Application of Business Systems Architectures to DoD Engineering Programs

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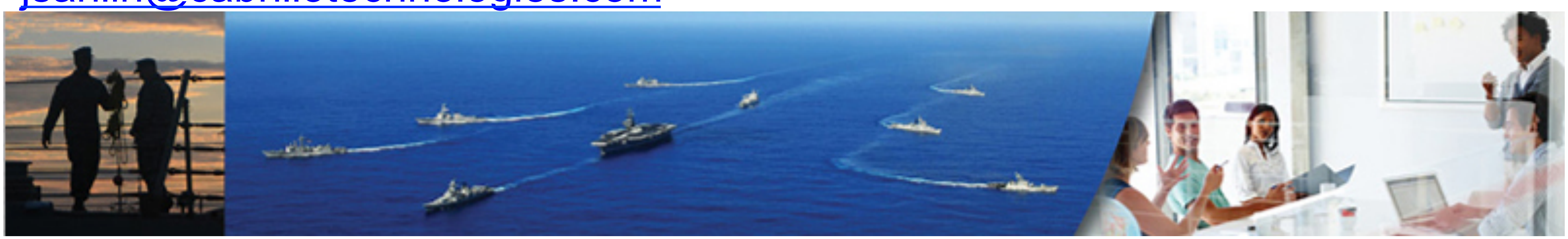


Agenda

- U.S. Federal Cloud Computing Initiative
- Value of Cloud Computing
- Challenges to Adoption
- Solution: Systems Engineer as Decision Coach

U.S. Federal Cloud Computing Initiative

- All Federal agencies must consider options for cloud computing before acquiring new IT infrastructure.
- Target opportunity: $20 Billion
  - 25% of Federal IT Spending

"Our responsibility in government is to achieve the significant cost, agility and innovation benefits of cloud computing as quickly as possible."

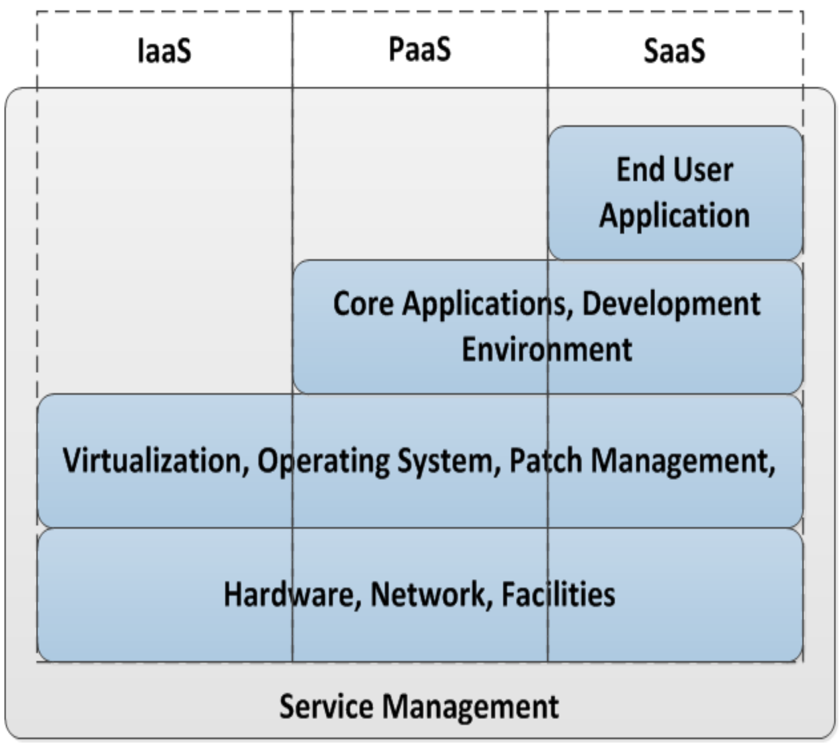
~ Vivek Kundra, U.S. CIO, 2011

(Kundra, 2011)

A Stairway to the Clouds

NIST Definition of Cloud Computing Identifies a number of Cloud Computing Models and Technology Enablers

