Analysis of Resources with Visualization and Integrated Simulation Support (ARViSS) Programs

Presented By:
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The Design Knowledge Company (TDKC) Corporate Overview

Background

- Small business headquartered in Dayton, Ohio
- Founded in 1999 as one-man consulting firm
- Transitioned to R&D contracting firm in 2003
  - Topped 10 employees (2006)
  - Topped 40 employees (2010)
  - Currently 90 Employees

Profile

- Small Business Flexibility, Low-Cost/High Value
- Focus research on specific, hard-to-solve warfighter needs
- In just over ten years, we have been
  - Selected for National Tibbetts SBIR Award in 2007 and 2012
  - Awarded 5 Phase III SBIRs
- Nationally recognized expertise in human factors, visualization, and space-related development

TDKC Offices

- Colorado Springs, CO
- Lompoc, CA
- Albuquerque, NM
- Washington, DC
- Atlanta, GA
- Dayton, Ohio (Headquarters)

Provide leading-edge research and development services to government and industry in the following areas.

Agile Work Environments to connect independent, heterogeneous data sources for a single integrated user experience.

We Deliver Airpower…Period!
Framework for Full Lifecycle

Warner Robins Air Logistics Complex

Adaptable Analysis & Visualization

Status Reporting

ARViSS TECHNOLOGY

Re-planning

Quality Control

Workflow/Automation

We Deliver Airpower…Period!
ARViSS Decision Support Application

Warner Robins Air Logistics Complex

A User-Centric Comprehensive Environment for Data Integration, Assessment and Ramp Operations Support

We Deliver Airpower…Period!
Asset Lifecycle Information Management (ALCIM)

Providing superior depot maintenance, engineering, and development for major weapon systems

Leveraging SBIR Investment
Delivering Advanced Capability

ARViSS TECHNOLOGY
Adaptable Analysis & Visualization
Status Reporting
Quality Control
Workflow/Automation
Re-planning

Asset Life Cycle Information Management (ALCIM) STTP
VALUE PROPOSITION:
ALCIM will provide much-needed situation awareness of machine assets to drive preventative maintenance and ensure flow.

LifeMeter TECHNOLOGY
Logistics Enterprise Support
LifeMeter Equipment
Depot Interface
Shop Floor Support
Smart Machine Capability

We Deliver Airpower…Period!
ARViSS Provides Flexible Manufacturing Support

Warner Robins Air Logistics Complex

**Input Data**
- AMXG/CMXG Plans and estimated time (LDMS)
- AMXG/CMXG Performance and Quality (OEE)
- CNC Machine Diagnostics/Prognostics (SBIR P1/2)
- Digital Twin Model Meta-Data
- Historical Performance Data

**Arrvues Dynamic Scheduling Agent Set**
- First-In-First-Out
- Last-In-First-Out
- Command Priority
- Tail Priority

**Queueing Models**
- Compare WIP Ests.?
- Optimized Schedule?

**Genetic Algorithm**
- Previously Trained
- Action Necessary

**Deep Learning (CNN)**
- Threshold Exceeded
- Action Necessary?

**Heuristic Digital Twins**
- Performance Degradation

**Fault and Failure Prognostics**
- Maintenance Tickets and Resources

**Output Revised Schedule**

**GUI-based**
- ARRVUE Workbench for: Operations Engineering Maintenance

**Projection that Key Asset is failing/needs maintenance**

**Schedule adjustments based from AMXG reconciliation agreements**

We Deliver Airpower…Period!