Catena-X THE FIRST OPEN AND COLLABORATIVE DATA ECOSYSTEM

Informational Requirements at Dismantling to enable form preserving R-Strategies

Overview and Outlook (July 2024)

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1. INTRODUCTION & MOTIVATION

In the journey towards the end-of-life of vehicles (ELVs), the pivotal moment arrives with the issuance of the Certificate of Destruction by an authorized dismantling company for end-of-life vehicles or a designated collection point for ELVs. Upon receipt of such certificate, a vehicle is irrevocably considered "end-of-life" and may no longer be placed on the market. However, the ELV directive does not extend to the components within the vehicle, many of which may retain their functionality. Immediate scrapping would therefore be a waste of valuable materials and well-preserved parts. This is why today's dismantlers endeavor to filter out usable parts from ELVs in order to provide them to remanufacturers. The decision to reuse components is based on the physical condition of the components as well as estimates of market demand.

In addition to reuse, other R-Strategies should be considered at the end of a vehicle's lifecycle, especially when direct reuse of its components is not feasible. These include remanufacturing, repair, and refurbishment of components. Presently, the economic feasibility of extracting components that are not directly intended as spare parts is questionable. The labor-intensive process of disassembly, internal logistics, and component storage generates considerable costs.

Furthermore, the pricing volatility for defective components destined for remanufacturing, repair, and refurbishment, as well as complete and accurate information about vehicle components and market demands for used components, becomes essential. Lastly, vehicles need to be designed to enable the reliable retrieval of parts with high remanufacturing, repair, refurbishment, or reuse potential and demand, along with parts designed to optimize and support R-Strategies (reuse, repair, refurbishment, remanufacturing etc.)

This whitepaper addresses the data parameters required to enable dismantlers to effectively support form preserving R-Strategies at the end-of-life stage, with a special focus on reuse and remanufacturing. By identifying the critical data elements for informed decision-making in the management of end-of-life vehicles, this paper aims to promote a more sustainable and economically viable approach to component utilization in the automotive industry.

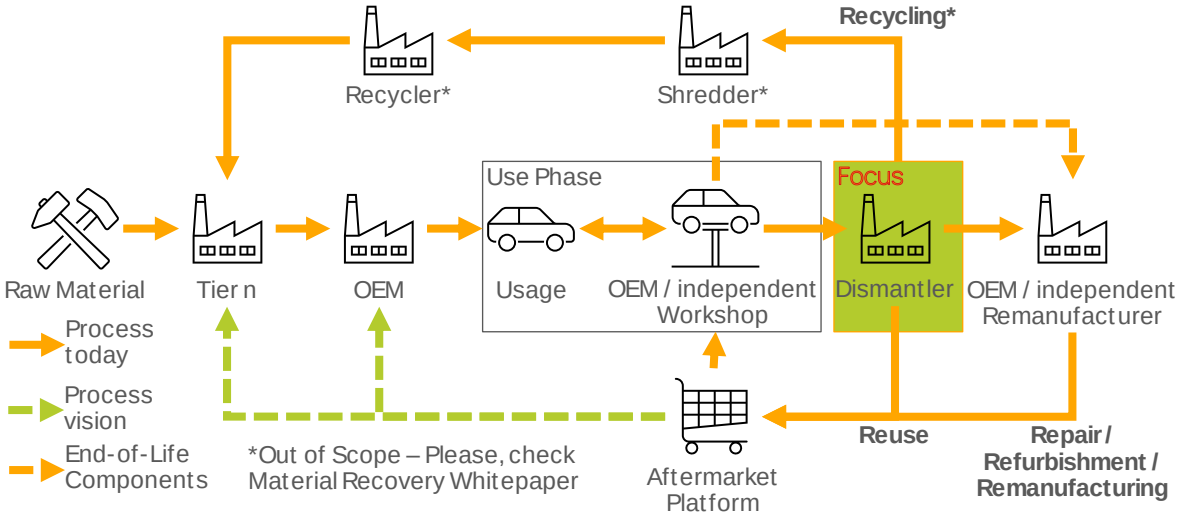
In a next step, the working group will take into consideration the requirements and specifics of the aftermarket workshops. In parallel to the dismantlers, they can supply cores to the remanufacturing production even before the whole lifecycle of the vehicle ends.

