

i3P INNOVATION INVESTMENT PRIORITIES

Summary Report

The Infrastructure Industry Innovation Partnership (i3P) recently completed a study to identify the Innovation Investment Priorities (IIP) for the infrastructure and construction industry. The objective of the research was *“to identify and agree with sector / programme / supply chain practitioners the innovation priorities for our sector; those areas of activity that can drive most value (including productivity) and where there is the opportunity for transformational change.”*

The research began with a desk-based study of key strategic documents. This informed a survey of i3P members' current and recent innovation projects and a series of interviews with key industry stakeholders. Two workshops were held to explore the findings with industry stakeholders and the i3P membership.

A key outcome from the study was agreement of a Framework within which to locate future innovation projects. The Framework aligns innovation activity according to:

- **Why** we carry out innovative projects, with investment outcomes focused on
 - improving process efficiency
 - improving process outcomes
 - reducing process harm; and
- **Where** in the project lifecycle we carry out innovative projects – that is, which of assets' lifecycle processes are being impacted by investments?

The Framework – adopted by the i3P Strategy Board – allowed the research team to locate members' innovation investments, and to understand any investment gaps that need addressing to help meet the industry's Construction 2025¹ aspirations. Investment needs were assessed in the context of the UK's Transforming Construction Challenge², which tasks the industry to become more productive, delivering increased lifetime value by increasing the digitisation of, and the application of manufacturing techniques in the industry.

This report recommends four strategic priority themes for the industry to meet these challenges. One theme relates to action on the 'demand' side, one theme to action on the 'supply' side, combined with two critical underpinning themes. The four strategic priority themes for the industry are as follows:

¹ <https://www.gov.uk/government/publications/construction-2025-strategy>

² <https://www.ukri.org/innovation/industrial-strategy-challenge-fund/transforming-construction/>

STRATEGIC PRIORITIES

ARTICULATING DEMAND – CAPABLE CLIENTS

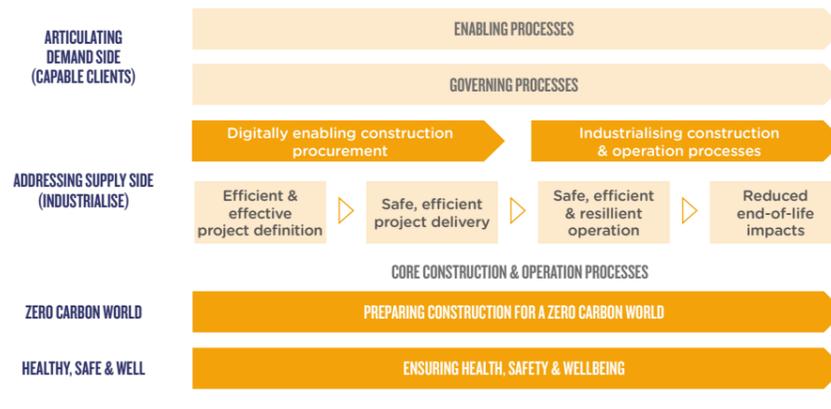
Our study reinforces previous work³ exploring the role of project clients in creating the organisational structures and demand to encourage positive change. The up-skilling of construction clients through the application of digital technologies will allow them to better articulate their value drivers, and to make best use of limited budgets. This would require, for example, the digitisation of standards and regulations and a means by which clients can express their requirements, expectations, and aspirations in a manner that facilitates effective delivery of projects. These digitised constraints can act as the starting point for a golden thread of data to be delivered across the projects, enabling automated delivery, and act as a signal for the development of new digitised delivery models.

ADDRESSING THE SUPPLY SIDE – INDUSTRIALISE

The study has also highlighted the opportunities available to the industry through the processes of industrialisation. However, the construction delivery process is complex, emergent and adaptive, involving multiple parties at varying stages of development. In these circumstances, organisations will typically adopt incremental, rather than transformational improvements to avoid disrupting their existing businesses. Calls for ‘digitisation’, or the adoption of manufacturing perspective can seem nebulous and daunting. Industry should develop a supply-side industrialisation road map that moves the industry forward in stages.

PREPARING CONSTRUCTION FOR A ZERO CARBON WORLD

The Government’s aspirations for a net zero carbon economy presents the industry with existential risks. How can we build and operate new assets in a net zero carbon world? The diffusion of new technologies



and ideas in the industry is slow. The industry should revisit the UKGCB’s 2013 roadmap⁴, the latest academic studies, and the Infrastructure pipeline to consider the development of a technological and policy roadmap that will position the industry to develop its response to that challenge.

