

The Digital Product Passport Imperative

Enabling compliance, product lifecycle
traceability and circular economy initiatives

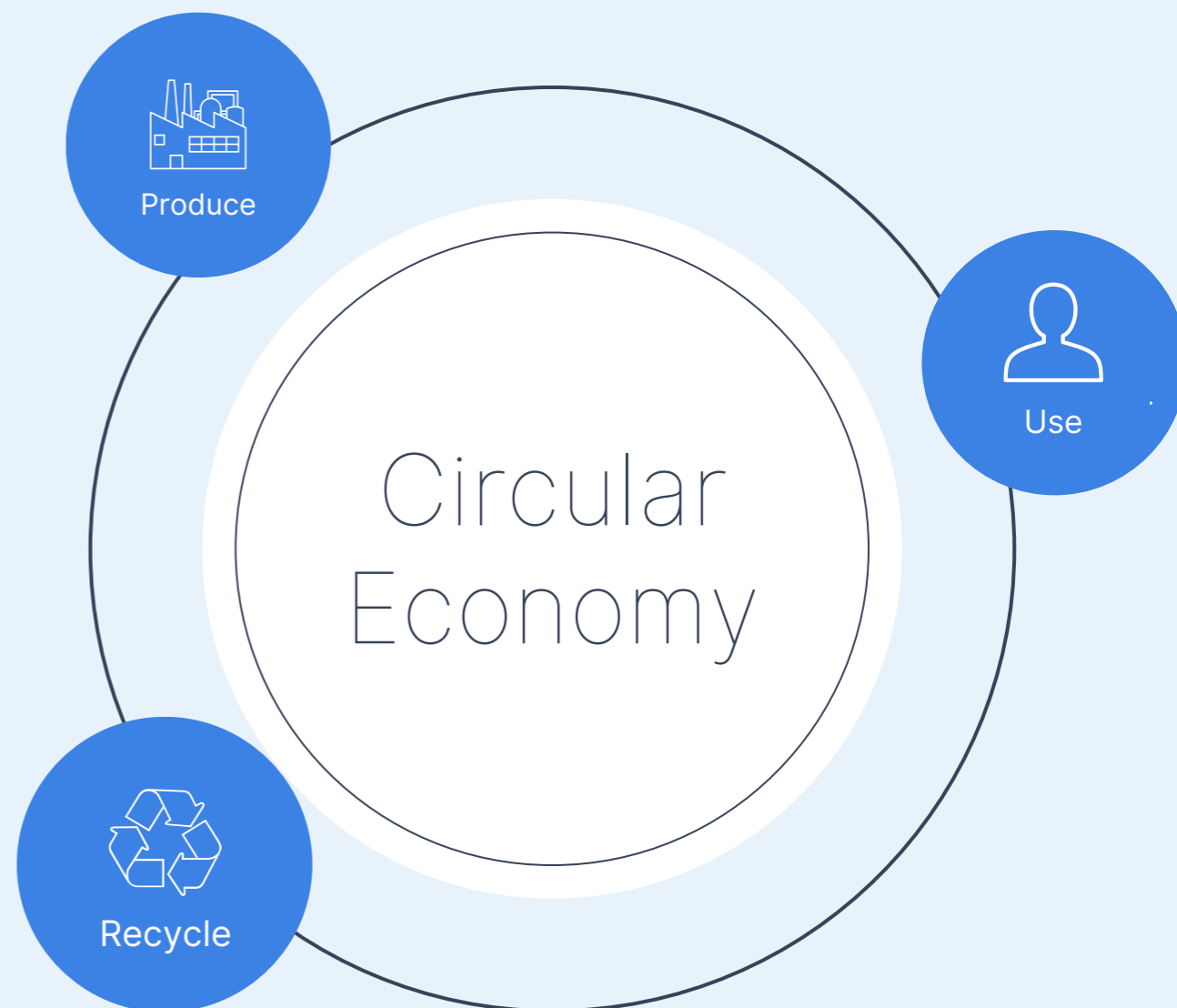


Introduction

Digital product passports (DPP) form the technical basis for enabling the EU's transition to a circular economy (CE), and the recent sustainable products regulation is a framework that will guide the way toward a more resilient and transparent economy.

