

# HOW TO INCREASE AGILITY IN ENGINEERING PROJECTS

A playbook for transforming engineering  
projects to become more agile

## The dilemma of engineering projects


Today, many engineering projects are struggling with delays, budget overruns, dissatisfied customers and demotivated engineers. The root causes of these issues range from complex time plans, unclear deliverables and inefficient project meetings to low team allocation, silo thinking and a lack of customer feedback.

Most engineering projects that face these challenges are shaped by project management traditions characterised by detailed planning and team segregation based on areas of expertise. This tradition focuses primarily on delivering the technical sub-elements of the solution (the “what”) and leaves little room for considering whether the solution creates value (the “why”) and if

the processes for how it is delivered are engaging and efficient (the “how”).

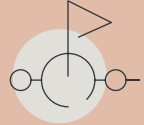
We need to run engineering projects that focus on team collaboration and engagement. We need to test assumptions by sharing progress and incorporating feedback from customers and other stakeholders. We need to **increase agility in engineering projects.**

### Increasing agility in engineering projects can help you ...




Improve project efficiency by up to

**50%\***



Cut project delays by up to

**12 months\***



Achieve up to

**4x\***

higher team engagement

#### Four key challenges in engineering projects:

- Ensuring on time delivery to customers
- Making project execution efficient
- Increasing employee engagement and motivation
- Improving cash flow and keeping payment milestones

\*Results based on Implement’s learnings from engineering projects conducted over the last 10 years.

## Engineering projects – the agile way

Agility is the ability to adapt to change, quickly respond to unpredictability and thrive in the face of uncertainty, all while being productive and cost-effective without compromising on quality. A project based on agile principles will be responsive to change, progress through collaboration and continue delivering value despite shifting customer demands.

Agility can create high impact in engineering projects, although it can be difficult to find the right ways of implementing and working with agile initiatives. We believe the best way to start an agile transformation journey is to start small. That's why we have created ten hacks and bite-sized insights to help you get started with increasing agility in your engineering projects.

## 10 hacks to increase agility in engineering projects

- #1 Organise projects in small teams around value streams
- #2 Co-locate team members (physically or virtually)
- #3 Set a collaboration rhythm
- #4 Demonstrate progress
- #5 Make the change order process value-driven
- #6 Pulse checks
- #7 Apply tailored project management frameworks
- #8 Create and push transparent deliverables
- #9 Promote behaviours that drive customer value
- #10 "Short and fat" resource allocation

## What are engineering projects?

In this playbook, we define engineering projects as work within the broad umbrella of engineering, such as structural engineering, mechanical engineering or industrial engineering. In other words, engineering projects that deliver a physical end product. The scope of this playbook does not cover software engineering projects.



# #1

## Organise projects in small teams around value streams

Engineering projects are often organised around functional expertise with support functions constituting a key part of the top project team. This means that discussions often centre around support issues such as legal matters or quality limitations instead of acting as arenas for engineers to unleash their creativity. Engineering projects are also prone to gathering large numbers of specialised people in one project team. However, a project group of +20 people means that project communication becomes inefficient and meetings turn into mini conferences that often end with no concrete outputs, actions or decisions.

### Customer value as the key organising principle

Organising projects in value streams defined by customer value means team members have end-to-end responsibility and a clear and direct line of sight to customer value. It creates a direct link from daily engineering tasks to customer value, creating ownership over the solution. This type of “skin in the game” will provide more engagement and responsibility for making the right decisions fast. Speed and accuracy increases dramatically when decisions are made where the knowledge and responsibility lies.

Support functions could also be organised differently and gathered in one project support workstream where the head of the project support function is represented in the top project team.

### Small teams of max. nine people

Building small teams increases trust, improves communication and boosts motivation. Starting from the top team, allocate max. nine people to each team, ensuring that the most critical knowledge is available in the team. Break into several small teams if the project is large.

