



# Attaining Value from Actionable DoD Enterprise Architectures

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# Agenda

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- **Current State of Attaining Architecture Value**
- **How to attain value**
  - **Start with Integrated Architectures**
  - **Measure the Quality and “Goodliness” of an Architecture**
- **Enabling actionable architectures**
  - **Static Architecture Analysis**
  - **Dynamic “Executable Architecture” Analysis**
- **Governance Measurement Instruments**
- **Conclusion**

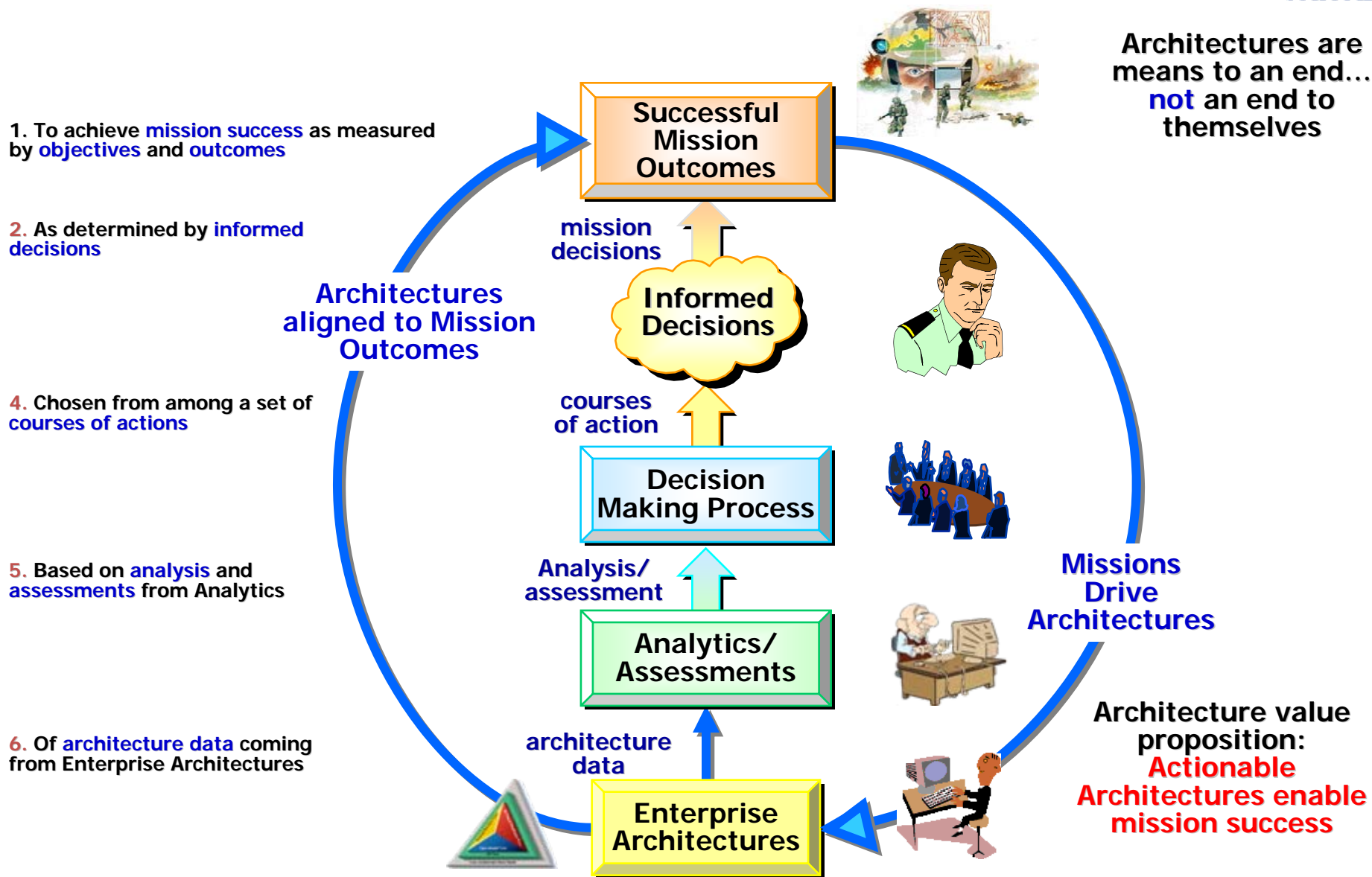
# C2 Enterprise Architectures

- Supports **improvements in C2 operational concepts** and joint force interoperability
  - Defining the force and force **capabilities**
  - Allocating **human resources** to acquire and improve capabilities
  - **Equipping** the forces with systems and other material resources
  - **Transforming** to an **agile** net-centric force
  
- Supports understanding of **highly complex C2** doctrine, organizations, missions and processes
  - Characterized by strong **direct linkages** between human and organizational issues
  - This **human dimension** largely distinguishes C2 assessments from other military operational assessments



# What Are We Trying to Achieve?

## Overall Mission Outcomes and Objectives = Success



# Current State of Attaining Architecture Value



Agencies and organizations spend significant time and resources on architecture planning and development ... yet rarely get value



Too often architectures are viewed as **mandated compliance** requirement (e.g., JCIDS "**check the box**")



Architecture use (beyond JCIDS) for planning, decision making, and improving operational execution ranges from **minimal –to- non-existent**



Results in "**architecture for architecture sake**" + "**wallpaper**" + "**shelfware**"



Leads to....

- [1] **uncertainty** about how architectures impact future capability and warfighter performance
- [2] **difficult** enterprise-wide **acceptance** and support
- [3] **increased resistance** by senior military and management leaders

# How to Attain Value ...

## 👉 Use Actionable Architectures

- ***Value*** can be achieved (and resistance overcome) if agencies make their architecture actionable ....

- *...use their architectures (via analytics) to provide value to decision makers and leaders in achieving overall mission goals and objectives*
- *...and then communicate that value*

- “Architecture analytics”...

