RT-145: Engineered Resilient Systems: Tradespace Tools Research

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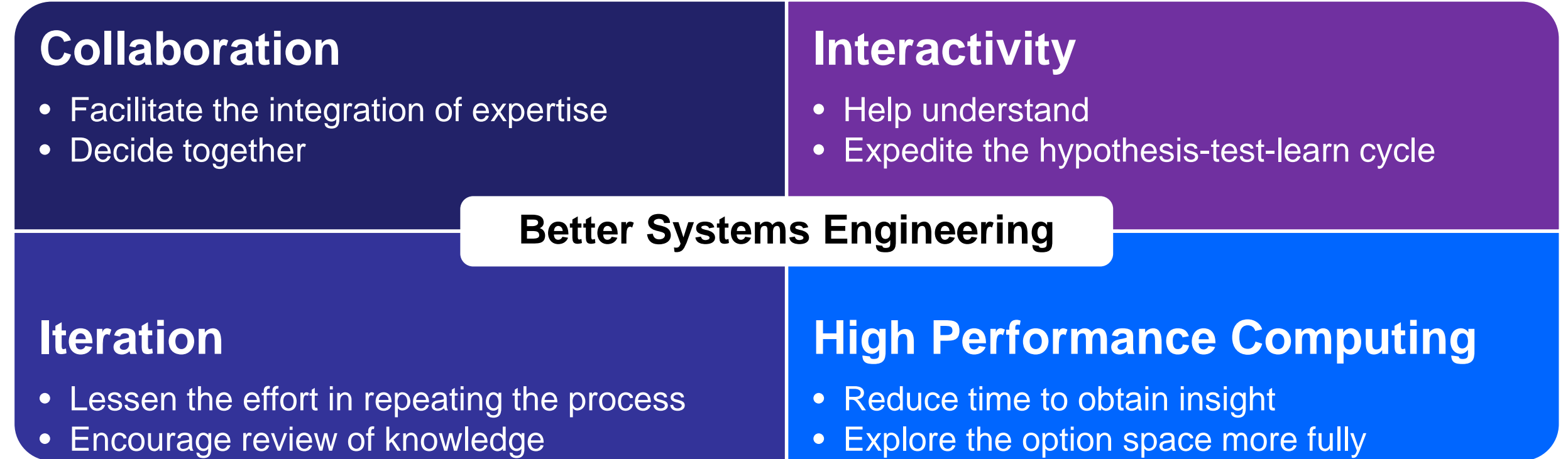
Research Task / Overview

The Department of Defense's Community of Interest for **Engineered Resilient Systems (ERS)** calls for systems that are effective over their life cycle, even when the mission context changes beyond its initial intention. Towards this end, tradespace analysis is of great importance, which enables adaptable designs using diverse systems models that can easily be modified and re-used, and the ability to iterate those designs quickly with a clear linkage to evolving mission needs. GTRI's Systems Engineering Research Division is co-developing a web-based, collaborative tradespace environment along with the US Army's Engineer Research and Development Center for the ERS Community of Interest. This leverages GTRI's expertise in collaborative model-based systems engineering, and ERDC's leadership of the DoD' High Performance Computer infrastructure

Goals & Objectives

Primary goal of this effort is to create a comprehensive tradespace analytics capability that supports complex DoD systems under a wide range of operation scenarios. This effort produced a collaborative, modular open architecture software framework, which allows users to conduct trade studies leveraging executable MBSE integrated with HPC assets. This enables communication of complex results to stakeholders in order to support effective decision processes.

