



A&M INSIGHTS

# HOW TO IMPLEMENT AN AGILE, NEXT GENERATION ENGINEERING ORGANISATION

A&M'S PROVEN APPROACH TOWARDS ENGINEERING EXCELLENCE

JUNE 2019

In an environment of increasing technological advancements and automation, speed of response and functionality of the product/solution are increasingly important. When it comes to lead times for solutions and business margins, engineering is the differentiator at the research stage as well as for design and development of new products and solutions.

Across different industries, A&M repeatedly sees four areas where engineering organisations are failing to achieve their potential. By working on the recurring levers within these 4 key areas, we have been able to achieve some significant improvements. These are: cross-functional set-up and working, efficient and effective ways of working, optimal output quality and work satisfaction.

In this document we outline the issues that engineering organisations face in these four areas and provide practical steps to overcome these issues.



Improvements that the A&M team has been able to make for engineering organisation clients.



Efficiency increases  
of up to  
**23%**



Increased supplier  
on-time-in-full delivery to  
**96%**



Increased project  
on-time-delivery to  
**95%**



Improved bid  
success rates to  
**65%**



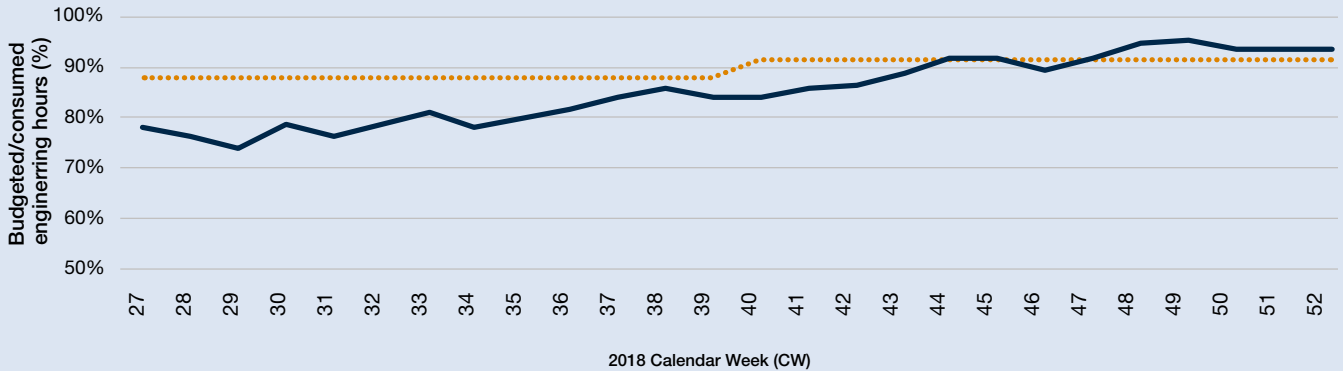
Reduced rework across  
the value chain by  
**15%**



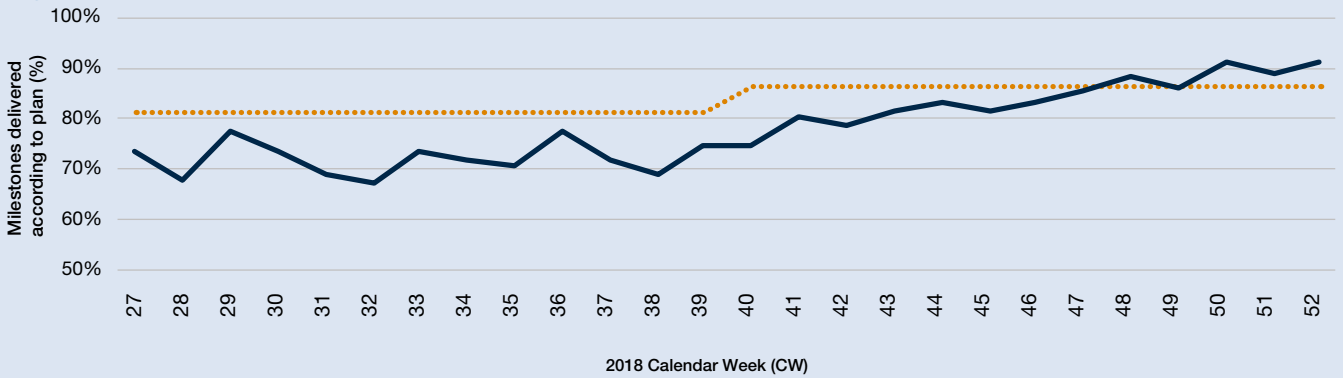
Rise in project  
margins by up to  
**35%**

