APPLYING THE EXPERIENCE OF THE TECHNICAL PASSPORT TOWARDS THE EU DIGITAL PRODUCT PASSPORT

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Abstract: *The EU wants to set a global standard for the development of a circular economy by reducing the carbon footprint and promoting the sustainable production and consumption of products and their parts. Therefore, the Digital Product Passport (DPP) is expected to be introduced in 2026. The DPP aims to provide information on the environmental sustainability of products. The starting point for creating a DPP must be the basic product data document. The experience of the Eurasian Economic Union (EAEU) in the field of Technical Passports can serve as a good basis. A Technical Passport is an operational document that indicates basic data about a product, service or equipment. It is issued by the manufacturer regardless of the country of manufacture. The Technical Passport is available during the entire life cycle of the equipment or device and must be taken out of service together with the product and accompanying equipment. This paper attempts to clarify the necessary product data that should be contained within a DPP and the road map to be followed to establish a DPP.*

Key words: Digital Product Passport, Technical Passport, Sustainability, Life cycle

1. INTRODUCTION

In an era marked by technological progress and increased consumer awareness, the concept of a "Digital Product Passport" (DPP) has risen to the forefront of discussions around sustainability, transparency and accountability. As concerns about the environmental and ethical implications of products continue to grow. This innovative approach has the potential to reshape industries and drive positive change globally.

At its core, a DPP is a comprehensive and digital record of a product's life cycle, from its creation to its final disposal. It offers a dynamic and interconnected way to communicate key information about a product's origin, materials, production processes and impact on the environment. Using digital technologies such as blockchain, QR codes and online databases, companies can create an accessible and verifiable platform for sharing vital data with consumers, regulatory bodies and other stakeholders.

One of the most profound impacts of Digital Product Passports lies in the empowerment of consumers. In an age where conscientious shopping is on the rise, individuals are increasingly seeking out products that align with their values and expectations. A Digital Product Passport equips consumers with the knowledge they need to make informed choices. Imagine scanning a QR code on a pair of jeans and instantly gaining insight into the cotton's origin, the factory's labor practices, and the carbon footprint of the production process. This newfound transparency fosters trust between businesses and consumers, encouraging a more sustainable marketplace.

The concept of a circular economy, where resources are used, reused, and recycled in a continuous loop, has gained traction as a solution to the challenges posed by traditional linear consumption patterns. Digital Product Passports can play an essential role in advancing this vision. By offering a digital record that documents a product's journey, companies can ensure that materials are sourced responsibly, products are designed with durability in mind, and the end-of-life phase is managed in an environmentally friendly manner. This not only minimizes waste but also encourages the development of innovative recycling processes.

2. EU'S PUSH FOR DIGITAL PRODUCT PASSPORTS

The European Union (EU) has been a pioneering force in pushing for the adoption of a Digital Product Passport as part of its broader sustainability and circular economy initiatives. The concept of a Digital Product Passport aligns closely with the EU's vision for a more sustainable and resource-efficient economy. The EU Circular Economy Action Plan, unveiled in March 2020, places a strong emphasis on promoting the

circular economy model, wherein products and materials are designed for longevity, repairability, and recycling. Digital Product Passports are seen as a crucial tool to help achieve the goals of this plan.

The EU's push for Digital Product Passports is driven by several factors:

- **Transparency and Consumer Empowerment**: By providing consumers with accessible and reliable information about the products they purchase, Digital Product Passports empower individuals to make more informed choices aligned with their values and sustainability preferences.

- **Circular Economy Promotion**: Digital Product Passports encourage manufacturers to consider the entire lifecycle of their products.

- **Market Transformation**: The widespread adoption of Digital Product Passports can incentivize businesses to adopt more sustainable practices to meet consumer demands and regulatory requirements. This can lead to a broader transformation of industries toward more responsible and environmentally conscious operations.

- **Efficient Regulation**: Regulatory bodies can use the data provided by Digital Product Passports to monitor compliance with environmental regulations, ensuring that products meet required standards and contributing to the achievement of sustainability goals.

- **Data-Driven Decision-Making**: The availability of real-time data through Digital Product Passports enables policymakers and businesses to make informed decisions about resource allocation, waste management, and product innovation.

