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DPPS IN THE DUTCH MARKET
ADOPTION PULSE

November 2025

EXECUTIVE SUMMARY: NL GOVERNMENT SHOULD SUPPORT DPP DEVELOPMENT AND ADOPTION VIA THE COE-DPP TO REDUCE DEPENDENCE ON RAW MATERIAL IMPORT AND TO STIMULATE ECONOMIC GROWTH

NL could use its digital frontrunner position to drive economic growth with DPPs, add to its circular ambition, enhance resilience and improve NL competitiveness	• The Ministries of I&W and EZ are both partially responsible for the implementation and benefits generated by DPPs and the 'twin transition' of digitization and sustainability • They could help the twin transition by stimulating DPP adoption and use by banking on investments in data sharing initiatives to reduce dependency on raw material imports and improve NL competitiveness
Organizations need knowledge on DPPs, networking opportunities and resources for DPP implementation to start with DPP implementation today	• Activity in DPP knowledge building focusses on technical research subjects and long-term data access solutions, whereas the market needs practical support to build, implement and adopt DPPs today • Resources need to be directed to DPP implementations that contribute to the circular economy and add economic value to support the twin transition
Organizations should strategically decide on their DPP strategy: compliance only or beyond compliance	• 'Compliance only' companies need to inform their value chain on DPP expectations and wait for legal clarity before implementation; they should be able to rely on providers that offer compliant DPP solutions • Companies who aim to create value beyond compliance should start right away by analyzing and deciding on how they can get value out of DPPs and start experimenting as soon as possible
Policymakers can accelerate DPP adoption by creating legislative clarity, stimulate and enforce DPP adoption, and support organizations on implementation and value creation	• Legislative clarity is a prerequisite for 'compliance only' companies to start with their DPP implementation • Enforcement of DPPs at organizations and stimulation of DPP adoption for consumers speeds up adoption • Policymakers should prioritize policy incentives that ease and accelerate DPP implementation for organizations and incentives that focus on new economic value creation with DPPs
CoE-DPP can accelerate DPP-adoption and the twin transition significantly by serving as a one-stop shop for DPP implementation with scalable solutions focusing on economic value creation	• The CoE-DPP can act as DPP accelerator, by becoming a one-stop shop for DPP implementation and adoption by providing knowledge, networking opportunities and resources to fill for market needs • DPP activities should focus on scalability of DPP solutions and economic value creation to support the valorization of benefits of the twin transition supported by DPPs

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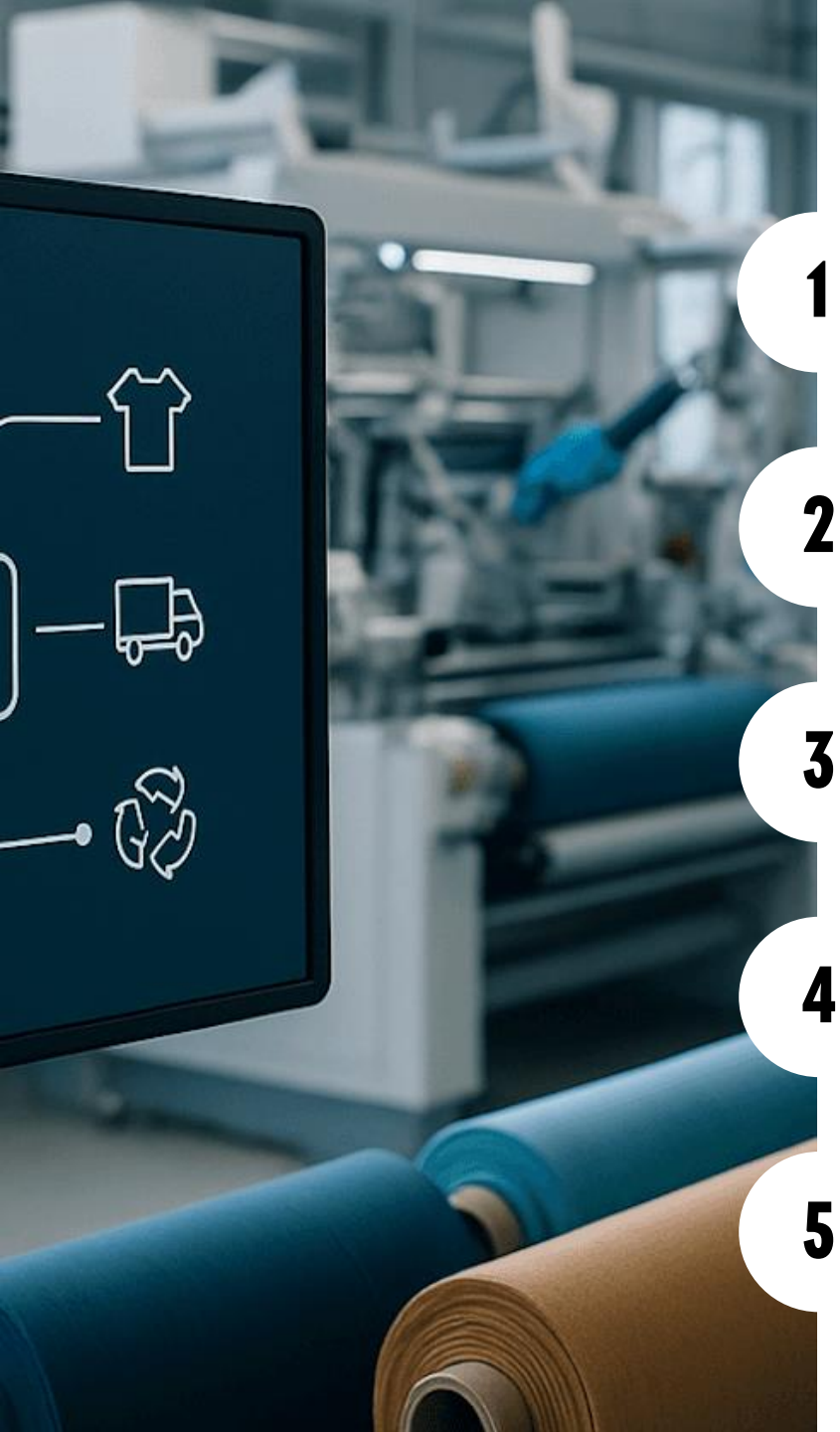

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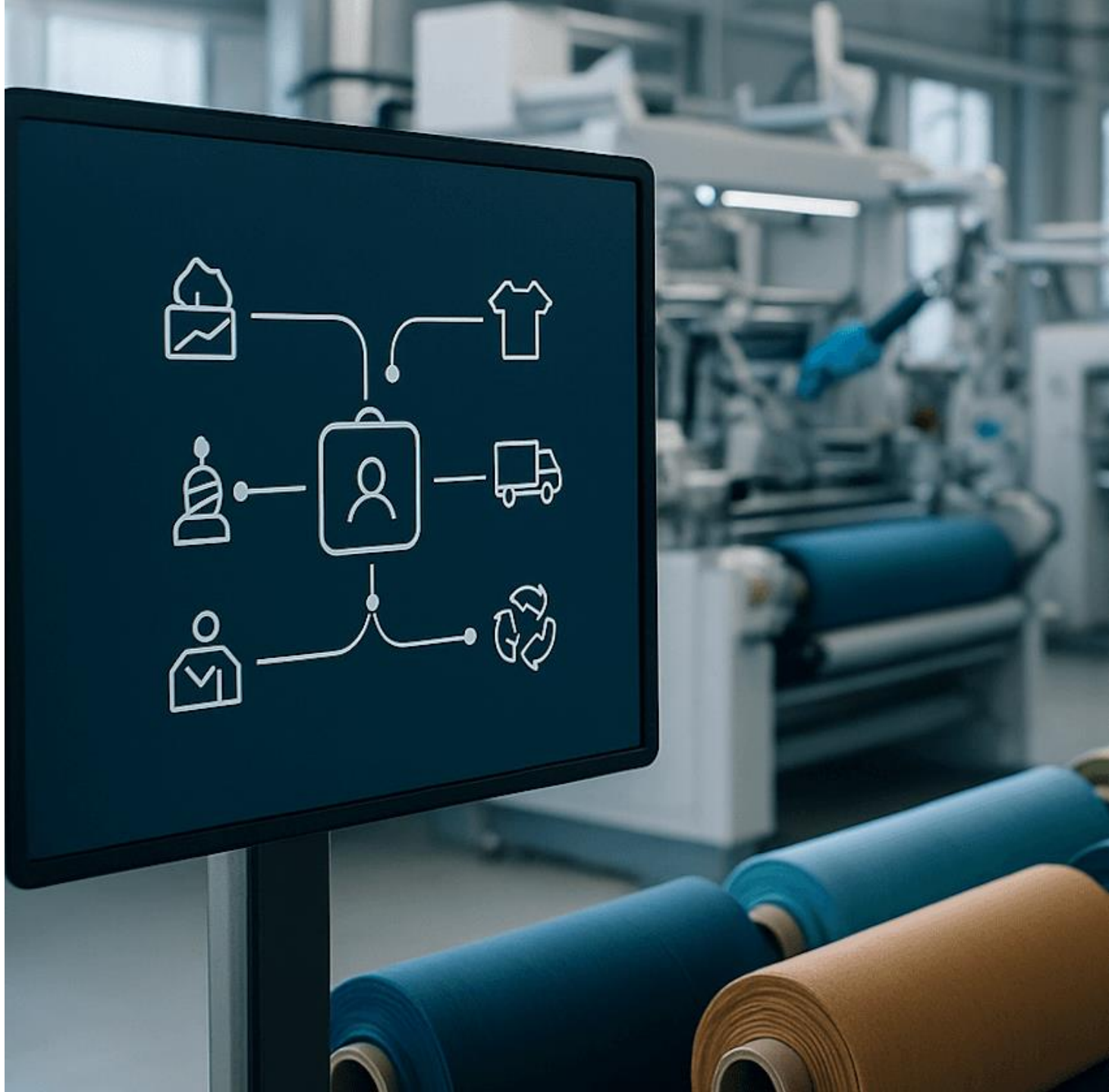
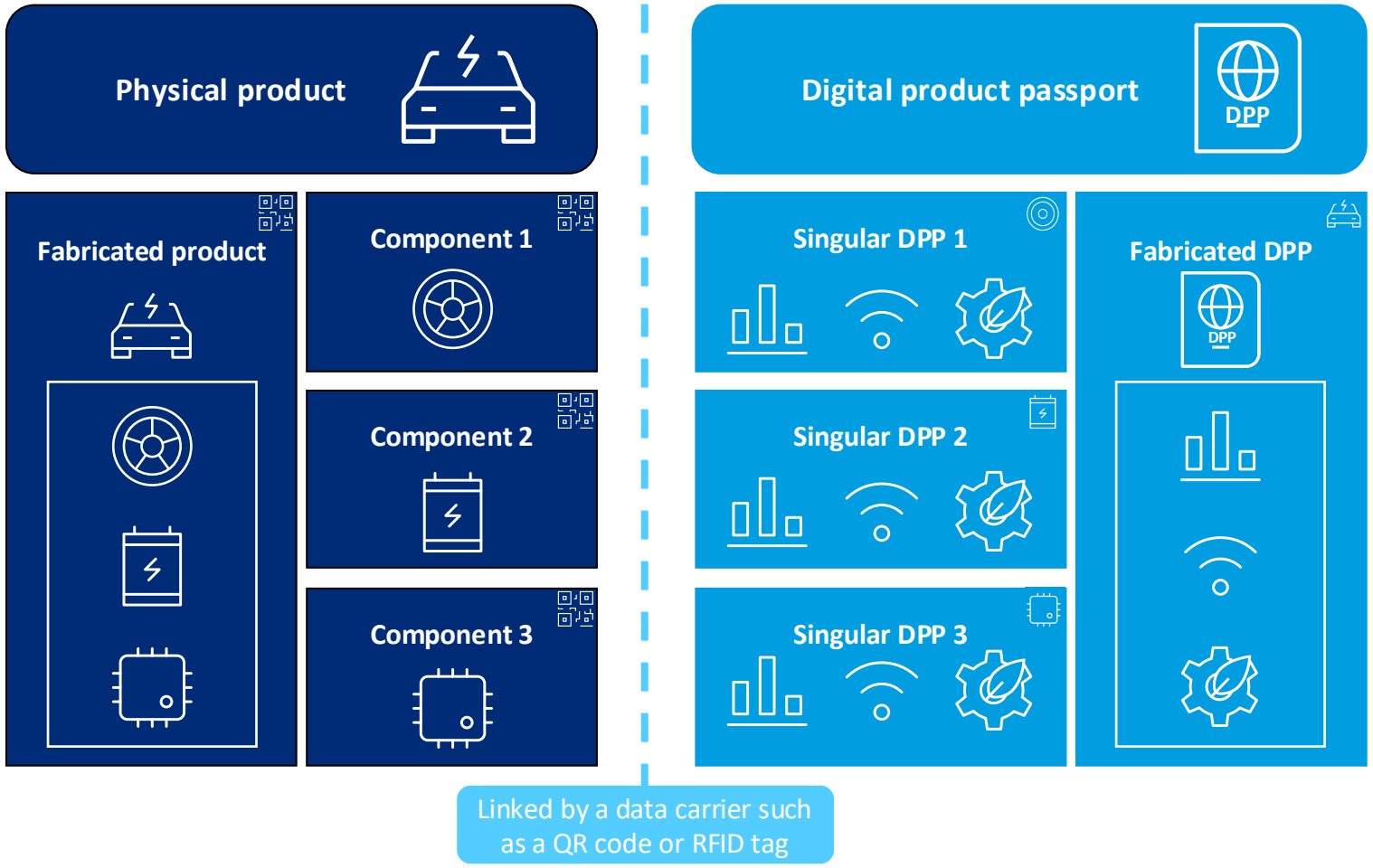
CONTEXT OF DPPS

WHAT ARE DPPS AND WHY ARE THEY INTRODUCED?



DIGITAL PRODUCT PASSPORT: A DIGITAL REPRESENTATION OF A PHYSICAL PRODUCT LINKED VIA A DATA CARRIER, PROVIDING INFORMATION ABOUT A PRODUCT'S CHARACTERISTICS, SOURCING AND USAGE

Each physical product receives a digital representation in a Digital Product Passport…



..through which data is made available and accessible to stakeholders

- The **organization placing a product on the market is responsible for creating the DPP** and making it available (Responsible Economic Operator; REO)
- DPP data is supplied by the supply chain
- Stakeholders will only be able to view data they are **permitted to access,** ensuring **data sovereignty**
- The data is accessible by **scanning a data carrier** on the product (e.g., QR code)

Technical definition DPP:
"Data set that sums up the components, materials and chemical substances in a product" - Adisorn et al. (2021)

Societal definition DPP:
"Mechanism to influence consumers' behavior on sustainable purchase and responsible product ownership"- King et al. (2023)

Source: Towards a DPP Fit for contributing to a CE (Adisorn et al, 2021), A proposed universal definition of a DPPE (King et al, 2023) TNO, ESPR, INNOPAY analysis

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REGULATORY CONTEXT: DIGITAL PRODUCT PASSPORTS ARE INTRODUCED IN AN UPDATE OF 'THE NEW LEGISLATIVE FRAMEWORK', AND PRODUCT REGULATION SCOPE IS EXPANDED BY THE ESPR

Non-exhaustive overview of sectors engaged in DPPs and their legislative DPP coverage

Sector[1]	DPP covered by ESPR & delegated acts	DPP covered by sector specific regulation
Aluminum	✓	×
Aviation	×	×
Batteries	×	✓
Cleaning products	✓	×
Construction	×	✓
Energy related	✓	×
Furniture	✓	×
High tech	×	×
Iron & Steel	✓	×
Maritime	×	×
Mattresses	✓	×
Textile/Apparel	✓	×
Toys	×	✓

Updates of the New Legislative Framework introduce DPPs in existing regulation and broadens the product scope with the ESPR

- The 'New legislative framework' (NLF) aims to improve the internal market for goods and strengthen the conditions for placing products on the EU market
- In 2022, an evaluation of the NLF concluded that the NLF needs an update to respond to current and future needs of product legislation
- The evaluation resulted in the incorporation of challenges and opportunities of digitization and complex supply chains and introduces the following measures:
  - A digital product passport
  - A digital CE marking
  - Facilitating remanufacturing and high-quality recycling of products
- As part of the update of the New Legislative Framework and the EU Green Deal, the Ecodesign for Sustainable Product Regulation (ESPR) is introduced

Source: European Commission, INNOPAY analysis. **Note:** 1. Not all sectors who will have to introduce a DPP, this list contains at least all sectors that were interviewed

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REGULATORY BACKBONE: ESPR HORIZONTAL AND VERTICAL RULES SET CRITERIA FOR PRODUCT CATEGORIES; WORKING PLAN DRIVES EXECUTION AND IMPLEMENTATION TIMELINE OF MOST DPPS

HORIZONTAL REGULATION BUILDS FRAMEWORK AND INTRODUCES DPPS

- The ESPR stablishes a single, EU-wide framework to set eco-design requirements for nearly all products
- Enables requirements on durability, reliability, reparability, upgradability, reusability, recyclability, presence of substances of concern, recycled content, energy/resource efficiency, and environmental footprint information
- Establishes conformity, market surveillance, penalties, and governance for developing and enforcing delegated acts
- Introduces the Digital Product Passport (DPP) to standardize lifecycle sustainability information; detailed data/content rules will be set in implementing delegated acts per product group

VERTICAL REGULATION SPECIFIES REQUIREMENTS FOR EACH PRODUCT GROUP

- Product group-specific delegated acts will define measurable performance and information requirements for each priority product group (e.g., textiles, furniture, metals), including thresholds and test methods
- Each delegated act will specify the DPP scope and data model for that product group (e.g., composition, recycled content, repairability, lifecycle info)
- Acts may specify horizontal-type criteria tailored to the product (e.g., repairability scores, upgradability, software/firmware support policies, design for disassembly)
- Designed to be coherent with sectoral laws (e.g., Batteries Regulation) to avoid overlap and ensure consistent compliance pathways

The Working Plan (2025–2030) sets priority product groups and an indicative timeline for delegated act per product group

Non-exhaustive

- **Iron & steel**
- **Aluminum**
- **Textiles/ Apparel**
- **Tires**
- **Furniture**
- **Energy related products**
- **Mattresses**

Source: European Commission, INNOPAY analysis

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FUTURE VISION: DPPS ARE PART OF EU TWIN TRANSITION OF SUSTAINABILITY AND DIGITIZATION, DRIVING CIRCULAR ECONOMY, STRENGTHENING EU SOVEREIGNTY & ENCOURAGING CIRCULAR CONSUMER CHOICES

DPPs support EU policies on competitiveness, a greener future and digitization…

EU SOVEREIGNTY
Reduce dependence on non-EU technology and materials, future of EU competitiveness and sustainable growth (see also Draghi report)

EU GREEN DEAL
Path to climate-neutrality, a circular economy and material sovereignty

EU DIGITAL STRATEGY
Aiming for digital single market and human centric data economy

DPP

… resulting in reinforced sovereignty, economic growth by circular economy value and better informed consumer purchasing decisions

REINFORCE EU SOVEREIGNTY
Reducing dependency on external sources of strategic materials

€13B LOST YEARLY
as EU recycles < 50% of 11kg e-waste per capita

VALUE THROUGH A CIRCULAR ECONOMY
Optimizing material efficiency and product lifecycles, enabling new business models

30-200X MORE NEW JOBS
compared to landfilling and incineration for batteries

INFORMED PURCHASING DECISIONS
Providing consumers with accurate information to assess the true impact of their purchase

96% ADOPTION RATE
Of mobile phones in the EU enables DPP accessibility

Source: EU Commission1, EU Commission2, EU Commission3, EU Commission4, TNO, Thuiswinkel, GAIA, Dealroom, CIRPASS, Pubaffairsbruxelles, INNOPAY Analysis

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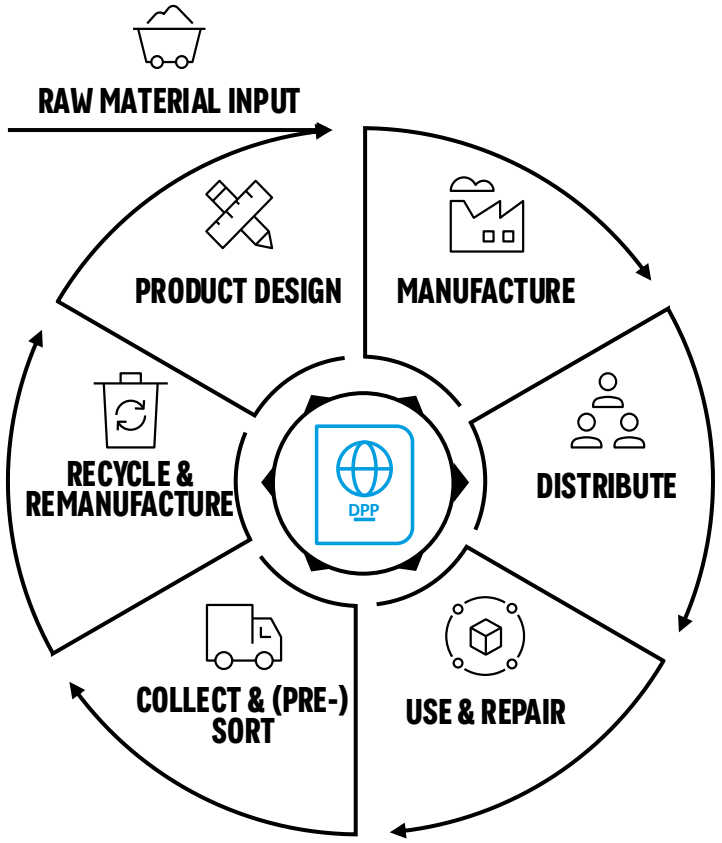
LIFECYCLE VALUE: DPPS ARE DYNAMIC DIGITAL DOCUMENTS THAT CAPTURE PRODUCT LIFECYCLE DATA FROM EVERY ACTOR ALONG THE WAY, ADDING VALUE THROUGHOUT THE PRODUCT LIFECYCLE