*Set of processes, practices, and procedures that “transform” architecture data into actionable information that supports the planning, decision making, and operational execution processes*

## Value (*noun*) :

*Worth, desirability, importance, or usefulness of something to somebody*

*Within context of an **Enterprise Architecture** ...*

***(Architecture) Value is where***

- ***somebody (enterprises, agencies, etc)***
- ***performs actions (develop architectures)***
- ***to obtain results (analytic)***
- ***that are useful (planning, decision making, & improving operational execution)***
- ***to somebody (businesses, warfighters )***

# Architectures as Overall Planning & Management Tool

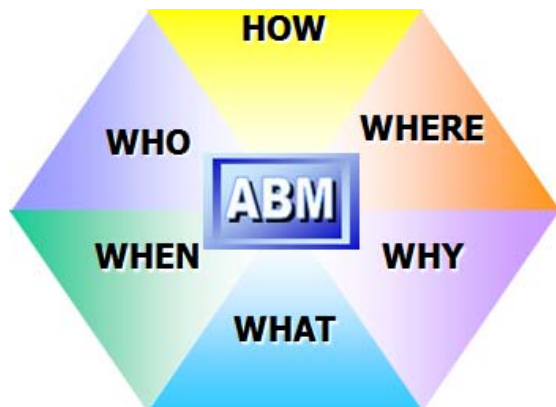
Architectures should be seen as an **overall planning and management tool** that enables organizations to be **agile** in reacting to rapidly changing operational environments

Architectures are **reusable assets** that you **invest** in to attain value ... they are **not** an expense

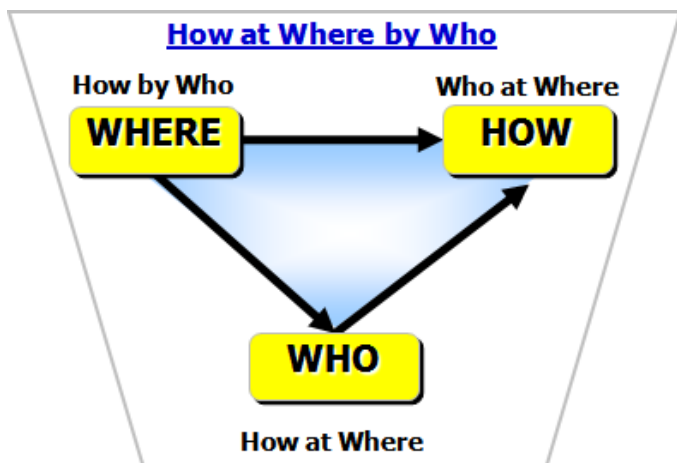
*When an architecture is used for value, it becomes **actionable**, hence the term **Actionable Architectures***



# Start with Integrated Architectures



- However, before using architecture descriptions for any purposes, one must **start** with an architecture that is integrated, unambiguous, and consistent



- **Activity Based Methodology (ABM)\*** was developed to improve the practice of DoD architecting
- Architectures developed with ABM answer the six Zachman interrogatives: **WHO, WHERE, HOW, WHAT, WHY, WHEN**
- ABM recognized triple relationship between **WHO – WHERE – HOW**

\* Activity-Based Methodology is a concept developed by The MITRE Corporation and Lockheed-Martin, Copyright © 2003

# Little Attention Today Paid to Measuring EA Quality “Goodliness”?



- How do you know when you are “**done**” and claim your architecture can be used for decision making purposes?
- When you reach that “**done**” state, how do measure architecture **quality**, **verifiability**, **traceability**, **compliance** and **completeness**?
- What Quality Control/Quality Assurance process was the architecture subjected to assess its **structure** and **data** quality content?
- Were there any **inconsistent** or **physical/ logical impossibilities** that would result in invalid analysis?
  - OV-3 and SV-6 exchanges where it is **physically** or **logically impossible** to exchange anything – e.g., Air Force AWACS node with Army Tank Unit node
  - Tools cannot prevent this because they have no way knowing any physical or logical impossibilities

✓ ***Measuring architecture quality increases architecture value***

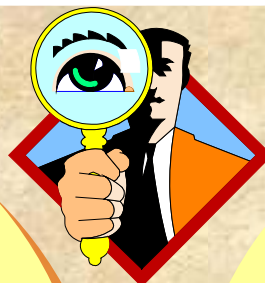
# Enabling Actionable Architectures

## Static Analysis

Data Mining

DOTMLPF

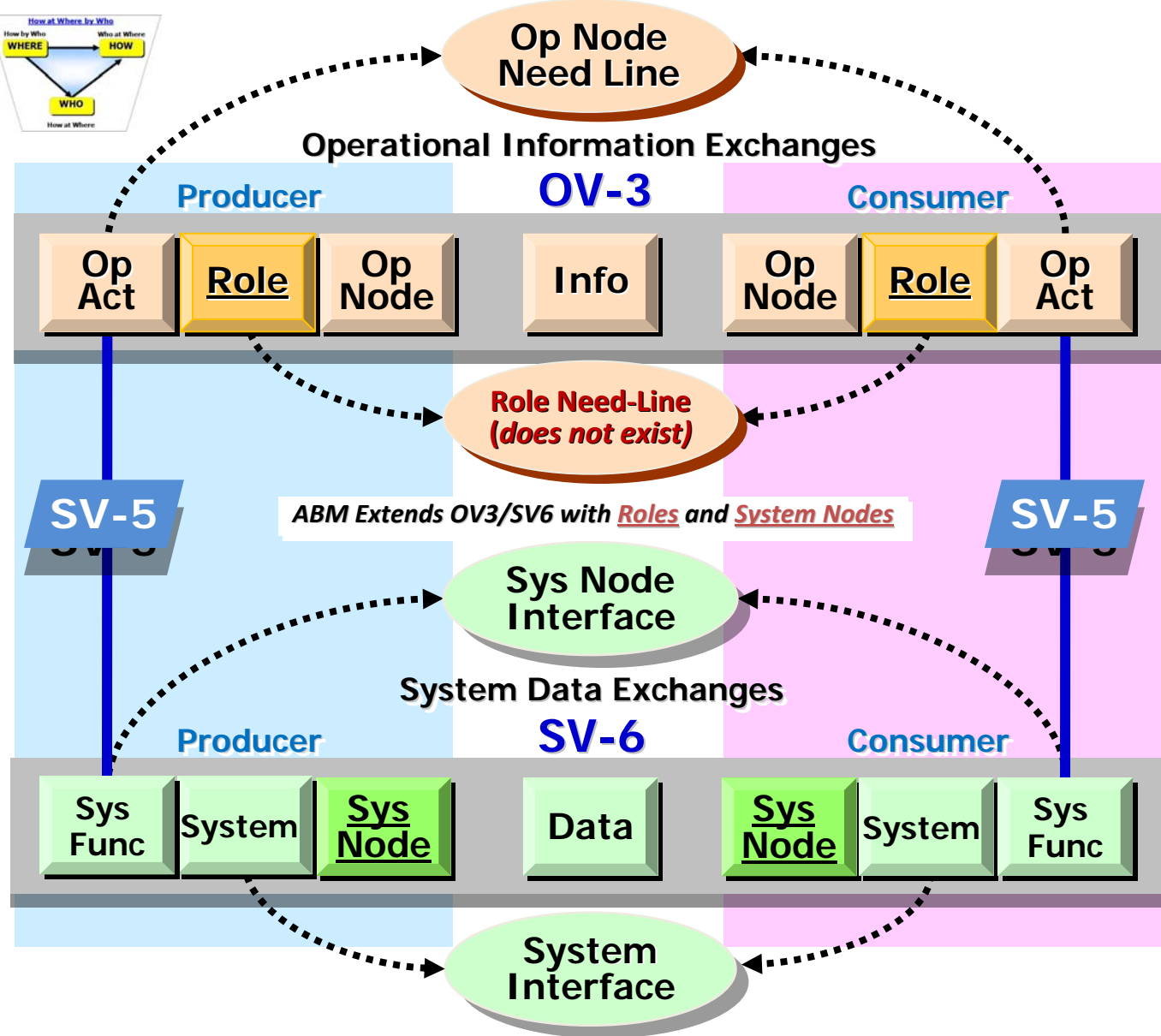
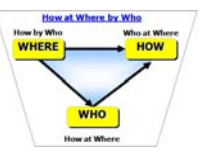
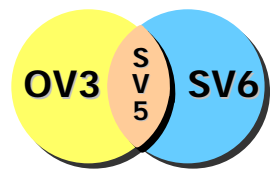
Visual



