Built Environment
Industry Innovation Council

Increasing the Productivity of the Buildings Network by adopting Building Information Modelling

Summary

A study commissioned by the Built Environment Industry Innovation Council[i] has shown that the use of Building Information Modelling (BIM) by those involved with the design, construction and operation of buildings (Buildings Network) will dramatically increase their productivity.

In our experience, there are very few options available for enhancing productivity that can be achieved on such favourable terms and without difficulty to achieve structural reform[i]

Using BIM has the fortunate ability to reduce time, cost, material consumption and carbon emissions while improving quality. BIM is a highly effective way of capturing and sharing accurate, digital, three dimensional information regarding the design, construction and operation of a building.

An Australian survey has found that using BIM is estimated to improve the productivity of the Buildings Network by a very significant 6-9% with an extremely high benefit cost ratio (BCR) of ten.

Concerted government support for the use of BIM by the notoriously fragmented Buildings Network could increase usage in 2025 by 6-16% according to conservative estimates from industry representatives. This accelerated rate of BIM adoption would produce an economic benefit equivalent to $5 billion added to Australia's GDP.

Widespread use of BIM will also increase the performance of new and renovated buildings with improvements in: material consumption; energy efficiency; carbon emissions; and the productivity of the occupants. These gains have not been fully quantified by the BEIIC study and are in addition to the GDP increase noted above.

Context

According to Built Environment Industry Innovation Council, increasing use of information technology, facilitated by the National Broadband Network, will have a profound effect on the way the Built Environment is planned, designed, procured, constructed and operated:

- Plans and designs can be conceived, tested and optimised in a virtual world before committing to construction. Such plans and design will benefit from access to data about usage, consumption and performance of the existing built environment.
- Construction will tend towards a manufacturing process using "just in time" procurement allied to "mass customisation" and on-site assembly with all information flowing directly from digital databases and/or information rich models (Built Environment Models - BEM).
- Assets can be managed and efficiently operated directly from BEM, reducing energy consumption, optimising operating costs and determining replacement plans.

- Some systems (transport, electricity grids, water supply for example) can be optimised in real time using sensors, networks and computers.
- People will improve their usage of systems if provided with real time, pertinent information via communications networks (urban informatics, smart meters).
- All usage, consumption and performance of systems and assets, including relevant human behaviour, can be recorded; used for physical optimisation and reconfiguration; and fed back into the planning and design of the future built environment.

The Built Environment Industry Innovation Council study confined itself to the use of BIM in the design, construction and operation of buildings – a subset of the bigger picture set out above.

Accelerating BIM Uptake

The following actions would accelerate the uptake of BIM by the Buildings Network:

- Using BIM in the procurement of Commonwealth buildings. This would give the additional benefit of increasing their performance in use and the return on investment.
- Encouraging State Governments and other public bodies to follow suit.
- Developing and implementing new contractual frameworks that encourage efficient collaboration while addressing the issues of risk, responsibilities and liabilities when using BIM.
- Developing a national strategy for BIM implementation including plans, targets and guidelines.
- Encouraging the development of national standards for BIM.
- Encouraging the creation and maintenance of intelligent object libraries that comply with national BIM standards.
- Reducing BIM related skills gaps in the current and future Buildings Network workforce

Conclusion

BIM has macroeconomic significance; its accelerated widespread adoption would make a significant difference to national economic performance; and there is a compelling economic case for encouraging greater use of BIM in Australia[i]

Such encouragement can be effectively provided by the Australian Government.

[i] Source: Allen Consulting Group, 2010, *Productivity in the buildings network: assessing the impacts of Building Information Models*, report to the Built Environment Innovation and Industry Council, Sydney, October 2010.