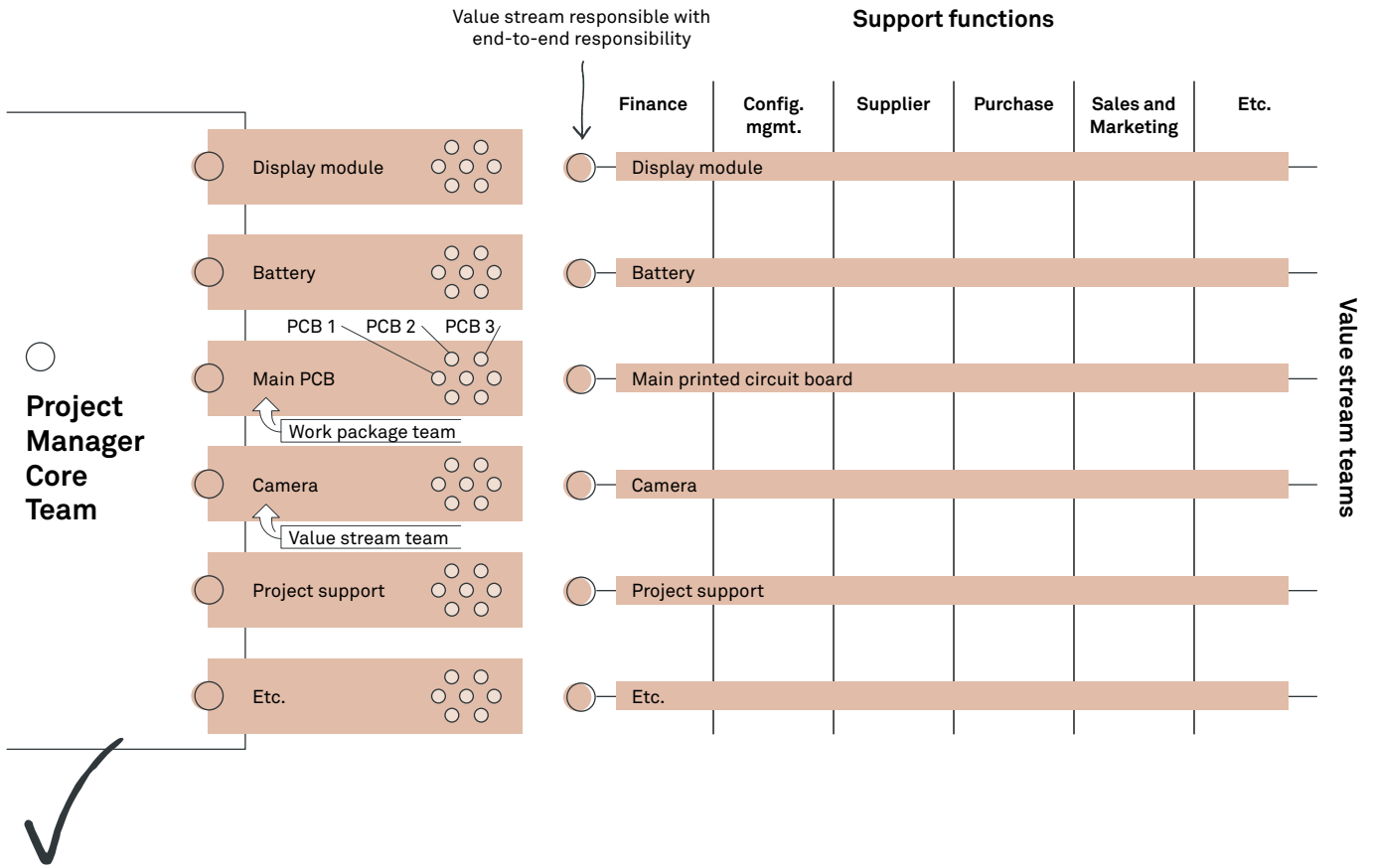
### Team checklist

- A project manager/team captain that represents the value stream in the top project team
- End-to-end value responsibility for delivering the working solution and manufacturing capability
- A cross-functional setup that spans beyond engineering and organisational units
- Team members with their primary loyalty towards the project (i.e. paying customer)
- Ring fence team members to ensure high allocation to the project



Example

Example of a project organised in value streams



## #2 Co-locate team members (physically or virtually)

It's the norm in many engineering projects that engineers stay in their own function, which enables knowledge-sharing between projects but hinders communication within projects. Engineers and project managers tend to also be spread out across too many projects, leaving no time for collaboration or socialising. Collaboration often relies on delegation via spreadsheets, which can cause tension and problems with project progression and communication. And while modern communication technologies help bring project members and key competences into play across time and space, it can lead to some engineering experts spending the majority of their time working alone in spreadsheets or PowerPoints without ever being properly present for a project.

### Strive for co-location (physical or virtual)

Meeting your team at least once at the initiation of a project is important, because bringing people together enhances trust, engagement and motivation and can help get projects off to a good start.

By creating a physical and virtual project space where engineers are co-located, project progress will increase dramatically as collaboration becomes easier and communication becomes less complex. Ideas and issues can be shared and discussed within seconds, and decisions can be made much faster. Allocating a fixed project room or a virtual office setup means your team will spend time together and will be able to socialise, which will help them become high performers.

### Use visuals

Visuals ease communication and help us understand complex matters faster. For example, building a visual plan or demoing a prototype makes the project tangible.