## Dynamic Analysis



# Static Architecture Data Mining



Reveals and discovers hidden rules, practices, gaps, seams, relationships, requirements, and patterns on how an enterprise conducts its business

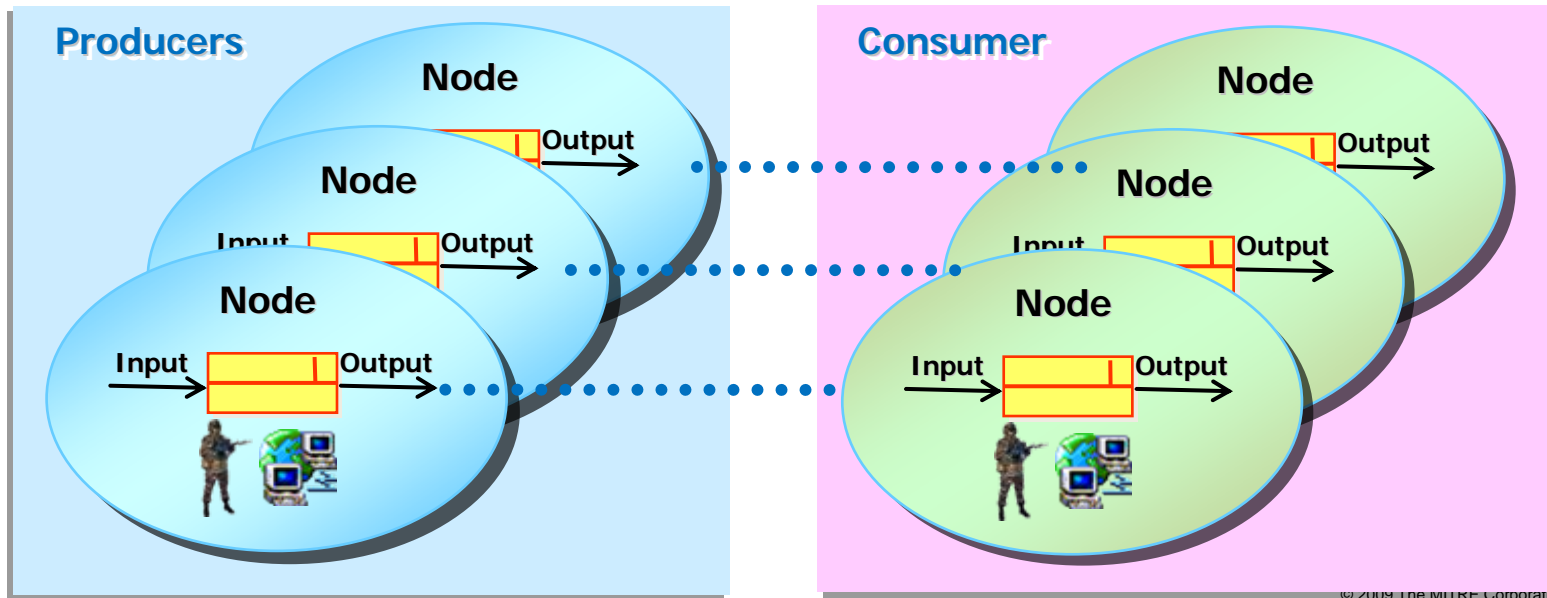
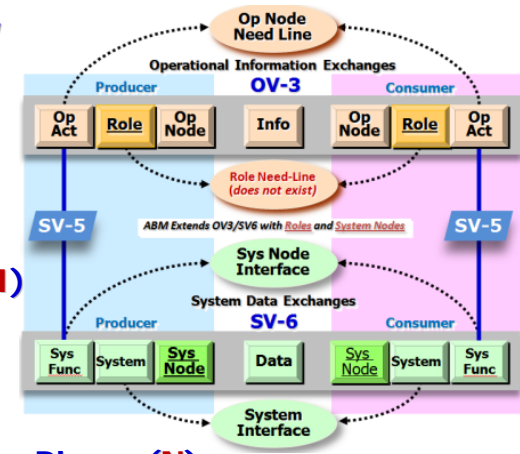
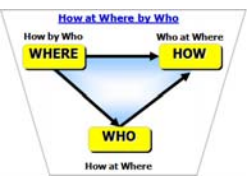
**Gaps, Overlaps, Redundancies**

Determine "what if" effect and impact of change

# Typical Data Mining Analysis Examples



- Inputs, Outputs, Producer and Consumer Resources (Roles, Systems), Nodes, and their work Activities
- Aggregation of...
  - Places (**N**) where Producers(**R**) and Consumers (**R**) do work (**A**)
  - Work (**A**) and who performs that work (**R**esources)
  - Products(**O**) & which **R**esources produce them
  - **R**esources & what they produce (**O**), & their work Requirements(**I**)
  - **R**esources & their work Responsibilities (**A**)
- Which...
  - Producers(**R**) communicate with which Consumers (**R**)
  - Producing Places (**N**) exchange information with which Consuming Places (**N**)
  - Roles (Producing & Consuming) use which Systems (Producing & Consuming)
- Etc, etc, etc....



# Static DOTMLPF Analysis

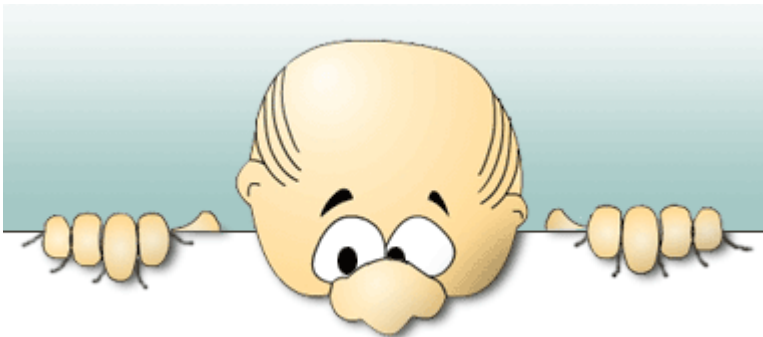


## **Organizations of Trained People**

- led by effective and competent **Leaders** (human resources within organizations **WHO** do work)
- performing **Doctrinal** operations (**HOW** work is performed)
- at **Facilities** (locations – **WHERE** work is performed)
- using **Material** resources (system resources **WHO** do work)

