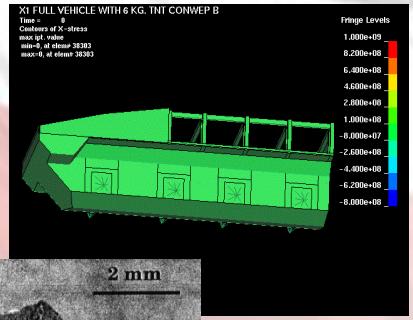
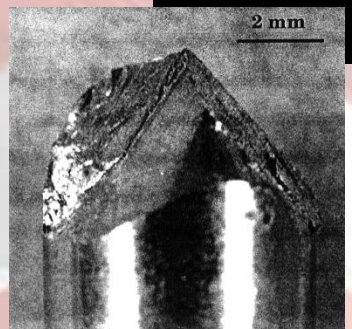
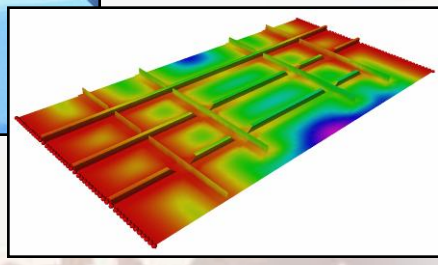
Chemical and Materials Information Management

RDECOM





for Sustainable Engineering and Design



Army Corrosion Summit 2010

February 11, 2010

Session C – RDT&E

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
FEB 2010		**00-00-2010 to 00-00-2010**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Chemical and Materials Information Management for Sustainable Engineering and Design	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **US Army Research Laboratory,Aberdeen Proving Ground,MD,21005**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
2010 U.S. Army Corrosion Summit, Huntsville, AL, 9-11 Feb

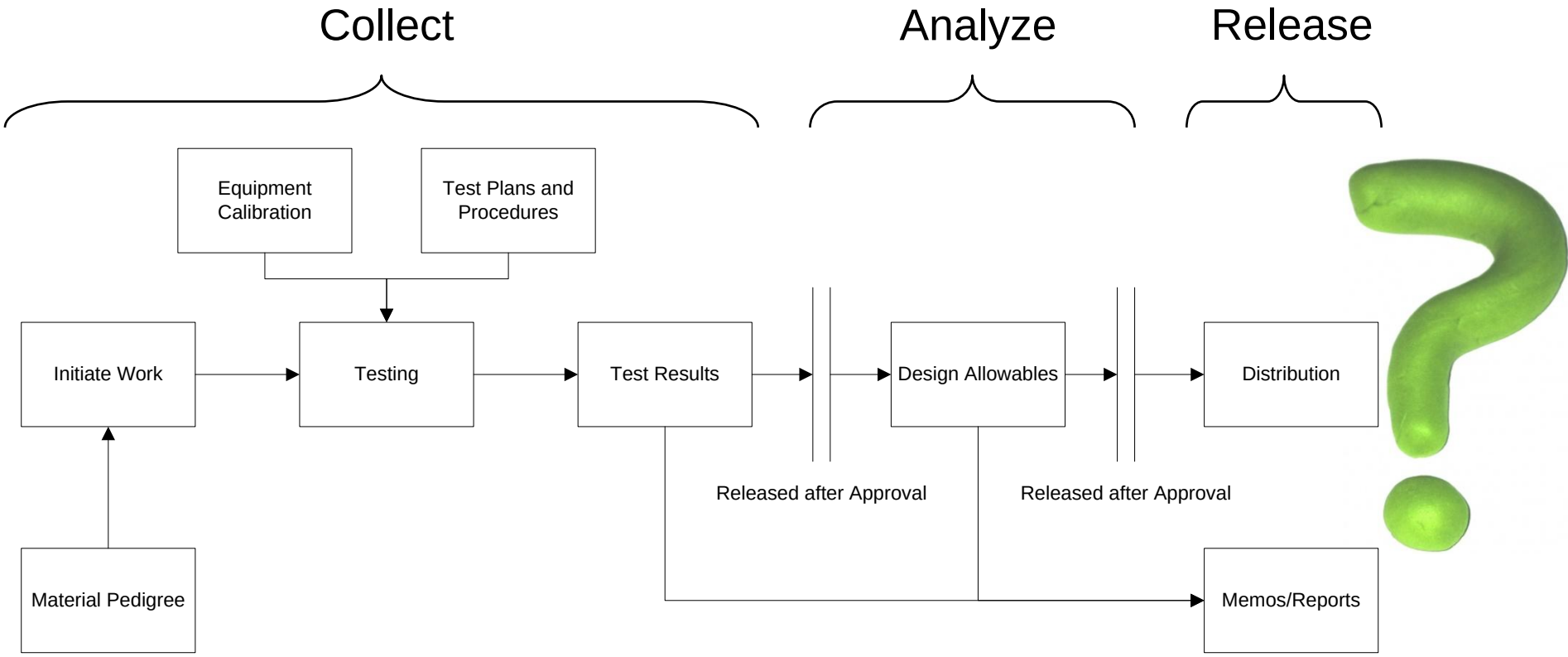
14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**18**	

