

Response to Infrastructure & Projects Authority Proposal for a New Approach to Building

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Introduction

Constructing Excellence fully supports the move to a platform approach to building and we welcome this opportunity to have an impact on the process. Using government procurement to drive a platform approach has the potential to transform our industry and overcome some of the current market reluctance that exists. We particularly welcome the launch of the Construction Innovation Hub and the work that it will do to underpin this approach.

In response to the Government's call for evidence the Constructing Excellence Manufacturing & Technology Group held a workshop on 10th January 2019 at the offices of Pinsent Masons. A full list of contributors is available in Appendix 1, opinions expressed are of the individuals and do not necessarily reflect those of the organisations they represent. Participants at the Constructing Excellence Annual Conference on 12th December 2018 were also polled to gather their opinions on the platform approach.

According to participants at the Constructing Excellence Annual Conference procurement and contracting models, client capability, appetite to change and agreement on new standards and regulations were viewed as the main barriers to embedding manufacturing technology in the built environment. Participants also indicated that 90% support platform approach to building, however over one third were unsure whether the market would accept such an approach.

Key Points for Consideration

- **Client-led** – clients need to lead this change through the formation of delivery models and subsequent procurement activities that enable the transition. Government departments and major public sector infrastructure programmes should take a leadership role.
- **Procurement** – the approach and process of procuring assets needs to fundamentally change to accommodate a platform-based approach.
- **Consistency** - the industry needs a consistent approach from government at all levels.
- **Pipeline** – to unlock investment industry needs a robust and accurate pipeline of projects.
- **Collaboration** – industry and government clients need to find commercial mechanisms that enable long-term relationships and deep collaboration based on trust.
- **Whole life value** – government procurers must look beyond capital expenditure to take a whole life view of the asset and work with the industry to deliver and share value across the life of the asset.
- **Manufacturing** – the platform approach should not be about moving traditional construction processes from sites to factories, the platform approach should learn from and fully embrace manufacturing approaches and technologies.

Adopting and implementing the approach across capital programmes

Q1. How can government best encourage the adoption and implementation of this approach to its capital programmes?

Pipeline

Visibility of a clear and trustworthy pipeline is fundamental to enable businesses to make long term, robust decisions and leverage investment. This should result in a move away from project-based to programme-based delivery, enabling government clients to develop long-term and mutually beneficial relationships with supply chain partners. This in turn provides a strong basis for the supply chain to innovate and share the benefits across the programme partners.

The Infrastructure Forum report 'Sustainable Procurement: A Vision for UK Infrastructure' highlights the issues around unreliable pipelines driving unsustainable behaviours such as lowest cost procurement, high risk transfer to supply chains and inadequate investment in skills.

Intelligent Client

Government clients need to actively engage in projects, engaging with the whole supply chain, contractors, consultants and manufacturers at an early stage. Procuring not just on capital cost but based on value to drive performance across the whole life of the asset. Government clients need to accept non-traditional ways of working that maximise the benefits achieved from the innovative use of standard forms of contract, minimising variations and locking down designs much earlier in the process.

Consistency

One of the greatest challenges to BIM adoption was the lack of consistency applied by national, regional and local government procurement teams. There is an opportunity to learn from this and ensure consistency is applied to the platform approach. This will require empowerment through focused engagement and training of government organisations.

Enforcement

Empowerment is not enough; consistent approaches will need to be enforced at all levels of government procurement from central government, through departmental procurement, government agencies and local government. This needs to be supported through a programme of education and training for both government clients and industry.

What changes are needed in the sector?

Q2. Within your organisation or sector what changes are needed, including in relation to technologies, skills and commercial models for this approach to succeed?

Business Models

The existing contracting and procurement models are under pressure in terms of its economic sustainability and the quality it delivers. There needs to be greater alignment of value across the supply chains, with different mechanisms to finance the industry beyond the existing top-down approach to managing finances. There must be a recognition that more investment needs to be made at the concept and design phase. This will reduce the need for further design work at the later stages of the project. Moreover, with a platform-based approach delivering repeatable projects, design work should be able to be re-purposed and re-used.

Project 13 provides a framework to move away from traditional transactional arrangements to an enterprise based business model. This should be pursued particularly to ensure the team is set up for longer-term relationships, boost certainty and productivity in delivery and improve whole life outcomes in operation.

This transition may result in many of our established industry suppliers struggling to operate in the changed world. There are clearly economic and political debates required on the Government's role in supporting change, but also potentially letting certain organisations fail.

Digitalisation

The industry must embrace digitalisation including emerging technologies such as machine learning and artificial intelligence. This will require more openness and collaboration around sharing data in a secure manner. The industry will also need to place more trust in data to deliver consistency across projects, moving from experiential-based to data-based decisions.

Servitisation Model

The sector could investigate a servitisation model, where payment is based on long term value, for example leasing fixtures and fittings or buying levels of lighting rather than lighting systems. As the manufacturer retains ownership of the product and its disposal this opens up opportunities for circular economy and resource re-use.

