

A DATA-DRIVEN PATH TO BETTER NEW PRODUCT DEVELOPMENT WITH PDM



QUICK RELEASE



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INTRODUCTION

Imagine a world where complex engineering projects are routinely completed on time, on budget, and on target. Engineers employ data and insights to make progressive improvements to the way they work and are fully deployed and free to innovate.

Anyone who has been in business for a long time, however, knows we don't operate in a perfect world. Recent external forces – from geopolitical strife to supply chain disruption, a global pandemic, and rampant inflation – have conspired to spoil our best-laid plans. Further compounding these issues internally, companies operate in siloes and often unnecessarily separate people and tasks that should be completed in unison or through close cooperation.

80% OF COMPLEX ENGINEERING
PROJECTS ARE LATE OR OVER BUDGET



1.1_ THE PROOF IS IN THE ENGINEER'S PRODUCTIVITY

The combination of external and internal pressures has a dramatic impact on product development and the productivity statistics are stark. Engineers typically spend a third of their time on their core innovation work. What's more, ninety percent of projects run late or over budget and critical innovation is slowed. With failure comes constant firefighting, sapped productivity, immense frustration, and high stress levels.

If all this paints a bleak picture, organisations must adapt to survive against constant global economic and social pressures, financial

strain, talent scarcity, and the demands of global mandates, particularly those driving decarbonization.

Project management and delivery need to improve in an era where talent is scarce and priorities are multifaceted. To succeed, engineering data needs to be better sourced and deployed, processes need to be improved, and managers need to think big but be willing to start small.

1.2_ THE BENEFITS OF DATA-DRIVEN ENGINEERING

The difference between success and underperformance lies in the utilisation of data – which, unlike engineers is an abundant resource. However, is it managed and deployed as an accelerator of innovation and speed to market?

Engineers may be the heartbeat of a product-development organization but data is their lifeblood. What is the quality of that lifeblood? The access to that lifeblood? And the ability to fully utilize it? To generate a positive answer to these questions, a company's engineering function must become truly data-driven where:

- » **Engineers have the time they need to adequately focus on the job at hand.**
- » **Product realization avoids the impact of out-**

of-specification materials and quality failures.

- » **Timeline slippage and corresponding cost implications are avoided.**
- » **Products reach the market on time or ahead of time.**
- » **Commercialize innovation as quickly and successfully as possible.**

Often, managers try to accomplish these goals by employing big systematic overhauls or implementing new software systems. While this can help the company modernize or become more efficient, it may fall short when it comes to making real-time improvements that impact speed time-to-market or drive the ability to respond to changes or challenges that arise during the life of a development program.

2.0_

GETTING THE BASICS RIGHT

Where is the best place to start? Focus on the fundamentals.

The foundation of the data-driven engineering organization is data quality. Quality can apply to many aspects of the data and be introduced in many ways. Our experience has led us to create an approach to Product Data Management (PDM) that connects the silos and marries the efficiency and precision of a best-in-class process with timely, accurate and human centric information flows.

2.1_ WHAT IS PDM?

Product Data Management, or PDM, is how QR_ refers to the data management underpinning New Product Development (NPD) and Product Lifecycle Management (PLM) for clients that develop complex engineered products.

Product data describes the collective body of attributes and characteristics recorded for a given component, part, module or complete product as it iterates through the development and lifecycle journey. This can include physical properties such as weight, dimensions and materials, and less tangible attributes such as country of origin, manufacturer, production date, warranty period, and operating hours. Related to but distinct from that definition, it also provides the basis for tracking the status of the programme that is developing the product.

PDM comprises the processes, skills and enabling tools used to ensure product data is

complete, accurate, up-to-date and available to those who need it, when they need it, and how they need it. It provides real-time, part-by-part status visibility that can help to optimise the timeframe of a programme, allocate engineering resource and drive operational efficiency across both the new product development cycle and subsequent in-service product life cycle.

