George Mason University

The Structure of I.T. Spending as Measure of Organizational Disorder

Paul A. Strassmann, March 29, 2005

Outline of Presentation

1. **A theory of organizational order;**
2. I.T. indicators of DoD organization;
3. Data management as key to systems order;
4. Entropy reversal rules;

Summary

The Second Law of Thermodynamics (The Law of Entropy)

- Energy spontaneously disperses if not hindered by organization.

- Claude Shannon's application to information theory:*

S = -k[Pilog(Pi)]

* In "Mathematical Theory of Communications"

"Entropy" is a Measure of Organizational Disorder

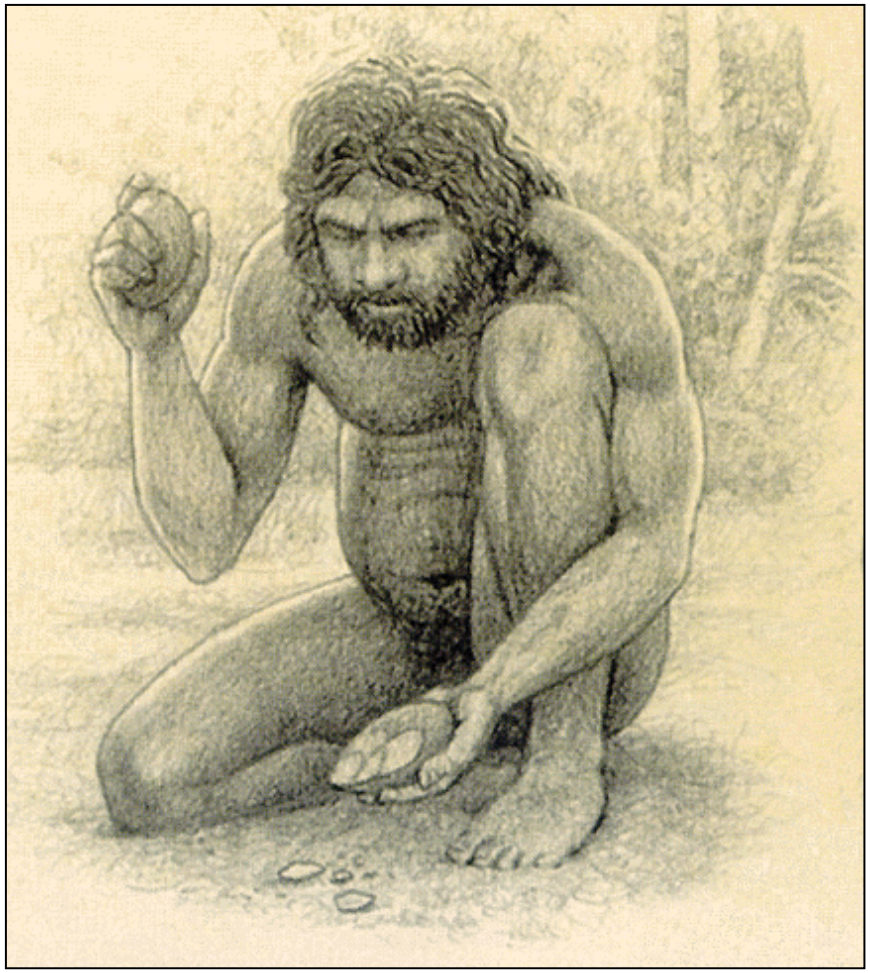
- Measures randomness in a system;
- Measures loss of information in a message*;
- Measures deterioration in performance.

