



Thought leadership paper

Measuring the Benefit of Modern Methods of Construction (MMC)



Introduction

They say if you can't measure it, you can't manage it, and this couldn't be more true for construction in the current climate. Challenges around the globe of skills shortages, high levels of inflation and poor productivity has left the industry seeking new solutions and ways of working.

The saviour to our problems: Modern Methods of Construction. Modern Methods of Construction (MMC), despite its name, isn't all that new. Simply put, it's the application of manufacturing processes and procedures aimed at achieving a better balance of standardisation and customisation. This is against the traditional approach, where construction projects tend to be delivered as if they were one of a kind giving rise to artisan level of craftsmanship. As global governments and private sector increasingly look to mandate its use, we would

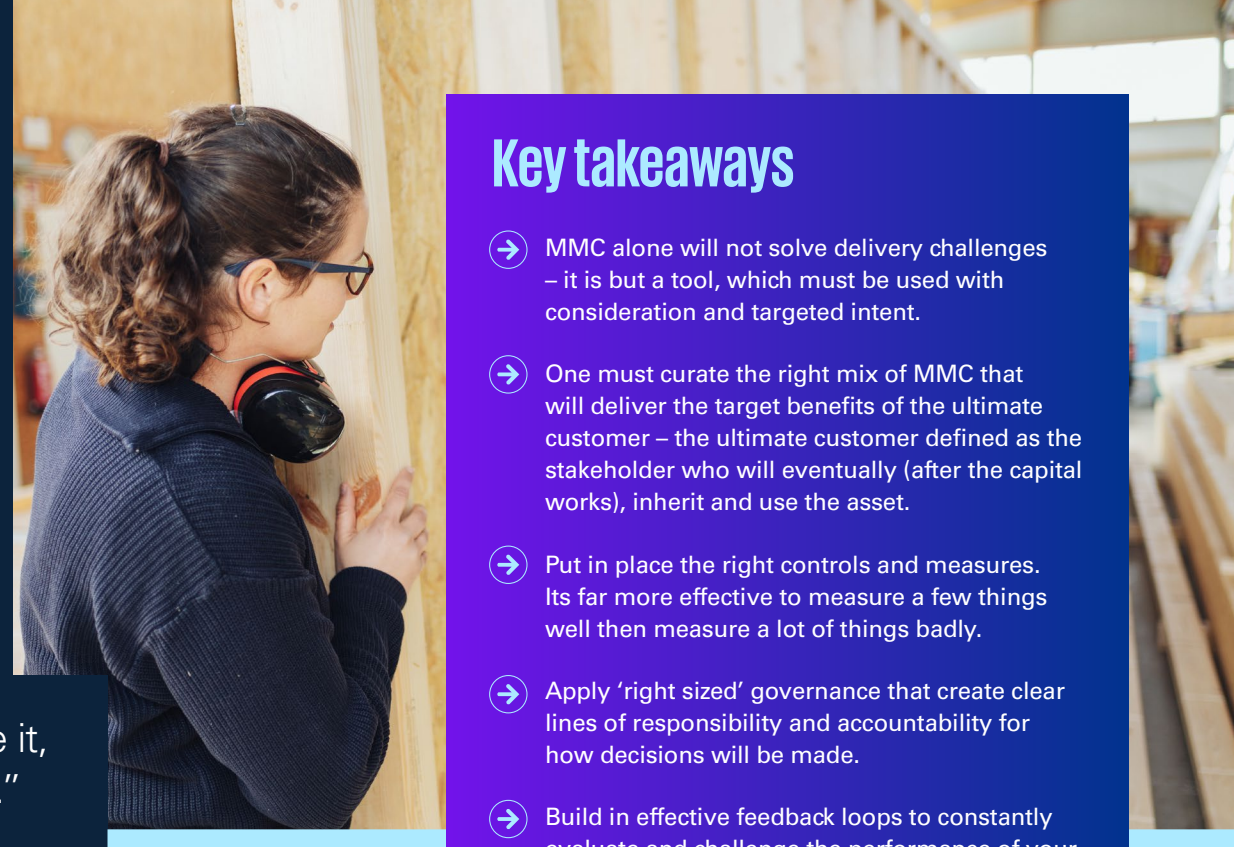
encourage clients to exercise caution. Before leaping into full scale adoption of MMC, clients should first outline the target outcomes to be achieved by MMC and put in place 'right sized' measurement and performance indicators, to evaluate against success.