Already today, there are various market mechanisms and different players available to achieve a high availability of used components in order to foster any R-Strategy.

2. PROCESS FLOW & TERMINOLOGY, AND BUSINESS MOTIVATION

2.1 Process Flow & Terminology

Figure 1: End-of-Life Processes for Vehicles and Components



A vehicle is assembled at the Original Equipment Manufacturer (OEM) facility, where the various components and parts that make up the vehicle are brought together and integrated into the final product. The OEM sources these parts from different tiers of the upstream supply chain. This multi-tiered supply network includes component suppliers, sub-system suppliers, and raw material providers, all of which contribute to the production of the individual parts that are assembled into the complete vehicle.

Once the vehicle is fully assembled at the OEM plant, it is then distributed to its use phase. During this use phase, various parts of the vehicle may need to be exchanged or repaired if they become damaged or wear out over time. This aftermarket for replacement parts is an important part of the overall automotive lifecycle and a source of end-of-life (EoL) components. Informational requirements specifically for workshops will be elaborated in a second step.

At the EoL of a vehicle, it is handed over to a specialized dismantling facility. Here, the process of vehicle decommissioning and component recovery begins. First, a certificate of destruction is issued, formally marking the vehicle as being at the end-of-life. The dismantling facility then performs mandatory disassembly procedures, including the removal of legally required hazardous materials, such as fluids and batteries, as well as the draining of any remaining liquids.

Subsequently, the vehicle is further dismantled, with individual parts and components being removed for appropriate R-Strategies. Parts that cannot be meaningfully reused or remanufactured are sent to recycling facilities, where the materials are recovered and reprocessed for use in new products.

Reused and remanufactured parts are distributed back into the aftermarket through various sales channels, including both OEM-authorized and independent workshops and retailers. This closed-loop system helps to extend the useful life of automotive components and reduce waste, contributing to a more sustainable and circular economy in the automotive industry.

To increase circularity even for the OEM's new vehicle production and to ensure the supply with critical components it is our vision to also deliver components into a second life (which have gone through any recovery process) to the OEM. This depends on the current status and changes of the bill-of-material (BOM) as planned of the vehicle in production.

2.2 Reuse

Reuse takes place for a product which is still in good condition and fulfils its original function (and is not waste) for the same purpose for which it was conceived. Products for reuse are often offered when the user does not need the utility of the product any longer (Jayaraman, 2006). Reuse includes only minimal maintenance activities or aesthetic improvements between the different life cycles of a product (Willskytt et al., 2016).

2.3 Remanufacturing

Remanufacturing is a standardized industrial process that restores used products to their original performance level or better, with a warranty equivalent to or surpassing that of newly manufactured products. The remanufacturing effort includes dismantling the product, restoring and replacing components, and testing individual parts and the whole product to ensure it meets its original design and performance specifications, as seen from the customer's perspective. According to CLEPA, remanufacturing is a standardized industrial process by which a used product or part is returned to same-as-new, or better, condition and performance. The process is in line with specific technical specification, including engineering, quality and testing standards. The process yields fully warranted products (CLEPA, 2016). Remanufacturing marks the beginning of a new lifecycle.

Generally, there are three types of remanufacturers as presented below. However, an exact categorization of them is often not possible (Sundin, 2004). These types can also be applied to other R-Strategies, such as repair and refurbishment. Also, a single company can perform multiple R-Strategies and be categorized in multiple of the three types below:

1. **Original Equipment Remanufacturer (OER)**: An OER remanufactures its originally self-produced products. Often, an OER is an original equipment manufacturer (OEM) which performs remanufacturing in an own business unit. A remanufacturing OEM usually has advantages by an established supply chain network which eases reverse logistics, retailer trade-ins and product returns from workshops. An OEM, respectively OER, also benefits from access to design knowledge, spare parts and service methodologies (Sundin, 2004).
2. **Contracted remanufacturer**: A remanufacturer, who performs remanufacturing on behalf of another company, often of an OEM, is called a contracted remanufacturer. In such a case, an OEM normally sees remanufacturing as a part of its business model, e.g. for spare parts in after sales, but does not remanufacture itself. The contracted remanufacturer benefits from a probably consistent stream of business and the aforementioned supply chain advantages of an OEM. Thus, its risks are reduced and, furthermore, the remanufacturer can expect support from the OEM for procuring spare parts, receiving design and testing specifications and even tooling (Sundin, 2004).

