

The EU's Digital Product Passport (DPP) and its Potential Impact on Bangladesh

Introduction

In an era of increasing consumer demand for transparency and sustainability, the European Union (EU) is pioneering a transformative initiative known as the Digital Product Passport (DPP). Set to become mandatory for nearly all products sold in the EU by 2030, the DPP aims to revolutionize product information and lifecycle management. This research paper delves into the intricacies of the DPP, exploring its purpose, benefits, and potential challenges, with a particular focus on its implications for Bangladesh, a major exporter to the EU.

As a significant player in the global textile and apparel industry, Bangladesh faces both opportunities and challenges in adapting to the DPP's requirements. This paper examines the potential impact of the DPP on Bangladesh's export sector, analyzing the economic, social, and environmental dimensions of this new regulatory landscape. By understanding the intricacies of the DPP and its implications, Bangladeshi businesses can proactively prepare for this shift, ensuring compliance while capitalizing on the opportunities it presents.

What is the Digital Product Passport (DPP)?

The Digital Product Passport (DPP) is a comprehensive digital record providing detailed information about a product throughout its entire lifecycle¹. It acts as a digital identity card for products, storing valuable data on sustainability performance, recyclability, and environmental impact². This data includes details about manufacturing, such as involved processes, composition, parts, materials, and substances; usage, including how the product is utilized during its lifecycle; end-of-life management, such as options for recycling, reuse, or safe disposal; and compliance data, such as proof of compliance with ESG laws and conformance to sustainability standards³. The DPP aims to close the gap between consumer demands for transparency and the current lack of reliable product data¹.

The technology stack supporting DPPs includes several essential components:

- **Reliable and Secure Data Storage:** Using technologies such as centralized cloud-based product databases, distributed ledger technology (DLT), or blockchain, these serve as a secure and decentralized storage solution for the data contained in DPPs⁴.
- **Big Data:** The analytics associated with big data facilities help identify the important data elements that should be included in a DPP. Organizations can employ big data analytics to improve practices and processes through actionable insights obtained from the information on a DPP⁴.
- **Cloud Computing:** The cloud provides the storage and computing infrastructure necessary for the effective use of DPPs. Cloud providers implement robust security, ensuring all data is kept secure and privacy is maintained. Cloud solutions can be integrated with business-critical systems to drive efficient use of DPP data⁴.
- **Internet of Things (IoT):** Devices such as Near Field Communication (NFC), UHF Radio

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Frequency Identifier (RFID) tags, or ambient IoT Pixels enable a DPP to be updated with real-time information concerning an item's location, condition, and usage ⁴.

- **QR Codes:** QR codes offer a low-cost method of accessing the data on a DPP. Consumer devices such as smartphones and dedicated scanning equipment enable immediate access to a DPP's wealth of information ⁴.
- **APIs:** The use of application programming interfaces (APIs) facilitates communication between DPPs and diverse software applications that process their data. Real-time updates are supported via APIs to ensure the information on a DPP is current and accurate. An API can be used to strengthen security by encrypting data and providing additional protection against threat actors ⁴.

Importance of the DPP

The DPP is important because it contributes to a more traceable, transparent, and sustainable product lifecycle ⁵. By providing detailed information about a product's journey, the DPP empowers consumers to make informed choices, encourages businesses to adopt sustainable practices, and helps regulators enforce environmental standards.

Traceability: The DPP enhances product traceability by creating a digital record of the product's journey through the supply chain ⁶. This includes information on the origin of raw materials, manufacturing locations, and distribution channels. This traceability helps to ensure the authenticity and quality of products, while also enabling better supply chain management and risk mitigation ⁷.

Transparency: The DPP promotes transparency by making detailed product information readily available to consumers and other stakeholders ⁸. This transparency helps to build trust and allows consumers to make informed decisions based on a product's environmental impact, social responsibility, and ethical sourcing.

Sustainability: The DPP supports sustainability by encouraging the design, production, and consumption of products that are durable, repairable, reusable, and recyclable ⁹. By providing information on a product's environmental footprint, the DPP incentivizes businesses to adopt more sustainable practices and reduce their impact on the planet.

Combating Counterfeiting: With product counterfeiting being a significant issue, especially in food and consumer electronics, a digital passport can verify the authenticity of a product, ensuring safety and quality ¹⁰.

Resale Value: A DPP can be used to inform resale value, specifically in the context of electric vehicles. For example, an electric vehicle's battery passport could tell you where the battery's components were originally mined; what proportion of the lead, cobalt, lithium, and other elements was sourced from recycling (good) instead of mining (less good); and an indication of battery health, which might inform resale value ⁸.

