

A PRODUCT SUSTAINABILITY UNDERSTANDING TOOL -A MODEL WITH SCOPE AND ATTRIBUTES

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ABSTRACT:

The principle of Digital Product Passports (DPPs) has proven to be a vital tool in supporting sustainability, transparency, and accountability in industries. By offering product-related information on material procurement, environmental performance, social processes, and lifecycle management, DPPs fill the disconnect between cumbersome sustainability regulations and consumer knowledge. This study delves into the extent, characteristics, and uses of DPPs, especially in the apparel and fashion industry, where traceability and circularity are increasingly becoming market and regulatory requirements. The research also identifies the ways in which DPPs can get businesses aligned with international sustainability standards, enable compliance with changing EU legislation, and build consumer confidence through open exchange of information.

KEYWORDS: Circular economy, Digital Product Passport (DPP), EU regulations, fashion industry, lifecycle management, sustainability, transparency.

I. INTRODUCTION

Sustainability is no longer a choice; it is an urgent global imperative. As climate change accelerates, driven largely by industrial carbon emissions, its far-reaching effects have become impossible to ignore. Governments, organizations, and individuals are all grappling with the consequences—extreme weather events, rising sea levels, and the destabilization of ecosystems. The United Nations Sustainable Development Goals (UN SDGs) have placed this crisis at the forefront of global attention, compelling nations to act decisively. In response, governments are enacting stricter regulations to ensure the goods entering their markets meet sustainable production standards. This shift is especially significant for manufacturing hubs across Asia and South Asia, which supply a vast portion of exports to the EU, US, and UK. These regions are now under increasing pressure to prove that their products meet environmental and ethical benchmarks. Accountability for a product's entire lifecycle—from raw material extraction to end-of-life disposal—is becoming an expectation rather than an exception.

Customers are also driving this change. Today's buyer is dissatisfied with weak promises. They want to be sure that the products they purchase are made in a way that respects the environment and society. However, most consumers don't engage with technical jargon or complex certifications. They seek clarity, simplicity, and assurance that their choices align with their values—without having to decipher a maze of data. The growing need for transparency has enabled tools such as the Digital Product Passport (DPP). A DPP serves as a concise, accessible record of a product's environmental and social impact, detailing metrics like carbon emissions, water usage, and labour conditions. By offering this information in a user-friendly format, the DPP empowers consumers to make informed decisions while holding brands accountable for their sustainability claims. In today's rapidly evolving landscape, tools like the DPP are not just helpful—they are essential. They bridge the gap between technical complexity and consumer awareness, driving a collective shift towards a more sustainable future for industries, governments, and individuals alike [1].

II. A TOOL FOR CONSUMERS, STAKEHOLDERS, INVESTORS OR GENERAL - DPP

A "product passport" is a set of data pertaining to a product that can be electronically accessed through a data carrier in order to "electronically register, process, and disseminate product-related information among supply chain enterprises, authorities, and

consumers," according to the European Commission (EC). The DPP provides critical details about a product's origin, composition, and options for repair, disassembly, and end-of-life management, such as recycling or safe disposal.

By providing easy access to this data, the DPP facilitates the expansion of circular economy initiatives. The Digital Product Portfolio is likely to contain the following information:

- Examples of fundamental product data include the product name, make, model, batch number, manufacture date, and warranty details.
- Material data: This comprises the locations of component and raw material origins as well as the vendors utilized for sourcing.
- Ownership information: Specifics on previous and present owners (particularly important for durable goods that can be sold and resold).
- Repair data: Details regarding the product's general repairability as well as particular repair occurrences and causes.
- Sustainability data: This includes the usage phase's carbon impact and the production and distribution operations'

For consumers and stakeholders, the DPP serves as a valuable resource, highlighting the sustainability characteristics of products and materials. It empowers informed decision-making and strengthens transparency, making it easier to align purchases or operations with environmental and ethical standards. Ultimately, the DPP is necessary to create a more sustainable circular economy [1][2].