Value chain parts of a product with a DPP in the product's lifecycle



All phases in the value chain benefit from DPP data availability

	Phase	Examples of DPP usage	Examples of DDP benefits
	Raw Material Input	DPP verifies recycled content, enabling compliance and boosting market confidence in secondary materials, supporting targets for recycled content	**DOUBLE** of circular material use by 2030 is the aim of the EU Commission
	Product Design	By exposing repairability/durability and energy data, DPPs help designers and consumers design and select products that perform better and last longer	**62%** of consumers search for durability data when buying a product
	Manufacture	Auditable material identity through DPP makes switching to recycled inputs verifiable, unlocking large raw material, energy and CO_2 savings (aluminum, steel, plastics)	**95%** energy reduction by recycling for aluminum compared to raw materials
	Distribute	Serialized product identities linked via DPP improve stock accuracy and enable efficient reverse logistics—reducing waste and supporting circular refurbish/return loops	**20-30%** inventory accuracy improvement can be established using RFID tags
	Use & Repair	DPP centralizes repair information and warranty status, increasing successful repairs and reducing after-sale costs while cutting lifecycle emissions by extending product life	Extending lifespan of smartphones by 1 year would cut same CO2 as eliminating **2M** cars
	Collect & (Pre) Sort	Digital identification plus detailed DPP data improves sorting accuracy and safety, increasing purity and capture rates for high-value recycling streams.	**53%** of post-consumer textiles are suitable for chemical recycling
	Recycle & Manufacture	Through DPP, enhanced input quality and traceability of waste streams improve yields and recyclate specifications, and unlock higher-value second-life use of materials	Increase in recycled plastic reduces carbon footprint by **10.5%** per ton

Source: European Union, International aluminium,, ITAB, WE forum, pro fashion INNOPAY analysis

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NL POLICY CONTEXT: INTRODUCTION AND SUPPORT OF DPP ADOPTION IN NL IS COVERED BY MULTIPLE MINISTRIES REQUIRING COLLABORATION FOR A SUCCESSFUL TWIN TRANSITION

IN THE NETHERLANDS, THERE ARE 2 MINISTRIES WHO TAKE UP THE POLICY PART[1] OF THE TWIN TRANSITION TO SUPPORT ORGANIZATIONS WITH DPP IMPLEMENTATION

Ministerie van Infrastructuur en Waterstaat

"Het **ministerie zal bijdragen** aan de kerngroep duurzame digitalisering **en inzetten op de ontwikkeling en introductie van product- en/of materialenpaspoorten** (…), deelnemen aan een Europees onderzoekstraject over data-deel-infrastructuur en met kennisinstellingen verder werken aan monitoring om te komen tot betere beschikbaarheid en hogere kwaliteit van data."

CoE DPP

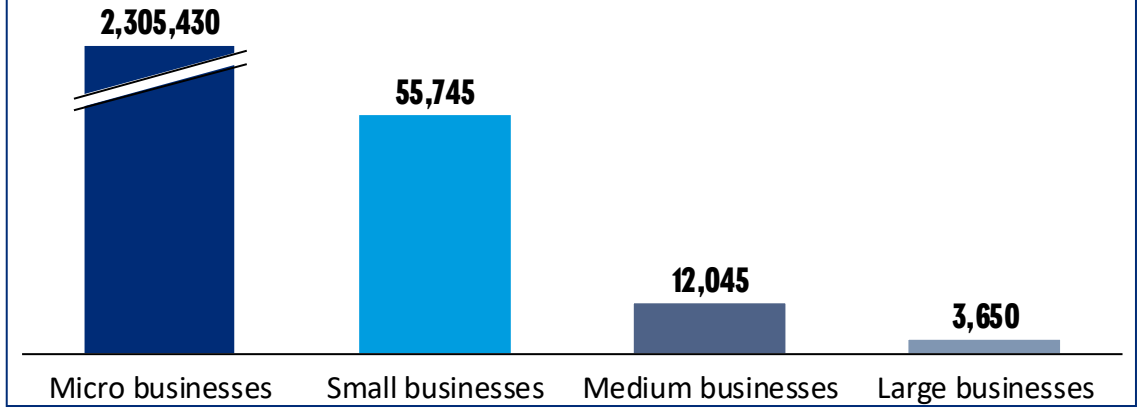
Ministerie van Economische Zaken

"Het ministerie van Economische Zaken (EZ) heeft, samen met een aantal andere ministeries, het **initiatief genomen om de ontwikkelingen rondom Digitale Product Paspoorten (DPPs) in Nederland te stimuleren**. Hiervoor heeft het ministerie geld beschikbaar gesteld en worden **de activiteiten voor het DPP ondergebracht bij het Centre of Excellence for Data Sharing & Cloud (CoE-DSC)."**

ESPR MANDATES MEMBER STATES AND THE COMMISSION TO SUPPORT SMBS WITH DPP IMPLEMENTATION

"The **Member States and the Commission should**, in their respective areas of responsibility, **provide adequate information including guidance, provide targeted and specialized training, and provide specific assistance and support, including financial support, to SMEs** active in the manufacturing of products for which eco-design requirements are set. Those actions are particularly important for product groups where the presence of SMEs is relevant."

MAJORITY OF ORGANIZATIONS SUBJECT TO ESPR AND DPP IMPLEMENTATION ARE MICRO AND SMALL ENTERPRISES



1. Other Dutch government authorities, like Customs, Ministerie van Defensie, and KGG are active in the DPP developments from an execution point of view

Source: CBS, European Commission, Update nationaal programma circulaire economie, CoE-DSC, INNOPAY analysis

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NL OPPORTUNITY: NL IS WELL POSITIONED TO USE ITS DIGITAL LITERACY TO DRIVE ECONOMIC GROWTH WITH DPPS, ADD TO ITS CIRCULAR AMBITION, ENHANCE RESILIENCE AND IMPROVE NL COMPETITIVENESS

NL HAS A LEADING DIGITAL POSITION IN BOTH SKILLS AND (INTL.) INITIATIVES

NL is positioned in the top 3 in the digital economy and society index, making DPPs more **accessible for organizations and consumers**

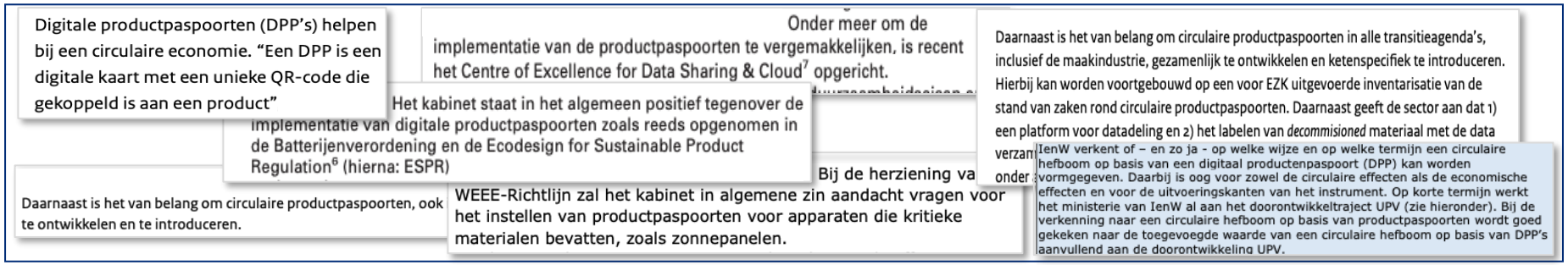
NL very active in EU Initiatives, supporting DPPs and data sharing

INTERNATIONAL DATA SPACES ASSOCIATION · GS1 Nederland · CIRPASS 2 Digital Product Passport · Catena-X · DATA SPACES SUPPORT CENTRE · gaia-x

NL highly invests in data sharing initiatives

DSGO Afspraken over toegang tot data · Platform Duurzame Huisvesting · iSHARE · hdn altijd vooruit · EDSN energiedata voor iedereen · Maritiem Masterplan Net Zero 2030 · JoinData · Edu-V · bdi

THE DUTCH GOVERNMENT EXPLORES ROLE OF DPPS FOR SOVEREIGNTY AND CIRCULARITY IN DIFFERENT POLICY BRIEFS



DPPS CAN DRIVE ECONOMIC GROWTH AND ADD TO ENHANCED RESILIENCE AND NL COMPETITIVENESS

ECONOMIC GROWTH THROUGH CIRCULAR ECONOMY ENABLEMENT

- GDP growth through business model innovation and improved efficiency of circular business models
- Have a chance of developing new digital unicorns in the emerging market of DPP software providers

ENHANCED RESILIENCE

- NL is **fully dependent on** imports of >12 **critical materials from non-EU countries**
- DPPs adoption **strengthens sovereignty** by reducing this dependency on third countries by improving yield of material harvesting from waste

IMPROVED NL COMPETITIVENESS

- Adopting DPPs strengthens the NL competitive position by **enabling organizations to implement them widely and securing future EU market access** as regulations phase in, with over 60% of Dutch goods exports soon require DPPs

Sources: Digital skills & jobs platform, EU Commission, Rijkswaterstaat, Nationaal programma circulaire economie. Tweede kamer, RVO, INNOPAY analysis

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2

ADOPTION PULSE SURVEY RESULTS

WHAT ARE SUCCESSES IN DPP ADOPTION? WHAT ARE CHALLENGES? AND WHAT ARE MARKET NEEDS?

RESEARCH SETUP: EXPLORING DPP'S STATE OF PLAY IN THE DUTCH MARKET, INCL. OPPORTUNITIES, CHALLENGES & SUPPORT NEEDS OF 4 DIFFERENT TYPES OF ORGANIZATIONS IN 11 DIFFERENT SECTORS

23 INTERVIEWS WITH ECOSYSTEM REPRESENTATIVES

50+ Responsible economic operators involved

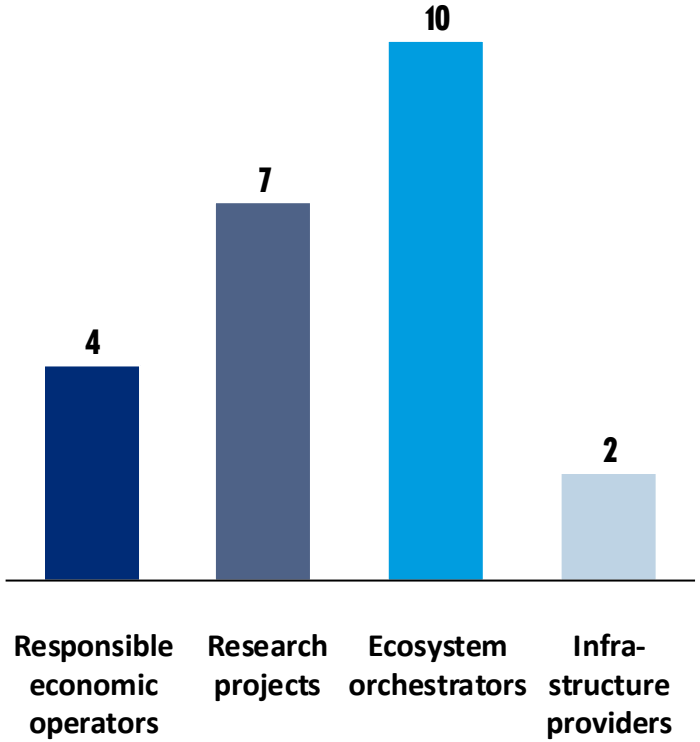
20+ DPP service providers involved

10.000+ Suppliers involved

Sectors surveyed

- Batteries
- Energy related products
- Iron & Steel
- Mattresses
- Textile/ Apparel
- Aviation
- Maritime
- Construction products
- High-tech
- Cleaning products
- Sector agnostic

Distribution of types of interviewees



Research topics

- Business value and benefits
- Implementation status
- Implementation success factors
- Implementation challenges
- Support needs

Source: INNOPAY analysis

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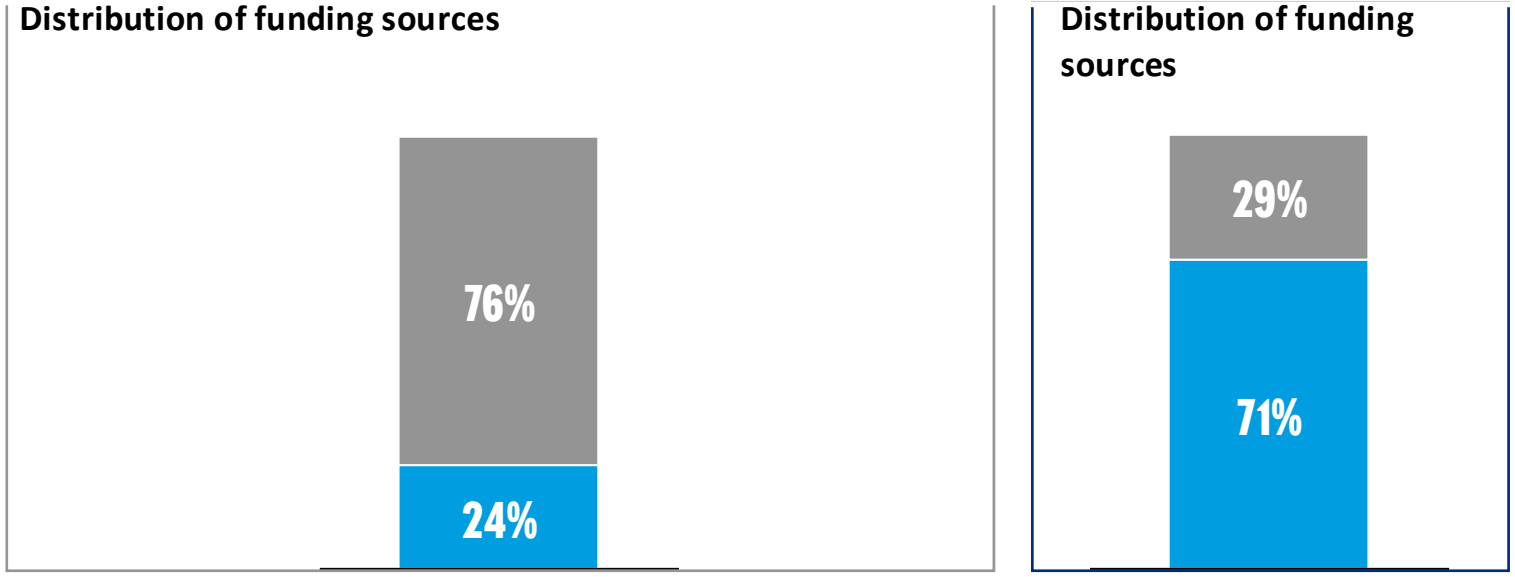
DEVELOPMENT STATUS: 31% OF INTERVIEWEES LAUNCHED THEIR DPP, MAINLY FUNDED WITH OWN MEANS, WHILE SUBSIDIES ARE FOCUSED ON RESEARCH PROJECTS WHICH ARE YET TO BE LAUNCHED

Stage of DPP development

DPPs yet to be launched — *Launched DPPs*



Source: INNOPAY analysis, see Appendix B1 for the complete statistics and observations on development stage, funding sources and value chain coverage of DPP initiatives

Observations

- **31%** of interviewees have launched their DPP solutions, well before compliance timelines are due
- **71%** of launched DPPs is funded by organizations' own means, which indicates that implementation is accelerated by perceived business value of DPPs
- **MOST** of the subsidies received by interviewed ecosystems is directed at research activity
- **NONE** of the interviewees mention external financing with loans or investments from 3rd parties as means of funding

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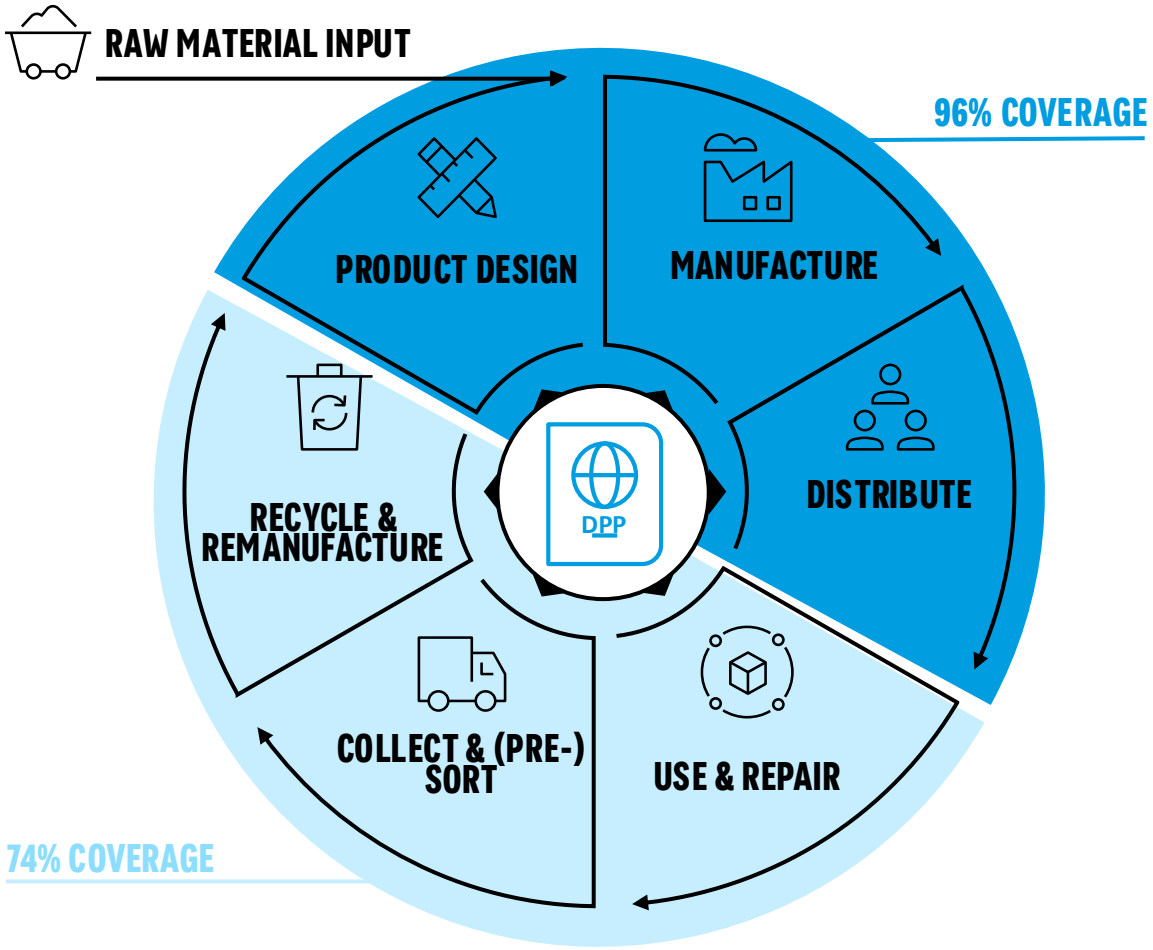
IMPLEMENTATION PERSPECTIVE: INTERVIEWEES INITIATE DPP DEVELOPMENT FROM A COMPLIANCE PERSPECTIVE, BUT ACCELERATE WHEN SEEING BUSINESS VALUE OF DPPS

Value chain coverage of surveyed DPP ecosystems



Focus of DPP ecosystems is on product design, manufacture & distribute

- **96%** of ecosystems' solutions cover the product design, manufacture and distribute, value chain parts as most DPP ecosystems are initiated from a compliance perspective
  - Organizations must provide a DPP with their products to be allowed to distribute these in the near future
- **74%** of ecosystems' solutions cover user & repair, collect & (pre-)sort, and recycle & remanufacture value chain parts
  - Organizations find it challenging to see the business value of DPPs after 'distribute', although most circular economy value is there

"BEFORE YOU CAN START USING CIRCULAR BUSINESS MODELS TO CREATE VALUE BEYOND COMPLIANCE, YOU FIRST NEED TO DEVELOP A DPP INSPIRED BY COMPLIANCE"

Source: INNOPAY analysis, see Appendix B1 for the complete statistics and observations on development stage, funding sources and value chain coverage of DPP initiatives

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DPP VALUE: MOST PERCEIVED VALUE OF DPPS IS IN COMPLIANCE, FURTHERMORE DPPS CONTRIBUTE TO DIGITAL SUSTAINABILITY