3. **Independent remanufacturer**: An independent remanufacturer has very limited or no contact to the OEM. Normally, it has to buy or collect cores itself from the end users. It usually has to purchase spare replacement parts and has to generate necessary product knowledge itself. An independent remanufacturer generally markets its products under an own label or for private brands of others. OEMs might regard independent remanufacturers as competition for their own virgin and after sales business even if the OEM has no remanufacturing business (Sundin, 2004).

2.4 Recycling

Recycling is the process of collecting, sorting, and processing waste to release materials that can be reused for their original purpose or other purposes, except for the energy recovery. Recycling means any recovery operation by which waste materials are reprocessed into products, materials, or substances whether for the original or other purposes. It includes the reprocessing of organic materials but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations (DIRECTIVE 2008/98/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 19 November 2008 on waste and repealing certain Directives, 2008). It might involve mechanical but also chemical activities.

2.5 Business Motivation

There are various business motivations that drive the dismantling of ELVs in order to enable the reuse and remanufacturing of automotive components and parts.

Firstly, there are significant economic motivations for dismantlers to achieve profits by selling quality-assured used parts for direct reuse, as well as by offering cores (used parts) to remanufacturers. The reuse and remanufacturing of these components can be a lucrative revenue stream for dismantlers, as the parts can be resold at a lower cost compared to brand new replacements, while still providing value to customers.

Furthermore, dismantlers are required by regulations to perform mandatory drainage and dismantling procedures on ELVs. This includes the removal of hazardous materials, fluids, and other components that must be properly handled and disposed of. Complying with these regulatory requirements is another key driver for the dismantling process.

Beyond the economic and regulatory motivations, there are also broader supply chain and sustainability-related reasons that incentivize the reuse and remanufacturing of automotive parts:

1. **Sales of Quality-Assured Used Parts (Reuse):** Dismantlers can offer a reliable supply of used, quality-checked parts for direct reuse in the aftermarket, providing cost-effective alternatives to new replacement parts.

2. **Sales of Cores for Remanufacturing**: Dismantlers can sell the used cores (components) to remanufacturers, who can then restore them to like-new condition and sell them back into the supply chain.

3. **Sales of Remanufactured Parts to the Aftermarket**: Remanufacturers can sell their restored parts through the aftermarket, offering high-quality, warrantied products at a lower cost than brand new replacements.

4. **Future Vision: Sales of Remanufactured Parts to OEMs / Tiers**: While currently not fully compliant with regulations, there is a future vision for remanufactured parts to be accepted and integrated back into the original equipment supply chain.

5. **Increased Supply Chain Resilience**: Reuse and remanufacturing can help increase the resilience of the automotive supply chain by reducing the need for new, virgin materials and pre-products, thereby mitigating the impact of supply chain disruptions.

6. **Regulatory Compliance**: Dismantling and component recovery processes are necessary to comply with various regulations, such as the ELV Directive, Battery Regulation, and other relevant environmental policies.

7. **Voluntary Sustainability Targets**: Companies may also pursue reuse and remanufacturing initiatives to meet their own self-defined sustainability goals, internal codes of conduct, or customer expectations regarding circularity and environmental responsibility.

By understanding these diverse business motivations, stakeholders across the automotive value chain can better align their strategies and operations to enable a more circular and sustainable approach to ELV and component management.

3. INFORMATIONAL REQUIREMENTS

To enhance information exchange for efficient ELV / EoL component utilization, the identification of critical data requirements and their availability is a necessary prerequisite. This whitepaper starts by capturing the data requirements from the perspective of the dismantling company, with other stakeholders to follow. The step of data requirement collection is essential for future standardization efforts, which are motivated by the six objectives (O) below. The working group's vision for reuse and remanufacturing guided the development of the objectives. Additionally, the order of objectives was determined by the sequence of activities and R-Strategy decisions that occur at a dismantling facility: Regardless of any further decisions, mandatory dismantling must be carried out on every ELV. Subsequent decisions regarding the removal and whereabouts of reusable / remanufacturable components follow.