Why Is It Important to Have a Digital Product Portfolio?

The DPP offers valuable information to businesses and consumers alike.

The DPP provides both companies and customers with useful information. For companies, it centralizes supply chain data, fostering transparency and confidence across internal teams and external stakeholders.

- **Promoting Sustainability and Circular Economy**

By managing resource flows and encouraging sustainable sourcing, the DPP supports eco-friendly practices. It also promotes circularity by enabling repair, recycling, and reuse, thus creating opportunities for circular business models such as resale and rental services.

- **Improving Performance and Ensuring Compliance**

By fulfilling environmental disclosure obligations and lowering the risk of non-compliance, the DPP promotes regulatory compliance. Additionally, it helps brands make the shift to more environmentally friendly business models by facilitating lifecycle assessments and the creation of sustainability indicators.

- **Supporting Comprehensive Lifecycle Management**

Beyond manufacturing, the DPP tracks post-sale activities, offering insights into product usage and durability. It also prepares companies for effective end-of-life management by aligning with Extended Producer Responsibility (EPR) principles and enabling better recycling processes.

- **Driving Market Differentiation and Trust**

Through enhanced transparency, the DPP offers a competitive edge by creating a unique customer experience. It also ensures product authenticity, particularly in luxury segments, protecting brands against counterfeiting while maintaining resale value and consumer trust [3].

III. SCOPE AND DIMENSION OF DPP

DATA COLLECTION & NEEDS

A wide range of data types can be gathered and then disseminated throughout entire ecosystems and value chains when evaluating Digital Product Passports in terms of their present and future usefulness.

General Details

Important product information like IDs, batch numbers, manufacturing sites, and operator data are captured by the general category. This foundational information ensures traceability and helps consumers verify product authenticity, safeguarding against counterfeit purchases.

Transparency of Sources

The types and sources of the chemicals, parts, and raw materials used in manufacturing are described in this category.

It contains information about recovered or recycled resources as well as the manufacturing process sustainability, including ethical compliance. Customers may, for example, confirm ethical sourcing or green claims, which increases customer confidence in sustainable businesses.

Environmental Footprint

The DPP tracks environmental metrics, including carbon emissions, waste generation, and resource utilization across the product lifecycle. It quantifies impacts such as energy usage or emissions during production and highlights recyclable materials, helping brands and consumers assess sustainability performance.

Trail of Ownership

A detailed account of previous and present ownership is kept, documenting the times and events of transfers.

For resale marketplaces where ownership history adds legitimacy and value, like luxury products or used apparel, this feature is extremely beneficial.

Maintenance History

The maintenance category logs repair activities, detailing the location, costs, and nature of repairs. This provides stakeholders with a comprehensive view of a product's durability and repairability. For example, a luxury watch's repair history stored in the DPP offers transparency to both current owners and prospective buyers.

Digital Documentation

Important documents including guarantees, insurance, service records, and warranties are kept in the DPP. This guarantees smooth claim validation and streamlines administrative procedures.

For example, a vehicle owner can use the DPP to redeem service benefits without manual documentation.

Lifecycle Instructions

Guidelines on repair, refurbishment, disassembly, and recycling are included in this category, enabling stakeholders to manage the product's end-of-life responsibly. These guidelines encourage reuse and a smooth transition to remanufacturing, which advances the circular economy [4].

DPP CARRIER METHOD – DATA CARRIER SOFTWARE

The system that gives end users access to the Digital Product Passport associated with a certain product is referred to as a data carrier. According to current EU guidelines, companies will be allowed to choose the data carriers they use for every given product, batch or kind. Data carrier types appropriate for DPPs include:

QR CODE: Currently widely used for a variety of purposes across numerous industries and businesses, the QR code might be regarded as the standard data carrier. QR codes are well known for their resilience in addition to being simple to link to smart devices. Because its main purpose is to store product-based data rather than serve as a conduit between a user and a webpage (which may have the relevant DPP)

BARCODE: It is a similar option to the QR code carrier type, although it has less flexibility in terms of data held and value.

