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DoD Enterprise Architecting: Joint Issues Derived From SOF Air Analysis

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Overview

- Introduction
- Six Step Enterprise Architecture Approach
- Special Operations Forces (SOF) Air Architecture
- DoD And Joint Architecting – Observations And Biases
- Topics for Further Research

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Introduction

- Project to Analyze & Model SOF Air ops activities
  - Assist SOF Air community determine critical processes
  - Results to aid SOF Air: shortfalls, training, funding
- SOF Air Is…
  - Inherently joint at tactical level
  - Designated AF and Army units
  - Unique application of air power

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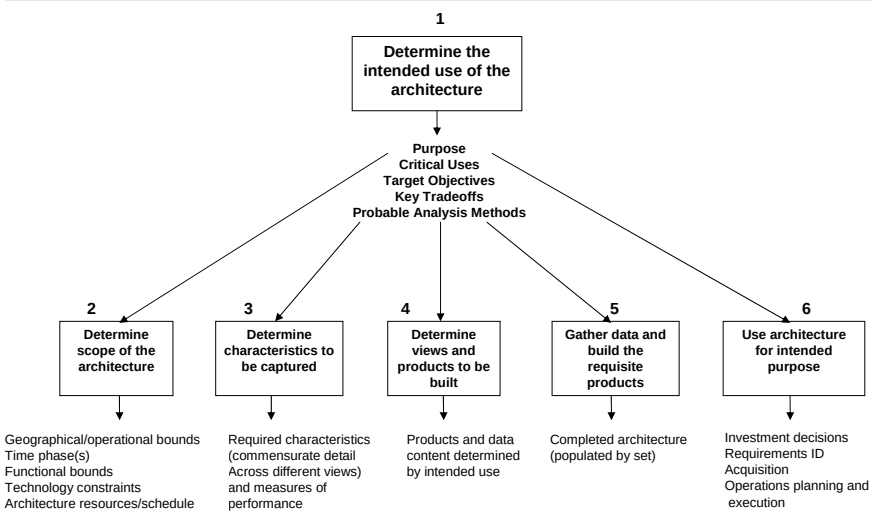
DoDAF 6-Step Enterprise Architecture Approach



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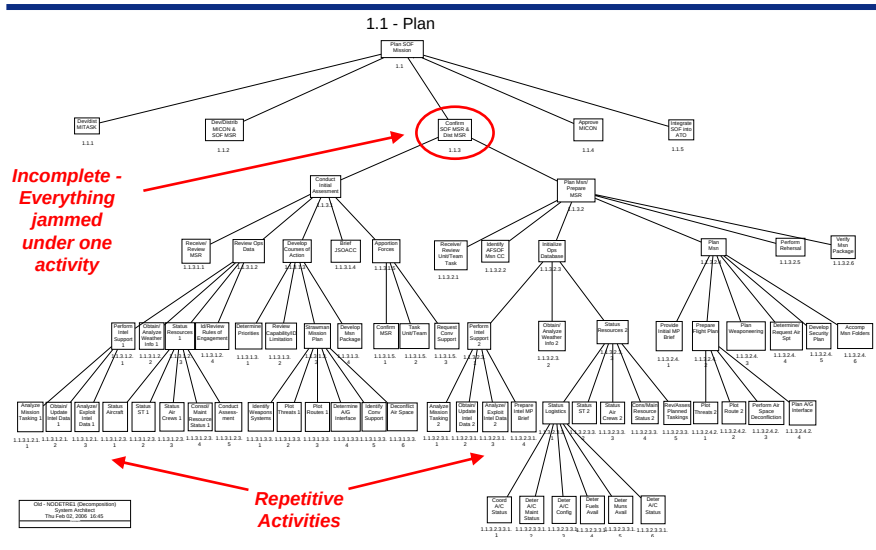
Old OV-5 Node Tree (Plan)



