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Stakeholder Interrelations:
Capturing the Hidden System

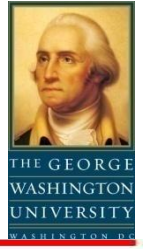
Presenter Biography:

- Doctoral Candidate pursuing PhD in Systems Engineering
- Principal Systems Engineering Manager at SAIC
- Lead Engineer for highly secure and reliable DoD networks
- Former U.S. Marine Corps Communications Officer, supported Operations Enduring Freedom & Iraqi Freedom

Key Takeaways

1. DoDAF captures the views of program stakeholders but fails to capture the interrelations of those stakeholders (a system with n*(n-1)/2 interfaces)
2. Proposed “Fit-for-Purpose” DoDAF views accurately characterize this stakeholder system
   - Provides unique insertion of Social Network Analysis into Architecture Framework
   - Fulfills original intent of Architecture Framework by capturing the *entire* socio-technical system
3. This application of systems thinking enables systems engineers to field systems more efficiently and provides assurance of lasting stakeholder support

Background



Research Question:

- Can the stakeholder system be captured in a DoDAF Fit-for-Purpose view?

Motivation:

- Half of strategic decisions fail, often due to lack of involvement of key stakeholders[1]
- Failure has three forms; all are expensive[2]
  - Poor outcome, never initiated, or partially implemented
- In general, public sector avoids stakeholder analysis[3]
- DoD does consider stakeholders (via JCIDS, DAS, and DoDAF) yet DoD program performance is still lacking

What's missing? A systems approach!

Theory and Approach

Theory:

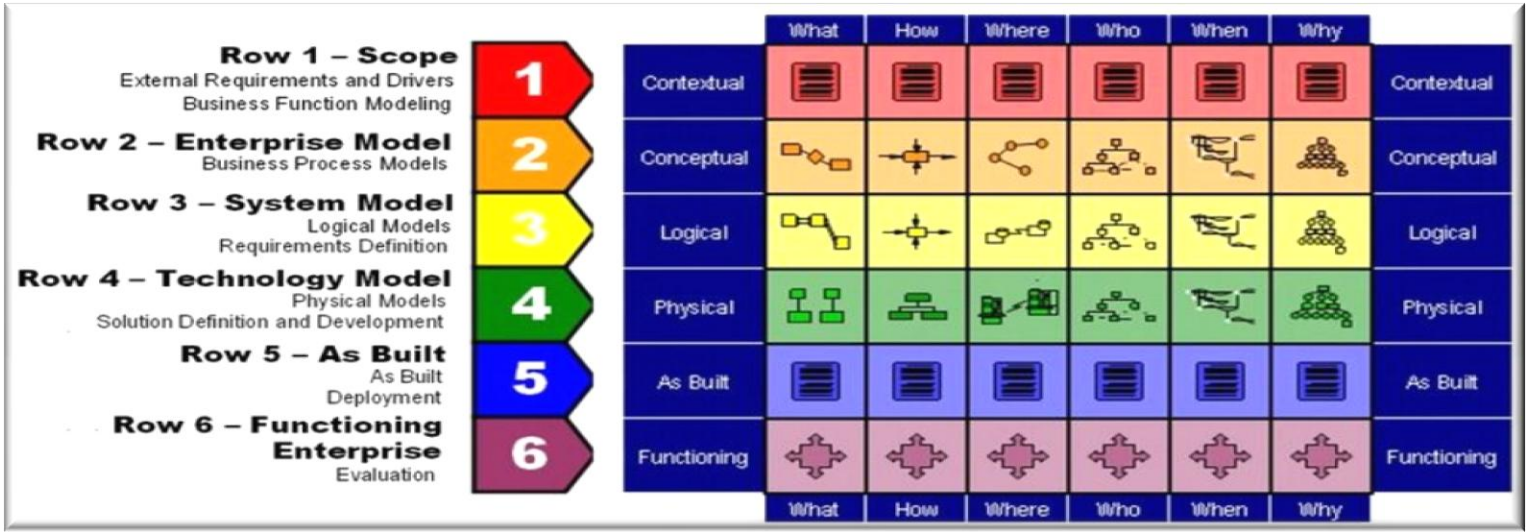
- Stakeholders form a system with n*(n-1)/2 interfaces
- This system is not captured in current architecture models
- Relationships are often more important than individuals