Figure 2: Vision and Objectives

"Our vision is to establish a data-driven ecosystem for end-of-life vehicle and/or component treatment, focusing on reuse and remanufacturing strategies.

This includes creating a transparent and standardized information exchange, identifying and standardizing data requirements, developing data models, and enabling an efficient circular economy.

The ultimate goal is to increase sustainability while staying profitable and complying with regulations."

O1 Support data exchange about mandatory dismantling in accordance with current legislation.

O2 Support data exchange for R-Strategy decision-making (Reuse, Reman, Recycling) in accordance with current legislation.

O3 Support data exchange to improve the dismantling process in accordance with current legislation.

O4 Prethink demand for processes and data to fulfill upcoming legislation.

O5 Establish a concept of rights and roles for data exchange between stakeholders specific to Reuse, Reman, and Recycling.

O6 Enhance visibility of environmental impact that Reuse, Reman, and Recycling creates.

The list of objectives may be subject to expansion or inclusion of additional goals in the future.

The diverse processes and decisions carried out at a dismantling company facilitate various business needs, which are influenced by economic, environmental, technical, and legislative factors.

- **Informational Business needs** are considered as informational demands within an organization to address business challenges, improve operations, or achieve strategic objectives.
- Every business need holds **data requirements**, specific parameters, necessary to address the identified business needs effectively. Data requirements are viewed as initial drafts that are later refined and specified into attributes essential for data modeling.

In the following, the identified data requirements per business need are summarized according to their influencing factor. Additionally, each data requirement is mapped to its availability, information source, and relevance per objectives O1 and O2, which are the prioritized objectives at the moment.

- The data **exchangeability in Catena-X** is ensured by the existence of a data model, standardizing the required data attributes and their exchange.
- The data **availability in databases** is ensured by the existence of an automotive database, providing the required parameter.
- The data **source** refers to the stakeholder group or provider from which the information originates.

The data requirements per business need outlined in this document are considered a working agenda for this expert group and are subject to extension.

3.1 Fulfillment of economic business needs

The economic business needs identified in Table 1 are especially demand and effort-driven:

- **Demand for reuse parts**: The demand for reuse components workshops and aftermarket platforms placed with the dismantling company.
- **Demand for remanufacturing cores**: The demand for cores remanufacturers place with the dismantling company.
- **Effort of dismantling:** The utilization of resources for the dismantling of components in regard to working units and tools required.

This whitepaper does not address the market prices of components and materials, as they are heavily influenced by the internal policies of the parties involved in the market.

Table 1: Economic business needs and resulting data requirements

Availabilities: covered | not covered | partly covered | not applicable | For future consideration

Informational business need	Data requirement	Exchange-ability in C-X	Availability in databases	Source	Relevant for O1	Relevant for O2
Demand for reuse parts	manufacturer part ID (OE Number, OEM Number)			Workshops		x
	Quality grade			Workshops		x
	Amount			Workshops		x
Demand for remanufacturing cores	manufacturer part ID (OE Number, OEM Number)			Remanufacturer (OEM, Tier, Independent)		x
	Quality grade			Remanufacturer (OEM, Tier, Independent)		x
	Amount			Remanufacturer (OEM, Tier, Independent)		x
Effort of dismantling	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		x
	Working units			OEM, A2mac1		x
	Tools needed			OEM, A2mac1		(x) optional

3.2 Fulfillment of environmental business needs

The environmental business needs identified in Table 2 focus on the environmental impact assessment of R-Strategies:

- **PEF (product environmental footprint) impact of R-Strategies**: The total environmental impact, including various environmental aspects such as product carbon footprint (global warming potential), ozone depletion potential, acidification, depletion of non-renewable resources, etc.

