CBRN Data Backbone

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March 30, 2007

Outline

- The Data Problem
- CBRN Data Backbone
- First steps:
  - Steering Committee
  - Feasibility Study
    - Study Plan

The Data Problem

- Most CBRN data, critical to current and future programs is:
  - Not validated
  - Inaccessible
  - Unreliable
  - Unstructured and structured data distributed everywhere
  - Legacy database architectures are unsuitable for current applications
- While the CBRN Data Model formalizes data transfer between M&S applications, no provision has been made for the storage, maintenance, and reuse of CBRN data
- Many organizations lack tools to assist in critical analysis functions; i.e.:
  - Policy and planning
  - Fiscal decision making
  - Engineering trade studies
  - Systems development
  - CONOPS development
  - Test analysis

CBRN Data Backbone

- It is critical that a new program be established to carry out the functions necessary to construct, employ, maintain, and safeguard a system for the access of validated CBRN data.

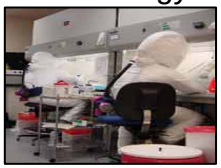
- This system will:
  - Contain validated CBRN data, piecewise-accessible to different communities as appropriate for security and efficiency
  - Provide rapid access over the Internet or applicable secure networks (NIPRNET, SIPRNET, etc.)
  - Be interactive, to the extent possible, to provide the most utility to users
  - Assist in identifying gaps in data and evaluating the fidelity of existing data
  - Prevent repetition of costly and time-consuming testing
  - Allow easy entry of new validated data

CBRN Data Backbone

Multiple User Communities

Policy & Planning | Acquisition | Science & Technology | Analysis | Test & Evaluation | Experimentation | Training | Operations








Strategic Analysis
- Decision Support Tools

S&T Gap Analysis & Identification of Areas for Future Research

R&D Modeling & Analysis
- Product Development Models

Materiel and Personnel Performance Evaluation

M&S in Support of T&E
- Design of Tests
- Validated Capture of Test Data
- Overarching T&E Models

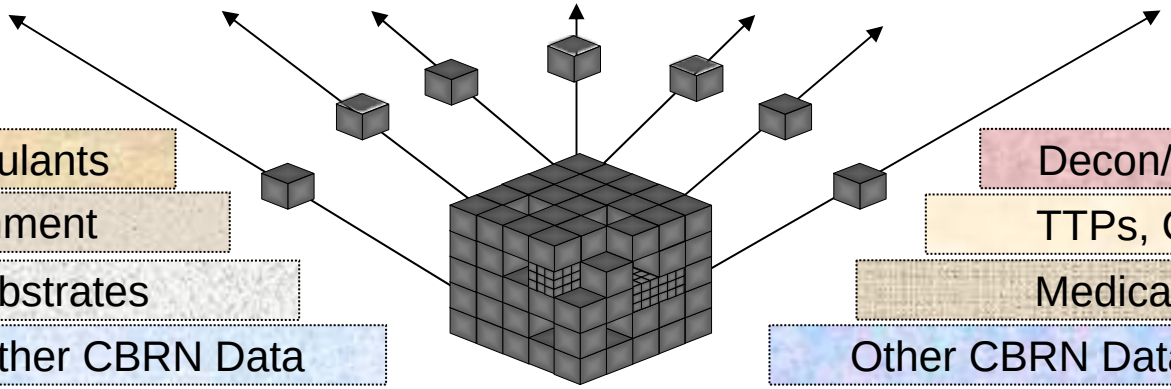
Design of Experiments

Operational IS
- JWARN
- JEM

Operational M&S & Analysis
- JOEF

Design of Training Exercises

Multiple Applications



Agents & Simulants
Environment
Substrates
Other CBRN Data

Decon/ColPro/IP/CA
TTPs, ConOps
Medical
Other CBRN Data

CBRN Data Backbone

Challenges

- Security
- Validation
- Stable, efficient architecture
- Volume
- Retrieval speed
- Maintenance
- Other challenges expected to be uncovered during the course of the JSTO-funded study

First Steps

- Create Steering Committee to guide all efforts related to Data Backbone development.
  - JSTO will coordinate the Steering Committee congruously with the study

- Conduct a study of the concept's feasibility and potential architectures
  - JSTO kicked off an 18-month study on October 11, 2006