Purpose of the DPP

The DPP initiative is driven by several key goals, all aimed at promoting sustainability and

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responsible consumption:

- **Transparency:** The DPP provides detailed product data, including origin, materials, environmental impact, and recyclability, making this information electronically accessible to all stakeholders across the value chain ¹¹. For example, a consumer could scan a QR code on a garment to learn about the materials used, the factory where it was made, and its environmental impact.
- **Sustainability:** By sharing information on carbon emissions, resource use, and recyclability, the DPP promotes eco-friendly production and consumption ¹¹. This encourages businesses to reduce their environmental footprint and consumers to make more sustainable choices.
- **Traceability:** The DPP enables the tracking of a product's lifecycle from raw materials to disposal, improving supply chain visibility and accountability ¹¹. For instance, a DPP for a smartphone could track the journey of the device from the mining of its components to its eventual recycling.
- **Product Quality and Safety:** The DPP ensures compliance with safety and quality standards by providing access to certifications, instructions, and test results ¹¹. This helps to ensure that products meet safety regulations and perform as expected.
- **Consumer Empowerment:** Consumers can access verified product data on sustainability, ethical sourcing, and environmental impact, enabling them to make informed purchasing decisions ¹¹. This empowers consumers to support businesses that align with their values.
- **Circular Economy:** The DPP encourages longer product lifespans by providing details on repairability, reusability, and the presence of hazardous materials, ultimately reducing waste ¹¹. This promotes a circular economy where products are kept in use for longer and resources are used more efficiently.

EU Regulations for the DPP

The DPP is primarily governed by the Ecodesign for Sustainable Products Regulation (ESPR), which came into effect on July 18, 2024 ¹². The ESPR outlines the key requirements for DPP creation, access, and data sharing ¹². It mandates that all products placed on the EU market must have a DPP that complies with the regulation ¹². While the ESPR did come into effect on that date, the mandatory implementation of DPPs for most products is expected to be phased in by 2030 ⁷.

A key part of the ESPR is the new digital product passport. The EU Commission will manage a public web portal, enabling consumers to search for and compare the sustainability information provided in the product passports ⁷.

In addition to the ESPR, other EU regulations contribute to the DPP framework:

- **EU Strategy for Sustainable and Circular Textiles:** This regulation aims to improve the longevity and durability of textiles, with the DPP playing a key role in providing information on material composition and environmental impact ¹².
- **Construction Products Regulation:** This regulation ensures that construction materials meet circularity and safety standards, with the DPP potentially serving as a tool for compliance with circular economy-related criteria ¹³.
- **New EU Battery Regulation:** This regulation focuses on making batteries more

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sustainable, safe, and recyclable, with the DPP providing data on the entire product lifecycle needed for reporting ¹³.

Upcoming deadlines for DPP implementation include:

- **April 19, 2025:** The first working plan for DPP requirements will be adopted, defining further details for implementation ¹⁴.
- **July 19, 2026:** The digital registry will be established, acting as the centralized repository for all DPP data within the EU ¹⁴.

Industries and Products Impacted by the DPP

The DPP initiative will initially focus on product categories with high environmental impact and potential for improvement ¹². These include:

- **Textiles:** Garments and footwear are among the first product categories required to have DPPs ¹.
- **Batteries:** Industrial batteries with a capacity greater than 2kWh, electric vehicles (EV) batteries, and light means-of-transport (LMT) batteries will require DPPs from 2026. The EU Batteries Directive outlines the specific information required for a DPP in this industry, defining product attributes that should be reported on, the level of access required for that data (public or private), and specific sub-industries that require battery passports ¹.
- **Electronics:** Consumer electronics and ICT products will also be subject to DPP requirements ¹².
- **Furniture:** Furniture, including mattresses, will be included in the initial rollout of the DPP ⁵.

The DPP will be progressively extended to other industries and products in the coming years ¹. The EU Commission will regularly update the list of products that must comply with the regulation ⁵. According to the ESPR, the first batch of products that need to have DPPs include:

- Iron and steel ⁵
- Aluminum ⁵
- Textiles (garments and footwear particularly) ⁵
- Furniture ⁵
- Tyres ⁵
- Detergents ⁵
- Paints ⁵
- Lubricants ⁵
- Chemicals ⁵
- Energy-related products with ecodesign requirements ⁵
- Information and communication technology products & other electronics ⁵

The EU is also targeting the electronics and utility industries ¹⁵. In the electronics industry, this includes electric motors, tyres, e-bikes and e-scooters, defence equipment, the space industry, medical devices, vehicles, pumps, fans, circulators, power supplies, computers, servers, data storage products, power transformers, professional refrigeration equipment, and imaging equipment ¹⁵.

