**05.** New Horizons

# Exploring the Relation between Circularity and Adaptability in Adaptive Reuse

Mohammad B. Hamida
*PhD candidate*
*Department of Management in the Built Environment*

*Adaptive reuse is a coping strategy that can be implemented to proactively or reactively address change in buildings*. We quite often refer to adaptive reuse as "building transformation," "building conversion" or even "building change of use" – which can be simply described as the process of re-purposing and re-using a building to meet the functional requirements of a new use. Adaptive reuse has been seen considered closely related to circularity as a strategy that prolongs the lifespan of existing buildings, thereby minimizing waste, and limiting the use of new material resources.

In fact, *adaptive reuse* is a multi-dimensional strategy whose application *depends on* complex social dynamics and emergent phenomena that trigger building changes such as: *building obsolescence, property vacancy, market volatility, demographic changes, technological advancements,* and *environmental degradation*, among others. All of these factors, alone or in combination, may trigger building changes and therefore, the adaptive reuse of buildings becomes an inevitable and indispensable action. We do, however, need to prepare for adaptive reuse in a comprehensive way: this means ensuring that it is not limited to 'resource reuse' only from a materials' perspective, because that may result in overlooking contextual considerations pertaining to the long-lasting functionality of the built environment. Instead, adaptive reuse needs to be planned in a way that can be futureproof to accommodate changes across all of the aforementioned complex social phenomena.

So, how can we make adaptive reuse futureproof and resource-efficient? We do argue the need for a new conceptual framework that brings together circular and adaptive strategies in order to cope with the complex social phenomena we previously mentioned. We hereby introduce the concept of *'Circular Building Adaptability'* (CBA) as:

*The capacity to contextually and physically alter the built environment and sustain its usefulness, whilst keeping the building asset in a closed-reversible value chain.*

*The Circular Building Adaptability Model*

Based on an extensive literature review, we have been able to identify ten determinants that can enhance the longevity and efficiency of adaptive reuse interventions. Some of these are exclusively related to *adaptability*, like *functional convertibility, volume scalability* and *asset refit-ability*. Some other determinants relate exclusively to *circularity*, such as *material reversibility, resource recovery* and *building demount-ability*. But there are some that apply to both *circularity and adaptability,* namely: *configuration flexibility, product demount-ability, asset multi-usability* and *design regularity.*

# Circularity for Educators

Through a careful exploration of a series of adaptive reuse case studies that manifested components of circularity and adaptability, we have been able to define a series of applicable strategies for promoting these determinants. Using demountable building components for instance, promotes the capacity of a building to adapt to physical changes, while also facilitating the reusability of these components somewhere else in the long run.

In light of the call for speeding up the transition to a circular built environment, and the need to promote the adaptive capacity of our buildings to cope with ongoing societal changes, “adaptive reuse” becomes a promising strategy. The Circular Building Adaptability Model can further promote the capacity of any adaptive reuse intervention to add value to building assets. It does this by fulfilling the long-lasting functionality in buildings, and eliminating waste generation. But it can also build on the building’s regenerative capacity for the benefit of its occupants, and help them withstand environmental challenges, while also rendering it responsive to complex contextual dynamics. Ultimately, bringing circularity and adaptability together, and aligning them with adaptive reuse of buildings is a way to redevelop our properties in a future-proof and resource-efficient way.