The European DPP effort will also be a likely testing ground for more widespread global product passport initiatives, both because brands aiming to include their products on the EU market will have to comply with EU regulations, and also because the world as a whole is trying to move toward smarter, more measurable and more sustainable supply chains and product/material usage.

The European DPP, by enforcing the need to assign unique digital identities to individual products at the item level and making the resulting supply chain data shareable, may be a decisive and important step in pushing the global economy toward greater sustainability.





Background

The European Union Green Deal

The European Union has taken the lead on sustainability efforts, and many look to the EU for best practices in implementing legislation to support sustainable initiatives. European-level climate legislation and proposed actions will contribute to achieving Europe's sustainability goals but will also, as this paper outlines, affect all global brands that want to place their products on the European market.

The EU's active efforts in taking responsibility for sustainability issues will extend beyond the EU, which will influence sustainability issues outside of the EU as well. Regulations will in many cases cover global upstream supply chains. Requirements put on manufacturers will trickle down to their global suppliers, all the way back to the beginning of the supply chain at the global farming and material extraction level. Whole industries will have to change their operations, being part of global supply chains (e.g., mining and cotton industry).





What Drives the European Green Deal?

In June 2021, the European Climate Law wrote into law the goal set out in the European Green Deal for Europe's economy and society to become climate neutral by 2050. The law also sets the intermediate target of reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. The law aims to ensure that all EU policies contribute to this goal and that all sectors of the economy and society play their part. To bring the EU Green Deal proposals to life, sustainable products will have to become the rule rather than the exception.

EU proposal for a new ecodesign for sustainable products regulation

Putting the European Green Deal's aims into practice depends on a framework that outlines a set of requirements for sustainable products. The EU proposal for a New Ecodesign for Sustainable Products fulfills this need, requiring that products in specific verticals meet these imperatives in order to be sold within the EU market:



Product durability, reusability, upgradability and reparability



Energy and resource efficiency



Presence of substances that inhibit circularity



Recycled content



Remanufacturing and recycling



Carbon and environmental footprints

(Note: Food, feed, and medicinal products are exempted from the scope of the regulation.)



Tackling the Information Gap

Critically, though, to document and prove that these requirements have been met, there are equally detailed information requirements that must accompany these products. A challenge thus far to achieving even minimal levels of product lifecycle transparency and circularity has been immature or inadequate information transfer within the value chain.

Regardless of whether this is because different stakeholders are digitized at different levels or are using incompatible standards for information sharing, the underlying problem remains: the information gap has been a roadblock to implementing this kind of detailed, shareable, and easily accessible recordkeeping.

This is where the **digital product passport** comes into play.