Top 4 average score on perceived value of business benefits from DPPs from all interviewed ecosystems

- **4.4/5** — TRACEABILITY AND (ESG) REPORTING
- **4.3/5** — INCREASED FORMAL PRODUCT COLLECTION
- **4.0/5** — INFORMED PURCHASING DECISIONS
- **4.0/5** — EASED SERVICING

Top 4 digital sustainability [1] topics expected to be supported by DPP

- **4.5/5** — STAKEHOLDER ENGAGEMENT
- **4.4/5** — REGULATORY COMPLIANCE & RISK MANAGEMENT
- **4.4/5** — BUSINESS MODEL INNOVATION
- **4.0/5** — SUSTAINABLE SUPPLY CHAINS

1. Digital sustainability entails environmental, social and economic elements, see Digital sustainability: about much more than just reducing CO_2 | INNOPAY
Source: INNOPAY analysis, see Appendix B2 for the complete statistics and observations on perceived business benefits and digital sustainability topics

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SUCCESS DRIVERS FOR DPPS: COLLABORATION, STRATEGIC VALUE, DPP UNDERSTANDING, TECHNOLOGICAL INFRASTRUCTURE AND ACCESS TO INFORMATION

Identified success drivers for DPP realization

	1	2	3	4	5
	COLLABORATION	**STRATEGIC VALUE**	**DPP UNDERSTANDING**	**TECHNICAL INFRASTRUCTURE**	**ACCESS TO KNOWLEDGE**
What?	Engaging internal & external stakeholders is a must	Find a right to win, to drive commitment	Know DPP's requirements, business value and working	Prioritize a flexible and accessible infrastructure	Access to others' experiences/learnings
Why?	• Generates broad insights into DPP value and development • Provides support & power in creating and shaping DPP • Drives value chain trust and influence within networks	• Ensures a strong organization vision and collective ecosystem vision on DPPs • Speeds up the development process due to management buy-in	• Leads to DPP design that brings optimal value • Helps to tackle challenges & minimize expensive pivoting when it's gained early-on • Drives engagement by having stakeholders grasp DPP's value	• Is a prerequisite for DPP functionality and comprehensiveness • Creates opportunity for later DPP adjustments • Enables DPP accessibility to the entire value chain	• Saves resources by learning from similar initiatives • Supports development of DPPs and is driven by trust when it comes to (sensitive) data in the value chain

Source: INNOPAY analysis, see Appendix B3 for the complete statistics and observations on DPP's success drivers

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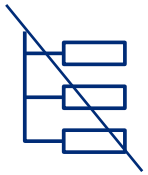
CHALLENGES THAT HINDER DPP ADOPTION: LACK OF DATA ACCESS AND AVAILABILITY, A LACK OF STANDARDIZATION, A SHORTAGE OF RESOURCES, LEGAL CLARITY, AND HESITANCE IN VENDOR CHOICE

Identified challenges for DPP realization

	1	2	3	4	5
					
	LACK OF DATA ACCESS & AVAILABILITY	**LACK OF STANDARDIZATION**	**SHORTAGE OF RESOURCES**	**LACK OF EU CLARITY**	**HESITANCE IN VENDOR CHOICE**
What?	Incomplete, low-quality, unavailable data	Differences in DPP data, formats, semantics	Organization's limited resource availability to DPPs	Limited information on DPP timelines and content	Risk & unclarity in choosing the right service provider
Why?	• Compromises DPP value • Data collection is demanding & time-consuming with suppliers; • Value chain partners have conflicting priorities; • Value chain partners are hesitant in data sharing	• Hinders useful data exchange in the value chain • Results in lack of interoperability between initiatives within and between industries and beyond county borders	• Results in, delays & scope restrictions of DPP projects • Indicates lack of available resources or organizational prioritization by not having earmarked project budget vor DPPs available in the organization	• Is worsened by earlier pivots in EU sustainability regulations, resulting in lack of trust • Causes confusion, delay & organizational deprioritization of DPPs	• Driven by organizations who fear lock-in and postpone their service provider selection • Hinders implementation: organizations lack internal skills to create the DPP infrastructure themselves

Source: INNOPAY analysis, see Appendix B3 for the complete statistics and observations on DPP's challenges

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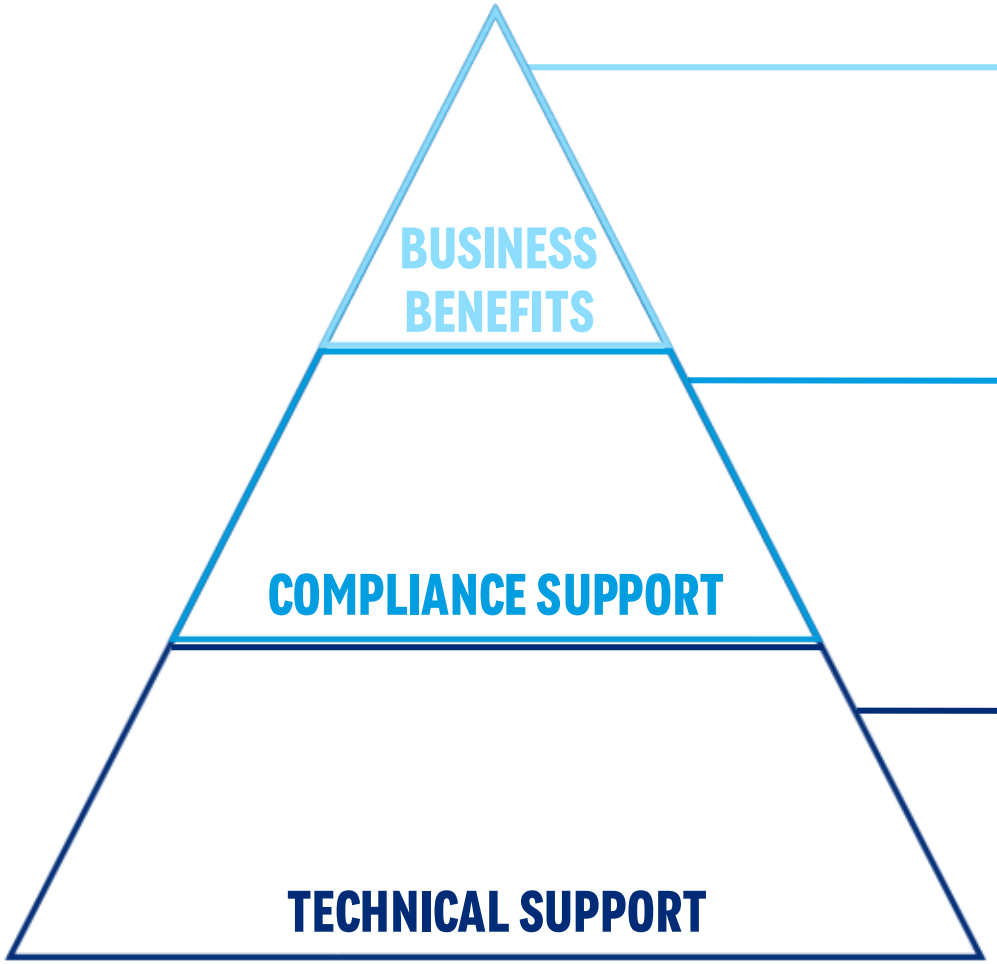
INFORMATION SOURCES: ALL INTERVIEWEES LOOK FOR EXTERNAL INFORMATION ON DPPS FOR THEIR DPP DEVELOPMENT, AND MOSTLY FIND SOURCES FOR TECHNICAL AND COMPLIANCE SUPPORT

Interviewees name several types of sources, which they consult through e.g. events, conversations, discussions, websites, publications, and tools



8% OF TOTAL USED SOURCES ARE CONSULTED FOR REALIZING BUSINESS BENEFITS

Interviewees consulted sources to understand:
- (Realization of) DPP value by looking at proof of concept and use cases (e.g. CIRPASS-2, ecosystem partners, service providers)
- Ecosystem partners' needs by consulting their partners

38% OF TOTAL USED SOURCES ARE CONSULTED FOR COMPLIANCE

Interviewees consulted sources to understand:
- Legal requirements and timelines (e.g. standardization organizations, industry associations)
- Perceptions and expectations on legal requirements from others (e.g. ecosystem partners, data sharing initiatives, service providers)

56% OF TOTAL USED SOURCES ARE CONSULTED FOR TECHNICAL SUPPORT

Interviewees consulted sources for support with:
- Setting up a technical infrastructure by consulting their service provider
- Standardization and interoperability (e.g. standardization organizations, data sharing initiatives)

Source: INNOPAY analysis, see Appendix B4 for a complete overview of sources used

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MARKET NEEDS: A ONE-STOP-SHOP WITH EXTERNAL AND INDEPENDENT SUPPORT FOR A KNOWLEDGE PLATFORM, LEGISLATIVE CLARITY, RESOURCES AND EFFICIENT DATA SHARING

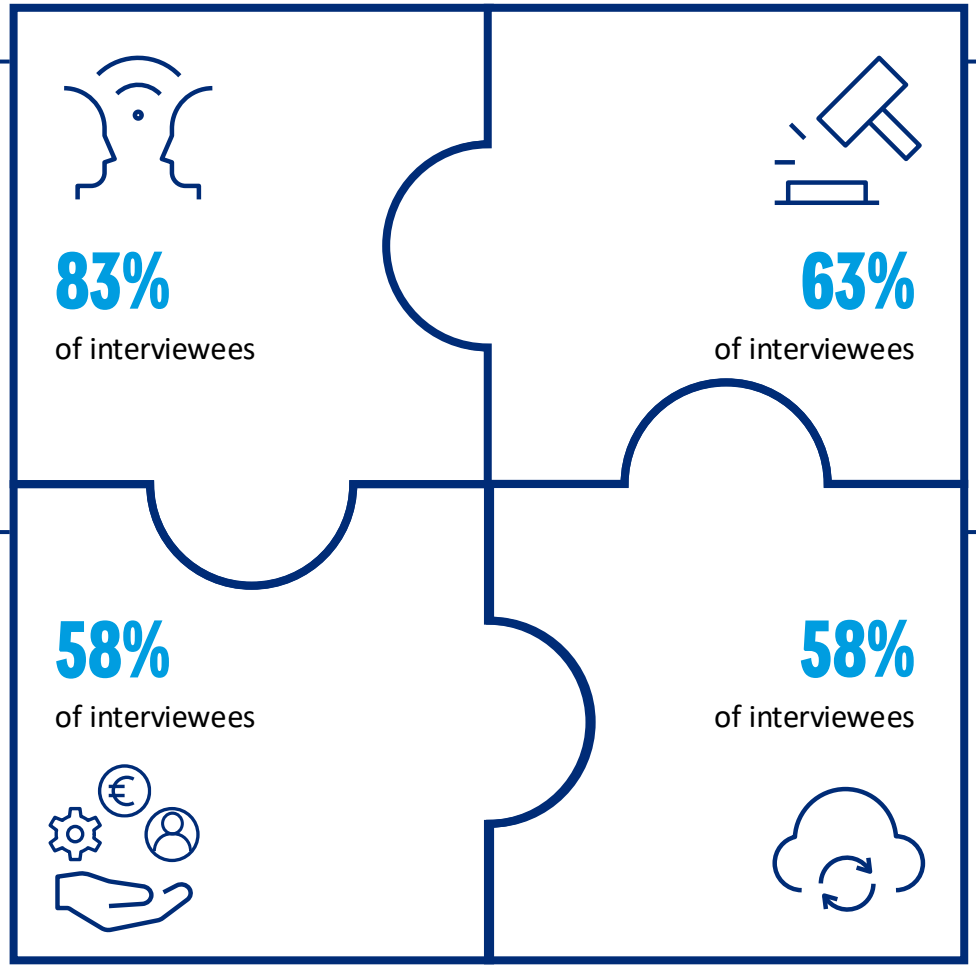
Interviewees need a one-stop-shop when looking for support with realizing their DPPs

KNOWLEDGE PLATFORM

- Facilitate a source of objective information on DPPs
- Disseminate learnings of DPP initiatives to organizations that are exploring out how to implement their DPP
- Build a community & networking platform to link initiatives and share learnings

RESOURCES

- Provide or help find financial support for REOs to start and accelerate their DPP development, with a focus on SMB
- Facilitate contact with DPP experts serving as advisors to help responsible economic operators (get started) with their DPP development
- Support DPP setup and implementation with expertise and step-by step guides



LEGISLATIVE CLARITY

- (Lobby to) clarify and establish legislation timelines to create certainty
- Inform on EU legislation, legislative updates and minimum DPP requirements
- Translate EU legislation to goals and policies of Dutch government

EFFICIENT DATA SHARING

- Orchestrate standardization of data formats, systems and infrastructure to simplify the value chain data collection process and ensure interoperability
- Apply quality levels in DPP implementation to allow for different paces of development and transparency on DPP quality

Source: INNOPAY analysis, see Appendix B4 for a complete overview of support mentioned to be needed

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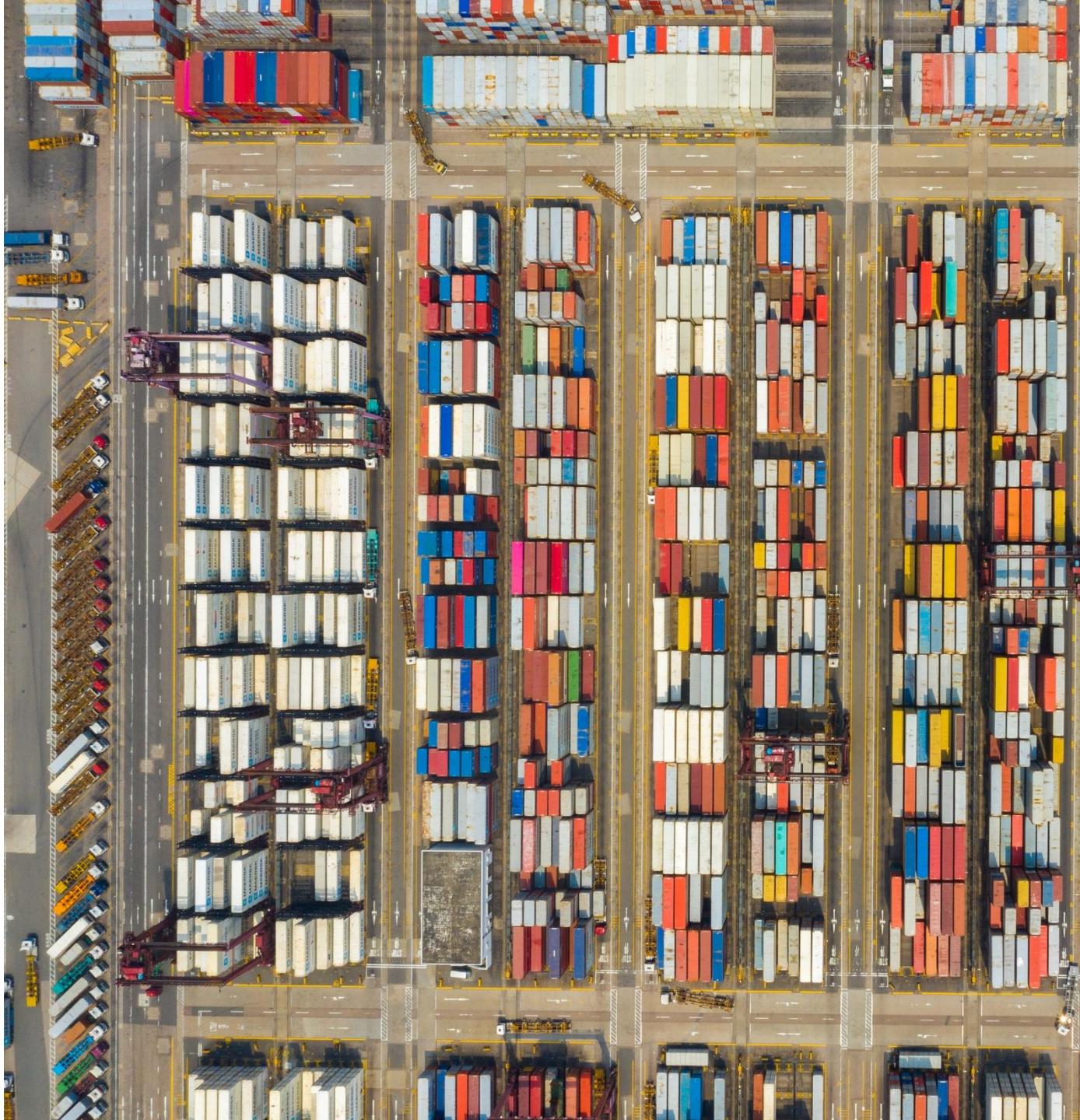
3

ADOPTION PULSE CONCLUSIONS

WAT CONCLUSIONS ON DPP ADOPTION CAN WE DRAW BASED ON THE ADOPTION PULSE SURVEY?



DPP VALUE LAYERS: DPPS CAN BE BUILT WITH THREE DIFFERENT LAYERS OF DATA, THAT JOINTLY DEFINE THE BUSINESS VALUE OF A DPP

DPP001234

1

REGULATORY REQUIREMENTS

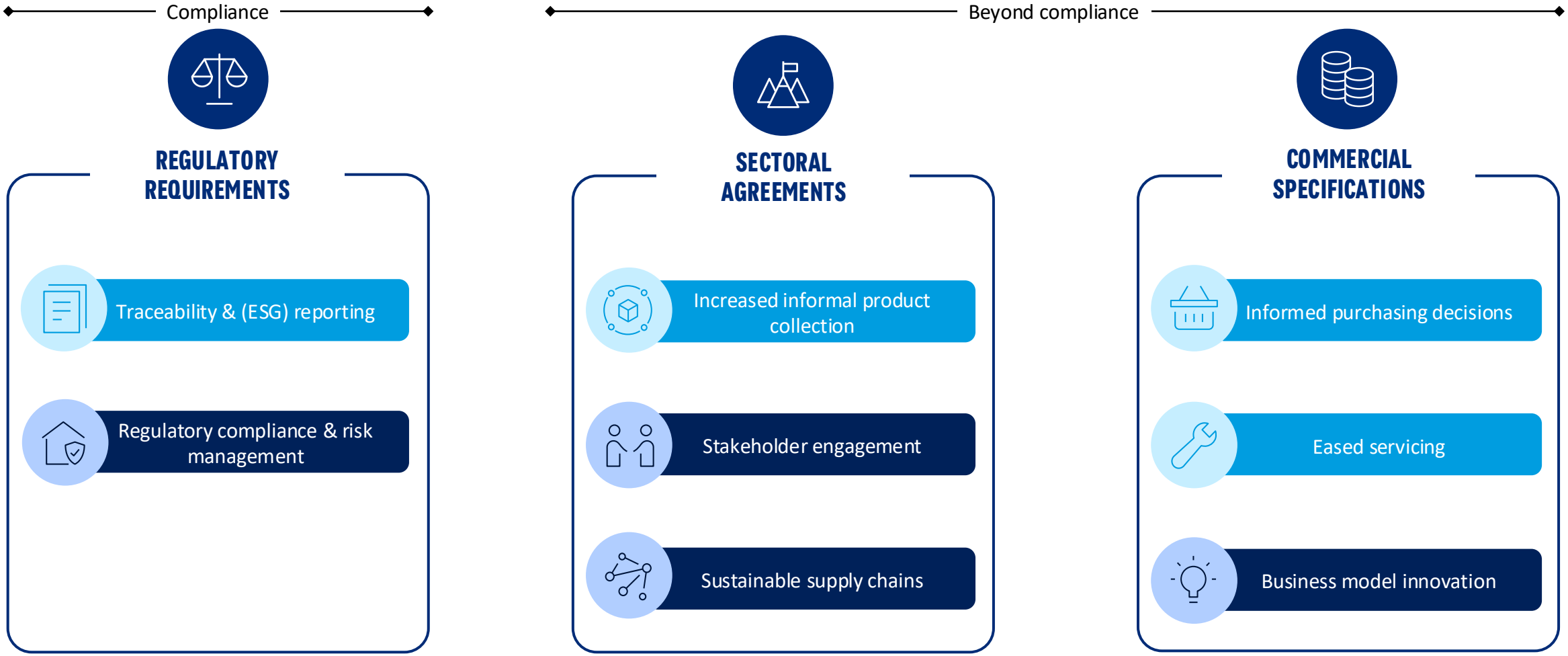
PRODUCT PASSPORT

For example:

- CO2 emissions
- Material composition, incl. recycled content

*T<BLUE<<TSHIRT<<

BUSINESS BENEFITS: MOST PERCEIVED BUSINESS BENEFITS AND DIGITAL SUSTAINABILITY VALUE OF DPPS LAY BEYOND COMPLIANCE, FILLING IN THE SECTORAL AND COMMERCIAL LAYERS OF DPPS



Top 4 business benefits from DPPs

Top 4 digital sustainability topics mostly contributed to by DPPs

Source: INNOPAY analysis

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REALIZE BUSINESS VALUE: TO BANK ON 'BEYOND COMPLIANCE' VALUE OF DPPS, ORGANIZATIONS MUST UNDERSTAND THE POTENTIAL BUSINESS VALUE OF DPPS AND DECIDE HOW TO CAPTURE IT