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Complexity of DPP Creation

The process of creating a DPP can be complex, requiring businesses to gather and manage a significant amount of data throughout the product lifecycle¹⁰. This involves:

- **Regulatory Navigation:** Understanding the specific DPP requirements for different product categories and ensuring compliance with relevant regulations¹⁰.
- **Data Sourcing:** Identifying and collecting data from various sources, including internal systems, suppliers, and third-party providers¹⁰.
- **Data Management:** Establishing systems for storing, managing, and updating DPP data throughout the product lifecycle¹⁰.
- **Technology Implementation:** Selecting and implementing appropriate technologies for data capture, storage, and access, such as RFID tags, QR codes, and blockchain¹⁰.

Blockchain technology plays a crucial role in ensuring data security and immutability for DPPs⁶. By utilizing a blockchain framework, companies can create a secure and transparent record of product information, minimizing the risk of data tampering and fraud.

Tools and Resources for DPP Creation

Several tools and resources are available to help businesses with DPP creation:

- **Traceability Software:** Software solutions that enable businesses to track and manage product data throughout the supply chain, facilitating data collection and reporting for DPPs¹⁶.
- **PIM Systems:** Product Information Management (PIM) systems centralize and manage all product-related information, providing a single source of truth for DPP data¹⁷.
- **Blockchain Platforms:** Blockchain technology offers a secure and transparent way to store and manage DPP data, ensuring data integrity and immutability⁵.
- **Data Carriers:** Technologies like QR codes and RFID tags provide a physical link between the product and its digital passport, enabling easy access to information¹⁷.
- **Industry-Specific Solutions:** Organizations like Catena-X (automotive) and the Global Battery Alliance (batteries) are developing DPP frameworks tailored to the specific needs of their industries⁴.

Bangladesh's Export Scenario in the EU

The EU is Bangladesh's largest export destination, accounting for over 60% of all exports¹⁸. This trade relationship is largely facilitated by the EU's "Everything But Arms" (EBA) scheme, which grants duty-free, quota-free market access to least developed countries (LDCs)¹⁸.

Bangladesh's major exports to the EU include:

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Product Category	Export Value (USD)	Share of Total Exports (%)
Clothing	\$22.95B	93%
Footwear	\$598.04M	2.4%
Frozen Food	\$242.31M	1%
Agro-products	\$242.31M	1%

It is estimated that Bangladesh has an untapped export potential of an additional \$11.3 billion to the EU, of which more than 90% is in apparel ¹⁹.

Bangladesh is currently making preparations to transform its entire trade onto a digital platform ²⁰. This includes the implementation of logistics, legal, technological, and knowledge-based support mechanisms.

Impact of the DPP on Bangladesh's Exports

The DPP requirements will have a significant impact on Bangladesh's export sector, presenting both challenges and opportunities:

Challenges:

- **Compliance Costs:** Implementing DPPs will require investments in technology, data management systems, and staff training, potentially increasing costs for Bangladeshi businesses ²¹.
- **Data Management:** Gathering and managing the required data across complex supply chains can be challenging, particularly for SMEs with limited resources ²¹.
- **Competition:** Bangladeshi exporters may face increased competition from countries that are more advanced in their DPP implementation ⁵.
- **Transparency Requirements:** Meeting the DPP's transparency requirements may be difficult for some Bangladeshi businesses, particularly those with opaque supply chains ²².

Opportunities:

- **Enhanced Competitiveness:** By demonstrating compliance with EU sustainability standards, Bangladeshi exporters can enhance their competitiveness and gain a market advantage ⁵. The potential of DPPs to drive innovation and competitiveness in the Bangladeshi textile and apparel industry is significant ⁵.
- **Improved Sustainability:** The DPP can incentivize Bangladeshi businesses to adopt more sustainable practices, reducing their environmental impact and improving their social responsibility ⁵.
- **Access to New Markets:** Compliance with the DPP can open up new market opportunities

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for Bangladeshi exporters, as consumers increasingly demand sustainable and ethically sourced products ²³.

- **Innovation:** The DPP can drive innovation in the Bangladeshi textile and apparel industry, encouraging the development of more durable, repairable, and recyclable products ⁵.

What Large Organizations Are Doing

Many large organizations are already taking steps to comply with the upcoming DPP regulations. Here are a few examples:

- **Tommy Hilfiger:** This clothing brand has integrated DPPs to improve supply chain traceability and operational efficiency, achieving 95% visibility of materials ²⁴.
- **H&M Group:** H&M is actively involved in initiatives like CIRPASS, which aims to develop and test DPPs for various product categories, including textiles ²⁵.
- **Decathlon:** This sporting goods retailer is using RFID technology to enhance product transparency and traceability, laying the groundwork for DPP implementation ²⁵.
- **Nespresso:** Nespresso has implemented a system that allows consumers to trace the origin of their coffee beans, showcasing their commitment to supply chain transparency ²⁵.
- **Audi:** Audi is developing battery passports for its electric vehicles, providing detailed information on battery origin, composition, and lifecycle ²⁶.
- **Tesla:** Tesla is also incorporating battery passports into its electric vehicles, enhancing transparency and supporting sustainability efforts ²⁶.