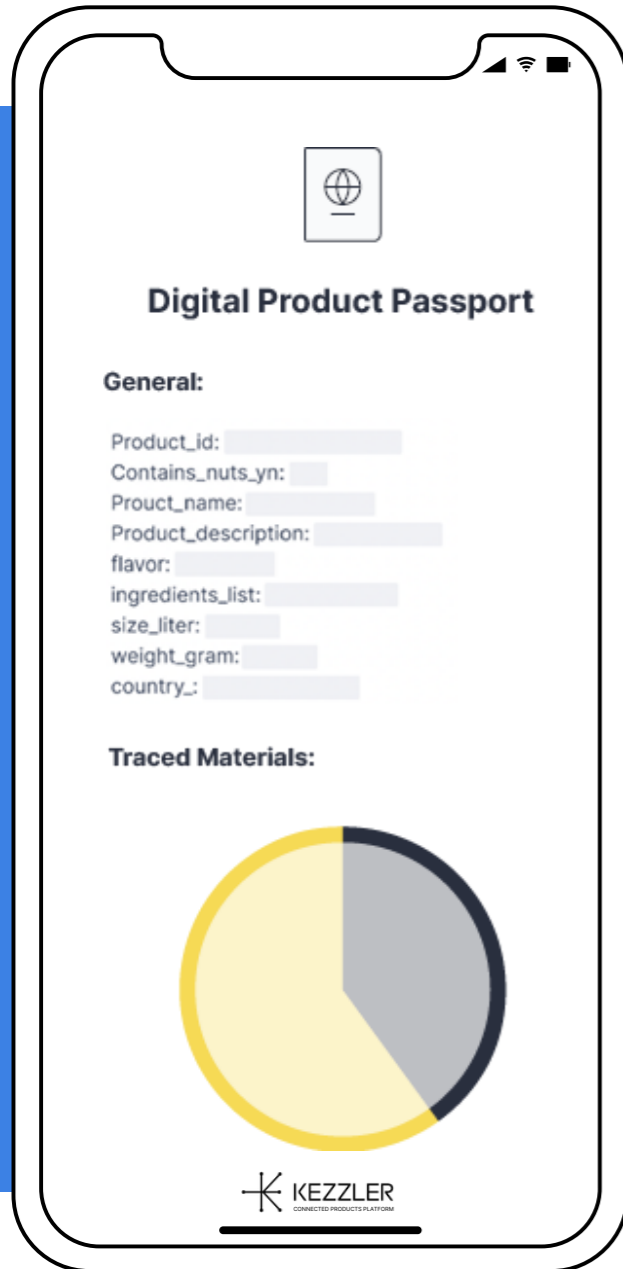


What is a Digital Product Passport?

A digital product passport is an electronic record of a product in a database, which remains available at least until the product's end of life. In order to comply with EU regulations, the product should carry a link to the product passport on the product itself.

It is predicted that this link carrier will be in the form of a QR code, as it is compatible both with industrial readers and consumer mobile devices as well as having sufficient data-carrying capabilities. Some industries may allow for or require RFID, or a combination of the two.

When scanning the QR code on the product, the user will automatically be redirected to an online page, showing the complete and updated product passport for the specific product at hand.



