



DATA MINING FOR ORGANIZATIONAL DESIGN

In evaluating the effectiveness of a particular organizational structure, analysts are typically limited to somewhat squishy, qualitative assessments. But in one recent case, CNA has combined wargaming techniques and big-data analytics to quantify inefficient seams in a proposed structure and to suggest improvements.

All organizations have seams—the edges across which information or responsibility must pass from one unit to another. Information transfer across seams typically leads to information loss and time delays; thus, seams can represent risk to organizational efficiency and effectiveness. This is particularly problematic for non-standardized tasks—a common mode for many operational military organizations.

In an effort to mitigate this risk, our organizational design studies explore different organizational structures, with different seams, to develop options that minimize information loss and time delays on the most critical processes and decisions. Typically, the analysis underpinning these design options has been qualitative, developed by understanding and diagramming process flows and organizational “value chains.”

Recently, CNA pioneered a new, quantitative methodology as an additional tool for organizational design. The United States Africa Command (AFRICOM) asked us to test a proposed new organizational structure with several hundred staff. CNA developed a wargame to examine the organization’s size and structure before it was implemented. Across 12 wargame scenarios—from an epidemic in a

refugee camp to a missile attack on a U.S. ship—command participants representing department heads responded by deploying individual billets to specific tasks on the game board for the amount of time needed to accomplish the mission.

Twenty players over three days generated thousands of data points showing who in the organization needs to coordinate with whom, for how long and how often. We were able to discern indications of organizational dynamics that ordinarily would only play out once the organization stood up, and we could quantify that coordination through the use of a big data tool called affinity analysis. The retail sector uses affinity analysis to understand what products customers commonly purchase together, and consequently make product recommendations to shoppers.

The results of this analysis identified—to a quantifiable degree and within explicit confidence parameters—specific billets that were consistently tasked together. In some cases, these billets were located in different parts of the proposed organization, crossing seams in order to function. This suggested that the command consider changes to the design such as merging two directorates, centralizing certain command personnel, and establishing physical proximity and regular synch meetings between staff in different units. This CNA analysis represents a rigorous way to explore hypothetical organizations and evaluate their design efficiency—before a single person has been assigned.

ABOUT CNA CORPORATION

CNA is a not-for-profit research and analysis organization with 75 years of experience providing government agencies with data-driven insights and real-world, actionable solutions grounded in our direct experience with the operational environments where these solutions are applied. CNA developed the foundational techniques for operational analysis to address complex challenges facing government programs. We have applied these techniques successfully in areas ranging from defense to aviation, education, justice, and homeland security.

For more information please contact:

Margaux Hoar, Research Team Leader
Organizations, Roles, and Missions Team
703-824-2205
hoarm@cna.org