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PLM ESSENTIALS

9. PROCESS DEVELOPMENT MODEL

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9 PROCESS DEVELOPMENT MODEL

At the heart of all complex engineering and associated manufacturing processes is Product Data Management (PDM) - the business function that organises, maintains and reports all product data.

PLM captures and tracks information on the individual parts, components and modules that constitute a finished product throughout its lifecycle, including changes made during development.

This includes part numbers, supplier details, CAD drawings and more, with everything stored in databases easily accessible to the likes of project managers, engineers, salespeople, purchasing and QA teams.

Efficient management of product data enables faster product development, getting them to market more quickly while also driving down costs.

PROCESS DEVELOPMENT MODEL

EVERY PROCESS, SIMPLY SPELLED OUT

It's one thing keeping tabs on the physical elements of the manufacturing process, such as part numbers, names and designs. But managing the processes that connect all these tangible things needs to be just as simple.

A process development model helps eliminate errors within the processes themselves, allows for constant improvements to be made, and keeps every process transparent for every department involved.

To show you how this works, we've put together this case study of a process development model we recommended for a small but notable electric vehicle manufacturer.

WHAT IS A PROCESS DEVELOPMENT MODEL?

A process development model is a simplified outline of the processes involved during the development of a product.

This document captures a model to be used by the manufacturer to develop and improve processes defined, including, but not limited to:

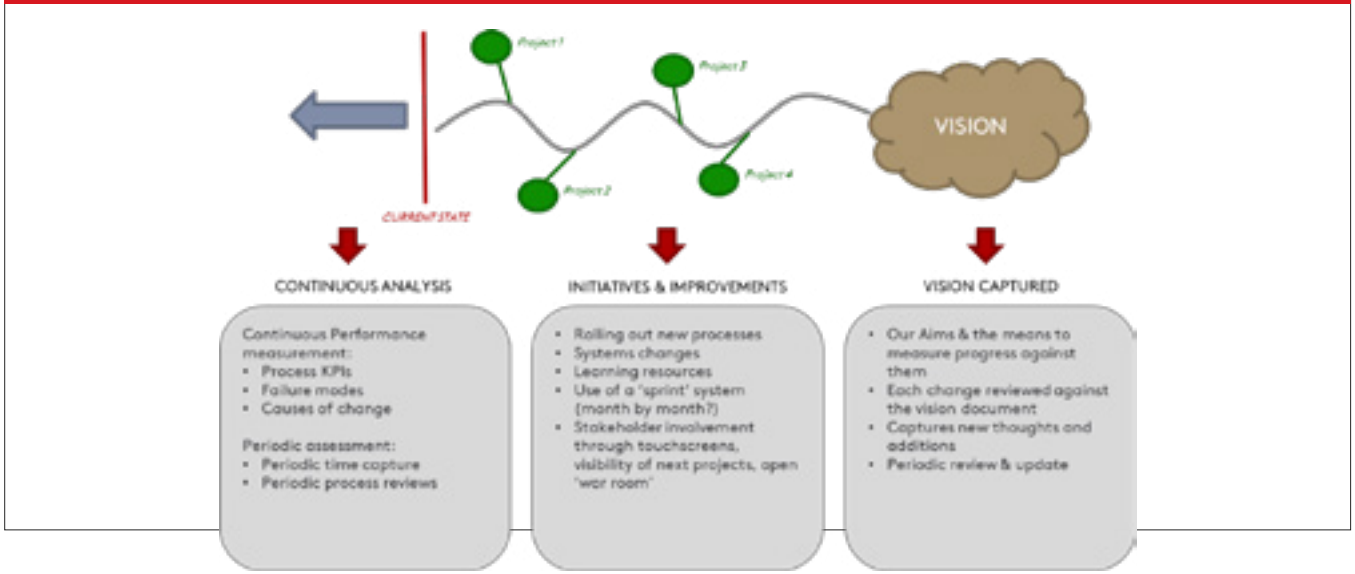
- **Part Numbering**
- **Part Naming**
- **Attributes of Parts and BOM**
- **BOM Setup**
- **Engineering Structure**
- **Engineering Drawings**
- **Engineering Change Management**
- **Configuration Management**

SEVEN PRINCIPLES OF PROCESS DEVELOPMENT

Seven key principles guide the model, these are:

- **Fast, lean processes with minimal risk of bottlenecks, obstruction or error**
  Minimal signatures, bounded time constraints, early and continuous visibility
- **Quick responses to all types of change (assembly, service and design led)**
  Easy and early capture of issues and concerns
- **Strong visibility and management of cost, weight, service and assembly implications**
  Clear reporting of these parameters for any project and review / management processes
- **Low admin burden**
  Automation of data movements and pre-population of information
- **100% data accuracy**
  Visibility, management and correction of data misalignments
- **Measurable process performance**
  Process KPIs, metrics and visibility to drive Continuous Integration (CI)
- **Driven continuous improvement**
  Well-defined, regular process reviews to address new needs and opportunities

THREE STAGES



DEVELOPMENT MODEL

REQUIREMENT CAPTURE

Methods, models and processes for ongoing continuous improvement vary in their structure and application and are usually tailored for the environment as well as the problem on which they are focused.