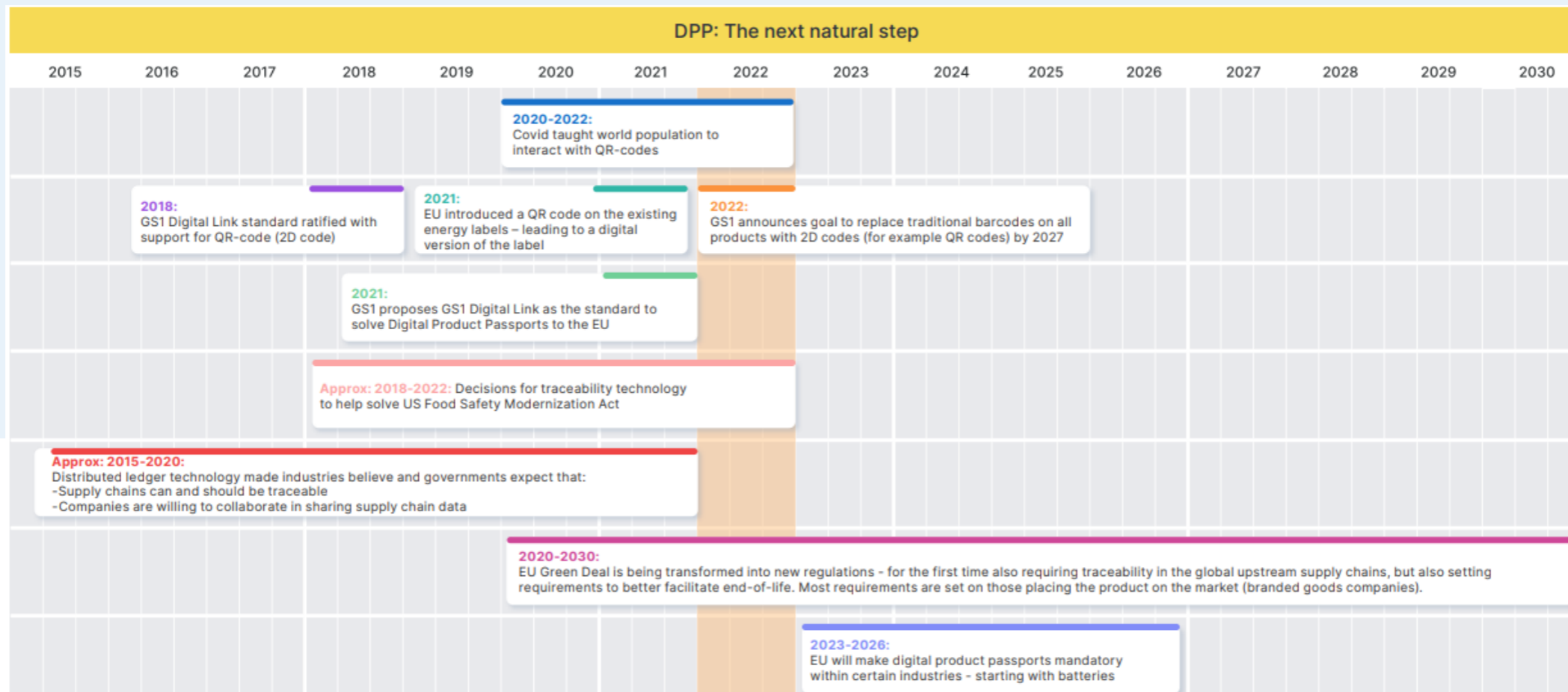


Why the Time is Right for Digital Product Passports

The Sustainable Products Initiative as described in the EU's Circular Economy Action Plan (CEAP, COM (2020) 98 final) establishes a need for a digital product passport (DPP) that gathers data on a product and its value chain.

The objective of the DPP is to support sustainable production, to enable the transition to a circular economy, to provide new business opportunities to economic actors, to support consumers in making sustainable choices and to allow authorities to verify compliance with legal obligations.

In the period between 2023-2026, DPP solutions will be at the core of several converging consumer, legal and regulatory demands and market trends.





DPP Rationale and Benefits: Consumer, Business and Government

The EU has a threefold rationale for implementing Digital Product Passports, above and beyond their ability to make products traceable in a circular economy.



For Consumers

Make more informed choices

Consumers, accustomed to having digital information at their fingertips, are beginning to demand sustainability-related information about the products they buy, and are willing to pay more to get it. Ethically sourced products are increasingly important to a new generation of conscious consumers. A DPP can provide the basis for more informed consumption and active information to help consumers repair and recycle their products.

For Businesses

Access information to improve environmental performance, ESG and sustainability claims and decisions

A DPP will provide businesses with access to granular information that can improve environmental performance, supply chain visibility, and help contribute to more accurate sustainability claims and decisions. It can also help facilitate meaningful dialogue and foster trust with consumers as well as pave the way to making products and packaging a direct channel of two-way communication with consumers. A DPP will enable mutual data exchange between different economic operators in the value chain. As an example, the sharing of data between manufacturers and recyclers can improve operations and processes.



For Authorities

Support enforcement and surveillance work

A DPP can help regulatory and law enforcement agencies monitor for compliance with a wide range of upcoming legislative requirements, as shown in the figure below. A product passport can effectively be a digital compliance and auditing solution that enables end-to-end product transparency.





Get Ready:

What Product Categories Will Come First?

The EU has laid the groundwork for the deployment of DPPs as of 2023. The DPP rollout will be gradual, with batteries and textiles already subject to draft regulations, and toys coming up before the end of 2022. The rollout is predicated on the adoption of a number of delegated acts across the target product categories. It is likely that the European Commission will introduce 18 new delegated acts between 2024-27 and a further 12 in the lead-up to 2030.