* According to Claude Shannon

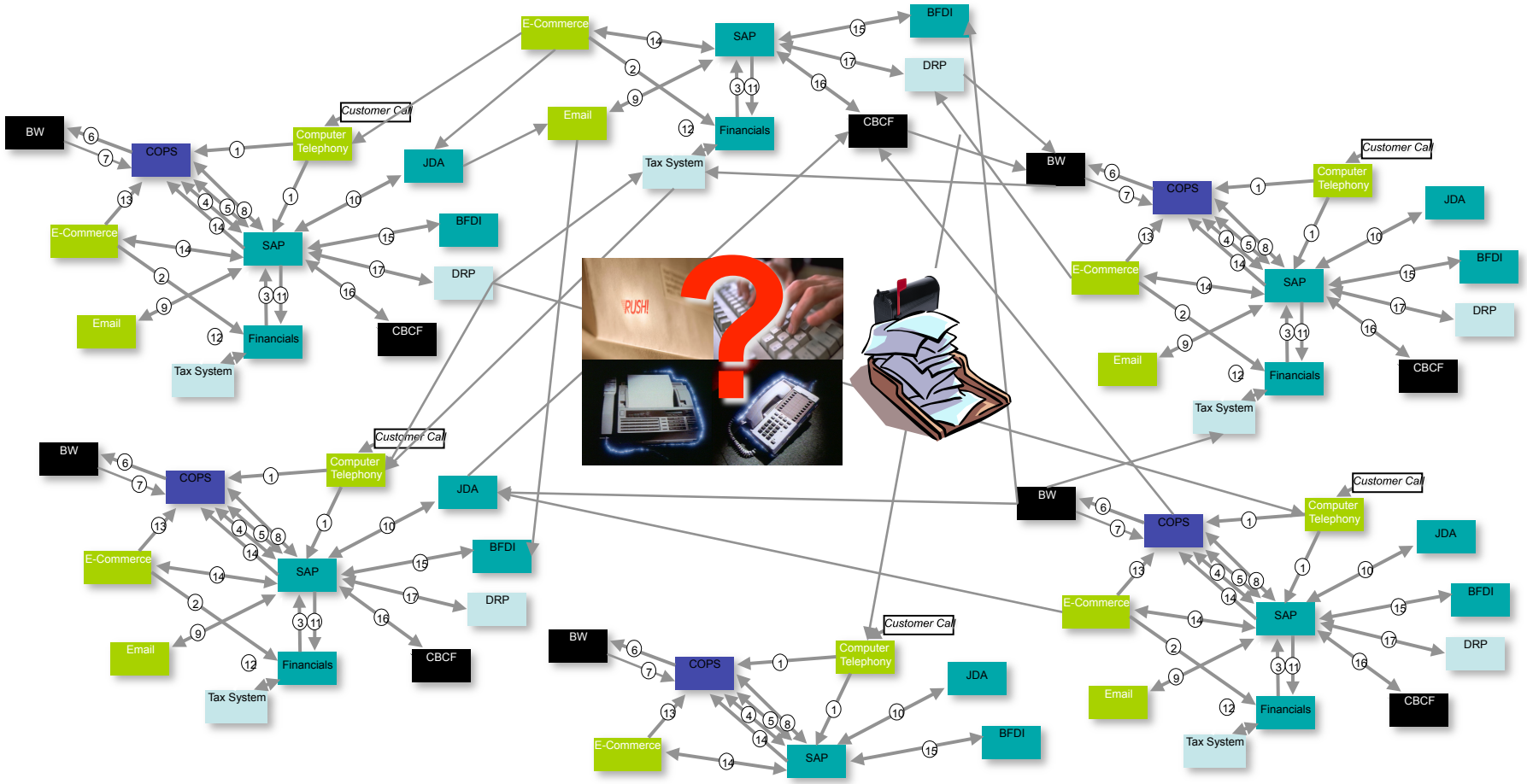
The Effects of Entropy on Organizations

Disorder ← Organization → Integration

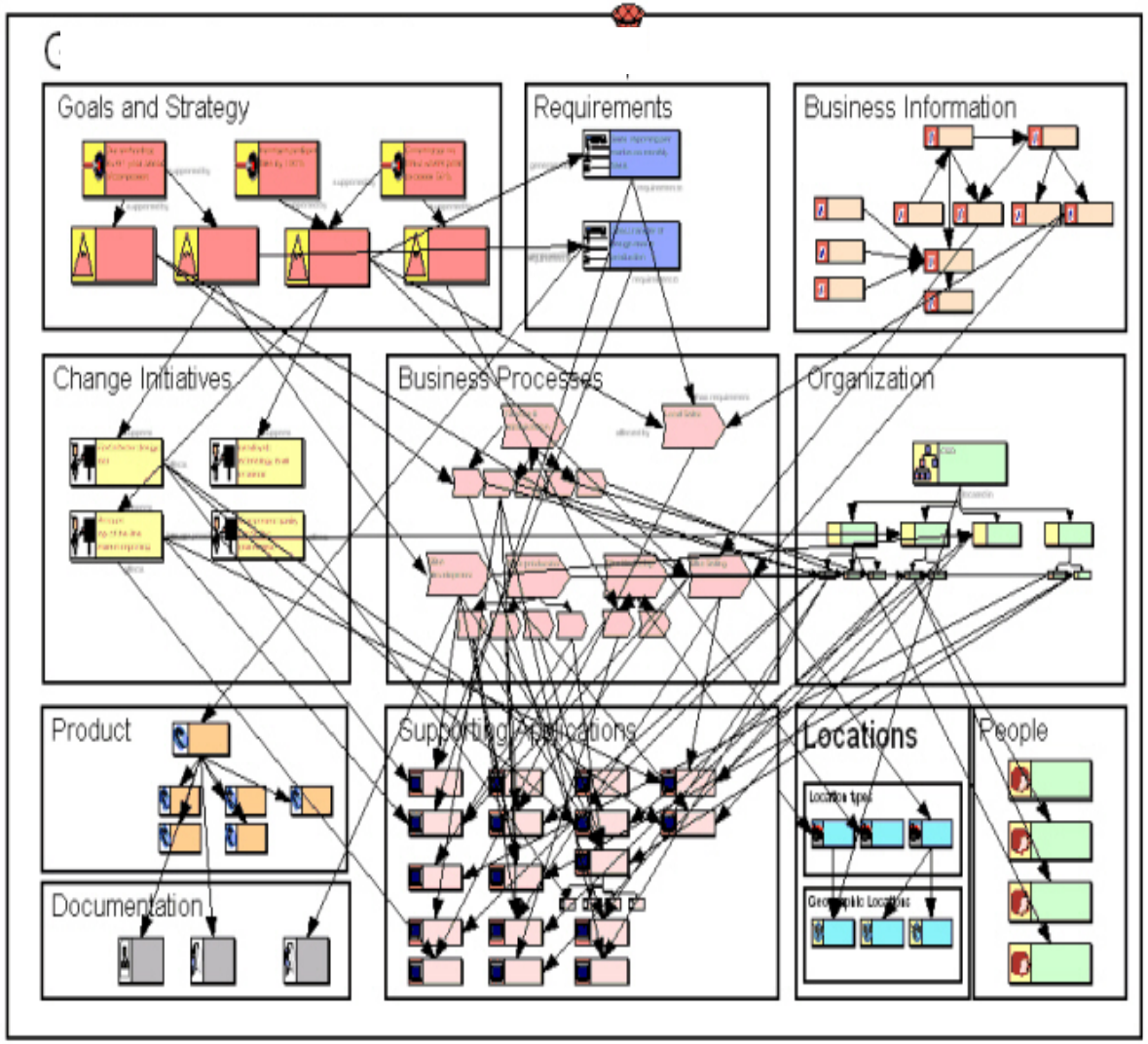
The First Systems Organizer



Integration is More than Connecting



Systems Integration Policy & Organizational Conflicts



- Goals
- Strategy
- Requirements
- Changing scope
- Processes
- Standards
- Security
- Organization
- Products
- Operations
- Maintainability
- Locations
- People
- Politics

Outline of Presentation 2

1. A theory of organizational order;
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Summary

DoD FY 2006 I.T. Budget by Function (Final Budget)

