

2006 International Command and Control Research and Technology
Symposium

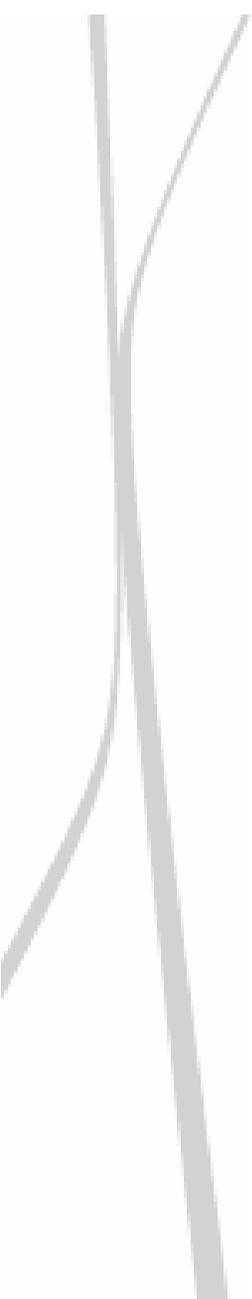
Re-Architecting the Department of Defense Transformation: *Transition to the Information Age*

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Agenda

- ▶ Thesis Objective
- ▶ Analysis Methodology
- ▶ Analysis Results
- ▶ Recommended Acquisition Architecture

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The objective of this brief is to present a proposed DoD acquisition process that is designed for the Information Age and network-centric warfare

- ▶ Rapid changes in technology and military missions are outpacing the ability for policy and institutional organizations to adapt accordingly
- ▶ Significant drivers of change include:
 - Network-Centric Warfare (NCW)
 - Global Information Grid (GIG)
 - Effects Based Operations (EBO)
 - Global War on Terror (GWOT)
 - Global Economics
 - Complexity of Technology
 - Reduced Industrial Base
 - Wartime Operational Lessons Learned
 - Rapid Commercialization of Technology

The dimensions of Force, Time and Space are changing in the Information Age



Focusing on the acquisition system is the best metric for sustained transformation since it is the production system of the military

- ▶ Unfortunately there are indications that the current acquisition system is antiquated and ill-designed for the information age

“I believe that the primary problems (with the acquisition system) are institutional, and that they require an institutional change. Congress is not responsible for executive operations within institutions. You are responsible for overseeing, but not conducting those operations. You are responsible for setting the institution right.”

John J. Hamre Report to the Senate

“...The committee is concerned that the current Defense Acquisition Management Framework is not appropriately developing realistic and achievable requirements within integrated architectures for major weapons systems based on current technology, forecasted schedules and available funding....”

House Conference Report #109-89 – HR-1815 – Title VIII – Acquisition Policy, Acquisition Management and Related Matters p.355

“One hundred and twenty eight prior studies have been completed on the acquisition system....we still see some of the same issues”

Defense Acquisition Performance Assessment Dec 2005



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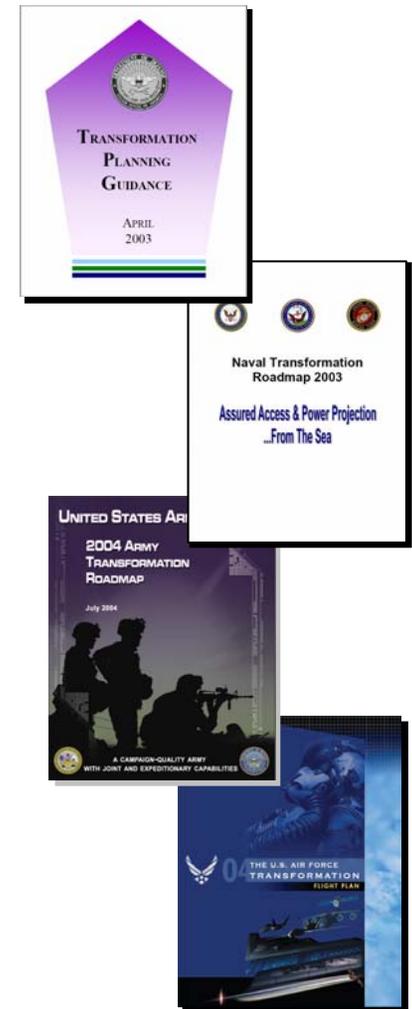
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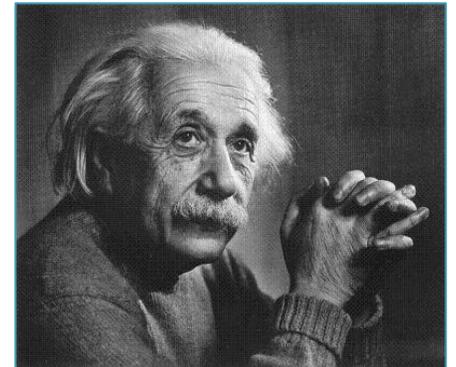
The analysis methodology is a three step process, reviewing documentation, building system dynamics models and conducting a comparison to develop the recommendation