NFC- Already used for contactless payments, NFC is similar to QR codes in that it can be accessed by the majority of modern smart devices, however they are more expensive because they are essentially standalone hardware devices (stickers with embedded antenna and microprocessor. The ability to be placed "inside" a product rather than "outside," which offers additional security benefits, is one of NFT tags' main advantages over QR and barcodes [5].

IV. KEY SUSTAINABILITY REGULATIONS

FIRST – 1 - EU REGULATIONS

The textile and fashion industry in the EU is facing growing pressure to comply with a range of sustainability regulations. These include requirements for detailed environmental reporting, circular product design, and stricter waste management practices. As sustainability becomes a key driver in the industry, businesses must adapt to meet these new standards and maintain their market position. The broader Circular Economy Action Plan (CEAP) encompasses almost all of the European Union's ongoing or planned projects [6].

Eco-design for Sustainable Products Regulation (ESPR): The Eco-design for Sustainable Products Regulation (ESPR), which takes effect on July 18, 2024, aims to improve the sustainability of products in the EU market. It broadens the scope of the previous Eco-design Directive to cover almost all physical items, with a focus on enhancing circularity, energy performance, recyclability, and durability. The law establishes requirements for reducing environmental and climate footprints, encouraging a circular economy, and fostering the growth of a strong market for sustainable products. The EU's approach on circular and sustainable textiles: By 2030, all textile items sold in the EU are expected to be "durable, repairable, and recyclable, to a great extent made of recycled fibers, free of harmful compounds, created in respect of social rights and the environment," according to the strategy. DPP will be used to provide improved product information, allowing customers to verify the firms' green claims and regulatory bodies to monitor sustainability compliance [7].

SECOND – 2 – EU

Carbon Border Adjustment Mechanism (CBAM): The CBAM (Carbon Border Adjustment Mechanism) Regulation, which takes effect on October 1, 2023, attempts to establish a fair price for carbon emissions embedded in commodities imported into the EU. During the transition period (October 2023 to December 2025), importers must meet new reporting and administrative requirements for emissions in imported goods. Beginning in January 2026, importers will be required to obtain CBAM certificates to offset emissions. This rule primarily affects EU-based enterprises and their supply chains who are required to report emissions and production data from international suppliers [8].

THIRD – 3 - EU Corporate Sustainability Reporting Directive (CSRD):

The Corporate Sustainability Reporting Directive (CSRD) mandates firms to provide extensive social, environmental, and governance information beginning in January 2023. It broadens the reach to encompass more companies, hence improving transparency for investors and stakeholders. The CSRD seeks to standardize reporting to save money and improve consistency in sustainability disclosures, with the first reports due in 2025 [9].

Adopting the Digital Product Passport (DPP) will assist businesses in not only meeting sustainability objectives, but also complying with evolving EU laws such as the CSRD and Ecodesign Regulation. It will be employed as the means of facilitating these mechanisms and achieving the objectives. DPP's streamline reporting by allowing organizations to better track product data, material sourcing, and environmental impacts, ensuring they remain ahead of regulatory obligations and preserve supply chain transparency.

This proactive approach helps organizations negotiate the increased demand for sustainability while also reducing the complexity of regulatory compliance.

V. THE FASHION APPAREL INDUSTRY’S DPP

The digital product passport provides a comprehensive view of the product's (shirt) journey, from the initial sowing of cotton to the final transportation of the shirt, integrating key factors that impact both the environment and society. It starts with product information, such as material composition and sourcing details, emphasizing environmental metrics like carbon emissions, water usage, and waste management. Social aspects, including labour conditions, fair wages, and ethical practices, are documented to ensure compliance with sustainability and human rights standards. End-of-life considerations, such as recycling and disposal options, highlight the product's contribution to a circular economy. Lastly, certifications and labels, like organic material or fairtrade verifications, validate the product’s adherence to industry sustainability standards.