- Objective: Provide the DoD with knowledge superiority and efficiency and increase the defensive capabilities and effectiveness of the warfighter through the accuracy, interoperability, and reuse of validated CBRN data

Steering Committee

Steering Committee Objective:

- Consider CBDP strategies to provide guidance and recommend investment for Data Backbone development

The CBRN Data Backbone Steering Committee will:

- Guide data backbone program development by providing policy direction and strategic planning, and providing oversight of critical development efforts.
- Prioritize and recommend investments.
- Meet quarterly to review development and provide timely guidance on critical issues. Meets at higher frequency respective of investment cycle.
- Include representatives from the JRO, JPEO, JSTO, and the T&E Executive, but also PDTESS, DOT&E, DMSO, other agencies/orgs as appropriate.

Feasibility Study

- Objective: Investigate the feasibility of and potential architectures for constructing a CBRN database that is validated, web-based, and interactive. Among other activities, this will include an investigation into:
  - What data exists? Where is it? Who uses it? Is it reliable? …
  - Feasible architectures (ensure coordination with Service-Oriented Architecture being developed by JPM-IS)
  - Challenges and potential risks
  - Appropriate measures of comprehensiveness for CBRN data
  - How to establish a process for submission of data
  - Any other issues of concern for backbone construction, including those voiced by the Steering Committee
  - Combined recommendation at the end of the study (March 2008) for the 2010-2015 POM submission by JPEO and JSTO

Study Constraints

1. Study duration is 18 months
2. It is an applied research study, not an IT project
3. Government support is REQUIRED to identify and access data providers, sources, and users
4. Study is driven by the data & user requirements, not existing data constructs or IT/IS tools or technologies
5. Technical requirements will address current and future needs
6. Study focus is the M&S CBRN COI
7. This study will focus on both physical S&T and medical data for M&S and IS

Study Plan

1. Identify data users and their data requirements
2. Identify data users' data fidelity requirements
3. Identify gaps between data requirements and existing data
4. Assess data mining, warehousing processes, technologies, and tools
5. Provide recommendations for a plan for developing the CBRN Data Backbone (a data collection, enterprise architecture, storage and access system)

1.a. Identify data users

Scope

- The Study Team will determine the sets of CBRN data users and formulate a representative set of data users within the operational, training, analysis, and test & evaluation communities.

Key task #1

- Develop user survey

Products

- List of CBRN data users
- Documentation with analysis of survey results

1.a. Identify data users

Scope

- The Study Team will determine the sets of CBRN data users and formulate a representative set of data users within the operational, training, analysis, and test & evaluation communities.

Key task #2

- Interview users to determine a set of fundamental scientific relationships that are of importance to each user, as well as the associated set of data types.

Products

- List of CBRN data users data types and tools
- Documentation with analysis of interview

1.a. Identify data users

Scope

- The Study Team will determine the sets of CBRN data users and formulate a representative set of data users within the operational, training, analysis, and test & evaluation communities.

Key task #3

- Show relationships between them, as a function of CBRN data Identify specific data, data types and tools produced or used by each type of CBRN data user.

Product

- Illustration of CBRN data relationships that exist between data users

1.b. Identify data users' needs

Scope

- The Study Team will determine the sets of CBRN data users and formulate a representative set of data users within the operational, training, analysis, and test & evaluation communities.

Key task #1

- Input will be sought from users. The interrelationship between different users data requirements will be used to define user needs.

Products

- List of data user data needs
- Illustration of the relationships between users and data

1.b. Identify data users' needs

Scope

- The Study Team will determine the sets of CBRN data users and formulate a representative set of data users within the operational, training, analysis, and test & evaluation communities.

Key task #2

- Develop a "data life cycle" of the CBRN community

Product

- Comprehensive description of data life cycle

1.b. Identify data users' needs

Scope

- The Study Team will determine the sets of CBRN data users and formulate a representative set of data users within the operational, training, analysis, and test & evaluation communities.

Key task #3

- Evaluate data types identified by users against JPM-IS Data Model

Products

- Summary of evaluation of CBRN data types against DOM

2. Identify data fidelity requirements

Scope

- The Study Team will formulate a notional set of data fidelity requirements that apply to each user.