Number of Projects	Budget Category	FY 2006 Budget - $000	% of total	
585	Warfighter	$7,644,381	25.4%	Teeth
102	Acqusition	$251,225	0.8%	
1,891	Infrastructure, Enterprise Environment	$15,333,534	51.0%	
251	Finance, Accounting	$643,210	2.1%	Tail
440	Human Resource Management	$2,218,081	7.4%	
680	Installation, Environment, Logistics	$2,551,152	8.5%	
172	Planning, Budgeting and Other	$1,444,902	4.8%	
4,121	Total I.T. Spending	$30,086,485	100.0%	

T-T Ratio: 25.4%/(100-25.4) = 34%

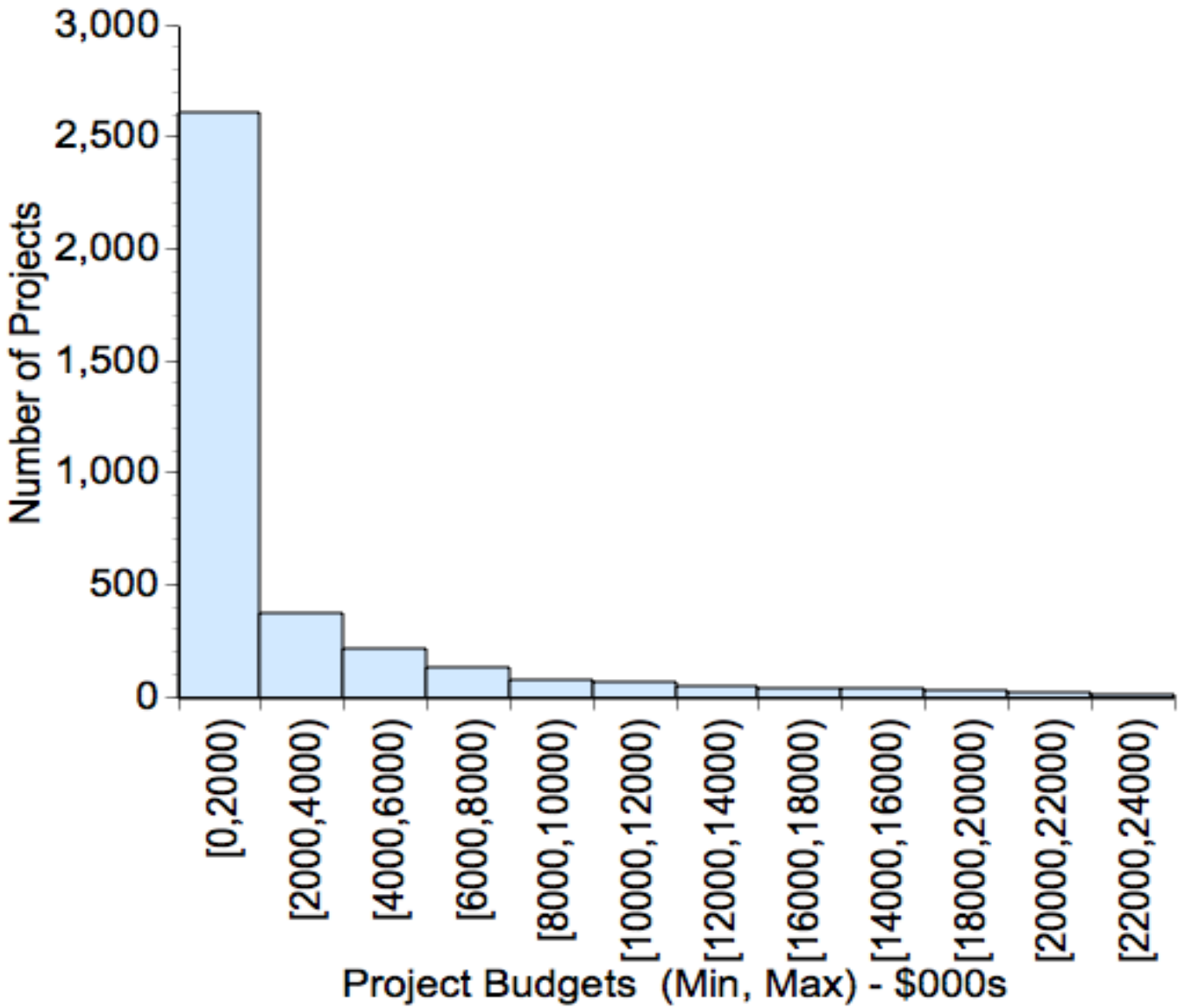
Support I.T. Excludes Embedded I.T. (FY2005)