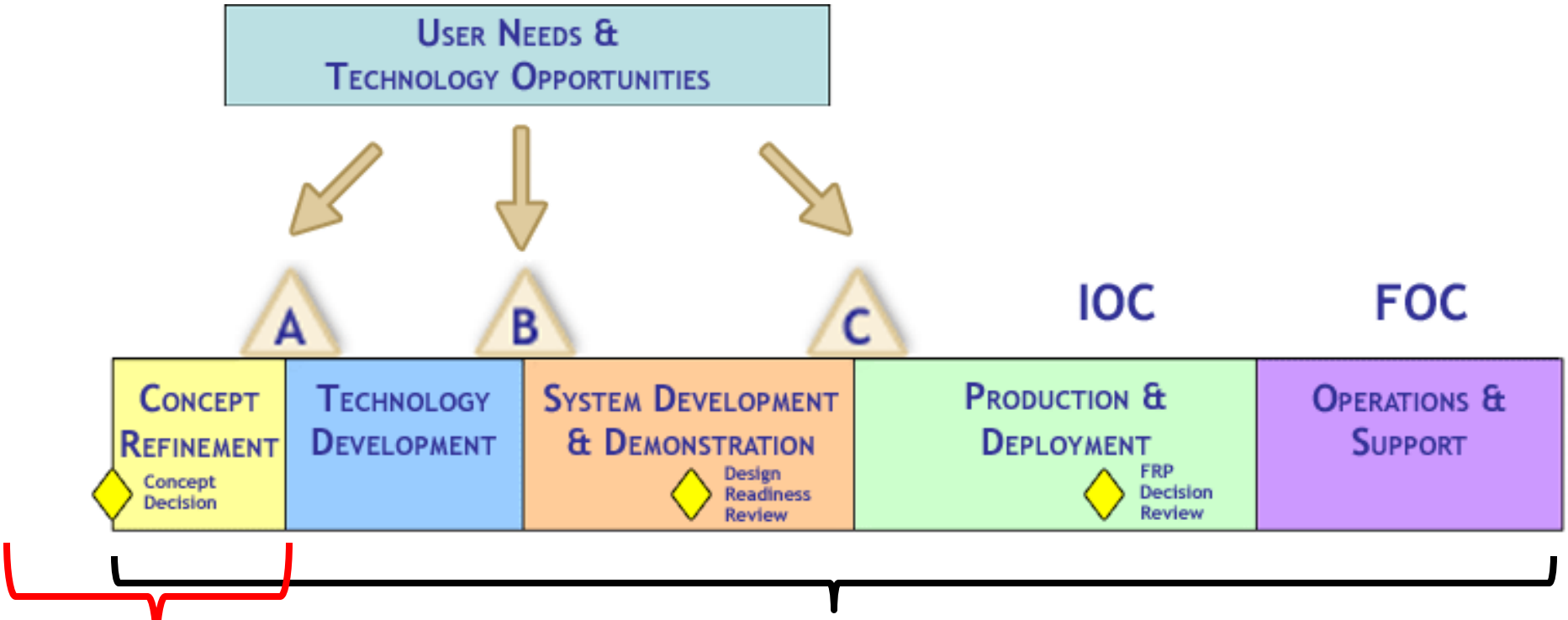
Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18