- Leads to better definitions of **agile** military warfighting capabilities
  - Gaps- shortfalls – duplications ?
  - Tactics, Techniques and Procedures?
  - Personnel solutions – new personnel or personnel with better qualifications?
  - Materiel solutions – a new system?
  - Organizational Solutions?
  - **NON-MATERIAL** Solutions – education? Skill?
- **HOWEVER** - standard DOTMLPF analysis guidance lacking

# Static Visual Representation Analysis

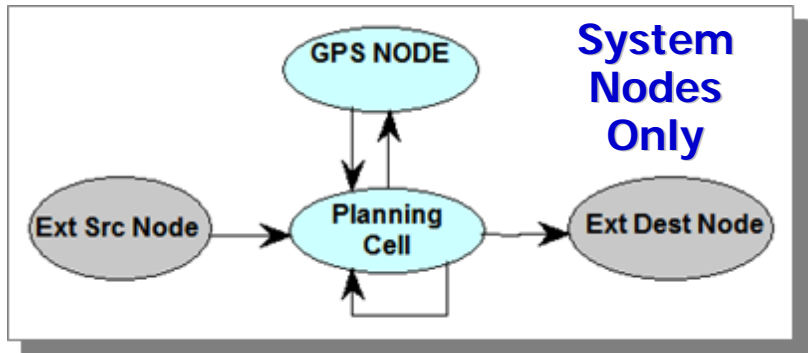
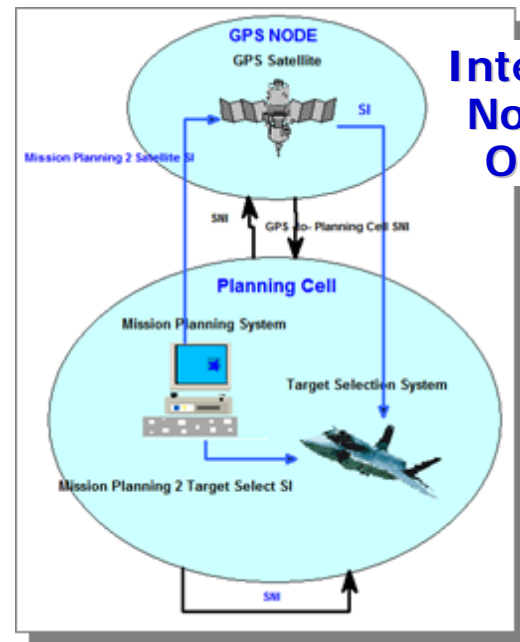
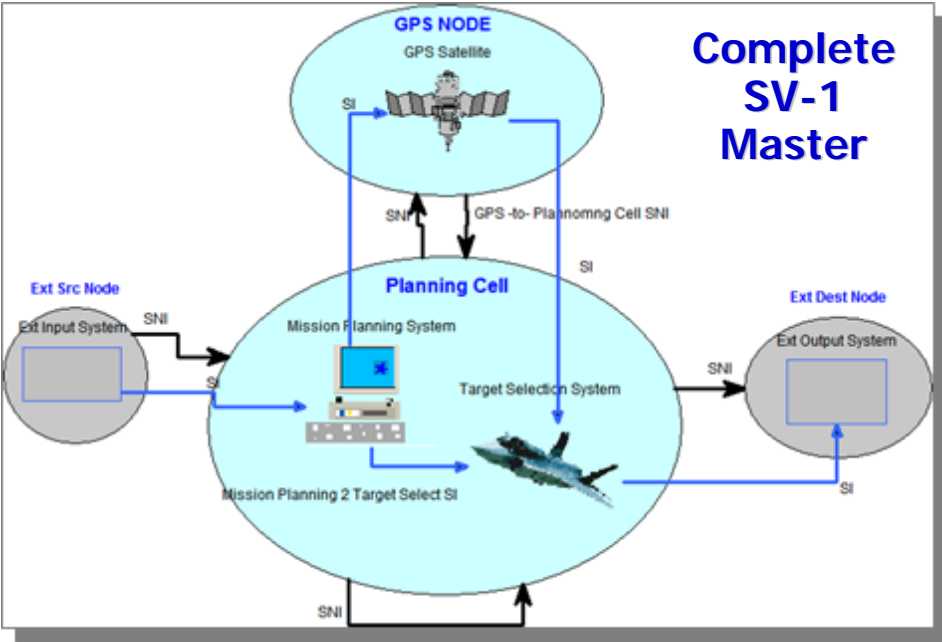


- **“*Management View*”** – Visual way to educate and communicate architecture value to senior management and military leaders
  - Present architecture value in short, concise visual ways in their language and in terms they understand
- Two approaches
  - v1) **Selectively depict** certain element and relationship sets in multiple versions of the same product
  - v2) Structuring a single product **multiple ways**



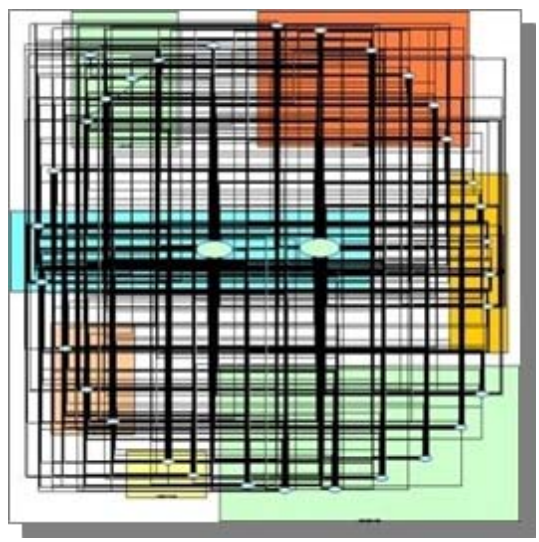


# V1. Visually Selective Depicting: Example: SV-1

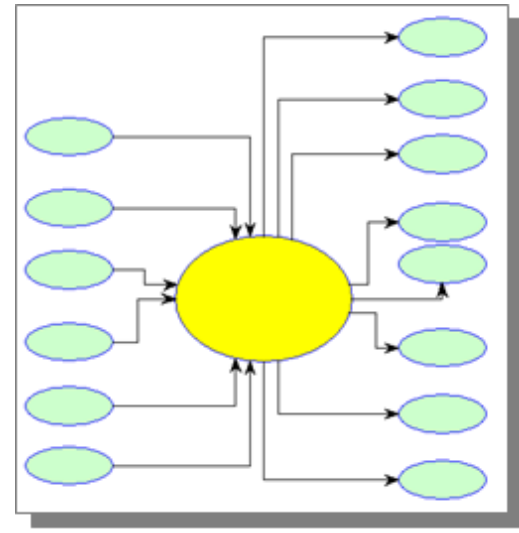
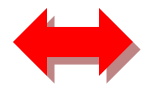