Cloud Computing Models: A Stairway to the Clouds



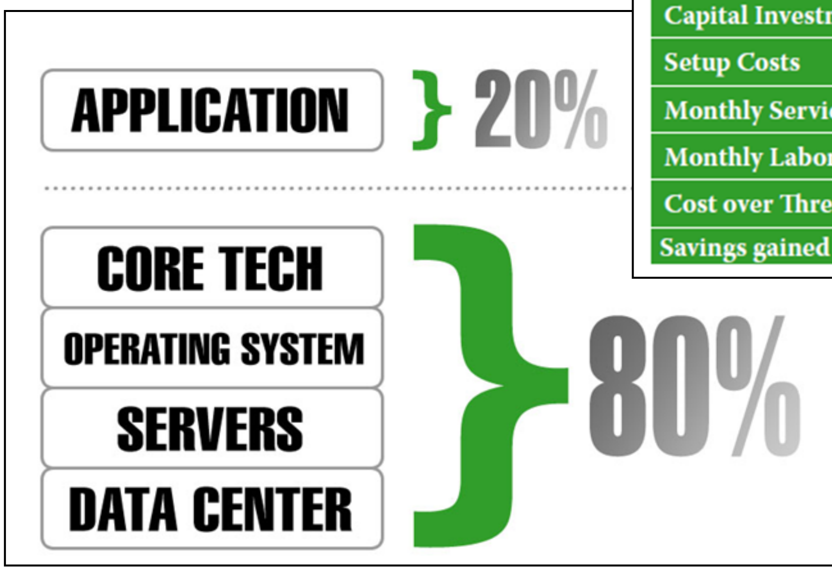
Cloud Computing Technology Enablers

IaaS	PaaS	SaaS	Service Management
• Server Virtualization • Virtual Networking • Data Encryption • Storage Area Networking (SAN) • Network Attached Storage (NAS) • Community of Interest (COI) Segregation	• Application Virtualization • Desktop Virtualization • Virtual Desktop Interface (VDI) • Containerized Applications • Automated Provisioning • Map/Reduce	• Service Oriented Architecture (SOA) • Enterprise Service Bus (ESB) • Data Service Bus • Data Distribution Service (DDS) • Standardized Data Dictionary / Ontology	• Network Monitoring • Application Platform Interface (API) • Quality of Service (QoS) Management

(Mell and Grance, 2011; Sahlin, 2013)

Why Cloud Computing?

Cloud Computing is attractive to commercial industry because it reduces Total Ownership Costs (TOC), which increases <u>PROFIT</u>



	Internal IT	Managed Services	The Cloud
Capital Investment	$40000	$0	$0
Setup Costs	$10000	$5000	$1000
Monthly Services	$0	$4000	$2400
Monthly Labor	$3200	$0	$1000
Cost over Three Years	$149000	$129000	$106000
Savings gained	0%	13%	29%

Problem: 80% IT Expense is NOT spent on CORE Business

But do Business Architectures make sense for Government?

(Rackspace, 2011)

Federal Adoption of Cloud Computing

- U.S. federal government spending on cloud computing will reach $1.7 billion in 2014 and is likely to exceed $7 billion by 2017

~IDC Research, 2013

- U.S. Federal Cloud Spending slightly increased from FY2012 to FY2013

~U.S. Office of Management and Budget, 2013

(McCarthy, 2013; McCarthy, 2013a)

Federal Adoption of Cloud: A Closer Look

Cloud Model	FY2012 Cloud Spending ($M)	FY2013 Cloud Spending ($M)	% Change
Software as a Service (SaaS)	$ 765	$ 740	- 3%
Platform as a Service (PaaS)	$ 317	$ 315	- 1%
Infrastructure as a Service (IaaS)	$1,000	$1,200	+ 20%
Total	$2,082	$2,255	+ 8%

Real growth in Federal Cloud Computing is simply Data Center Consolidation (IaaS)

Why is higher-order Cloud Computing declining?

(McCarthy, 2013a)

Affordable Care Act: Insurance Exchanges

When the Affordable Health Care Act went into effect on October 1, 2013, the Federal Heath Care Exchange (HealthCare.gov) experienced a number of issues regarding site performance and software problems

Outsourcing this exchange to a public cloud (e.g., Amazon Web Services) could have allowed for on-demand resource provisioning to support the initial spike of activity.

Five thoughts on the Obamacare disaster

By Ezra Klein, Published: October 14 at 11:59 am E-mail the writer

1. So far, the Affordable Care Act's launch has been a failure. Not "troubled." Not "glitchy." A failure. But "so far" only encompasses 14 days. The hard question is whether the launch will still be floundering on day 30, and on day 45.

(Klein, 2013)

Value of Cloud Computing to Government

- **Efficiency**
  - Improved asset utilization (server utilization > 60-70%)
  - Aggregated demand and accelerated system consolidation
  - Improved productivity (app development/management, network, end-user)
- **Agility**
  - Purchase "as-a-service" vice major capital investment
  - Near-instantaneous increases and reductions in capacity
  - More responsive to urgent agency needs
- **Innovation**
  - Shift focus from asset ownership to service management
  - Tap into private sector innovation
  - Encourages entrepreneurial culture
  - Better linked to emerging technologies (e.g., devices)

So why aren't all the cool kids doing it?

