A Quantitative Methodology for Mapping Project Costs to
Engineering Decisions in Naval Ship Design and Procurement
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Abstract

Alternative methods for cost estimation are important in the early conceptual stages of a design when there is not enough detail to allow for a traditional quantity takeoff estimate to be performed. Much of the budgeting process takes place during the early stages of a design and it is important to be able to develop a budget quality estimate so a design is allocated the necessary resources to meet stakeholder requirements. Accurate project cost estimates early in the planning and design processes can also serve as a cost-control measure to assist in managing the design process. With an understanding of the most significant engineering decisions that affect project costs, project team members and stakeholders can proactively make cost-effective decisions during the design process rather than after construction begins and it is too late to prevent going over budget.

This research examines the potential of Artificial Neural Networks (ANNs) as a tool to support the tasks of cost prediction, mapping costs to engineering decisions, and risk management during the early stages of a design's life-cycle. ANNs are a modeling tool based on the computational paradigm of the human brain and have proved to be a robust and reliable method for prediction, ranking, classification, and interpretation or processing of data.

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