There are core themes running throughout all process improvement activities that, if considered, will form a strong basis for continuous improvement activities at the manufacturer:

- **Existing process metrics should drive process improvement and form the basis for change**
- **Regular open sessions encourage stakeholder engagement so that many ideas to improve and refine processes are captured**
- **Previous process change decisions and the resulting impacts are a valuable tool in considering the net benefit of potential change**

Above all, process revisions should be justified by weighing up the potential benefits against the likely risks.

PROCESS OWNERSHIP

Processes without clearly defined ownership quickly become sluggish and eventually get ignored as other inputs and outputs need change:

- **Current process owners should be identified and bought into any recommended change. If there's no owner or it is a newly defined process, ownership should be clearly defined and agreed**
- **Ownership of process deployment (particularly for bigger changes) should be agreed and clearly communicated early on**

RESOURCES FOR PROCESSES

A process must be supported with the correct resources to carry it out, and a new process is no different. Systems, tools, people and access should all be considered before implementing a change:

- **The budget available for a change should be understood and ideally based upon the predicted cost benefit to the business of the process change**
- **Existing system functionality should be considered to reduce admin workload and avoid unnecessary development costs**
- **A team appropriate to the size of the change will be needed to generate training material and documentation, deliver training and embed the process**

REPORTING, METRICS AND KPIS

To make sure processes are followed correctly and perform well, it's important to gather the right data and make it available to the right people at the right time. But metrics can be a double-edged sword and drive unintended behaviours.

Before the process begins, define the metric that will be captured to measure its performance, and determine how these relate to metrics already in place:

- **Make sure any defined KPIs are unlikely to become 'perverse' metrics that could drive counterproductive activities**
- **Think about how metrics will be captured, and who'll capture them**
- **Any chosen KPIs should be actionable – a KPI that can't drive a clear response shouldn't be a KPI**
- **Agree on reporting timings and ownership**

IMPLEMENTATION AND TRAINING

Implementing a new process at an inappropriate time, incompletely or without training will undermine confidence in the process and lead to confusion. And it may have a bigger negative impact than the original issue it was designed to combat:

- **Consider timing relative to project needs, and set and communicate a clear implementation date – a new process will not get up to speed overnight**
- **Extra support may be needed immediately after the process is implemented, until everyone's familiar with the change**
- **Consider how to make sure everyone follows the process correctly – you might need a new system or extra personnel. When people are under pressure, there can be a temptation to revert back to old ways of doing things**
- **Clear communication of the process change will be needed. This could be via email, classroom sessions or meetings.**

MANAGEMENT SIGNOFF

As a final step before a change is kicked off, senior management (and ideally in the future a Quality Manager) should review and approve the proposal to release the required budget and resources, and make sure it's compatible with the other processes, adheres to core principles and fits with the manufacturer's overall culture, vision and strategy.

IMPLEMENTING CHANGE FOR REAL

The most common mistake is a lack of focus and time dedicated to improvement in the face of high workloads and tight deadlines. Here are some practical ideas to make this process easier to implement:

- **Use a monthly 'sprint' approach to:**
  - Review current process performances
  - Review achievements vs plan
  - Roll out new elements – this is very visible and engages the whole team
  - Agree list for next monthly 'sprint' – again, involve your team
  - Provide a board level update – this helps maintain a senior focus
- **Have a fixed space/whiteboard/screen which is focused on process development as well as the virtual space, sharing what is happening very clearly**
- **Make it effortless to feedback any problems or ideas during any normal day – e.g. a button on each screen or within a learning portal**
- **Make sure there's senior support, so everyone sees it as important, which maintains the link between process and strategy**

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ABOUT QUICK RELEASE_

Quick Release_ is the leading Product Lifecycle Management consultancy. QR_ has 350+ professionals across three continents working alongside some of the largest, most innovative and prestigious vehicle manufacturers, aerospace technologists and Tier 1 suppliers.

Our mission is to enhance competitive advantage by bringing products to market faster and more efficiently. We do this by improving product data quality and flow through every part of a business from concept to manufacture, working with senior management teams to tackle the biggest blockers of productivity; we release engineers to focus on the product, not the data.

Leveraging bespoke tools, methodologies and benchmarking, our professionals offer the full spectrum of PLM services designed to guide start-ups through the unknown unknowns, take businesses looking to scale to the next level, and facilitate transformation in established manufacturing and technology OEMs. Read more: Why does PDM matter?

UP TO SPEED ON THIS MODEL?

If you'd like to know more about process development models, or any other aspect of PLM, we'd love to hear from you.

QR_ have advised on and implemented process development models for EV start-ups, specialist, volume, and commercial vehicle manufacturers.

Our SMEs would love to hear your process headaches and explore quick, unobtrusive solutions that deliver lasting, whole-business value.

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