Approach:

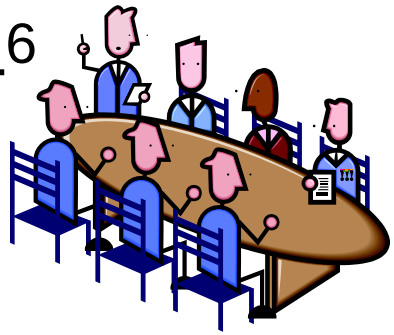
- Perform a through literature review of Architecture Framework, Stakeholder Analysis, and Social Network Analysis
- Develop a series of Fit-For-Purpose DoDAF views detailing stakeholder interrelations
- Test feasibility via pilot study

Architecture Framework

- Describes a system using differing views and viewpoints
- Concept by Zachman in 1987[4]
  - Borrowed tools from field of Architecture to describe information technology projects
- Current varieties:
  - TOGAF, FEAF, MODAF, NAF, etc.
- DoDAF 2.0[5]
  - 50 Pre-defined models
  - Supports flexible “Fit-for-Purpose” views



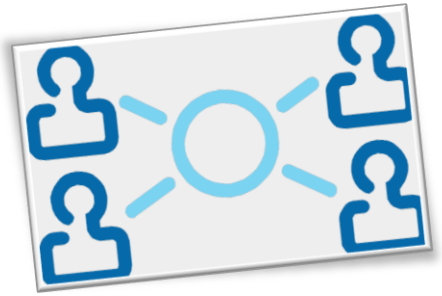
Stakeholder Analysis



- Established by Freeman in 1984[6]
  - *Strategic Management: A Stakeholder Approach*
- Stakeholder Analysis studies the positive and negative effects of people who can influence, or are influenced by, a program
- Increasingly global and interconnected world has led to an increase in the number and influence of stakeholders[2]

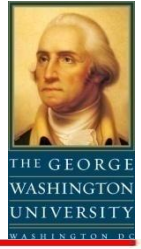
Social Network Analysis

- Rooted in Sociology
  - Simmel in1908 discussed emergent behavior of a collection of humans[7]



- Examines the networks that intertwine individuals, groups, and organizations
- Applied in a variety of disciplines
  - Anthropology, psychology, management, etc.
- Significant role in Systems Engineering field of Knowledge Management

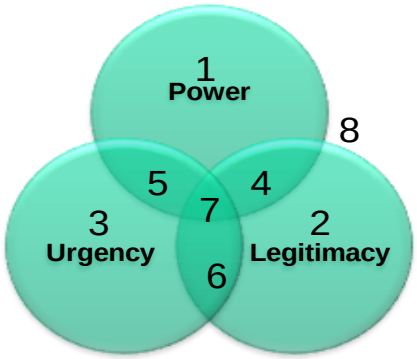
Literature Review Results



- No architecture frameworks were discovered that captured all stakeholders in a networked view
  - Stakeholders generally captured via isolated viewpoints
  - Some frameworks capture human interactions that support system functions
- Stakeholder Analysis is lacking in public sector[3]
  - Shortage of how-to guides
  - Considered time consuming
  - Afraid results will upset others
- Social Network Analysis not often merged with Stakeholder Analysis
  - Public Resource Management appears to be the exception
- Building blocks discovered were applied to create a “best of breed” framework (next slide)

Draft Fit-for-Purpose DoDAF View

Stakeholder Crosswalk Defines the Who



Class of Stakeholders

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Program Models

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S/H	A	B	C	D
OV-4	1	7	5	3
SV-6	2	3	8	7
PV-2	4	1	2	1
CV-7	8	4	6	5

Stakeholder Network Defines the How

Stakeholders

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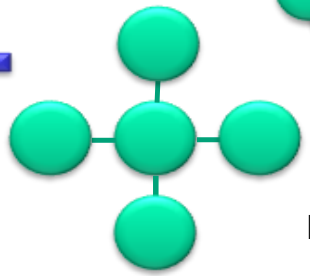