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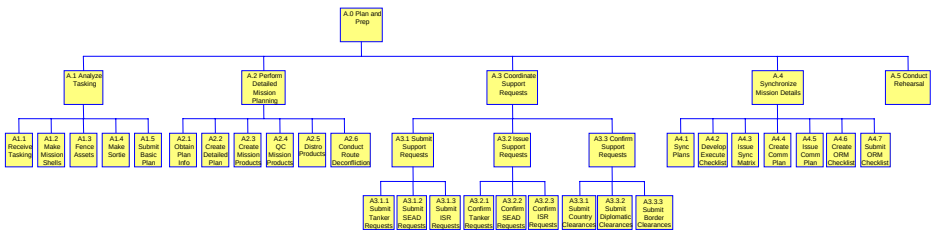
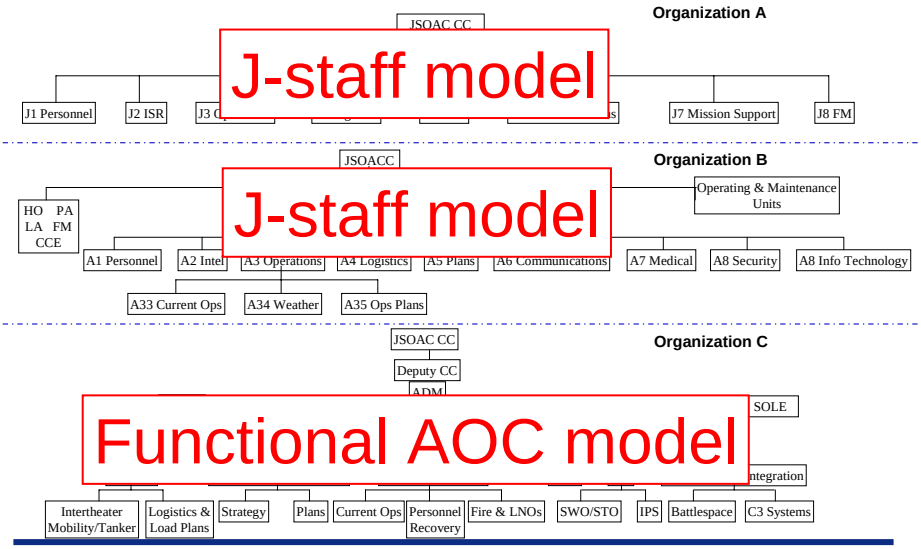
New OV-5 Node Tree (Plan and Prep)



OV-4 Organization Charts



DoD And Joint Architecting: Observations And Biases

- The Architecture Team
- Common Lexicon
- Process Ownership
- Appropriate Abstraction
- Organizational Bias
- Level of War Bias
- Hollow Transfer Activities

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Building The Architecture Team

- 1 SOF pilot, 2 fighter pilots, 1 civil engineer
- All familiar with DoDAF architecture views
- One SME & most familiar with operations
- Essential for team to have a good mix of SMEs and systems architects
- 2 Elements - Core team and network of SMEs

HEURISTICS:

- ***Lack of experience in the domain = architecting pain***
- ***A readily available network of SMEs makes the architecture relevant***

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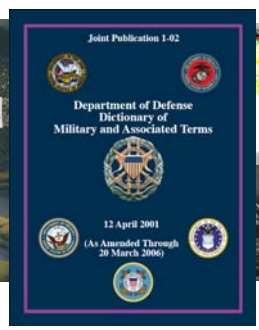
Common Lexicon

- Differences in vocabulary between services
- Rock Drill vs. Rehearsal
  - Deck (USN) = Ground (AF)
  - Latrine (USA) = Head (USN)



