

Facilitating V-Model Analyses: Data Visualization for Test and Evaluation

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The classic V-Model is critical to Systems Engineering. This paper will examine the special data visualization needs and challenges presented by Test and Evaluation (T&E). The rapid and insightful analysis of the masses of data collected during the test and evaluation cycle, including the improvement of V-Model analyses, has become one of the grand challenges of this community. Optimally exploiting this flood of data is challenging to those performing the tests and evaluations. The authors assert that newly developed capabilities utilizing emerging capabilities can and should be implemented to assure the T&E analysts are given the information they need most, when they need it, and in a form that will produce the correct outcome. The paper recounts and alludes to historical examples of the difficulties in effectively conveying information within the chain of command, supporting the notion that these problems are neither unique to simulation or T&E nor are they issues that can be ignored. Special emphasis will be put on new ways to convey the range of analytic solutions and alternative conclusions and communicate the relative likelihood of future performance, durability and safety. The Test and Evaluation community is also faced with the need to convey the insights contained in the data in enlightening and compelling ways to both analysts and end-users. A survey of associated topics like causal modeling and behavioral science insights will be presented along with analysis as to their contribution to better exploitability. The paper concludes with recommended approaches for studying, evaluating and implementing the most promising techniques and technologies.

Key Words: Data Visualization, Data Management, V-Model, Systems Engineering

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