This paper offers its readers a framework from which one can evaluate and determine the 'right mix' of MMC for a given project, programme, or portfolio of capital works and how to align this tool against target outcomes.

MMC applied as a blunt instrument and without correct alignment with core objectives and complementary strategies will fail to deliver anything like the benefits that it can. It should be noted that where reference is made to programmes, the concepts would equally apply to projects or portfolios. What is important here, is scale.

▮▮ If you can't measure it, you can't manage it."

Peter Drucker



Key takeaways

- ➔ MMC alone will not solve delivery challenges – it is but a tool, which must be used with consideration and targeted intent.
- ➔ One must curate the right mix of MMC that will deliver the target benefits of the ultimate customer – the ultimate customer defined as the stakeholder who will eventually (after the capital works), inherit and use the asset.
- ➔ Put in place the right controls and measures. Its far more effective to measure a few things well then measure a lot of things badly.
- ➔ Apply 'right sized' governance that create clear lines of responsibility and accountability for how decisions will be made.
- ➔ Build in effective feedback loops to constantly evaluate and challenge the performance of your delivery strategy.

Why is it important to put in measurement frameworks when adopting MMC?

MMC seeks to make manufacturing-scale advantages in delivery by moving away from a 'first of a kind' approach. At its core it drives greater standardisation across the capital programme and can introduce compounding incremental gains from repeating processes and fine-tuning product development. Some benefit can be gained by substituting onsite activities with offsite, but they are limited and quickly flat line.

Setting up programme delivery for success and getting the very best of MMC deployment requires a systematic approach that incorporates a strategy for right-fit adoption and a measurable way to indicate success.

Adoption of the right mix of MMC with sufficient metrics will enable programmes to achieve far superior benefits, in addition to putting in place further incremental gains over repeatable application.



Why is it so hard to measure well in construction?

- Many comparisons are made with other sectors, such as automotive and aeronautical about their approach to delivery, and much can be learned. However, the construction industry is not yet able to create sufficient verticality in its supply chain, when compared with these other sectors.
- Construction industry supply chains are complex, with many 100's of suppliers that are poorly aligned and rarely incentivised appropriately to work together under one united commercial model.
- Buildings, roads, bridges, etc are big and complex to move around. Building the building (or road, bridge, etc), remote from its final location clearly makes little sense and therefore the construction site continues to move from project to project.
- Data is heavily siloed and like commercial models, lack the alignment of the supply chain to work together under a single common data model. This is a highly complex challenge and requires interventions at all levels of the supply chain – from client to manufacturers.
- As a result of poor alignment, the quality of data suffers (accuracy, trust, format, etc) therefore real insight, insight that drives better decision making, is difficult to ascertain. Without insights we cannot determine what is working and what is not. We also do not recognise problems until their effects are already being played out.
- There is a lack of true whole life costing of capital projects & programmes. Decisions about choice of MMC are therefore made entirely based on a narrow lens of the direct impact on capital cost, small improvements on schedule and benefit profiles that do not drive value for the customer.

So, how do we address this problem?

Start with the end in mind.

Before standing up any capital programme, due consideration must be given to the target outcomes that are to be achieved from MMC and what 'good looks like'. This sounds rather obvious, but often this critical part of a programme is not given sufficient time and attention. Programmes start their life not being set up for success. There is a danger that MMC is seen as a panacea that will somehow result in huge cost or schedule benefits, that fail to materialise. Significant benefits are certainly available but only with an appropriately formed strategy and a clear client brief.

Adopt realistic target benefits.

In terms of target outcomes, sometimes not overreaching and instead adopting more realistic target benefits (especially when deploying new forms of MMC), will result in better success. Recall, that a tiny percentage (0.2% according to Prof. Bent Flyvbjerg), of large capital programmes deliver on time, on budget and on benefit. Simply achieving greater certainty of outcome may be of sufficient benefit alone.