- DoD Dictionary & Joint/Multi-service publications provide common ground

Common Lexicon

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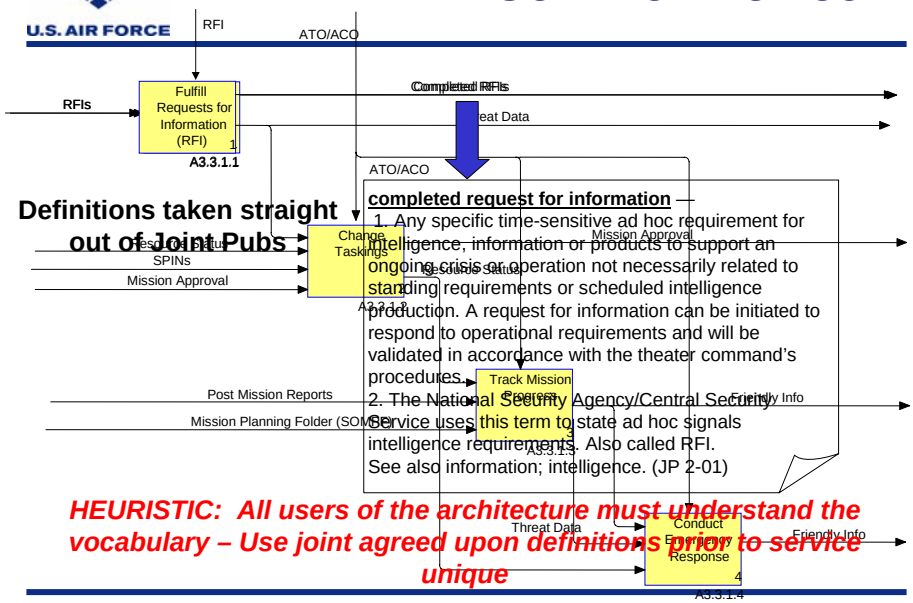

Definitions taken straight out of Joint Pubs

completed request for information —
1. Any specific time-sensitive ad hoc requirement for intelligence, information or products to support an ongoing crisis or operation not necessarily related to standing requirements or scheduled intelligence production. A request for information can be initiated to respond to operational requirements and will be validated in accordance with the theater command's procedures.
2. The National Security Agency/Central Security Service uses this term to state ad hoc signals intelligence requirements. Also called RFI.
See also information; intelligence. (JP 2-01)

HEURISTIC: All users of the architecture must understand the vocabulary – Use joint agreed upon definitions prior to service unique

Process Ownership

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- **Overlapping guidance from multiple organizations & services**

- **Unofficial versus official guidance**

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Process Ownership

Who owns the process?

- **Multiple stakeholders in joint processes**
- **Common process requires buy-in**
- **Owner needs to be designated for irreconcilable differences**

HEURISTIC: When establishing an enterprise-wide operational architecture, there needs to be one benevolent dictator to overcome irreconcilable differences

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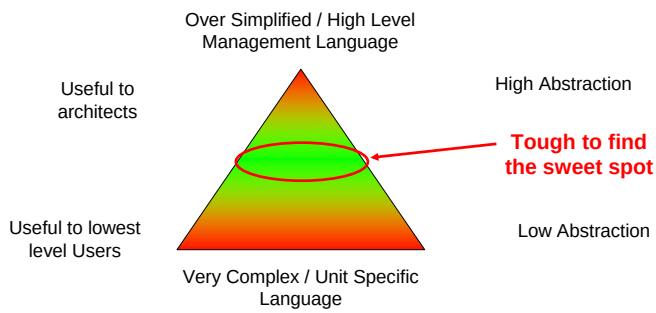
Appropriate Abstraction

Abstraction vs. Usefulness of the Model



HEURISTIC: Architect at the level of abstraction that answers the questions. The abstraction level will be determined by the stakeholder with the lowest level abstraction needs/questions.

Organizational Bias

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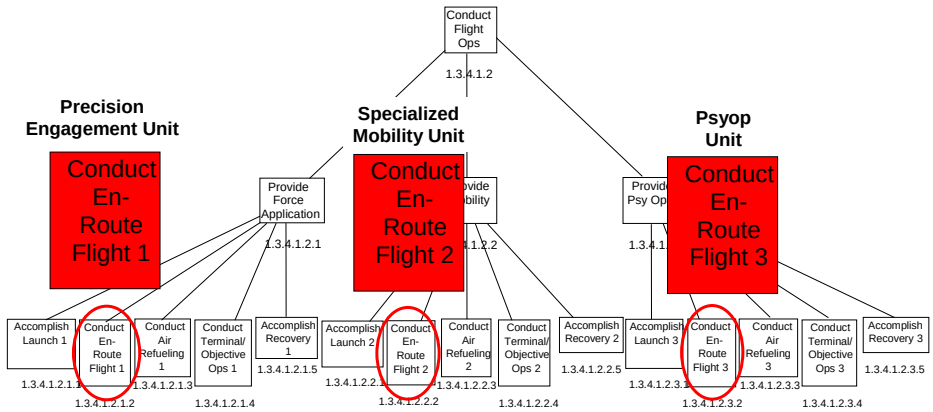
Old Node Tree decomposed with organizational baggage