	FY2005 Outlays - $ Millions	% of Total
Military Personnel - I.T. Supports	$108,884	25.4%
Operations and Maintenance - I.T.	$163,877	38.2%
Procurement - I.T. is Embedded	**$78,233**	**18.3%**
R.D.T&E - I.T. is Embedded	**$66,205**	**15.4%**
All other	$11,358	2.7%
Total	$428,557	100.0%
Information Techology	$28,700	6.7%

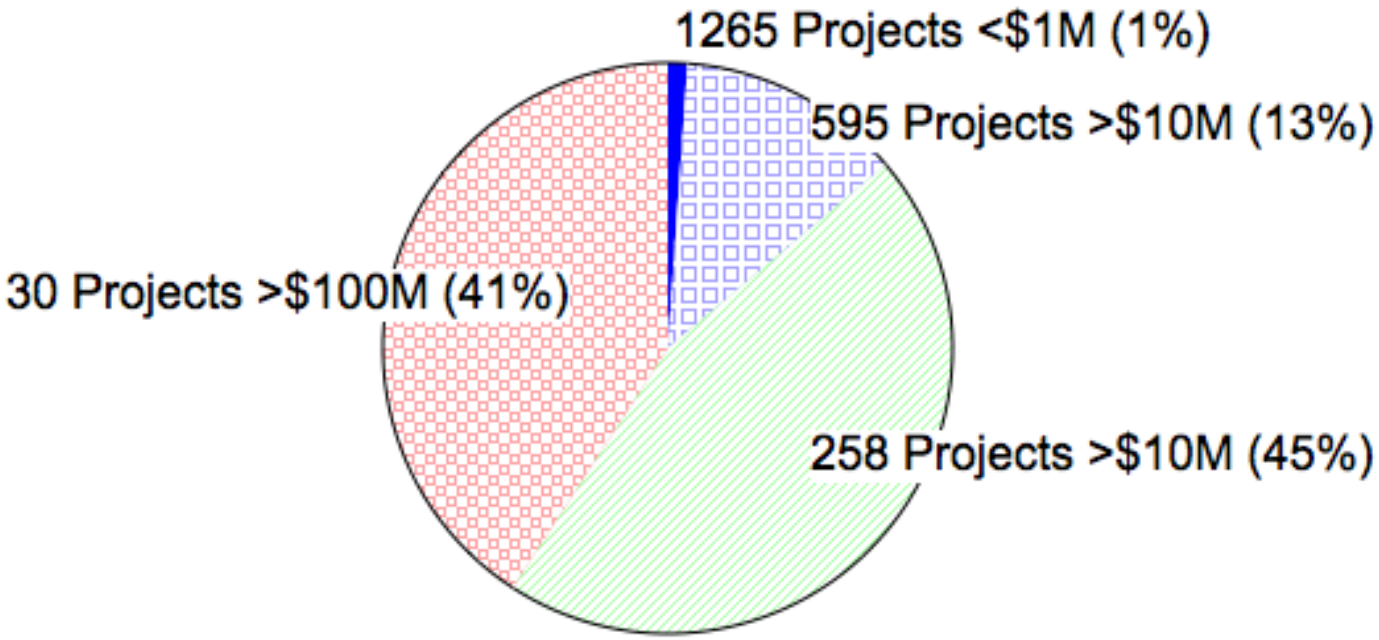
Preliminary FY06 I.T. Infrastructure Budget by Component

