



d-twin

White paper

Streamlining materiel data
exchange across the Defence
supply chain

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What this paper is about:

Some of the largest ever Australian Defence build programs are underway. Hundreds of companies are involved, some large, some small, some in-between. Now more than ever the end-customer is demanding higher quality data deliverables to enable their information management platforms to support more complex assets. The increasing demands for improved data quality are driven by the need to maintain high levels of safety, mobility and responsiveness, ultimately leading to more targeted, cost-effective maintenance programs and mission support.

Over the past 20 years, data exchange standards have evolved and matured. MDES, as an example, is the Australian Defence Department's Maritime Systems Division's Materiel Data Exchange Standard. The ability for companies large or small to deliver to these standards is a challenge for a variety of reasons. Getting it wrong costs schedule, money and credibility.

This white paper discusses how all companies, independent of information management systems in use, can better manage their data. The ultimate goal is to ensure data is delivered to meet the customer's needs in a secure, cost effective, repeatable manner that minimises errors, ensures correctness and reduces costly impacts of data deliverable rejections.

Environment

Product Lifecycle Management is the discipline of providing a controlled single source of truth. Product information must be managed over the life of an asset from its initial requirements, through design, build, support and disposal. In the world of complex Defence asset acquisition and sustainment there is no single system or organisation managing the cradle to grave information lifecycle.

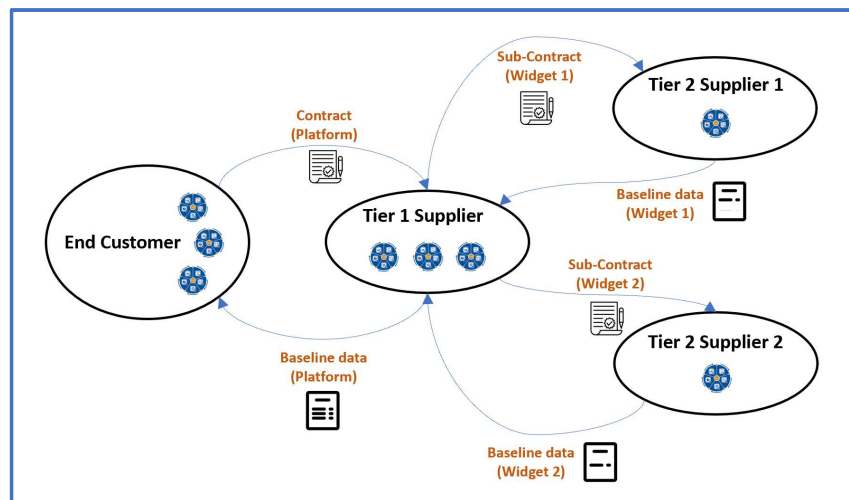


Figure 1: A complex data eco-system

Large companies have typically invested heavily in running their own information management systems. Mid-sized companies may have extended their ERP systems to manage PLM due to the perceived costs (and overheads) of running a PLM system. Small companies may be running Excel (the world's most popular PLM system by the way). The



Australian Defence Department is using their systems of choice and will no doubt align these to the future Defence ERP program.

These key environmental challenges are summarised below,

- Multiple information management systems in and across the supplier eco-system
- Suppliers managing PLM data differently depending on their own specific business needs and way of doing business
- Defence's requirement (in an ideal world) would be to send and receive the right data at the right time to their suppliers and end-users

Standards such as MDES and LMDEF (the Australian Department of Defence's Land Systems Division's Data Exchange Standard) have laid the foundation for this 2-way data exchange and it is up to the supply chain to ensure they meet these standards. This is no easy task.

What is needed?

The objective of a sound data exchange strategy should be to enable companies to use a platform which supports complex data configuration rules and provides the ability to create and consume standard data exchange packets. The platform should be provided as a service and existing information management systems should plug-in and require no costly enhancements or customisations.

Moreover, the technology should not burden existing IT departments and must be capable of conforming to one or many standards. Having a Defence focused solution would be a distinct advantage.

Not just about technology:

This problem domain is not just one of technology. The data structures manifested through the Product Lifecycle of Defence Assets are complex, really complex. In most cases, the data structures Designers use are different to those required by Maintainers. Also, data required by one party may not be available or relevant to the other party. Conformance to a data exchange standard requires a deep understanding of how these data structures translate and map through business processes. These business processes must be combined into a technology platform to complete the picture.

D-twin's Solution:

Orchestrate is a solution built by D-twin to address this complex issue. By combining our many years of expertise in integrating PLM systems, with our strong Defence domain background, Orchestrate delivers a software platform to help companies participate in PLM eco-systems. This can be achieved through the creation and consumption of data exchange packets, loosely coupled integrations and through batch or online processes.

The technology in Orchestrate was designed from the ground up and provides a codeless configurable platform to reduce complexity and the total cost of ownership. Through the use

of specific system adapters and web services, Orchestrate enables multiple systems to communicate without having to change the underlying source or target systems. Rules based validation enables data to be extracted and formatted in accordance with defined standards without manual uncontrolled intervention.