Collaboration
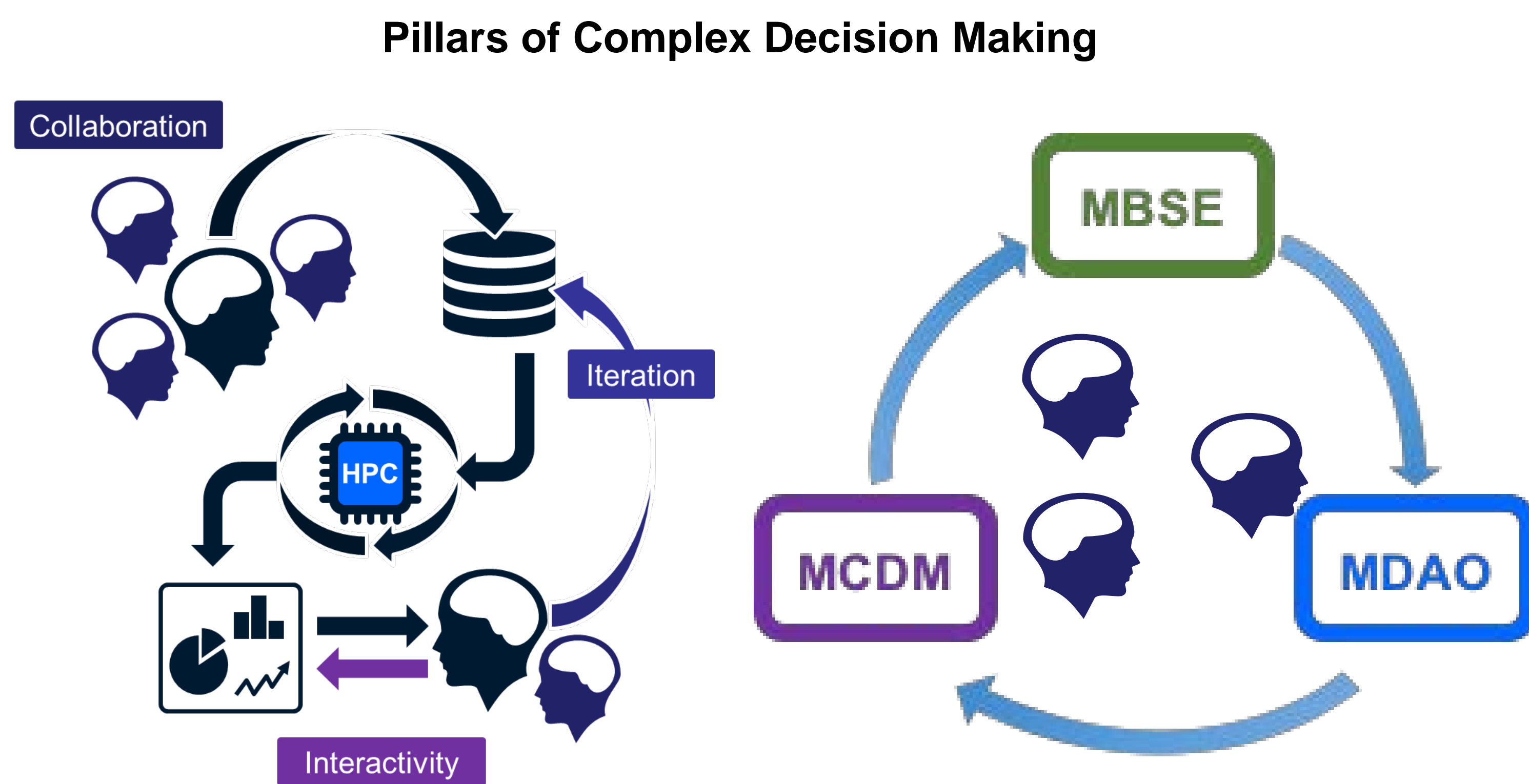- Facilitate the integration of expertise
- Decide together

Interactivity
- Help understand
- Expedite the hypothesis-test-learn cycle

Better Systems Engineering

Iteration
- Lessen the effort in repeating the process
- Encourage review of knowledge

High Performance Computing
- Reduce time to obtain insight
- Explore the option space more fully

