

# Lean forward

**Andy Marsh** encourages project managers to think “lean”

**L**ean management is a philosophy that seeks to embed efficiency and flexibility in an organisation's structures and processes in order to provide a competitive advantage.

While its origins lie in manufacturing, the approach is increasingly being applied on capital programmes. With construction sector labour costs under long-term inflationary pressure as a result of the industry's endemic skills shortage and the weak pound driving up material costs in the UK, the appeal of lean management's ability to encourage efficiency and streamline the construction process has never been stronger.

### From cars to construction

The enduring image of lean manufacturing techniques comes from the automotive industry – the production line operated with balletic precision by a fleet of robots, with excess eliminated by “just in time” logistics and inefficiency being ruthlessly removed. Now, construction industry leaders have adopted the lean approach and adapted it to suit their own needs.

For both automotive and construction industries, the primary attraction of lean management is similar – its ability to help an organisation build a resilient core operation that consistently and efficiently provides what is required of it.

A lean approach is a disciplined one to an organisation's structure and processes, as well as to the behaviour of its staff. In capital programme terms, this could range from fundamental structural matters, such as how the supply chain is managed and how its success is judged, to the most vital processes, such as how decisions are made and by whom.

### Principled approach

The first principle of lean management is to understand customer value, that is, what the customer is prepared to pay for from among the many activities conducted on their behalf.

This underpins the second principle of lean management, value stream mapping, which identifies every part of the process that does not create value and then suggests ways to eliminate waste (see [Figure 1](#), overleaf). In a construction context, the fields most likely to be affected include the movement of

“

The discipline and rigour that lean thinking brings to an organisation's core structure and day-to-day operations enable responsiveness and adaptation

materials, rework, waiting time and inventory taking. By reducing such systemic waste, the idea is to improve both timeliness and profitability.

Lean managers then build efficiency by creating “flow” and “pull”, the third and fourth principles. Flow is best thought of as synchronisation – a seamless, integrated process, in which no operation is left waiting for another to be completed. Batch processing is replaced by single-piece processing – with, for example, the use of modular construction materials assembled off site – wherever possible. “Pull” supports this by ensuring that work is only triggered when the next step in the process demands it.

The fifth principle of lean thinking is perfection – in other words, the unrelenting pursuit of improvement by collaborative problem-solving and innovation. Given that organisations are often created from scratch to work on particular projects, such techniques can be used at the outset to design a streamlined decision-making process, in which checks and balances for each decision type are tiered according to the level of risk involved.

If it is used correctly on a construction programme, lean management will help achieve the following:

- improve collaboration across the supply chain with more streamlined, transparent and profitable processes
- promote efficiency by reducing waste – such as double handling or the redoing of substandard work – and by inculcating a culture of getting things right first time
- simplify and standardise core processes to ensure consistent quality and value for the client
- encourage interdisciplinary working – in which suppliers work together to provide an overall element or package, rather than working in isolation
- enable greater incorporation of off-site and modular construction elements
- encourage operational excellence, by securing a commitment to do things well across all functions, while striving for profitable growth.

### Core strength

The discipline and rigour that lean thinking brings to an organisation's core structure and day-to-day operations does not preclude responsiveness. On the contrary, it aims to enable it and empower the organisation to adapt quickly to changing circumstances.

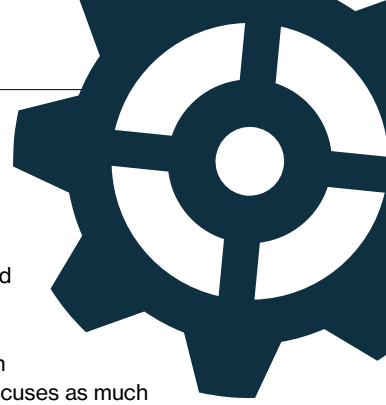
Take, for example, the “just in time” inventory strategy, a well-established technique originating in the automotive sector, which lean management pioneered in the manufacturing industry. This is built on the principle that a manufacturer should receive goods only when they are needed in the production process, and not before. The result is to make that process highly responsive, thus removing the need to hold large stocks and reducing inventory costs.

The philosophy has since proved itself highly efficient across the retail, travel and hospitality sectors as well. But it relies on an organisation having the courage to dispense with cumbersome contingency planning and to place its trust instead in speed and agility. While a capital programme may use “just in time” strategies to minimise materials' inventory costs, they can have an even greater effect in managing changes to the design.