Make sure that your physical project room is designed for visualisations. Decorate the space to inspire a team environment and create a sense of belonging, for example by hanging up engaging project posts or examples of engineers' work.

In your virtual office, make sure to use video when you are in contact with the team, as discussions are more engaging when we can see each other in action. There's a range of different communication technologies that can help you set up a remote office for all your team.



# #3

## Set a collaboration rhythm

Meetings can sometimes feel time-consuming and inefficient in engineering projects. Therefore, they are only planned on an ad hoc basis to firefight immediate problems or make urgent decisions. Meetings are often not properly prepared for by organisers or attendees, and they lack focus, a feeling of urgency and good facilitation. So instead of promoting collaboration and knowledge-sharing, meetings turn into briefing sessions and debate clubs that slow down progress and can cause delays.

### **Set a rhythm with project sprints**

Project meetings should be thought of as encounters that ensure attention, information-sharing and collaboration – a way to drive progress and make the right decisions as a team. Setting up a fixed rhythm for this collaboration ensures the right encounters at the right time. A solid project rhythm drives faster development and creates high energy.

Using sprints ensures a sustainable project pace instead of one long stretch. Sprints are key to increasing agility as they enable us to organise projects in increments, which allows for ongoing adjustments to the plan and collaboration based on feedback and learnings.

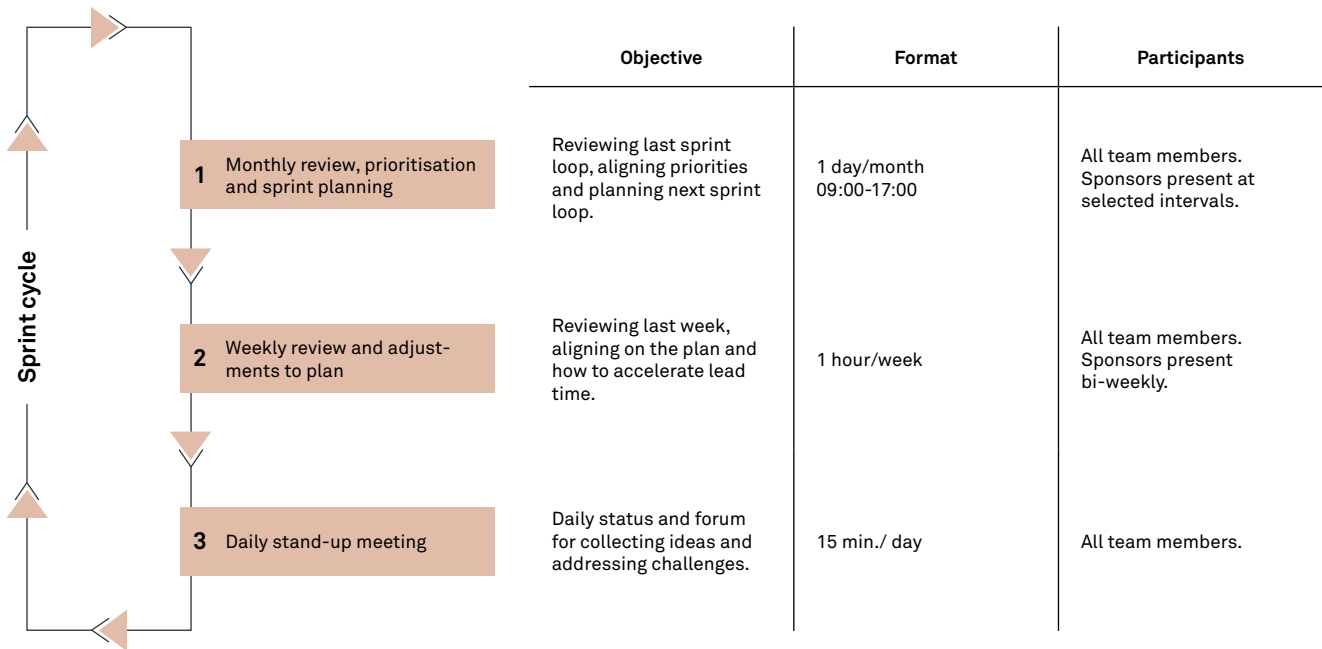
### **Facilitate engaging and productive meetings**

Preparing timely, fixed agendas and ensuring active facilitation of meetings increases our efficiency and engagement. Sticking to set meeting formats with clear objectives helps everyone understand the purpose and process of the meeting. Being aware of the energy and cultivating a positive ambiance makes meetings engaging for everyone involved.

