The Pugh Controlled Convergence Method: model-based evaluation and implications for design theory

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Abstract

This paper evaluates the Pugh Controlled Convergence method and its relationship to recent developments in design theory. Computer executable models are proposed simulating a team of people involved in iterated cycles of evaluation, ideation, and investigation. The models suggest that: (1) convergence of the set of design concepts is facilitated by the selection of a strong datum concept; (2) iterated use of an evaluation matrix can facilitate convergence of expert opinion, especially if used to plan investigations conducted between matrix runs; and (3) ideation stimulated by the Pugh matrices can provide large benefits both by improving the set of alternatives and by facilitating convergence. As a basis of comparison, alternatives to Pugh's methods were assessed such as using a single summary criterion or using a Borda count. These models suggest that Pugh's method, under a substantial range of assumptions, results in better design outcomes than those from these alternative procedures.

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