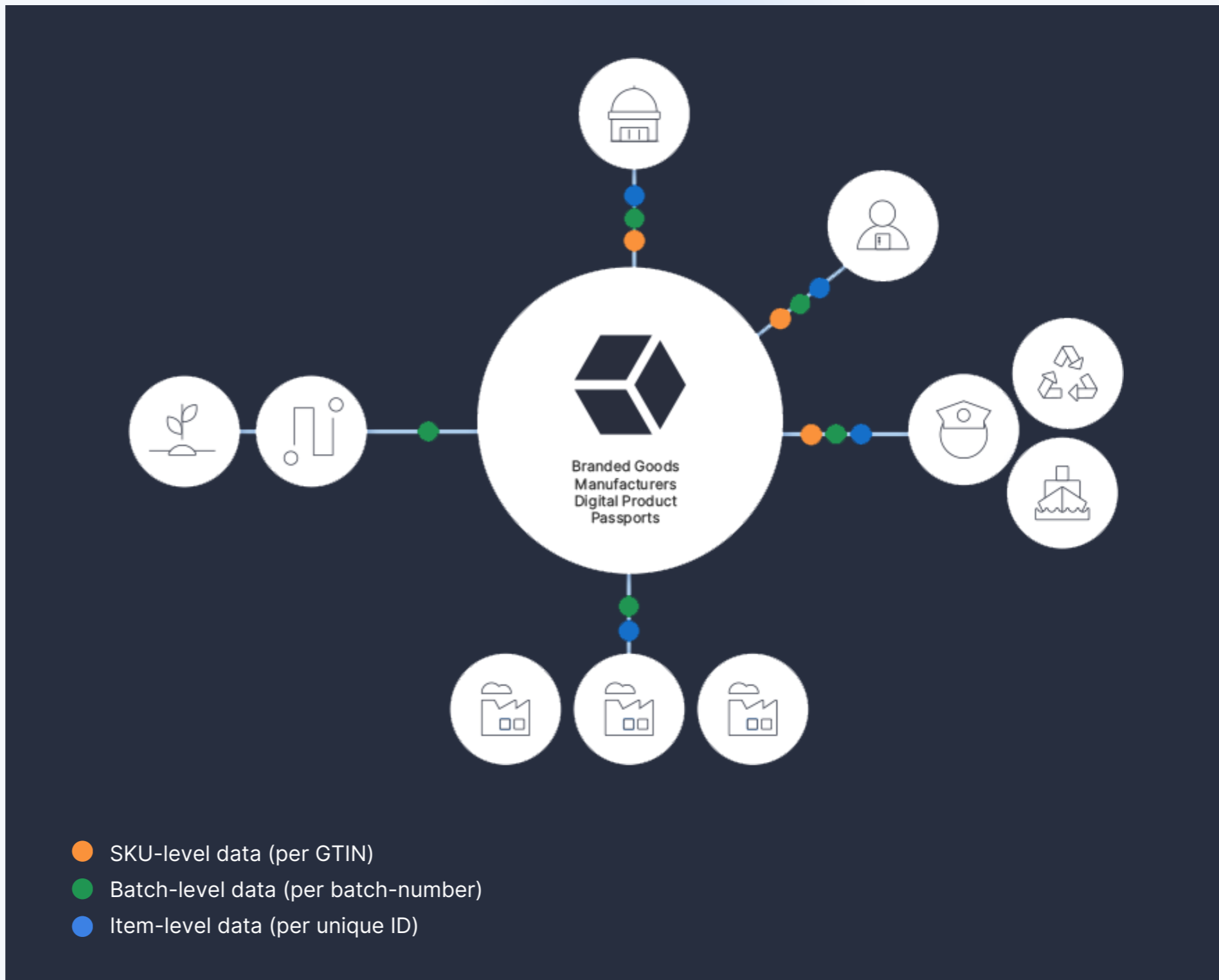


DPP Readiness

Preparing for the coming requirements means that branded goods manufacturers' will need to build a technical foundation for data collection and sharing across the value chain.

Companies must build their own internal product passport systems in order to mirror the required data to external product passport systems - one example being the required reporting to the EU system.

Traceability data may be required at different levels of granularity.





Technical Foundations: Digital Product Passports at the Enterprise Level

Putting DPPs into practice will require a technical solution to collect all data about manufactured and distributed products. Digital traceability technology is key to deploying DPPs at enterprise scale. All physical components and materials can be assigned unique digital identities (UIDs), and throughout the entire supply chain journey, data is collected and associated with that UID each time anything happens to it across its life cycle.

How Does This Work?

The DPP merges ingredient and material traceability data from the upstream supply chain with manufacturing data. At manufacturing, a DPP is issued per individual manufactured item (or batch) in the enterprise solution. After manufacturing, the DPP is kept live and updated during the product's entire lifecycle.