It is worth remembering that, rather than being an immutable fixture of a construction project, the design is liable to alter repeatedly. During the extended timeframe of a capital programme, this could occur for many reasons – an unexpected event, a change in the business's requirements or by the client simply changing its mind.

Used correctly, lean thinking should give management the two things it needs to make late design changes successfully: an understanding of how much variability is required to ensure both optimum efficiency and value, and a map of the last possible moments for change. In the same way that “just in time” strategies ensure efficiencies in inventory and logistics, the processes





inspired by lean management enable capital programmes to be nimble, giving them the intelligence and ability to make critical decisions at the crucial moment.

With the common data environment of building information modelling enabling clients, programme managers and the supply chain to comprehend the impact that a change has made instantly and throughout the asset's lifecycle, agile planners can design long-term, adaptive processes that will move the programme seamlessly from construction into usage.

### Saving time

When judging the value of a project it has commissioned, a client will make its assessment largely on the basis of the physical structure's quality, and the steps directly involved in producing it. In crude terms, this is likely to mean the most tangible, value-adding elements – the structure, its functionality and so on – rather than the necessary but less obviously value-generating aspects such as pre-construction or regulatory work, scaffolding or logistics.

No value will be attributed to time that is wasted. Whatever the reason for that

waste – waiting, redoing substandard work, enforced redesign or unnecessary inventory management – such activity costs time but offers negligible value.

Incredibly, in a typical construction project, non-value-generating activities could account for around 60% of days worked. For the lean project manager, these wasteful operations will be the most obvious candidates for elimination. So while the client may assess the project outcome on the final physical structure and cost, for those involved in completing the project time is just as important a driver of client value. For this reason, optimising the behaviour and interaction of the supply chain is crucial.

### Best behaviour

While lean management has made great inroads into the construction industry, at times it has been bolted on to existing ways of working, or applied late in the day to turn around an underperforming project. Lean management can have a significant impact in such circumstances, but its ability to make a decisive difference is constrained if it is only used in this way.

To fulfil its potential it should be used from the project's outset, and as an approach that focuses as much on people's behaviour as on the organisation's structure.

Successfully shifting the paradigm of a large organisation is likely to be around 80% down to making the right behavioural and cultural changes, and the remaining 20% down to the tools and techniques that are deployed.

It follows that when designing the ideal programme architecture, it is vital that a culture of collaboration and optimal behaviour be ingrained from day one. Project managers have a key role to play in establishing the collaborative dynamic needed to enable all those engaged in the construction process to thrive and achieve their full potential.

However, the definition of "optimal" will vary over time, and with the business's priorities as well as its classification of value, although it will typically factor in time, cost and quality. Priorities will inevitably shift, and the ideal organisation will be developed to respond to and embrace change.

By identifying and maximising client value, lean management eliminates waste in a large organisation by streamlining structures and processes while simultaneously instilling in staff a drive for constant improvement and the desire to ensure better outcomes.

As the political upheavals of 2016 filter into 2017's economic uncertainty, it is lean management's combination of two crucial elements – a resilient, efficient core operation and a progressive culture that welcomes and adapts to change – giving organisations both the capability and confidence to embrace uncertainty in the pursuit of operational excellence.

Figure 1

#### Value stream timeline: focus on time

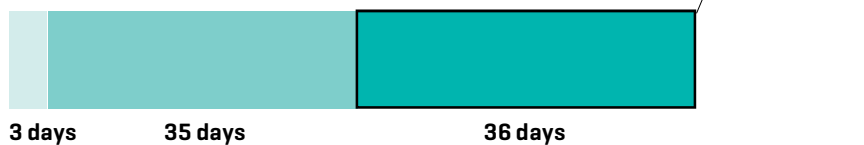
Typical value stream [assuming 100 days]



Typical improvement focus on the value-adding element: 40% reduction from five to three days



Lean focus on non-value-adding elements: 40% reduction from 60 to 36 days



Pouring concrete, laying bricks, fitting joinery, electrical wiring etc.

Scaffolding, health & safety, building inspections, measures, drawings etc.

Snagging, rework, material movement, handovers, design changes, reports etc.



Andy Marsh is Managing Director of Turner & Townsend Suiko  
andy.marsh@turntown.co.uk



Related competencies include Programming and planning