(Kundra, 2011)

Adoption Challenge 1: Making the Business Case

- Cloud Computing is fundamentally a BUSINESS Architecture designed to maximize profit.
- Cost Savings (without top line revenue growth) are often not realized for YEARS.
- Government agencies often operate on a zero-sum game budget; increases in one area must be offset by reductions in another.

Adoption Challenge #2: Who Pays the Bill?

Total Ownership Cost (TOC): of an IT Enterprise include SW Development, Procurement, Staffing, Facilities, Training, etc.

Transitioning to a cloud will require some initial investment

Code	N1	N2/N6	N4
Title	Manpower, Education, and Training	Information Dominance	Fleet Readiness and Logistics
Financial Responsibility	• Personnel / Staffing • Curricula Development • Training Delivery	• Development of IT Systems • Procurement of IT Systems • Sustainment of IT Systems	• Documentation • Spares • Power • Facilities • Fuel

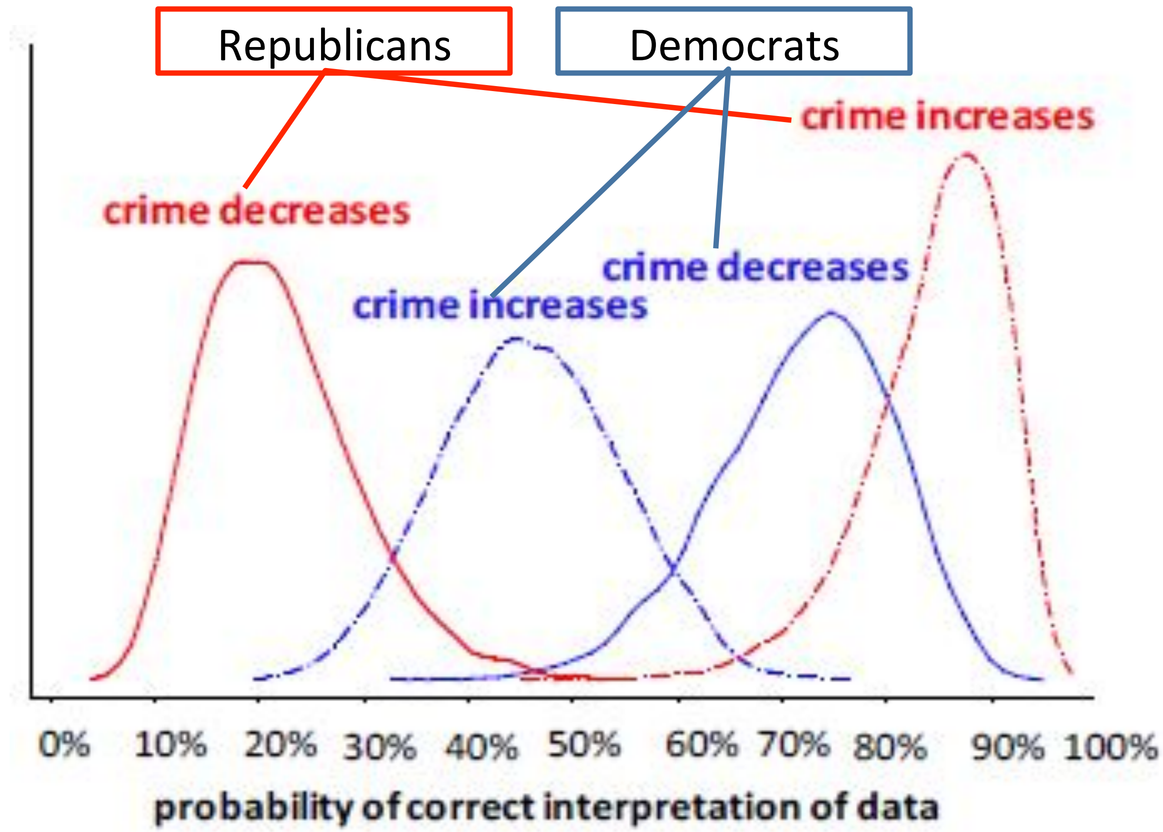
No single bill payer = no incentive for enterprise decisions!