At manufacturing, every single product is marked with an alphanumeric identifier. This identifier is unique, either per manufactured item or batch of items. It corresponds to the Unique ID of the DPP. This unique ID is either carried by an RFID tag, but more often, incorporated in the web URL of a QR code. Regardless, it enables a link from the product at hand to data about the product found in the DPP.



Through a DPP platform, various users and external data systems may be granted access to different information, depending on the user. Examples of different users include employees in different roles (e.g., logistics or claims and returns), consumers, retailers, government reporting systems, customs, recyclers, deposit return systems, etc.





More Granular DPPs Cover More Use Cases – Creating More Value

Internally, branded goods companies have long wanted more granular traceability, and technology within the last decade has matured enough to enable the level of granularity desired. Despite the fact that the final details of the EU DPP requirements are not ready, the direction is clear: full traceability for a granular understanding of the value chain will not only be a desire but a must-have. As such, companies can start (and have started, in many cases) to prepare for what is coming, while getting a return on their investment along the way.

	Limited value when DPP per product type	Additional value when DPP per manufactured batch	Additional value when DPP per manufactured product
 Examples for textiles	Identified by GTIN as ID <ul style="list-style-type: none"> Material composition and amount Care instructions Repair instructions Spare part ordering (e.g., buttons) Inventory management 	Identified by GTIN as ID + Batch number as ID <ul style="list-style-type: none"> Upstream traceability data (e.g., cotton) Child / forced labor compliance demonstration Deforestation compliance demonstration Animal health demonstration % of recycled content in lot Carbon footprint per lot Water consumption per lot 	Identified by GTIN as ID + Serial number / unique ID <ul style="list-style-type: none"> Second-hand facilitation Authenticity verification Prevent unauthorized distribution Carbon footprint of distribution Deposit return systems Notice of destruction from recycling Claims and eCommerce return management Virtual wardrobe of branded goods
 Examples for batteries	<ul style="list-style-type: none"> Material composition and amounts Technical specifications Disassembly instructions Bill of materials / spare parts 	<ul style="list-style-type: none"> Upstream traceability data (e.g., cobalt) Child / forced labor compliance demonstration Deforestation compliance demonstration % of recycled content in batch Carbon footprint per batch Product recall 	<ul style="list-style-type: none"> EU Battery Passport Batch IDs of contained modules (and/or cells) Module replacement during service/repair Other maintenance Notice of destruction at compliant recycling facility Transfer of EPR when repurposing Controlled access to Battery Management System Traceability of recycled material
Maximum value if DPP with GTIN + Serial number / unique ID per passport Example of product link to passport: https://brand.com/01/8716200715232/21/8S78RRP2ZE82YE6			
More value of DPP with GTIN + Batch number as ID per passport Example of product link to passport: https://brand.xxx/01/8716200715232/10/AB12671			
Limited value of DPP with GTIN per passport Example of product link to passport: https://brand.xxx/01/8716200715232			



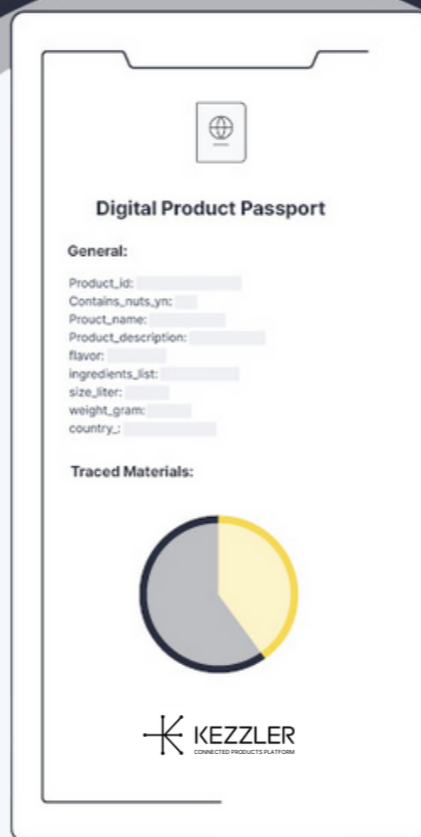
Why a Private DPP Solution?