Life of Material Data



Includes both material property and process data

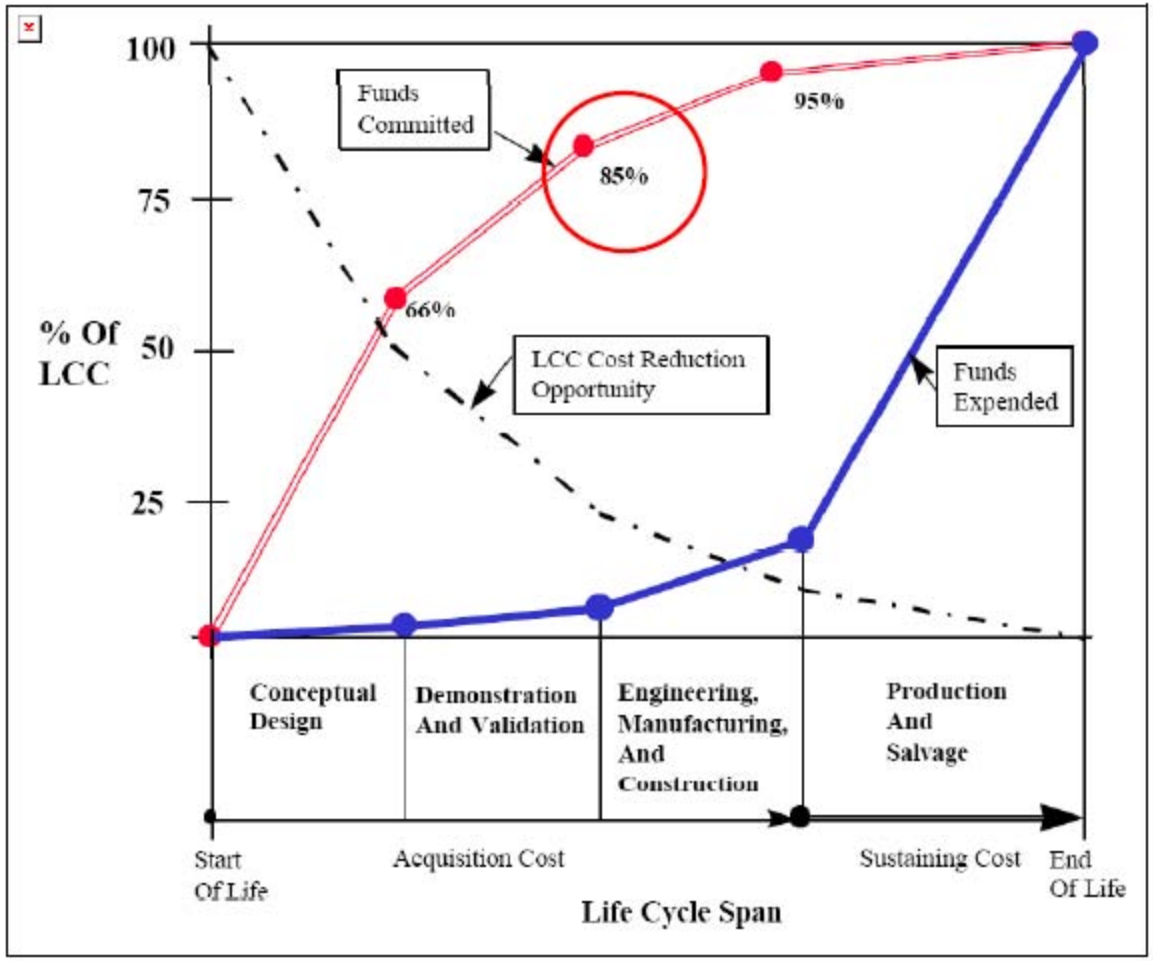
Acquisition Life Cycle



Traditional Materials Information Input

Materials Information Needed

Impact of materials and process information on product lifecycle

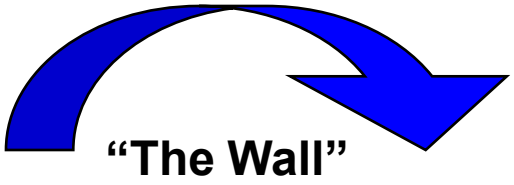


From: H. P. Barringer & D. P. Weber (1996) "Lifecycle Cost Tutorial"

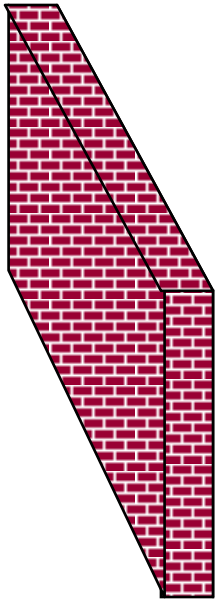
Project Funding Trends by Commitment and Expenditure of Lifecycle Cost (LCC))

85% of life cycle costs and environmental impact is built-into products during design

