Digital Engineering (DE) promises to improve acquisition outcomes, such as speed and quality of delivery, through enabling early prototyping and test and facilitating the communication of design details between teams. MITRE realized these promises by successfully applying DE techniques to the acquisition of the US Space Force (USSF) Deep Space Advanced Radar Capability (DARC) in Pre-Milestone B and beyond. DARC is a tactical ground-based radar system for monitoring satellites in geostationary orbit. This presentation will discuss how MITRE used a combination of physical analysis, Model-Based Systems Engineering (MBSE), and software prototyping, in an interconnected digital ecosystem, to perform trade studies, exercise architectures, and create software specifications that became a basis for the acquired system. It will demonstrate a lightweight approach used to loosely couple architecture modeling and software development that minimized discrepancies in delivered products and reduced the effort of iteration. This approach can be used as an exemplar for other such acquisition efforts that want to realize the promises of DE.

Keywords: digital engineering, model-based systems engineering, toolchain, software development, prototyping, acquisition, radar

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