1. The transformation plans of each Service was compared to the DoD Transformation Planning Guidance (TPG)
2. System dynamics models were made of each transformation plan
3. A comparison of the systems dynamics models was conducted to identify similarities and opportunities
 - ▶ In conjunction with other research the system dynamics models will be compared against each other to identify patterns in the Service models
 - ▶ A complete model of the DoD acquisition system was created to validate joint operation interactions in actual use verses theoretical use
 - ▶ A new model was constructed to identify a possible new architecture of the acquisition system embodying NCW and Information Age transformation requirements



System Dynamics was selected for its ability to visually track numerous interactions and identify reinforcing or counterproductive actions in a system

- ▶ System Dynamics provides a systematic means of tracking the stocks and flows of money, material, time, or effort for managing changes in complex systems
- ▶ It allows visualization and modeling of numerous effects and feedback loops, on, in, and between systems so as to optimize changes to produce the desired results
- ▶ Difficulties in managing complex systems manifest in:
 - Unintended consequences
 - Policy resistance
 - Undesirable patterns of behavior
 - Reducing the effectiveness of the system by modifying the wrong system factor

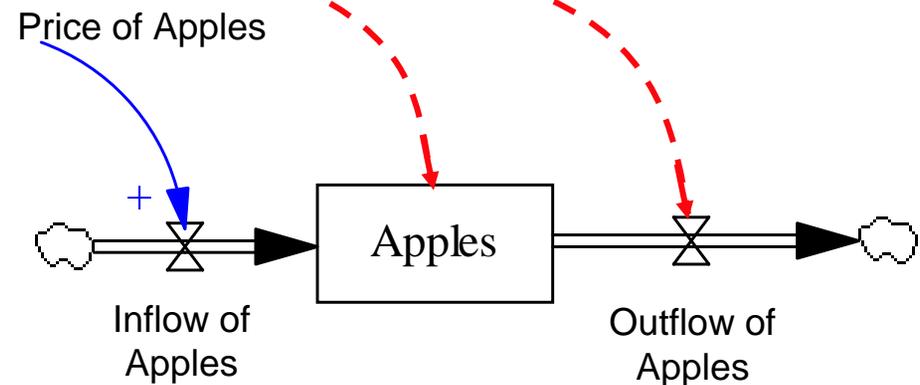
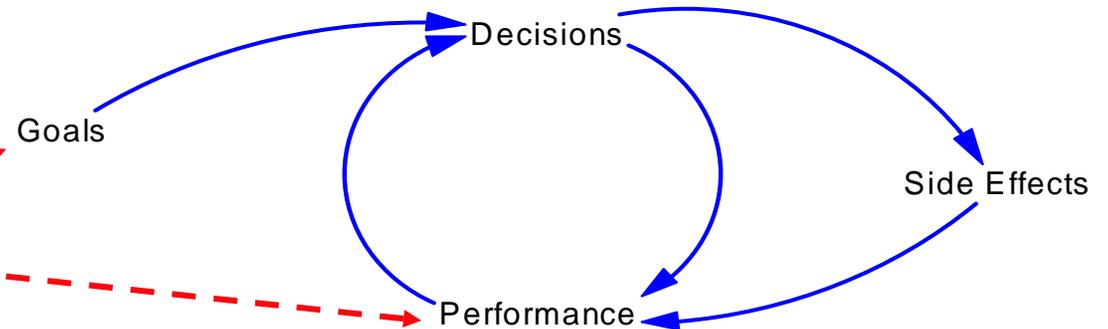