Roles of Social Networking

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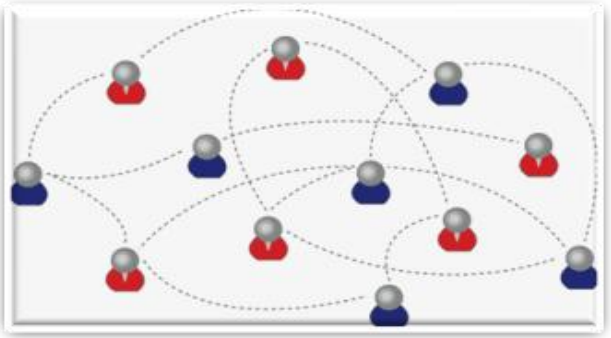
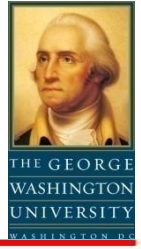


5 Steps, 5 Hours

1. Stakeholder Identification
   - Time estimate: 45 minutes
2. Stakeholder Classification
   - Time estimate: 1.5 hours
3. Time-Phasing and Analysis
   - Time estimate: 30 minutes
4. Build the Stakeholder Network
   - Time estimate: 1.5 hours
5. Analyze Social Roles
   - Time estimate: 45 minutes

Step 1: Stakeholder Identification



- The term stakeholder is often traced back to Freeman's landmark definition[6]
  - "any group or individual who can affect or is affected by the achievement of the organization's objectives"
- Typical DoD stakeholders include:
  - Acquirers
  - Sponsors
  - Evaluators
  - Developers
  - Trainers
  - Maintainers
  - Suppliers
  - Operators

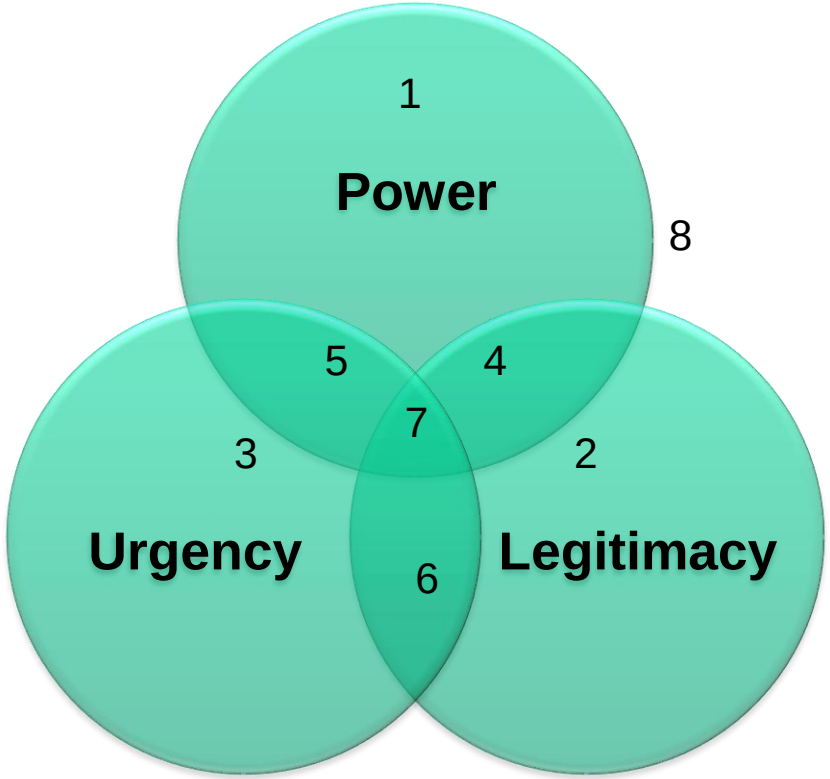
Step 1 Execution

- Approach:
  - Provided intro and background materials
  - Showed definition and groupings
  - Individual, then group brainstorm
- Results:
  - Closer to 1 hour with introductory material
  - 31 stakeholders captured in Excel
  - Primary concerns also recorded

Evaluators				
Eval H	**Eval I**	**Eval J**	**Eval K**	**Eval L**
mission	compliance	feasibility	feasibility	compliance, mission

Step 2: Stakeholder Classification

- Per Mitchell, Agle, & Wood Stakeholders are defined by their possession of[8]:
  - Power
  - Legitimacy
  - Urgency



