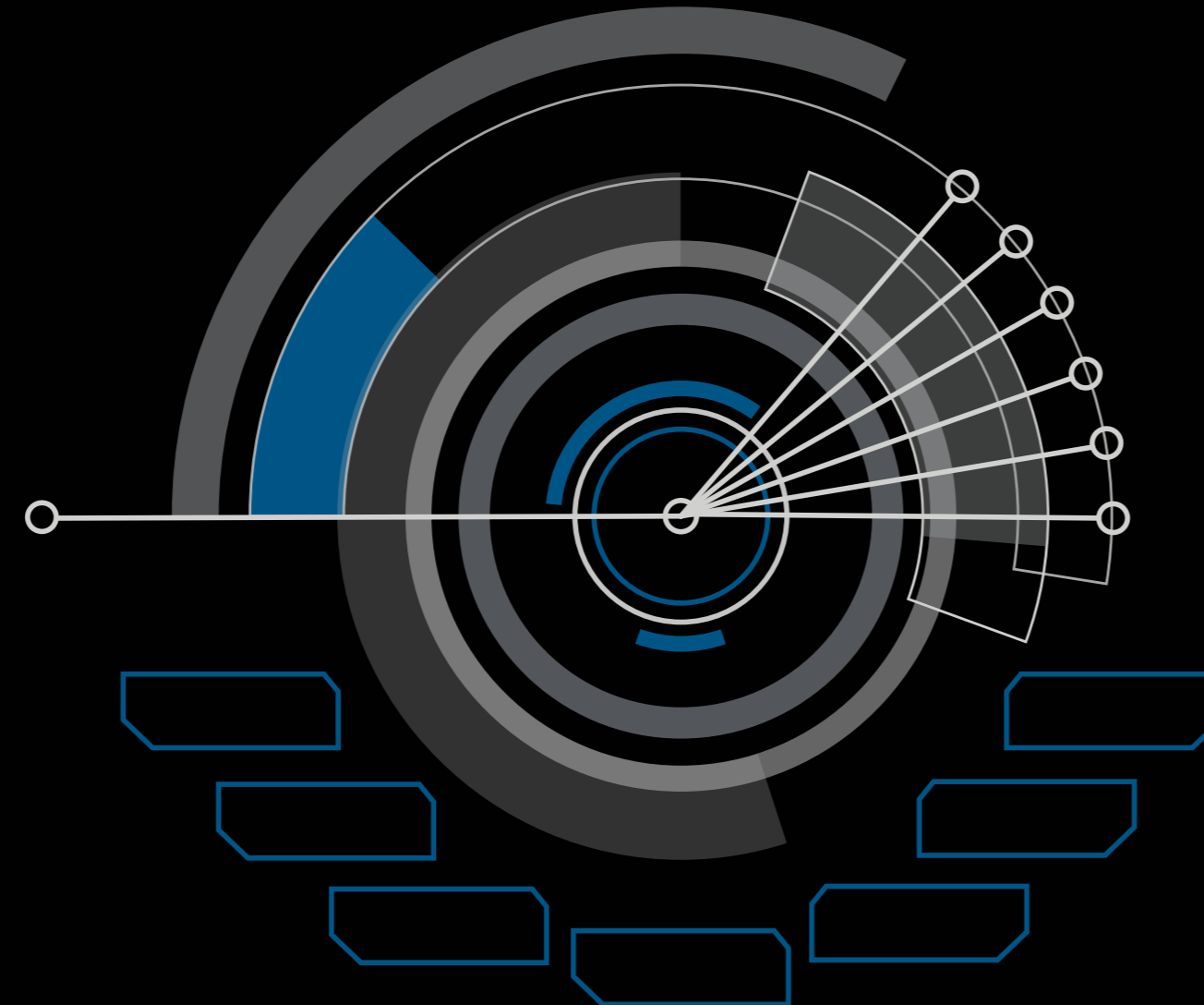


Predictions – Modern Methods of Construction

The world is on the brink of a technological transformation; one that will disrupt the way we all live our lives, the way we work, and the way we interact. The World Economic Forum has, for a few years now, described this upcoming event as the ‘Fourth Industrial Revolution’, and has characterized it as a ‘fusion of technologies that is blurring the lines between the physical, digital, and biological spheres’¹. Multiple industries are continuing to enter this exciting new era, transforming the way they work with the support of new digital technologies and automation, and innovative organizational structures.