*“If I can’t picture it,
I can’t understand it.”*

Albert Einstein

System dynamics models are comprised of three fundamental elements and two types of connections

- ▶ The three fundamental elements are:
 - Factor Effects
 - Valve Factors
 - Stocks
- ▶ Factor Effects are anything which influences the system
- ▶ Valve Factors control the flow of units between stocks
- ▶ Stocks are the storage or accumulation of units





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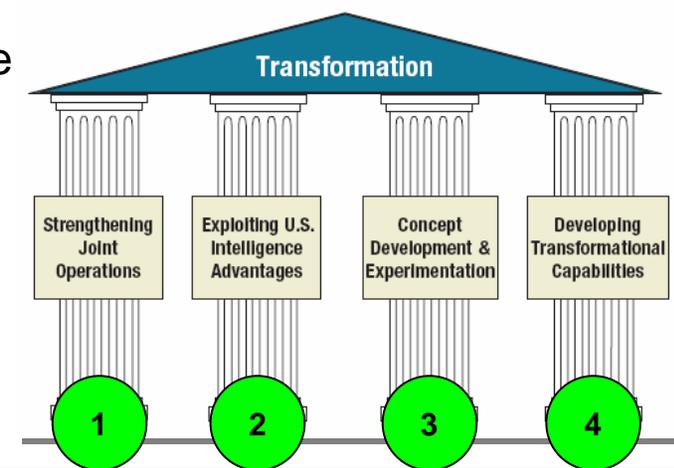
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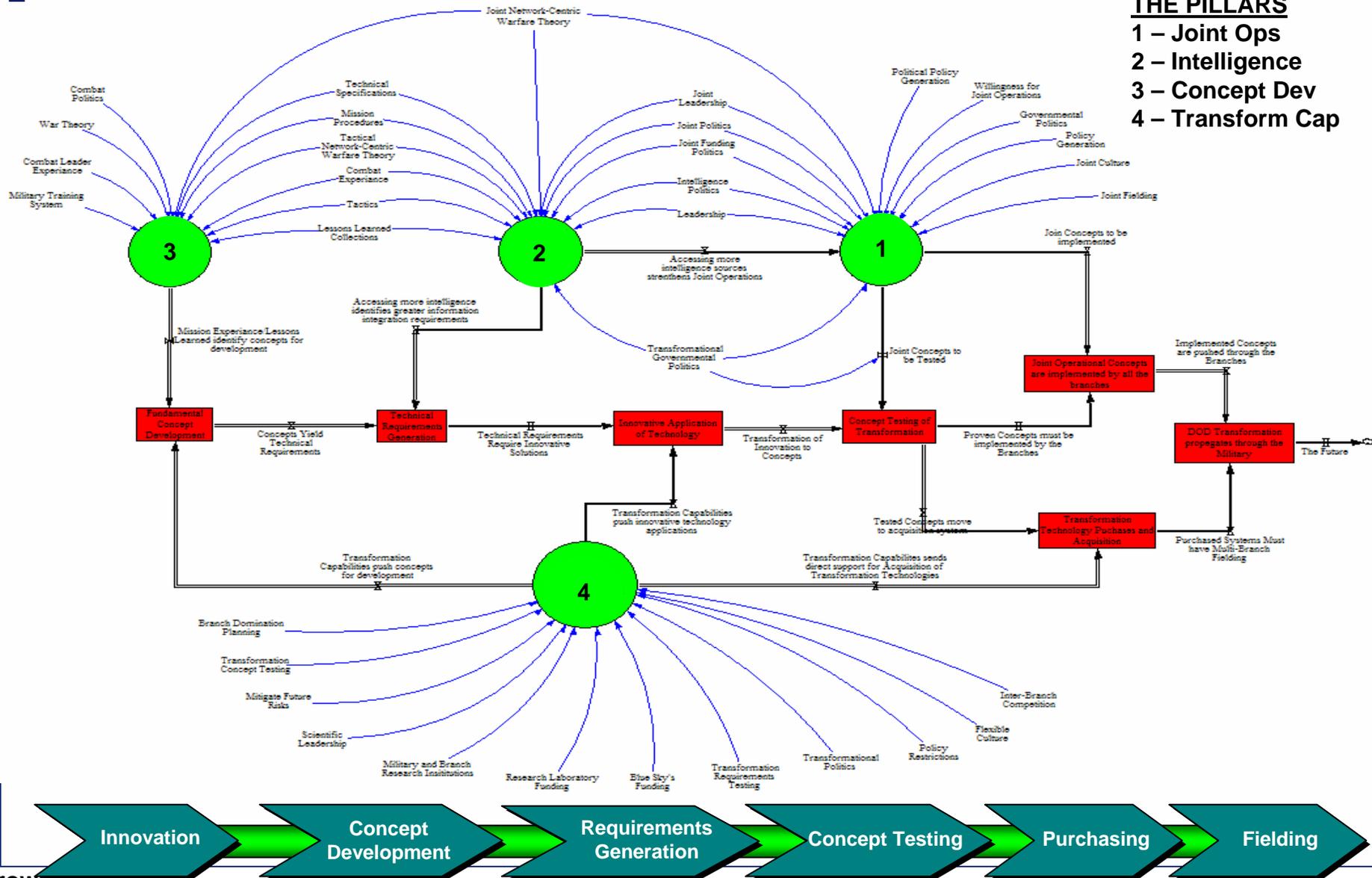
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The Transformation Planning Guidance views transformation to occur around 4 transformational pillars

