

## Implementation of Social Network Analysis to Analyze the Dependency between Construction Bid Packages

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**Abstract :** The division of the project scope into work packages is the most important step in the preconstruction phase of construction projects. The work division determines the scope and complexity of each bid package, resulting in dependencies between project participants performing these work packages. The coordination between project participants is necessary because of these dependencies. Excessive dependencies between the bid packages create coordination difficulties, leading to delays, added costs, and contractual friction among project participants. However, the literature on construction provides limited knowledge regarding work structuring approaches, issues, and challenges. Manufacturing industry literature provides a systematic approach to defining the project scope into work packages, and the implementation of social network analysis (SNA) in manufacturing is an effective approach to defining and analyzing the divided scope of work at the dependencies level. This paper presents a case study of implementing a similar approach using SNA in construction bid packages. The study uses SNA to analyze the scope of bid packages and determine the dependency between scope elements. The method successfully identifies the bid package with the maximum interaction with other trade contractors and the scope elements that are crucial for project performance. The analysis provided graphical and quantitative information on bid package dependencies. The study can be helpful in performing an analysis to determine the dependencies between bid packages and their scope elements and how these scope elements are critical for project performance. The study illustrates the potential use of SNA as a systematic approach to analyzing bid package dependencies in construction projects, which can guide the division of crucial scope elements to minimize negative impacts on project performance.

**Keywords :** work structuring, bid packages, work breakdown, project participants

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