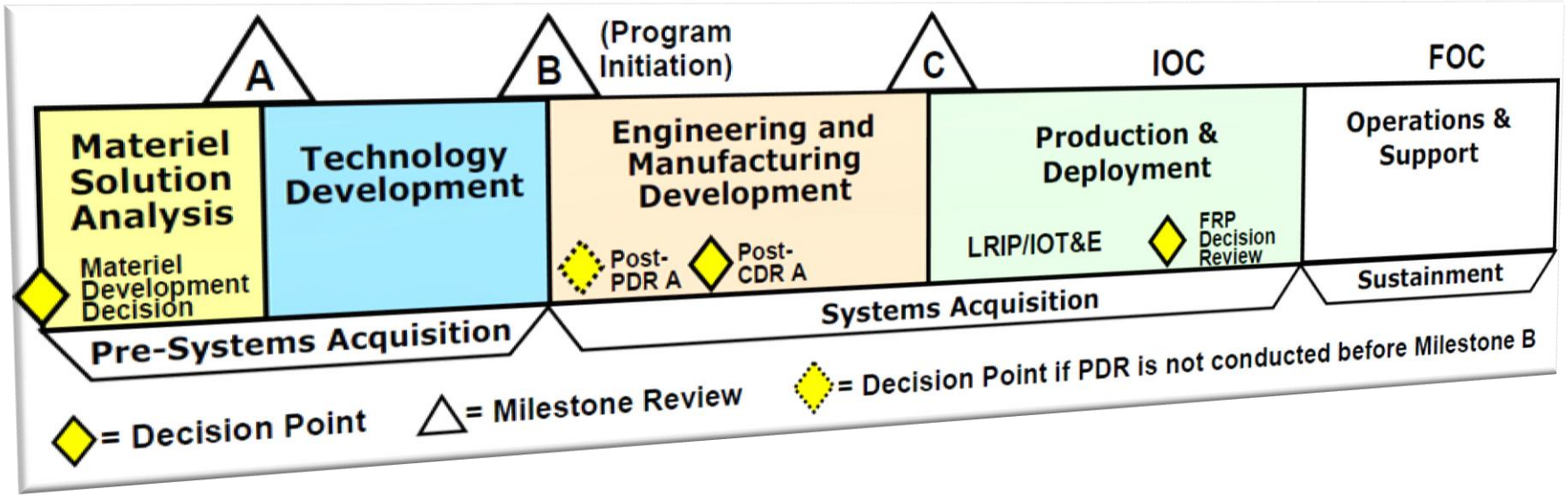
Step 2 Execution

- Approach:
  - Based upon existing DoDAF models
  - Answered yes/no to power, legitimacy, urgency; formula calculated number
  - Focused on current program phase
- Results:
  - Additional stakeholder identified
  - Focus on questions vice numbers kept results from influencing decisions
  - Relied upon primary concerns
  - Grouping of stakeholder and viewpoints made work very efficient
  - Less than 1 hour to complete 480 cells (15 models x 32 stakeholders)

Grouping	Acquirers	
Organization	A	B
Concern	cost, sched	acq risk
AV-1	7	2
AV-2	7	2
OV-1	5	8
OV-2	5	8
OV-3	5	8
OV-4	5	8
OV-5	5	8
OV-6c	5	8
SV-1	7	2
SV-2	7	2
SV-4a	7	2
SV-5a	7	2
SV-6	7	2
TV-1	7	4
TV-2	7	4

Step 3: Time Phasing and Analysis

- Program phases are defined in DoDI 5000.02[9]



Step 3 Execution

- Approach:
  - Made duplicate copies of previously populated tabs and renamed for subsequent phases
  - Discussion focused on stakeholder role changes
  - Additional tab built to show trend through phases
- Results:
  - 1.25 hours for three additional phases
  - Legitimate stakeholders generally only accounted for 1/2 to 2/3 of all stakeholders; urgency was lacking
  - At least one time-phased change for each model except OV-1 and OV-4

