

Illuminating Trade Decisions in Support of the Engineered Resilient Systems Architecture

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Abstract: This paper describes the process of developing a system through computer based model simulations and trade space analysis for exploration of alternatives during early stages of a system's lifecycle. The methods of experimental design were leveraged to identify the key system drivers that affect systems' effectiveness. By utilizing an agent-based simulation model, the data used to explore tradeoffs were generated and further examined. Insights delivered from the simulations are derived to assess the input and output behavior within the operational domain. The results of the analysis allow us to draw conclusions about which decision factors matter most when designing a system. This innovative process saves the Department of Defense time and resources while also assuring our military force will gain and maintain superiority over America's enemies, foreign and domestic. The research supports the trade space analytics line of effort of the Engineered Resilient Systems (ERS) Architecture, a project developed by the U.S. Army Engineer Research and Development Center (ERDC).

Keywords: Trade Space Analytics, Design of Experiments, Modeling and Simulations, Decision Analysis