

LESSONS LEARNED FROM THE A2C2 EXPERIENCE

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Abstract

The research program entitled Adaptive Architectures in Command and Control (A2C2) is an ambitious interdisciplinary project currently sponsored by the Office of Naval Research (ONR). This industry-government-academia initiative examines in depth the underlying processes of organizational changes and architectural adaptations that occur in complex organizations.

The motivation for the A2C2 research program is a recognition that military command and control organizations, designed initially for nominal missions using a defined set of doctrine, components and assets, will be stressed by demands for greater inter-operability with joint forces, often for unique situations that were possibly unforeseen at the time the system was designed. It is argued that joint-service, combined military operations cannot succeed using rigid procedures and static structures. To achieve superior performance and maintain a common picture of the battlefield, C2 organizations must be able to adapt their architecture. The thesis put forward in A2C2 is that a fundamental requirement to the design of adaptive organizations is a practical knowledge of the nature of the interaction between two key dimensions, both driven by the mission's objectives: The task structure and the organizational structure.

This presentation will summarize progress done on the A2C2 program over the last four years, with an emphasis on those lessons which could be applied to other interdisciplinary research programs. More specifically, the model-based experimentation paradigm that has guided the A2C2 researchers will be examined, and recommendations for enhancements will be proposed. The integration of modeling and simulation methods, the development of meaningful measures, the reconciliation of disparate theories of organizations, adaptation, and command and control, the difficult craft of designing experiments with the inputs of subject-matter experts, and the refinement of models using scientifically-analyzed empirical data are all challenges that were taken on by the research team.

The goal of the A2C2 research is to advance the state of knowledge regarding decision making in organizational settings to include an understanding of how, why, and when organizations adapt and what skills, training, and technology are required to support that adaptation. A key lesson that was learned the hard way by the A2C2 team is that, when the objective is to address such complex, multi-dimensional C2 research problems, the interdisciplinary model-based experimental approach might be well worth the challenge.