Table 2: Environmental business needs and resulting data requirements

Availabilities:	covered	not covered	partly covered	not applicable	For future consideration

Informational business need	Data requirement	Exchange-ability in C-X	Availability in databases	Source	Relevant for O1	Relevant for O2
PEF (product environmental footprint) impact of R-Strategies	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		x
	Product Carbon Footprint (PCF)			The whole supply chain		x
	Other environmental impact categories (outlook for the future)			The whole supply chain		(x) optional

3.3 Fulfillment of technical business needs

The technical business needs identified in Table 3 refer to the identification, assessment, and dismantling process of components:

- **Identification of individual components**: Identification of components on type and instance level. This includes the component's part number replacement list, in case its part number changed over time.
- **Versioning of component life cycles:** Identification of the life cycles covered by the component, whether it is in its first life cycle or has already been reused or recycled.
- **Safety level check for reuse**: Access to safety classification information for components, such as ASIL levels (Automotive Safety Integrity Level), SC (Special Characteristics), and CC (Critical Characteristics).
- **Transport specification regarding hazardous warnings**: Adherence to transportation specifications of components.
- **Transport specification regarding used high-voltage batteries**: Adherence to transportation specifications specific to used high-voltage batteries.
- **Compatibility of component**: Listing of all vehicle models within and across brands for which a component is suitable.
- **Quality assessment of components**: Detailed assessment of a component's quality regarding its reuse and remanufacturing potential. This includes visual, functional, telemetry, and diagnostic checks.

- **Dismantling guidelines and map**: Localization of individual components within the vehicle as well as information on non-destructive dismantling and retention of functionality and safety after being dismantled.
- **Evaluation of existing components**: Assessment of all available components installed in an ELV based on a Bill of Material (BOM).

Table 3: Technical business needs and resulting data requirements

Availabilities: covered | not covered | partly covered | not applicable | For future consideration

Informational business need	Data requirement	Exchange-ability in C-X	Availability in databases	Source	Relevant for O1	Relevant for O2
Identification of individual components	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		x
	part-instance (serial number, e.g. reman number)			Tiers, OEM, Remanufacturer		x
	part number replacement list			OEM		(x) optional
	UUID (DT ID)			Discovery + Digital Twin Registry		x
Versioning of component life cycles	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		
	part-instance (serial number, e.g. reman number)			Tiers, OEM, Remanufacturer		x
	R-Strategy certificates			Dismantler, Workshops, Remanufacturer, Recycler		x
Safety level check for reuse - ASIL, SC and CC	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		
	ASIL level			Tiers, OEM		(x) optional
	characteristics			Tiers, OEM		(x) optional
Transport specification regarding hazardous warnings	specifications			Regulation	x (to be discussed)	

Informational business need	Data requirement	Exchange-ability in C-X	Availability in databases	Source	Relevant for O1	Relevant for O2
Transport specification regarding used high-voltage batteries	(test) specifications			Regulation		
Compatibility of component	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		x
	Fitment list			Tiers (across brands), OEM (for one brand)		
Quality assessment of components	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		x
	Component type			VDI 4080		x
	Inspections specifications and classifications			DIN SPEC 91472 (Reman), VDI 4080(Reuse)		x
	telemetry data (e.g. mileage)			OEM		x
	remaining useful life			Tiers, OEM		x
	DTC (diagnostic trouble code) plus definition			OEM, Vehicle itself		x
Dismantling guidelines and map	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		x
	Location of component (e.g. coordinates)			OEM		
	Capability of non-destructive dismantling of component			Tiers, OEM		x
	Retention of component functionality and safety once re-assembled after dismantling			Tiers, OEM		x

Availabilities:	covered	not covered	partly covered	not applicable	For future consideration

Informational business need	Data requirement	Exchange-ability in C-X	Availability in databases	Source	Relevant for O1	Relevant for O2
Evaluation of existing components	BOM			Vehicle itself		x
	Vehicle identification number (VIN)			Vehicle, Owner		x

3.4 Fulfillment of legislative business needs

The legislative business needs in Table 4 translate present regulations into concrete data requirements, while also considering potential changes in relevant legislation going forward. The legislative focus at this point lies on the compliance with the current ELV directive, while also considering future data requirements of the ELV Regulation. In contrast to the current ELV Directive the upcoming ELV Regulation is directly applicable, meaning it automatically becomes law in all EU member states the moment it is passed:

