

Design Evaluation and Technology Transition: Moving Ideas From the Drawing Board to the Fleet

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Abstract

A prototype decision support system (DSS) was developed for shipboard tactical decision makers as part of the Tactical Decision Making Under Stress (TADMUS) project. The design for this DSS was based on naturalistic decision processes employed by experienced commanders in demanding littoral, air warfare situations. Many iterations of the DSS design occurred, eventually resulting in an interactive prototype that could be used in conjunction with dynamic tactical scenarios. Navy officers with experience in air warfare participated in structured experiments that examined the impact of this prototype DSS on their tactical decisions. Results indicated that the DSS yielded a significant improvement in situation awareness and response coordination, both for experts and for less experienced tactical decision makers. This finding, which was corroborated across several studies, provided encouragement that if the DSS were to be implemented in operational systems, a substantial performance gain would be expected.

The next challenge was to transition the essential design features to operational C^2 systems. Two key systems engineering considerations to doing this quickly were (a) to recode relevant portions of the DSS in a device-independent language that makes it easily incorporated into C^2 systems and (b) to include links to input from real tactical data sources. By taking these important transition steps, the user-centered design process for TADMUS has been able to make it easier and faster for system engineers to insert key DSS functions and features into C^2 systems.