

The Architecture of Adjustment: Artificial Intelligence and Adaptive Reuse in Industrial Heritage Interiors

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Adaptive reuse consists of assigning a new use to existing buildings without destroying their essential structure or their historical, cultural, or material value. This type of intervention in heritage industrial spaces poses specific challenges for architectural design, especially in the realm of interior spaces, where the new programmatic transformation must operate with precision, restraint, and sensitivity toward what already exists. In this context, the present study examines the role of artificial intelligence (AI) as a support system for the design process in small-scale interventions, focused on detail and fine-tuning, without replacing the fundamental criteria of architectural design and critical human approach. Thus, rather than substituting core design principles, AI is conceived as an instrument that enables the refinement, verification, and adjustment of project decisions, reinforcing the analytical capacity of the designer. Within this framework, two former industrial buildings converted into schools of architecture become experimental laboratories in which the aim is to develop a design calibrated to the needs of international and multicultural student communities, while always maintaining respect for the identity qualities of the intervened industrial architectural heritage. In line with recent literature, AI is employed as a decision-support system, facilitating the exploration of scenarios and the comparative evaluation of alternatives. The effectiveness of these tools depends on a human-in-the-loop approach, in which the sensibility of the architects, critical judgment, and awareness of the site's memory remain irreplaceable elements. Therefore, the project is understood as an iterative and adaptable process, based on data and grounded in human, contextual and cultural knowledge. The paper advocates for an “architecture of detail” as opposed to an architecture of excess, arguing that AI can contribute to a project methodology that is close to artisanal practices and compatible with reflective, pedagogical, and cultural processes.