- **Fulfilment of ELV Directive - Finite list of components for mandatory dismantling, incl. drainage and depollution**: Consideration of vehicle components that must be dismantled by law, including procedures for draining and depolluting fluids, ensuring component safety and environmentally responsible recycling and disposal.
- **Fulfilment of ELV Regulation - Circularity vehicle passport**: Consideration of the Circularity Vehicle Passport, detailing the materials and components of a vehicle to promote circular economy activities.
- **Fulfilment of ELV Directive - Waste & R-certificates reporting**: Consideration of reporting responsibilities to track and verify the waste and R-Strategy rates of vehicle components.
- **Fulfilment of ELV Directive / Regulation - Certificate of Destruction**: Issuance of a Certificate of Destruction to confirm that end-of-life vehicles are disposed.

The following legislative business needs are considered to be of importance and will be kept in mind for future consideration.

- EU Battery Regulation 2023/1542
- Proposal for an Ecodesign for Sustainable Products Regulation (ESPR)
- ISO 59000 family of standards

Table 4: Legislative business needs and resulting data requirements

Availabilities: covered | not covered | partly covered | not applicable | For future consideration

Informational business need	Data requirement	Exchange-ability in C-X	Availability in databases	Source	Relevant for O1	Relevant for O2
Fulfilment of ELV Directive: Finite list of components for mandatory dismantling, incl. drainage and depollution	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM	x	
	Location of component (e.g. coordinates)			OEM	x	
	Dismantling instructions / Treatment manual			OEM, A2mac1	x	
Fulfilment of ELV Regulation: Circularity vehicle passport	manufacturer part ID (OE Number, OEM Number)			Tiers, OEM		
	Amount			OEM		
	Location of component (e.g. coordinates)			OEM		
	Weight			Tiers, OEM		
	Compulsory feature description of component			Tiers, OEM		
	Dismantling instructions / Treatment manual			OEM, A2mac1		
	Best treatment technique			Tiers, OEM		
	Treatment tools and technologies			Tiers, OEM		
	Functionality, inter-changeability and compatibility description			Tiers, OEM		
	Contact point of the manufacturer			OEM		

Availabilities: covered | not covered | partly covered | not applicable | For future consideration

Informational business need	Data requirement	Exchange-ability in C-X	Availability in databases	Source	Relevant for O1	Relevant for O2
Fulfillment of ELV Directive: Waste & R-certificates reporting	part-instance (serial number, e.g. reman number)			Tiers, OEM, Remanufacturer		
	R-Strategy certificates			Dismantler, Workshops, Remanufacturer, Recycler		
Fulfillment of ELV Directive / Regulation: Certificate of Destruction	Name, address, and registration or identification number of issuer			Dismantler		
	Name and address of competent authority			Dismantler		
	Date of issue			Dismantler		
	Vehicle nationality mark and registration number			Dismantler		
	Class of vehicle, brand and model			Dismantler		
	Vehicle identification number (VIN)			Dismantler		
	Name, address, nationality of the holder or owner of the vehicle			Dismantler		
Battery Regulation	For future consideration			Regulation		
ISO 59040 - Product Circularity Data Sheet	For future consideration			Standard		
Ecodesign for Sustainable Products Regulation	For future consideration			Regulation		
Green Claims Directive	For future consideration			Directive		

3.5 Interpretation of data requirements

According to CX - 0126 Industry Core Part Type and CX - 0127 Industry Core Part Instance, vehicle and component information are differentiated based on **part type and part instance**. Part type refers to a generic, not physically produced, part on the material- or catalog-level, identified by its manufacturer part ID (e.g., OE number). On the other hand, a part instance is a physically produced instance of a part type, which can be realized as a serialized part, a just-in-sequence part without a serial number, or a batch. For the coverage of economic business needs, part type information is sufficient, as the data requirements of demanded amounts and quality grades, as well as for dismantling efforts, are described on the manufacturer part ID level. This applies to the environmental business needs as well, where the PCF (Product Carbon Footprint) of a component represents an averaged value at the part type level. However, future research should include PCF calculations with increasing accuracy, e.g. at the instance level, to support detailed R-Strategy comparisons and, thus, decision-making. In contrast, technical business needs heavily rely on instance-specific data. Assessing all components installed in an ELV necessitates the BOM (Bill of Materials), including maintained components, which is specific to the VIN (vehicle identification number). Additionally, requirements for telemetry data and past lifecycle information of individual components exemplify part instance data. The legislative business needs require both part type and part instance. For mandatory dismantling and the circularity vehicle passport, component / vehicle information at the part type level is sufficient. However, waste & R-certificates reporting and the certificate of destruction are at the part instance level.