Besides being ready for possible upcoming requirements

Critical to making the DPP concept work is the need to establish more centralized data repositories to consolidate all the data about a company's products in combination with added traceability data that will be required in order to report to the EU. Companies also gain additional business benefits from traceability, which is why many companies are starting today:

✓ Improved supply chain processes

- Detect and stop unauthorized distribution & counterfeits
- Inventory & shelf-life across supply chain
- Incentivizing sales channel
- Targeted and efficient recalls
- Claims and returns handling
- Comply with government traceability requirements



✓ Enhanced consumer experience

- Connected product experience for consumers
- Loyalty & rewards enablement
- Ingredients and traceability story
- Direct channel of communication
- eCommerce reordering
- Last mile data on consumers
- Inform, guide and incentivize consumers on sustainability and recycling



DPP Preparation Checklist

What are technical teams doing right now to be ready?

- ✓ Plan for user and consumer product interaction by implementing GS1 Digital Link (some must start by implementing GTIN)
- ✓ Add GS1 Digital Links to the actual products rather than outer packaging or hang tags
- ✓ Switch to random and unique IDs (UIDs) in GS1 Digital Link rather than running serial numbers to prevent tampering and fraud (as already required by the EU for pharmaceuticals and tobacco)
- ✓ Move UID creation to centralized global systems rather than generating at factories or using pre-programmed RFIDs. This is for scalability purposes and ease of global rollouts
- ✓ Implement GS1 EPCIS repositories to tie supply chain events to unique IDs and enable traceability data-sharing between supply chain participants
- ✓ Implement specialized common UID / EPCIS repositories that scale well with an ever-growing number manufactured products rather than relying on legacy ERP because fast response times of UID validation and data-retrieval are needed. It is not only needed to meet consumer expectations on user experience but also to meet the required response times for IT systems downstream
- ✓ Improve factory traceability systems to cover transformation events from raw materials to final product
- ✓ Implement centralized systems that can gather and consolidate data from various IT systems in order to prepare for mandatory EU Digital Product Passport reporting
- ✓ Implement systems that enable secure sharing of the right data with the right internal or external users or IT systems



DPP Example: Real-World Value

The fashion and apparel industry is front and center with the introduction of DPPs. So-called “fast fashion” has run counter to the principles of a circular economy, seemingly designed for convenience but not sustainability. With the EU’s strategy for sustainable and circular textiles, fashion brands will be first to answer for and change their approach and to roll out DPPs.



If we look at a fashion apparel brand as an example, what value will these preparatory steps outlined deliver or enable, even before the EU is ready with the DPP mandate?

Enable distributors and consumers to verify authenticity of product

Prevent counterfeiting

Prevent unauthorized distribution – hitting global margins

Combine with current RFID for even better inventory management

Let consumers build their virtual wardrobe of branded goods

Build stronger loyalty programs through interaction with clothing

Facilitate, streamline and improve eCommerce returns

Allow movement of goods across borders

And to better ESG efforts:

Facilitate secondhand market (including authenticity and pedigree of product)

Facilitate private deposit-return schemes

Demonstrate the absence of child and forced labor in supply chains in collaboration with supply chain participants

Collaborate with suppliers in aggregating total carbon footprint and water consumption across the upstream supply chain

Include carbon footprint data from the distribution

Share composition and material data needed for recycling with recyclers

Combine with RFID for easier sorting in recycling

Receive notification that garment is recycled or repurposed in order to prove sustainability efforts

Demonstrate the required or claimed percentage of recycled materials being used



Conclusion

The EU digital product passport is coming and will affect companies across industries worldwide. Many companies have decided to see this as a huge opportunity. If you represent a branded goods company – what action is your company already taking to prepare?

Enabling future compliance with the EU DPP mandate is a journey that starts today, and Kezzler is committed to being at the forefront of developments in these and other regulations.

Reach out to us at Kezzler for a discussion on an incremental preparation that enables a future-proof DPP solution that will provide benefits immediately - even before DPPs are required.