

Guest editorial

Taking stock on building adaptability research and practice

Buildings are a key part of the built environment and they have a significant impact on the economic, social and environmental sustainability of a society. These include: their contribution to the wealth of nations, providing space for economic and social/family activities, defining the culture and heritage of a society, and impacting the natural environment through the use of materials and energy in their construction, operation and use, and the emission of CO₂ and other harmful gases to the environment.

Buildings are generally fixed assets with a lifespan of around 25/30 years but which can last for hundreds of years. Over the course of their lifetime, they are adapted to incorporate new performance requirements, cope with the changing needs of owners and users and the pressing challenges that climate change may bring (Thompson *et al.*, 2014). The importance of adaptability is also acknowledged in other disciplines such as ecology, where adaptive capacity is seen as "essential for maintaining the resilience of social-ecological systems and for coping with environmental change" (Fazey *et al.*, 2007, p. 375).

The adaptability of buildings is therefore a key lifecycle consideration and is a very important strategy for the sustainable design and construction of buildings (Langford *et al.*, 2002; Webster, 2007; Gosling *et al.*, 2013). The more adaptable buildings are, the better they will maximise their social and economic value (e.g. through extended useful life) and the less their impact on the environment through less consumption of resources to create new buildings. However, like all lifecycle issues, there is usually a trade-off with the initial capital cost of construction and the need for informed decision-making at the design stage is crucial to understand the costs and benefits of such measures (Thompson *et al.*, 2014).

The consideration of lifecycle issues in the design and creation of buildings is now well established and various techniques such as whole life costing, designing for facilities management, etc. have been developed to assist with lifecycle analysis. Likewise, adaptability also needs to be considered early on in the design process for new buildings, and at the point when changes to an existing building are proposed. The availability of appropriate tools and techniques that will allow relevant stakeholders to make informed decisions about the adaptive capacity of new and existing buildings will make an invaluable contribution to the creation of more adaptable buildings.

This special issue on building adaptability is an attempt to take stock on current research and practice in the adaptability of buildings. It comprises of eight papers and a book review, which draw mainly from research in the UK, but also from Australia, Iraq, Italy and Hong Kong. With respect to building sectors, it includes heritage buildings, retail, civic, social care and sport (Olympic construction).

The first paper by Heidrich *et al.* is a literature review of developments in the adaptability of buildings. It sets the tone of the special issue by providing a "state-of-the-art" on trends in research and practice. Insights into the meaning of building adaptability and implications of various adaptation strategies are provided, and recommendations for further research are made.

The next three papers in the issue focus on restoration, heritage and traditional buildings. The first of these, by Nwachukwu *et al.*, examines critical success factors for

Most of the papers in this special issue are from participants who attended a Workshop on Building Adaptability at Newcastle University, UK, on Thursday 21 July 2016. The Workshop was part of a project ("Towards a Standardised Assessment of Building Adaptability") that was funded by Newcastle University's Institute for Sustainability and Gateshead Council. The contributions of funders and workshop participants are gratefully acknowledged.



stakeholder management in restoration projects in the UK, whilst the second by Conejos *et al.* looks at the adaptivity of nineteenth-century buildings using case studies from Australia and Hong Kong against the framework of the adaptSTAR model, which assesses the adaptive reuse potential of heritage buildings. The third paper, by Agha and Kamara, explores the adaptations of traditional courtyard houses in Baghdad, Iraq, and provide insights into an aspect of adaptability that is not often discussed in literature: lifestyle and user adaptations, and how these relate to the ease of change of the building fabric.

The remaining four papers are mainly focussed on the design issues relating to adaptability. Fieldson's paper examines the early consideration of lifecycle needs in the retail section and explores the possibilities, processes and people who might "[...]" influence the afterlife of the building and incorporate future needs through design [...] and communication of design intention [...]" Ladinski's paper on the Gateshead Civic Centre building is a case study of how early design decisions have contributed to the adaptability of a civic building. Brown and Cresciani's paper explores models of adaptability in Olympic construction using case studies from the Rome (1960) and London (2012) Olympic Games. And finally, the adaptations of a new care home development to accommodate climate change concerns are explored in Botti and Ramos' paper.

The book review on Robert Schmidt III and Simon Austin's book (*Adaptable Architecture: Theory and Practice* – Schmidt III and Austin, 2016) by Costantini, is a concise precis of a book that was informed by extensive research into the adaptability of buildings. It is thus a fitting conclusion to the collection of papers in this special issue, but not to the research in the subject of adaptability. As the various papers have suggested, there is still further scope to understand the interrelationships between the various triggers for adaptability, the range of possible interventions and implications for adapting all types of buildings and for all types of changes they might face over their lifecycle.

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