Product data can be used across the entire organisation, beyond engineering, and drive efficiencies across manufacturing, supply chain, commercial, and finance. PDM is best viewed as a dedicated whole lifecycle discipline rather than sub-function of engineering. At its core, a PDM system or approach makes data more accessible and human-centric, thus making its impact relevant and impactful across an organization.

WHY DO WE NEED PDM?

In product development circles, quality data is defined as accurate, timely, visible, usable and shareable. Gone are the days of relying on a spreadsheet or waiting for a bespoke software program to be developed. Today's data-driven engineering organization employs real-time and easy-to-use tools – including mobile devices – to capture, share and use the information needed.

Consider this: if the quality of the data is poor, then trust and visibility go out the window. If the information flow is slow, the data is of little use. These issues need to be addressed at the beginning of the process.

Implementing effective PDM to support new product development or other complex manufacturing projects allows a company to apply proven processes, proprietary software, and other digital tools, to handle product data from concept to delivery.

3.1_ THE WHOLE BUSINESS BENEFIT OF PDM

When everyone has access to the data they need, it not only improves the effectiveness of the engineering function but also the business operating model more broadly, including master data management; prototype launch and build operations; supplier collaboration; end-to-end supply chain management; and operational agility to respond to demand fluctuations.

Successful PDM enablement of projects can

reduce delivery risk and costs, as well as accelerate time to market. It can turn distributed teams into highly functional collaborative units benefiting from up-to-date data that provides a single version of the truth.



3.2_ THE DEMOCRATIZATION OF DATA

Ensuring the quality of the data is not something just anyone in the organization should be tasked with. Information Technology (aka IT) is not a simple administrative role – it takes dedicated focused professionals to keep on top of this.

When you enable organizations to truly mine their data, all functions – up and down stream of engineering – will flourish. To enable this, people

with deep domain knowledge need to work with the data and be joined at the hip with those who can put it to work.

Finally, the data needs to be democratized. The right data presented in the right way to each individual group of people at the right time and that will drive real-time informed decisions.

3.3_ PROGRAM EXECUTION AND PROCESS CAN'T BE SILOED

Too often, the development of a bigger, better process is divorced from everyday program execution. These two priorities must be tackled together. In other words, organizations need to be able to walk and chew gum at the same time if engineering time is to be better deployed and programs are to meet their deadlines.

This way, whatever issue a program team identifies one day should lead to a small improvement from the process team the

following day. Often, a series of gradual, incremental improvements deliver real transformational gains.

Such lessons should be shared broadly and immediately. Cross functional, interdepartmental information sharing is therefore essential. Also, change happens best when it is implemented in manageable steps. Far-reaching changes often become hard to achieve and their effectiveness diluted and delayed.



