

C4 Decision Making Bottlenecks

PROGRAM DESCRIPTION

OPNAV N81 asked SPAWAR, Architecture and Human Systems to identify and resolve human decision-making bottlenecks encountered in supporting Major Combat Operations (MCO).



HSI CHALLENGE

PSE analyzed existing anti-submarine warfare (ASW) decision procedures, identified decision bottlenecks, and evaluated alternative ways to mitigate the bottlenecks.

- Determine how to resolve command and control associated (C4I) human decision making impediments that could reduce effectiveness in a maritime campaign
- Examine the relative contribution of CONOPS changes and tactical decision aids in shortening detect-to-engage timelines and reducing operator/decision-maker bottlenecks.

APPROACH

A team of process modelers and ASW subject matter experts (SMEs) used the General Decision Process Model (GDPM), developed by PSE, to describe the ASW domain-specific decision process. SMEs used that description to identify seven potential decision making bottlenecks. PSE HSI experts then evaluated those bottlenecks and identified human performance drivers and potential mitigation techniques for each bottleneck. Both speed and quality of decisions were evaluated along with human performance requirements and constraints. PSE helped construct detailed process models for two of those activities, which were used to drive simulations of the proposed mitigations on the ASW decision process. PSE and SMEs then compared the potential impact of each proposed mitigation option on the decision process and its likely effect on the outcome of the 2014 MC02 campaign.

SOLUTION

PSE identified potential problems in manpower, workload balancing, and decision support in each GDPM activity (triggering, data collection, data correlation, uncertainty resolution, and alternative selection). PSE recommended CONOPS changes to OPNAV to improve decision speed and quality. PSE also proposed a set of ASW systems solutions and tactical decision aids that incorporated improvements in several ASW functional areas.

BENEFITS

The GDPM analysis approach enabled SPAWAR to respond in only a few weeks to OPNAV N81 requests for modeling and simulation support for acquisition policy and budgeting decisions. A particular strength of this approach is that it incorporates human operator and team performance into system effectiveness modeling.

This effort was sponsored by Office of the Chief of Naval Operations (OPNAV) Assessment Division (N81), Space and Naval Warfare Systems Command (SPAWAR), Architecture and Human Systems.