantly, results revealed a statistically significant and positive three-way DPP label (no, yes) x Perceived Brand Transparency x CPE interaction effect on WTP (B = 1.80, SE = .83, $t(168) = 2.17$, $p < .05$, 95% CI = [.16, 3.44]). This indicates that the combined influence of DPP presence, perceived brand transparency, and CPE significantly impacts WTP. Further, a slope analysis was conducted to assess differences at one standard deviation below (-1SD) and above (+1SD) the mean. Specifically, significant differences in WTP were observed at high levels of perceived brand

transparency (+1SD) and high levels of CPE (*B*= 6.05, SE = 2.70, *t*(168) = 2.24, *p* < .05, 95% CI = [.71 to 11.38]). This finding suggests that products labeled with a DPP are likely to generate a higher willingness to pay when consumers perceive both high brand transparency and ethicality levels. Interestingly, results also show that when perceived brand transparency and ethicality are low, the presence of a DPP label is not a differentiating factor from a product that does not come with a DPP label, as it does not significantly affect differences in their willingness to pay (Figure 1). Concerning purchase intention, results showed a statistically significant and positive main effect of Perceived Brand Transparency on consumers' purchasing intentions (*B* = .41, SE = .19, *t*(168) = 2.13, *p* < .05, 95% CI = [.03 to .79]). Results also showed a non-significant two-way DPP label (no, yes) x Perceived Brand Transparency interaction effect on purchasing intentions (*B* = -.40, SE = .26, *t*(168) = -1.53, *p* > .05, 95% CI = [-.91 to .11]. Yet, a statistically significant and positive two-way DPP label (no, yes) x CPE interaction effect was verified (*B* = .60, SE = .26, *t*(168) = 2.28, *p* < .05, 95% CI = [.08 to 1.13]. This indicates that the impact of DPP's presence on purchasing intentions was positive and more pronounced for consumers with a higher perceived ethicality of the brand than those with a lower perceived ethicality. However, and contrary to expectations, a non-significant three-way interaction effect of DPP label (no, yes) × Perceived Brand Transparency × Consumer Perceived Ethicality on purchasing intentions was obtained: (*B* = -.06, SE = .10, *t*(168) = -.62, *p* > .05, 95% CI = [-.27 to .14]), partially supporting hypothesis 2.

Figure 1: Three-Way Interaction Effects on WTP



Discussion

The present research aims to understand the impact of DPP on consumers' purchase behaviors. The findings indicate that while a DPP positively affects consumers' WTP, it does not significantly influence their purchase intentions. Several factors may explain these results. Firstly, as a relatively new concept, DPPs may not be fully understood by consumers due to inexperience, leading to a disconnect between awareness and purchase intentions. Secondly, it shows a gap between a consumer's stated value for a product and their actual buying behavior. More importantly, a significant and positive three-way interaction was observed between the presence of a DPP, perceived brand transparency, and consumer-perceived brand ethicality on WTP. This finding highlights how the impact of perceived brand transparency is amplified by consumer perceptions of the brand's ethical considerations on their WTP for products when a DPP is present. The findings show that when consumers see a fast fashion brand as both transparent and ethical, a detailed product page (DPP) increases their willingness to pay more. Enhanced technological features, like detailed product information, improve brand transparency and perceived value, justifying higher prices (Vhatkar, et al., 2024).

Theoretical and Managerial Implications. Our findings support existing research indicating that consumers are willing to pay more for socially responsible and environmentally sustainable products, particularly when brands demonstrate transparency and ethical practices (Lin et al., 2017). It highlights how DPPs utilize digital technologies to provide accurate information about product sourcing and environmental impact, thereby enhancing credibility (Götz et al., 2022; Walden et al., 2021). In line with recent studies on improving supply chain transparency (Heim, 2022), this research applies signaling theory, showing that DPPs signal a brand's commitment to traceability and transparency (Erdem & Swait, 1998; Spence, 1973). The findings offer managerial insights into integrating DPPs strategically in fast fashion, promoting responsible innovation and alignment with consumer preferences for a more transparent retail future.