(U.S. Navy, 2013)

Adoption Challenge 3: Zealotry Makes Us Dumb

In a recent study by Yale researchers…

If a person has a strong political position, he/she is highly unlikely to correctly identify trends EVEN AFTER being shown data that counters his/her ideas.



Enter the Systems Engineer!

(Kahan, Peters, Dawson, and Slovic, 2013)

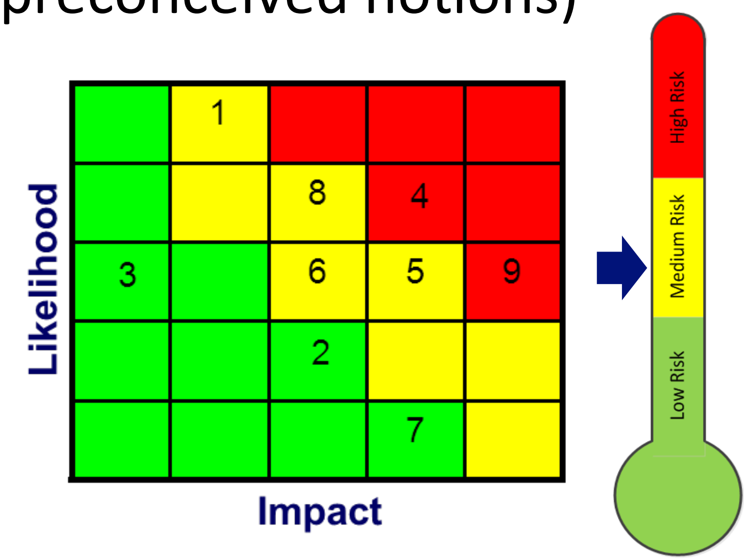
Systems Engineer as Decision Coach

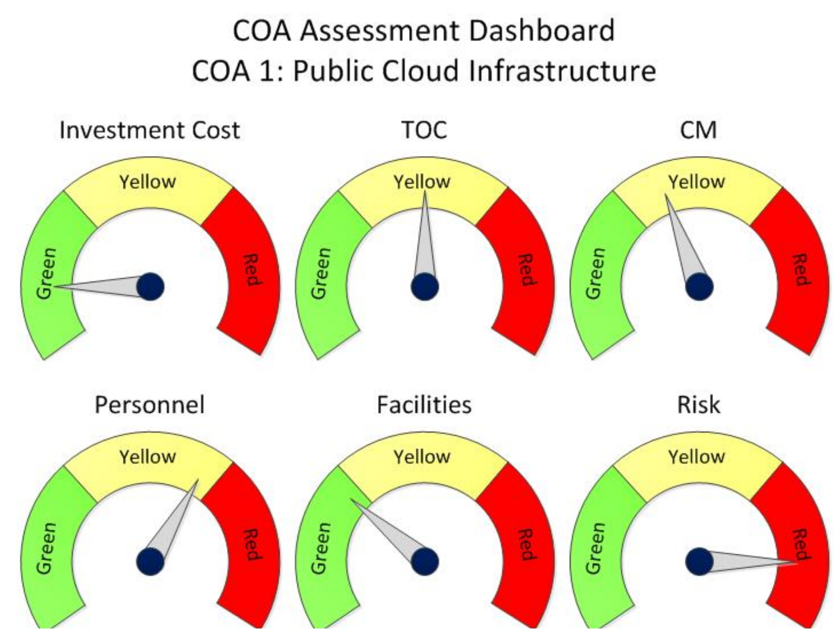
- The Systems Engineer must take on the role of Decision Coach
- Filter through masses of data
- Identify actionable information
- Present the information that:
  - Generates SYMBOLIC associations between facts and risk
  - Ensures decision makers can take advantage of their capacity for science comprehension

Make the data make sense!

The Infographic: Mightier than the Data!

Symbols are far more powerful than raw data in affecting decision makers (especially when combatting preconceived notions)





COA	IC	PM	CM	P	T	F	R	E_{COA}
CSP A	3	1	1	3	1	1	3	1.857
CSP B	2	2	2	1	3	2	1	1.857
CSP C	2	3	2	2	2	3	1	2.143
Private	2	3	3	2	2	2	2	2.286