Understand who are the key stakeholders.

Identification and engagement of all key stakeholders will ensure that the strategy meets the requirements of the ultimate customer, across the entire lifecycle of the asset. Without appropriate engagement, choices will be made based on short term gain and long-term pain for the operators. This ultimately results in downtime loss and opex implications that typically outweigh the initial capex savings for which the decision was made.

Map specific challenges against MMC options.

With clear ambition, intent, and outcomes the programme should map against the plethora of MMC options, to identify the right fit. This mapping may well evolve as a programme matures and should be revisited periodically throughout the programme. Identifying the specific challenges that the programme faces will help the selection process of MMC, for which there are many types to choose. For example, a highly constrained site with poor access may not benefit from the adoption of large volumetric modules.

Define the MMC delivery strategy.

Clients should be aware that there are many different variants and sub-variants of MMC and without a properly formed delivery strategy (that considers the right selection of MMC), may inadvertently select an inappropriate mix of MMC that deliver poor outcomes. Clients who have had little exposure to MMC may benefit from narrowing the adoption of MMC to a small number of types. This will allow the development of appropriate skills, policies, and procedures within the client organisation, which are necessary to achieve the target outcomes.



Defining the different categories of MMC

The seven categories of MMC – developed by the UK’s Department for Levelling Up, Housing and Communities (DLUHC)* – offer a helpful means of grouping together options. In effect, these are the new tools of delivery.

Many clients have adopted different configurations of these tools to deliver better outcomes on their programmes. The success of this application is highly varied.

What clients need is a common language that binds the adoption of MMC under a common set of principles and procedures; a brief set by the client.

These principles & procedures need to be intrinsically linked to the business case, which outlines the case for investment. Without this, the tools (MMC), do not deliver value for the ultimate customer.

This is not dissimilar to Apple describing the rules in which application developers must work in order for their products (the applications), to be hosted on the Apple platform. Apple doesn’t own the intellectual property or the innovation of the application (it doesn’t need to and nor should it), but it does need to outline a code of conduct and method of interface to protect the experience of Apple’s customers, who use its platform.

We would offer that the current categorisation therefore fails to recognise the importance of first considering strategy, which defines the principles & procedures, to help enable benefits of MMC deployment to be fully realised.

A new category, category 0 is therefore needed to give this sufficient consideration.

For example, a high-rise hotel development seeking to adopt offsite bathroom pods as part of its delivery solution, will fail to obtain significant schedule benefit if the manufacturing delivery process is not linked to interfaces and logistical needs of the project.



		Categories of MMC			
		Category	Description	Lead	
A	Philosophy strategy	Category 0	Briefing, scoping and design stage (standardisation)	Process led	
	B	Offsite, DFMA & PDFMA	Category 1	3D primary structural systems	Product led
			Category 2	2D primary structural systems	
			Category 3	Non systemised primary structural components	
			Category 4	Additive manufacturing (structural and nonstructural)	
			Category 5	Assemblies and subassemblies	
			Category 6	Material and product innovations	
C	Deliver & Implement	Category 7	Site process innovations	Process led	

* DLUHC was formerly known as the Ministry for Housing, Communities, and Local Government (MHCLG).

Image of DLUHC’s 7 MMC Categories (grey) with the addition of Category 0 (blue) to help enable full realisations of MMC deployment.

Putting strategy in to Delivery

Ideally, the delivery strategy should be developed at the start of the programme, **alongside the business case** to ensure target benefits are achievable and have in place the right framework to monitor realisation.

When forming the delivery strategy, a systems approach is needed, to balance the various trade-offs against the programme objectives. Consideration of priority themes within the programme benefits will help to prioritise decisions. Delivery strategies should seek to adopt a mixture of MMC categories that best meet the requirements of the programme and the ambitions of the ultimate customer.

