



BUILT TO LAST?

Rob Mather outlines how renewed defence demand is stretching manufacturers and offers four key operational trigger points to achieve high-performance manufacturing

Defence manufacturers are now facing a rebound in orders, with a reversal in downscaling and defence budgets increasing. But for increased demand to be met, there are four key focus points where digital tools can help defence manufacturers accelerate production – from AI-enabled anomaly detection, to unifying data platforms to bolster production and automating workflows, to keeping on the right side of regulations.

Surge in demand is straining defence manufacturers, but digital transformation can be a game-changer. Deloitte industry analysis underscores the urgent need for digital transformation within the defence ecosystem to address the challenges posed by escalating demand. The report highlighted the potential of modernising and integrating processes to enhance production efficiency, reduce cycle times and elevate product quality.

To achieve this, defence organisations must adopt a holistic approach to software and information

management, breaking down silos and creating a unified system that connects the shop floor, right up to the executive suite. By integrating data from various sources, including Manufacturing Execution Systems (MES), Enterprise Asset Management (EAM), Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) systems, companies can establish a single source of truth to inform decision-making and streamline operations. Here are the top four areas of development where digital approaches are laying the foundations for high-performance defence manufacturing.

ARTIFICIAL INTELLIGENCE

To help deal with surges in demand, defence manufacturers have reversed inventory strategies from lean and just-in-time principles to over-stocking parts to ensure inventory buffer. Despite reducing production risks, financial risks have been increased due to cost of purchase, storage and tracking of materials and parts.

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To better balance risk, defence manufacturers can look to integrate operations and take advantage of demand-driven material requirements planning (DDMRP). This will ensure inventory levels match demand levels and supply chain variability. By looking at actual usage data, DDMRP can determine if the stock level for a part is sufficient to cover demand, making defence manufacturers more sensitive to supply chain disruptions, variations in demand and production downtime.

The use of AI within defence forces and manufacturers is on the rise. With the US Department of Defence budgeting \$1.8-billion for AI applications and stating that AI applications will be used to help defence forces and organisations recognise patterns, learn from experience, make predictions and generate recommendations.

AI can help further de-risk production and financial issues. Manufacturers should look to combine anomaly detection and pattern recognition with real-time data correlation. The combination of AI anomaly detection and DDMRP can radically increase the speed and accuracy of problem detection throughout all aspects of the organisation and action potential chokepoints before they escalate into complex and costly problems.

INTEGRATING PLANNING AND PRODUCTION DATA

Defence manufacturing projects by their very nature are complex, with multiple production lines working to intricate assembly requirements. Project management, already a major challenge for defence manufacturers, is further exacerbated by this current ERP management software causing a disconnect throughout operations, alongside a lack of a skilled workforce readily available to defence manufacturers. Recent reports from Guidant Global highlight the workforce issues facing the UK defence sector, with key decision makers stating they're already facing a lack of skilled manufacturers and mechanics.

Implementing integrated project management software will allow defence manufacturers to align their planning through their operations to optimise their production and increase efficiency. The use of IoT technologies such as integrated project management software allows for data to flow in real time so people, systems, and capabilities can be leveraged in every aspect of their operations.

The increased visibility brought by integrated project management software can allow for manufacturing teams to react quickly to new priorities. Ensuring workers and machinery are coordinated to maximise efficiency and capacity and avoid time, money and resources being wasted.

NEW STANDARDS FOR WORKFLOW AUTOMATION

One of the biggest challenges defence manufacturers are struggling to overcome due to rising demand levels is reducing lead times. In August 2023 the delivery time for production materials reached 87 days. Despite being reduced by 13 days compared with 2022, the average lead time has yet to recover to pre-pandemic levels. Integrated workflows can help defence manufacturers reduce this with its ability to provide all relevant parties with data so that people,

machines and assets' time and skills are all optimised. A key part of digital transformation within the defence manufacturing industry is to move away from siloed data to real-time data that flows from the shop floor to the top floor of defence manufacturers. Powerful Manufacturing Execution Systems (MES) with integrated workflow engines will allow for data to flow from end-to-end, so every worker has operational visibility of what's happening and what needs prioritising.

Utilising powerful MES with integrated workflow engines brings far more benefits to defence manufacturers compared with typical ERP systems with data aggregators or business intelligence reports. Integrated workflow systems are accessible for all relevant parties – providing vital insights into ongoing work everywhere.

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BEWARE REGULATIONS

Defence manufacturers operate in an industry defined by regulatory requirements whether it's supply chain, cyber security, sustainability or employment – they all have their own regulations to comply with. This requires defence manufacturers to have fully traceable operations and processes which generate information that is readily available for regulatory reporting.

As regulations get stricter, current disjointed systems make it hard for defence manufacturers to meet requirements, with slow data compilation and increased risk of information being inaccurate or out-of-date. A real-time, single source of the truth is really needed.

This means manufacturing management platforms should include integrated and automated templates for mandatory government reports that are ready to use when called upon. Combining MES and ERP in one place will also help them comply with the ISA-95 standard from the International Society of Automation (ISA). This ensures they are using these standardised data models and communications to enable consistent and accurate data exchanges throughout all business systems.

To capitalise on the current surge in spending, manufacturers must view their transition to digitised operations as a strategic imperative – including the readily available tools at their disposal. Partnering with specialised technology providers can accelerate this journey by providing tailored solutions and deep industry expertise. By consolidating disparate data systems into a unified, intelligent platform, defence manufacturers can de-risk supply and demand, optimise operations, enhance decision-making, and ensure regulatory compliance. Ultimately, a robust digital foundation is essential for achieving high-performance manufacturing, mitigating risks, and sustaining long-term growth in this dynamic and, once again, growing market ●