Number of Projects	Component	FY 2006 Budget - $000	% of total I.T. Budget
775	Air Force	$4,360,739	61%
289	Army	$3,023,296	50%
60	DISA	$3,388,673	
43	DLA	$594,357	
576	Navy	$3,525,161	57%
405	All Other Agencies	$3,006,412	
	Total (Enterprise Environment +Unspecified Support)	$17,898,638	59%

80% of I.T. Projects <$2 Million



Challenge: Interoperability of 2,148 Infrastructure Projects



2,148 FY2006 I.T. Infrastructure Projects = $17.9 Billion

Outline of Presentation 3

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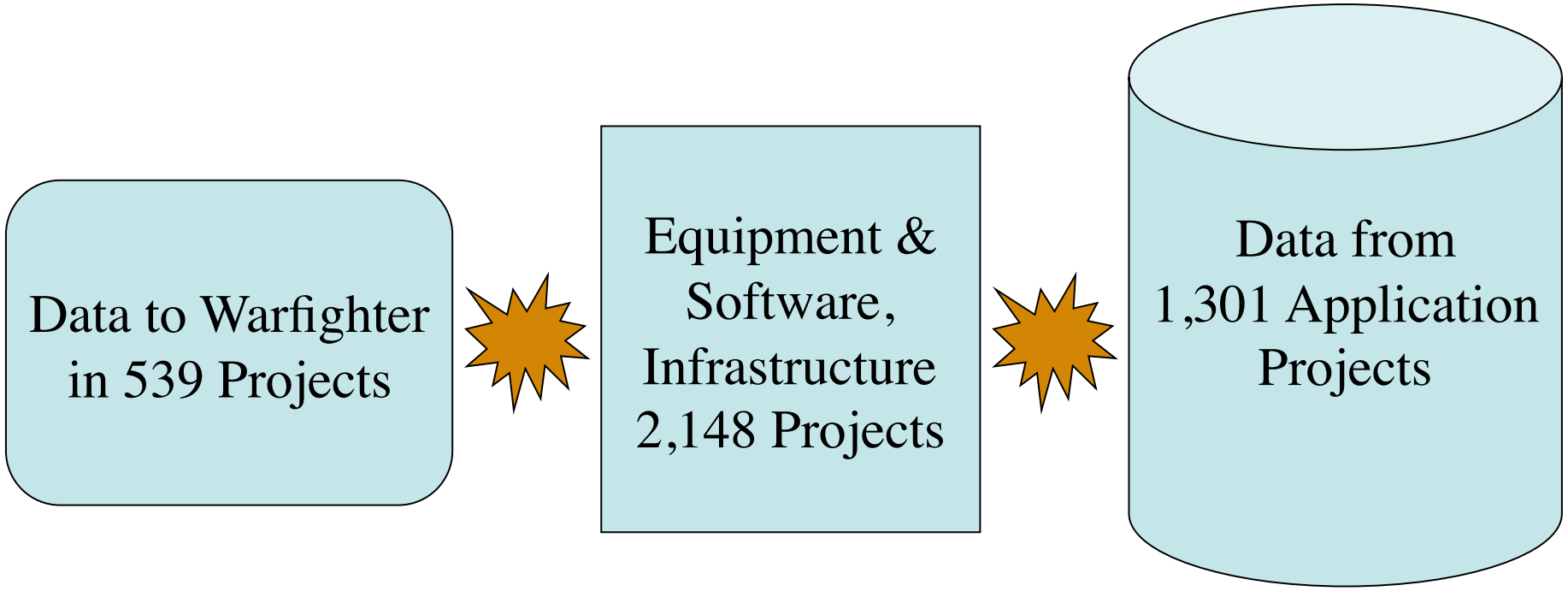
Summary

DoD Directives Support DoD Data Management

- DoD Directives 5000.12 and 5000.18 issued in 1964.
- DoD Directive 5105.19, “Defense Information Systems Agency – DISA”, June 25, 1992.
- DoD Manual 8320.1-M-1, “Standard Data Element Development, Approval, and Maintenance Procedures”, May 1992.
- DoD Manual 8020.1-M, “Functional Improvement Process”, August 1992
- DoD Manual 8320.1-M, “Data Administration Procedures”, March 1994.
- DoD Directive 8320.2, “Data Sharing in a Net-Centric Department of Defense”, December 2, 2004.

