



DIGITAL INDUSTRIES SOFTWARE

Supplier collaboration and management

A new model to transform your supply chain relationships

Executive summary

The aerospace and defense industry is experiencing a tremendous amount of change. Pressure to reduce program cost and schedule while meeting requirements is a challenge for original equipment manufacturers (OEMs) and suppliers alike. Programs are becoming increasingly complex and highly integrated and the trend toward globalization has made it critical to have a secure, digitally based approach to improve supply chain collaboration and protect your data.

Documents drive the supply chain

Most aerospace and defense companies are using traditional document-centric approaches for communicating with supply chain partners. Supply chain management (SCM) departments often take responsibility for managing the supply chain, which involves the exchange and coordination of requirements, work packages and deliverables. These teams are familiar with this document-centric approach. Leading-edge companies have begun efforts to automate the exchange of design data, but there has not been a universal solution that applies a model-based philosophy across all types of supply chain collaboration.

SCM department leaders may have explored digitized solutions but many have found it difficult to justify the costs. For the most part, a document-based process has helped them achieve their goals.



Adopting a new approach appears to have a steep learning curve, will require organizational changes, may involve new types of contractual relationships and require implementing technology that seems to have a long return-on-investment (ROI). It can be hard for SCM managers to justify new digital approaches since they only focus on how it will save their department money. Program managers, engineering leaders and manufacturing vice presidents can often justify the ROI for these systems since their programs see a bigger benefit from digital transformation than SCM teams.

Lack of secure collaboration and oversight

As companies work to meet customers' demands for increased performance and as innovative products emerge, aerospace and defense products are becoming increasingly complex and highly integrated. Current processes that rely on document-centric systems do not scale to the increased rigor needed, resulting in cost overruns and schedule delays. There is also pressure on both the OEM and suppliers to reduce cost and improve schedule performance, which is driving the urgency to do something different.

Aerospace and defense supply chains often involve the exchange of a variety of types of data that is organized into documents, including requests for proposals, contracts, a plethora of technical data packages and other documents describing change requests and approvals. The traditional approach used for managing these document-based exchanges requires many manual steps to coordinate the work of product teams and management across all partners involved in a project.

Important data can get lost in translation or misinterpreted between OEMs and partners, suppliers and customers. Some companies are increasingly expecting suppliers to use specific authoring tools to ensure accuracy, but this increases costs within the supply

base. There is also a delay between when the OEM makes a design change affecting a supplier's component or deliverable and when the supplier is notified.

Currently, problems or issues of a schedule slipping or deviation from the requirements at the supplier level are communicated via email or verbally. By the time the supplier communicates to the OEM via email, it may be too late for the OEM to react to those changes. The need for this kind of real-time communication grows in significance as products and business relationships become more complex and the components become more interdependent.

Digital data rights protections are growing in importance owing to intellectual property (IP) protection concerns and new export control regulations. Companies typically use emails or provide access to shared drives to exchange documents with the suppliers, which provides some protections but can be easily breached. The documents may have a stamp indicating the applicable export classification number and license but no capability to automatically enforce export controls and IP protection, resulting in loss to business, fines or criminal prosecution.

A new model

Leading aerospace and defense companies are starting to adopt a model-based approach for organizing communications and collaborative activities with supply chain partners. These comprehensive digital twin models are linked through a digital thread to enhance communication and collaboration

in the supply chain while maintaining traceability of all deliverables back to requirements. This also enables increased automation of workflows. This enables a shift toward sharing data and models, not documents that need to be manually maintained and updated. This approach can help manage and share data related to all aspects of a project, such as engineering, manufacturing, quality and product support data, to facilitate more accurate and precise communications, improve visibility and coordinate more complex processes efficiently, accurately and quickly.