Servitisation provides steady revenue for the industry which can be valued by the market and therefore makes the sector more investable. Moreover, servitisation reduces the initial cost for government clients and should ensure quality and value over time.

Offsite manufacturing not offsite construction

The industry must invest in and embrace manufacturing technologies. It must move away from doing 'onsite' activities in factory environments to truly embracing manufacturing approaches. This will require manufacturers to invest in new lines, new technology and resources and require government to support innovation.

Collaboration

Truly embracing collaboration is the key to unlocking the platform-based approach. Mechanisms and incentives need to be found to enable better and collaborative behaviours. The role of integrators will become more important, for example many manufacturers now looking at a new role of 'data integrator manager'. Equally breaking down the barriers between design and delivery teams are critical to delivering change.

Engagement with industry & measuring the benefits

Q3. How should government engage with industry to make sure this approach succeeds?

Engage at all levels of the supply chain

Real change can only occur through engaging installers, fabricators and manufacturers. Government should ensure it engages early with potential manufacturers and designers to better understand the technical and commercial challenges of successfully implementing this approach.

Cautiously

Government should take care when engaging with industry to make sure it gets a representative, cross-disciplinary engagement. It should be careful to ensure that the voices of those who do not wish to change do not over-ride those who want to make change happen. This should build on existing mechanisms.

Consistently

Government should take a long term and consistent approach to engaging with industry. Government should articulate its wants and needs through continuous communication to make sure that industry understand the governments required outcomes.

Q4. How can the benefits of this approach best be measured?

Continuous improvement

The government should build on existing and established KPIs to demonstrate continuous improvement over a long timeframe. Moreover, government should mandate the collection and sharing of those KPIs to ensure transparency and trust.

Performance KPIs

The government should work with industry to establish outcomes based KPIs that go beyond the build and handover, going beyond how the asset performs and looking at societal outcomes. This should bring in the work that is being carried out in the Construction Leadership Council on procuring for value.

Risks & costs and supporting the economy

Q5. What risks and costs (including hidden and associated costs) would this approach create for your organisation or sector?

Costs

A key cost will be the investment that will need to be made in new lines, technologies and resources for the platform approach. Moreover there will be significant costs for the industry investing in the IT infrastructure required to process the amount of data needed for a fully digitally-enabled platform approach.

Risks

- Standardisation - if implemented badly could reduce the quality of outcomes.
- Lack of established supply chain – recognise that this will take time to grow.
- Warranties and processes not yet in place.
- A true representation of the benefits is not yet in place.
- Government procurers (especially occasional clients or where decisions are made by politicians) do not understand this process.
- Clients will not understand that they too need to change e.g. design freezes etc.
- The industry is not allowed to fail – the industry needs a safe space to innovate and test ideas – must not give up at first hurdle.
- Expectations on how quickly the industry can be turned around – widespread change will take time to manifest.
- Some established roles will be threatened by this change however, it will lead to new roles and greater productivity.
- A fluctuating pipeline may cause supply and demand issues that will need time, money and confidence to resolve.
- Encouraging manufacturers to engage with clients will disrupt traditional supply chains and routes to market.

Q6. How can this approach best be used to support the economy on a local and a national level?

Share wealth

The platform approach opens significant opportunities to share wealth and deliver jobs where jobs are most needed around the UK. Furthermore, this approach offers opportunities for more stable jobs and working conditions for those working in the industry who move from site-based to manufacturing environments.

Major projects

Greater collaboration across major projects and frameworks using this approach will enable much better investment decisions to be made. Government incentives can then be used to encourage investment in areas that need it most.

Tax credits

There is also a potential to use the R&D tax credit system, which is very much under-utilised by the construction sector, to encourage investment.

Contracting models and building requirements

Q7. How would current contracting models and building requirements need to change, in order to best facilitate procurement from a product platform?

Long-term contracts with manufacturers

Manufacturers need to have a long-term commitment in order to make the R&D and capital investments needed to support this change. This includes finding mechanisms around current public procurement rules to provide certainty earlier in the process so that manufacturers are not carrying out considerable design work at risk. Given the right IPR contract, manufacturers could share risk and benefits, get paid on time (or perhaps up-front) therefore leveraging more of the knowledge from within the manufacturing base. This could include longer-term maintenance contracts or leasing contracts – perhaps even a servitisation model building on the lessons learnt from the PFI approach.

Long-term commitments on sub-assemblies could unlock considerable investment in manufacturing, for example a 5-year public framework, with manufacturers operating under a controlled license programme to support UK or local manufacturers.

Support innovation

This is a clear departure from the traditional contracting models and will require time and effort from all involved including client departments, contractors, consultancies and professional services and manufacturers to work collaboratively. Mechanisms (perhaps through government funding or tax incentives) will need to be found to test the approach and the parameters around it.