Organizational Bias

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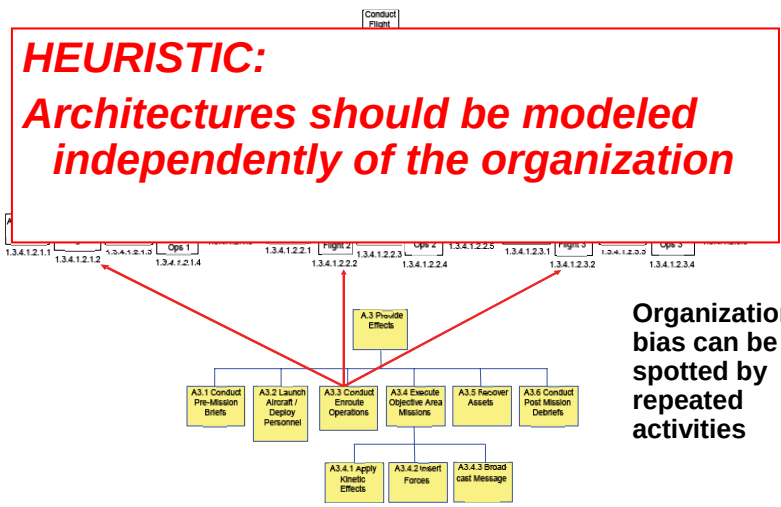
HEURISTIC:

Architectures should be modeled independently of the organization



Organizational bias can be spotted by repeated activities

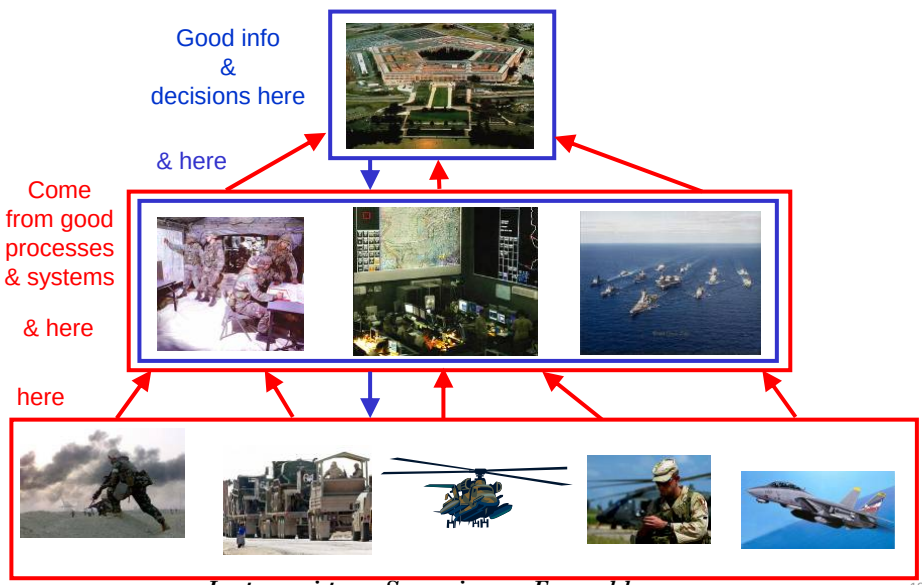
Level of War Bias

- Military architectures/systems/personnel tend to focus on either operational level or tactical level, not both

- Operational Level
  - Focused on major operations and providing the means by which tactical successes are exploited
  - Parts of Air Operations Center, Major Headquarters