Key task #1

- Define a fidelity scale that can be used to quantify data usability from user input

Product

- Description of data fidelity scale

2. Identify data fidelity requirements

Scope

- The Study Team will formulate a notional set of data fidelity requirements that apply to each user.

Key task #2

- Apply a notional fidelity scale to data requirements

Product

- Summary of results of applying the notional fidelity scale to data requirements obtained in part 1

2. Identify data fidelity requirements

Scope

- The Study Team will formulate a notional set of data fidelity requirements that apply to each user.

Key task #3

- Use data fidelity scale to determine how data can be categorized in the CBRN Data Backbone

Product

- Description of the data categories generated by application of fidelity scale

3. Assess existing technologies

Scope

- Based on analyses of CBRN users and their requirements, the Study Team will recommend technologies and IT-based tools.

Key task #1

- Develop a list of technical requirements based on data utilization and fidelity requirements, as well as a Service Oriented Architecture (SOA) utilizing Network Centric Enterprise Services (NCES) standards.

Product

- A list of potential technologies
- Technology selection criteria document

3. Assess existing technologies

Scope

- Based on analyses of CBRN data users and their requirements, the Study Team will recommend technologies and IT-based tools.

Key task #2

- Identify potential processes and or technical solutions to enhance a user's relationship to data.

Product

- A description of the notional set of processes to utilize the technology

3. Assess existing technologies

Scope

- Based on analyses of CBRN data users and their requirements, the Study Team will recommend technologies and IT-based tools.

Key task #3

- Document data flows in accordance with client requirements and industry best practices.

Product

- Data Flow Document

3. Assess existing technologies

Scope

- Based on analyses of CBRN data users and their requirements, the Study Team will recommend technologies and IT-based tools.

Key task #4

- Develop a technology integration concept

Product

- Technology integration document describing technology integration considerations and recommendations

3. Assess existing technologies

Scope

- Based on analyses of CBRN data users and their requirements, the Study Team will recommend technologies and IT-based tools.

Key task #5

- Address the development of a web services based data storage and access system.

Product

- Document that describes issues regarding the development of a web services-based data storage and access system.

3. Assess existing technologies

Scope

- Based on analyses of CBRN data users and their requirements, the Study Team will recommend technologies and IT-based tools.

Key task #6

- Create a development plan for prototype data storage and access system.

Product

- Development plan document.

4. Assess data availability

Scope

- The Study Team will assess the availability of the required CBRN data, and the feasibility of obtaining the data that is not readily available.

Key task #1

- Utilize data requirements list generated in 1b. to determine specific areas of data availability for investigation

Product

- Document describing data availability

4. Assess data availability

Scope

- The contractor will assess the availability of the required CBRN data, and the feasibility of obtaining the data that is not readily available.

Key task #2

- Review existing JSTO S&T programs to determine if the data requirements listed during 1b. are being met, or if similar data is being generated

Product

- Document describing JSTO S&T data requirements connections to or gaps between data that is available or being generated

4. Assess data availability

Scope

- The Study Team will assess the availability of the required CBRN data, and the feasibility of obtaining the data that is not readily available.

Key task #3

- Review non-JSTO programs to determine if the data requirements listed during 1b. are being met, or if similar data is being generate

Product

- Document describing non-JSTO S&T data requirements connections to or gaps between data that is available or being generated

4. Assess data availability

Scope

- The Study Team will assess the availability of the required CBRN data, and the feasibility of obtaining the data that is not readily available.

Key task #4

- Assess the types of data that are required, the scientific efforts that must be undertaken to obtain the data, and an approximation on the time and financial resources needed to obtain the data.

Product

- Document describing identified data gaps, with approximate measures of resources available to obtain data needed to fill gaps

5. Final report

Scope

- The Study Team will provide recommendations for a prototype data storage and access system development plan, including a description of the data and associated fidelities.

Key tasks

- Combine and interpret the results of the study phases
- Describe the user-to-data relationships
- Compile the list of data sources and repositories; describe existing data
- Describe the IT-based tools and technologies best suited to store and retrieve CBRN data, using a well defined evaluation criteria

Products

- CBRN Data Backbone Study (text document)
- Executive Briefing

Questions?

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