The strength and flexibility of Orchestrate can be understood by examining some of the following typical use cases. Whilst these are not exhaustive, they do represent some of the innovative thinking which has been applied in the creation of Orchestrate:

1. *Generating repeatable, standards-driven, data packs.*

Data used to generate standard data packets can be stored in different source systems. These systems might be Microsoft Excel, SharePoint or a more structured PLM system. Orchestrate comes with predefined templates supporting standards such as MDES and LMDEF. Typically, small sized companies delivering data packs to their Primes, as well as Primes delivering standard data packs would gain value in this.

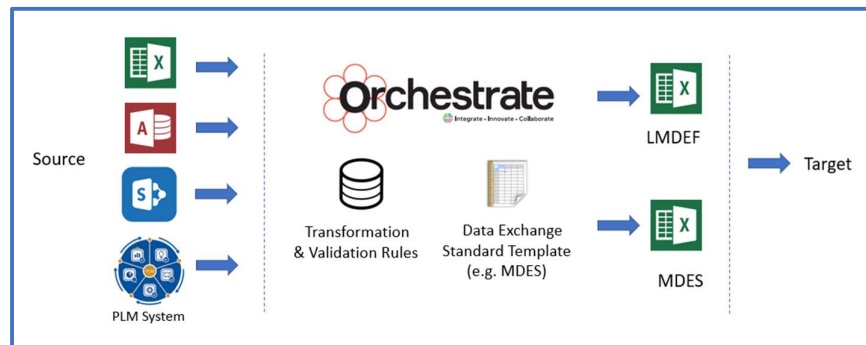


Figure 2: MDES / LMDES extractor

2. *PLM to ERP integration.*

Perhaps a more common scenario is to support companies running PLM and ERP best of breed systems from different vendors. Aligning BOM, Material and Document data is critical in supporting a master data management strategy. The ability to drive bi-directional integration not only through transactional 'add, change, delete' functions, but also embedded into the business process ensures integration is triggered at the right time (after approval of an engineering change, for example), is critical.



Figure 3: PLM to ERP Integration

3. The integrated supply chain.

A more complex example, and relevant for large Defence programs, is the deployment of Orchestrate to perform different integration tasks across the supply chain, the Prime and the Defence Program:

- A. Support a PLM 'Hub' of the supply chain. A hub is a secure PLM capability which the supply chain accesses, separate to the Prime's enterprise PLM system. This enables the supply chain to interact with the prime in a structured way and retains a separation from the Prime's Enterprise PLM system.
- B. Support for the Supply chain to submit and load data exchange packets to the Prime's PLM system
- C. Integration between the PLM Hub and the PLM Enterprise system
- D. Generation and loading of data exchange packets from the Enterprise PLM system

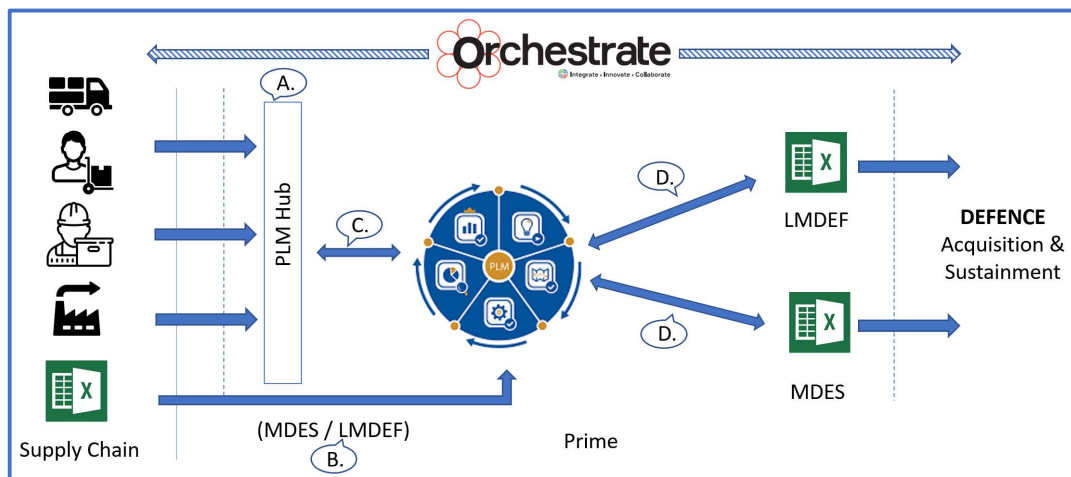


Figure 4: Large program end-to-end solution with a PLM Hub

4. Managing multiple PLM environments

Some companies may find themselves in a position of supporting several PLM systems. This could be because of a merger or acquisition of another company that has legacy PLM systems, or different end customers mandating the use of a system different to the company's enterprise PLM system. Orchestrate supports the alignment of these different PLM systems into the enterprise eco-system, and then aligns the enterprise PLM system with the ERP system in use.