These examples demonstrate that large organizations across various industries are recognizing the importance of DPPs and taking proactive steps to prepare for their implementation.

Preparing for the DPP: Recommendations for Bangladeshi Businesses

To effectively prepare for the DPP, Bangladeshi businesses should take the following steps:

- **Understand the Regulations:** Thoroughly research and understand the DPP requirements, including the ESPR and other relevant regulations ⁶.
- **Assess Current Capabilities:** Evaluate existing data management systems and identify any gaps or areas for improvement ²⁷.
- **Invest in Technology:** Implement appropriate technologies for data capture, storage, and management, such as PIM systems, blockchain platforms, and data carriers ²⁷.
- **Collaborate with Stakeholders:** Engage with suppliers, partners, and industry associations to ensure data accuracy and consistency across the supply chain ⁶. Collaboration and data sharing across the supply chain are essential for successful DPP implementation ⁶.
- **Train Staff:** Provide training to employees on DPP requirements, data management processes, and the use of new technologies ²⁷.
- **Develop a Phased Strategy:** Create a phased implementation plan with clear goals, timelines, and resource allocation ⁶.
- **Seek Support:** Utilize available resources and support services, such as industry associations, government agencies, and technology providers ¹⁴.

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- **Address Potential Challenges:** Be aware of the potential challenges in implementing DPPs, such as technological infrastructure, standardization, data security, and integration with existing systems ¹⁴.

Cost Impact of the DPP

Implementing DPPs will involve costs for businesses, including:

- **Technology Costs:** Investments in software, hardware, and data carriers ²⁸. This includes the cost of implementing on-premises solutions, which provide organizations with greater control over their data and infrastructure, or cloud-based solutions, which offer scalability, flexibility, and reduced capital expenditure ²⁹.
- **Data Management Costs:** Costs associated with data collection, storage, and management ²⁸.
- **Training Costs:** Expenses related to training employees on DPP requirements and new technologies ²⁸.
- **Compliance Costs:** Costs associated with ensuring compliance with DPP regulations and standards ²⁸.

However, the DPP can also lead to cost savings in the long run:

- **Reduced Waste:** By promoting circular economy practices, the DPP can help businesses reduce waste and minimize the need for raw materials ⁴.
- **Improved Efficiency:** The DPP can improve supply chain efficiency by providing better visibility and traceability, leading to reduced costs and optimized processes ⁴.
- **Increased Sales:** By demonstrating sustainability and transparency, businesses can attract environmentally conscious consumers and potentially increase sales ²³.

Cost Handling and Funding Mechanisms

Businesses can handle the costs of DPP creation through various approaches:

- **Cost Allocation:** Allocate DPP costs across different departments or product lines.
- **Pricing Strategies:** Adjust pricing to reflect the added value of DPPs and the costs associated with their implementation.
- **Efficiency Gains:** Utilize the efficiency gains from DPP implementation to offset the costs.

Potential funding mechanisms for DPP creation include:

- **Government Grants:** Explore government grants or subsidies that support DPP implementation.
- **Industry Initiatives:** Participate in industry initiatives that provide funding or resources for DPP development.
- **Private Investment:** Seek private investment from organizations that support sustainable and circular economy practices.

Ethical and Social Considerations

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The DPP initiative raises important ethical and social considerations, particularly regarding data privacy and security. The International Data Spaces Association (IDSA) plays a crucial role in ensuring data sovereignty and ethical data exchange for DPPs³⁰. IDSA provides a framework for secure and standardized data exchange across multiple organizations, ensuring that data is handled responsibly and ethically.

Synthesis

The EU's Digital Product Passport (DPP) initiative is poised to reshape the global trade landscape by promoting transparency and sustainability across product lifecycles. While presenting challenges for businesses, particularly in terms of data management and compliance costs, the DPP also offers significant opportunities to enhance competitiveness, improve sustainability, and access new markets.

For Bangladesh, a major exporter to the EU, the DPP has profound implications. By proactively preparing for this new regulatory landscape, Bangladeshi businesses can ensure compliance while capitalizing on the opportunities it presents. This includes investing in technology, collaborating with stakeholders, and adopting a phased implementation strategy. The DPP has the potential to transform the Bangladeshi textile and apparel industry, driving innovation and promoting sustainable practices. By embracing this initiative, Bangladesh can solidify its position as a responsible and competitive player in the global market.

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