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System-Level Experimentation Study

Abstract

This study is about system-level experimentation (SLE) – campaigns of genuine discovery experiments – and how SLEs can be used to drive disruptive innovation.

SLEs support the discovery, exploration, and understanding of new operational and system concepts and the technology needed to support those concepts in future environments. As such, SLEs are complimentary to, but different from ATDs or JEFX (focus on early discovery versus later demonstration), Battlelabs (focus on game changers versus near-term needs), or Big Safari or the Rapid Capabilities Office (focus on discovery in future environments versus fast fielding to meet high priority needs). Similarly, SLEs are not wargames (e.g., the AF/A8 Futures Game), but SLEs could be conducted in the futuristic scenarios of such games.

Disruptive innovations often arise from the "friction of war." To mimic that effect, SLEs must incorporate a challenge-competitive environment to maximize depth of innovation and exploration, with an unfettered, highly skilled adversary with no cultural limitations and with technical restrictions imposed only by physics. The experiments should be staffed with carefully selected individuals who have attributes conducive to "out of the box" exploration. Experiments can be conducted in gaming environments ranging from simple "seminar explorations" to networked gaming to being in the field. The SLE approach developed in this study also integrates recently codified industry innovation practices (e.g., innovation starts with the CEO).

The study identifies four essential components in the development of disruptive innovation by means of system-level experimentation: ideas, people, venue, and experiments.

- Ideas: Innovation occurs throughout an organization and must be sought out. It is critical to identify ideas that challenge standard ways of doing things.
- People: Not all people are innovative. Those that are must be identified, supported, protected, and valued.
- Venue: A venue is not a specific place or facility. It is an exploration space, which might be a virtual environment or the battlefield of a war game.
- Experiments: The only way to explore the complexities of a system is through campaigns of experiments, based on the proper venue, people, and ideas. Combining these into a rigorous program of technology and CONOPS will create a deep understanding of what the future may be and how to best meet it.

A case study based on the development of the armed Predator is used to illustrate the SLE approach. The single recommendation is to replicate this case study through the auspices of a Chief of Innovation reporting to the CSAF. The recent creation of an Air Force Futures Program between AF/A8

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and AU/CC provides a near-term means to implement this recommendation without creating a new organization. Over time, the Air Force might consider creating a civilian IPA position for someone who served as a Chief of Innovation in industry.