Proliferation Increases the Costs of Infrastructure



Program Management & Integration Largest Life Cycle Cost

	Costs	% of Total
Operating Systems & Application	$294.750	6%
Integration Software	$222.750	5%
Software Implementation	$3.431.514	75%
Hardware	$62.078	1%
Program Management & Integration	$537.600	12%
TOTAL START-UP	$4.548.691	100%
Software Support and Licenses	$641.501	59%
Program Management & Integration	$438.000	41%
TOTAL OPERATIONS	$1.079.501	100%
Program Management & Integration	$6.766.996	53%
TOTAL LIFE CYCLE	$12,669,738	100%

Implementation of MetaData Policies Lagging

DoD Component	Acronym	FY2005 -$000	FY2006 - $000	BEA Package
OSD	FADAS	$13.469	$13.807	Financial Management Enterprise Data
OSD	ADAS	$13.206	$13.160	Acquisition Management
MDA	MDA	$10.121	$10.308	Enterprise Services Environment
NAVY	AO- DA	$5.576	$5.532	Direct Services for Citizens
OSD	IEDAS	$4.498	$5.004	Installation Enterprise Data and Reporting
TRANSCOM	CE	$5.392	$4.445	Enterprise Reporting Foundation Level
OSD	SPBDAS	$3.245	$2.871	Strategic Planning and Budgeting
TMA	HDIS	$2.425	$2.425	Military Health System
ALL OTHER		$6.740	$6.794	Data Management
OSD	SPBDAS	$30.284	$0	Strategic Planning and Budgeting
	Total, Data Projects	**$94,956**	**$64,346**	
	Infrastructure	**$17.284**	**$17.898**	
Data /Infrastructure		**0.55%**	**0.36%**	