Data & Analysis

Methodology

Pillars of Complex Decision Making

Integration with High Performance Computing
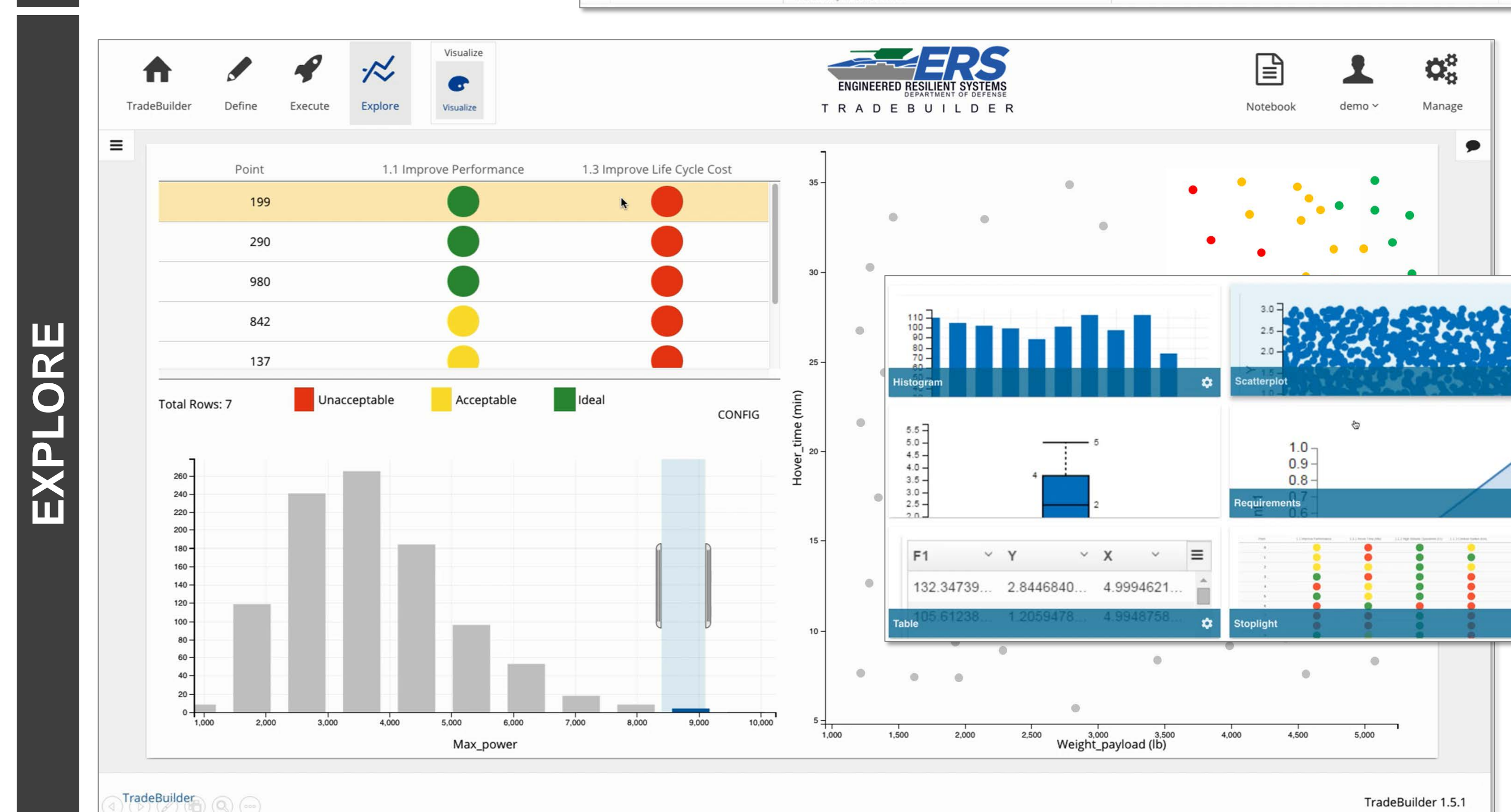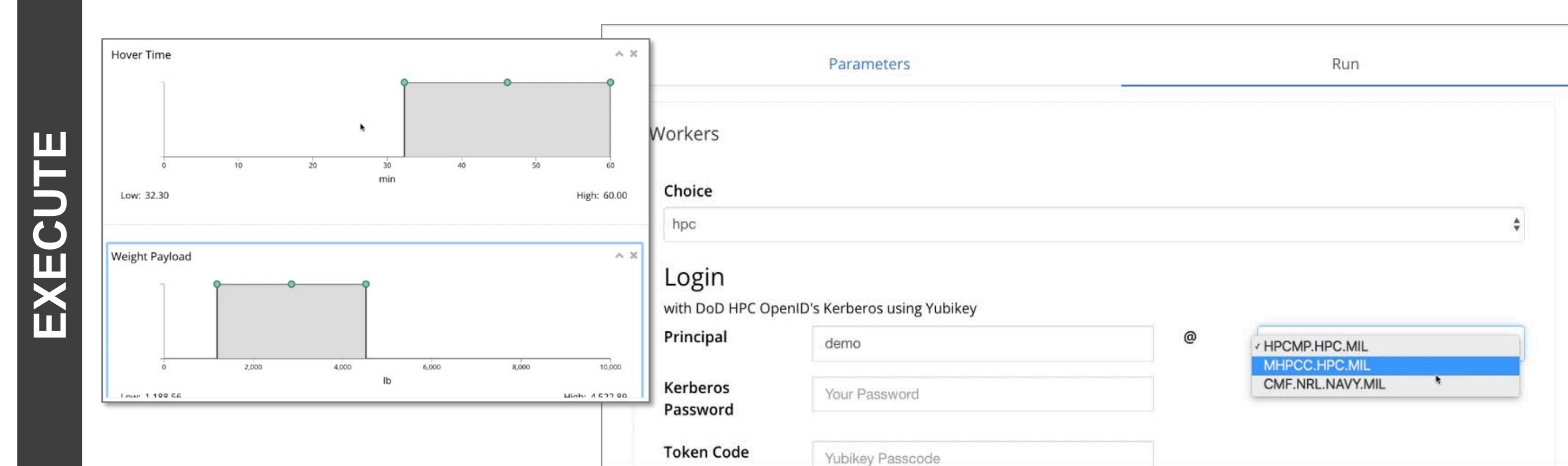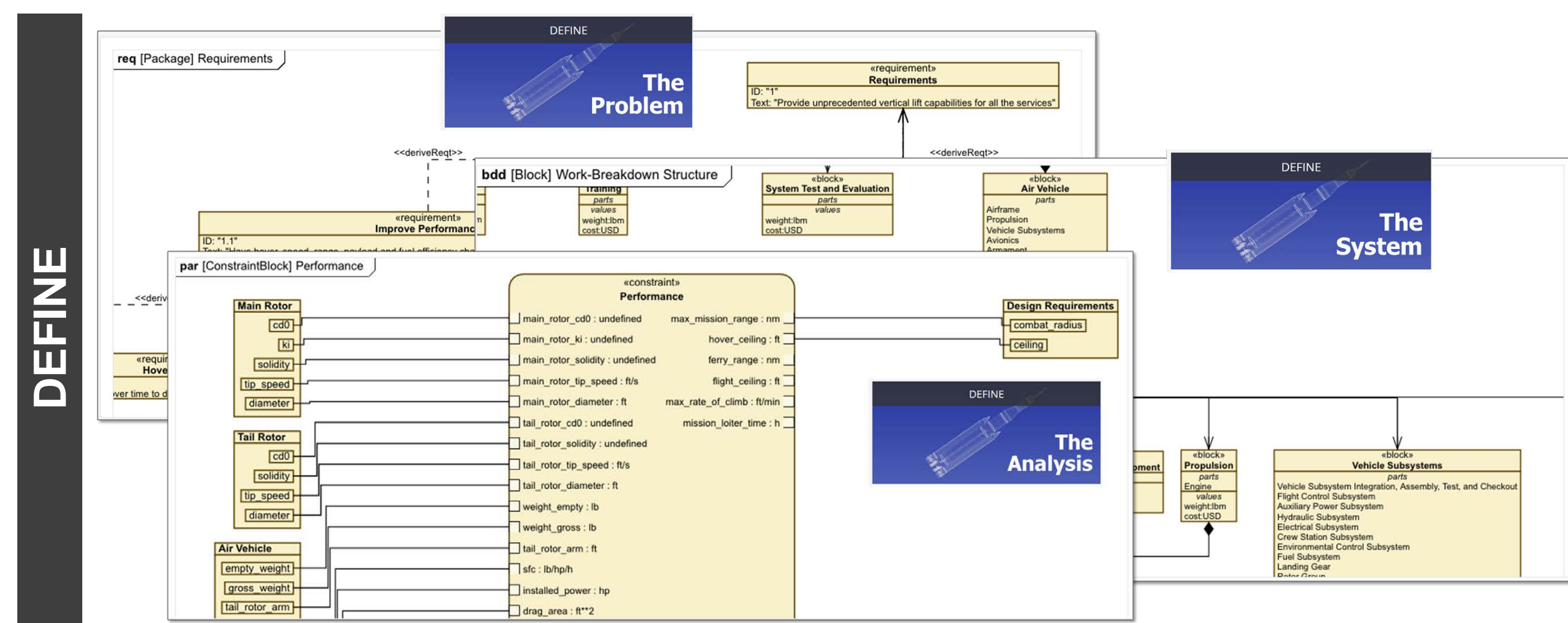