CHALLENGES OF SUSTAINABLE REUSE. A RESILIENCE-BASED APPROACH.

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Abstract. The paper presents the first methodological achievement of an on-going research aimed at developing of an assessment tool to support sustainable processes of adaptive reuse through resilience evaluation in historical buildings, where the resilience-based approach is intended in terms of the tolerable transformation that an existing building can undergo unless the impact on its constitutive systems generates undesirable effects. An effective preliminary evaluation shall be designed to highlight the residual performances of the building and understand the effect of each transformative action while considering the compliance with new expected uses through the match with a set of conceivable design strategies. In this direction the methodology here presented focuses on two assessment indices: the first one, called "Performance Adequacy and Vulnerability" (PAV) is calculated on the actual state of the good for the evaluation of its residual performances, and then integrated in perspective of a grid of design strategies with the aim of determining which can be considered more advantageous. The latter is called "Resilience Threshold Evaluation" (RTE) and is applied in the phase of evaluation of the proposed feasibility studies in order to estimate the expected transformative effects on the building and their positive or negative impacts as applying to its resilience thresholds. The described approach was integrated into a workflow based on HBIM, as a preliminary and simplified informative model is useful to support preliminary decision-making processes, allowing to recover the information on the residual performance of the building and simulate design alternatives in a simpler way, with the advantage of ensuring time-saving, data-safety and transparency in each step. The methodology itself is now under validation on a set of historical buildings of the University of Pavia.

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