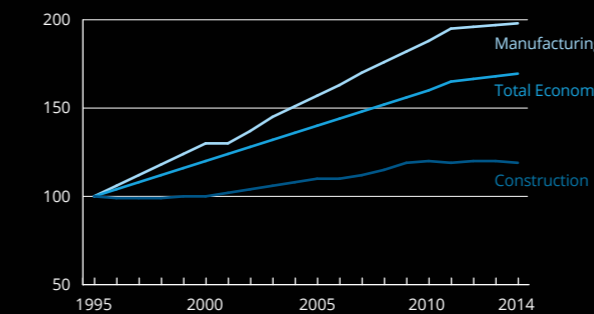
1. Statement by Klaus Schwab World Economic Forum 2016, <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/> accessed 13 May 2020



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But the construction sector is lagging. Despite being one of the largest and most important industries (accounting for some 9% of the European Union's overall economy according to the European Commission), construction has had a productivity problem for decades. Whilst other industries have progressed significantly in the last 25 years, construction remains a slow adopter of new technologies and innovation and therefore continues to be plagued with past failings. Low margins, high risk, skills gaps and inconsistent project delivery have a material impact on both the industry and its clients.

Figure: Global productivity, real gross value added, 1995 = 100 per hour worked²



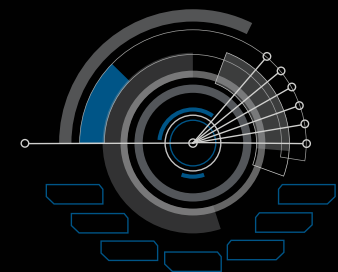
2. The Economist, The construction industry's productivity problem, August 17, 2017, <https://www.economist.com/leaders/2017/08/17/the-construction-industrys-productivity-problem> accessed 28 April 2020

There have been substantial developments in some areas of construction including robotics and automation which are pushing the envelope as to what can be manufactured for building and infrastructure projects off-site. Building Information Modelling (BIM) is now in use across most major projects, and is even mandated on certain governmental projects. The capability exists to 3D print building modules and components, make extensive use of drones to complete site surveys and make greater use of the Internet of Things. If such technologies were more widely embraced the industry and its clients could potentially create more sustainable and efficient buildings. So, why is productivity in construction still lagging?

The continued alignment of new and recent technologies already within the industry will continue to trigger the disruptive modernization many continue to look and hope for. A more advanced position will be achieved through a holistic change of mindset within the industry that realizes that technology is a friend to be embraced rather than an enemy whose aim is the demise of tried and tested roles and norms. The industry's past responses to the challenges that the construction industry faces (e.g., improved training, increased wages, creating and leveraging less adversarial contracting techniques) have not been universally effective in creating a catalyst for change. Past responses have generally failed to create a 'tipping point' to generate a notable uptick in productivity and we would therefore contend that only with the broader integration of people, processes, data and technology

will the productivity of the industry be truly disrupted. Some of the key actions the industry might want to consider pursuing are listed below:

- Attract top talent - to do this, consider recruitment and training in line with other advanced manufacturing/heavy industries, such as the industrial and automotive manufacturing sectors. Focus efforts on re-branding to generate elements such as a more inclusive agenda, up-skilling with digital techniques and software platforms, new training and re-training to keep in-sync with the latest building technology methods;
- Construction organizations need a step change in their operating models, including their governance, processes and systems, so that they are more aligned with leading practices in manufacturing. Some of the reasons off-site manufacturing has not been able to fulfil its full promise is because it is too often used for single projects, or used to support or supplement other, more traditional, construction processes which makes it hard to justify the costly upfront investment needed to establish manufacturing facilities;
- Greater alignment of supply chains through the entire asset lifecycle will be needed in order to truly 'system integrate' the construction technology and innovation that is already available. For example, the use of BIM has been in place for more than a decade but without buy-in and commitment from all key parties involved in delivering and operating the



asset to be constructed, the true value of BIM, which applies throughout an asset's entire lifecycle (not just the design), can never be fully realized;

- The industry culture must continue to build on the progress already made and strive towards even greater collaboration - To date, construction behaviors continue to struggle to get the balance right. Embracing more standardized processes (like those in manufacturing) and leveraging the latest available technologies (which can encourage contract compliance, and reduce potential claims through effective early warning systems and transparent 'one version of the truth' reporting) could help all parties work better together towards a common objective; and
- The industry must find a way of investing more heavily in integrated toolsets because single tools used by individual suppliers or clients can only add value to very specific elements in an asset's lifecycle, whereas integrating technology across a project

can align project resources, improve quality, and increase efficiencies. For example, BIM is a 'gateway' tool for other technologies, including robotics, drone construction monitoring, and 3D printing where each of these are strong value drivers for off-site fabrication, and could increasingly supplement the step change needed to improve productivity in the industry more generally.

The opportunities for 'positive' disruption in the industry continue to be large and exciting. The businesses that pioneer, embrace and develop these disruptive changes, and can take advantage of them, will have a significant competitive advantage over their peers. The key question remains – is your business doing enough to harness the opportunities of the Fourth Industrial Revolution?

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