- Tactical Level
  - Focused on battles and engagements
  - Squadron, Aircraft, Airman, Soldier

Level of War Bias



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Level of War Bias

- Systems tend to be built to satisfy needs of only one level
  - TBMCS-FL
  - TBMCS-UL
- Processes do not follow operational and tactical level boundaries
  - Stream back forth across both levels
  - Flow is key to net-centric operations
- *Heuristic: When architecting DoD systems, do not limit context to operational or tactical level if not necessary – follow the process/flow*

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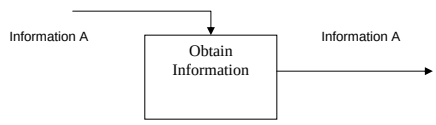
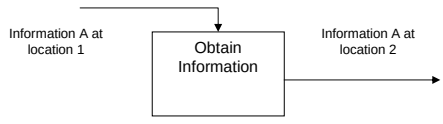
Hollow Transfer Activities

- Move information, do not transform it
- Indicated with terms such as
  - Obtain
  - Receive
  - Transmit
  - Issue
  - Distribute
  - Submit
  - Store
- Information class with location attribute





Hollow Transfer Activities

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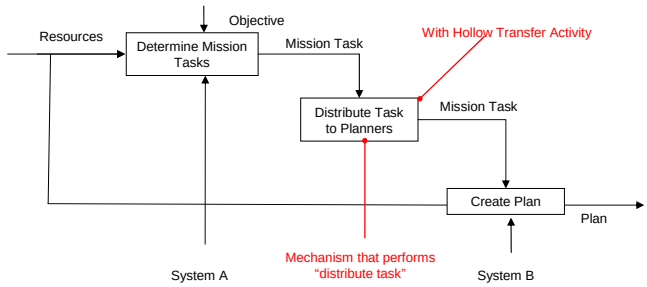
- With Visibility



- Can see key activity and apply mechanism
- SV functions map to OV activities

Hollow Transfer Activities

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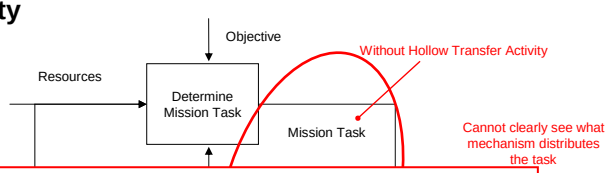
- Without Visibility



Heuristic: Be critical of Hollow Transfer Activities; ensure they have the appropriate visibility

- Can loose visibility on transfer activity
  - Capability/systems gap
  - Lack of interoperability

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Observations Summary

- The Architecture Team
  - Lack of experience in the domain = architecting pain
  - Need for an available network of SMEs (still in the field)
- Common Lexicon
  - All users of the architecture must understand the vocabulary
- Process Ownership
  - When establishing an enterprise wide operational architect, there needs to be a boss
- Appropriate Abstraction
  - Architect at the highest level of abstraction which provides the most insight for the user

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Observations Summary

- Organizational Bias
  - People tend to think organization first, not process
  - Architectures should be modeled independent of the organization
- Level of War Bias
  - When architecting DoD systems, do not limit context to operational or tactical level if not necessary – follow the process/flow
- Hollow Transfer Activities
  - Be critical of Hollow Information Transfer Activities, ensure they have the appropriate visibility

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Topics for Further Research

- Object Oriented or Structured Analysis?
  - Which one best for capturing info flow
  - Which one best for modeling DoD organizational based processes
- What models best capture Hollow Transfer Activities?
  - As TPPU evolves in systems, how do we ensure the information flows are not dropped from architecture
- AFSO21, BPR, and DoDAF – how do they mix?
- Constraints based architecture?
  - Start with organization/systems, then build operational architecture

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QUESTIONS???