Success factors in DPP implementation…

STRATEGIC VALUE creates stakeholder commitment, accelerates development & stakeholder alignment

DPP UNDERSTANDING leads to valuable DPP design and stakeholder engagement

TECHNOLOGICAL INFRASTRUCTURE must be realized for DPP's functionality

ACCESS TO KNOWLEDGE results in efficient DPP development

COLLABORATION is a prerequisite for DPP development and implementation

… generate three important themes for organizations to focus on for successful DPP implementation beyond compliance

1. Understand what DPP's are and how they bring value to your organization to build management support for DPP development
2. Determine how to best get access to the data required for your DPP set-up given your ecosystem characteristics and goals
3. Activate and align both internal and external stakeholders to realize DPP business value in the short- and long term

Source: INNOPAY analysis

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PUSH AND PULL: ORGANIZATIONS NEED CERTAINTY IN REGULATORY REQUIREMENTS AND INSIGHTS IN THE BUSINESS VALUE OF DPPS TO START DEVELOPMENT

INTERVIEWED ECOSYSTEMS

All interviewed organizations expressed their concerns about the market conditions for DPP implementation for other organizations in their sector and highlighted what would help to improve DPP adoption:

PUSH: ORGANIZATIONS WAIT WITH DPP IMPLEMENTATION UNTIL THEY HAVE LEGAL CLARITY

- Organizations fear **useless investments** in case of policy changes/ clarification
- Organizations consider data exchange without standards to be **too complex and time-consuming** to get started with DPPs
- Organizations **fear lock-in** and postpone their service provider selection, as it is unclear which ones base their tools on standards

PULL: INSIGHT IN BUSINESS VALUE CREATES A PULL FOR ORGANIZATIONS TO INVEST IN DPPS

- Organizations prioritize other activities in their resource allocation, due to a **lacking feeling of urgency and unawareness about potential impact & added value**
- Organizations must be invited to get started with their DPP data collection, as essential **value chain partners have different priorities and timelines**

Source: INNOPAY analysis

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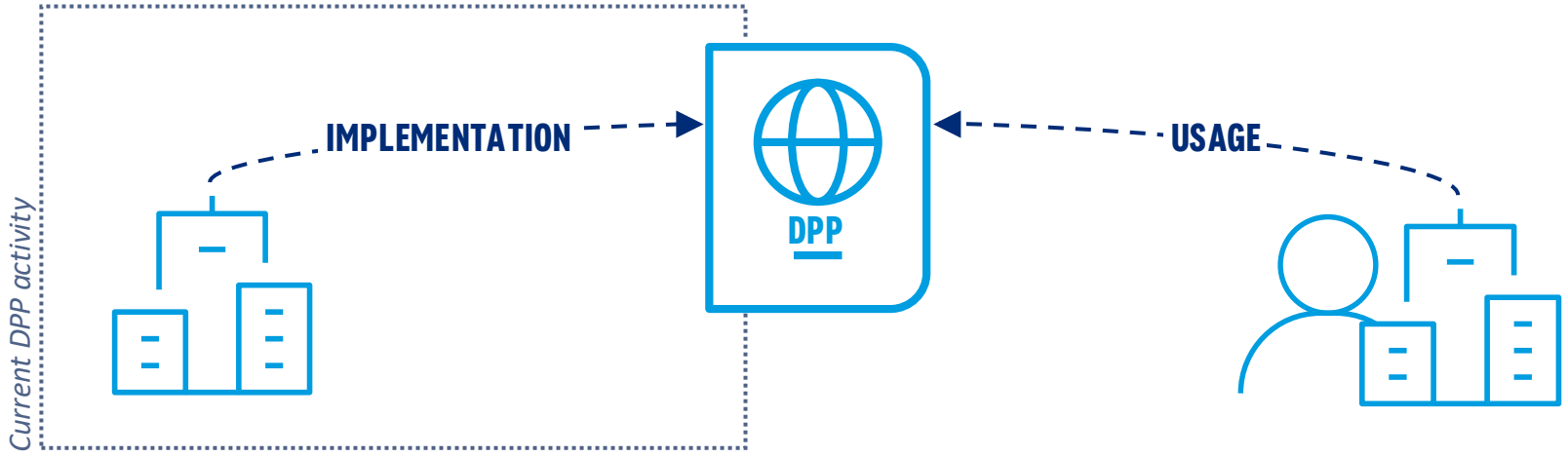
IMPLEMENTATION FOCUS: CURRENT DPP-ACTIVITY IS FOCUSED ON IMPLEMENTATION AND NOT ON STIMULATING DPP USAGE - THE FRONTIER OF ADOPTION IS YET TO BE DISCOVERED

DPP adoption consists of two elements: organizations implementing DPPs and usage of DPPs by consumers and organizations



- Current market activity is focused on (knowledge) development and implementation of DPPs, rather than the use of DPPs

"A LOT OF FUNDING IS GOING TO EDUCATION AND KNOWLEDGE ON THE DPP TRANSITION. HOWEVER, FOR THE ORGANIZATIONS DRIVING THE TRANSITION, IT IS VERY DIFFICULT TO FIND EXTERNAL FUNDING"

- Resources allocated to stimulate the actual 'usage' of DPP's either by consumers or business (or both) as end-users

"IN THREE YEARS, WE WILL HAVE DPPS, BUT WE WILL STILL NOT BE ABLE TO DO MUCH WITH THEM IF NO ONE USES THEM"

Source: INNOPAY analysis

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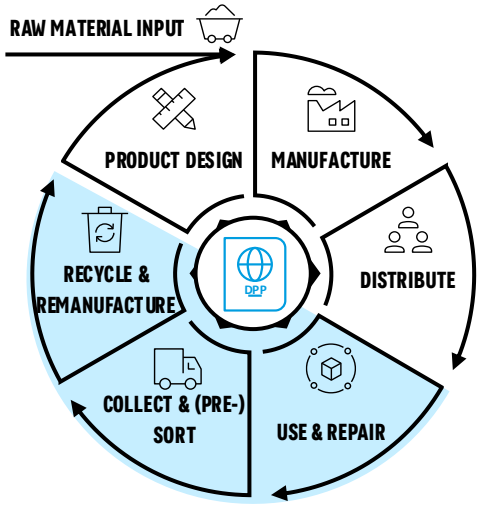
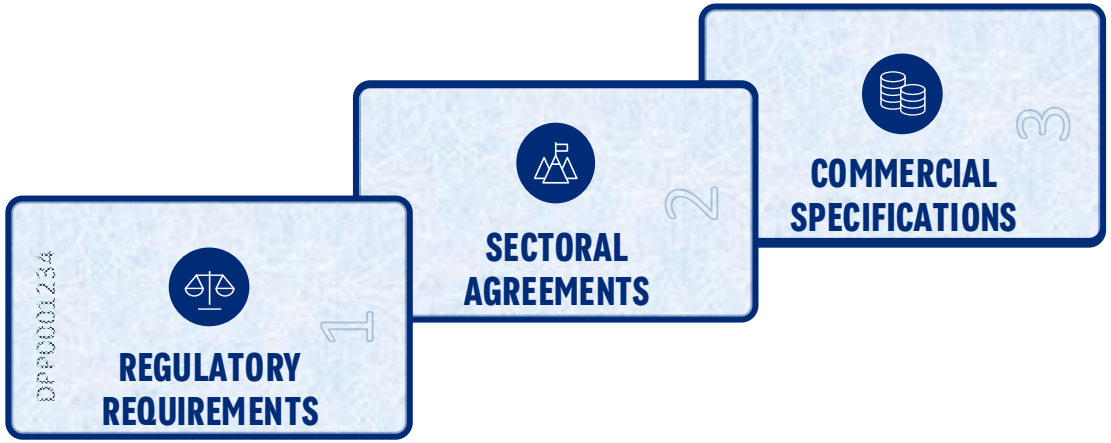
ADOPTION CONTINUUM: THE WAY THAT RESPONSIBLE ECONOMIC OPERATORS ASSESS WHERE THE BUSINESS VALUE OF THEIR DPP LANDS DETERMINES HOW THEY IMPLEMENT THEIR DPPS

Adoption is a continuum: the realization of consumer and business value depends on how DPP is implemented by the REO





BUSINESSES AS END-USERS VALUE EXAMPLES

- More transparent procurement procedures
- Improved repair service and maintenance propositions
- Better second life and refurbishment valuation

"WE ARE LOOKING AT POSSIBLE EXTRA SERVICES THAT WE CAN OFFER RECYCLERS TO MAKE DPP USAGE EASIER AND MORE INSIGHTFUL"

CONSUMERS AS END-USERS VALUE EXAMPLES

- Improved brand reputation at consumers due to second life value of products
- New sales opportunities with opening a new channel for extra product sales (e.g. spare parts)
- New channels to sell extra services from 3rd parties (e.g. embedded insurance, maintenance services)

"WE INFORM CUSTOMERS ON OUR PRODUCTION PROCESS AND HENCE SELL MORE PRODUCTS BECAUSE WE SHOW HOW SUSTAINABLE WE ARE"

Source: INNOPAY analysis

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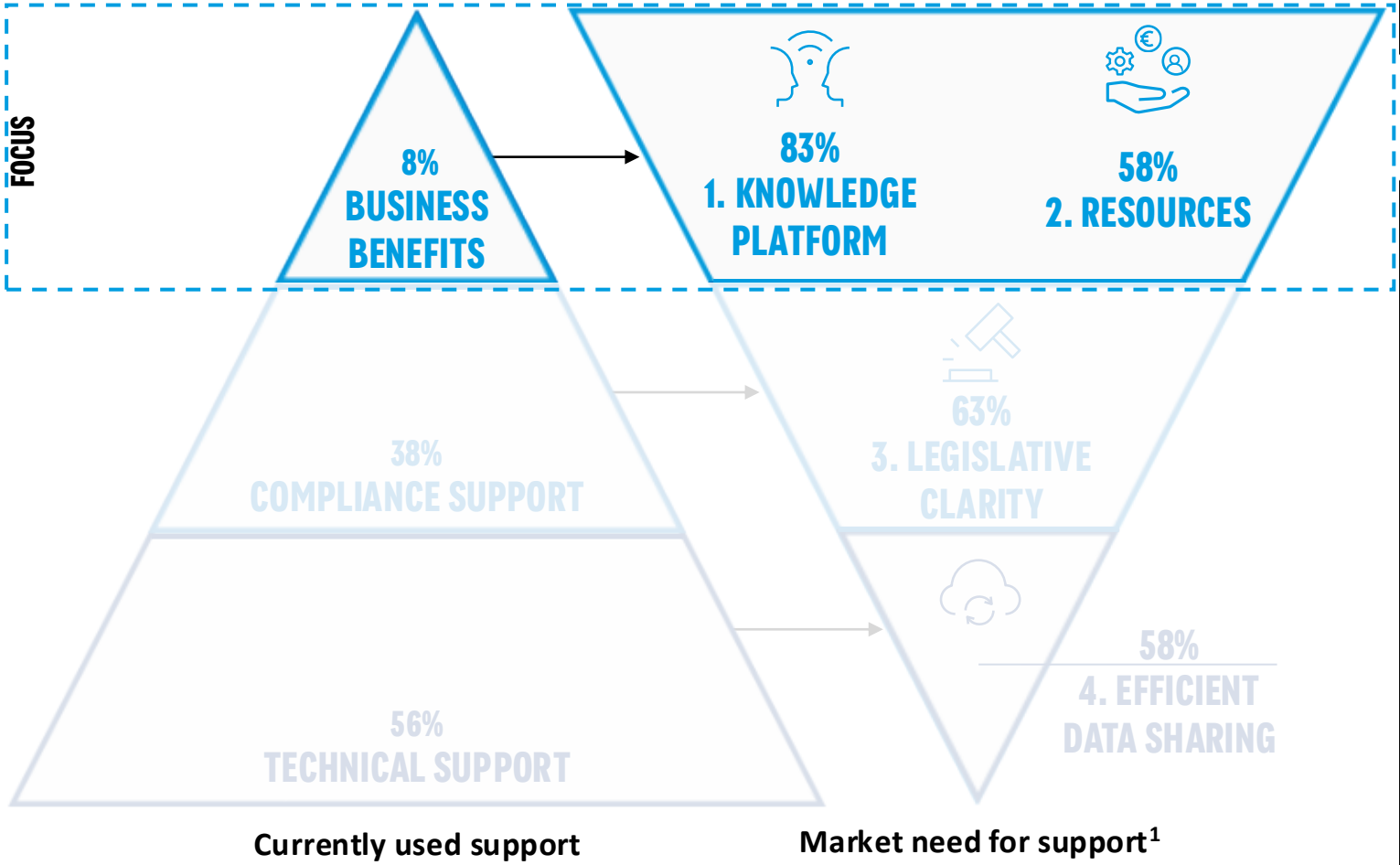
MARKET NEED (1/2): INSIGHTS IN BUSINESS BENEFITS HELP TO START DPP IMPLEMENTATION, CLOSING THE GAP BETWEEN OFFERED AND NEEDED SUPPORT IS ADAMANT

Organizations state that a lack of insight in business benefits prevents them from starting with DPPs



Sources on business benefits are challenging to find or don't offer the right support

1. **Organizations start with DPPs when they see the business benefits.** Organizations need knowledge and a networking platform to learn from their own and other industries how to realize business benefits from DPPs to get started with their DPP implementation.
   When organizations see business benefits, they tend to invest in DPPs beyond compliance
2. **Organizations need more resources** to realize DPP business benefits and are often unaware of possibilities on green financing and financial stimulus from the government, current DPP compliance focused efforts are financed with running budgets of sustainability departments
   - Organizations indicate that subsidies should aim to support micro- and small business to comply with DPP regulation by focusing on implementation of DPPs
   - Commercial lenders need to inform their client base on the possibility of funding DPP projects with green loans and collaborate to find the value pockets

1. See page 19 for more details on market needs
Source: INNOPAY analysis
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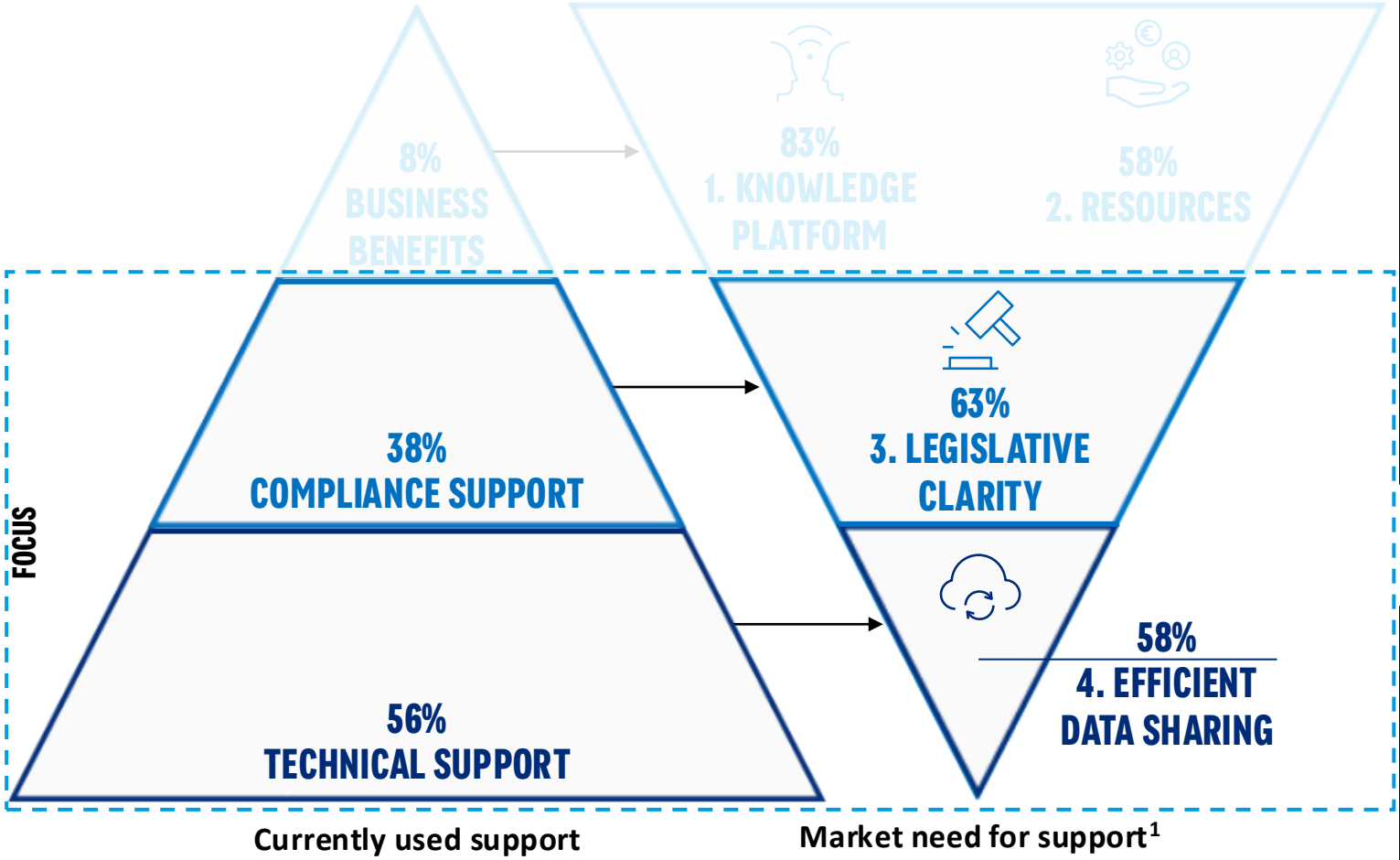
MARKET NEED (2/2): MANY ORGANIZATIONS MAKE USE OF COMPLIANCE AND TECHNICAL SUPPORT, YET NEED ADDITIONAL LEGISLATIVE CLARITY AND EFFICIENT DATA SHARING

Current initiatives identified and used many sources with technical and compliance support, but identify remaining gaps on support beyond timelines and technical research/standards



Legislative clarity is needed, and efficient data sharing speeds up DPP implementation

3. **Organizations need legislative clarity for their DPP development.** Many aspects of legislative requirements of DPPs on sector level are unclear:
   - Timelines for different sectors are unclear and subject for discussion
   - Unclarity on minimal requirements on data that need to be in the DPP even worry frontrunners who can make a good guess on what should be in it
   - Requirements to alter and update data (real-time) in a DPP are a big question for all involved
4. **Organizations acknowledge the efforts on standardization and efficient data sharing.** However, they see many 'research focused' initiatives regarding long-term DPP data access optimization. Whereas they look for concrete solutions to help them accelerate DPP data collection today. Additionally, they need guidance on existing standards and solutions that can help accelerate data sharing now

1. See page 19 for more details on market needs
Source: INNOPAY analysis
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PRACTICAL DPP QUESTIONS: USAGE CHALLENGES REMAIN FOR THE BASIC OPERATIONS OF DPPS & THE USE OF SENSITIVE AND REAL-TIME DATA IN DPPS – WHICH REQUIRE AGREEMENTS TO OVERCOME

Practical implementation questions are unanswered: to enable optimal DPP usage, agreements must be made by ecosystems as the legislator is not expected to in such level of detail

DPP USAGE CHALLENGES:

A. Data operations concerns for data in DPPs
- It is unclear who can Create, Read, Update or Delete (CRUD) data in a DPP in which situation

B. Sensitive data concerns on consumer privacy or REO strategy
- Real-time consumer data is often protected by regulation. In EV batteries: location tracking, battery status, # of charging cycles
- Data on (supply-chain) operations could jeopardize the REO's market position when accessed by competitors

C. Real-time data concerns: unclarity on how 'real-time' is real-time
- Real-time data has high value potential for circular use cases (e.g. for the repair shop of EV batteries)
- The difference in DPP costs can be a factor 100 depending how real-time the data needs to be

Non-exhaustive

AGREEMENTS ARE REQUIRED, to answer open questions such as:

A. What parties should be able to update the data in the DPP? And what identification, authentication and authorization framework should be used for this?
- What company types or digital identity attributes from the eIDAS wallets are required for updating or reading certain attributes in the DPP?
- How to register DIY repairs of products by consumers?

B. What data in the DPP should be available to whom in what situation?
- How to make data access management scalable?
- E.g. customs should be allowed to access more data than competitors or the consumer

C. How 'real-time' is real-time?
- How often should real-time data be updated and who pays the price?
- How does 'DPP user' know what the status s of the real-time info?

