



**WESTERN SYDNEY
UNIVERSITY**



Centre for
Smart Modern Construction

c4SMC INTER-UNIVERSITY ACADEMIC ROUND TABLE

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Off-Site Construction Manufacture-Business Impact

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Presentation Outline

- Barriers
- Business Value
- Subcontractors Acceptance/Value
- Insurance and Financing
- Digital Technologies
- Project Management Practices/Curriculum

Barriers

- lack of technology awareness
- supply chain capacity constraints
- cultural perception
- lack of viable business process models/solutions
- high initial investment costs
- incompatibility and inflexibility of designs
- separation of design from manufacturing
- perceived higher overall cost
- logistics and transportation challenges
- lack of skills to work with these new technologies and components

Business Value

- Whole Life Cycle Analysis
 - Expensive upfront
 - 10% time savings (6 months off 5 year project)
 - Price escalation saving
 - Shorter borrowing period
 - Time to market decreases, added revenue
 - Improved Asset Management
 - 7% cost saving
- (KPMG, 2016)

Subcontractor Acceptance/Value

- Traditionally, up to 95% project is subcontracted-source of fragmentation
- Subcontractors need to embrace the approach

“Subcontractors were only just beginning to understand these impacts and still retaining the old structures in a newly emerging production and technological world” (Goh and Loosemore,2017)

“Say a 5 million dollar contract I don’t do the fit out and I don’t supply the fixtures so it reduces the 5 to a 3.8 but I still have my managers on site for the whole project ... so while my workload reduces my overhead stays the same” (Goh and Loosemore,2017)

Insurance and Finance

- Do Banking/Finance and Insurance sectors understand and accept Offsite Construction?
- Prefabrication reduces the on-site work to a simple installation process, with no gradual progression, so the builder/ manufacturer needs funding up-front.
- Such cash flow issues struck Unitised Building and Modscape. They were forced to seek overseas financial backing or draw on private equity

<http://builtoffsite.com.au/issue-01/prefab-australian-building-sector/>

Digital Technologies

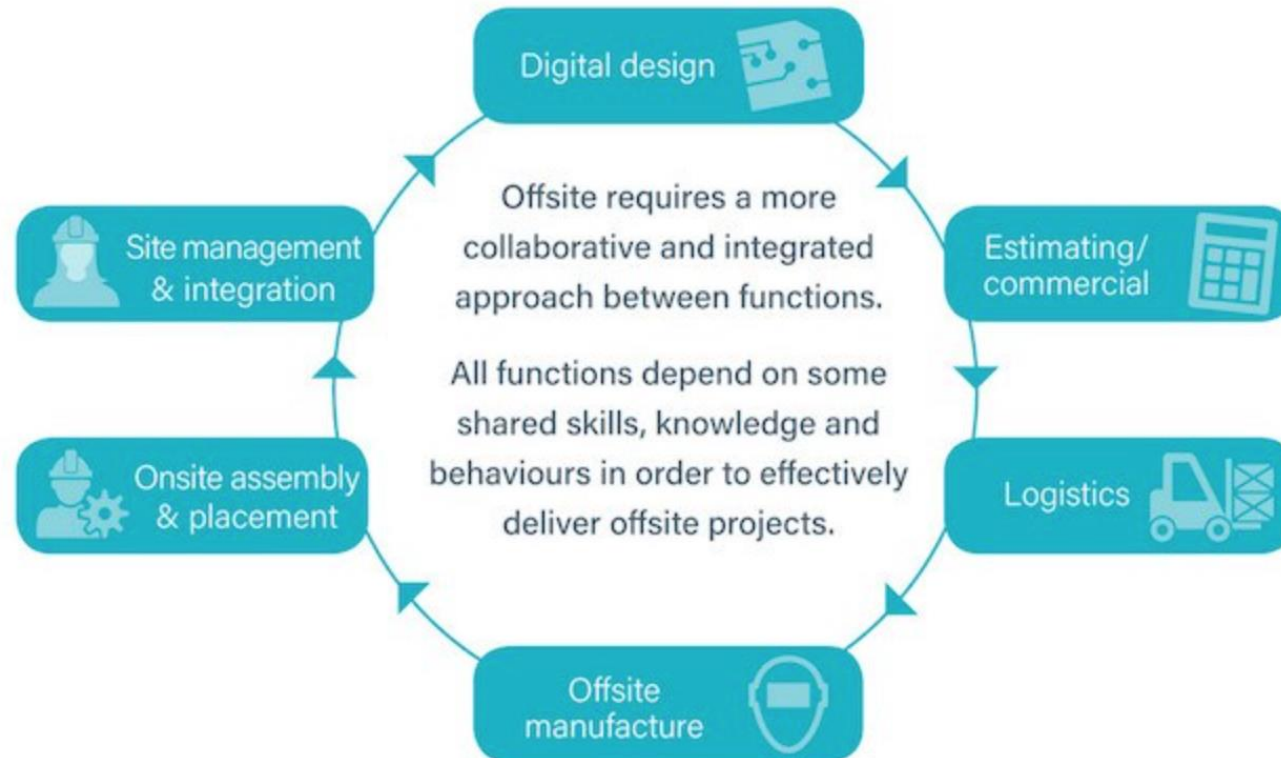


Project Management Practices/Curriculum

- Planning and Scheduling approach fundamentally changes (modules manufacture/assembly rather than activities)
- More time upfront in design/manufacture and less in constructing
- Risk Management
- Stakeholder Management
- Quality Management
- Contract Management-Role of RFIs/Change Orders?
- Site layout/logistics
- Knowledge Management?
- Unlearning

Conclusion

- OSCM has to be integrated through the use of digital technologies, seamless integration of different operations/processes through reliable and timely information, earlier involvement of all stakeholders



Bibliography

- A.G., 1999. *Off-site fabrication: prefabrication, pre-assembly and modularisation*. London: John Wiley & Sons.
- Chiang, Y.-H., Hon-Wan Chan, E., and Ka-Leung Lok, L., 2006. Prefabrication and barriers to entry—A case study of public housing and institutional buildings in Hong Kong. *Habitat international*, 30, 482–499
- Edward Goh & Martin Loosemore, 2017. The impacts of industrialization on construction subcontractors: a resource based view, *Construction Management and Economics*, 35:5, 288-304
- KPMG, 2016. Smart construction :How offsite manufacturing can transform our industry, <https://assets.kpmg.com/content/dam/kpmg/pdf/2016/04/SmartConstructionReport.pdf>, accessed 12 Nov 2018.
- Lu, N. and Liska, R.W., 2008. Designers' and general contractors' perceptions of off-site construction techniques in the united state construction industry. *International journal of construction education and research*, 4, 177–188.
- Loosemore, M., 2014. *Innovation in the construction industry: turning serendipity into capability*. London: Routledge.
- Rahman, M., 2014. Barriers of implementing modern methods of construction. *Journal of management in engineering*, 30, 69–77.
- Goulding, J.S., et al., 2015. New off-site production and business models in construction: priorities for the future research agenda. *Architectural engineering and design management*, 11 (3), 163–184.