PART 1

Product Information: Product information is any data maintained by a company on the goods it makes, buys, markets, or distributes [10].

Product Information	
1	Brand name and logo
2	Product name and description / Product ID
3	Material composition (recycled / certified content)
	a) Shell / Lining
	b) Trimmings
4	Size and colour options
5	Batch no’s / reference Nos
6	Weight / Volume
7	Date of manufacturing / Manufacturer ID

Table 1 Product Information

PART 2

Environmental Footprint: The product's possible environmental impact over the course of its lifecycle, including emissions during transportation and disposal, as well as the quantity of greenhouse gasses, water, and other resources utilized in its production [11].

Environmental Impact	
Carbon footprint	GHG emissions volume generated during the production, transportation, and disposal of the shirt
Water usage	Amount of water consumed in the manufacturing process, including water for growing cotton and textile dyeing.
Energy consumption	Energy used in manufacturing and transportation.
Traceability (Place/Mill)	Traceability at the place or mill level involves identifying and recording specific details about where raw materials are sourced and processed. For example, it tracks which farm, mine, or forest the raw material originates from, and the mill or facility where it is converted into usable inputs.

Table 2 Environmental Impact

Environmental Impact Phases			
Phase	Carbon footprint (Kgs of Co2e)	Water usage (Litres)	Energy consumption (Kwh)
Agriculture phase + transport	Assess emissions from irrigation systems. Account for emissions from soil cultivation methods.	Optimize water use with efficient irrigation techniques like drip and precision systems, recycle runoff water, and select low-water cotton varieties to reduce water consumption in agriculture.	Energy-efficient farming practices, renewable energy sources like solar power for operations.
	Optimize transport modes (sea, air, water, road) by tracking fuel emissions (diesel, petrol, gas)		
Yarn+ Fabric phase + transport	Use energy-efficient spinning, dyeing,	Use water-efficient equipment and technologies	Use energy-efficient machines, looms, and knitting machines to

	finishing machinery and manage chemical treatments sustainably.	to reduce water usage, and treat waste water for recycling and reuse. Minimize water contamination through better chemical management and explore waterless processes.	save energy in yarn production. Add heat recovery systems and use renewable energy in the fabric production process. .
	Optimize transport modes (sea, air, water, road) by tracking fuel emissions (diesel, petrol, gas)		
Garmenting transport	Measure emissions from sewing and washing processes, and energy used by machinery.	Adopt sustainable washing methods like ozone or enzymatic treatments, use low-water machinery, and implement water recycling systems.	Enhance sewing efficiency, adopt lean manufacturing to reduce energy use and waste, and transition to renewable electricity in production and transport.
	Optimize transport modes (sea, air, water, road) by tracking fuel emissions (diesel, petrol, gas) and prioritizing low-carbon options.		
Use Phase	Encourage sustainable washing and garment care practices, repair, and upcycling.	Promote durable garments with low-impact wash care practices to reduce water and use.	Promote energy-efficient practices in retail and promote sustainable washing and drying practices too.
Disposal	Quantify emissions from landfill or recycling	Recycling and upcycling reduce the need for water-intensive disposal processes	Encourage circular economy practices and use biodegradable materials to minimize environmental impact.

Table 3 Environmental Impact Phases

PART 3

Social Impact: Details regarding the working conditions of those who make the product and any possible effects on human rights that may arise from its usage or manufacture [12].

Social Impact	
Labor conditions	Assurance that the shirt was produced under fair labor conditions, possibly including certifications like Fair Trade or information about the manufacturer's labor practices
Supply chain transparency	Country where the shirt was manufactured / efforts to ensure ethical practices throughout the supply chain.
Community impact	Any positive contributions the brand makes to the communities where its products are produced, such as supporting education or healthcare initiatives.