1. **Strengthening Joint Operations** – creation of future joint operating concepts and architectures is considered the key to the DoD transformation strategy
2. **Exploiting U.S. Intelligence Advantages** – the development of transformed intelligence capabilities which will help anticipate adversaries' intent is a key capability
3. **Concept Development and Experimentation** – the DoD must have multiple joint and Service concept development efforts to ensure competition of ideas
4. **Developing Transformational Capabilities** – the DoD needs strong mechanisms for implementing results from concept development and experimentation to meet the six operational goals established by the QDR



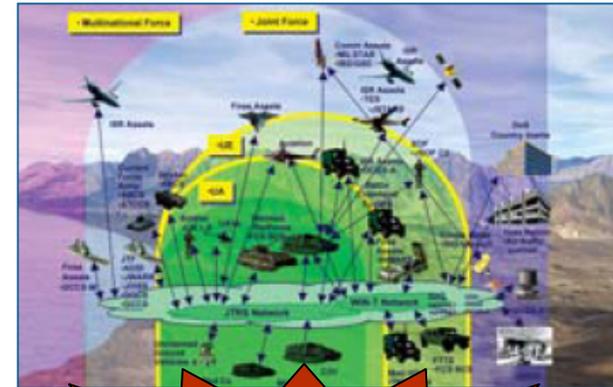
Analysis of Transformation Planning Guidance indicates a clear solution neutral objective goal for the military



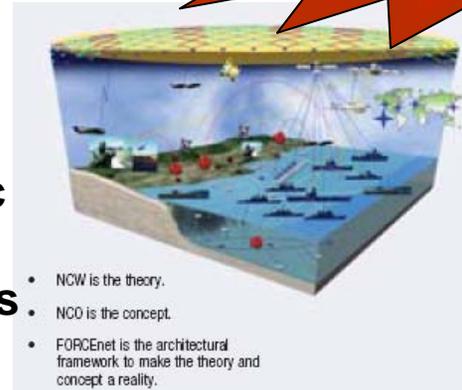
Analysis of the Service responses to the Transformation Planning Guidance indicates a solution created specifically for each Service

PROBLEMS WITH THE ROADMAPS

- ▶ Three separate independently developed network-centric systems does *not* achieve the vision of the DoD in the information age
- ▶ This architecture is producing competition between the Services and inhibiting transition to a joint network-centric Global Information Grid
- ▶ This is the result of Title 10 authority in conjunction with a platform-centric development process and confirms the acquisition system is operating as designed