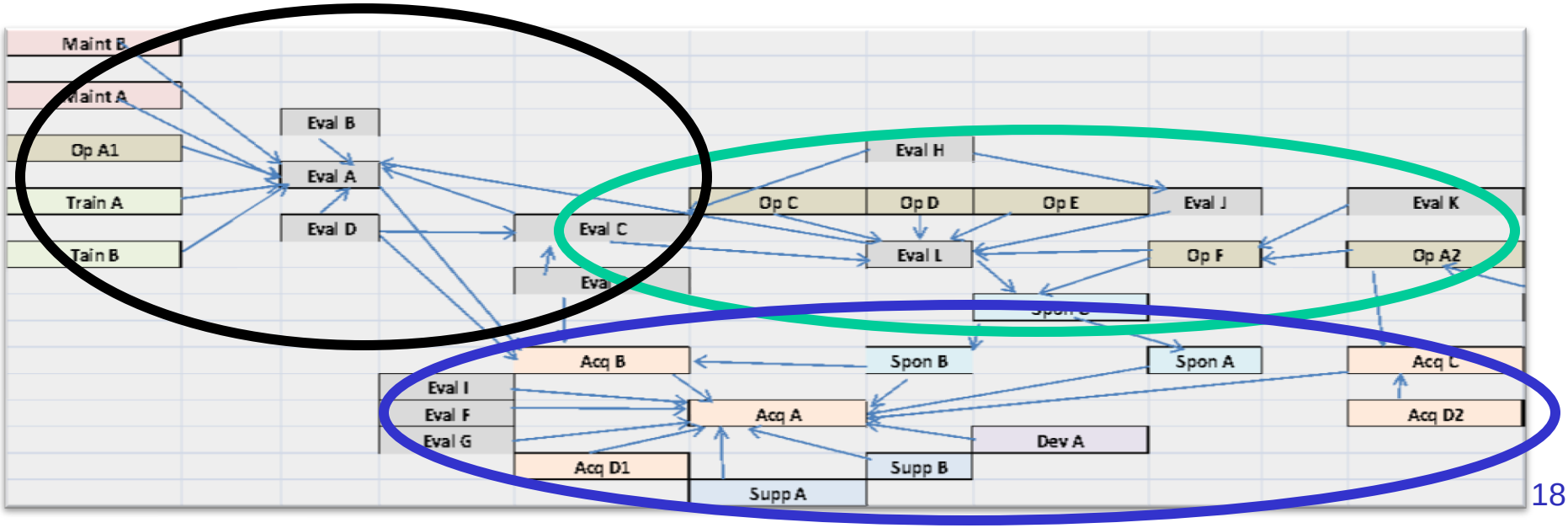
	Grouping	Operators					
	Organization	Op A	Op B	Op C	Op D	Op E	Op F
	Concern	mission, promotion	profit, reputation	mission	mission	mission	mission
SV-4a	TD	8	8	8	8	8	1
	EMD	8	8	8	8	8	1
	P&D	2	2	2	2	2	4
	O&S	2	2	2	2	2	4

Step 4: Build the Network

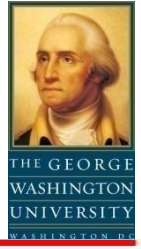
- Cannot use typical SNA software that rely on:
  - Email usage (multiple DoD and contractor networks in play)
  - Interview results (Restricted access to stakeholders)
- Can use Anklam's social network roles[10]:
  - Central connector – Someone who is highly connected to many others in the network, who may be either a key facilitator or a "gatekeeper"
  - Broker – Someone who communicates across subgroups
  - Boundary spanner – A person who connects a department with other departments
  - Peripheral specialist – Someone less connected or not connected at all
  - Pulsetaker – Someone who uses his or her connections to monitor the health of an organization
- Diagrams from Cross & Prusak amplify roles[11]

Step 4 Execution

- Approach:
  - Review SNA roles
  - Plot in Excel with arrows between cells
  - Consider direction of primary influence
- Results:
  - Started with self, moved outward
  - Separate drawings for subsequent phases
  - Leveraged Excel's large work area
  - Multiple networks emerged



Step 5: Analyze Social Roles



- Again, Anklam's definitions characterize the role stakeholders play within the social networks[10]:
  - Central connector – Someone who is highly connected to many others in the network, who may be either a key facilitator or a "gatekeeper"
  - Broker – Someone who communicates across subgroups
  - Boundary spanner – A person who connects a department with other departments
  - Peripheral specialist – Someone less connected or not connected at all
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Step 5 Execution