Chemical & Materials Dilemma



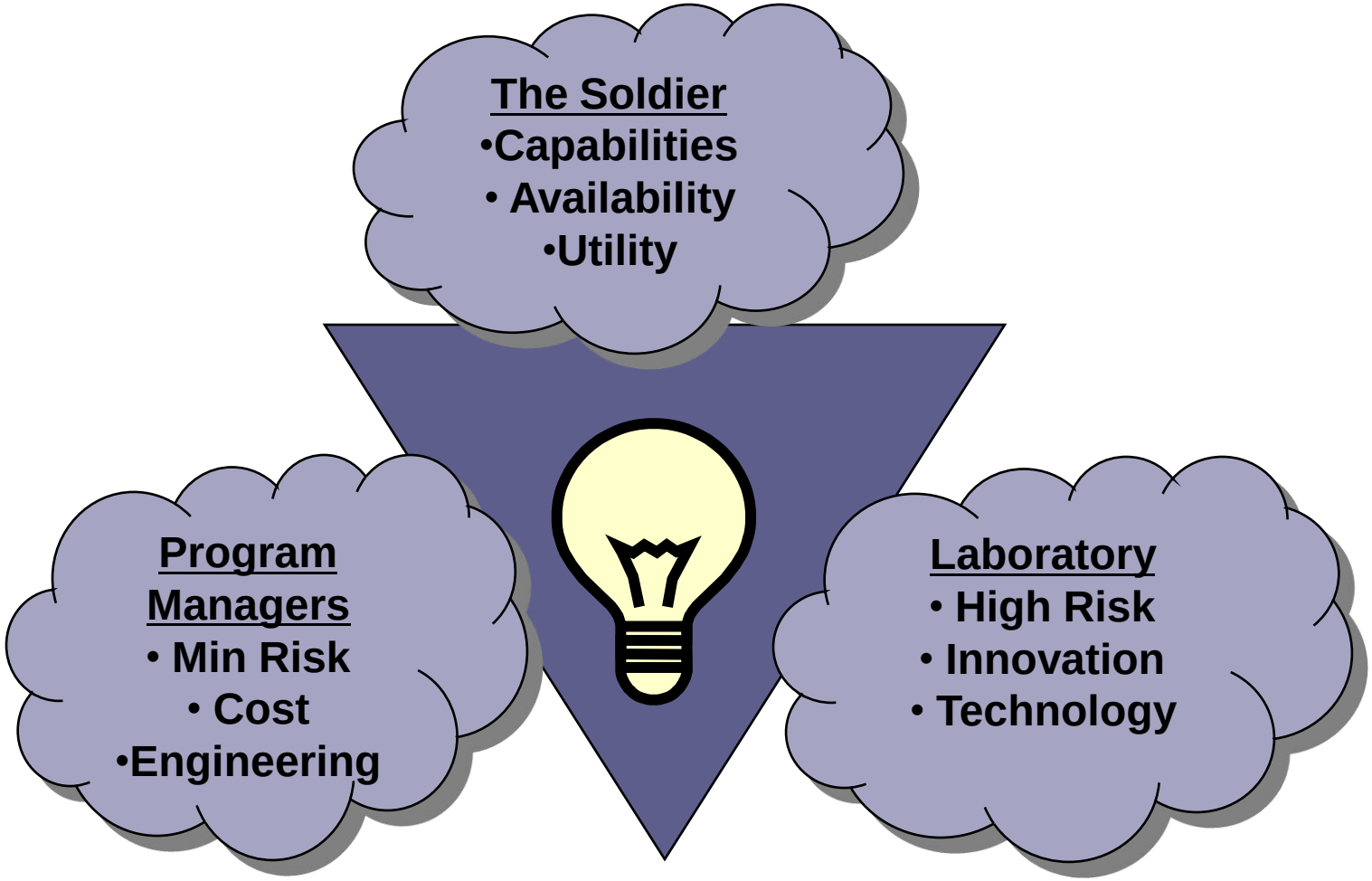
Technology Development
- Cycle times 7-30 Years
- Developed independent of application
- Empirical developments
- Modeling
- Multi-scale issues



Engineering Design
- Cycle times 3-5 Years
- Requires confidence in materials system
- Risk Averse
- Modeling enables rapid developments in design