Table 4 Social Impact

Social Impact				
1	Labour conditions	Fair trade Ensure workers are paid fairly and work in safe conditions, free from child or forced labor. Support ethical practices that treat workers and communities with respect.	Supplier audits and standards Regularly check suppliers to ensure they follow fair labor laws and working conditions. Hold suppliers accountable for treating workers ethically and responsibly.	Certification and standards Choose products certified by trusted standards like Fair Trade or WRAP to ensure good labor practices. Support brands committed to responsible labor and environmental standards.
2	Supply chain transparency	Supplier audits Regularly check suppliers to make sure they are following ethical and sustainable practices. Audits help ensure they meet environmental and social standards.	Supplier code of conduct, ethical practices Set clear rules for suppliers to follow, focusing on ethical sourcing and responsible practices. Make sure suppliers treat workers fairly and follow environmental guidelines.	Social compliance, logistics partners certifications Choose logistics partners and suppliers with trusted certifications like Fair Trade or Organic. This ensures everyone in the supply chain meets ethical and social standards.

3	Community impact	Community programs Ensure local communities benefit from agricultural practices, job creation, and skills development. Collaborate with local organizations to support economic growth and sustainable livelihoods.	Support healthcare or education initiatives Provide healthcare and safety standards for workers, and offer education or training programs to improve skills and income levels. Invest in community well-being and opportunities for growth.	Cultural Preservation and Heritage Support local artisans and traditional craftsmanship, preserving cultural heritage while creating economic opportunities. Incorporate local traditions and craftsmanship into the production process to sustain cultural identities.
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Table 5 Social Impact Measures

PART 4

Use phase and End-of-Life Considerations:

It seeks to reduce waste by designing out pollution, keeping products and materials in use for as long as possible, and then recovering or recycling them once they have reached their end of life.

Use phase and End-of-Life Considerations	
1.Care Category	
a) Washing Instructions	Wash in cold water to extend garment life; use eco-friendly settings on machines.
b) Detergents	Use biodegradable detergents; measure dosage accurately.
c) Drying Instructions	Air dry garments; avoid tumble drying where possible.
d) Ironing Instructions	Iron on appropriate settings; avoid ironing where not necessary.
e) Storage Instructions	Store garments in a cool, dry place; avoid exposure to direct sunlight for prolonged periods.
2. Disposal/Recycling information	
a) Importance of Recycling This Product:	Environmental Benefits: Recycling lessens its influence on the environment, saves resources, and decreases trash. Economic Benefits: Recycling saves money by reducing disposal costs and recovering valuable materials.
b) Recyclable Materials:	Recyclable Components: Identify parts that can be recycled, like fabric, buttons, and zippers. Some parts may need to be separated before recycling.
c) Recycling Process	Processing Details: Explain how the product's materials are recycled. End Products: Highlight new products that can be made from recycled materials, such as new clothing, insulation, or cleaning rags.
d) Consumer Education and Engagement	Join Recycling Programs: Tell customers how they can join recycling programs by returning old products. Share where to drop them off or partner with organizations that collect and recycle items.

Table 6 Use phase and End-of-Life Considerations

PART 5

Certifications and Labels: Certifications or labels indicating the shirt's sustainability credentials, such as organic certifications, recycled content certifications, or eco-friendly manufacturing standards [13].