ENSURING HEALTH, SAFETY AND WELL-BEING FOR ALL

The industry’s aspiration is that construction activities should be 100% safe whilst ensuring the health and well-being of everyone working or involved with the industry. How can we design, build and operate new assets in a zero harm construction world? The industry has made significant improvements over the past 20 years. However, the industry should now explore how, by applying new technologies and ideas in construction, we can delivery on these health, safety and well-being aspirations.

The i3P Strategy Board is currently working closely with the Construction Leadership Council (CLC) to leverage this research. The next step is to identify the next level of detail and to ensure that we are able to articulate each of the four strategic priority themes with clarity across the whole industry.

This process includes the development of a series of roadmaps for delivering on these priorities to transform the industry. These roadmaps could be used to identify the necessary investments and activity in the industry, which can then be compared against the investment analysis undertaken during the research. As an industry, we will then be in a position to identify what further projects are required to deliver the necessary transformational change, focusing and encouraging collaborative and coordinated research, development and innovation activity. These projects can be located in the strategic Framework to ensure a coherence, while the development of communities of interest can build industry cohesion.

Ownership of these strategic roadmaps should be vested in an adequately resourced Construction Leadership Council supported by the Infrastructure Industry Innovation Partnership (i3P) and other industry bodies.

It is clear from the research that in addition to these four priority themes, there are specific shorter-term opportunities for the industry to improve productivity, and reduce project uncertainty over costs and time. The following recommended actions are consistent with the strategic aims described.

OVERVIEW OF RECOMMENDED ACTIONS

INDUSTRY ACTION: DEVELOP AN AGREED MODEL OF THE CONSTRUCTION ASSET LIFECYCLE

The benefits achievable by intervention in existing processes were seen to be inconsistent between projects and studies. This is due, in part, to a lack of clarity of the language used and the absence of a comprehensive, industry-wide strategic framework for locating and analysing the problems at hand. The industry should collaborate to develop common benchmarks, an agreed lexicon to describe interventions, and, building on the work of i3P, produce a map of the construction asset lifecycle. Adopting a common analytical framework will enable a more holistic perspective on the benefits of interventions in the project and programme environment.

INDUSTRY ACTION: DEMYSTIFYING INDUSTRIALISATION

The research has highlighted that the industry could make significant productivity gains by focusing on its current activities consistently – ‘*doing what we do now, better*’. By analysing the construction process into its constituent sub-processes, each can be explored at a granular level and appropriate levels of industrialisation applied, up to and including the digitisation envisioned in ‘Industry 4.0’⁵. However, developing a common understanding of what this means is an important early step. Industry could leverage work undertaken in academia to develop best practice guidelines as to how companies might obtain the benefits of the industrialisation of their processes.

INDUSTRY ACTION: INTRODUCING A NEW PROJECT DELIVERY MODEL DECISION POINT

The benefits of industrialisation can be most readily be achieved when early decisions are taken

to adopt the necessary design protocols to facilitate manufacture and assembly (i.e. DfMA). However, currently, there is little consideration of project delivery model prior to the commencement of design. The Government departments with a presumption for offsite should introduce an early and unambiguous decision point as to the delivery model in infrastructure and construction projects.

INDUSTRY ACTION: CONSOLIDATING GOVERNMENT DEMAND AS STIMULUS

Consolidating and smoothing major clients’ demand has an important role to play in stimulating a market response. Building on existing work⁶, the Government departments with a presumption for offsite should explore their common procurement needs and the opportunities to consolidate and digitise these requirements where possible.

INDUSTRY ACTION: LEARNING FROM OTHERS

i3P member organisations with operating infrastructure assets are making significant advances in the application of digital technologies. We are also aware of related activity in non-member organisations. Projects delivering new assets can and should be learning from this experience. Knowledge transfer should be facilitated by the active development of communities of interest.

INDUSTRY ACTION: DEVELOP FUNDING MODELS TO SUPPORT PRE-COMPETITIVE INDUSTRY ACTIVITY

Knowledge consolidation and transfer have a large role to play in the coming transformation. However, funding and coordinating the collaborative activities that advance the industry can prove challenging in such a competitive, fragmented, and margin-constrained industry. Funding models

should be explored that facilitate a strategic view of technology change across the industry.

The i3P membership is committed to collaborating to advance the infrastructure and construction industry, building on our members’ ongoing £1bn innovation investments. We look forward to working across the infrastructure and construction industry to address the challenges we face during the process of change, to help share knowledge, and to form communities of interest that we can deliver on the aspirations of the Transforming Construction agenda.

3 For example, the ICE’s Project 13 <http://www.p13.org.uk/>

4 <https://www.building.co.uk/focus/construction-40-where-are-we-now/5090500.article>

5 <https://www.building.co.uk/focus/construction-40-where-are-we-now/5090500.article>

6 https://www.cdbb.cam.ac.uk/system/files/documents/DigitalBuiltBritainbook_screen.pdf



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