Use of New Materials & Processes only Occurs With Mitigation of Risk

Technology Dilemma – Differing, Sometimes Conflicting Perspectives/Values



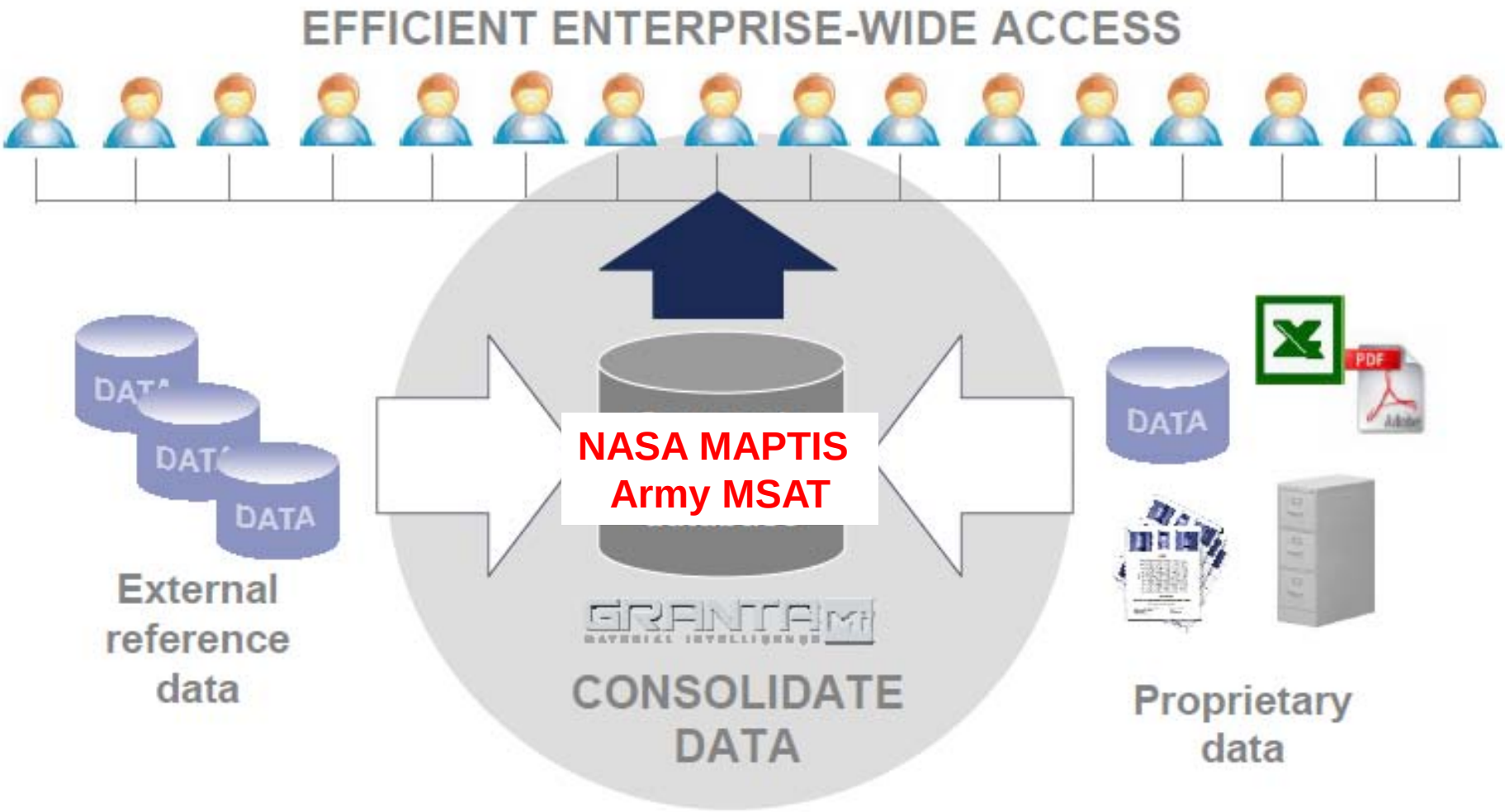
Army Materials Summit 2006
Dr. Steve McKnight

