

Heilmeier Catechism for Burns Concept

Were one to meet Dr. Heilmeier in the elevator at DARPA, would one say:

Problem/Objective

With declining budgets, burgeoning threats, increasing ops tempos, and aging weapons systems, the nation needs a better method of optimizing life-cycle sustainment logistics functions.

Current Approach/Procedure

Program managers are given dauntingly huge and complex flow charts with literally hundreds of procedures and constraints to identify and optimize. Inevitable and multiple small errors in this process cause an enormous ultimate impact, leading to failures, waste, and over-runs, all of which can then be futilely described by indecipherable mathematical formulae explaining why it failed.

New Idea/Strategy

A multi-disciplinary approach to use the power of advanced analytic techniques and new technologies to implement a method more founded on martingale and Hidden Markov, than on the increasingly antiquated Markovian view of the evolution of logistics, all in order to better predict and optimize the costs and contributions of the entire system of systems and its impact on the defense posture of the nation.

Stakeholders/Users

The main beneficiaries of this advanced approach will be each of the tax-paying citizens of the United States who contribute \$6,000 per year to defense, the Congress who is responsible for controlling those expenditures, the warfighters whose lives depend on their efficient operation, and the acquisition professionals who must administer these gargantuan projects.

Risks/Benefits

Should the new techniques be faulty, there will be losses of time, money, lives and security of the nation. These risks could be mitigated by simulations which will help assure the efficacy of the new approach prior to implementation. The benefits would be manifold and invaluable: optimization will be improved, costs will be constrained, schedules will be verified and systems will be made more available, reliable and useable for the warfighter.

Costs/Schedule

Estimating that a ten-person team, five each of systems engineering researchers and high performance computing scientists would produce working and validated tools within three years. SWAG \$10M total personnel and computing equipment costs.

Metrics/Assessment

Demonstrate, via computer generated simulations of logistics function, the efficacy improvements of martingale analyses over Markovian approaches. Test applications on small and short time-frame DoD systems procurements.