

Applied Research Center for Advanced Technologies Experimentation

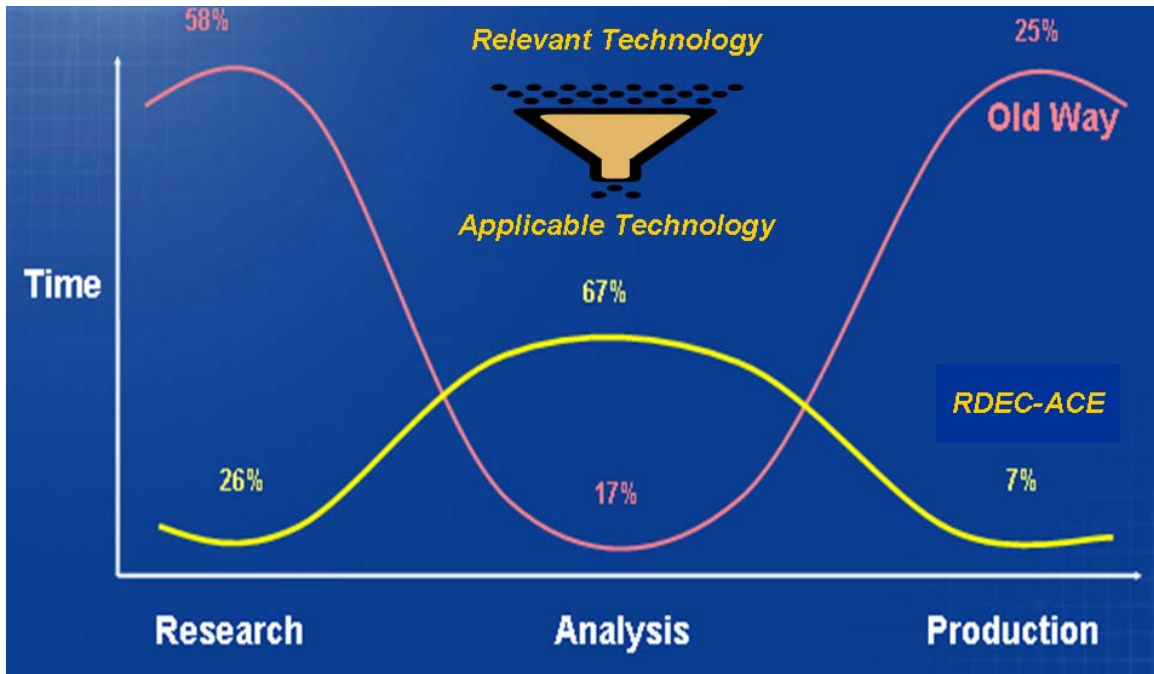
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Research Summary

Situation Addressed. Planning for responses in homeland security may be classified using four threat-level categories: irregular, catastrophic, disruptive and traditional. Prevention, preparedness, and response for these threats require R&D partnerships, especially in the phases of prevention and early detection that result in high-payoff and minimal disruption. A formal university-industry-government partnership for exploring advanced technologies in high consequence event preparedness and response is emerging between Virginia Tech, SAIC and Arlington County, Virginia, through a concept of applied research centers for homeland security (ARCHS).

Technical Approach. The research partnership offers a functional framework for guiding the research, analysis and selection of advanced technologies to support early warning and decision making. It grows from a program ongoing for more than 3 years in the Intelligence Community and involving the exploration of advanced technologies and analysis practices, analysts and operators, and metrics-based assessments. Key technologies examined and tested include rapid language translation, entity and event detection, link discovery, pattern recognition across dimensions of space and time, uses of computing resources in an interactive and adaptive environment, and various methods for information protection and sharing of sensitive information. Subsequent to individual technology exploration, these component technologies are assembled into a system-of-systems model in which technologies are explored for bringing users with diverse viewpoints together in a collaborative problem-solving environment. There, users can have access to their relevant data sources, use discovery tools, rapidly generate models for structured arguments, and present and vet competing hypotheses. This dynamic environment is examined for its technical and performance-effectiveness through a metrics-based assessment program. The extension of this framework to the academic community and local government through the ARCHS model emphasizes ongoing parallel experimentation and analysis.

Within the context of the operational environments, our objectives are to substantially improve the technology selection and integration process by reducing the time between identification of relevant technologies, getting empirical evidence of their alignment with the operational need (measurable), and selecting applicable technologies for the operational needs.



Current Status: Currently populating new laboratories in Arlington, Virginia, establishing relationships with SAIC and Arlington County partners, and ramping up on relevant technologies that are to be the basis for empirical research and applied integration activities.