The European Union expects the DPP for the first group of products to enter into force in 2026/7. years. This includes electronics and ICT, batteries and vehicles, textiles, plastics, construction and buildings. The battery passport will first come into effect for industrial and electric vehicle batteries in late 2026 or early 2027. In June 2023, the European Parliament adopted a new regulation for batteries and used batteries, repealing Directive 2006/66/EC. With this regulation, a new era of battery production and use with stricter sustainability rules begins (EC, 2023a). Final DPP format and content remain unclear at this point (WBCSD, 2023). For now, it is certain that the battery passport creates a digital twin of the battery, which stores all information about the battery in the cloud.

For now, there are only battery passport proof-of-concept results that Audi and Tesla have agreed to publish to demonstrate the feasibility of collecting data on sustainability performance, integrated with data on material origins and technical data (GBA, 2023).

3. TECHNICAL PASSPORT IN EAEU

One of the main conditions for the smooth movement of products and services in the Eurasian Economic Union (EAEU) is the possession of a technical passport. The EAEU is a regional organization that includes Armenia, Belarus, Kazakhstan, Kyrgyzstan and Russia, and aims to create a single economic market within these countries. A technical passport is an operational document that indicates basic data about a product, service or equipment. It is issued by the manufacturer regardless of the country of manufacture. It is written in Russian or bilingual, in which case one of the languages must be Russian. A technical passport must be issued for each product. The serial number of the product must be entered in the passport. It must be available during the life cycle of the product, equipment or device and at the end of the working life of the product and equipment. This puts the technical passport out of use together with the product and/or accompanying equipment. The document is structured, consists of several parts and has legally established conditions for execution.

In addition, in order for a certain product to acquire the prerequisite for placing on the market in the EAEU, it must have the EAC (Eurasian Conformity Mark). EAC is a certification mark that indicates that products comply with all technical regulations of the Eurasian Customs Union. The goal is to protect the life and health of people and the environment, as well as to prevent the transmission of false information to consumers. When applying for the award of the EAC mark, it is necessary to attach the product's technical passport.

The passport is a working document necessary for the circulation of equipment or devices on the EAEU market. It contains information on the manufacturer's warranty, technical parameters, information on product certification and disposal, as well as any additional information on installation, commissioning or maintenance. All changes to the machine, such as upgrades, conversions, installation of spare parts, repairs and welding, are recorded in the passport. It is a set of technical documentation written in a

standardized format. That document must be submitted to the certification body for certification and licensing and must be delivered together with the machine to the end user.

Products without a technical passport cannot be placed on the market. Among them are various equipment, machines and mechanisms. The requirement for having a product passport is specified in the technical regulations of the EAEU. Each unit of the product is completed with such a document, which accompanies it throughout its working life.

The passport is issued in the design phase, i.e. the start of production. A technical passport must be issued for each piece of equipment or device and each serial number. It is a document intended for the customer. Depending on the equipment, the passport may consist of different chapters. In general, the passport has information about technical parameters and characteristics, recycling and certification. It is issued by the manufacturer most often according to the standards GOST R 2.610-2019 rules for the implementation of operational documents and general requirements, types, completeness, rules for designing and completing operational documents).

Each technical passport is unique and must therefore be issued individually for each item. The items in the passport depend solely on the type and name of the product itself. Figure 1 presents a few pages (out of 20) of the Technical passport for the Fuel pump station. In general, we can say that the technical passport should contain at least the following information:

