Center for Advanced Design Research & Evaluation

Modeling Relative Influence of Environmental and Socio-Cultural Factors on Context-Specific Functions

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ABSTRACT:

Traditional models in building physics are based on theories in physics and physiology, typically characterized by a-contextual settings and domain-specific articulations. It is, however, commonly understood and appreciated that physics and physiology, alone, do not entirely explain observed patterns of user behavior in buildings-in-use, and that people do not experience various aspects of a setting in isolation. This study at the Georgia Institute of Technology, using Post-Occupancy Evaluation (POE) data from 26 courtrooms, developed a set of models that: 1) integrated variables from multiple domains, 2) developed a smaller set of aggregated functional dimensions intuitive to building stake-holders, 3) were context specific, 4) captured instrumental as well as abstract functions, and 5) articulated the relative influence of variables on the aggregated outcome measures. POEs started as a methodology to provide user input in building design and has expanded to a practice that incorporates user feedback along with technical and financial performance. Starting with one-off studies during the late 1960s, POEs have expanded considerably in terms of building types, tools, methods, and scope. The POE data in this study included physical, environmental, as well as user attribute data. Physical and environmental data were collected using scientific instruments widely accepted in the building evaluation community. User evaluations of the courtrooms on multiple dimensions were collected using 7-point ordinal scale measures.

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CADRE is a nonprofit research and development initiative, supported and funded in part by HKS, Inc.

Environmental and user attribute data were regressed on aggregated performance dimensions (resulting from Principal Component Analyses) to arrive at the integrated models, presented in this paper. The authors argue that the modeling approach supplements the traditional paradigm in two ways: 1) by validating traditional building physics models, and 2) by enabling validation from the clients' perspective, focused on higher-level functional requirements.

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