

Go with the flow

With so many touchy-feely partnering arrangements in place across the industry, **Ross Pearman** looks at another approach claiming more tangible results.



Do the words partnering, alliances, frameworks and preferred suppliers sound familiar? The industry is now awash with different approaches by clients and contractors attempting to encourage closer working and trying to sing from the same hymn sheet drawn up by the likes of the Egan and the Latham reports.

However, increasing cynicism is creeping into the industry over the use of partnering and what exactly it means.

Many feel it's an excuse to provide group hugs between the client and the contractor, while at the same time stabbing each other in the back.

However, one organisation, Lean Thinking, is hoping to restore faith in collaborative working in the industry. It is promoting lean project management and encouraging a total focus on creating 'continuous flow' and eliminating waste.

Implementing the approach on various sites and design offices has shown some significant improvements.

Architects, consulting engineers and contractors have delivered radical reductions in

project duration of up to 27%, while simultaneously achieving reductions of up to 8% on the predicted costs. This frees up resources earlier to move on to other projects to start earning more money.

Such improvements are up in the mid 90% of the national key performance indicator benchmarking scores (see box).

So far, the process has been successfully applied across all sectors of the industry, involving organisations such as Gleeson Civil Engineering, Linden Homes, Halcrow and the Highways Agency.

The process

So how does it work, and will it be the new panacea for the industry, or just another buzz word?

"The industry's progress in radically reducing the time and cost of construction, while simultaneously improving quality and safety, appears to be very slow," says Ali Mafi, who heads up Lean Thinking.

"In the large majority of cases, any significant improvement achieved against one or two benchmark measures is at the

expense of the others.

"For example, when projects start to run late, resources are increased and time goes down, but costs go up.

"This is where continuous flow comes in," says Mafi. "Creating continuous flow is the only way to radically improve time, cost and quality simultaneously, without a trade off."

Mafi also believes that improving flow can help achieve outstanding benchmark scores across the industry.

"It is important to note that if a jigsaw puzzle could depict the actions and thinking that leads to continuous flow, there would probably be near to one hundred pieces required to complete the picture. Partnering would represent only one piece," he explains.

"What also needs to be understood is that the delivery of a construction project, at whatever stage, is determined by its 'constraint'. Project teams must concentrate their attention on the constraint of the project, rather than just keep throwing resources at it.

"Even with modern methods of construction, such as off-site

manufacturing, if the flow and the constraint of the project are not managed, then the project duration will increase."

He adds: "Continuous flow is not a tool kit and there are no boxes to tick. You don't have to be a lean master engineer, a black belt in 6 Sigma or an EFQM expert to apply it. It's a way of working."

"This is clear proof that sustainable change and radical improvement must start from within," he adds.

As an example of one factor that impedes flow on projects, especially in design offices, Mafi believes that the industry should do away with the traditional approach of having all new trades starting on site on a Monday – something that is adopted by probably 95% of the industry.

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"It is well known that a large majority of the causes of delay are due to system failure rather than people failure."

reveals Mafi. "For example, the mindset that is focused on keeping everyone busy to achieve economies of scale often leads to people being redirected to non-critical activities or multitasking. These can add up to 40% extra time to the overall duration."

And his message to senior staff? "All directors, managers and their staff need to 'learn to see' by gathering the facts and getting close to the real value-adding activities," he says.

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"On one scheme, the project team was adamant that 80% of

the delays were due to the client or the weather. When we set up a system to gather the facts, it demonstrated that the perceived causes for the delay were actually less than 7%. This meant that 93% of the problems and delays on site were due to the project management system.

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Woodhead case study: flow in practice

Contractor: Woodhead
Client: Nottingham County Council
Projects: Five children centres (total value £2.5m)

Nottingham-based building contractor Woodhead has been working in partnership with Nottingham County Council for several years. Its managing director, after attending one of Mafi's workshops, decided to introduce the Lean Thinking process for creating continuous flow across five children centre projects.

The key to success, claims Mafi, was the buy-in from managing director David Woodhead, who led the implementation, which looked at changing the way work was planned and carried out.

"The gains on these projects were attributable to working smarter in the continuous flow way, rather than the usual initiatives such as partnering/alliances, activity bonus schemes, people working faster, additional resources or value engineering," Mafi suggests.

"All the projects were delivered significantly early and below budget, in spite of the normal delays from a lack of information, new instructions, bad weather, and the fact that the contract manager and site managers were absolutely adamant that, based on their many years of experience, the programs were very tight and couldn't be delivered early."

So how did it work in principle? "The implementation process started by taking the target programmes and creating lean, optimised programmes for each project, taking into account a number of factors not commonly considered in construction."