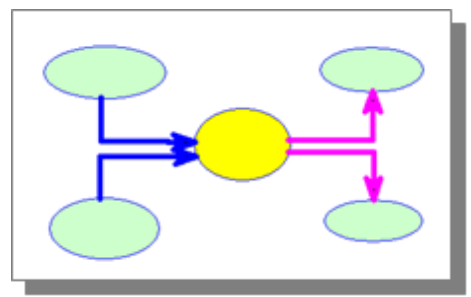
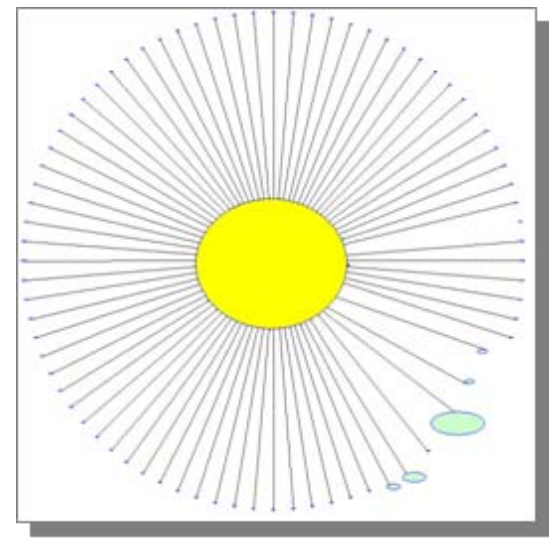
# V1. Visually Selective Depicting: Example: OV-2



Typical  
OV-2



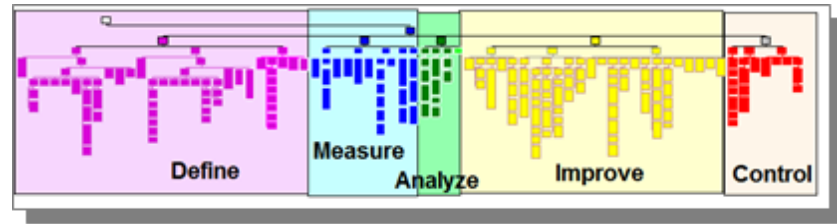
Node Centered OV-2 (s)



# V2. Visually Structuring a Single Product Multiple Ways - OV-5 Node Tree

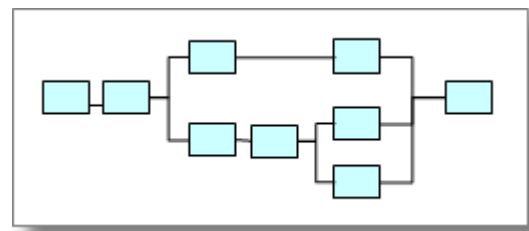


**Classification:**  
by Functional Area



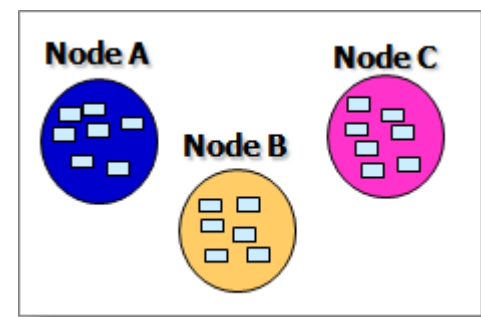
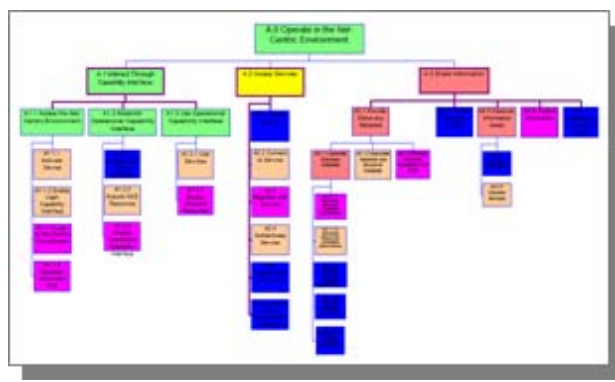
More complete Node Tree

**Organization:**  
by Leaf Activities



Executable Model(s)

**Grouping:**  
by Node,  
by Role,  
by ...



OV-2 Nodes showing Activities

# V2. Visually Structuring a Single Product Multiple Ways - Formatted OV-3 Report



	A	B	C	D	E	F	G	H
1	IER	From Activity	From Node	From Op/Node/Activity Roles	ICOM Arrow	To Activity	To Node	To Op/Node/Activity Roles
2	Travel Directions Detected	Receive Travel Directions	Baltimore	"Travel Clerk"	Travel Directions Detected	Notify all Travel Departments	United States	
3	Correlated Travel Data	Process Travel Assessment	Boston	"Travel"	Correlated Travel Data	Update Common Travel Picture	Cleveland	"Travel Director"
4	Request for Travel Assessment	Requested Travel Assessment	Boston	"Travel"	Request for Travel Assessment	Re-Redirect Travel Plans	Cleveland	"Travel Director"
5	Merged Travel Data	Coordinate Effects	Boston	"Travel"	Merged Travel Data	Decide to Look at Travel Plan	Denver	"Travel Planner"
6	Correlated Travel Data	Process Travel Assessment	Boston	"Travel"	Correlated Travel Data	Update Internal Information	United States	
7	Confirmed ID	Report Target Data	Chicago	"Travel Manager"	Confirmed ID	Coordinate Effects	Boston	"Travel"
8	Travel Assessment	Report Travel Assessment	Chicago	"Travel Manager"	Travel Assessment	Process Travel Assessment	Boston	"Travel"
9	Confirmed ID	Report Target Data	Chicago	"Travel Manager"	Confirmed ID	ReAnalyze Travel Directions	Cleveland	"Travel Director"
10	Travel Assessment	Report Travel Assessment	Chicago	"Travel Manager"	Travel Assessment	Process Travel Assessment	Cleveland	"Travel Director"
11	Confirmed ID	Report Target Data	Chicago	"Travel Mana				
12	Travel Assessment	Report Travel Assessment	Chicago	"Travel Mana				
13	Confirmed ID	Report Target Data	Chicago	"Travel Mana				
14	Travel Assessment	Report Travel Assessment	Chicago	"Travel Mana				
15	No Travel ID	Report Target Data	Chicago	"Travel Mana				
16	Correlated Travel Data	ReAnalyze Travel Directions	Cleveland	"Travel Direct				
17	Destination Configuration Data	Redirect Travel Plans	Cleveland	"Travel Direct				
18	Travel Configuration Data	Re-Redirect Travel Plans	Cleveland	"Travel Direct				
19	Traveling Configuration Data	Redirect My Traveling Plans	Cleveland	"Travel Direct				