"SENSITIVE DATA RELATED TO OPERATIONS AND REPAIR ACTIVITIES CAN PROVIDE COMPETITIVE ADVANTAGES. THUS, DISCLOSING THIS DATA COULD JEOPARDIZE OUR MARKET POSITION"

"A REPAIRER CANNOT JUST ACCESS PRIVACY SENSITIVE DATA, BUT REQUIRES CONSENT FROM THE END USER AND MANUFACTURER THAT OWNS THE DPP TO ACCESS THE DATA"

Source: INNOPAY analysis

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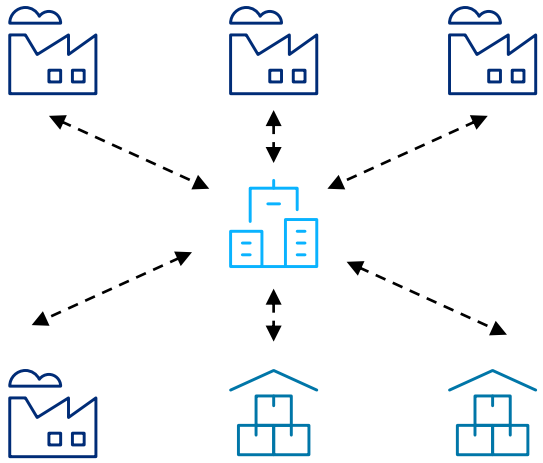
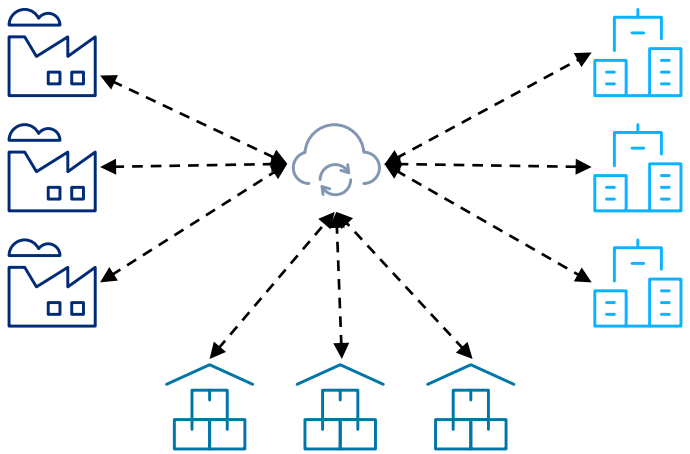
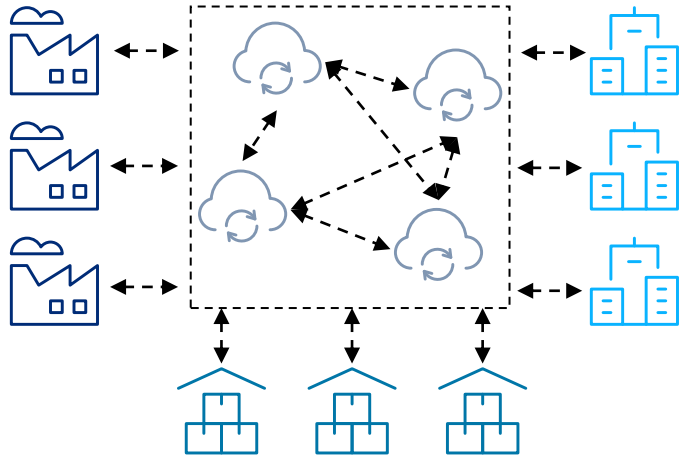
WE IDENTIFY 3 WAYS OF REALIZING DATA ACCESS: WITH DIFFERING NEEDS FOR INDUSTRY AGREEMENTS, INDUSTRY ASSOCIATIONS CAN PLAY A ROLE IN ORCHESTRATING THE FITTING OPTION FOR THEIR SECTOR

	REO is the DPP data orchestrator	Platforms as DPP data orchestrator	DPP data availability scheme
			
Scope	Individual value chains	(cross-) Sector value chains	(cross-) Sector value chains
Data access agreements	Bilateral agreements	On platform terms	Agreed upon by participants via scheme governance
Industry agreements	**LOW** need	**SOME** need	**HIGH** need
Avg. value chain data trx cost	**€€€**	**€€**	**€**
Benefits / risks	+ Low effort to set up - Not scalable	+ Easy to use, some standards - No interoperability between platforms, power imbalance	+ Interoperability between all participants & power balance - Needs (cross-)sector effort & coordination

Source: INNOPAY analysis

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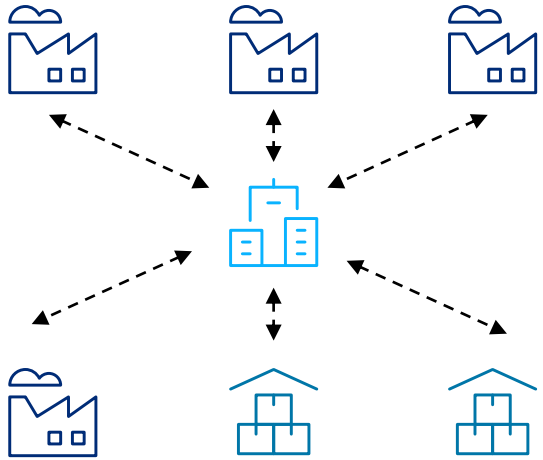
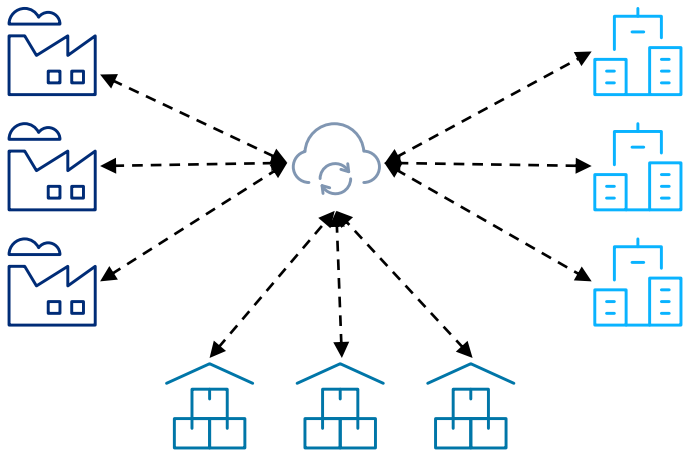
DATA ACCESS STRATEGY: INDUSTRY ASSOCIATION CAN ACCELERATE DPP ADOPTION BY ADVOCATING FOR REO AND PLATFORM ORCHESTRATORS FIRST, AND FACILITATE THE REALIZATION OF DPP SCHEMES LATER

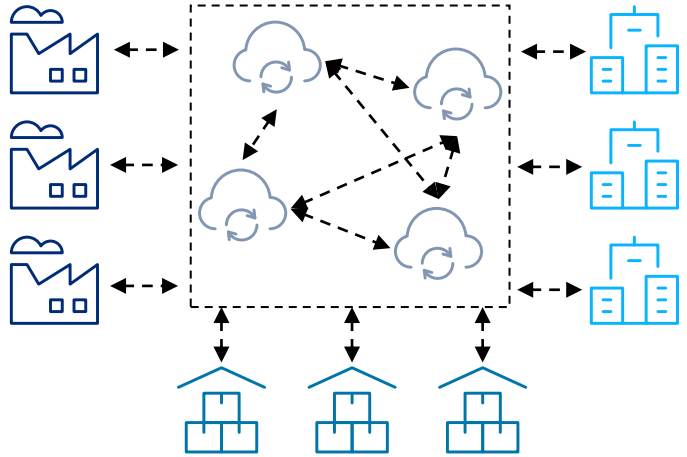
REO is the DPP data orchestrator



Platforms as DPP data orchestrator



DPP data availability scheme



- Most parties **start with the option of an REO or platform as DPP data orchestrator, leading to quick DPP implementation** and the assumption of providing sufficient functionality for the early phase of the DPP transition whilst improving sectors' data readiness
- Gradually, the need for the creation of wider **DPP data availability schemes** becomes important; as this elevates efficiency and effectiveness of DPPs within in a sector AND as the need for **exchange data beyond sectoral, platform or ecosystem boundaries** becomes inevitable (e.g. for products with multiple components, often surpassing sectoral boundaries)
- Realizing data access through a scheme is **most future-proof**, as it will create interoperability between all parties involved, leading to frictionless data accessibility across sectoral and national boundaries which in turn provides low data transaction costs, most economic and most societal benefits. Current NL data sharing initiatives can form a welcome and fruitful launching pad

Source: INNOPAY analysis

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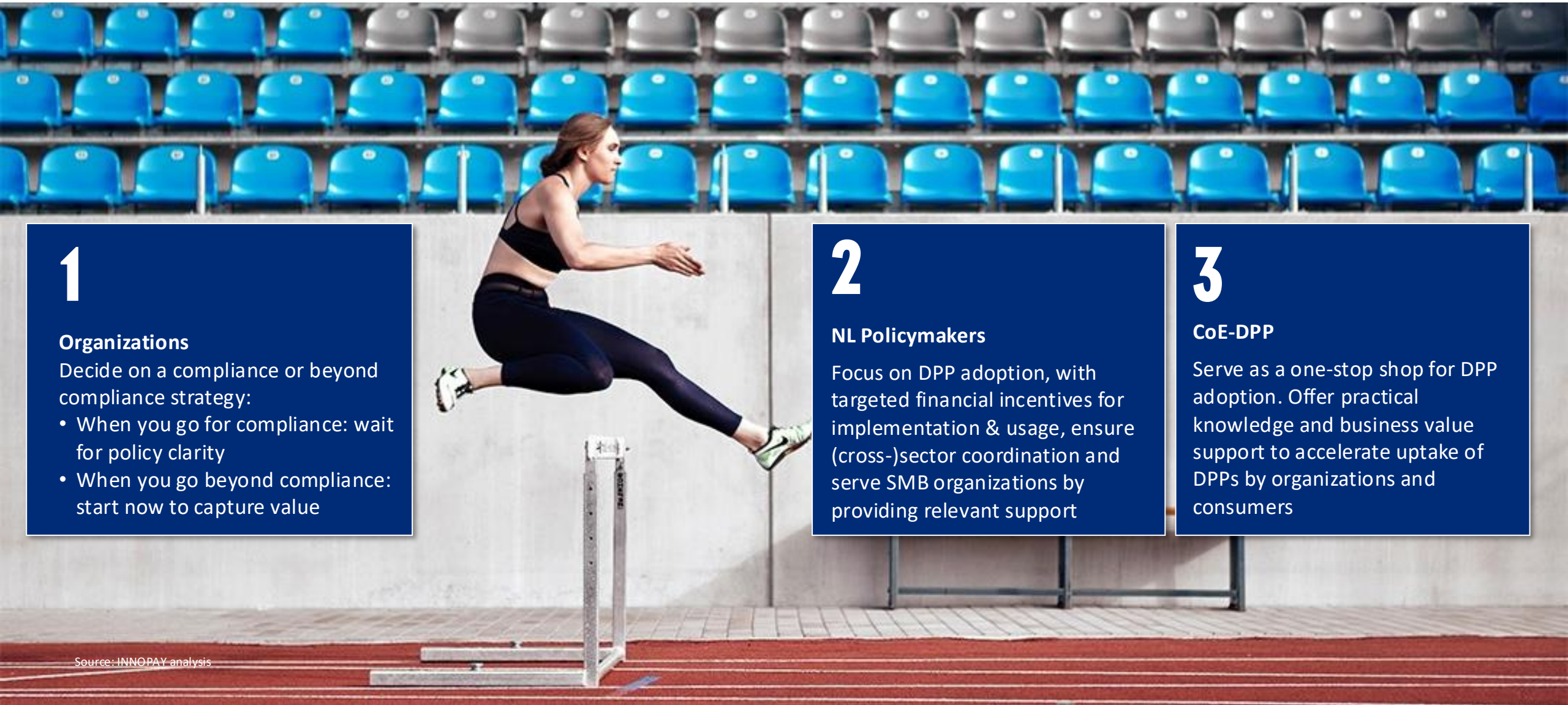
4.

RECOMMENDATIONS

HOW DO WE ACCELERATE ADOPTION OF DPPS, FROM BOTH AN ORGANIZATION, POLICY AND COE-DPP PERSPECTIVE?

SUMMARY: RECOMMENDATIONS ON ACCELERATION OF DPP ADOPTION FOR ORGANIZATIONS, POLICYMAKERS AND THE COE-DPP



1

Organizations

Decide on a compliance or beyond compliance strategy:

- When you go for compliance: wait for policy clarity
- When you go beyond compliance: start now to capture value

2

NL Policymakers

Focus on DPP adoption, with targeted financial incentives for implementation & usage, ensure (cross-)sector coordination and serve SMB organizations by providing relevant support

3

CoE-DPP

Serve as a one-stop shop for DPP adoption. Offer practical knowledge and business value support to accelerate uptake of DPPs by organizations and consumers

Source: INNOPAY analysis

ORGANIZATIONS SHOULD STRATEGICALLY DECIDE ON HOW THEY WANT TO ENGAGE WITH DPPS TO GET THEIR DESIRED VALUE FROM DPPS AND START RIGHT AWAY

Actions to take for rolling out a DPP depend on an organization's DPP strategy

1. Take a compliance only strategy	OR	2. Take a beyond compliance strategy
1 **Assume what you will need:** Assess availability of data that is minimally expected in the DPP (e.g. CO_2 footprint)		1 **Build management support:** Understand what DPP's are and how they can bring value in your context (your value chain, processes)
2 **Engage with supply chain:** If minimally expected data is unavailable – engage with supply chain to inform them on upcoming ask		2 **Organize data access:** Determine how to best get access to the data required for your DPP set-up given your ecosystem characteristics and goals
3 **Wait for clarity:** Roll out an implementation program as soon as policy clarity is provided		3 **Focus on business value:** Activate and align both internal and external stakeholders to realize DPP business value in the short- and long term

Frontrunners succeed to realize business value by starting DPP implementation fast

"YOU SHOULD START WITH DPP IMPLEMENTATION NOW, IF YOU ADHERE TO THE PARETO PRINCIPLE YOU CAN MAKE A LOT OF IMPACT EVEN IF YOU'RE NOT 100% COMPLETE, MAKE A DIFFERENCE AND LEARN!"

"START WITH YOUR DPP AND KEEP THE FLEXIBILITY TO ADD MORE DATA OR CHANGE THINGS IN THE STRUCTURE OF YOUR DPP"

"IT IS NOT EASY TO COLLECT DATA IN A SECTOR THAT IS NOT DIGITALLY NATIVE, WAITING TO DO EVERYTHING IN THE 18 MONTHS IMPLEMENTATION TIMELINE AFTER DELEGATED ACTS OF THE ESPR ARE RELEASED IS RISKY"

"THE EASIEST WAY TO START IS WHEN YOU HAVE A CLEAR VIEW ON DPP BUSINESS VALUE, AFTER THAT, THE LEGISLATION AND COMPLYING WITH IT IS JUST A NICE BONUS"

Source: INNOPAY analysis

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Deep dive on NL policy advice available in Appendix A

POLICYMAKERS ACCELERATE DPP ADOPTION BY CREATING LEGISLATIVE CLARITY, STIMULATING AND ENFORCING DPP ADOPTION, AND SUPPORT ORGANIZATIONS WITH KNOWLEDGE AND RESOURCES ON DPPS

Develop policy and delegated acts with empowerment of market forces in mind and act as a reliable partner

- Provide clarity on legislative timelines and DPP compliance baseline at EU level

- Embed the expected effect of DPPs to wider government goals to ensure funding: e.g. (digital) sovereignty, CO_2 emission reduction and development of the circular economy
- Appoint an owner (dossierhouder) at DG/SG level for the subject DPPs to ensure coherent and aligned policy and funding for DPP initiatives
- Invest in neutral (knowledge) platform (CoE-DPP) that makes DPP-adoption and knowledge widely available and easily accessible especially for SMEs

"MANY THINGS ARE UNCLEAR, WHAT IS REQUIRED AT WHAT POINT IN TIME? AND CAN WE BE SURE THAT THERE IS NO DELAY IN IMPLEMENTATION TIMELINES?"

Support organizations to adopt and implement DPPs by catering to their needs of knowledge and resources

- Ensure harmonization and interoperability of DPPs within the EU to prevent DPP fragmentation beyond borders
- Stimulate investments in DPP solutions by creating awareness on their applicability for green loans

- Ensure SMBs with limited resources succeed when they implement DPP solely as compliance driver by providing financial support and other measures as set out in article 22 of the ESPR
- Direct (grant)money to grow economic activities for REO's working on DPPs with a focus on implementation and adoption
- Stimulate Dutch DPP service providers so that they can develop and scale beyond national borders and become an export product

"FOR SMB'S COLLECTING DPP DATA AND SETTING IT UP IS NOT SUSTAINABLE, IT COSTS THEM SO MUCH TIME AND MONEY"

Enforce DPP adoption at organizations and communicate to increase DPP adoption of consumers

- Communicate and/or campaign for consumers & organizations on possibilities of DPPs to increase adoption
- Enforce DPP adoption to ensure a level playing field for those who invested in DPP compliance
- Embed use of DPP in processes with relevant authorities

- Empower and align relevant authorities to enforce adoption of DPPs in the Dutch Market (e.g. Douane, NVWA)
- Stimulate both sides of adoption:
  - Stimulate demand for products with a DPP including recycled, refurbished and re-used goods during by including relevant criteria in government tenders
  - Activate consumers with DPP adoption campaigns and stimulate DPP use in the use phase of a product and beyond

"DPP WILL ONLY GET THEIR EFFECT ON THE CIRCULAR ECONOMY WHEN PEOPLE AND ORGANIZATIONS START USING IT. WITHOUT ADOPTION IT IS JUST ANOTHER COMPLIANCE BURDEN"

Source: INNOPAY analysis

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Deep dive on possible extra activities in Appendix A

COE-DPP: BECOME A ONE STOP SHOP FOR KNOWLEDGE, EXPERTISE & RESOURCES WITH A FOCUS ON ACCELERATION OF IMPLEMENTATION AND ADOPTION OF DPPS TO CREATE ECONOMIC VALUE FOR NL

1. Community building
Business benefits

- Build a one-stop shop for networking, linking sector initiatives on DPPs and organizations to allow them to learn from each other
- Act as central communication point and knowledge hub for DPP implementation and business value knowledge
- Align with 'CoE-DPP's from other member states to speed up and converge DPP implementation in EU

2. Expertise and resources
Business benefits

- Create implementation tools, e.g., an implementation roadmap and best practices to lower the implementation burden for organizations
- Support SME with their DPP setup and implementation with money and expertise
- Run and support DPP pilots for new types of DPP implementation and innovations
- Run studies on costs of DPP implementation

CoE DPP

3. Single gateway to official information
Legislative clarity

- Provide sound and checked information on an EU legislation overview, timelines and minimum DPP requirements per sector
- Give sector specific status updates regarding legislation progress
- Lobby to create legislative clarity on an (inter)national level

4. Facilitate innovation and interoperability
Technical support

- Represent Dutch DPP stakeholders in international DPP standardization initiatives
- Coordinate with Dutch DPP IT providers to ensure interoperability and easy implementation between solutions
- Encourage synergies with existing data sharing initiatives for DPP data sharing

Source: INNOPAY analysis

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A business of Oliver Wyman

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A business of Marsh McLennan

APPENDIX A

DEEP DIVE POLICY RECOMMENDATIONS

NL DEEP-DIVE: EMBED EXPECTED DPP EFFECTS IN POLICY, APPOINT A GOVERNMENT DPP OWNER AND INVEST IN COE-DPP AS NEUTRAL KNOWLEDGE PLATFORM

	Embed the expected effect of DPPs to wider government goals to ensure coherent policies and funding: e.g. (digital) sovereignty, CO_2 emission reduction and circularity	Appoint an owner (dossierhouder) at DG/SG level for the subject DPPs and ensure coordination with those responsible for the circular economy	Invest in neutral (knowledge) platform (CoE-DPP) that make DPP-adoption and knowledge widely available and easily accessible especially for SMEs
What			
Why	• Create more coherent DPP policy by tying DPP-related efforts to larger goals • Relevant funding can be allocated according to the goals by tying DPP-related efforts to larger goals • This allows policymakers to incorporate the expected effects	• DPPs span the twin transition of digitization and sustainability, and help the circular economy transition • These responsibilities are currently divided between the ministries Infrastructuur en Waterstaat (I&W) and Economische Zaken (EZ), allowing for an analysis paralysis when no one takes the lead on this file • DPP implementation can be a gamechanger for large transitions, and can be a competitive advantage for NL businesses and thrive innovation, but when nothing happens, it will just turn into a compliance burden	• Organizations indicate that they need single place where they can find knowledge and connect with other market players about DPPs • Lower barriers of entry by providing a neutral platform serving as 'single point of contact' such as the CoE-DPP • The adoption pulse shows: knowledge about business benefits drive DPP implementation. A neutral platform showing business benefits is a low-cost way to give organizations that want to implement just the push they need
How (Non-exhaustive)	• Execute studies on the the added value and contribution of DPPs are towards government goals with regards to (digital) sovereignty, CO_2 emission reduction and circularity • Make sure that the different policy owners of DPPs of separate fields interact, align and are all responsible for their part of the DPP implementation success	• Appoint an owner (dossierhouder) at DG/SG level who is responsible for the implementation and adoption of DPPs either within EZ or I&W. Make sure alignment with other ministries (owning part of the DPP dossier) is part of the function description. • Organize interdepartmental collaborations and meetings to align efforts from policymakers at both I&W and EZ	• Fund the CoE-DPP so that it can work with market players and prioritize efforts based on market demands (e.g.): – Serve as simple one stop shop for trusted knowledge on DPPs and their business value – Support in setting up voucher program together with government players e.g. Min EZ/RVO – Serve as hub to help execute voucher program – Organize targeted meetups to drive DPP adoption in specific industries