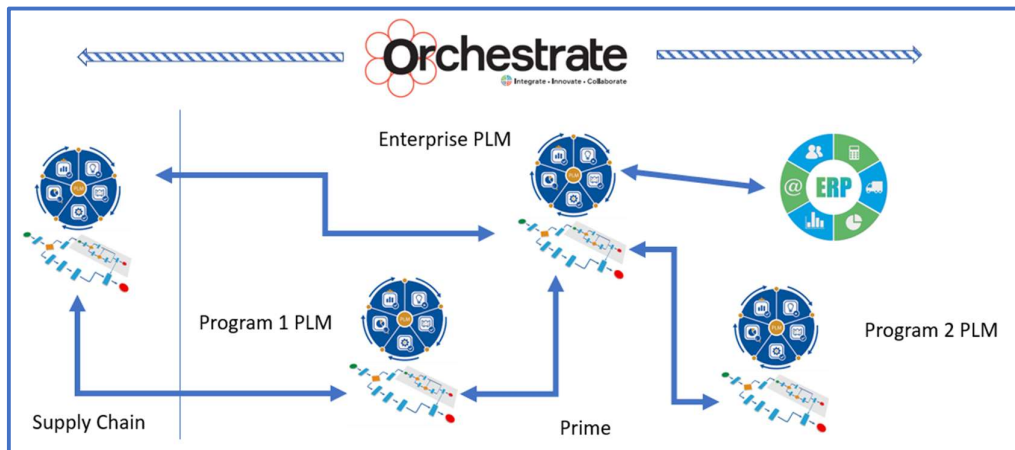
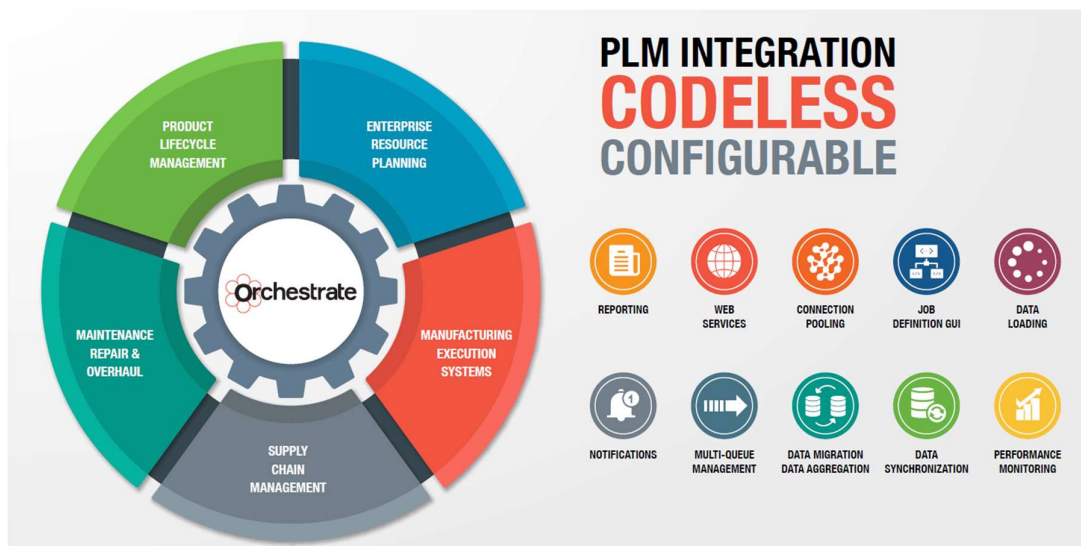


Figure 5: Integration of multiple PLM systems within one company

Conclusion

D-twin's purpose is to 'make PLM work for Australian Industry' by tackling some of the big ticket issues facing companies on their PLM (Digital Transformation) journey.

Being able to integrate PLM data with other systems and enable it to flow easily to the external supply chain and customer environments is a critical success factor in making PLM work for everyone. Our Orchestrator platform supports a variety of integration needs. In the Defence context, Orchestrator delivers significant benefits through its ability to enable companies to create and consume standards-based data exchange packets, at the right time, in the right format and validated to eliminate rejection.





We are PDM, PLM and enterprise integration industry experts with global experience across a range of domains and platforms – Teamcenter, Aras, Metaphase and more. We have breadth and depth in our end-to-end product lifecycle experience and deep technical knowledge in major PLM platforms. Our purpose is to make PLM work for Australian Industry.

We understand PLM is just as much about people, culture and process as it is about technology. We support our customers' digital transformations by extracting maximum value from their existing PLM and legacy investments whilst positioning them for the new wave of IoT and cloud.

We offer independent advice that is solely focused on your business outcomes. Although we love the challenging technology stuff, our focus is always on solving business problems.

We are Australian based and focused, with Defence security cleared resources. We have worked with blue chip organizations globally and have strategic partnership with Australia's best manufacturers.

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