Accelerating support advantage: The time is now for Digital Prescriptive Maintenance

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Introduction

Strategy and tactics may provide goals and maneuvers for any military force – but support delivers the means. And while the needs of the warfighter have changed in recent years, the fundamental priorities of logistics, engineering, and equipment support have not – from providing transparency and resilience to improving efficiency and effectiveness within the support enterprise to sustain military effect.

Detailed insights into equipment and supply availability ¬– made available through data exploitation – are central to successful operational planning. Today, digital capabilities like robotic automation, artificial intelligence (AI), and connected products combine to create a new opportunity to drive even greater impact – especially when it applies to logistic and equipment support policies, processes, and information systems.

The readiness challenge: How to transform equipment support

Gaining support advantage is a fundamental priority of the Ministry of Defence (MOD) and the defence suppliers who sustain the complex defence capability. It is critical to supporting readiness targets and controlling sustainment costs. Years of budget uncertainty combined with decades of increased operational tempo have led to investment initiatives being undermatched with support modernisation needs – leaving MOD support customers without the digital automation necessary to achieve the operational outcomes they desire.

It's no longer enough to use descriptive analytics to explain the past or predict machine and process failures. **Equipment support needs to be more prescriptive and more adaptable.** Support personnel need a way to access and interpret supplier information before a disruption ripples through the supply chain – so they can understand how disruption impacts readiness and military effects. They also need a way to analyse supply and operational alternatives to support mission success. This requires a level of integration best achieved with intelligent automation that combines the agility and power of low code and AI.

The intelligent solution: Digital prescriptive maintenance

Digital Prescriptive Maintenance (DPM) leverages technology to triage and troubleshoot problems, diagnose next steps, and take optimal corrective and preventive actions. The core components of DPM include:

- Total Productive Maintenance
- Prescriptive data analytics
- Automated maintenance case management

The fourth wave of supply chain management

Total Productive Maintenance

Total Productive Maintenance (TPM) refers to the practice of maintaining equipment and systems to avoid breakdowns, slowdowns, and defects. TPM has its roots in the Toyota Production System and has historically focused on improving overall equipment effectiveness. In the commercial world, a team environment would engage manufacturers and operators to work together to prevent equipment downtime – leading to improvements in product design, increased quality, and maximised equipment availability.

This has significant relevance for MOD because of its unique customer situation. Although MOD has a very structured requirements definition process, it is still significantly disconnected from its industry supplier partners due to formal procurement processes, data silos, and outdated systems. An intelligent automation platform can provide the ability to access both operational and inventory data in real time – providing a holistic view of the entire value chain. Armed with this insight, engineers can communicate fixes or view technical specs with the touch of a button. This input can then be shared immediately within the support enterprise to reduce repair time, and with suppliers to accelerate product improvements and recertifications.

Harnessing the power of data for enhanced decision-making and automated action

Prescriptive data analytics

Connected devices generate enormous amounts of information. Computers and sensors in equipment can continuously record and stream data about their status, behavior, and performance. IDC predicts that there will be 55.7 billion connected devices worldwide by 2025, 75% of which will be connected to an internet of things (IoT) platform. The data generated from connected IoT devices is predicted to be 73.1 zettabytes by 2025.[i] This creates exponentially more data than people or standalone applications. But data is nothing without analysis. The real value comes from analysing the data to be information-led and to make effective, actionable decisions.

However, with DPM data analysis goes beyond description to prescription. Because of this distinction, systems integration is critical; applications, databases, support systems, connected device platforms, and other tools must talk to each other through a digital backbone. This capability already allows best-in-class industry customers to perform advanced analytics and take the appropriate, orchestrated action based on a holistic view of the entire supply chain.