Source: INNOPAY analysis

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NL DEEP-DIVE: SUPPORT ORGANIZATIONS TO ADOPT AND IMPLEMENT DPPS BY CATERING TO THEIR NEEDS OF KNOWLEDGE AND RESOURCES

	Adhere to article 22 of the ESPR to ensure SMBs with limited resources succeed when they implement DPP solely as compliance driver	**Develop new export products for NL by stimulating investments in DPP-solutions, service providers and infrastructure to**	**Lower the transaction costs for data availability of DPPs by encouraging synergies with existing data sharing initiatives**
What			

Why	• Interviewed ecosystems and organizations indicate that they expect that the introduction of DPPs results in bankruptcy of SMB players in their sector
	  ○ The majority (> 95%) of businesses in the economy are micro and small- businesses
	  ○ The ESPR mandates the commission and member states in article 22 to support Micro and Small companies with (but not limited to) the implementation of DPPs with financial support, access to finance, specialized management and staff training, and organizational and technical assistance
		• Organizations must invest in DPPs now, whereas the expected returns are on the long-term horizon
		  ○ Even if organizations have a beyond compliance strategy solution, they expect business benefits to materialize in 3 years
		  ○ Organizations indicate that most DPP investments come out of running budgets, as there is no financial space to invest on a project bases until the expected returns
		• Currently the investments and efforts to remain in line with the Paris agreement from the Dutch Financial sector are insufficient
			• The Netherlands has a frontrunner position in numerous data sharing initiatives and an acting CoE-Data Sharing and Cloud
			  • The concept of 'Data Spaces' could be useful in enabling the flow of data in supply chains, needed to 'fill' mandated DPP fields.
			  • Connecting both fields (data sharing and DPP's) in relevant ways, can be beneficial and cost effective comparing to re-inventing the wheel

How (Non-exhaustive)	• Provide financial incentives for DPP use and compliance, with vouchers or in other ways
	• Help industry associations & the CoE-DPP to:
	  ○ Provide training management and other relevant stakeholders on DPP for compliance and value
	  ○ Provide technical assistance for the implementation and management of DPPs
	• Provide a government accredited compliance only DPP solution provided by the CoE-DPP
		• Incentivize Dutch financial service providers to lend money for DPP investments to contribute and diversify to their green portfolios'
		  ○ Investments in DPPs are considered green investments in the EU taxonomy for classification of investments
		• Stimulate NL DPP IT service providers to help them grow and create a new IT export product from The Netherlands
			• Merge initiatives that have a similar scope e.g. logistics where possible by merging brands, governance and maintenance organizations and where possible technically merge infrastructure
			• Support existing data sharing initiatives to build additional (sectoral) features, incentives for participants and policies required to support DPPs

Source: INNOPAY analysis

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NL DEEP-DIVE: ENFORCE DPP ADOPTION AT ORGANIZATIONS, STIMULATE DEMAND FOR PRODUCTS WITH A DPP AND COMMUNICATE TO INCREASE DPP ADOPTION OF CONSUMERS

	Work together to create a 'whole of government' approach; ensuring that relevant authorities are empowered and aligned to enforce adoption of DPPs	**Stimulate demand for products with a DPP including recycled, refurbished and re-used goods by including relevant criteria in government tenders**	**Activate consumers with DPP adoption campaigns and stimulate DPP use in the use phase of a product and beyond**
Why	• Ensure that all market players adhere to regulations by empowering NL authorities to enforce DPP adoption • Stimulate 'rippling' effect in the market by knowing that relevant authorities will use and enforce DPP's • Prevent competitive disadvantages for organizations that have already invested in DPP compliance by applying a unified approach	• Create incentives for manufacturers to produce products with DPPs by including DPP criteria in government tenders • Raise awareness among consumers about the benefits of sustainable choices, like recycled and refurbished goods by promoting DPPs	• Stimulate the demand side of the circular economy to speed up growth by pointing out the business value and the attractiveness of circular business • Create a ripple effect on businesses wanting to implement DPPs by consumers with communication campaigns • Most business value of the circular economy, and hence DPPs, is in the use phase of a product and beyond. To allow business to reap the business value of DPPs this part of the lifecycle needs to be stimulated
How (Non-exhaustive)	• Cater for alignment between responsible ministries (via dossierhouder) and executive agencies such as Customs or the Netherlands Food and Consumer Product Safety Authority (NVWA). Or use theCoE-DPP to help facilitate and organize) • Provide training sessions and resources to authorities so they can effectively monitor and enforce DPP standards • Establish clear guidelines that authorities can use to assess compliance and enforce DPP regulations	• Ensure all government tenders explicitly include criteria for DPP-compliant products also before compliance dealineze • Run campaigns to educate tender assessors on the importance of DPPs in sustainability and procurement processes • Adapt legislation where needed to promote or make it possible to re-use products	• Facilitate collaborations with executive organizations such as RVO, Industry associations and/or civil society organizations (consumentenbond) to support communication/campaigns targeted at use of DPP's by consumers • Stimulate pre-requisites that are needed for a transition to a circular economy such as skill training for workers, facilities for repair and resales of products

Source: INNOPAY analysis

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DEEP-DIVE: EXTRA POSSIBLE ACTIVITIES FOR THE CENTRE OF EXCELLENCE DIGITAL PRODUCT PASSPORTS

Sector specific DPP development

- Support the development of sector wide agreements on DPP and its implementation in collaboration with industry associations
- Design and develop cases where DPPs can integrate with existing propositions or initiatives such as digital twins, material passports, BIM, circular passports and other initiatives
- Create a decision tree for organizations to identify their next step in DPP development

New DPP business models

- Support development of lighthouse use cases and DPP projects with sector actors
- Explore synergies and business models of DPPs with other sustainability incentives such as:
  - Study synergies with book and claim methodologies
  - Giving out carbon credits for DPP-logged events that prolong product lifetime

DPP practitioner certification

- Certify different players in the DPP space by:
  - Certification of DPP-service providers on technical compliance, interoperability
  - DPP implementation partners based on a curriculum
  - Certification of sector players and compliance with industry associations

DPP + tech developments

Non-exhaustive

- Explore how AI can contribute to DPP challenges such as:
  - Bill of material extraction
  - Automatically calculating CO2 footprint
  - Improving (semantic) interoperability and comparability of DPPs
- Explore potential interplay possibilities with the EU Digital Identity Wallet
- Explore how Privacy Enhancing Technologies can benefit DPPs

Source: INNOPAY analysis

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APPENDIX B

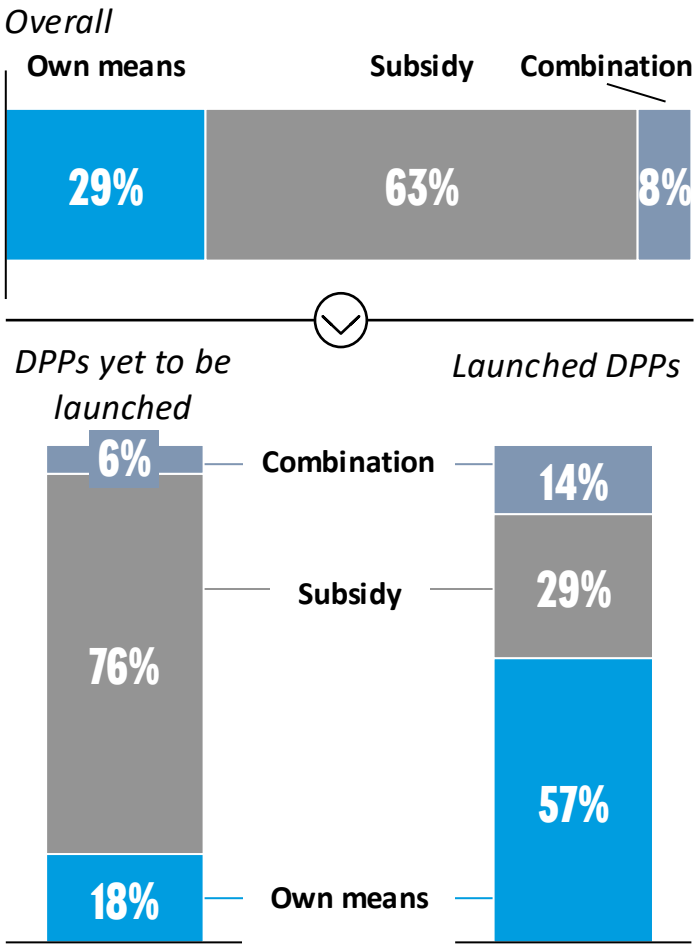
INTERVIEW RESULTS

B1: DPP ADOPTION STATUS

Funding patterns, adoption phases, value chain coverage

EU/DUTCH SUBSIDIES FUND 75% OF THE INTERVIEWED ECOSYSTEMS, WHILE ONLY 25% OF INITIATIVES RELY ON THEIR OWN SUSTAINABILITY BUDGETS FOR DPP ADOPTION

Distribution of main funding sources of DPP-ecosystems



Source: INNOPAY analysis

Observations

- 71% of Dutch initiatives are subsidized, with **over two-third of subsidized initiatives focused on research**
  - Responsible Economic Operators **rarely realize a return from investing in a DPP in the near term, justifying public funding**
  - Dutch subsidies used to develop DPPs are diverse, interviewed initiatives make use of National Growth Fund money, research money from SIA and subsidies to **stimulate (regional) innovation**
  - All subsidy programs require participants to deliver in-kind hours as a compensation for the grant money: with often a minimum of 50% of investment required from in-kind hours
- 29% of the initiatives fully finance themselves, highlighting the market's **hesitancy to invest due to the legislative uncertainty and unclarity of business benefits**
  - **Some organizations invest their own money in DPPs**, either anticipating future compliance needs or recognizing business opportunities
  - However, **most organizations wait for legislative clarity** before committing to investments, resulting in a lower activity in DPPs
- 57% of the DPPs that are already launched are realized solely with organizations' own means

"OUR EARLY INVESTMENT IN DPPS GIVES US AN EDGE OVER COMPETITION NOW AS WE WON A MAJOR BID DUE TO OUR DPP AVAILABILITY, IN THE FUTURE IT WILL KEEP GIVING US A COMPETITIVE EDGE AS WE REMAIN AHEAD WITH OUR EXPERIENCE"

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STATUS OF INTERVIEWED FRONTRUNNERS INDICATES THAT THE MAJORITY OF DPP INITIATIVES IS STILL IN EARLY STAGES

Stage of DPP development

The majority of the interviewed ecosystems has not launched its DPP yet

OBSERVATIONS

69%

of interviewees has not launched its DPP yet

- Organizations lack a feeling of urgency caused by vagueness/unclarity of regulation
- Organizations often don't allocate resources to a dedicated person for DPP activity

"IMPLEMENTATION OF A DPP IS A TIME-CONSUMING EXERCISE. IF YOU START IN THE 18 MONTHS AFTER THE DELEGATED ACTS OF THE ESPR ARE PUBLISHED, YOU HAVE TO MAKE IT A RUSH EXERCISE TO COMPLY. PROBABLY LEAVING A LOT OF BUSINESS VALUE ON THE TABLE"

Source: INNOPAY analysis

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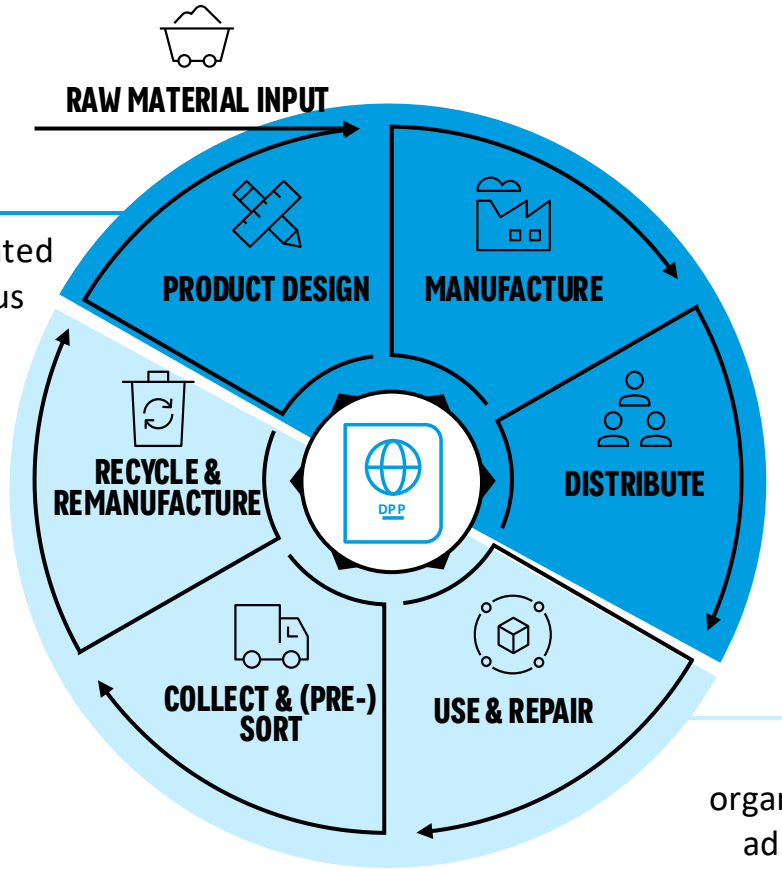
INTERVIEWED ECOSYSTEMS VALUE FULL VALUE CHAIN COVERAGE FOR DPP IMPLEMENTATION, WITH MOST FOCUS PUT ON USING DPPS FOR PRODUCT DESIGN, MANUFACTURING & DISTRIBUTION

Percentage of interviewed ecosystems that cover each value chain stage in their DPP initiative



96% COVERAGE

Many ecosystems are initiated from a compliance, and thus responsible economic operator, perspective

74% COVERAGE

After a product launch, organizations start thinking about additional ways of creating DPP value – resulting in full value chain DPP engagement

OBSERVATIONS

MOST frontrunner initiatives involve only part of the value chain in their DPP

- As many organizations in the value chain don't prioritize DPPs yet, it's hard to convince and engage all value chain partners
- Organizations that start the DPP initiative often have limited resources allocated to DPP development, resulting in limited scope focusing on compliance (thus REO perspective) first and an inability to cover the full complexity of the ecosystem

Source: INNOPAY analysis

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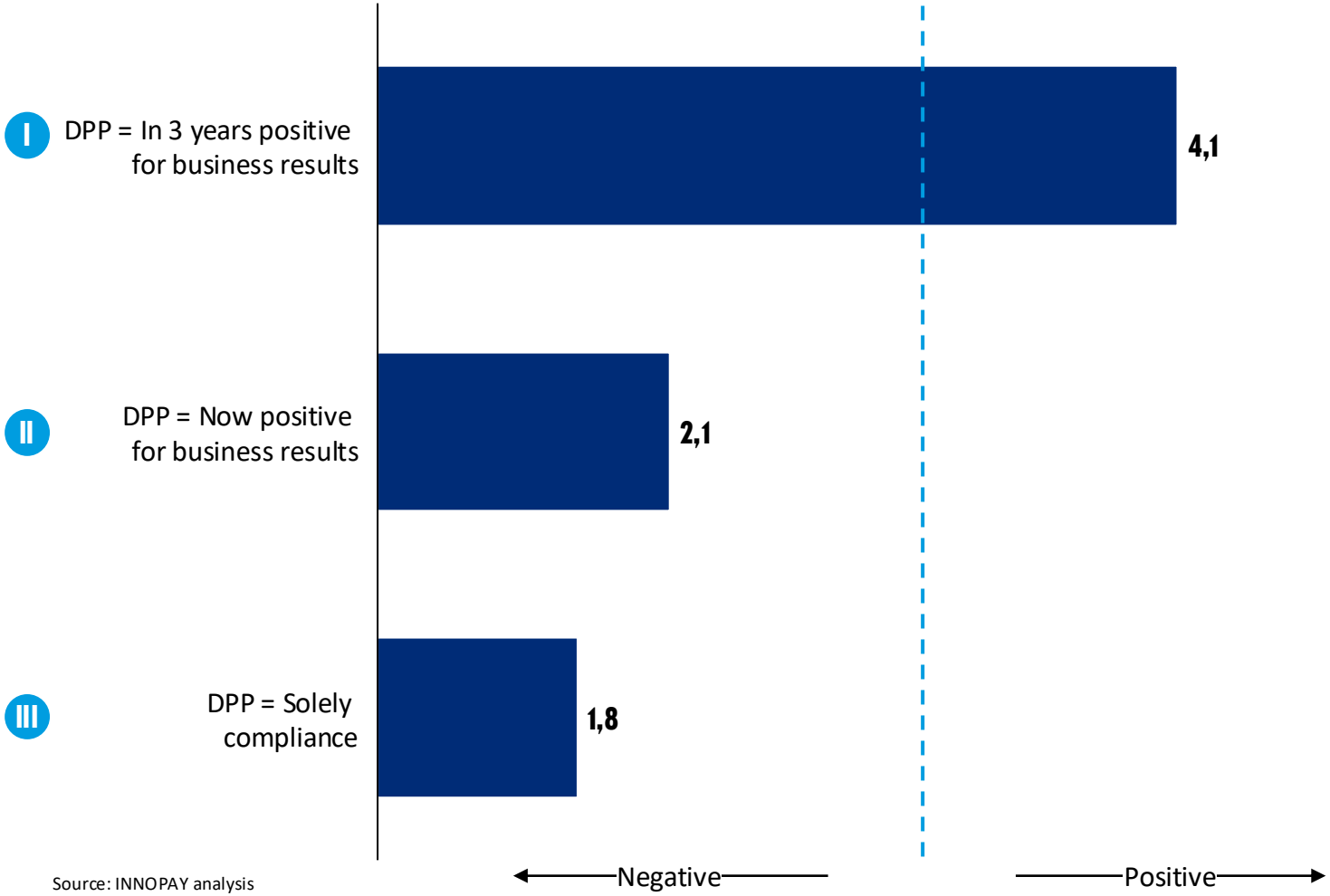
B2: BUSINESS VALUE

Business benefits, contribution to digital sustainability & expected impact on business performance

IMPLEMENTATION OF DPPS IS EXPECTED TO DRIVE POSITIVE BUSINESS RESULTS WITHIN 3 YEARS, PROVING DPPS TO BE MORE THAN JUST A COMPLIANCE OBLIGATION ON THE LONGER TERM

Average score on the perceived value creation regarding DPPs on a 1-5 scale (1: completely disagree – 5: completely agree)



Source: INNOPAY analysis

Observations

- **DPP is more than just a compliance burden on the longer term**
  - **Organizations expect a positive business result following DPP implementation in 3 years,** while compliance remains the primary driver for adopting DPPs
  - The **Responsible Economic Operator** (REO), tasked with implementing the DPP, **rarely directly benefit from these positive business outcomes,** which can make actors hesitant to initiate the implementation

"THE REO BEARS THE COSTS TO CREATE THE DPP, WHILE OTHERS REAP THE BENEFITS OF IMPROVED RECYCLING"

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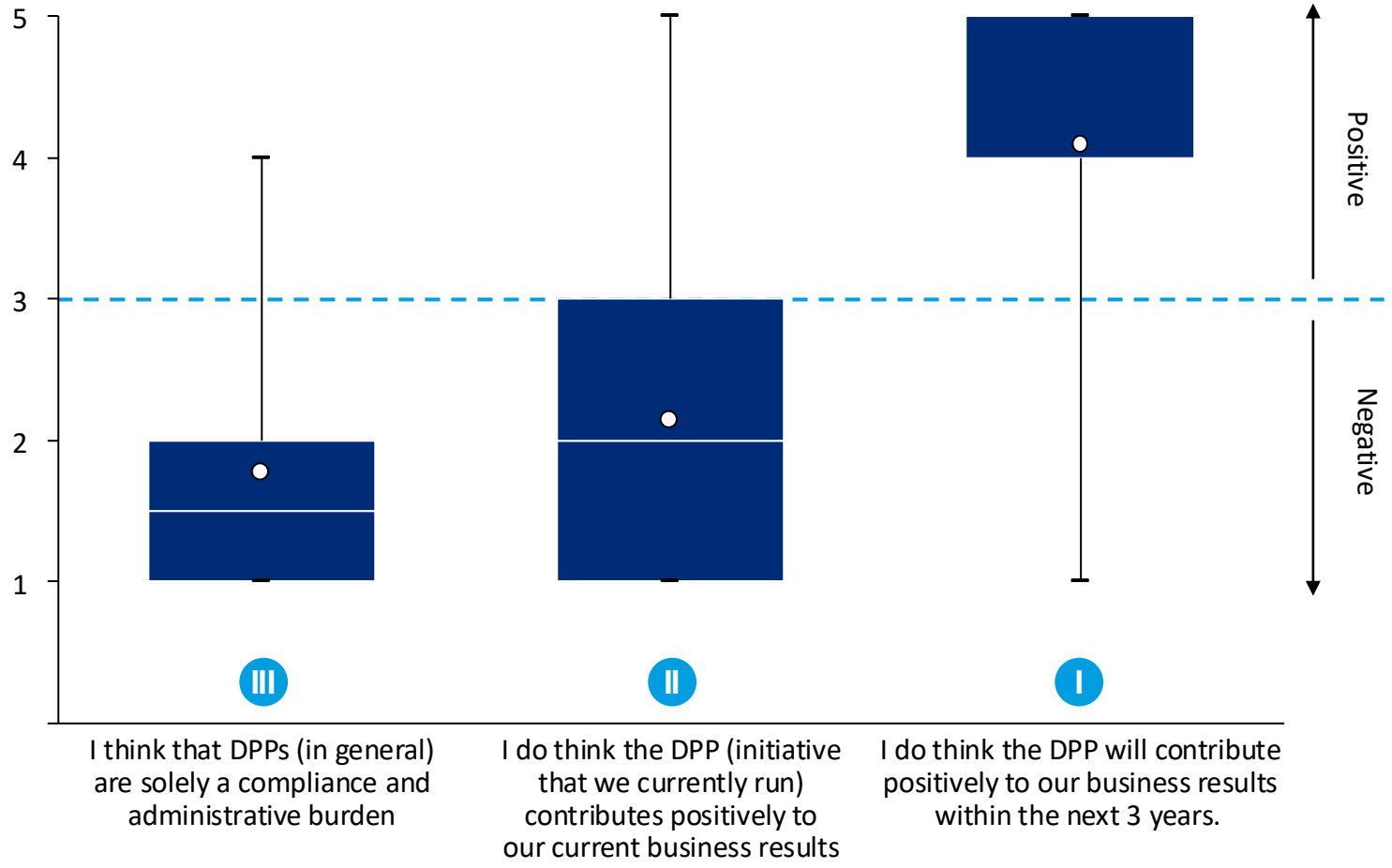
THERE IS STRONG CONSENSUS ON THE FUTURE VALUE CREATION OF DPPS, WITH THE EXCEPTION ALREADY REPORTING POSITIVE BUSINESS RESULTS DRIVEN BY DPP IMPLEMENTATION