- Basic product information (intended use, data sheet number, certificates, registrations, manufacturer, etc.);
- Product specifications and technical data (accuracy specifications for measuring instruments, IP ingress protection, weight, dimensions, transport conditions, etc.);
- Scope of delivery;
- Serial number, TAG number;
- Notes on quality control and production standards, as well as the signature of the quality representative;
- Warranty duration and conditions;
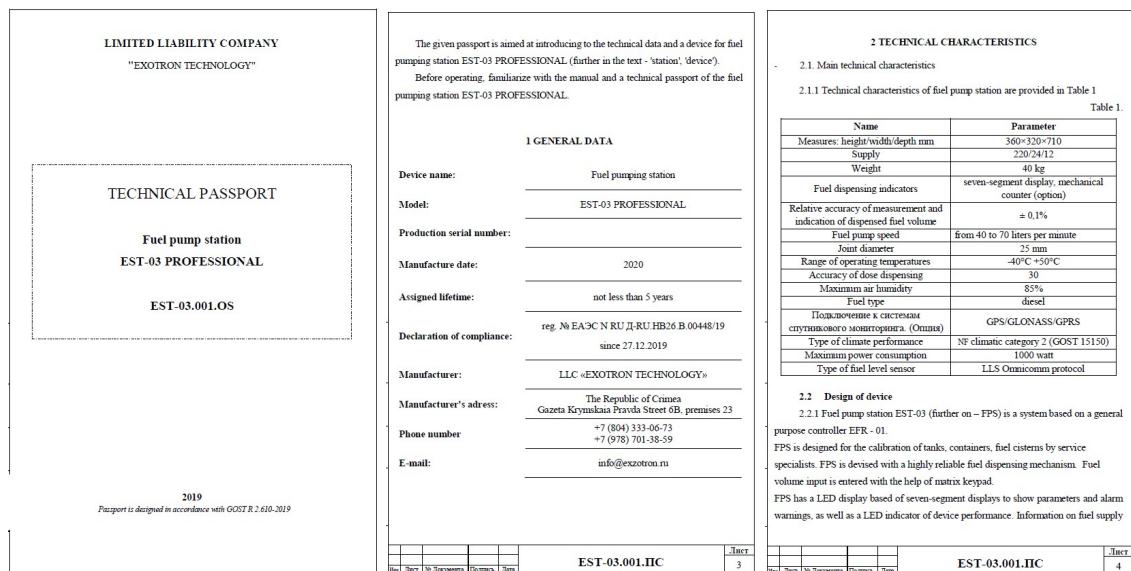- For measuring instruments: Recalibration interval.

Figure 1: An example of the Technical passport for the Fuel pump station

4. DISCUSSION

As we saw, the DPP aim to collect data about a product and its supply chain and share it across value chains so that all actors, including consumers, better understand the materials and products they use and their impact on the environment:

1. **Product data.** First, it is necessary to define the framework for the information that will be included in the DPP. In the case of DPP, it can be all types of data contained in the EAEU

Technical Passport. These data can be supplemented with the elements listed by the European Commission in Annex 1 of the Proposal for an Ecodesign Regulation for Sustainable Products (ESPR).

2. **Data carrier.** Product information should be stored on a data carrier and associated with a unique product identifier. The required unique product identifiers can use existing technologies such as barcodes, QR codes, RFID tags or the like, to submit product digital passport data. The data carrier must be physically present on the product, its packaging or on the documentation accompanying the product.

3. **Digital technologies and infrastructure.** It should be taken into account that all information included in the DPP should be based on open standards, developed in an interoperable format and machine-readable, structured and searchable. In addition, there are privacy concerns related to data sharing, and the technological infrastructure needs to be robust and secure to prevent manipulation or fraud.

From an operational perspective, it's not as difficult as it might seem. In the end, this process can be almost completely automated.
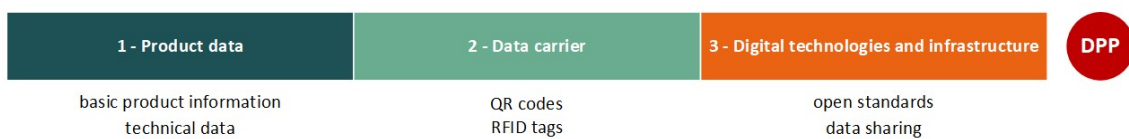

1 - Product data	2 - Data carrier	3 - Digital technologies and infrastructure	DPP
basic product information technical data	QR codes RFID tags	open standards data sharing	

Figure 2: Road map for establishing DPP

5. CONCLUSION

The Digital Product Passport is not merely a technological innovation; it is a catalyst for systemic change. By harnessing the power of digitalization and data transparency, businesses can transition towards more ethical, sustainable, and responsible practices. Consumers armed with information can drive demand for eco-friendly products. As the concept gains traction and overcomes its initial challenges, the DPP has the potential to reshape economies, mitigate environmental damage, and promote a more equitable global marketplace.

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