## THE IMPACT OF GIVING WARFIGHTERS A VOICE IN EARLY TECHNOLOGY DEVELOPMENT

# Reviewing How Early And Frequent User Inputs Impacted A Particular Hpac Model Design

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This presentation walks through the different stages of development of one model in Defense Threat Reduction Agency's (DTRA) Hazard Prediction Assessment Capability or HPAC, the Missile Intercept capability or MInt.  The process started with the original seeds of the idea of adding a missile intercept capability to complement existing missile models in HPAC that fly out threat missiles (non-intercepted) to their destinations and ends with where the modeling and simulation program is heading.

Early on, DTRA foresaw the full measure of an intercept success as not only the intercept event itself but also the final consequences on the ground in terms of surviving agent and/or missile debris.  DTRA has drawn from its extensive CBRNE experiences to understand the need of its CBRN models to handle pre-/post-crises as well as the crisis point itself.  Regarding MInt, this translated to (1) Graphical User Interface (GUI) essential elements so analysts could utilize what they knew about pre-/post-crisis missile scenarios and (2) conditions for the Application Programming Interface (API) so DTRA systems could communicate with other agencies during a crisis.  During a crisis event, DTRA would receive necessary data allowing it to publish consequence assessments thereby aiding the decision-making process to protect the public, the warfighter, and the environment.

DTRA Research & Development (R&D) efforts have shown repeatedly the need for R&D GUIs to illustrate new capabilities to the user.  R&D GUIs are the prototype GUIs for new capabilities in HPAC.  Users understand the new capability only via the GUI.   Once an R&D GUI has stabilized and early adopters are comfortable with it, it can be formally transitioned to Programs Of Record (PORs).  Interestingly, many of the original R&D GUI elements remain in later POR GUIs, reflecting the importance of earlier user inputs.

Drawing from earlier technology demonstration approaches going back 25 years, DTRA utilized the concept of mini-exercises.  In such exercises, DTRA worked with a number of small groups to better understand their needs and the context of how proposed M&S tools may work.  The needs define the types of missiles and associated scenarios.  The context included what information were they receiving and processing, and what products they were expected to share.  This in turn helped define the API for M&S tools to facilitate such communications.  Then prototype networks were set up and used to demonstrate the successful relay of such information.

This HPAC/MInt development story illustrates how DTRA has taken advantage of every opportunity of user interaction to help steer current and future R&D model development towards operational products.  These products assist the important work of our analysts and warfighters in addressing CBRNE threats.