

SIMULATION-BASED SCHEDULING MODEL FOR MULTIPLE DESIGN PROJECTS

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ABSTRACT

A design firm often needs to allocate various types of design resources or participants to the multi-disciplinary activities of various design projects. Each of these design projects is undertaken either in a proposal phase, basic design phase, detailed design phase, or construction phase of a building project. Effective allocation of the design participants to activities depends on how the design activities of these design projects are scheduled. But the effect which is caused by design iterations in schedule and resource isn't considered before. This study finds design iterations by DSM and other methods and develops a simulation-based scheduling model to effectively allocate design participants to multiple design projects under the effect of design iteration. This model is helpful to find how to lean the design schedule and design resources. Particularly, simulation algorithms are proposed to model the uncertainties of design iterations, draw amounts of iterations, design participants' man hour, and activity durations. The operation of the model is demonstrated by applying it to a Taiwanese design firm who deals with multiple design projects.

KEY WORDS

Multi-project, design iteration; design schedule; design process; simulation

INTRODUCTION

A design firm often needs to allocate various types of design resources or participants (including architects, designers or crafts) to the multi-disciplinary activities of multiple design projects. Each of these design project is undertaken either in a proposal phase (i.e., the firm is preparing a bidding proposal to compete for the project), basic design phase, detailed design phase, or construction phase (i.e., the firm needs to review the compatibility between the design deliverables and the constructed facility) of a building project. Effective allocation of the design participants to activities depends on how the design activities of these design projects are scheduled. But the effect which is caused by design iterations in schedule and resource isn't considered before.

Scheduling of design projects is complicated because design activities frequently depend differently on information about each other. Namely, the design process involves various iterations across activities (Austin et al 1994, Austin et al 1999,

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