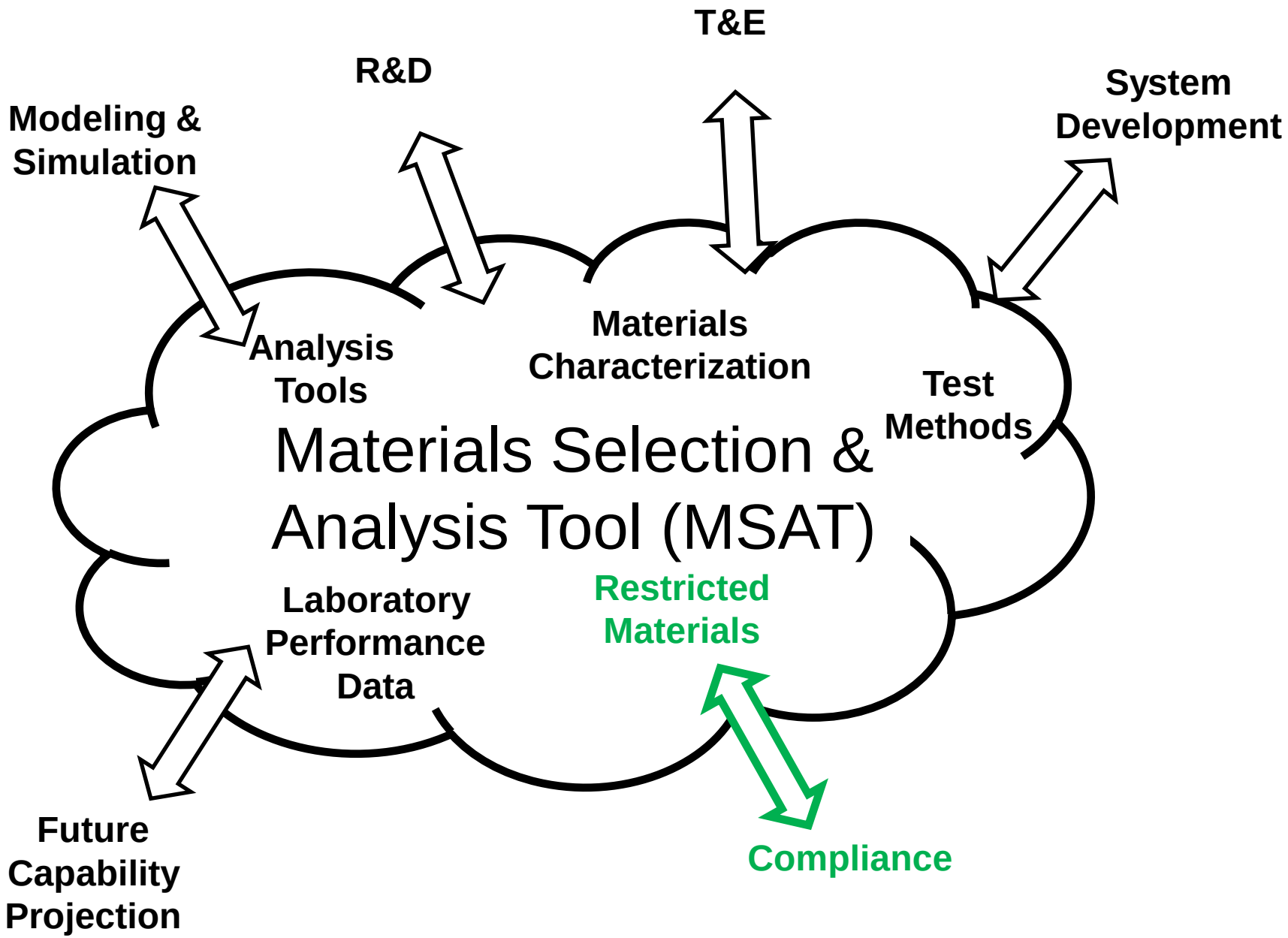
Business Transformation

- ***Standardize … to significantly enhance the ability to process and share information throughout DoD and the military services.***
- ***Eliminate stovepipes from solution design and deployment.***

Commentary: New focus on business operations across DoD
http://www.federaltimes.com/index.php?S=3937026
By DAVID FISHER February 08, 2009