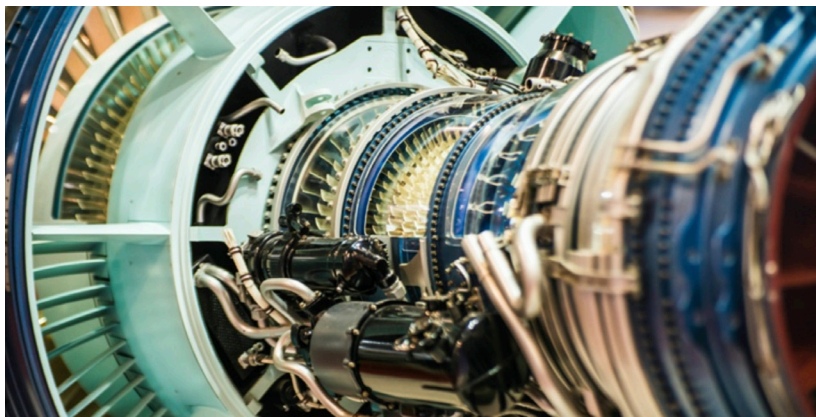
Supplier collaboration and management digital threads can transform supply chain relationships by enabling collaboration using model-based product data and providing visibility into supplier progress across the entire supply chain. This approach can reduce the time required for proposal evaluations, provide visibility into supplier progress, improve requirements compliance and improve communications.

Improving visibility

Another benefit of this approach lies in improving visibility of supplier status and capacity resulting in fewer surprises and late breaking information that impacts program cost and schedule.

During the source selection process, linking individual requirements directly to the responses for these requirements from the suppliers, makes the evaluation process easier to follow and share. This allows OEMs to automate the correlation of response with request for proposal (RFP) requirements rather than manually mapping responses in documents from multiple suppliers.

Because of this model-based approach, the work packages sent to the supplier and their respective deliverables are directly tied to each requirement. This ensures products delivered from supplier to buyer are compliant to the specific requirement. As a result, there is less of a chance for non-compliance.



Reduce risk of miscommunication

A digital thread can enable the exchange of any type of data between the OEM and supplier. This includes computer-aided design (CAD) models, simulation models, manufacturing simulations, part information and requirements. This reduces costs, improves the schedule and improves collaboration by reducing the risk of miscommunication.

Communication occurs by coordinating specific versions of a model that can be updated on both sides when required. All the information is packaged and sent collectively, rather than sharing some documents in one email, and then more later. This information tends to be more accurate because a digital model can include each contextual and referential supporting piece of data the supplier may need. As potential changes are reviewed, this will provide insight that supports impact analysis and enables a more informed decision to be made, reducing the risk of cost overruns or schedule delays due to potential rework.

Real-time visibility into supplier progress can allow teams to see delays and then use the comprehensive digital twin to assess what other tasks may be impacted so they can take timely corrective action.

This new approach provides visibility into supplier progress so the OEM can see the issues as soon as they pop up, and then take a more proactive corrective action on their end.

Automatically protect IP

IP protection, export control and International Traffic in Arms Regulations (ITAR) compliance can be programmatically enforced using digital threads. This can enable the secure and controlled sharing of digital assets. OEMs and suppliers can benefit by creating more efficient processes for sharing as much as they can while still protecting the data rights.

Programmatically enforced protections can use software to check if the supplier or individual is authorized or has a license to view the data. These licenses can be configured with an expiration date. This uses a sophisticated version of digital rights management to automatically enforce content protection policies. Fine-grained control over what and how data is shared with partners and suppliers can improve the granularity of data exchange while providing appropriate safeguards.

Conclusion

Transforming supply chain relationships needs to start with a plan for automating the exchange of more up-to-date and accurate data across suppliers, partners and customers. A digital thread extended across the supply chain can create the backbone for this infrastructure. This can help to improve the selection of sources, ensure everyone is on the same page, protect IP and enforce export controls. The net result is that companies can improve engineering collaboration, identify and address quality problems earlier and reduce time-to-market.

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