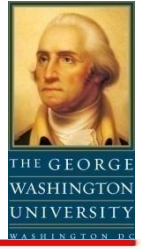
- Approach:
  - Reviewed role definitions
  - Identified networks and key members (by role)
  - Worked through one phase at a time
  - Documented network and role for each stakeholder

- Results:
  - All roles present (but not all present in every phase)
  - Central connectors and boundary spanners easiest to identify
  - One central connector was not previously identified as a major stakeholder
  - Influence paths clearly visible
  - Noticeable need for dedicated stakeholder managers when multitude of stakeholders interact directly with central connector

Findings

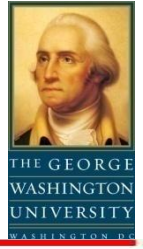
- Identified **who** is important, **when** they are important, and **how** to influence them
  - Mitigated fears of performing Stakeholder analysis
  - Cost: 3 SMEs x 5 hours, utilizing only Excel
  - Results: Priceless!
- Can be used for trade off decisions
  - Examine row and determine who counts
- Can be used to build winning coalitions
  - Review network map and strategize

Solution in search of a problem? No!



- DoD program performance is dismal, and the nation is in the midst of a financial crisis
- Simple (and optimistic) assumptions portray stakeholder impact on ~70 JCIDS/Acquisition Docs
  - 1 week per 70 documents to collect input (70 weeks)
  - 1/2 of those require 2nd pass, additional week (35 weeks)
  - 6 documents require face to face meeting, additional 4 weeks for planning and conducting (24 weeks)
  - Example total of 129 weeks equates to ~2.5 years!
- Proposed Fit-for-Purpose views allow wise decisions on which stakeholders to engage and when
  - Involving too many stakeholders is cumbersome
  - Involving too few is disastrous

Potential Future Work



- Confirm approach with additional programs
- Study effectiveness during:
  - Execution of trade-off decisions
  - Coalition building
  - Full program execution (return on stakeholder investment)
- Explore variations:
  - Use different stakeholder and/or social network approaches
  - Apply in non-DoD setting

Summary

1. DoDAF captures the views of program stakeholders but fails to capture the interrelations of those stakeholders (a system with n*(n-1)/2 interfaces)
2. Proposed “Fit-for-Purpose” DoDAF views accurately characterize this stakeholder system
   - Provides unique insertion of Social Network Analysis into Architecture Framework
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3. This application of systems thinking enables systems engineers to field systems more efficiently and provides assurance of lasting stakeholder support

Questions?

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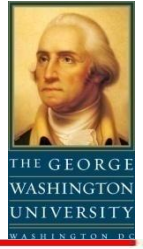

1. Nutt, P. C. (2002). *Why decisions fail: Avoiding blunders and traps that lead to debacles*. San Francisco, CA: Berrett-Koehler Publishers.
2. Bryson, J. M. (2004). What to do when stakeholders matter. *Public Management Review*, 6 (1), 21-53.
3. Bryson, J. M. (2003). *What to do when stakeholders matter: A guide to stakeholder identification and analysis techniques*. A paper presented at London School of Economics and Political Science.
4. Zachman, J. A. (1987). A framework for information systems architecture. *IBM Systems Journal*, 26 (3), 276-292.
5. US Department of Defense. (2009). *DoD Architecture Framework Version 2.0*. Washington, DC: Department of Defense.
6. Freeman, E. (1984). *Strategic management: A stakeholder approach*. Boston, MA: Pitman.
7. Scott, J., & Carrington, P. (2011). *The SAGE Handbook of Social of Social Network Analysis*. Thousand Oaks, CA: SAGE.
8. Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *The Academy of Management Review*, 22 (4), 853-886.
9. US Deparment of Defense. (2008). *DoDI 5000.02: Operation of the Defense Acquisition System*. Washington, DC: Department of Defense.
10. Anklam, P. (2005). Social network analysis in the KM toolkit. In M. Rao, *Knowledge management tools and techniques* (pp. 329-346). Burlington, MA: ELSEVIER.
11. Cross, R., & Prusak, L. (2002, June). The people who make organizations go-or stop. *Harvard Business Review*, 5-12.