Category	Certifications	Purpose
1. Process certifications- a) Raw material sourcing	Global Organic Textile Standard (GOTS)	Ensures environmental and social compliance across the textile supply chain.
	Organic Content Standard (OCS)	(OCS) confirms that products (such organic cotton) include organic materials.
b) Manufacturing process	OEKO-TEX® Standard 100	Certifies textiles are free from harmful substances.
	Bluesign® System	Focuses on the sustainable and responsible use of resources in textile production, ensuring environmental, health, and safety standards.
	Cradle to Cradle Certified	Assesses products and materials based on their environmental and social performance throughout their lifecycle.
2. Product certifications	Fair Trade Certified	Certified Fair Trade confirms that goods fulfill stringent economic, social, and environmental requirements.
	Carbon Trust Certification	Verifies carbon reduction claims, helping companies manage and reduce their carbon footprint across their operations and products.
	Recycled Content Standard (RCS)	The percentage of recycled content in a product is certified by the Recycled Content Standard (RCS).
3. Factory certifications	WRAP Certification (Worldwide Responsible Accredited Production):	Guarantees adherence to moral workplace norms.
	SA8000	Addresses social accountability, including fair wages, workplace safety, and freedom of association.
	ISO 14001	Helps companies manage environmental impacts and improve sustainability practices.
4. Campaigns	Feedback and Surveys:	Collects consumer feedback via QR codes for better sustainability practices.
	Social Media and Campaigns:	Encourages sharing and eco-friendly participation via social platforms.
5. Sustainability Commitments	Company Initiatives:	Share information about the company's sustainability initiatives and goals related to recycling and environmental responsibility.
	Impact Metrics:	Shares recycling impact data, like waste reduction or carbon savings.

Table 7 Certifications and Labels [14]

PART 6

QR Code or Website Link and Data Carrier of DPP

QR Codes or website link do just that by linking in-store products to Internet resources, enhancing the value of the shopping experience for buyers. QR codes can be integrated on the Product Tag to display all the above said information. This allows the consumers to verify the authenticity of sustainability claims and certifications by scanning the QR code. A DPP enhances transparency and engagement by providing consumers with direct access to detailed product information through QR codes or website links.

Example- Imagine a company selling sustainable cotton T-shirts. QR codes integrated into the product tags can link to detailed information about the T-shirt's lifecycle as depicted in the table,

Category	QR code / Website link purpose
1. Product Information	Links to manufacturing details, certifications (such GOTS and recyclable content), and the sources of the materials.
2. Care instructions	Provide tips on eco-friendly practices like washing in cold water, air drying, and repairing to reduce energy use and extend the product's life, delaying the need for replacements.

3. Recycling instructions	Offer clear guidance on recycling methods, including local centers, take-back programs, mail-in options, and maps of nearby collection points to facilitate easy participation.
4. Environmental Impact	Infographics showing the water and energy saved by using organic cotton and eco-friendly manufacturing processes.
5. Company Sustainability Goals	Updates on the company's progress towards its goal of using 100% renewable energy in its factories by 2025.
6. Consumer Engagement	Link to a social media campaign where customers can share photos of their T-shirts and sustainability tips, with the hashtag #EcoCottonLife.

Table 8 QR code / Website link purpose

Integrating QR codes and website links into DPPs promotes transparency and aligns with consumer demand for sustainable practices. This interactive approach enhances brand trust and empowers users to make informed, eco-conscious choices [15].

Additional components in DPP:

In addition, a product sustainability passport can include several other elements to provide a comprehensive overview of the product's sustainability profile and value proposition. Here are some additional components that can be included,

- **Lifecycle Analysis:** Analyse the shirt's lifecycle to find areas for improvement by assessing the environmental impact at each stage, including the sourcing of materials, production, distribution, use, and disposal.
- **Renewable Energy Use:** Emphasize how solar, wind, or other renewable energy sources are used in the manufacturing process to lower carbon emissions.
- **Sustainable Packaging:** To reduce waste, use recyclable, biodegradable, or recycled packaging materials.
- **Transparent Supply Chain:** Ensure ethical material sourcing and traceability while avoiding deforestation, unfair labour practices, and other risks.
- **Waste Minimization:** Use methods to reduce waste during production, such as recycling scraps, reusing resources, or switching to zero-waste manufacturing processes.
- **Social Responsibility:** Highlight the brand's dedication to the welfare of society by showcasing programs that promote fair wages, volunteer work, and charitable donations.
- **Durability and Longevity:** To increase shirts' longevity and lessen the need for frequent replacements, create designs and materials that are sturdy.
- **Customer Engagement:** To encourage environmentally conscious behaviour, offer advice on sustainable use, such as low-impact washing, mending, and appropriate disposal options.
- **Innovation Commitment:** Showcase the brand's commitment to ongoing development by setting specific objectives, implementing sustainable innovations, and providing frequent updates on its status.