Bibliographic References

Brunk, K. H. (2012). Un/ethical company and brand perceptions: Conceptualising and operationalising consumer meanings. *Journal of Business Ethics*, 111(4), 551–565.

Bubicz, M. E., Barbosa-Póvoa, A. P. F. D., & Carvalho, A. (2021). Social sustainability management in the apparel supply chains. *Journal of Cleaner Production*, 280, 124214.

Carter, C. R., & Rogers, D. S. (2008). A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38(5), 360-387.

Erdem, T., & Swait, J. (1998). Brand equity as a signalling phenomenon. *Journal of Consumer Research*, 7(2), 131–157.

European Commission. (2024). *Digital product passport in the textile sector* (Draft version). EPRS | European Parliamentary Research Service, Scientific Foresight Unit (STOA), PE 757.813. Panel for the Future of Science and Technology.

Foscht, T., Lin, Y., & Eisingerich, A. B. (2018). Blinds up or down? The influence of transparency, future orientation, and CSR on sustainable and responsible behavior. *European Journal of Marketing*, 52(3/4), 476-498.

Götz, T., Berg, H., Jansen, M., Adisorn, T., Cembrero, D., Markkanen, S., & Chowdhury, T. (2022). Digital product passport: The ticket to achieving a climate neutral and circular european economy?

Heim, H. (2022). Digital fashion revolutions: supply chain transparency, digitalization and the non-disclosure paradox. *Fashion Practice*, 14(3), 329-351.

Jansen, M., Meisen, T., Plociennik, C., Berg, H., Pomp, A., & Windholz, W. (2023). Stop guessing in the dark: Identified requirements for digital product passport systems. *Systems*, 11(3), 123.

Jin, C. H., & Lee, J. Y. (2019). The halo effect of CSR activity: Types of CSR activity and negative information effects. *Sustainability*, 11(7), 2067.

Kim, T., Barasz, K., & John, L. K. (2019). Why am I seeing this ad? The effect of ad transparency on ad effectiveness. *Journal of Consumer Research*, 45(5), 906-932.

Lin, J., Lobo, A., & Leckie, C. (2017). The role of benefits and transparency in shaping consumers' green perceived value, self-brand connection and brand loyalty. *Journal of Retailing and Consumer Services*, *35*, 133-141.

Mol, A. P. (2015). Transparency and value chain sustainability. *Journal of Cleaner Production*, 107, 154-161.

Niinimäki, K., Peters, G., Dahlbo, H., Perry, P., Rissanen, T., & Gwilt, A. (2020). The environmental price of fast fashion. *Nature Reviews Earth & Environment*, 1(4), 189-200.

Reck, R., Castagna, A. C., Shuqair, S., & Pinto, D. C. (2022). The transparency paradox: When transparency cues help or backfire for brands? *Journal of Cleaner Production*, 372,

Rzyczycki, A. (2023). Sustainability in the fashion industry. *Journal of Multidisciplinary Research*, 15(1), 33-39.

Statista. (2024a). Revenue of the apparel market worldwide from 2018 to 2028. *Statista*. https://www.statista.com/forecasts/821415/value-of-the-global-apparel-market.

Spence, M. (1978). Job market signaling. In *Uncertainty in economics* (pp. 281-306). Academic Press.

Taiminen, K., Luoma-Aho, V., & Tolvanen, K. (2015). The transparent communicative organization and new hybrid forms of content. *Public Relations Review*, 41(5), 734-743.

Turker, D., & Altuntas, C. (2014). Sustainable supply chain management in the fast fashion industry: An analysis of corporate reports. *European Management Journal,* 32(5), 837.

Vhatkar, M. S., Raut, R. D., Gokhale, R., Kumar, M., Akarte, M., & Ghoshal, S. (2024). Leveraging digital technology in retailing business: Unboxing synergy between omnichannel retail adoption and sustainable retail performance. *Journal of Retailing and Consumer Services*, *81*, 104047.

Walden, J., Steinbrecher, A., & Marinkovic, M. (2021). Digital product passports as enabler of the circular economy. *Chemie Ingenieur Technik*, 93(11), 1717-1727.