Efficient Enterprise Access



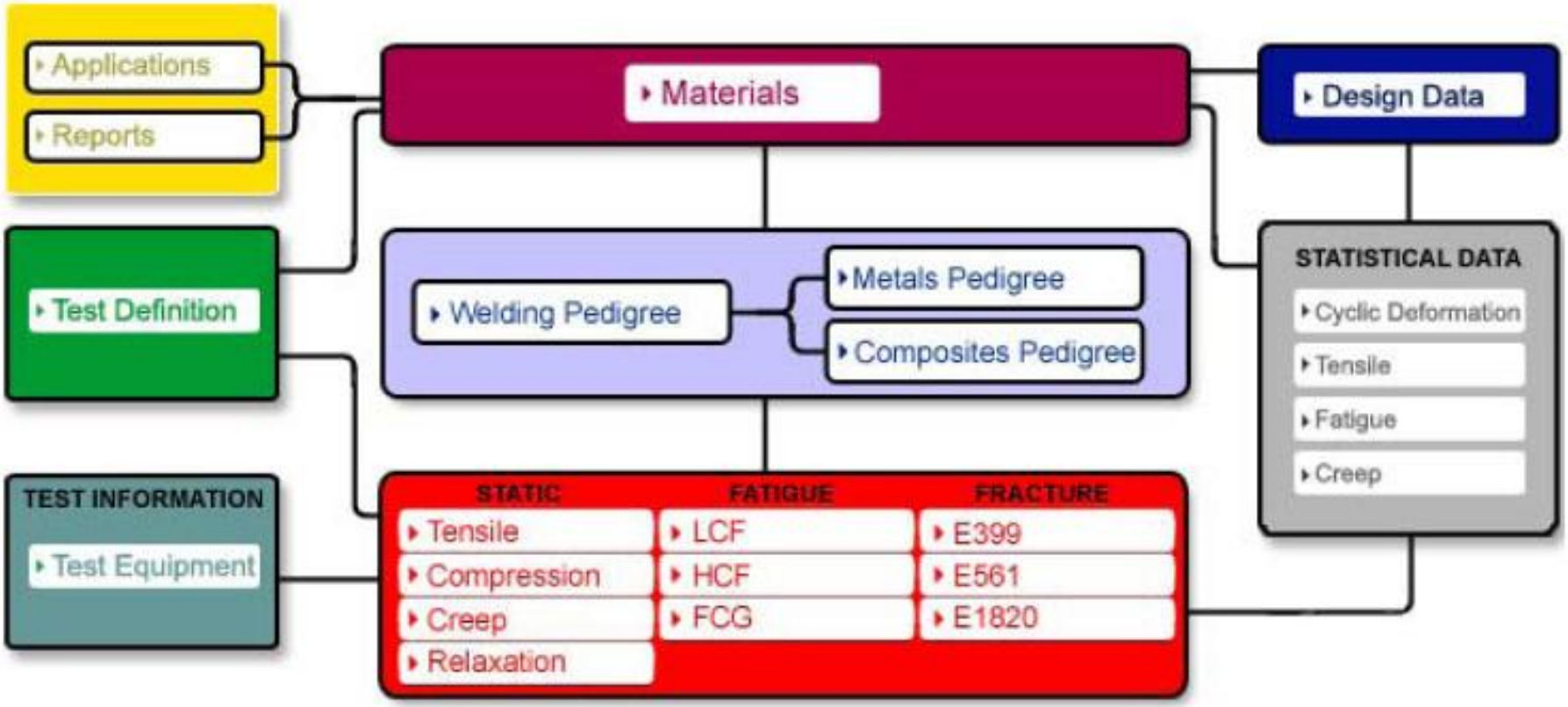

T&E
R&D
System Development
Modeling & Simulation
Analysis Tools
Materials Characterization
Test Methods
Materials Selection & Analysis Tool (MSAT)
Laboratory Performance Data
Restricted Materials
Future Capability Projection
Compliance

ARL Materials Vision

OBJECTIVES

- ***Identify, mature and transition advanced materials solutions***
- ***Develop capabilities to enable the Army to rapidly exploit breakthroughs***
- ***Accelerate the insertion of advanced materials***

Get the Data Challenge: Information Flow



Manage the Data

CAPTURE

ANALYZE

- Process test data
- Create approved design data
- Statistical process control
- …