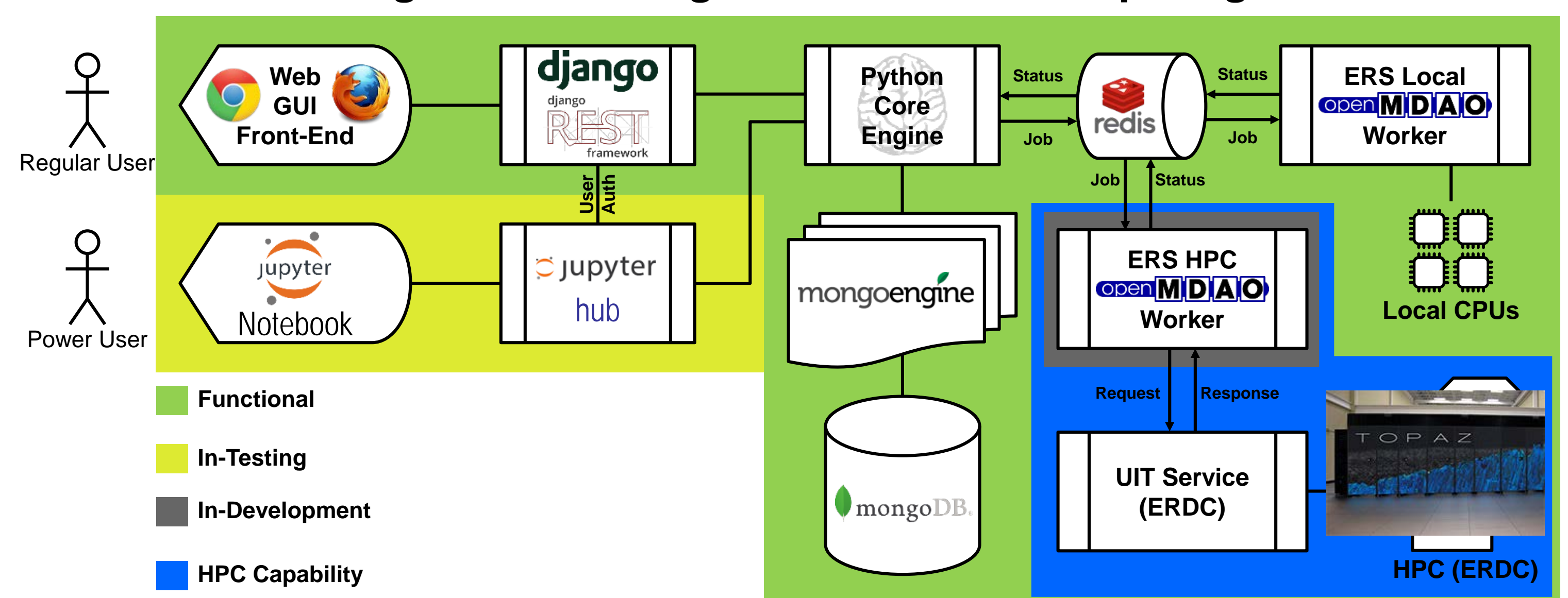
Future Research

USAF Strategic Developmental Planning and Experimentation

Integration with AFSIM simulation framework to operationally inform USAF future planning and technology investments

Chem Bio Defense

Leveraging the OneSAF simulation framework to quantify operational effectiveness of technologies

Contacts/References

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