The overall **availability of data** is limited. In automotive databases, the necessary information is frequently only partially covered, lacking the required level of detail, or confined within internal manufacturer databases without third-party access. While some data requirements within Catena-X data models are partly exchanged, there's a need for future coordination to align the involved data parameters to data models specific to the business needs.

A unique challenge of the data requirements at the dismantler is the high variety of involved **information sources**, including OEMs, Tier suppliers, service workshops, remanufacturers, recyclers, and the vehicles themselves as individual instances. This underlines the complexity of dismantling processes and the decisions necessary to promote a sustainable and economically viable approach to component utilization in the automotive industry.

4. SUMMARY AND FUTURE WORK

Upon the issuance of a Certificate of Destruction, a vehicle is considered "end-of-life" and cannot be resold, though its components may still be usable. Dismantlers strive to extract parts in order to apply subsequently the most appropriate R-Strategy. This whitepaper started by describing the terminology, stakeholders, process flow, and business motivation behind form preserving R-Strategies with a special focus on reuse and remanufacturing.

Further, it identifies critical data requirements and their availability to enhance information exchange for efficient ELV / EoL component utilization from the dismantling company's perspective and categorizes them according to business needs, including economic, environmental, technical, and legislative aspects. It becomes evident that informed dismantling and circular economy decision-making can only work if data is available and standardized.

As mentioned in Section 3, the current prioritized objectives are O1 and O2 (see Figure 2: Vision and Objectives). Concerning objective O1, which focuses on facilitating data exchange regarding mandatory dismantling in alignment with existing legislation, almost all data requirements are accessible through the IDIS database. IDIS contains information on safe handling (e.g. for airbag deployment, HV battery treatment), pre-treatment, dismantling of potentially recyclable parts, and other elements mentioned in ELV regulations. The plan is to review the existing data model for mandatory dismantling and incorporate the regulatory information currently available in systems like IDIS.

The second objective, O2, which aims to support data exchange for R-Strategy decision-making, relies on almost all the informational requirements identified in Section 3. Part instance-based data plays a particularly important role here, as it provides “as used” and “as maintained” insights about a vehicle or component. Therefore, calling for the development of a BOM as Maintained to address the information gap about a vehicle or component instance once it is transferred to the end user. The stakeholders in an optimized and standardized information exchange must be able to collaborate to make decisions on the most relevant strategy to maintain the component value after the dismantling, whether economic or ecological. Sharing detailed information about the part is essential to facilitate this decision-making process. The Digital Product Passport would enhance this data sharing at component level. Another long-term topic in mind is the data model implementation of the Circularity Vehicle Passport (CVP), which will become mandatory with the upcoming new ELV regulation. Both the BOM as Maintained and the CVP embody powerful tools to improve dismantling processes and support circular decision-making in the automotive industry.

In the future, it is planned to address additional perspectives on data requirements for reuse and remanufacturing besides the dismantler. This also includes the perspectives of service workshops distributing used components during a vehicle's life.

Aligning with other activities within the Catena-X association, such as the PCF and the Traceability working group, is essential to fill the gaps in the overall picture.

5. ATTACHMENT

5.1 List of Figures

5.2 List of Tables

5.3 References

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5.4 Participating Authors & Companies

Authors:

Noah Czorny, Fraunhofer Institute for Production Systems and Design Technology IPK

Christiane Grünewald, TÜV Süd

Matthias Hummel, KUMAsoft GmbH

Daniel Kopenetz, SAP

Janine Mügge, Fraunhofer Institute for Production Systems and Design Technology IPK

Jean-Baptiste Prono, Valeo

Tanja Rölker, Volvo Group

Christoph Schuch, Robert Bosch GmbH

Sophie-Odette Smolka, LRP-Autorecycling Leipzig GmbH

Corresponding author:

Florian Stern, BMW AG: florian.stern@bmw.de