With this level of visibility, logistic functions can better forecast demand – all while connecting supply and driving agility into the supply chain. Suppliers can better consolidate shipments

in accordance with demand, reducing transportation cost and improving time-to-delivery. Additionally, engineering services can improve how they work with financial and operational planners – reducing the need for repairable item inventory or new buys. It's all for the purpose of reducing logistics response time and order fulfillment. Finally, accurate and real-time data that reflects the entire supply chain enables equipment engineering staff to improve accuracy of maintenance scheduling and increase the efficiency of field maintenance. All of these benefits have a direct influence on equipment readiness, availability levels, and the cost of support.

It all starts with case management

Automated maintenance case management

To effectively deliver the benefits of DPM, the underlying structure must be grounded in case management.

The word "case" refers to a piece of work being conducted to achieve an intended outcome. A maintenance case involves multiple roles that can be assigned to it. In some situations, equipment maintenance or repair may be done remotely using software. In most situations, however, a technician is engaged. Facilities, spares, and other supply items need to be allocated accordingly. In either instance, an effective case management system will arm maintainers with information about the problem and the right parts and tools to fix it.

Case management is essential for DPM. It gives end-to-end visibility into support processes, ensuring appropriate responses and resolutions. By focusing on individual cases, process performance data is captured and analysed, providing a plan of action and framework for continuous improvement. Tracking the resolution of cases throughout the supply chain system enhances insight and identifies additional opportunities to eliminate bottlenecks and streamline and simplify processes.

Most importantly, processes are no longer static or reactive. Case management allows optimised, dynamic processes to be built directly into automated systems to drive improvements. In short, suppliers can improve cycle times, quality, and productivity – all at the same time. Additionally, with improved asset visibility, equipment engineering activities can improve efficiency and response time effectiveness – ensuring the right part at the right time, while reducing equipment downtime and improving readiness.

The end-to-end DPM strategy

Capturing business rules

Business rules guide decisioning and policies across the support organisation so that defence forces are effectively served. By using low-code application development, anyone inside or outside of IT – including business and operations analysts – can be empowered to define and build these rules into the system. The processes and procedures that drive these objectives may be derived from many sources throughout the support organisation. Capturing them directly ensures they won't be forgotten. Ultimately, case management enables insight to become actionable.

Collaboration and continuous improvement

Effective DPM involves continuous collaboration – and case management fosters this. Planners, maintainers, and suppliers across the entire support value chain can use discussions and sync chats – all within the context of shared mission objectives. Maintenance continuously improves from innovative idea exchanges and queries, while knowledge about the product or service is aggregated for reference and analysis.

Simply connecting equipment and capturing massive amounts of data won't unlock new opportunities for MOD or defence suppliers though. **True value is only created by taking the right actions at the right time.**

Intelligent automation and low-code platforms make collaboration easier through a visual development interface. This allows MOD and its industry partners to more easily upskill latent digital talent, empower support personnel to rapidly create, and maintain applications in real time. This approach will generate a common library of components that enable reuse to accelerate future application deployment. Low-code based intelligent automation will enable support teams to rapidly respond to operational, policy, or mission changes through a simple, visual reconfiguration in real time – while automatically generating an audit trail to master and manage all changes for future reference.

[i]IDC, IoT Growth Demands Rethink of Long-Term Storage Strategies, says IDC, 27 July, 2020 - IoT https://www.idc.com/getdoc.jsp?containerId=prAP46737220

Conclusion

Now is the time to modernise the defence support enterprise across the whole military-industrial complex. Agile development methodologies combined with a low-code approach increase rapid delivery of new support information systems – especially compared to traditional waterfall-based software development.

Collaboration between support business users and IT experts, using visual development and real-time data, sets the stage for MOD and industry partners to achieve sustainable digital transformation across the support enterprise. Predict potential issues and fix them before they impact military effect. Respond instantly when things go wrong. Empower equipment support teams with the skills, tools, spares, and insights needed to fix things fast.

The new standard of Digital Prescriptive Maintenance, powered by an agile, low-code platform, will enable the support organisation to rapidly deploy tailored equipment support systems and deliver sustainable support advantage – integrated and secured across the military-industrial complex.

Learn more

Click **here** to learn more about how Pega is helping global defence agencies automate their supply chain management.

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