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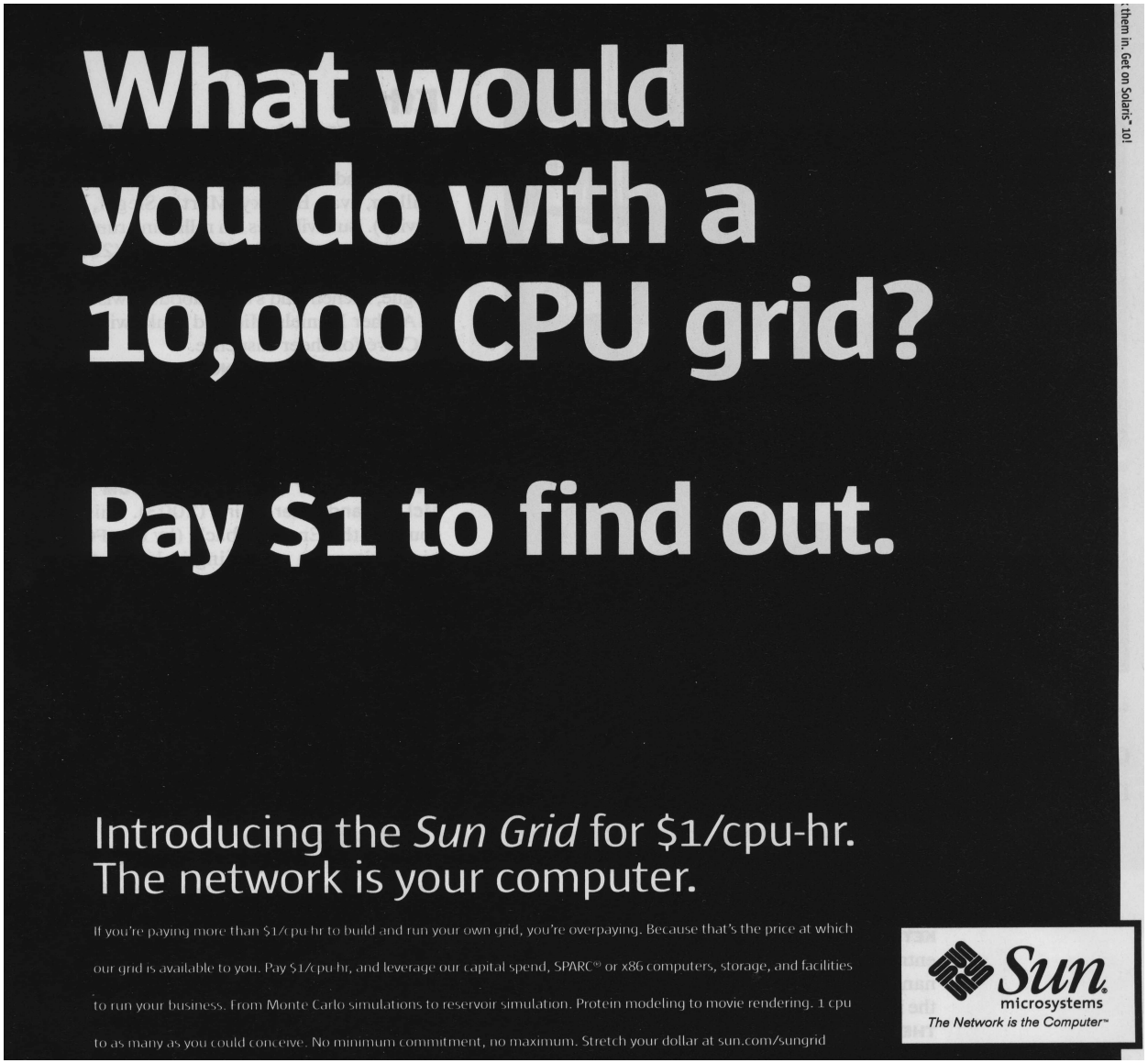
Summary

How to Decrease Complexity and Costs

1. Bar application logic from the infrastructure;
2. Remove application data from the infrastructure;
3. Migrate systems intelligence to the periphery for variety and innovation;
4. Enforce standards for access to infrastructure;
5. Shift to variable transaction costs

A Variable Cost Service - A Demand Infrastructure



A Volume Scaleable Infrastructure of Low Cost of Services

PREDICTABLE COSTS WITH NEW USER-BASED ORACLE ON DEMAND PRICING

Oracle On Demand provides support management services in an Oracle data center or at a third-party location. Oracle continues to extend its commitment to flexible pricing options with the following user-based purchasing options:

On Demand Location—Oracle Data Center

- Professional Application User—US$150/month
- Self-Service Application User—US$20/month
- External Application User—US$50/month

On Demand Location—Customer Site

- Professional Application User—US$90/month
- Self-Service Application User—US$12/month
- External Application User—US$30/month

The preceding prices are base price per user; additional discounts may apply based on volume.

IBM's ASCENTIAL Data/Infrastructure Consolidation Suite

- One integrated platform for all data integration tasks
- Integrated enterprise metadata management
- Scalable dictionaries to meet the largest demands of data migration
- Open, Service-Oriented Architecture
- Data Profiling & Data Quality
- Real-time Data Transformation and Routing
- Reusable Components & Rules
- Anytime, Anywhere Connectivity

Summary

- Complexity and costs will rise without structure and enterprise-wide order;
- DoD high cost infrastructure reveals entropy;
- A “dumb” infrastructure is more scaleable and upgradeable than local solutions.
- DoD can be improved by first simplifying the infrastructure, then imposing metadata discipline and only then consolidating applications.

Purpose of Information Management