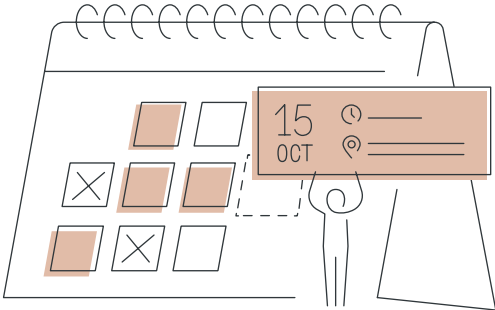
Tailor meetings to the needs of the project. Every project is unique, and this should be accommodated for when designing project touchpoints. For some projects, a bi-weekly touchpoint is sufficient, while others may need weekly or even daily meetings. Project managers should ask questions like: “What does my project specifically need to focus on?” and “What type of meetings would accommodate that?” to ensure that they define a rhythm for key events and prepare for and facilitate meetings that suit the characteristics of the project and its team members.

*Example*

**Example of a fixed collaboration rhythm in an engineering project**



Agendas	1 Monthly	2 Weekly	3 Daily
	<ul style="list-style-type: none"> <li>Demo and impact tracking</li> <li>Retrospective on sprint process</li> <li>Prioritisation for next sprint loop</li> <li>Detailed sprint planning</li> </ul>	<ul style="list-style-type: none"> <li>Track-by-track follow-up on visual plan</li> <li>Capturing ideas on how to accelerate lead time and deciding on actions</li> <li>High-five and back to work</li> </ul>	<ul style="list-style-type: none"> <li>Status from each team member on past day, next day, insights gained and challenges to be overcome</li> <li>Discussion on joint actions</li> <li>High-five and back to work</li> </ul>





# #4 Demonstrate progress

In many engineering projects, the customer can end up waiting months before seeing the final solution – or just pieces of the solution. Even internal project team members may not see their colleagues' work for long periods of time. The problem with this way of working is that the solution often needs to be slightly, or completely different to what the customer originally thought or what was communicated to the engineers. In addition, one engineer's solutions often depend on another engineer's solutions, e.g. pipes need to fit into a specific hole in a tank and therefore all of the sizes must be aligned.

## Don't tell it, show it!

Schedule demonstration sessions with a fixed rhythm, e.g. monthly. Demonstrate the product, solution, process or entire supply chain to selected people, e.g. the top project team, business owner, customer, key engineer for the demonstrated solution or other relevant stakeholders. The best demonstrations use a prototype. Show off your solution by using drawings, pictures, simulations or 3D printing, if the end product is too complex to demonstrate parts of (for example, if your end product is a train). A lot of prototyping can also be done virtually.

Demo sessions can also be used to identify critical interfaces in a simple matrix. This can be done by having a matrix poster available in the (physical or virtual) demo room and asking participants for their view on potential interfaces after each demo.

## Motivate your engineers and customers

Demo sessions infuse a lot of motivation and engagement into projects, as engineers get the chance to show off their work and customers get to see and feel the project progress. It enables everyone to gain a clear and aligned view on the solution while also igniting conversations and providing space for key questions and knowledge-sharing early in the project when there is still time to react.

Example of matrix to identify critical interfaces at demo session

Work packages/ value streams	Driver's cap	Car body	Toilets
Driver's cap			
Car body	Check mechanical link		
Toilets		Check water tank placement	

# #5 Make the change order process value-driven

Change orders can be seen in a negative light. From a customer perspective, it looks like engineers are going over budget or being inefficient; from an engineer perspective, it's regarded as an extra administrative task that needs to be squeezed into an already busy work schedule. In general, the change order process is considered to be almost non-existing in engineering projects and something that is demotivating, unstructured and not fit for purpose for engineers, management or customers.

