

ICCF 2020 Conference Report

The [University of Wolverhampton](#) held its 2nd International Conference on Construction Futures (ICCF2020) on 7 July 2020. This was held as a free online event due to COVID-19 and was co-chaired by Professor Mohammed Arif, Dr David Heesom and Professor Jack Goulding. This conference followed a slightly different format to 'conventional' academic-research conferences. This was delivered completely online through Zoom, which showcased leading research from 11 world leading experts on various areas related to the future of the sector. This attracted 361 individual participants from 46 countries.

The conference commenced with the announcement of an Honorary Doctorate for Mark Farmer. Mark is well known for his seminal 2016 report '[Modernise or Die](#)' which provides a future roadmap for the industry, along with 10 recommendations, key success factors and future steps. He has also been recently appointed as the UK Government's champion for Modern Methods of Construction.

Alan Muse ([RICS](#)) presented the vision from the recent RICS [Futures Report](#) and [Future of BIM](#) insight paper. He highlighted issues around talent and skills within the industry and the need to ensure these remained relevant as the industry progresses. In particular, noting that the role of BIM and digital construction was now a key part of all projects, especially the transition from BIM levels to BIM stages and the impact that industry 4.0 will have on these.

Don Ward (CEO of [CIB](#)) provided an overview of global research and aligned this to the context of the day's event. He presented the overarching commissions of CIB, and discussed the global sector trends from 2019, including productivity and skills shortages and how these impacted the demand for increased housing and infrastructure. This keynote also highlighted that offsite construction and the use of digital construction methods had the potential to not only help resolve these challenges, but given the recent COVID pandemic, there was a real opportunity to accelerate the adoption of digital technologies to foster increased collaborative working to deliver wide-ranging opportunities.

Professor Farzad Khosrowshawi ([Victoria University](#)) presented a thought provoking keynote titled 'God, human, physics, engineering, construction'. This presented discussions around entropy to the dawn of a new era through to the onset of the Internet of Things. The presentation called for a 'Construction Theory of Everything' to ensure a truly collaborative approach is adopted – especially for BIM. Collaboration within the industry was seen as being critical – where this should be demanded (rather than hoping for it to happen). It concluded with a postulation of the construction industry by asking would there be a need for homo-sapiens in the future?

Professor Chimay Anumba ([University of Florida](#)) discussed the concepts and applications of Cyber Physical Systems and Digital Twins within the context of construction. This highlighted the underlying philosophy of bi-directional coordination between 'physical' and 'virtual' in Cyber Physical Systems using several examples from the research undertaken at the University of Florida. This included monitoring temporary structures and analysing safety control for mobile cranes, including pioneering work on digital twins and the potential this has to improve maintenance, safety, and deliver optimal decision making.

Professor Mark Hastak ([Purdue University](#)) discussed the concept of Intelligent Planning Units (IPU), and how these can be used to break down complex built assets into simple units. The underlying principles of this can help stakeholders appreciate these relationships in order to develop built environment intelligence. A conventional building brick was used as an example of an IPU – demonstrating how Nano particles could be used to develop intelligent buildings, which in turn could lead to intelligent cities and subsequently a fully intelligent world.

Professor Lukumon Oyedele ([University of the West of England](#)) presented several approaches for leveraging digital innovation. This was underpinned by seminal work undertaken at the [Big-DEAL laboratory](#) including infrastructure, engineering, construction, operations and facilities management. This keynote highlighted that cross-disciplinary innovative digital solutions can be used to solve real-world problems using a number of conduits from Artificial Intelligence and Machine Learning, through to BIM and Big Data Analytics.

Professor Dilanthi Amaratunga ([University of Huddersfield](#)) presented a keynote on the current global pandemic and its impact on the construction sector and various supply chains. A range of unprecedented challenges were explored and contextualised against supply/demand corridors and subsequent changes in investment patterns. Evidential statistics highlighted that project durations could increase between 5-10% along with revised downturn in sector growth. However, several opportunities were also presented to offset and stabilise these challenges, including: supply chain optimisation using increased levels of digital workflows, the wider adoption of offsite construction and developing new design approaches that support more healthy living.

Professor Lucio Soibelman ([University of Southern California](#)) showcased a number of pioneering research activities and emerging technologies supporting the concepts of smart buildings. This included the use of measurement technologies and methods for enhancing project workflows. This was used to present a number of AI, automation and robotics exemplars, including the fusion of these to deliver greater efficiencies. This keynote also emphasised the need to embrace humanics into wider thinking, especially the key cognitive skills needed for the next generation construction workforce.

Professor Richard Burt ([Auburn University](#)) took the audience back in time to look how emerging technologies could meaningfully support the recording of historic buildings and subsequent reconstruction. This reflected on parallels between the new University of Wolverhampton historic [Springfield Brewery](#) site and the creation of new buildings on historic brewing sites in Alabama. The similarities in the architectural heritage of the buildings (in addition to the history of beer brewing) was showcased, including the need to adopt new approaches to construction as part of the regeneration process.

Professor Anil Sawhney ([RICS](#)) and Professor Javier Irizarry ([Georgia Tech](#)) reflected on Construction 4.0 and the impact of this on the 'new normal' as the world transitions to a post COVID-19 environment. Several technological solutions and scenarios were presented through this keynote, including the need to support social distancing through innovative approaches such as telepresence and remote observations/inspections. A wide range of opportunities were also discussed, including the need to revisit the training and education of construction professionals to meet new Construction 4.0 approaches.

The conference was closed by Don Ward (CEO of [CIB](#)) who asked conference attendees to reflect on his earlier poll to see if perceptions had changed after these keynote presentations. The rationale was to gauge opinions and viewpoints for future thinking. Survey results found that 80% of attendees believed that the industry was entering a new transformational era. Moreover, a significant proportion of respondents were optimistic that the emerging approaches, new working practices and digital challenges could help this transition.

Professor Mohammed Arif
Dr David Heesom
Professor Jack Goulding