"Each programme was then scrutinised with the individual project team to ensure: work was carried out in the smallest possible batches to allow an earlier start by the follow-on trades; there was little padding in the durations; the trades were activity-driven, rather than date-driven; and there were as many parallel activities planned as possible."

The next step for Woodhead was to establish the constraint of each project and create 'buffered programmes', which helped absorb any delays or disruption during construction and maximised the possibility of the project being completed ahead of time.

"Implementing the buffered methodology assumes that the duration of each task has some padding to protect it against variability," explains Mafi. "This padding of time is taken off each task and is accumulated and then added to the end of the project. The end date doesn't change the padding, but the padding will absorb any variation that may materialise. If variability doesn't materialise, then the buffer protection will grow. This keeps people more focused on each task as the timescales become tight."

The success of the buffer approach can be found on the table below, which shows that a majority of the projects used very little of the buffer time provided (the padding taken off each task). All of them scored below the blue 'programme' line, which was set up at the start of the project.

"This meant that the projects finished ahead of schedule, as they didn't use the buffer time bolted on to the end of the project. For example, an eight-day process would have two days stripped away. Those days would be added to the end of the process if needed."

"The chart shown here was part of a weekly check-up on progress. If at any point the projects started to hit the yellow or red zone, immediate action would need to be taken."

Also, as part of the weekly progress meetings, each project team updated its programme and identified the constraint activities (see pie chart, below). These constraints were then communicated to the site operatives to ensure they were worked on first.

"It was constantly emphasised that a day's delay on the constraint activity was a day's delay across the project," Mafi adds.

To measure the effectiveness of the project management system, each week, the weekly plan activities were monitored to see how many were completed on time.

Any that weren't completed had the reason for the delay recorded. The reasons for delay were then regularly analysed and problem-solving tools and techniques were used to establish root causes, which were then dealt with to eliminate or minimise re-occurrence.

"In doing this, Woodhead set itself a target of 60% on-time completion, which is way above the industry average of around 45%," Mafi adds.

Woodhead says: "The process of buffering a programme and then



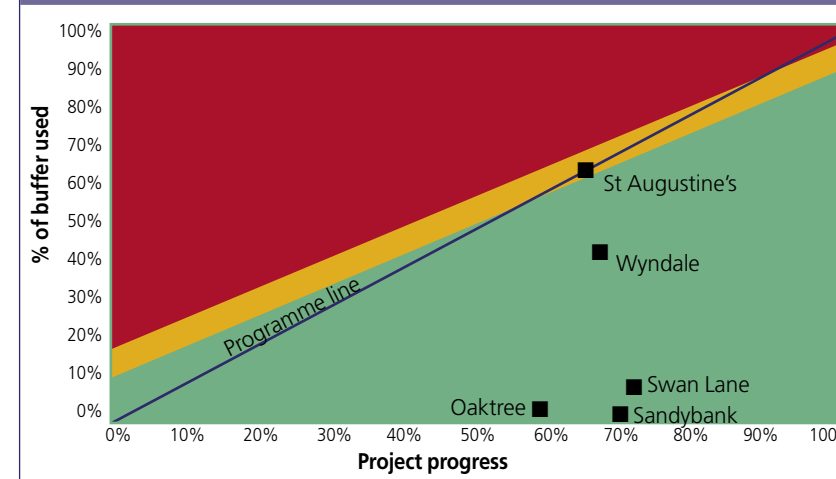
following the system to ensure we hit the target initially gave some interesting challenges. The discipline imparted by the system, however, creates great freedom for the users when followed."

Woodhead contracts manager Bob Johnson has also become an instant convert to the process. "It has made life so much easier. I'm a lazy b*****! Why should I go back to the old way?"

In order to maximise the possibility of each task being completed on time, an advance preparation procedure was set up. This involved a weekly drawing down of the next four weeks' activities from the project programme and, in collaboration with the appropriate suppliers and subcontractors, each of the tasks were checked against a set of predetermined criteria to ensure that the task was ready to start on its due date.

"Any task that wasn't ready had an action assigned to ensure everything was ready for it to start," Mafi explains. "We have proven that our lean project management process is the most advanced and cutting edge in delivering better projects faster and cheaper."