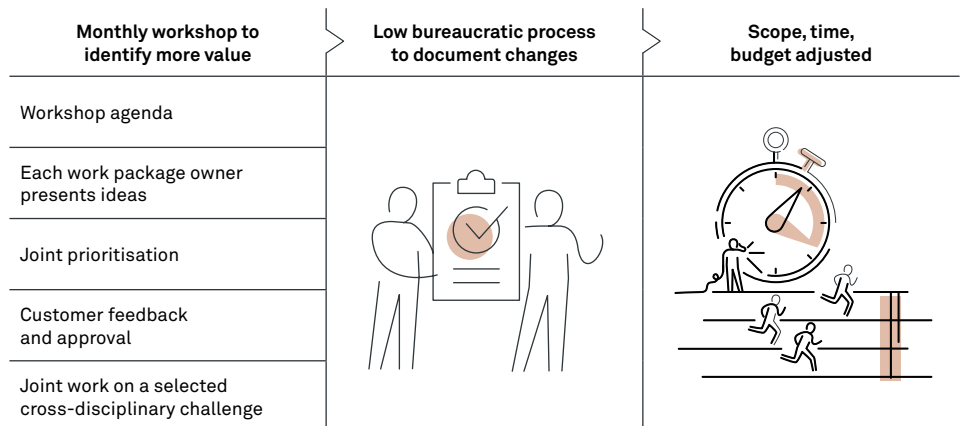
### Focus on adding value

A change order process rooted in creating and driving more value will make your customer feel like you are thinking and engineering above and beyond their expectations. Each adjustment to the scope, time or resources of the project should be seen as a chance to make the project more profitable.

Start by identifying how the original intention, scope, contract or specifications could be changed. Most engineering projects are open to suggestions for creating more value as engineers learn during the project and can come up with more or better ideas.

### Plan and simplify a value-driven process

A fixed rhythm of workshops that focus on identifying opportunities to add more value with as little bureaucracy as possible can simplify the process. These change order workshops could be on a bi-weekly, monthly or quarterly basis depending on the project size. The workshops should be outlined as a challenge to spark creativity and inspire solution-oriented thinking.



# #6 Pulse checks

“Watermelon reporting” is a common error in engineering projects. Reports to leadership are assigned a green colour, making management think and expect that everything is on track. However, when they delve a little deeper, it turns out that the report is a deep red colour. At some point, the true status of so-called watermelon reports is revealed, kickstarting an avalanche of firefighting, bureaucracy, meetings etc. All of which are non-value-adding for the customer, demotivating for team members and ultimately, very costly for the project.

## Be proactive and respond to the real project status

Pulse checks are recurring mini surveys of max. five questions posed to the team and key stakeholders to get feedback on an ongoing basis. Pulse checks focus conversations around what matters most. It helps ensure responsiveness to the actual project status (whether it’s related to impact, productivity or engagement), improve the ongoing dialogue and remove obstacles as early as possible.

## Tailor pulse checks to the project

The pulse check cadence and questions should match the type of project and be facilitated in a way that makes engineers feel comfortable speaking the truth. Therefore, we recommend doing the pulse check anonymously before a team meeting and then using the meeting to reflect on and discuss the conclusions and actions to improve the situation.

Pulse checks legitimise dialogue and can help address the issues that engineers often feel strongly about but do not dare bring up, either because they are afraid of losing face, dealing with angry management, igniting bureaucratic reporting or because they feel unheard. Therefore, pulse check questions should be chosen specifically for the context in order to address the most likely challenges.



# #7 Apply tailored project management frameworks

Many engineering projects follow a standard project model or framework, e.g. PMI, PMP or PRINCE2, which is strictly adhered to. This means making the same type of contracts, following the same processes and using the same tools. However, engineering projects are very different in nature. Some involve engineering well-known technology with well-known suppliers and contracts, while others demand a much larger degree of innovation due to a high level of uncertainty and a completely unknown solution that has never been engineered before. Standard engineering project frameworks are often followed too rigidly and to such an extent that project execution becomes inefficient. In general, more agile and innovation-based project frameworks are not applied often enough compared to the number of unknown solutions that have to be designed.

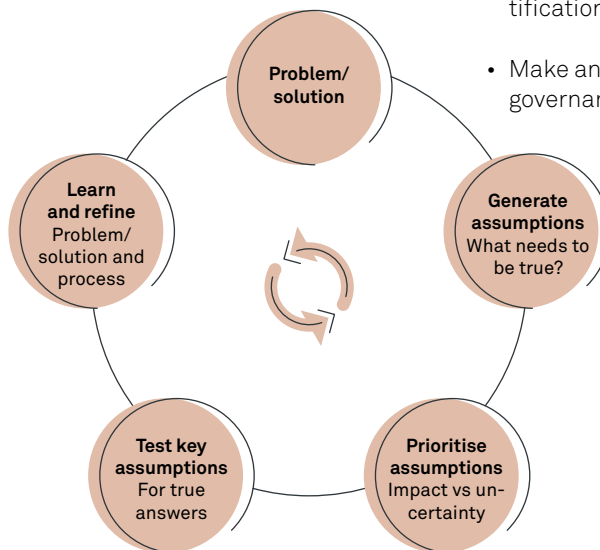
## Combine different project frameworks

Projects should be managed differently and use frameworks, models, methods, tools and people that are fit for the specific project. Standard project frameworks that are tried and tested work very well and should of course be used whenever they fit. But an add-on framework can be taken from agile and innovation paradigms for solution deliverables with high uncertainty. Start by identifying what part of the project delivery is a well-known solution and which parts need innovation and differ from the *modus operandi*.