Learn from Cabinet Office Trial Projects

The Cabinet Office Trial Projects group have been working on New Models of Procurement for some time and there are now some tangible examples where value is being created. 2 Stage Open Book had delivered 20% cost savings and improved programme certainty on Cookham Wood Young Offenders Institute and 26% savings on a £157 million North Wales Prison project. Supply chain collaboration with Surrey County Council and Kier delivered improved whole life value, improved warranties, better quality control, time savings and less waste. The Insurance Backed Alliancing approach is being used to reduce the risk of cost over-runs, cost disputes, enables design teams to collaborate directly with sub-contractors and suppliers with a clean sheet of paper to deliver better client outcomes and enable the use of BIM as a collaborative tool.

Standardisation

Requirements must be simplified and standardised with standard products. This will also support interoperability challenges. The requirements can be created and managed in a standardised database against types of buildings, spaces, systems and asset types, which designers and manufacturers can use to design standardized solutions that can automatically be tested against the requirements. This will help clients and their advisors create better thought-through requirements that are less likely to change. It also allows clients to focus on the organisational outcomes they want to achieve, e.g. accommodate more students, improve educational outcomes and support flexibility of space. If the 'Product' is able to demonstrate it delivers better than conventional construction, the business case is made. This builds on BIM as defined in the BSI/ISO standards, but being done properly with proper organisational requirements and asset requirements.

Product, process and interoperability standards

Q8. What unique requirements, including security, do different government departments currently specify that could (not) be rationalised or simplified?

The Constructing Excellence Group did not have sufficient knowledge of this area to effectively provide an answer to this and would require specific input from technical experts.

Q9. How and by whom should product, process and interoperability standards be set, validated and maintained over time?

Independent standards

The current approach to standards can be difficult to understand and requires updating to accommodate these innovations. The work that BRE, the MTC and CDBB are doing through the Construction Innovation Hub must underpin the development of these standards. The Construction Innovation Hub will also be working on digitising the building regulations, which should lead to the development of easy to use design and compliance support tools. If the standards become international standards this would help manufacturers to export and help drive similar initiatives on an international platform.

Standardisation of technologies

One of the greatest challenges to BIM adoption was the lack of consistency applied by national, regional and local government procurement teams. There is an opportunity to learn from this and ensure consistency is applied to the platform approach. This will require empowerment through focused engagement and training of government organisations.

Standardisation across the asset life

Standardisation should include CDM, testing and commissioning, maintenance and life cycle. All four of these should be more joined-up. CDM should directly inform testing and commissioning, which should involve those responsible for operations and maintenance. With Government Soft landings in place, ongoing testing and commissioning should be integral to operation and maintenance. A formalised structure of reporting and feedback in operation would support lifecycle management and informed asset management.

Digitally-enabled interoperability

A standardised platform base that can include common interfaces and assemblies akin to car manufacturing where quality and economies of scale are more easily managed. Traceability of components and products should be linked to BIM (focusing on the Information element of BIM and not distracted by the 3D visualisation elements). Data must be interoperable, structured and linked.

Intellectual Property and other issues

Q10. What should the balance be between the core Intellectual Property (IP) which is retained and available to companies in the sector, and the proprietary IP that should be owned by individual firms?

Intellectual Property

The issue of Intellectual Property (IP) will require careful consideration. The platform will need to allow sufficient scope for innovation to allow for product differentiation in terms of cost, durability etc. The IP for individual components is owned by the manufacturer and that should continue, sub-assemblies have different and separate IP. Between businesses IP should be process driven, given the basic outline and then the IP lies with innovating around that.

Standardisation across the asset life

Standardisation should include Construction, Design and Management (CDM), testing and commissioning, maintenance and life cycle. All four of these should be more joined-up. CDM should directly inform testing and commissioning, which should involve those responsible for operations and maintenance. With Government Soft landings in place, ongoing testing and commissioning should be integral to operation and maintenance. A formalised structure of reporting and feedback in operation would support lifecycle management and informed asset management.

Q11. Are there any other issues that you believe need to be considered if this approach is to be successfully implemented?

Skills

The platform approach will require a shift in the development and delivery of skills at all levels of the industry from site operatives, through manufacturing operatives to professional advisors and clients. There needs to be much more modelling undertaken on the requirements for a new skill base in a manufacturing enabled industry. Traditional trade and professional skills would need to be mapped against a new delivery model. This will require training providers and professional institutions to re-think their skills agenda and create more flexible approaches that keep pace with the technological change that this approach opens up.

Learn from the private sector

The public sector has a history of launching initiatives with a fanfare without a structure in place to support change. The public sector should look at how some private companies and developers are changing their approach to manufacturing-based approaches. Berkeley Group who have invested in a purpose-built, technologically advanced manufacturing facility in Kent to produce a range of modular housing products to meet their high specification and build standards. Legal & General modular homes are investing in factories to deliver a new supply solution to tackle the problem of a shortage of suitable, affordable housing in the UK.

Exploit the manufacturing base

The UK manufacturing base in construction is very strong and this should be exploited/supported. This would be a quick win and could open up export opportunities.

Appendix 1 – List of Contributors

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About Constructing Excellence

Constructing Excellence is a platform from which to stimulate, debate and drive much needed change in the Construction sector. Our thought leading members from the entire supply chain – clients, industry and users – share a vision for change through innovation and collaboration.

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