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- Backup

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Steps 1 - 3

- Step 1: Determine the Intended Use of the Architecture
  - Used to identify shortfalls, enhance training, allocate funding
  - Document standard core processes
  - Present at JSOAC conference for workshop
- Step 2: Determine the Scope of the Architecture
  - Limited to "Conduct SOF Air Operations" phase
  - Deployment, re-deployment, & support not included
  - Activities when forces in place & prepared to execute
- Step 3: Determine the Characteristics to be Captured
  - Find standard information flows & operational activities required to execute SOF Air operations
  - Independent of organizational restrictions—Difficult in SOF Air
  - Independent of traditional levels of war

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Steps 4 - 6

- **Step 4: Determining Views & Products to be Built**
  - Primary focus was OV-5 Node Tree & Activity Models
  - Limited by project time line (.3 man years)
  - OV-4 Organizational Relationship models used in analysis to separate organization from processes

- **Step 5: Gathering Data & Build Requisite Products**
  - Most time-consuming step (85%) – extensive research
  - OV-4 Organization Chart – no orgs were the same
  - OV-5 Node Tree – analyzed existing (incomplete), produced new
  - OV-5 Activity Model – analyzed existing (incomplete), created new streamlined models

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Step 5: Publications Reviewed

- Joint Publication 3-05, *Doctrine for Joint Special Operation*, 17 Dec 2004
- Joint Publication 3-05.1, *Joint Tactics, Techniques, and Procedures for Joint Special Operations Task Force Operations*, 19 Dec 2001
- Joint Publication 3-05.2, *Joint Tactics, Techniques, and Procedures for Special Operations Targeting and Mission Planning*, 23 May 2003
- Joint Publication 3-30, *Command and Control for Joint Air Operations*, 05 Jun 2003
- USSOCOM Directive 525-8, *Joint Special Operations Air Component (JSOAC)*, 26 Jan 1999
- USSOCOM Directive 525-7, *Special Operations Liaison Element (SOLE)*, 28 Mar 2003
- 352 SOG Instruction 10-202, *Air Force Special Operations Component Europe (AFSOCEUR) Structure and Procedures*, 01 Sep 2005
- USPACOM JSOAC Operating Instruction, *United States Pacific Command Theater Special Operations Air Component (USPACOM TSOAC) Joint Special Operations Air Component Operating Instruction*, 21 Apr 2005 (RevC - Draft)
- SOCCENT CJSOAC J3 Annex, *Combined Joint Special Operations Air Component (CJSOAC) Standard Operating Procedure*, 04 Mar 2005
- AFSOC Instruction 13-102, *Joint Special Operations Air component (JSOAC)*, 09 May 2006 (Draft)
- AFSOC Instruction 13-101, *Operational Procedures Special Operations Liaison Element (SOLE)*, 01 Aug 2005
- Hurlburt Field Instruction 10-402, *Air Force Special Operations Component (AFSOC) Operations*, 05 Apr 1996 (AFSOF)
- AF Doctrine Document 2-7, *Special Operations*, 16 Dec 2005
- AF Instruction 13-1AOC, Volume 3, *Operational Procedures – Air and Space Operations Center*, 01 Aug 2005
- AF Operational Tactics, Techniques, and Procedures 2-3.1, *USAF Command and Control Nodes*, 30 Dec 2004(C2 Nodes)
- AF Operational Tactics, Techniques, and Procedures 2-3.2, *Air and Space Operations Center*, 13 Dec 2004
- Field Manual 1-108, *Doctrine for Army Special Operations Aviation Forces*, 03 Nov 1993

Very extensive governing publications review

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Steps 4 - 6

- Step 4: Determining Views & Products to be Built
  - Primary focus was OV-5 Node Tree & Activity Models
  - OV-4 Organizational Relationship models used in analysis to separate organization from processes
- Step 5: Gathering Data & Build Requisite Products
  - Most time-consuming step (85%) – extensive research
  - OV-4 Organization Chart – no orgs were the same
  - OV-5 Node Tree – analyzed existing (incomplete), produced new
  - OV-5 Activity Model – analyzed existing (incomplete), created new streamlined models
- **Step 6: Use Architecture for Intended Purpose**
  - **Presented at conference/workshopped for 2 days**
  - **Used to assign organization and system mechanisms**
  - **Accepted by SOF Air as start to new baseline – living architecture**

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New Complete OV-5 Node Tree

Distributed & Less Redundant Activities