Page 1 of 3 Travel Example OV3 Matrix in 'TravelEx' **11**

Input/Output	FromActivity	FromNode	ToNode	ToActivity
<b>1 NodePairs=1</b>				
		IERCnt=1	1 United States	
1	1 Travel Directions Detected	2.7 Receive Travel Directions	L	7 Notify all Travel Departments
<b>2 NodePairs=4</b>				
		IERCnt=2	1 Cleveland	
2	1 Request for Travel Assessment	5.1 Requested Travel Assessment	L	5.2 Re-Redirect Travel Plans
3	2 Correlated Travel Data	5.3 Process Travel Assessment	L	5.8 Update Common Travel Picture
		IERCnt=1	2 Denver	
4	1 Merged Travel Data	3.3 Coordinate Effects	L	3.4 Decide to Look at Travel Plan
		IERCnt=1	3 United States	
5	1 Correlated Travel Data	5.3 Process Travel Assessment	L	4 Update Internal Information
<b>3 NodePairs=9</b>				
		IERCnt=2	1 Boston	
6	1 Confirmed ID	3.1 Report Target Data	L	3.3 Coordinate Effects
7	2 Travel Assessment	5.7 Report Travel Assessment	L	5.3 Process Travel Assessment
		IERCnt=2	2 Cleveland	
8	1 Confirmed ID	3.1 Report Target Data	L	3.2 ReAnalyze Travel Directions
9	2 Travel Assessment	5.7 Report Travel Assessment	L	5.3 Process Travel Assessment
		IERCnt=2	3 Houston	
10	1 Confirmed ID	3.1 Report Target Data	L	3.5 Receive Travel Data
11	2 Travel Assessment	5.7 Report Travel Assessment	L	5.3 Process Travel Assessment
		IERCnt=1	4 Miami	
12	1 Confirmed ID	3.1 Report Target Data	L	4.1 Conduct Travel Analysis
		IERCnt=1	5 New York	
13	1 Travel Assessment	5.7 Report Travel Assessment	L	5.3 Process Travel Assessment
		IERCnt=1	6 United States	
14	1 No Travel ID	3.1 Report Target Data	L	6 No Traveling Identification
<b>4 NodePairs=10</b>				
		IERCnt=1	1 Boston	
15	1 Correlated Travel Data	3.2 ReAnalyze Travel Directions	L	3.3 Coordinate Effects
		IERCnt=3	2 Chicago	
16	1 Traveling Configuration Data	1.3 Redirect My Traveling Plans	L	3.1 Report Target Data
17	2 Destination Configuration Data	2.3 Redirect Travel Plans	L	3.1 Report Target Data
18	3 Travel Configuration Data	5.2 Re-Redirect Travel Plans	L	5.7 Report Travel Assessment

# V2. Visually Structuring a Single Product Multiple Ways - Formatted OV-3 Three-Way Report



## Grandparent – Parent – Child

FromNode	FromActivity	ToNode	ToActivity
<b>1</b>	<b>Boston</b>		
1	Cleveland	1	Chicago
		2	United States
2	Denver	1	Houston
		2	United States
<b>2</b>	<b>Chicago</b>		
1	Boston	1	Cleveland
		2	Denver
		3	United States
2	Cleveland	1	Boston
		2	United States
3	Houston	1	Cleveland
		2	United States
4	Miami	1	New York
5	New York	1	Cleveland
		2	United States
<b>3</b>	<b>Cleveland</b>		
1	Boston	1	Denver

*Grandparent .NOT-EQUAL. Child*

# V2. Visually Structuring a Single Product Multiple Ways - OV-5 Activity Reports



## By Name

Activity/Def/ Note/ Source/ Author/ Parent	ICOM Name	Leaf/Ext/Par
1	Analyze Travel Data	L 2.2
	<2> Execute Transportation Plan	
1	O new entity	
2	O Travel Data	
3	I Travel Directions	
4	R Travel Director	
5	N Cleveland	
6	N Houston	
2	Analyze Traveling Data	L 1.2
	<1> Execute Travel Plan	
1	O Travel Data	
2	I Travel Directions	
3	R Travel Director	
4	N Cleveland	
3	Assess Travel Mission	p 3
	<0> Execute Travel Plan Context	
1	***	
4	Conduct Total Mission at Houston	L 3.6
	<3> Assess Travel Mission	
1	O End of Travel Mission	
2	I Travel Data	
3	I Travel Mission	
4	R Travel Helper	
5	N Houston	

## By Number

Number	Activity/Parent/Definition/Note/Source/Author	P/E/Leaf?
0	Execute Travel Plan Context	P
1	Execute Travel Plan	P
11	Sends Travel Report	L
12	Analyze Traveling Data	L
13	Redirect My Traveling Plans	L
14	Receive Critical Travel Directions	L
2	Execute Transportation Plan	P
21	Conduct Travel Plan Analysis	L
22	Analyze Travel Data	L
23	Redirect Travel Plans	L
27	Receive Travel Directions	L
3	Assess Travel Mission	P
31	Report Target Data	L
32	ReAnalyze Travel Directions	L
33	Coordinate Effects	L
34	Decide to Look at Travel Plan	L
35	Receive Travel Data	L
36	Conduct Total Mission at Houston	L
4	Conduct Travel Analysis and Mgmt	P
41	Conduct Travel Analysis	L
42	Conduct Travel Management	L

## By Diagram

2	0 Execute Travel Plan Context
	1 Execute Travel Plan
	2 Execute Transportation Plan
	3 Assess Travel Mission
	4 Conduct Travel Analysis and Mgmt
	5 Request Travel Assessment
3	1 Execute Travel Plan
	11 Sends Travel Report
	12 Analyze Traveling Data
	13 Redirect My Traveling Plans
	14 Receive Critical Travel Directions
4	2 Execute Transportation Plan
	21 Conduct Travel Plan Analysis
	22 Analyze Travel Data
	23 Redirect Travel Plans
	27 Receive Travel Directions
5	3 Assess Travel Mission
	31 Report Target Data
	32 ReAnalyze Travel Directions
	33 Coordinate Effects
	34 Decide to Look at Travel Plan
	35 Receive Travel Data
	36 Conduct Total Mission at Houston
6	4 Conduct Travel Analysis and Mgmt
	41 Conduct Travel Analysis
	42 Conduct Travel Management

# V2. Visually Structuring a Single Product Multiple Ways - OV-5 Activity Reports



## By Name

Activity/Def/ Note/ Source/ Author/ Parent	ICOM Name	Leaf/Ext/Par
1	Analyze Travel Data	L 2.2
	<2> Execute Transportation Plan	
1	O new entity	
2	O Travel Data	
3	I Travel Directions	
4	R Travel Director	
5	N Cleveland	
6	N Houston	
2	Analyze Traveling Data	L 1.2
	<1> Execute Travel Plan	
1	O Travel Data	
2	I Travel Directions	
3	R Travel Director	
4	N Cleveland	
3	Assess Travel Mission	P 3
	<0> Execute Travel Plan Context	
1	***	
4	Conduct Total Mission at Houston	L 3.6
	<3> Assess Travel Mission	
1	O End of Travel Mission	
2	I Travel Data	
3	I Travel Mission	
4	R Travel Helper	
5	N Houston	

