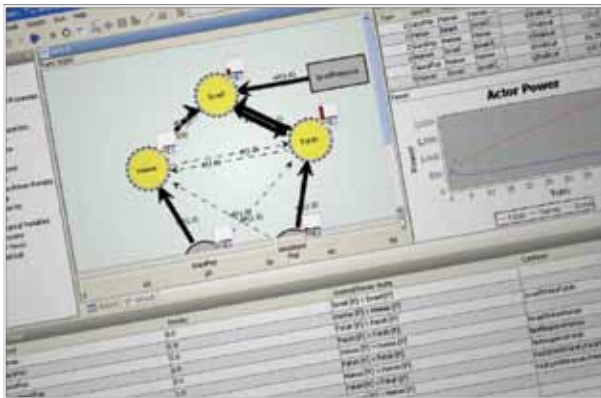


## CASE STUDY

# POWER-STRUCTURE TOOLKIT



A key problem in operations planning is understanding the breadth of the environment, including the potential second- and third- order effects of the plan on other aspects of the battlespace. Especially difficult is understanding the human networks involved and how they are impacted by a plan.



The Power-Structure Toolkit (PSTK) is a powerful tool for helping to answer questions about human networks. PSTK has the unique ability to rapidly simulate the behavior of networks of humans, groups, and processes. Through these simulations users can explore the dynamics of networks, project the behavior of the system into the future, evaluate courses of action for second- and third-order effects, and “what if” key scenarios. PSTK represents a major advance over traditional social network modeling and analysis tools, which only provide static visualization and analysis.

PSTK is designed to aid human experts in thinking about problems, not to replace them. PSTK’s powerful user interface and semi-automated model generators allow domain experts to use their own knowledge to construct models in their own terms, and explore the outcomes of those models using a range of explanatory data visualization displays. PSTK allows for complete drill-down into results, helping the analyst understand exactly why an actor made a decision or why the system changed course. Models can also be marked up with comments about the rationale for the model or with references to external documentation to support the model. Within minutes, a model can be quickly iterated to allow an analyst to explore many possible scenarios. Models and their results can be

shared among analysts working in a team, and snapshots of models and results can be easily exported to an image file for generating briefing materials.

PSTK is highly customizable and may be applied to a wide variety of domains. For example, PSTK has been used to model the political, economic, and social dynamics of Iraq and Afghanistan, insurgencies in the Philippines, terror group dynamics in the Middle East, and the business dynamics of the domestic airline industry. A range of default domains (e.g., PMESII) and dynamic processes are provided, and all these can be adapted or even replaced to meet the needs of a particular modeling task. PSTK can be run as a standalone modeling and simulation environment or interfaced with other models, simulations, and integration environments for multi-model systems.

The modeling and simulation engine behind PSTK is based on a social, political, and cognitive science theories, providing a robust foundation for simulation dynamics, and a well-defined framework for building models. PSTK’s extensibility also allows new theories to be added if needed. However, domain experts don’t need to be experts in these theories to use and understand the system: PSTK’s user interfaces keep the modeling task in the expert user’s hands.

### ABOUT SOARTECH

SoarTech combines artificial intelligence with cognitive and social psychology to engineer software solutions that “think the way people think.” From our beginnings in modeling human behavior, we’ve branched into many types of advanced decision-making technology. Our reasoning systems make your systems smarter – enhancing end-user capabilities and experiences. Three principles continue to guide all of SoarTech’s work: a basis in knowledge, a focus on the human, and an openminded approach to the problem. Never content with research for its own sake, we put our technology to work in complex, real-world applications and pride ourselves on the depth of our engineering skills. Talk to us about how our systems can work for you.

### CONTACT

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