Morphology in conceptual building design

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Author(s): Wim   Zeiler

As the effects of damage to our environment become all the more clear, there is an ongoing social transformation towards sustainability which will affect technology development and make forecasting more difficult. This calls for a holistic integrated design approach which, already at the initial conceptual design phase, requires the involvement of various design experts from different domains to form multidisciplinary design teams. In order to support these teams, a design method based on the use of morphological charts and a morphological overview was developed in cooperation with the Dutch professional organizations of architects and consulting engineers. This tool aids architects and engineers with their new role in the conceptual design phase, as it enables effective exchange of each discipline's perspective on the design task as well as structuring available domain knowledge. The method has been applied in the Master Program project "Integral Design", at the Faculty of the Built Environment of the Technical University Eindhoven. The design support tool is part of a multidisciplinary program in which students work together with experienced professionals. The outcome shows that the design support tool facilitates a significant increase in the number of possible solutions generated by design teams, and it demonstrates that the morphological charts and morphological overview can be used as an analysis tool for evaluating the impact of different interventions during the conceptual phase of the building design process. This paper provides both a detailed discussion of the design support tool itself, and how the tool was utilized to determine the effectiveness of individual designers. The impact of various interventions is investigated, such as that of adding an experienced professional to a student's design team and the use of C-constructs based on the Concept-Knowledge theory of Hatchel and Weil, in order to further stimulate the generation of sub-solutions.

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