## By Number

Number	Activity/Parent/Definition/Note/Source/Author	P/E/Leaf?
0	Execute Travel Plan Context	P
1	Execute Travel Plan	P
11	Sends Travel Report	L
12	Analyze Traveling Data	L
13	Redirect My Traveling Plans	L
14	Receive Critical Travel Directions	L
2	Execute Transportation Plan	P
21	Conduct Travel Plan Analysis	L
22	Analyze Travel Data	L
23	Redirect Travel Plans	L
27	Receive Travel Directions	L
3	Assess Travel Mission	P
31	Report Target Data	L
32	ReAnalyze Travel Directions	L
33	Coordinate Effects	L
34	Decide to Look at Travel Plan	L
35	Receive Travel Data	L
36	Conduct Total Mission at Houston	L
4	Conduct Travel Analysis and Mgmt	P
41	Conduct Travel Analysis	L
42	Conduct Travel Management	L

## By Diagram

2	0 Execute Travel Plan Context
	1 Execute Travel Plan
	2 Execute Transportation Plan
	3 Assess Travel Mission
	4 Conduct Travel Analysis and Mgmt
	5 Request Travel Assessment
3	1 Execute Travel Plan
	11 Sends Travel Report
	12 Analyze Traveling Data
	13 Redirect My Traveling Plans
	14 Receive Critical Travel Directions
4	2 Execute Transportation Plan
	21 Conduct Travel Plan Analysis
	22 Analyze Travel Data
	23 Redirect Travel Plans
	27 Receive Travel Directions
5	3 Assess Travel Mission
	31 Report Target Data
	32 ReAnalyze Travel Directions
	33 Coordinate Effects
	34 Decide to Look at Travel Plan
	35 Receive Travel Data
	36 Conduct Total Mission at Houston
6	4 Conduct Travel Analysis and Mgmt
	41 Conduct Travel Analysis
	42 Conduct Travel Management

# V2. Visually Structuring a Single Product Multiple Ways - OV-5 Role/Node Reports



## By Role

P/E/L	Role	Activity	Node
<b>1 Travel Analyzer</b>			
<i>Travel Analyzer</i>			
L	1	4.2 Conduct Travel Management	New York
L	2	5.3 Process Travel Assessment	New York
<b>2 Travel Clerk</b>			
<i>Travel Clerk</i>			
L	1	2.7 Receive Travel Directions	Baltimore
<b>3 Travel Coordinator</b>			
<i>Commander</i>			
L	1	3.3 Coordinate Effects	Boston
L	2	5.3 Process Travel Assessment	Boston
L	3	5.1 Requested Travel Assessment	Boston
<b>4 Travel Director</b>			
<i>Chief</i>			
L	1	2.2 Analyze Travel Data	Cleveland
L	2	1.2 Analyze Traveling Data	Cleveland
L	3	5.3 Process Travel Assessment	Cleveland
L	4	3.2 ReAnalyze Travel Directions	Cleveland
L	5	1.3 Redirect My Traveling Plans	Cleveland
L	6	2.3 Redirect Travel Plans	Cleveland
L	7	5.2 Re-Redirect Travel Plans	Cleveland
L	8	5.8 Update Common Travel Picture	Cleveland

## By Node

T/E	Node/	Activity
<b>1 Baltimore</b>		
	1	<b>27 Receive Travel Directions</b>
<b>2 Boston</b>		
	1	<b>33 Coordinate Effects</b>
	2	<b>53 Process Travel Assessment</b>
	3	<b>51 Requested Travel Assessment</b>
<b>3 Chicago</b>		
	1	<b>31 Report Target Data</b>
	2	<b>57 Report Travel Assessment</b>
<b>4 Cleveland</b>		
	1	<b>22 Analyze Travel Data</b>
	2	<b>12 Analyze Traveling Data</b>
	3	<b>53 Process Travel Assessment</b>
	4	<b>32 ReAnalyze Travel Directions</b>
	5	<b>13 Redirect My Traveling Plans</b>
	6	<b>23 Redirect Travel Plans</b>
	7	<b>52 Re-Redirect Travel Plans</b>
	8	<b>58 Update Common Travel Picture</b>
<b>5 Denver</b>		
	1	<b>34 Decide to Look at Travel Plan</b>
	2	<b>14 Receive Critical Travel Directions</b>
	3	<b>27 Receive Travel Directions</b>



# Dynamic Executable Architectures



- Enables **time-dependent (i.e. Zachman WHEN)** repeatable behavior and performance analysis of complex, dynamic operations and human and system resource interactions
- Dynamically assess **processes** and **organization structure** to identify **bottlenecks, delays, lags** and optimize **resource allocation**
  - Examine **responses** to 1 time, synchronous, and asynchronous (random) events
  - **Stress** model (conditions, events, scenarios) to the breaking point ... and beyond
  - **Fault** analysis – how to recover from single/multiple process & resource failures
  - **Balance resource workflow** and minimize queuing times
- Assesses and measures
  - **Measure of Performance (MOP)** – Individual person/ resource's ability to function in its operational environment
  - **Measure of Effectiveness (MOE)** – Overall organizational/force effectiveness in accomplishing mission objectives





# Three Measures of Merit: Areas of Analysis



## Time

- Time to perform Activity...delays due to **bottlenecks** – resource not available
  - **Increase number of resources**
  - **Have resources available more often**
- Time to Send information...delays due to network or task interdependency
  - **Alternate ways of communicating information among resources**
  - **Automate manual tasks**
  - **FIFO, LIFO strategies**

## Resource

- Utilization of Resources (Human or Mechanical)
  - **Bottlenecks** (Busy, Over-utilized) or **Idle** (not-so-busy, Under-utilized)
  - In context of when it performs its designed function within an overall process thread
- Cost of Resources -- **Static** (Price tag), **Dynamic** (Operating Cost)
- Marginal Utility of Additional Resource
  - Benefit gained by adding additional resource

## Reliability

- Health of the Operation
  - Impact of single point of failure ... qualitative assessments
    - Mission Failure, **Loss of Life**, Task Failure, Minimal Impact
  - Availability of alternate/back-up resources when needed
- Recoverability -- Time to recover from a failure
  - Adaptability to changes in environment
    - Time, Quality, Mission Success, Losses
  - Graceful degradation
    - Mission tasks completed prior to shutdown



# Three Solutions to Performance Issues



"Manage"  
30 minutes

## ↓ Decrease time of activity (lower rate of service)

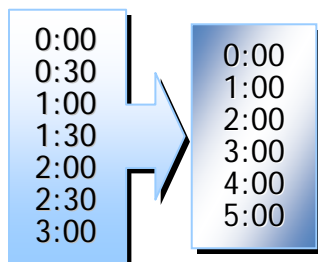
- Found way to automate some part of a process so as to reduce it's execution time
- Person responsible for execution, with better training/education can perform more efficiently thereby reducing execution time
  - Non-material DOTMLPF solution



