The business value of digital product passports

Exploring value-driven DPP implementation in the Dutch construction industry

Background

In the coming years, Digital Product Passports (DPPs) will be mandated in the Dutch construction industry through the ESPR, requiring manufacturers to provide detailed information of their products. However, if DPPs remain merely a compliance requirement, the industry may not invest sufficiently to fulfill its circular economy ambitions.

Research aim

To address this challenge, this thesis aims to unpack the business value that DPP implementation brings to manufacturers in the Dutch construction industry, thereby motivating their investment in DPPs. The research employs various qualitative methods to address four research questions: understanding how DPPs are defined and perceived (RQ1), gaining insights on DPP implementation from early adopter experiences (RQ2), co-creating value-driven implementation goals and steps with manufacturers (RQ3), and determining how to support value-driven DPP implementation (RQ4).
These questions are answered through literature exploration, interviews with construction industry stakeholders, non-construction early adopters, and DPP experts, alongside three co-creation workshops with manufacturers and various design activities.

Results

The findings reveal that early adopter experiences follow four distinct phases: Awareness, Evaluation, Action, and Reflection, with the Evaluation phase proving most crucial for success. Notably, construction manufacturers currently perceive DPPs as presenting significant challenges while seeing relatively little potential—a stark contrast to the opportunities described in existing literature.

When exploring value-driven implementation, manufacturers identified varied goals and steps that must be tailored to their specific contexts, highlighting the need for customized approaches rather than one-size-fits-all solutions.

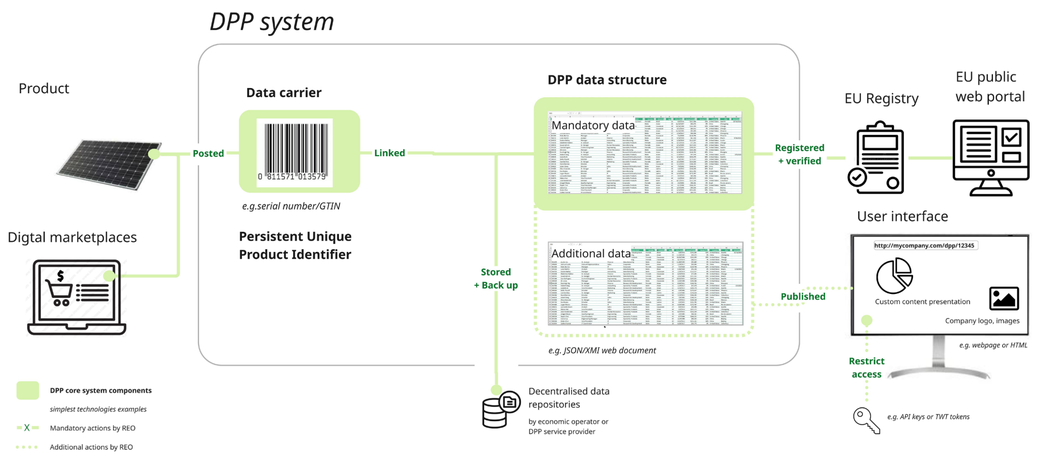
Conclusion

Given the current undeveloped landscape, this research proposes that manufacturers cannot be coerced into DPP implementation. Instead, a “gentle encouraging” approach is needed that validates manufacturers’ experiences, addresses their challenges, and builds confidence for implementation. To support this approach, this thesis developed future adoption scenarios as a practical resource for navigating implementation uncertainty.

What is a Digital Product Passport (DPP)?

Digital Product Passports are defined by EU regulation as “a set of data specific to a product that is accessible via electronic means through a data carrier.”
A DPP consists of a system (technical infrastructure like QR codes and databases) and data (product information including material composition, environmental impact, and circularity details). The system requires authentication, reliability, and interoperability to function effectively.
The success of DPPs depends on sufficient, high-quality data that supports circular economy practices. Data requirements are currently being developed through industry-specific norms and EU regulations.

Digital product passport



Value-driven DPP implementation

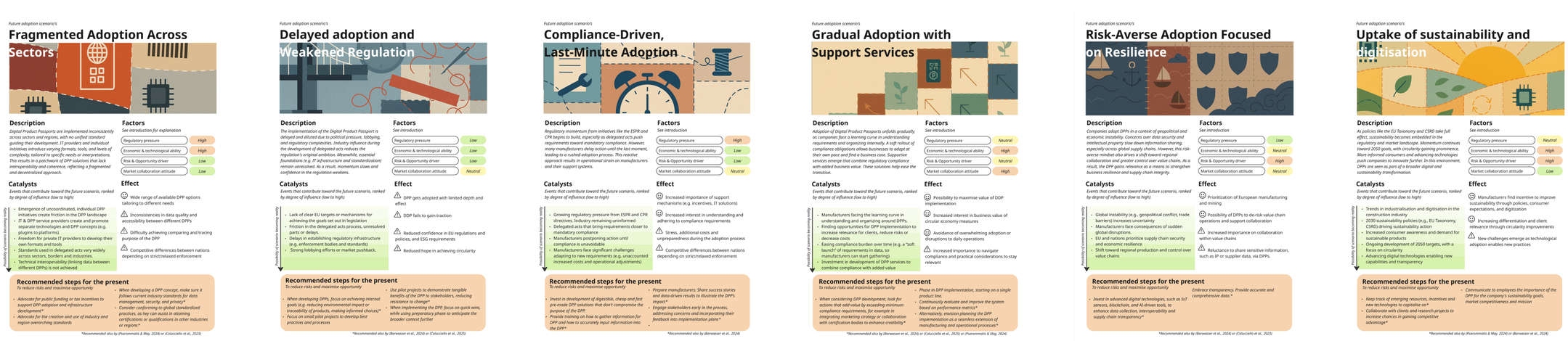
How did I overcome knowledge gaps?

Construction manufacturers struggled to envision how DPPs could bring business value, hampering exploration activities. To address this knowledge gap, opportunity cards were developed from academic literature and manufacturer interviews, reviewed by DPP experts, and translated into practical language through peer feedback.

The cards were designed for discussion and decision-making, with different information levels on front and back to support varying conversation depths. The main challenge was translating academic concepts into practical language that manufacturers could understand while keeping opportunities broad enough for different manufacturer types.

Opportunities for business value

Future adoption scenarios



Lena Trotereau

The business value of Digital product passports
September 2023
MSc SPD

Committee
C. Bakker
R. Price
V. Limpens

Company
EPEA Benelux

Faculty of Industrial Design Engineering

Delft University of Technology