Woodhead's buffer approach



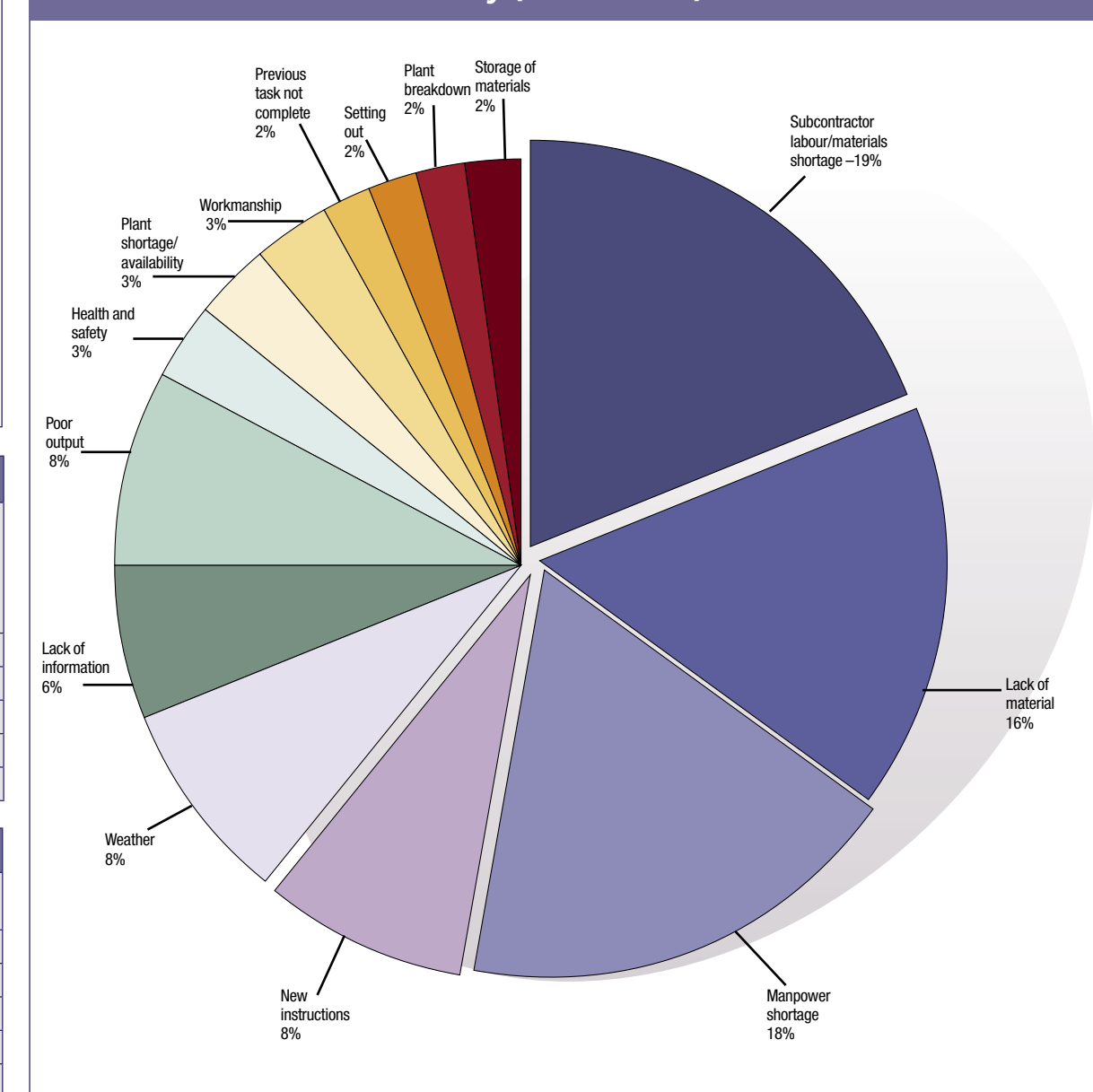
Woodhead's performance using flow

Project	Original estimated duration	Estimated duration reduced by using TEK offsite system	Actual duration applying lean project management	Actual time saved	Actual cost savings	Opportunity revenue for finishing early
Oaktree	30 wks	26 wks	19 wks	7 wks	7.4%	27%
Sandybank	32 wks	28 wks	22 wks	6 wks	5.5%	21%
Swan Lane	32 wks	N/A	26 wks	6 wks	8%	19%
Wyndale	32 wks	28 wks	24 wks	4 wks	4.9%	14%
St Augustine's	32 wks	N/A	31 wks	1 wk	5.2%	3%

Woodhead's KPI scores against UK average

Project	Time predictability (UK average, 2006: 60%)	Cost predictability (UK average, 2006: 44%)
Oaktree	90%	93%
Sandybank	84%	92%
Swan Lane	76%	94%
Wyndale	71%	96%
St Augustine's	62%	92%

Woodhead's reasons for delay (constraints)



Mafi has 15 years of construction experience; eight years in civil engineering and two years in rail maintenance.

He helped develop one of the best Lean Construction workshops in the UK and has worked for groups such as Constructing Excellence.

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Ali Mafi
Lean Thinking