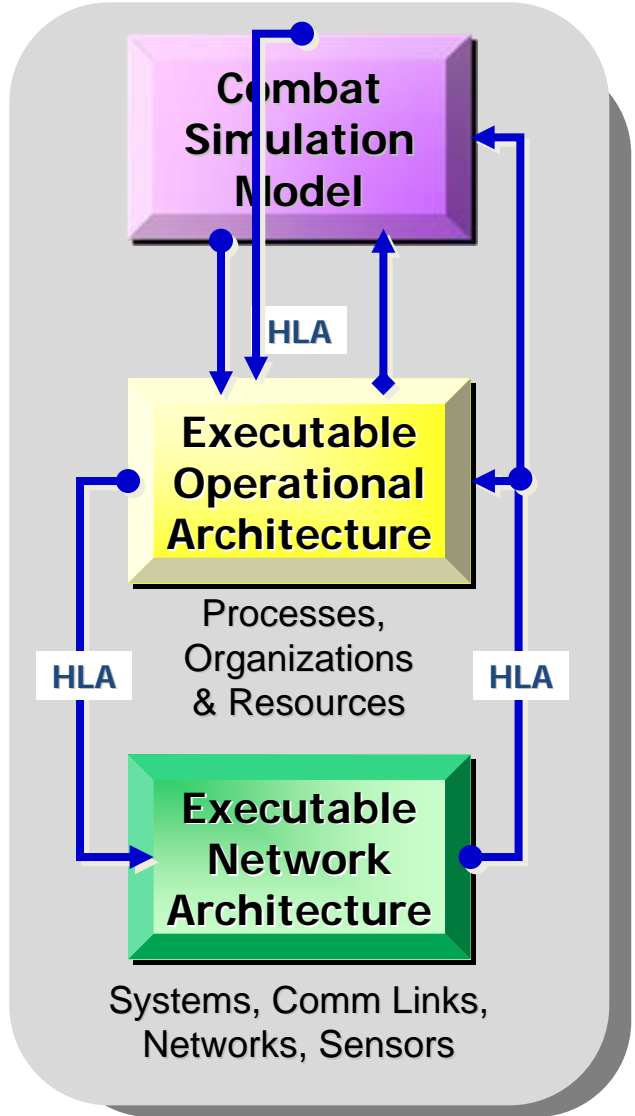
## ↑ Increase number (more capacity) of resources available

## ↓ Decrease number of incoming jobs (less demand on resource)

- Improve upstream operation (fewer jobs passed to the resource)
  - Decreased rate of arrival (less per time period)
- Change Organization (divert some jobs to an idle resource)
- Change Doctrine/tactics (process split or redefined with fewer inputs)



# Extend to Combat + Communication M&S Models Federation of Simulations



- **Extend single executable architecture to link with ...**
  - **[1] Combat simulation model as a mission scenario generator to provide different mission "stimuli (triggers)"**
  - **[2] Communication simulation model to incorporate system and network delays into overall processing time (and network fault analysis)**

# Two Governance Measurement Instruments Measures Contribute to Architecture Value

## ■ OMB Enterprise Architecture Assessment Framework (EAAF), v3.0, Dec 2008

- Assesses **capability** of EA programs
- Helps OMB and agencies assess capability of their EA programs to guide and inform strategic IT investments

Use Capability Area (Section 1.4)	Description: The agency has established the necessary management practices, processes, and policies needed for developing, maintaining and overseeing EA and demonstrating the importance of EA awareness and the value of employing EA practices within an agency. The agency uses its EA to inform strategic, information resources management, IT, and capital planning and investment control processes.						Assessment Value
	Outcomes: (1) Establishes strategic objectives and programs the agency needs to meet (citizens' needs). (2) Demonstrates the relationship between EA, strategic and capital planning processes. (3) Provides the ability to make better management decisions, and as necessary, the ability to assess and re-assess the path forward.						
	No evidence presented	Initial: Informal and ad-hoc EA processes, practices & artifacts exist but may be incomplete and/or inconsistent.	Managed: EA processes are planned and managed, and artifacts are complete at least at a high level of definition.	Utilized: Processes and products are documented, understood, and are being used in at least some agency decision-making activities.	Results-Oriented: EA processes are measured for effectiveness against a set of established performance criteria.	Optimized: EA processes continuously drive business improvement within the agency. Demonstrable improvement in efficiency, cost savings and service quality.	
A. EA Governance and Management (Section 1.4.1)	Level 1 Phoenix	Level 2 Phoenix	Level 3 Phoenix	Level 4 Phoenix	Level 5 Phoenix	Level 6 Phoenix	Relative

Increasing Assessment

## ■ GAO Enterprise Architecture Management Maturity Framework (EAMMF), v1.1

- Assesses EA program **capacity**
- Assesses maturity of an agency's EA program and its management

EAMMF Version 1.1			
	Stage 1: Creating EA awareness	Stage 2: Building the EA management foundation	Stage 3: Developing EA products
Attribute 1: Demonstrates commitment	Adequate resources exist. Committee or group representing the enterprise is responsible for creating, overseeing, or approving EA.	Written and approved organization policy exists for EA development.	Written and approved organization policy exists for EA maintenance.
Attribute 2: Provides capability to meet commitment	Program office responsible for EA development and maintenance exists. Chief architect exists. EA being developed using a framework, metadology, and automated tool.	EA products are under configuration management.	EA products and management processes undergo independent verification and validation.
Attribute 3: Demonstrates satisfaction of commitment	EA plans call for describing both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be". EA plans call for describing both the "as-is" and the "to-be" environments in terms of business, performance, information/data, application/service, and technology. EA plans call for business, performance, information/data, service, and technology descriptions to address security.	EA products describe or will describe both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be". Both the "as-is" and the "to-be" environments are described or will be described in terms of business, performance, information/data, application/service, and technology. EA plans call for business, performance, information/data, application/service, and technology descriptions to address or will address security.	EA products describe both the "as-is" and the "to-be" environments of the enterprise, as well as a sequencing plan for transitioning from the "as-is" to the "to-be". Both the "as-is" and the "to-be" environments are described in terms of business, performance, information/data, application/service, and technology. EA plans call for business, performance, information/data, application/service, and technology descriptions to address security. Organization CIO has approved current version of EA. Committee or group representing the enterprise or the investment review board has approved current version of EA.
Attribute 4: Verifies satisfaction of commitment	EA plans call for developing metrics for measuring EA progress, quality, compliance, and return on investment.	Progress against EA plans is measured and reported.	Quality of EA products is measured and reported. Return on EA investment is measured and reported. Compliance with EA is measured and reported.

# Conclusion

- When you use an architecture for **value**, it becomes **actionable**
- Agencies need to start with integrated architectures and then **continuously** apply static and dynamic analytics to gain increasing value
- Static and dynamic analytics are complementary in helping achieve the architecture value proposition – **that actionable architectures enable business and mission success**
- EAAF and EAMMF **contribute** to architecture value
  - Should be more prevalent within DoD to assess how well agencies and organizations are planning, developing, and using their architectures



✓ Ultimately, EA success will be measured by how well they help an agency meet its business and warfighter goals and objectives in accomplishing a mission