# Examples of engineering performance improvements that A&M has achieved for clients.

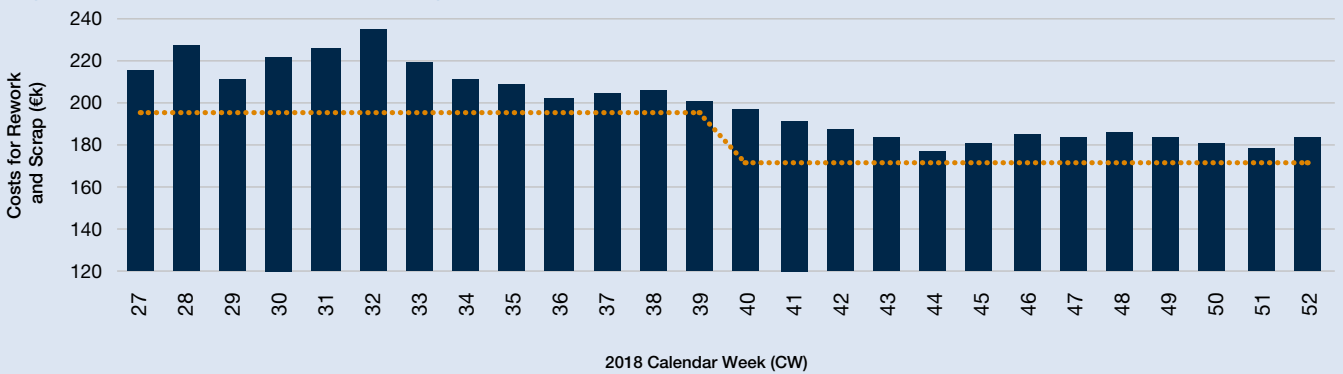
**Fig 1: Engineering Efficiency – Change in budgeted/consumed engineering hours**



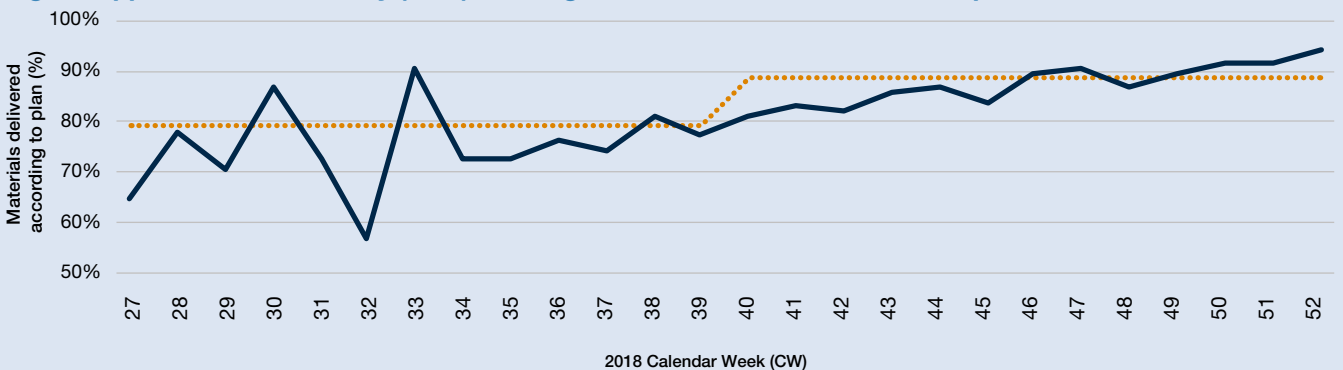
**Fig 2: Project on-time delivery (OTD) – % milestones delivered per time period**



**Fig 3: Cost of quality (CoQ) - Change in costs for rework and scrap (€k)**



**Fig 4: Supplier on-time delivery (OTD) – Change in % of materials delivered to plan**



..... Target — Actual

## There are four areas where A&M believes engineering organisations are failing to achieve their potential



### Cross-functional set-up and working

No single function within an engineering organisation understands the big picture or can deliver complex, customised solutions in isolation. Therefore, cross-functional working needs to be the paradigm for engineering businesses as only they can evaluate optimal specifications, risks and profitability appropriately.