Corporate materials database

MAINTAIN

- Capture & maintain context
- Change management
- Security / access control…

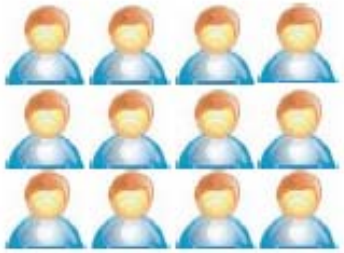
GRANTA MATERIAL INTELLIGENCE

TECHNOLOGY DRIVEN. **WARFIGHTER FOCUSED.**

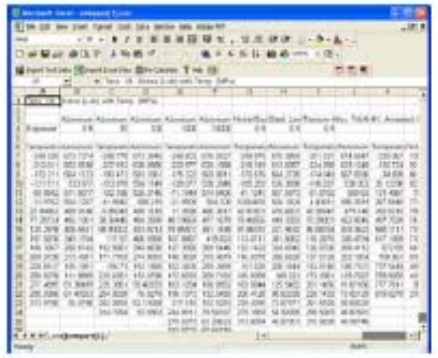
Distribute the Data

Ease of access
Web browser

Fit users' workflows
Plug-in, API



Scalable & robust



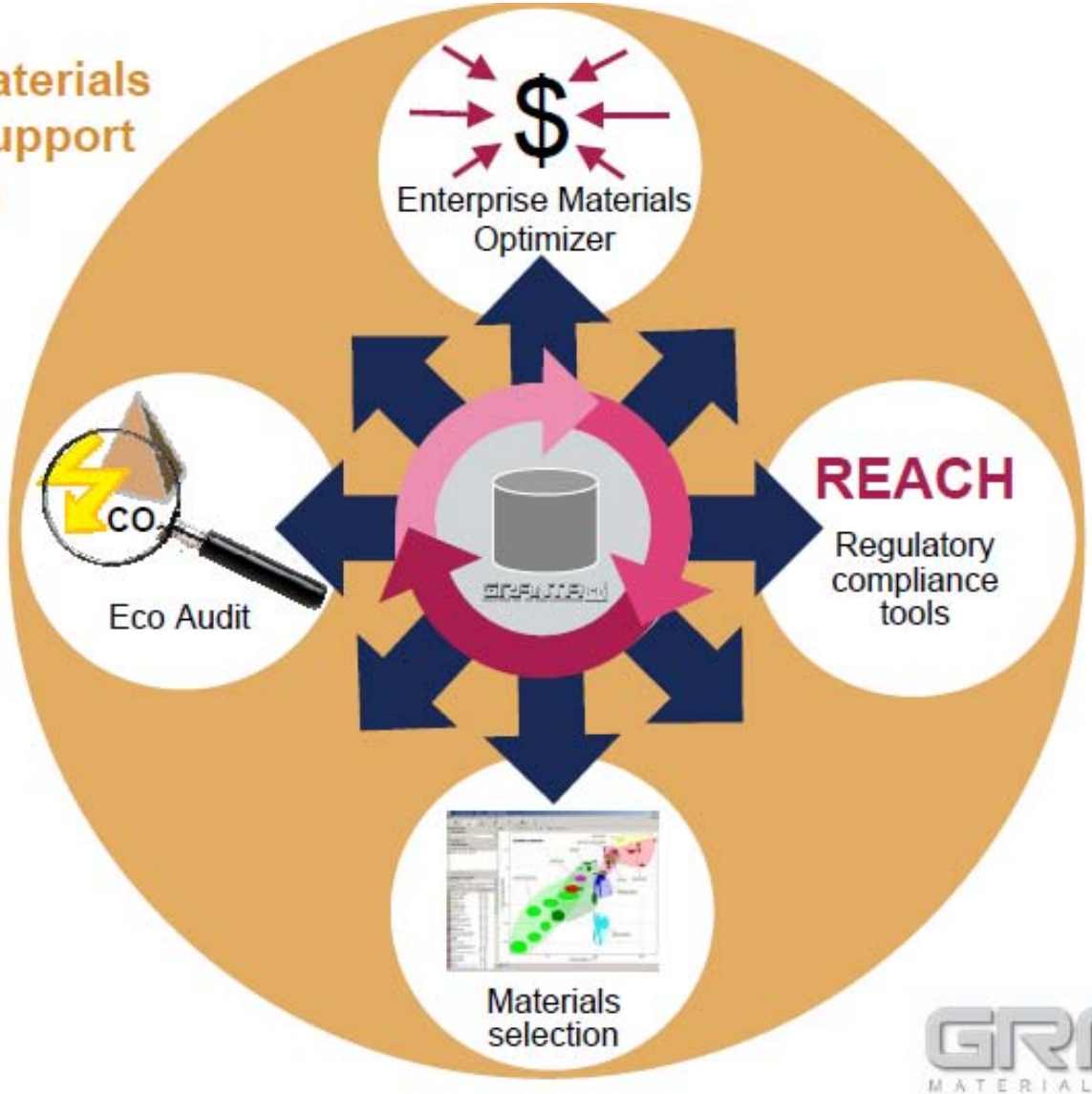
Desktop integration
Data to/from Excel

Secure & controlled

GRANTA
MATERIAL INTELLIGENCE

Use the Materials Information

Example materials decision support tools



GRANTA MATERIAL INTELLIGENCE

TECHNOLOGY DRIVEN. **WARFIGHTER FOCUSED.**

DoD-NASA Partnership

- MAPTIS - Materials & Process Technical Information System
- MAPTIS is a NASA-wide materials database established for the purpose of recording and disseminating material information
- MAPTIS distributes in-house & commercial databases
- Housed and administered by NASA

Looking Forward

- Single source – integrate with existing data sources
- Track materials to components through acquisition cycle
- Investigate restricted materials use
- Target implementation strategies

Partner Organization Contacts

Mr. Wayne Ziegler
US Army Research Laboratory
410-306-0746
wziegler@arl.army.mil

Ben Henrie
NASA Marshall Space Flight Center
256-544-2446
benjamin.l.henrie@nasa.gov

GRANTA
MATERIAL INTELLIGENCE


FOCUSED ON THE
WARFIGHTER