Creating a baseline

Outlining the starting position, is actually very difficult and is exacerbated by the industry's inherent approach to measuring performance and outcomes. However, the creation of baselines is fundamental and well worth the effort. The baseline should be clear and transparent of any underlying assumptions that might later result in different choices being made. Programmes shouldn't let perfect be the enemy of good (Voltaire). A baseline can (and should), be revisited at any point during the execution of the programme so long as the assumptions and impact of re-baselining are well considered.

Only when we have a clear starting point can we recognise when progress is being made.



Benefits targeted

For complex programmes with multiple target benefits, programmes should adopt an incremental gains profile. First targeting a specific selection of benefits (or promotion of benefit) and then choosing the most appropriate mix of MMC best placed to achieve these benefits. Multi criteria decision frameworks can be extremely useful tools, when right sized for the programme. They will help to prioritise benefits and drive greater alignment with the most appropriate type(s) of MMC.

Alignment of the delivery strategy with other programme strategies is important for successful outcomes. An ill-fitting procurement and delivery strategy will not only fail to deliver benefits, but it will also result in dis-benefit. For example, a programme that fails to appropriately define the performance characteristics and interface requirements of the bathroom pod example given earlier, will result in the narrowing of choice of supplier and the introduction of risk due to interoperability issues.

Programmes shouldn't let perfect be the enemy of good."

Voltaire

Mapping baseline and benefits

With the benefits and baseline clearly defined, we can articulate (in simple form), how the programme will make decisions about the adoption of different types of MMC. This is most appropriate **before engaging with suppliers and the market** to ensure that choices are made that continually drive progress toward the target outcomes.

Without sufficient governance in place, a **programme may become subservient to biased decision-making** with the client inadvertently inheriting additional risk. For example, a building requiring a high degree of future flexibility may be disadvantaged by selecting a pre-cast concrete floor construction unless appropriate provisions are built into the solution.

Furthermore, without appropriate governance decisions can become stuck creating unnecessary delay and impact outcomes.

Implementation

As described earlier, programmes are complex and are likely to require changes during implementation of the delivery strategy. Change may be required due to unforeseen circumstances or from necessity arising from poor performance against the target benefits. **Appropriate change management is therefore essential.** Programmes can quickly become reactive, making multiple changes simultaneously, without recording the basis for the change and any underlying assumptions. It therefore becomes difficult to track which of the changes are effective (or ineffective).

When setting performance metrics, it can be **tempting to overcomplicate and try to measure everything**. A few key metrics measured well are far more effective than measuring many, poorly. Equally, programmes should carefully consider the choice of metrics and KPIs that inform against performance outcomes. **'Vanity' metrics** have the ill-effect of misinforming when changes are needed and instead mislead clients into a false sense of benefit realisation.

Feedback loops

Feedback loops should extend across the **entire ecosystem** of stakeholders, from customers to suppliers. Feedback loops should seek to challenge what could be done better to achieve the target benefits, what would a version 2.0 look like. Feedback recorded should include both qualitative and quantitative data capture and should be linked to specific objectives and delivery changes.



Conclusion

MMC can deliver great benefits, if appropriately selected against the target outcomes and once deployed, carefully measured to ensure the selection is correctly returning the investment.

Rather like a high school science experiment, we should be mindful of the outcome that we are testing against and ensure sufficient means to measure success. Firstly outline your hypothesis with the outcome you are looking to achieve; secondly, state your baseline assumptions; thirdly, select your variables or available choices and; finally, consider what must be correct for the hypothesis, or outcome, to be true.

Only by narrowing the variables and having appropriate feedback loops about what works and what doesn't, are we able to tap into a much richer set of benefits from the deployment of MMC.

Contacts

In whatever sector you operate in, delivering capital programmes at pace and against the backdrop of significant skills shortage, hyperinflation and market capacity challenges, requires cross-sector, cross-industry insight and a different way of thinking.

KPMG bring together broad consultancy capability and specific construction industry knowledge to help clients operating across the entire value cycle, deliver better. Our clients achieve market leading delivery performance as we translate its business objectives into a delivery strategy that builds capability within its organisation and the supply chain.

Get in touch now if you want to know more.



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