## Projects with unknown solution deliverables

For projects with a high degree of uncertainty, the following initiatives can be introduced:

- Encourage and motivate innovative, outside-the-box thinking.
- Lead teams towards flexibility – the project scope and plans will definitely change and adjustments could occur often.
- Use methods and tools from innovation or agile project paradigms, e.g. Design Thinking or Eric Ries' Lean Startup methodology, to gain critical knowledge as early as possible in the project.
- Use supplier contracts that stimulate collaboration and joint solution identification, e.g. incentivising suppliers to identify alternative solutions instead of just aiming for delivering a solution that was originally thought of when there was very little knowledge and information available.
- Adjust your fixed meeting rhythm and agendas to include assumption identification, prioritisation and testing.
- Make an innovation strategy and governance for projects.



Assumptions-based testing model

# #8

## Create and push transparent deliverables

The only way to deliver exactly what is needed, when it is needed is with fully transparent deliverables. However, engineers often don't know exactly what is required, when it is required or the interdependence of deliverables between different functions in the project. This can be due to simple factors such as a lack of clarity about the latest version of documents or difficulty accessing relevant files. Lacking information can result in a team of engineers who don't know where to focus their efforts and waste time on unnecessary activities. Unclear project deliverables leave the door open to potentially costly misunderstandings, disagreements and problems that ultimately affect the project schedule, costs, quality and team motivation.

### Define the project deliverables

Strive towards well-defined deliverables and then constantly track the project progress while remembering that needs and expectations are not static. Keeping deliverables transparent can be done at different levels depending on the type of project, tools and team constraints. However, the implemented solution should meet the following requirements:

#### One location for all deliverables

Accessing the deliverables list should require minimal effort. The team needs constant and centralised access to these documents.

#### No doubt about what and when to deliver

Team members need clear roles and responsibilities so there can be constant alignment and revision of deliverables and prioritisation.

### Share the status and progress with the team

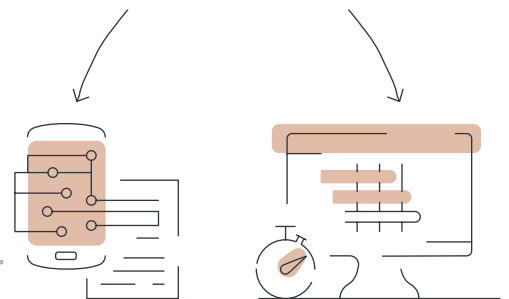
The plan should reflect the reality of the project and the progress of deliverables should be common knowledge and fully visible to the team and stakeholders.

#### Define "done"

Deliverables are broken down into smaller, more manageable chunks of work. This allows for simultaneous tasks and easy visualisation of progress. For ambiguous deliverables, use the "definition of done" from the agile project framework.

#### Best-in-class tools for transparency and visibility

Automated processes push information and notifications to users, enabling fully visible deliverables. These processes also provide displays of project dashboards, deliverables and real-time plans to help keep the team aligned and in the know.



\*Examples: Letsbuild, JIRA and Miro.

# #9

## Promote behaviours that drive customer value

Poor communication in engineering projects can lead to low motivation, less teamwork and inefficiency due to misunderstandings and disagreements. In many cases, support functions are granted authority from leadership to “police” projects in order to uncover any errors or risk, which can ultimately lead to a step away from their service-minded roots. Instead of helping create progress in projects, this can lead to decisions and key actions being postponed.

### Lead the way to productive behaviour

Leadership has a key role in promoting the right behaviours in projects to make them efficient, motivating and agile. Ultimately, their job is to create a setup that encourages collaboration, customer value creation and problem-solving across engineering and support functions.

Here are a few examples of ways that leadership can increase efficiency, customer focus and motivation in the engineering projects:

- **Communicate consequences:** The project manager and team members need to make leadership aware of the consequences of inefficient behaviour. For example, how many days will the project be delayed or could it be delivered faster if the team had problem-solved instead of “policed”?

- **Loyalty to the project team:** Support functions’ primary loyalty should lie with the project team and not their internal department. Leadership should ensure that the right team structures are in place to instil a sense of allegiance and that the top project team is represented based on end-to-end responsibilities and customer value rather than support functions.
- **Evaluation:** Participating in meetings and workshops means that leadership can keep their finger on the pulse about behaviours in projects and able to identify areas for improvement together with the team.
- **Ask the right questions:** During project meetings and workshops, the facilitator, meeting responsible or team members can rhetorically steer the team towards desirable behaviours by asking open-ended questions, e.g. “How can you contribute to finding a solution that works for all of us?”, instead of just accepting objections from critical people.
- **Customer involvement:** When possible, bringing a customer into meetings/workshops can also be a tool to steer behaviours and conversations towards creating customer value instead of focusing on internal limitations.