### Efficient and effective ways of working

To stay competitive, engineering organisations need to examine ways of working and make improvements. By cutting non-value adding activities, leveraging standards and outsourcing non-core work, market trends can be cost-efficiently dealt with.



### Optimal output quality

Understanding the root causes of errors is a mandatory pre-requisite of all engineering work. In addition, there needs to be rigid discipline in know-how and best practice sharing, as well as systemic problem solving. These are all crucial elements to achieve full potential.



### Work satisfaction

A business needs to focus on up- and cross-skilling, encouraging team building as well as offering alternative career paths to avoid talent exiting the industry altogether. Work satisfaction is central to attract and keep talent in engineering.

## Ten recurring levers for accomplishing engineering excellence

### A Cross-functional set-up and working

#### 1. Break functional silo set-up and mentality across the value chain

With increasing project and product complexity, business functions cannot successfully work in isolation. A functional set-up can offer benefits, for example in the case of standardised work. However, projects are often too complex to simply tick off tasks and dump outcomes over the fence (e.g. design and technical drawings). Engineering assumptions must be shared early so that procurement and manufacturing can have the required suppliers, materials and skills available in time, and for handovers to run smoothly. At A&M we generally advise that cross-functional teams are the default set-up.

In project tendering, a pool of experts can be used, and success achieved through all-in-one room set-ups (compare agile software development). Only by physically breaking functional siloes can holistic problem solving and best practice sharing be fostered and become standard practice.

#### 2. Get upstream customer interaction and scope “right first time”

In tendering, sales teams will own the customer relationship, but for success, they must involve execution experts prior to signing contracts, to ensure profitability. For example, feedback from engineering teams is critical for confidence on costs, technical risks, staffing and timelines. Engineering input will also ensure that the scope and requirements’ needs are fully understood.

Sales must be the only customer interface at this stage. They drive the process and achieve stakeholders’ buy-in, while engineering supports the alignment on scope, acceptance criteria (e.g. functionality, quality etc) and customer commitment to requirements.

#### 3. Drive successful downstream project execution cross-functionally

In project execution, from kick-off to installation and commissioning, the project leader owns and manages the customer. The leader needs to align closely with all stakeholders for transparency on status, issues and next steps. This means clear roles, responsibilities and escalation paths need to be in place (e.g. RACI).

All functions provide information on planning (milestones, resources, etc.) and track performance against KPIs, while

the project leader handles budget, cash flow and customer change requests. Excellent engineering teams make sure that they interact with all parties regularly and push critical information to the other teams' proactively.

## **B** Efficient and effective ways of working

### **4. Cut non-value adding activities and focus on output**

The focus on productive output is key for improving effectiveness. Each activity needs to deliver a result that the customer pays for. Non-value adding activities can be identified through value stream mapping and eliminated with continuous improvement methods. Engineering must assess historic, one-size-fits-all processes regularly and simplify according to project type and complexity (new/update/upgrade). Concentration on one deliverable at a time avoids productivity erosion.

For non-core activities, such as administrative tasks, regular reporting and reviews and discipline in cutting waste typically yields quick results.

Increasing planning granularity across functions, linked with continuously updated skills matrices, enables optimal use of resources and skill gaps in real-time.

### **5. Standardise modules, templates, etc. to reduce cost, risk and lead time**

Engineers often stress the uniqueness of design and prefer greenfield development over modifying existing modules or/drawings, etc. but our experience shows that reaping standardisation benefits is always possible. The business can avoid costly over-engineering while speeding up results delivery and increasing solution quality.

Excellent engineering teams extensively reuse modules, etc. as the default option for new projects. These are challenged and modified on an ongoing basis.

### **6. Outsource or exit non-core commodity engineering activities**

Outsourcing repetitive, commodity tasks lowers the pressure on pricing and scarce engineering resources. Defined criteria must distinguish non-core activities and provide guidance on the preferable outsourcing approach (e.g. internal/external, low/high cost country).