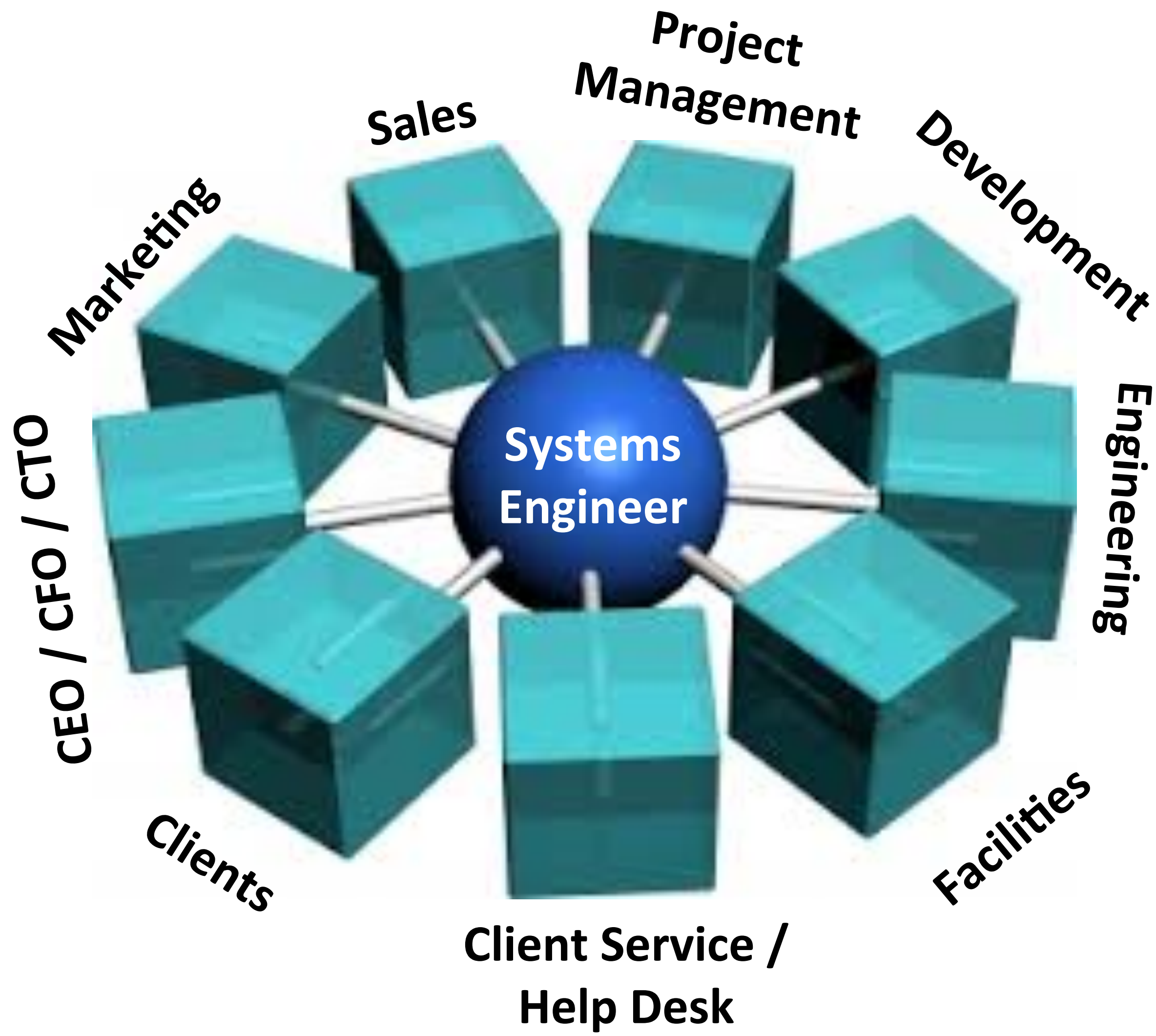
The Systems Engineer is ideally suited to understand which data are relevant and how to communicate them effectively

(Sahlin, 2013)

Why the Systems Engineer?

Systems engineering:

- *integrates all the disciplines and specialty groups into a team effort.*
- *considers both the **business** and the **technical** needs.*



(INCOSE, 2012)

About Cabrillo Technologies

Cabrillo Technologies is a wholly owned subsidiary of the McKean Defense Group. Our mission is to apply the best practices and architectures from a variety of industries to the tactical networking environment.

Our subject matter experts balance experience in ***both*** DoD and Commercial best practices to adapt commercial technology architectures to the challenges faced in military tactical environments.

… and I'm hiring!

http://www.cabrillotechnologies.com/

Publication Opportunity

Social Media and the Transformation of Interaction in Society

Book's Focus:

- Value of Social Media beyond the typical notion of Social Marketing
- Case studies of creative uses of Social Media in atypical scenarios (e.g., non-profit, military, law enforcement, etc.)

Target for publication: 2015

If interested in contributing a chapter, please contact me at jsahlin@cabrillotechnologies.com

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