EDITORIAL

Economics of Digital Construction

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Welcome to this special issue of our CEB journal, dedicated to exploring the multifaceted economic dimensions of digital construction within the Architecture, Engineering, Construction, and Operation (AECO) sector. As digital technologies increasingly spread throughout this sector, they bring about transformative impacts not only on how projects are designed and managed but also on the broader economic landscape. The rapid adoption of technologies like Building Information Modelling (BIM) and digital asset management systems has set a new paradigm in project efficiency and data utilisation. These advancements promise substantial economic benefits, ranging from increased productivity to enhanced decision-making capabilities, which, in turn, can spur significant growth in the broader economy. However, efficient and fair distribution and diffusion of these benefits in society is not always given, as stronger economies can more efficiently utilise the benefits of Digital Construction compared to weaker economies. Consequently, there is a need signaled for structural reforms in the latter, to improve the rate of integration of digitalisation in the construction sector (Kapogiannis, et al., 2023). Climate change is also a factor that now poses challenges for the construction sector, with digitalisation a key element able to address these challenges.

Our focus in this issue is diverse. We begin by setting the stage with a retrospective on the initial economic evaluations of BIM, highlighting foundational reports such as those by Schulz, et al. (2013) and the influential Construction 2025 Report by the United Kingdom government, which mandated BIM usage for public projects over a certain financial threshold. These foundational insights have shaped policies and practices that aim to harness the economic potential of digital technologies. However, challenges persist, especially for small and medium-sized enterprises (SMEs) coping with the demands of digital transformation.

The insights from OECD reports and European Union analyses in 2021 remind us that while the path forward is promising, it is strewn with hurdles that require strategic consideration and policy intervention. Henceforth, this issue features a diverse collection of articles from around the world (mainly Africa, Asia and Europe) that provide a deeper dive into these topics.

Cakmak and Akturk assess the existing literature on the potential of digital construction technologies from a building economics perspective, identifying digital construction technologies that contribute to building economics. The analysis showed that despite the added value of digital technologies to building economics, primarily in measuring and monitoring construction resources and activities, adoption is relatively slow and mostly concentrated on the early phases of the building life cycle.

Therefore, Alkhard, focusing on Digital Asset Management (DAM), highlights the need for transition from traditional to digital facilities and asset management methods, emphasising the necessity for modernisation in the construction sector. This research, conducted in a Saudi Arabian public school, demonstrates the practical implications of digital technologies in asset management, and shows how data-driven approaches can revolutionise traditional practices, leading to improved operational efficiency and strategic asset management in governance practices.

Despite digitalisation in the construction sector being a sine qua non prerequisite for economic efficiency, the wealth redistribution impact of new technologies should also be considered. The Afolayan and Ajibowu article on gentrification and housing policies in Lagos, Nigeria, offers an investigation and understanding of the socio-economic impacts of digital construction technologies. The study highlights the sustainability of public policy efforts at subsidising low-income housing and their eventual beneficiaries, thus shedding light on the broader socio-economic dynamics and policy efficacy within digitally evolving urban environments. It also mentions the importance of possible administrative, legal and taxation measures to achieve sustainable subsidy practices in future projects.

It becomes evident that the new digitalised era in the construction sector requires an appropriate institutional framework. In that sense, Sood and Laishram provide a systematic review on the implementation of 7D-BIM for infrastructure asset management, illustrating the critical challenges and potential solutions of adopting BIM across different stages of project lifecycles. This comprehensive analysis not only highlights technological impediments but also suggests how policy frameworks and governmental support can play pivotal roles in overcoming potential obstacles.

There are numerous benefits to digitalisation in the construction sector. However, as climate change poses new challenges for humanity, technology should inevitably strengthen sustainability. Getvoldsen, et al. consider the sustainability dimensions, aligning the principles of sustainability with the Climate Change Act 2008 through detailed numerical modelling of insulation improvements in UK housing. This study bridges the gap between digital construction, sustainability, and legislative frameworks, demonstrating the potential for significant CO_2 savings through integrated approaches.

This special issue, therefore, not only emphasises the economic benefits and challenges of digital construction but also explores its broader implications on society and policy. By investigating into these varied themes, we aim to foster a clearer understanding of how digital construction can drive economic and societal advancements. Taking for granted the usual tradeoff between efficiency and fairness in economics, our goal is to inspire our readers—whether policymakers, practitioners, or researchers—to actively engage with these insights and to consider how digital construction can be leveraged to achieve not only economic efficiency but also societal well-being and sustainable growth. Through collaborative efforts and continued dialogue, we can ensure that digital transformation of the AECO sector remains a cornerstone of innovative economic development and social progress.

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