Internal design centres in low cost countries can work well for standardised, high volume tasks. However, in more complex cases, the receiving partners' expertise, culture, language and accessibility need strong consideration and close monitoring.

## **C** Optimal output quality

### **7. Improve bids through early cross-functional collaboration**

All value chain contributors need to be involved early, even external suppliers. Clear approval processes and stage-gates should highlight risks and safeguard margins and timings.

In addition, state-of-the-art calculation and quotation tools, that incorporate best practices from execution, will help drive competitive pricing. Engineers can reap technical benefits (e.g. re-design) while collaborating closely with procurement for material cost reductions.

### **8. Address quality issues consistently and identify root causes**

In our experience, engineering issues that occur include lack of quality documentation/ information avoidance of proper simulations and testing and supplier quality checks (e.g. due to maverick buying). Root cause analysis is the key to eliminating these systemic quality problems.

## **D** Work satisfaction

### **9. Increase attractiveness of work through up- & cross-skilling**

Up- and cross-skilling are crucial for work satisfaction and motivation of engineering teams. Examples of new skills include adding project management, team leadership (incl. subcontractors) and customer-facing elements vs. back-office. An alternative approach is for engineers to work across industries, segments and technical topics.

### **10. Leverage team building and reciprocal task comprehension**

Our experience suggests teams work best if they get to know each other at project inception (e.g. start-up workshops) to understand culture differences and ways of working. This is especially important where teams are working across different geographies and time zones as virtual teams.

## A&M's experience on the ground

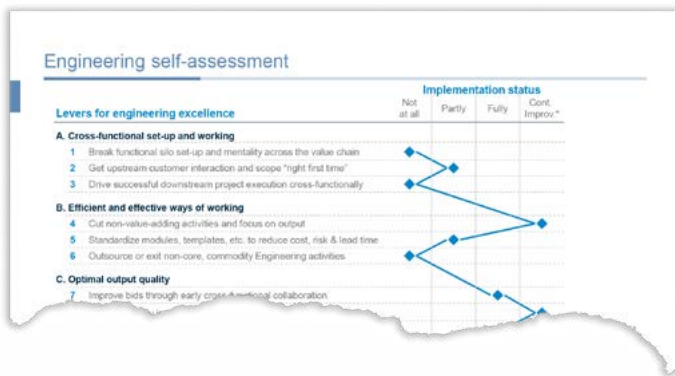
Engineering has a strong influence on the final quality of products and solutions for customers and A&M has worked with a wide range of clients on such issues and ranging from complex multi-nationals to smaller single site organisations. We have used a variety of methods to deliver efficiency and effectiveness increases but the key driving force is always to enable simplification and focus.

## How A&M can help

### 1. Rapid excellence diagnostic

Through using A&M's rapid self-assessment of the 10 engineering levers of excellence, an organisation can identify focus areas for improvement. By sharing this evaluation, A&M can then support companies by defining the roadmap towards engineering excellence.

An example of this is given below:



We suggest a one-day workshop with A&M experts to discuss your self-assessment. We would build a common understanding of your organisation's specifics and identify initial improvements. In addition, our team will share their views on setting up a transformation programme that is lean, measurable and delivers results at pace.

### 2. Engineering transformation: why A&M?

A&M can support the transformation from status quo to an excellent engineering organisation. We drive sustainable change in a hands-on manner, moving to a culture of optimal quality, collaboration and increased awareness of each person's impact on the bottom line.

Apart from a proven toolbox – which includes value stream mapping, KPI systems, visual management, root cause analysis and continuous improvement – we bring a broad range of engineering expertise as well as transformation and change management.

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## ABOUT ALVAREZ & MARSAL

Companies, investors and government entities around the world turn to Alvarez & Marsal (A&M) when conventional approaches are not enough to make change and achieve results. Privately held since its founding in 1983, A&M is a leading global professional services firm that provides advisory, business performance improvement and turnaround management services.

With over 3,500 people across four continents, we deliver tangible results for corporates, boards, private equity firms, law firms and government agencies facing complex challenges. Our senior leaders, and their teams, help organisations transform operations, catapult growth and accelerate results through decisive action. Comprised of experienced operators, world-class consultants, former regulators and industry authorities, A&M leverages its restructuring heritage to turn change into a strategic business asset, manage risk and unlock value at every stage of growth.

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