By including these additional elements in the product sustainability passport, brands can offer a more holistic view of their sustainability efforts and inspire confidence in consumers who prioritize environmentally and socially responsible products.

Examples of DPP:

Example 1: Chinti & Parker Use of Digital Product Passports (DPP)

The luxury fashion company Chinti & Parker has taken a big step toward sustainability and transparency by introducing Digital Product Passports (DPP). This feature offers comprehensive information about the materials, production process, and environmental impact of each garment. It was first introduced in their Peanuts collaboration and was later expanded to the AW24 Main and Autumn Basics collections. To ensure transparency and traceability, customers can obtain this information by scanning a QR code that is embedded on the care label.

The DPP enables customers to comprehend the entire lifecycle of the garment, from the procurement of raw materials to the manufacturing process, thanks to Chinti & Parker. According to co-founder Rachael Wood, this project provides information about their "from Goat to Garment" journey. The Peanuts partnership demonstrates the brand's commitment to fusing sustainability and style by further fusing whimsical designs with environmental responsibility. By embracing DPP, Chinti & Parker strengthens their goal to create a more sustainable future by establishing a standard for "transparent shopping practices" in the fashion sector and enabling consumers to make knowledgeable decisions [16].

Example 2: Nobody's Child

Nobody's Child, a sustainable fashion brand, has launched its second Digital Product Passport (DPP) pilot to enhance transparency and traceability in its clothing collections. Through this initiative, consumers can scan a QR code incorporated into the care label to follow the path of their clothing from design to production. Customers can gain insight into the lifecycle of their clothing by scanning the QR code, which offers comprehensive information on materials, manufacturing procedures, and environmental impact.

The DPP pilot offers a novel feature: customers can claim exclusive gifts like a unique non-fungible token (NFT), which functions as a digital receipt kept in a Coinbase wallet. This feature is featured in the Nobody's Child x Happy Place by Fearné Cotton SS24 collection. The technology also facilitates blockchain-based product provenance validation, which is in line with the rental and pre-owned markets by allowing traceability as goods are transferred.

Jody Plows, CEO of Nobody's Child, highlighted that "Our DPP embodies our commitment to transparency and accountability, fostering a deeper connection between customers and their clothing while encouraging conscious consumption." Starting with AW24, the DPP initiative will be extended to the brand's core collection, utilizing technology driven by Fabacus and their Xelacore platform. This platform ensures a thorough understanding of the impact of each garment by capturing and translating more than 100 data points. Nobody's Child leads the way in fusing technology and sustainability through its DPP pilot, giving consumers the resources they need to make wise and conscientious purchases [17].

DPP solutions have also been used by luxury brands to combat counterfeiting and confirm the authenticity of their products. Panerai, a well-known luxury watchmaker, uses DPPs to help customers verify the technical specifications and authenticity of their watches. Companies like Simple Chic, Tammam, and Born+Berg have advanced their DPP in terms of the completeness of the information they provide, outlining important components that are probably required for the final version of the DPP [18]

VI. CONCLUSION

The Digital Product Passport (DPP) is a revolutionary system that harmonizes industrial practices with worldwide sustainability objectives. It provides open data about sourcing, lifecycle footprint, and ethical fulfillment, enabling consumers to make responsible decisions while assisting enterprises in meeting compliance requirements. Its application to the fashion and textiles industry shows promise in driving circularity, lowering environmental footprints, and fostering greater stakeholder confidence. Finally, DPPs are not merely compliance mechanisms but strategic facilitators to a sustainable and competitive future.

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