Average score on the perceived value creation regarding DPPs (1: completely disagree – 5: completely agree)



Observations

- Ecosystems strongly agree that **DPPs represent more than just a compliance burden**
  - There is strong agreement across ecosystems on the **positive business results** expected from DPPs **over the next three years**
  - DPPs **are already driving positive business outcomes** for some initiatives, highlighting their immediate value beyond future potential in some cases

Source: INNOPAY analysis

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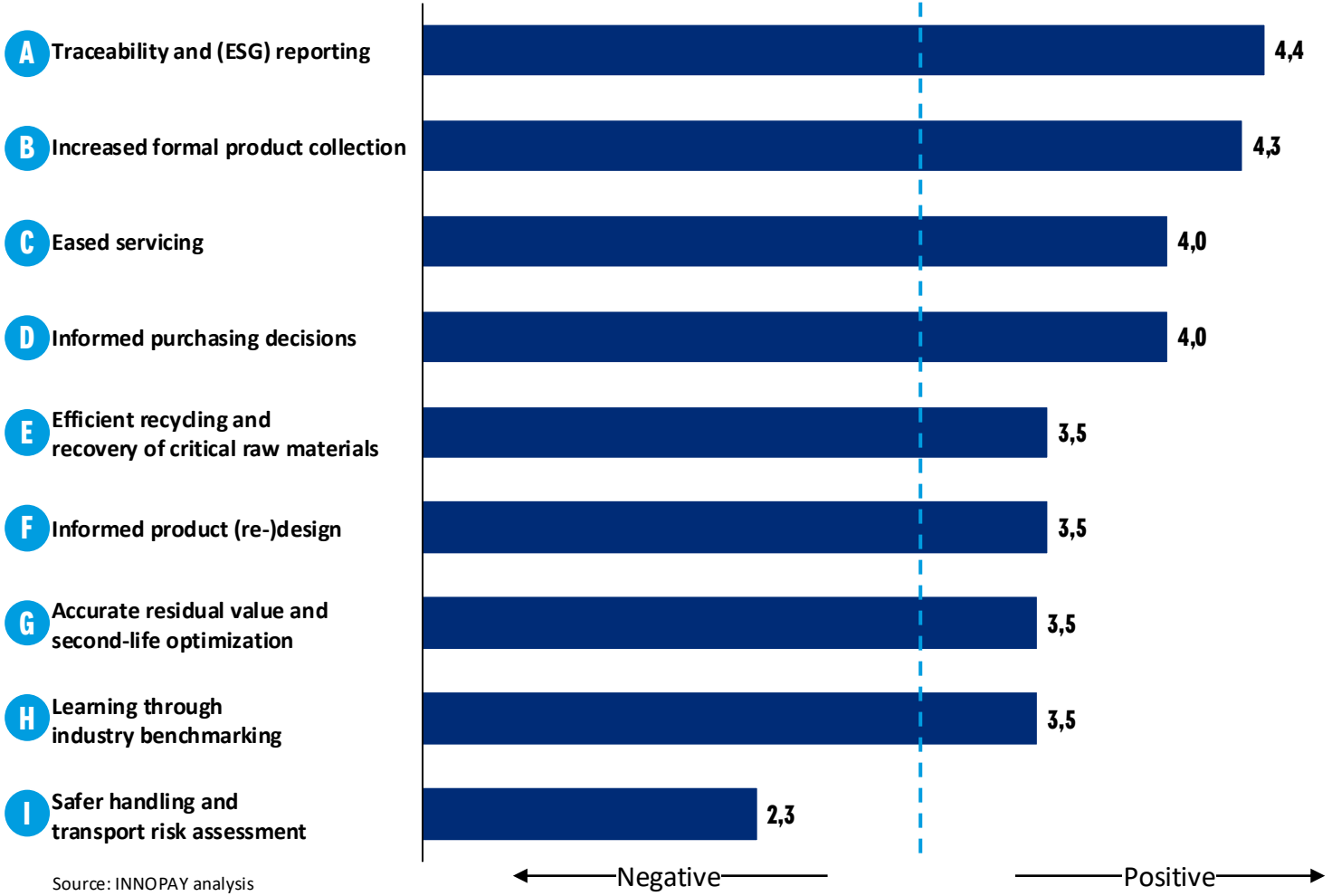
INTERVIEWEES HIGHLIGHT THE BUSINESS VALUE OF DPPS IN SUSTAINABILITY REPORTING, INCREASED PRODUCT COLLECTION, EASED SERVICING AND EMPOWERING INFORMED CONSUMER CHOICES

Average score on perceived business benefits from DPPs from all interviewed ecosystems (1: completely disagree – 5: completely agree)



Source: INNOPAY analysis

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Observations

- **Organizations recognize synergies** in complying with ESPR, CSRD, and CSDDD, viewing data collection alignment and reporting efficiency as greatest benefit

> "IT'S HELPFUL TO BRING DATA TO THE SURFACE NOT ONLY FOR DPPS BUT ALSO FOR REPORTING PURPOSES, LIKE WITH CSRD"

- Increased formal product collection ranks #2, while recycling and recovery of raw materials ranks #6, as **sectors like textile do not use DPPs for recycling and sorting**

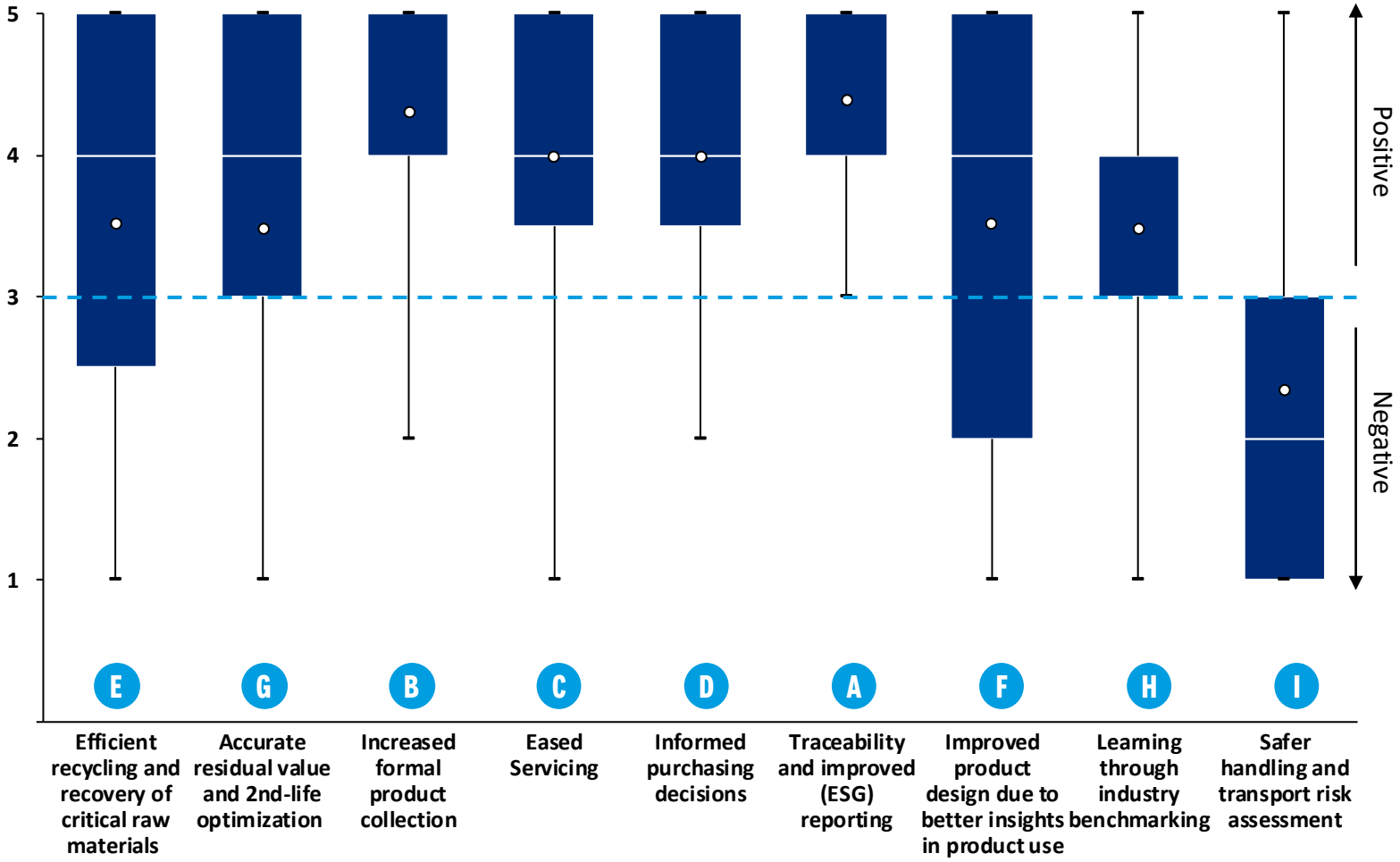
> "SORTING FACILITIES USE SENSORS TO RECOGNIZE TEXTILES DIRECTLY WITHOUT NEEDING TO LOCATE AND SCAN A QR, MAKING THE PROCESS MUCH FASTER"

- **Organizations hope DPPs will influence consumer buying decisions**, but remain uncertain as behavior changes slowly

> "THE CONSUMER IS JUST NOT USED TO DPPS"

TRACEABILITY AND IMPROVED REPORTING SHOWS STRONG AGREEMENT ACROSS INTERVIEWEES, WHILE SOME OTHER BENEFITS APPEAR MORE INTERVIEWEE DEPENDENT

Spread of score on perceived business benefits from DPPs from all interviewed organizations and ecosystems (1: completely disagree – 5: completely agree)



Source: INNOPAY analysis

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Observations

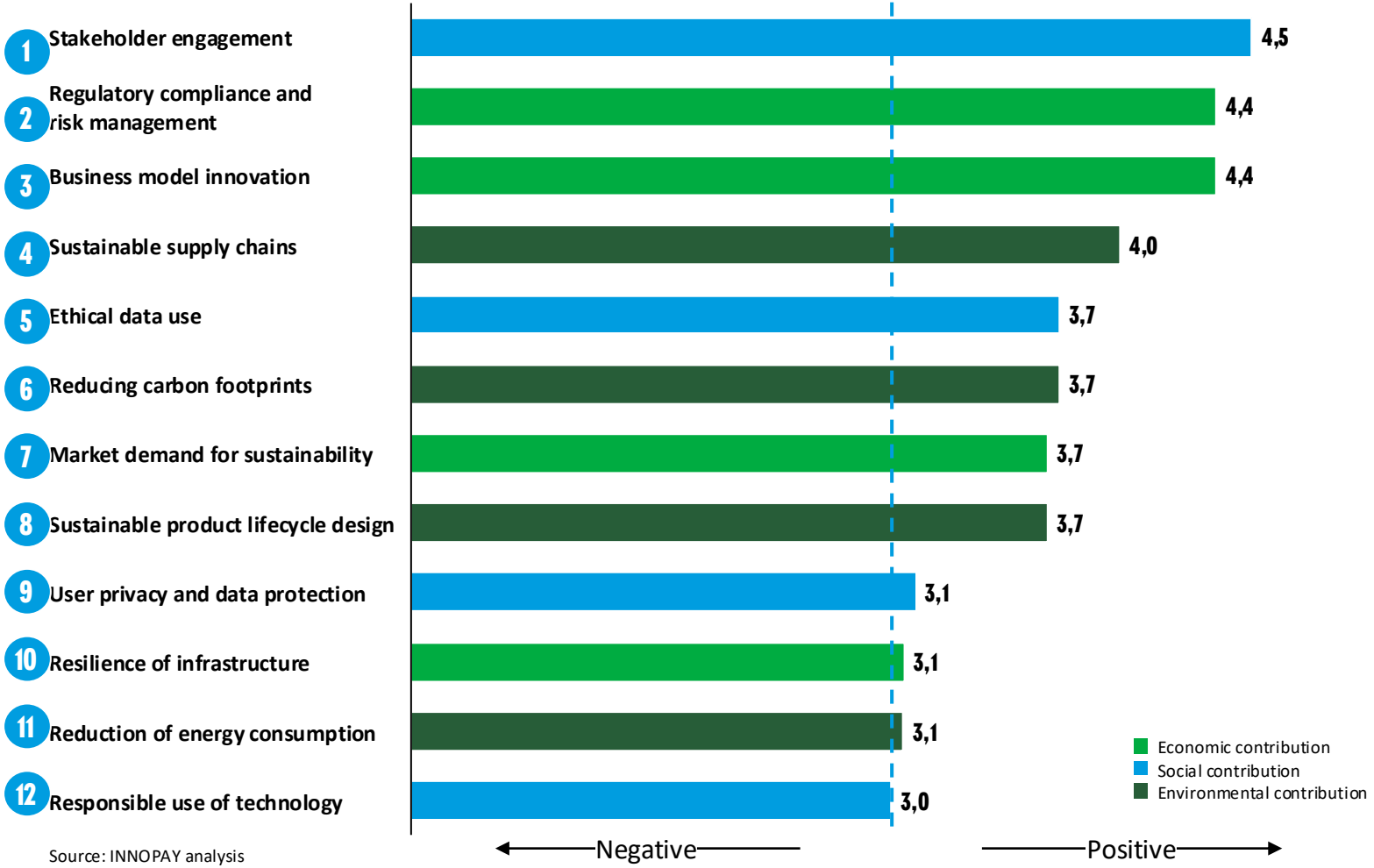
- **Across sectors, there is a broad agreement on the benefit of traceability and improved (ESG) reporting**
  - This benefit shows little deviation, suggesting similarity in priority across all interviewed sectors
- **Variations in sector priorities or feasibility likely drive the divided opinions** on the business benefits of efficient recycling, improved design and safer transport
- Organizations across all sectors **often present DPPs as a solution to many challenges.** Yet, at the same time they acknowledge that DPPs are more of a tool than a game-changer

"THE DPP IS A WONDERFUL TOOL, BUT NOT THE HOLY GRAIL THAT CHANGES THE WORLD"

"IN THE END, IT'S JUST A TRANSPARENCY TOOL"

DPP IMPLEMENTATION MOST POSITIVELY IMPACTS STAKEHOLDER ENGAGEMENT, FOLLOWED BY REGULATORY COMPLIANCE, BUSINESS MODEL INNOVATION AND SUSTAINABLE SUPPLY CHAINS

Average score on perceived results from DPPs on digital sustainability topics (1: completely disagree – 5: completely agree)



Source: INNOPAY analysis

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Observations

- Frontrunners **must establish relationships** with their supply chain to **receive and contribute data for the DPP**
  - This need explains why organizations score stakeholder engagement as the greatest impact of the DPP

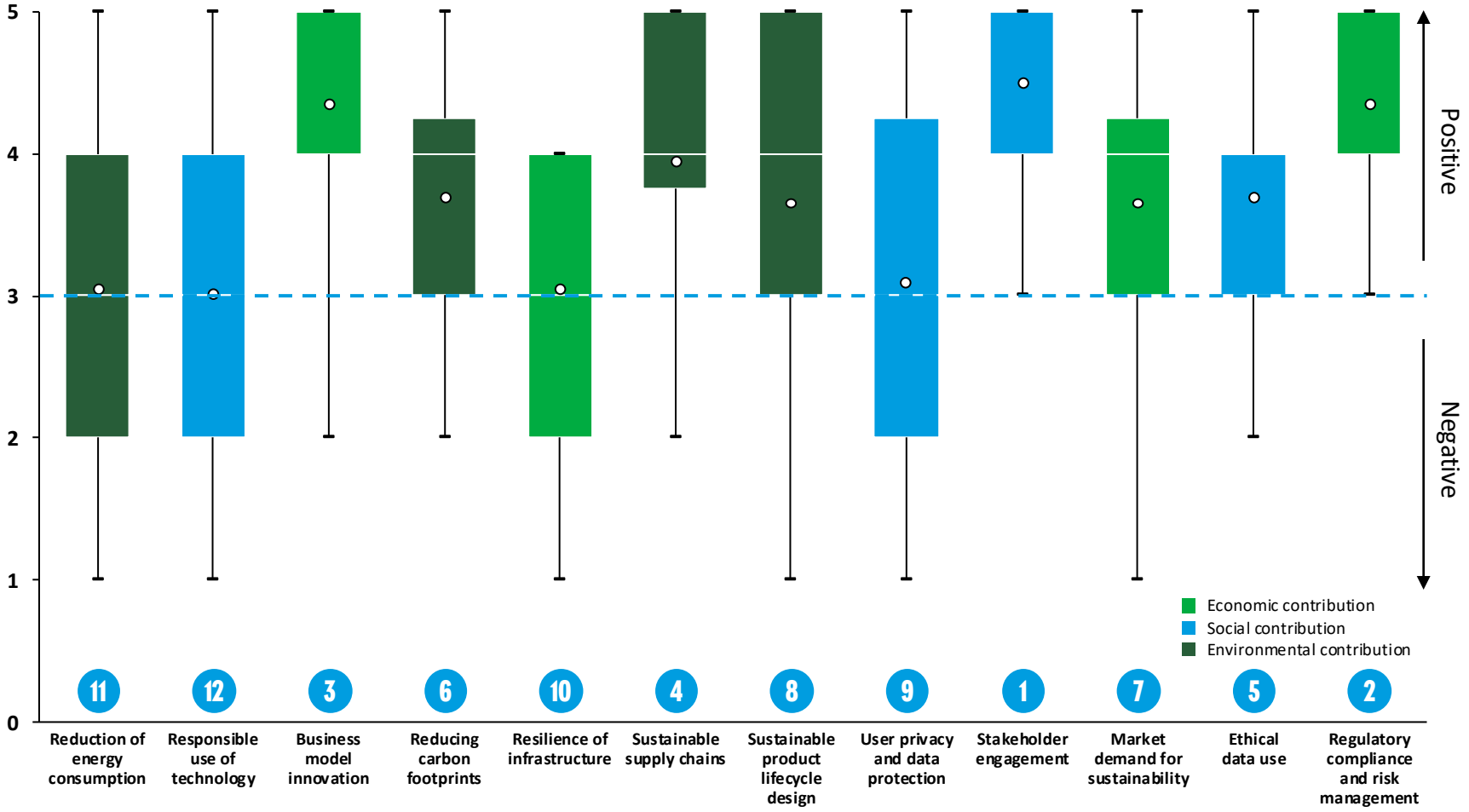
"THE DPP IS A CONVERSATION STARTER"

- Organizations tend to **prioritize compliance early and consider business models later**

"IN THE END IT'S NOT ONLY ABOUT COMPLIANCE: THE MORE A COMPANY LEARNS ABOUT DPPS, THE MORE ADDITIONAL VALUE THEY DISCOVER"

THE IMPACT OF DPP IMPLEMENTATION EXTENDS WELL BEYOND COMPLIANCE, WITH STRONG CONSENSUS OF INTERVIEWEES ON POSITIVE IMPACT ON STAKEHOLDER ENGAGEMENT & BUSINESS MODEL INNOVATION

Spread of score on perceived results from DPPs on digital sustainability topics (1: completely disagree – 5: completely agree)



