Discussion Paper

AAS Transfer of Ownership

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Introduction and Context

In enterprise and industrial environments, digital product data is often fragmented across systems, formats, and organizational boundaries. The Asset Administration Shell (AAS) provides a structured framework to unify and exchange asset-related information in a standardized and interoperable manner. One challenge of the AAS is the ability to transfer digital representations of assets between parties along the value chain. This becomes especially important when a party wants to add their own data to a digital twin or needs to provide some data for legal purposes, thus cannot / doesn't want to trust other parties to fulfil the requirements.

The initiative for defining ownership transfer mechanisms was driven by the Components Supplier Group within the Open Industry 4.0 Alliance. Their goal was to establish a means by which component manufacturers can not only provide digital twins of their assets to customers but also enable bidirectional exchange of data over the lifecycle of those products. The core idea is to make product-related information such as configuration data, updates, documentation, and analytical insights, systematically available through the AAS.

> **DISCUSSION POINT**
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> *How should the balance between supplier-provided AAS data and customer-enriched data be managed? And: Where should the line be drawn between the supplier's obligation to provide standardized information and the customer's role in extending it?*

What's your opinion?

Such questions are worth exploring further, particularly in communities where suppliers and users exchange experiences openly (which, let's be honest, sounds suspiciously like describing the OI4 Alliance itself – almost like it was designed that way).

In today's practice, documentation and software updates are often distributed via vendor websites or sent manually by email. This creates inefficiencies and inconsistencies in how customers receive and integrate product data. The use of AAS and a structured transfer of ownership promises to overcome these limitations by providing a guideline on how product data in digital twins can be exchanged along the value chain. This enables integration into enterprise systems such as ERP, PLM, or AAS infrastructure. This shift offers a pathway for more streamlined digital product integration and opens new forms of supplier-customer interaction.

Ownership Transfer and Technical Realization

Ownership transfer in the AAS context has two main dimensions. First is the transfer of the asset itself, typically a physical product, transferred from supplier to customer. Second is the digital transfer of the AAS instance, the digital twin of the asset, which contains product metadata and operational parameters. Operational data is not included in the initial transfer, as the AAS is enriched with this data during asset operation and could potentially later be exchanged with the supplier.

> **What's your opinion?**
>
> **DISCUSSION POINT**
>
> *What would it take for industry to fully embrace AAS-based ownership transfer as the new standard, and which barriers; technical, cultural, or legal still stand in the way?*

The AAS metamodel does not yet define ownership as an explicit attribute. Thus, transfer of ownership currently relies on the use of standardized API interfaces to transmit the AAS, rather than relying solely on file-based serialization formats such as XML or JSON. Customers transferring the AAS of an asset need to ensure AAS standard compliance and data integrity by changing the AAS ID of the instance received from the supplier.

The implementation focuses on cross-enterprise AAS data transfer. This includes the technical ability to export an AAS instance from a supplier system and integrate it into the customer's environment, with the data, that the supplier offers to its customer. Standardization plays a central role: only if the structure and semantics of the submodels are understood and used by both parties, data can be reused effectively.

SUPPLIER → **AAS** → **CUSTOMER**

Typical use cases include the early use of product data in engineering workflows (e.g., safety calculations), integration into operational environments (e.g., ERP or CMMS), and the ongoing exchange of information related to product changes, updates, and deprecations. Once an AAS is in place at the customer, product changes can be communicated directly, without relying on email or manual updates. The system also supports proactive notification of changes, vulnerabilities, or updates.

From the customer's perspective, integration of AAS enables automation in material and product creation workflows and seamless alignment between engineering and procurement systems. It also allows early access to configuration data for simulation and analysis. From the supplier side, AAS transfer allows for lifecycle engagement beyond the initial sale. This includes informing customers of product changes, running analytics on usage data, and offering service-related features such as smart service contracts or after-sales services.

A structured ownership transfer allows type-specific AAS data to be used consistently across multiple product instances and defines a standardized mechanism for sending back feedback and operational data to the manufacturer, if needed.

What's your opinion?

DISCUSSION POINT

How much trust and openness are needed on both sides to make this lifecycle engagement truly beneficial? In other words, what is the balance between protecting sensitive data and enabling collaboration?

Application Examples and Strategic Outlook

To illustrate the principle in non-industrial terms, consider a bicycle manufacturer sourcing navigation device. The navigation system's AAS could include a digital nameplate, software update history, warranty status, and service messages. Instead of static documents, these are transferred and updated automatically through the AAS.

In industrial settings, similar principles apply. Updates, documentation, and operational data are exchanged via the AAS, reducing manual intervention and enabling integration into customer systems. Predictive maintenance, for example, can be built on analysis of operational data exchanged via the AAS instance.

One technical challenge lies in the management of the different AAS IDs of the physical asset. When a customer imports the AAS of an asset, they must generate a new ID. Currently, the standard lacks a reference mechanism to link the new ID to its original source. This limitation reduces traceability and is being addressed in ongoing specification work. Another topic under development is the implementation of security and authorization mechanisms, ensuring that transferred AAS data is only accessible by authorized systems. The recently published specification "Part 4: Security" addresses some of these concerns, particularly in the context of dataspace concepts.

Ownership transfer in the AAS context has both immediate and long-term implications. In the short term, it simplifies integration, reduces manual errors, and enables more responsive customer support. Strategically, it enables suppliers to remain part of the operational lifecycle of their products, even when their assets are included in machinery operated by a customer that had no direct connection with them, laying the foundation for smart service contracts, feedback loops, and data-driven services.

As dataspace technologies and standards mature, ownership transfer mechanisms will play a key role in defining how manufacturers and customers interact over the full product lifecycle. Structured, tracible, and secure AAS exchange will be a prerequisite for scalable, modular, and cooperative industrial ecosystems.

What's your opinion?

DISCUSSION POINT

How can we ensure that ownership transfer mechanisms evolve in step with the needs of different industries, from manufacturing to mobility to energy?

Closing Reflection

The questions raised in this paper are practical ones. They concern standards, trust, technical feasibility, and business models that will shape industrial ecosystems in the years ahead. Such challenges can only be addressed through collaboration. These are the topics discussed daily in the **OI4 Alliance**. We invite everyone interested to join, share perspectives, and help shape how ownership transfer in the AAS evolves. Within this network of think-alikes, suppliers, integrators, and users define pragmatic pathways forward together. Ownership transfer is only one of many areas where collective insights drive real progress.