# #10 “Short and fat” resource allocation

Project portfolio leadership is a lever for execution efficiency that can be forgotten in the heat of a project. But it's up to project managers and owners to allocate resources efficiently and monitor capacity and capabilities. Typically, engineering organisations have too many “thin and long” projects going on at the same time. In some cases, engineers are only allocated 5-10% on a specific project or critical resources are allocated to multiple projects at the same time, leaving them with very little capacity to actually produce something.

## “Short and fat” allocation

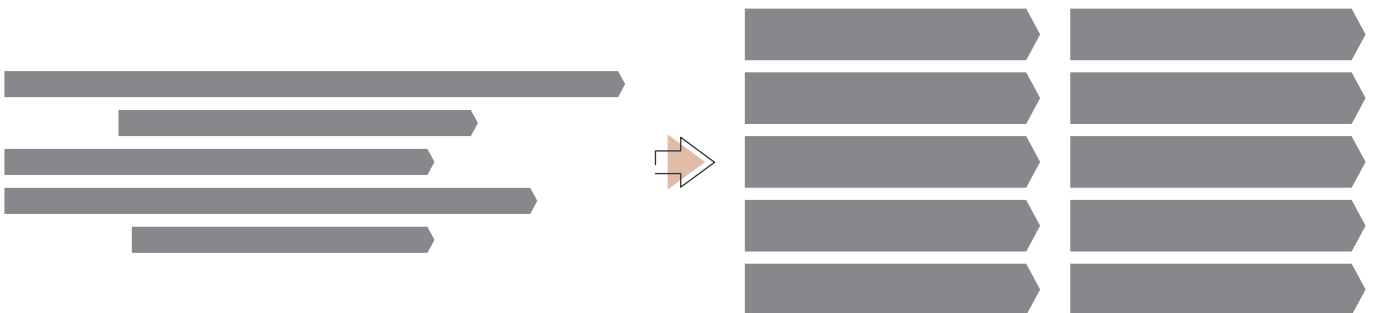
Once the crucial capabilities for the project have been identified, project managers should ensure +50% allocation of core team members, so engineers are allocated for a high-intensity and short period. This “short and fat” allocation ensures progress and impact creation in projects. If key resources can only be allocated 5-10% in a low-intensity and long period (so-called “thin and long” allocation), then it's recommended to put the project on hold or even cancel it, as project execution will be inefficient.

## Actively participate in project portfolio meetings

It's the project manager's job to constantly monitor whether key engineers are really as available to the projects as allocated. As engineers' tasks have a tendency to become inflated, as they get drawn into different projects, it's vital that you allocate time to prepare for and participate in project portfolio meetings. These meetings enable you to:

- Escalate resource bottlenecks for “here and now” issues.
- Look some months ahead for potential clashes with other projects. For example, if you see five projects have a validation or review phase in the same month, then it's likely that the projects will demand the same resources, thereby creating a bottleneck

From “long and thin” to “short and fat”



The 10 hacks can be used individually or as part of an entire transformation process in your engineering project





## Implement at a glance

Our large team of experts are ready to help you get started with increasing agility in engineering projects.

**+180** people with experience in engineering projects

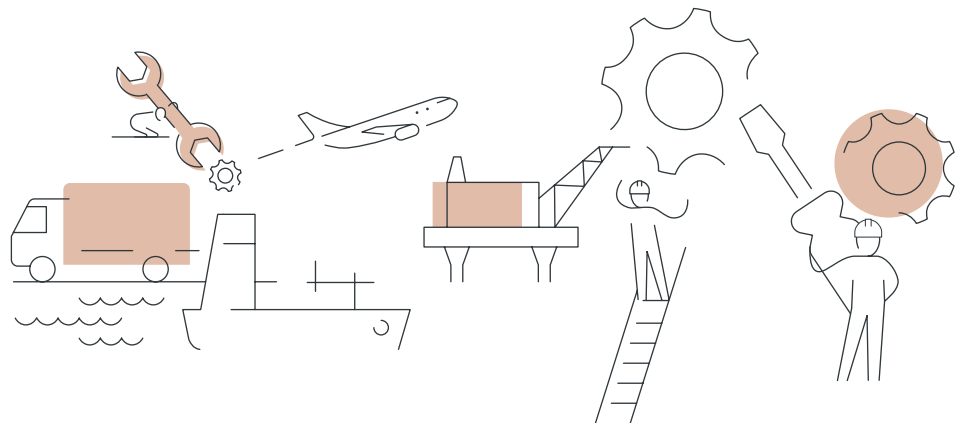
**+20** years of experience in project management and organisational transformation