Source: INNOPAY analysis

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Observations

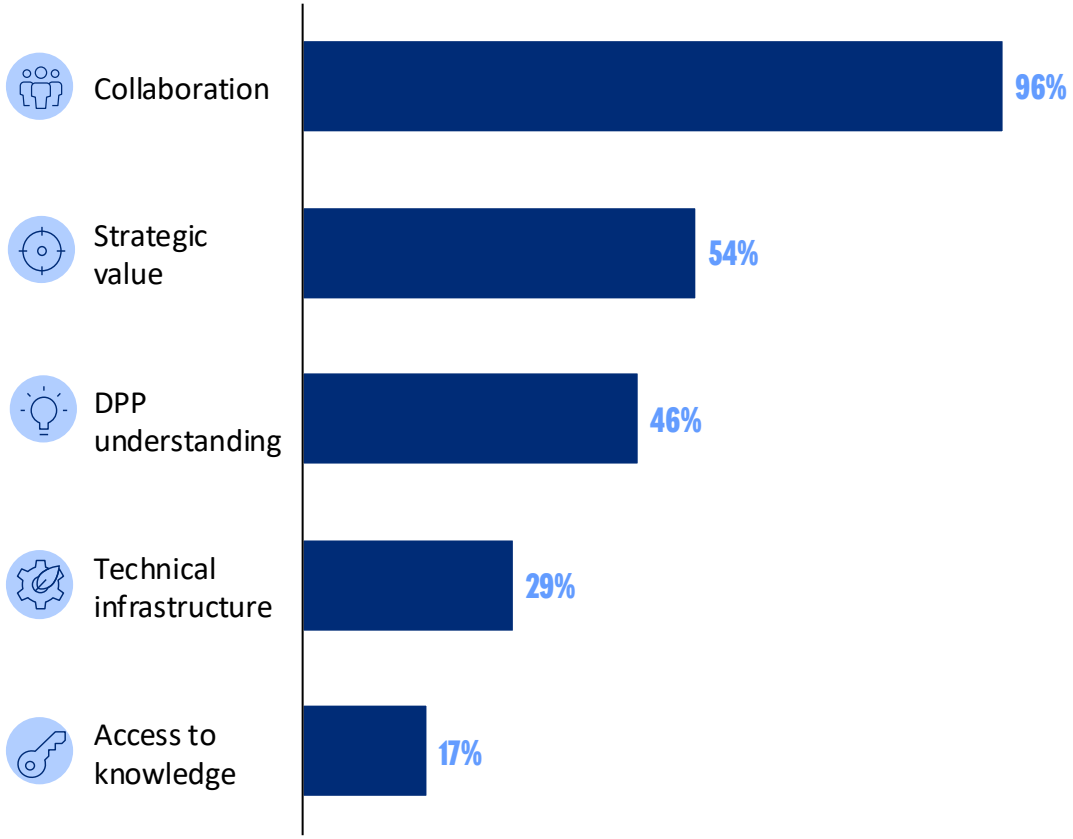
- **DPP benefits extend beyond compliance alone**
  - Business model innovation and stakeholder engagement are perceived very positively, with low variance, highlighting broad consensus on their value
  - Regulatory compliance and risk management also remain among the top priorities
- **Interviewed ecosystems strongly vary in their perceptions on the impact of DPPs on:**
  - Reduction of energy consumption
  - Responsible use of technology
  - Resilience of infrastructure
  - User privacy and data protection

B3: DPP ADOPTION INFLUENCERS

Challenges & success factors

COLLABORATION PROVES INVALUABLE FOR DPP IMPLEMENTATION - WITH UNDERSTANDING, STRATEGIC VALUE, TECH INFRASTRUCTURE AND INFORMATION ACCESSIBILITY AS IMPORTANT ACCELERATORS

Most frequently mentioned success factors for DPP



% of interviewees that mentioned the success factor

Source: INNOPAY analysis

Description and observations

Collaboration is a prerequisite for DPP development and implementation

- Cross-teams/organizations/sectors/borders collaboration generates insights & learnings
- Organizations often lack the internal capabilities for creating the DPP infrastructure: collaboration with service providers is essential & gives power over design choices
- To create a comprehensive DPP, full value chain collaboration, driven by trust and influence within networks, is crucial (e.g. through consortia or industry associations)

Strategic value creates commitment, alignment and accelerates development

- Stakeholder commitment ensures a collective ecosystem vision on DPPs and sufficient time investments, speeding up the development process

DPP understanding leads to useful DPP design and stakeholder engagement

- Building early organizational awareness of the when, what, why & how helps to account for unforeseen challenges, prevent last-minute decisions & develop a useful DPP with service providers

Technical infrastructure must be realized for DPP's functionality

- Committed, pro-active, flexible, early-adopting service providers are associated with success
- Accessibility of DPP tooling to the entire value chain is a precondition for comprehensive DPPs and often requires SMEs to be financially supported

Access to knowledge results in efficient DPP development

- Organizations can use experiences of similar initiatives to save time and money
- Trust (e.g. built in prior collaborations or through ecosystems) results in sharing knowledge and experiences

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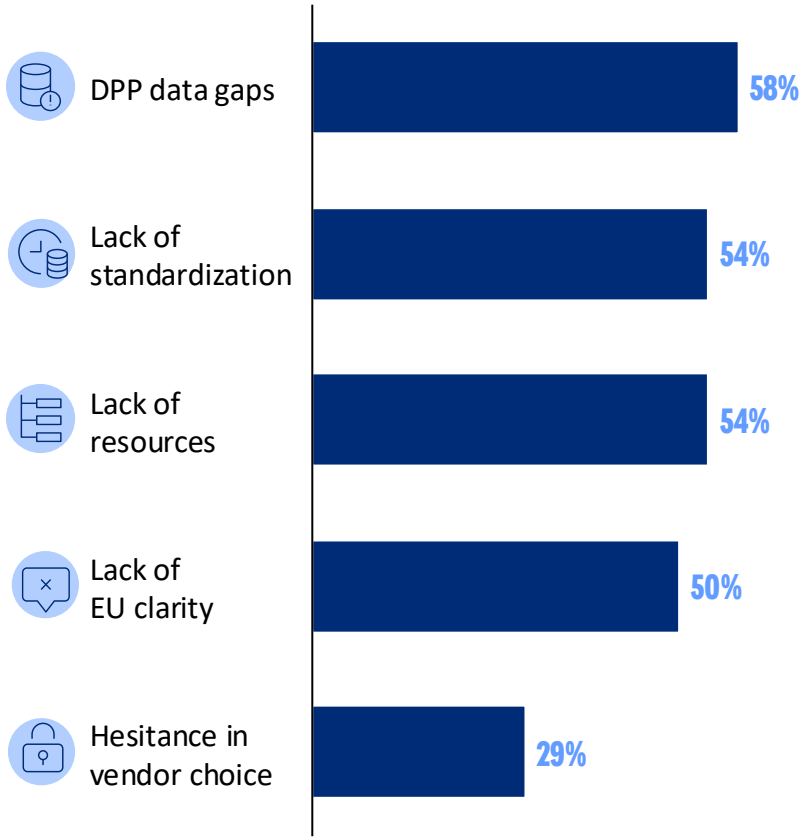
THE LACK OF DATA COMPLETENESS, DPP STANDARDIZATION, RESOURCE ALLOCATION, CLARITY, AND INFRASTRUCTURE INTEROPERABILITY SLOWS DOWN DPP REALIZATION

Most frequently mentioned challenges for DPP



% of interviewees that mentioned the challenge

Source: INNOPAY analysis

Description and observations

DPP gaps compromise the realization of a high quality, complete DPP

- It's challenging and time-consuming to collect accurate, high-quality data from suppliers
- For a complete DPP, data of all value chain organizations is needed, which is challenging as these organizations have other priorities and are hesitant to share their data

Lack of standardization for DPPs hinder useful data exchange

- There are no DPP industry standards defined yet and the difference in semantics between organizations makes data sharing challenging
- Dutch government is supporting initiatives that develop their own DPPs in isolation from the EU, risking in lacking interoperability between initiatives (on an EU level)

Lack of resources allocated to DPP development results in slow implementation

- DPPs are not seen as a priority, caused by the lack of organizational (data) readiness, the lack of a feeling of urgency and skepticism about impact and added value of DPPs
- Lack of dedication results in delays and restrictions of initiative scope and participation

Lack of EU clarity on DPP timelines and content causes confusion and delay

- EU changed its sustainability regulations and timelines before, resulting in lack of trust in EU's plans and organizational deprioritization of DPP implementation

Hesitance in vendor choice (due to lock-in risk) leads to delays

- Organizations lack the internal skills to create a DPP infrastructure themselves, and thus depend on service providers for their DPP implementation
- There is no clarity on which service providers base their tools on (international) standards, having organizations postpone their service providers selection

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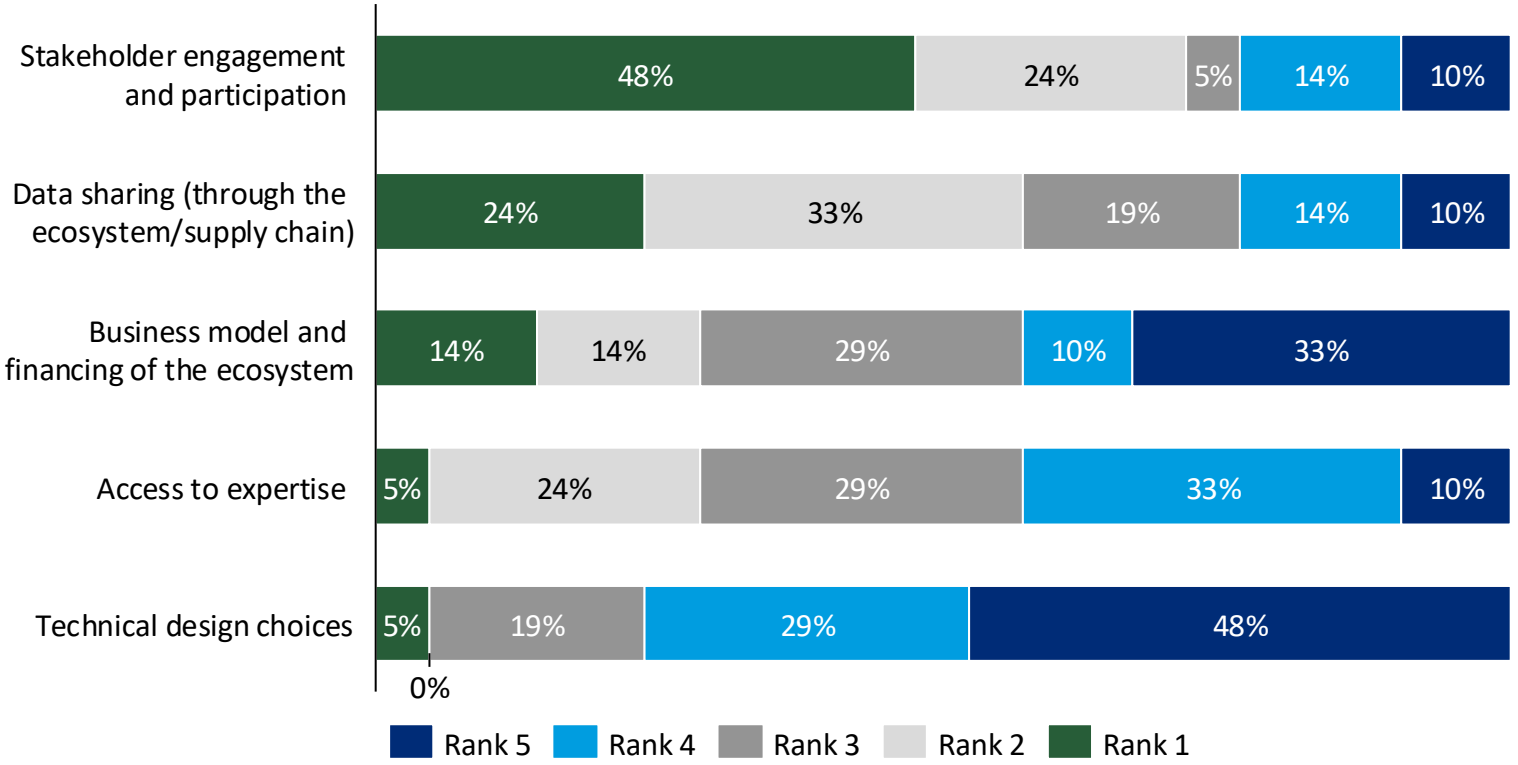
B4: MARKET SUPPORT

Available and needed support from the government, Industry associations & CoE-DPP

ORGANIZATIONS WIDELY RECOGNIZE STAKEHOLDER ENGAGEMENT AND PARTICIPATION AND DATA SHARING AS ESSENTIAL FOR SUCCESSFUL DPP ECOSYSTEM DEVELOPMENT

Organizations' ranking of key subjects in DPP ecosystem development



Observations

- **Involving stakeholders in the development process is essential**
  - Half of ecosystems consider stakeholder engagement and participation as most critical for developing a DPP

"THE PERSON RESPONSIBLE FOR DPPS OFTEN HAS 37 OTHER PRIORITIES, MAKING IT VERY CHALLENGING TO MAKE PROGRESS"

- **Engaged stakeholders are critical for enhancing data sharing**, which are both the highest ranked priorities for DPP development

"IF YOU SWITCH SUPPLIER EVERY SEASON, YOU WON'T BUILD STRONG RELATIONSHIPS, MAKING IT MUCH HARDER TO OBTAIN DATA"

"NO DATA, MEANS NO DPP, AND I BELIEVE THAT DATA SHARING AND STAKEHOLDER ENGAGEMENT GO HAND IN HAND"

Source: INNOPAY analysis
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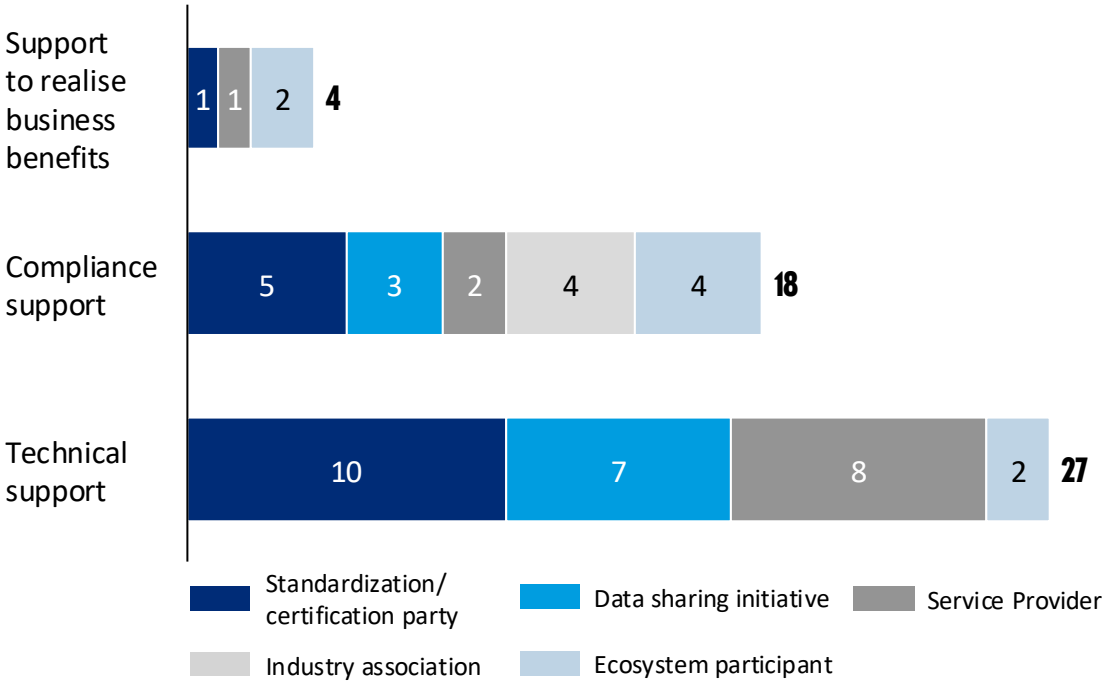
SOURCES THAT INTERVIEWEES CURRENTLY USE AND NEED FOR SCALING THEIR DPPS CAN BE CATEGORIZED INTO TECHNICAL SUPPORT, COMPLIANCE SUPPORT AND SUPPORT IN REALIZING BUSINESS BENEFITS

Overview of sources used by interviewees



Examples of mentioned sources

Sources mentioned by interviewees to be needed for scaling DPP

- Support to realize business benefits
  - Resources/capacity (time and/or money)
  - Customer demand
  - Feeling of urgency with stakeholders
  - Use cases for proof of concept
- Compliance support
  - Government support for clarity on timelines and requirements
  - DPP experts
- Technical support
  - Standardization
  - DPP solution provider

Source: INNOPAY analysis

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NEXT TO AVAILABLE SOURCES, INTERVIEWED DPP INITIATIVES MENTION THEY NEED ADDITIONAL SUPPORT FROM THE GOVERNMENT, INDUSTRY ASSOCIATIONS & COE-DPP

	83% Knowledge platform	63% Legislative Clarity	58% Resources	58% Efficient Data Sharing
Government	• Facilitate a source of objective information	• Clarify and establish legislation timelines for all sectors • Translate EU legislation to Dutch government goals • Loosen re-use legislation, as used materials often no longer comply with current legislation	• Provide financial support • Facilitate contact with DPP experts serving as advisors	• Standardize data formats and systems, e.g., LCA measurements • Apply quality levels in DPP implementation for consistent results
Industry Association	• Disseminate the key learnings of DPP initiatives	• Act as ambassadors to the government	• Help find subsidies • Facilitate contact with experts serving as advisors	• Create a value chain data sharing initiative with shared principles and common infrastructure • Orchestrate standardization of data formats within value chain
CoE-DPP	• Build a community & networking platform, linking initiatives • Act as central communication point • Conduct an ecosystem landscape scan	• Create EU legislation overview and outline minimum DPP requirements • Give status updates regarding legislation • Lobby to create legislative clarity	• Create implementation tools, e.g., an implementation roadmap • Support SME setup and implementation • Run DPP pilots	• Create a value chain data sharing initiative with shared principles and common infrastructure • Orchestrate standardization of data formats within value chain

Source: INNOPAY analysis

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APPENDIX C

DEFINITIONS

GLOSSARY

Concept	Definition
DPP	Standardized digital document that provides comprehensive information about a product's composition, production, use, and recycling
DPP adoption	DPP adoption covers both implementation of DPPs by Responsible Economic Operators and usage of DPPs by the end consumer (which can be both business and consumers)
DPP use case	An implementation of a DPP providing business value to the Responsible Economic Operator
Ecosystem	A collaboration with two or more organizations to develop or maintain a product or service, see slide 31 for different ecosystem setups
ESPR	Ecodesign for Sustainable Product Regulation, EU law
EZ	Economische Zaken, Ministry of Economic affairs in the Netherlands
I&W	Infrastructuur en Waterstaat, Ministry of Infrastructure and Waterways in the Netherlands
NLF	New Legislative Framework, EU law
Responsible Economic Operator	An EU manufacturer, importer, authorized representative or a fulfilment service provider who brings a product to the market

Source: INNOPAY analysis
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APPENDIX D

LIST OF CONSULTED EXPERTS

EXPERTS (1/2)

BRIGITTE ENGELEN

Propositie & innovatie manager duurzaamheid

Alpheios

JANET KES

Manager Batteries and Innovation at ARN

Battery Competence Cluster

JOLANDA LEENHOUTS

Project Manager at Brainport Industries Coöperatie U.A.

Brainport Industries

MARTIN VERBOOM

Development Engineer Sustainability Damen

Circles of Life & Damen

WIM GIELINGH

Founder of Real Capital Systems BV

Circulaire Geveleconomie

FRANS BECKERS

MD Cirmar

Cirmar

FRANCO DE VITA

DPP Principal Investigator (head of research)

COKaP

ARIE DE WILD

Hogeschoolhoofddocent Hogeschool Utrecht

Digitaal TEMPO in de bouw

HELMER VAN DER MERENDONK

Researcher Hogeschool Utrecht

Digitaal TEMPO in de bouw

PASCAL SLUITER

Researcher Hogeschool Utrecht

DPP Household Applicances

FRANK STIKSMA

Senior Researcher at Saxion

DPP Household Applicances

MICHIEL POTTER

Operations- & servicemanager

DPP IJmond

PRAMOD AGRAWAL

Projectleader Sustainable & Functional Textiles

DPP4CD

NICK VAN NIEUWENHUIZEN

Algemeen Directeur Ducky Dons

Ducky Dons BV

KAREN JANSSEN

Prof. Collaborate to Regenerate | Economy in Common

Fibre Forward

TAHIS MARTI

Researcher Sustainable Finance & Accounting

Fibre Forward

JAN POST

Strategic Partnerships at Philips Personal Health

Groeien met Groen Staal & Philips

BORIANA RUKANOVA

Senior Researcher TU Delft

Groeien met Groen Staal & Data Pipe

MICHIEL VAN YPEREN

Manager Sustainability

GS1

JITSKE VAN DER WOUDE

Sustainable Packaging & Product Technologist

Hunkemöller

FRANK HERMANS

Founder & CEO van Innotractor

Hyperion

LINDA BOS

Director Technology Hub

Hyperion & KLM

SUNDARA GURUSHEV

Product LCA Expert

Madaster

PAUL KLEINLANKHORST

Product Owner

Madaster

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EXPERTS (2/2)

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