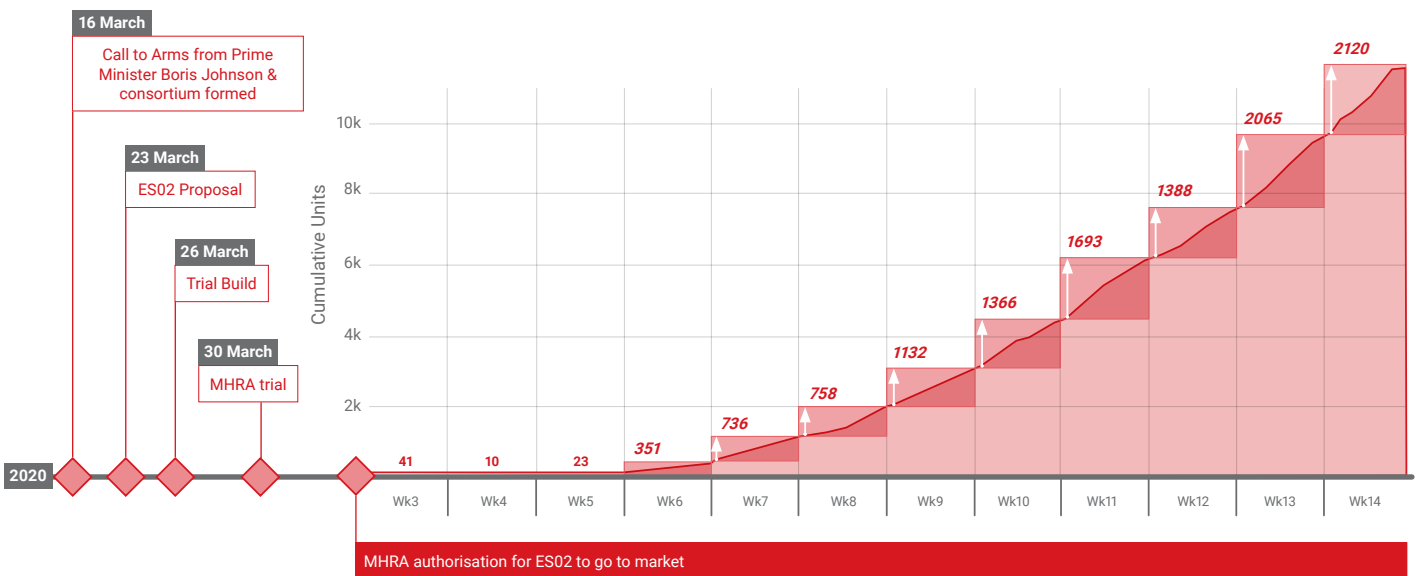
3.4_ CASE STUDY: BOOSTING PRODUCTION CAPACITY TO SAVE LIVES DURING COVID-19

The Ventilator Challenge UK consortium represents a good example of process and program improvement working in tandem. Few periods in recent history rival the urgency and uncertainty that arose during the Covid-19 pandemic in 2020. There was no playbook for how to deal with unprecedented events unfolding in real-time and this raised the stakes when it came to taking effective and decisive action.

The consortium was essentially a taskforce that was formed to address a “ventilator gap” between the 5,900 ICU units in service and the projected 20,000-units required. This taskforce needed to work together to re-engineer and recertify an existing design without the benefit of a local manufacturing base or centralized way of working.



Working in siloes would kill the team’s ability to ramp production 200-fold within 100 days; working with yesterday’s information or ignoring lessons learned would unnecessarily complicate the process and, in the end, potentially prevent the task force from helping to save lives.



Above: the first unit of the ESO2 ventilator was produced four weeks after HM Government set the challenge. Twelve weeks later over 11,000 had been produced, with half of those units being produced in just three weeks. This was only possible with a data-driven approach.



3.5_ SUCCEEDING WHERE DATA MEETS ENGINEERING

The Ventilator consortium was a success because the program was focused on minute-to-minute precision in execution, while the process was tweaked as new lessons were learned. It would have been a mistake to task the process improvement people with fixing the program. Why? Because process engineers are primarily focused on gateways and long-term tasks that can be repeated.

Those working on the program, meanwhile, don't have time to get the process and system folks up to speed.

Organizations that can get their products to market faster, better prepared, and more efficiently will be the clear winners. This requires agile and robust PLM and NPD processes underpinned by best practice PDM. QR_ is uniquely focused on this, connecting the silos to create timely, accurate, and human centric information flows that are an essential foundation for market leadership and growth.

WHERE DATA AND ENGINEERING MEET

Product Data Management (PDM) is where engineering meets data. Effective PDM is critical to the success of any advanced engineering program, and Quick Release_ is focused on enabling data-driven engineering to transform advanced engineering delivery capability from start-ups looking to scale to established manufacturing and technology OEMs looking to transform. If you are looking to build product data capability, we are ready to be your expert Product Data Management partner, bringing order to your data and processes and bringing your products to market faster, at less cost, and with reduced risk of delays. Our hands-on approach is far more effective and impactful than that of any generalist consulting firm.

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