**+800** FTEs dedicated to agile transformation projects

### **International experience**

We have extensive experience helping our clients with engineering projects from a range of industries:

- Train development
- Wind turbine development and manufacturing
- Offshore substation development and construction
- Brewery design and construction
- Airport engineering projects



How to increase agility in  
engineering projects

## How to get in touch

The world is begging for change. Let's go make it. We are ready to work alongside the world's most ambitious clients, taking on their toughest challenges.



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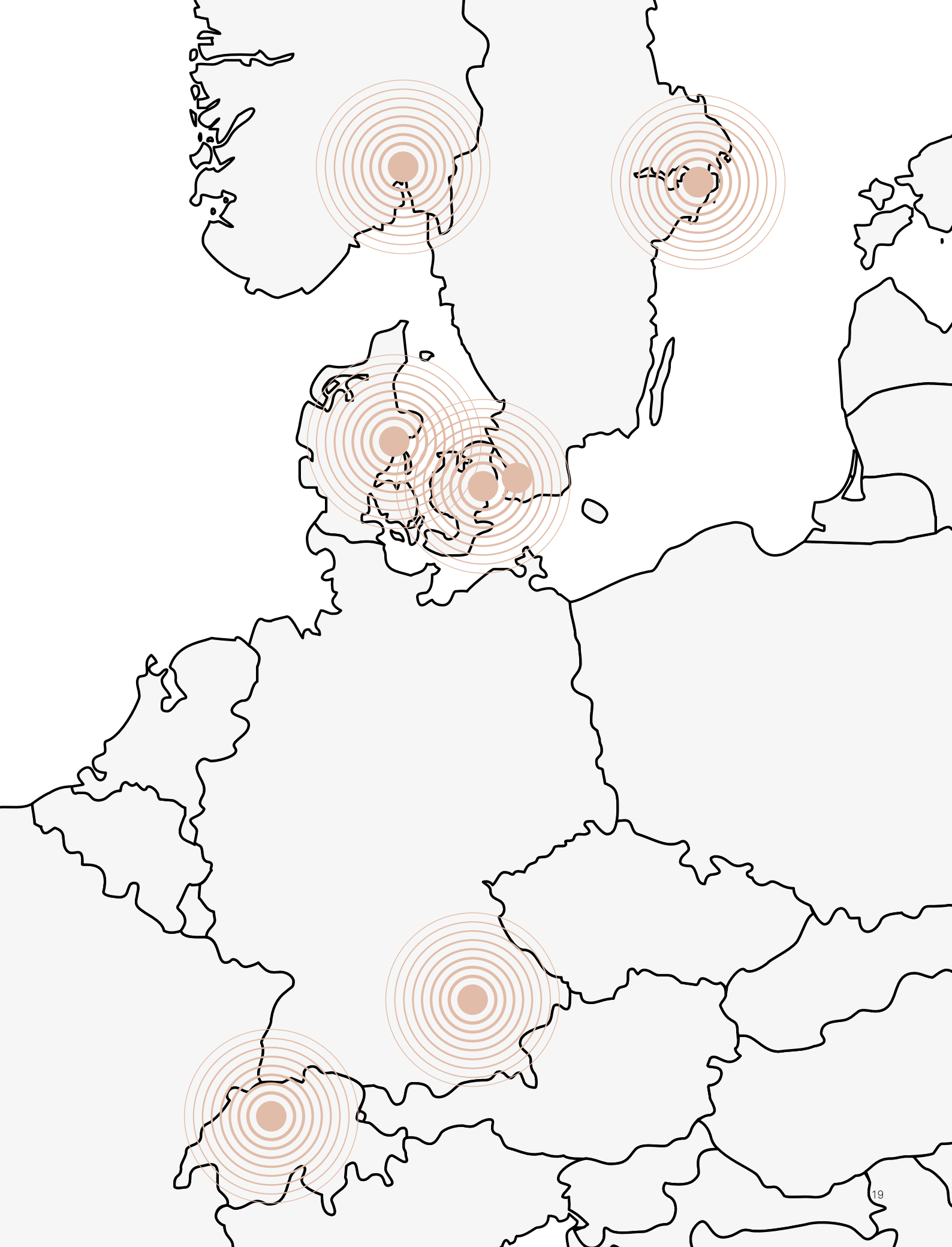
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