Many of the challenges that confront the Department of Defense (DoD) are characterized by the intersection of complex social, political, economic, and technical phenomena where conventional modeling techniques are inadequate. Human and organizational effects can dominate technical outcomes. For example:

- Combating the proliferation of counterfeit parts in military systems
- Managing joint and international acquisition programs
- Coordinating disaster and humanitarian responses involving governments, NGOs, and US agencies
- Sustaining the defense supplier base in the face of declining acquisition quantities

Enterprise problems challenge conventional modeling and simulation approaches because they involve the sometimes unpredictable behavior of humans and organizations as well many interacting elements with feedback and adaptation. Consequently, our objectives are to:

- Develop a modeling methodology that will allow analysts to study enterprise problems by intelligently scoping the problem space in a way that allows complex elements to be identified and mitigated
- Enable key stakeholders to “Drive the Future” before they commit to changes
- Providing means for experimentation and creation of response surfaces for key tradeoffs
- Creating an interactive environment for discussion and debate of strategies, policies & plans

The objective is to allow policy makers to look for the right mix of economic and acquisition policies to combat the risk of counterfeit parts in the defense supply chain, understanding various trade-offs.

Selected Potential Trade-Offs
- Investing in system design & development (robustness) vs. supply chain (counterfeit detection)
- Reduced counterfeiting via supplier penalties (including pass-throughs) vs. vulnerabilities created by supplier diminishment
- Reduced counterfeiting via trusted suppliers vs. vulnerabilities due to limited supply sources
- Scope of component inspections: cost vs. counterfeit reduction (detection effectiveness)

Counterfeit Parts Case Study

In tandem with methodology development, we are pursuing enterprise case study problems.

For RT-110, we are studying the problem of counterfeit parts as it relates to multiple DoD agencies and globalized supply chains that sustain DoD programs.

Immersion Lab

To facilitate exploratory interactions and allow stakeholders to “test drive” the future, Stevens has developed an Immersion Lab that will allow teams and stakeholders to interact with models and visualizations.

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