**The Problem!
Disconnected &
Disjointed Operations**



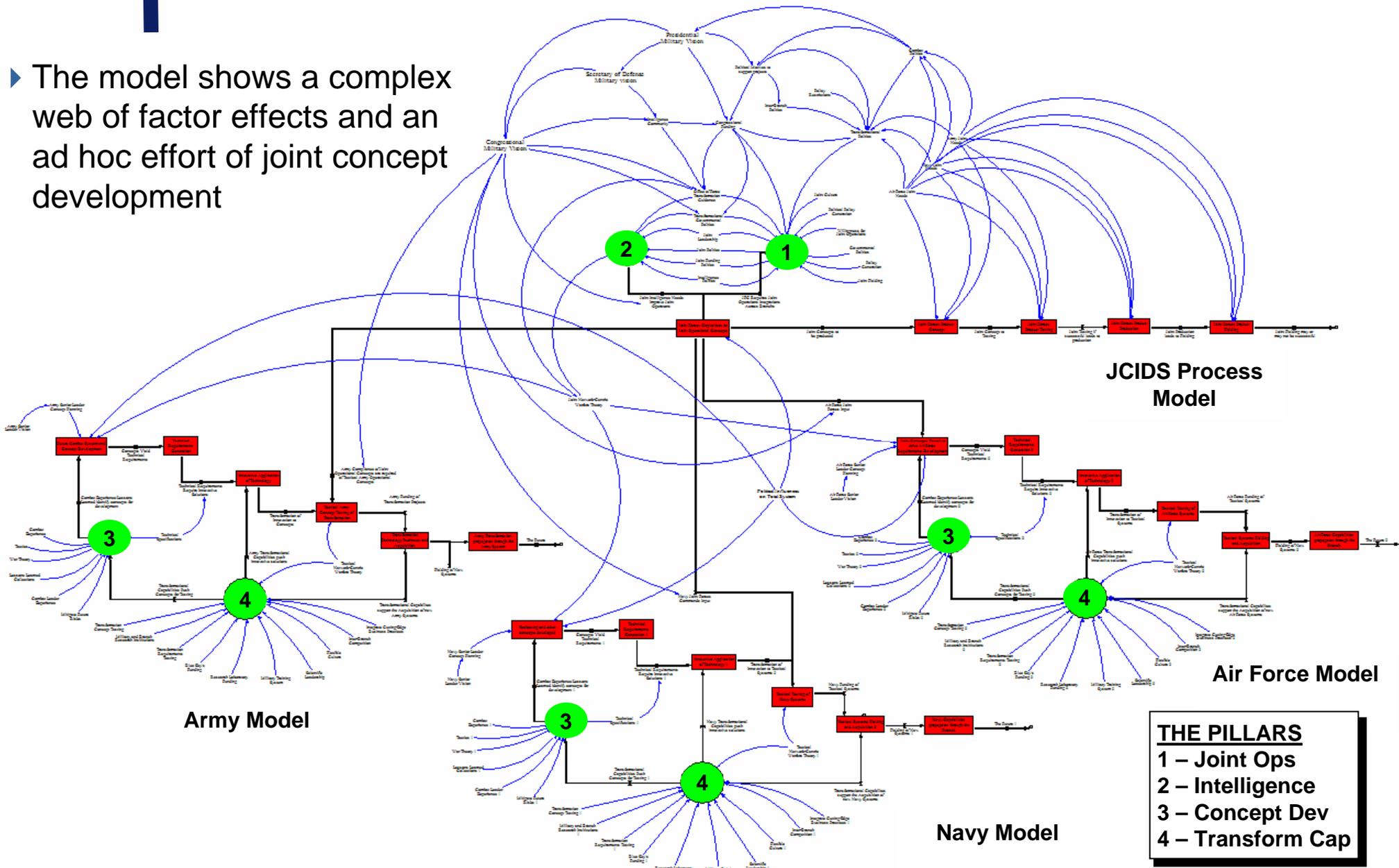
- NCW is the theory.
- NCO is the concept.
- FORCEnet is the architectural framework to make the theory and concept a reality.



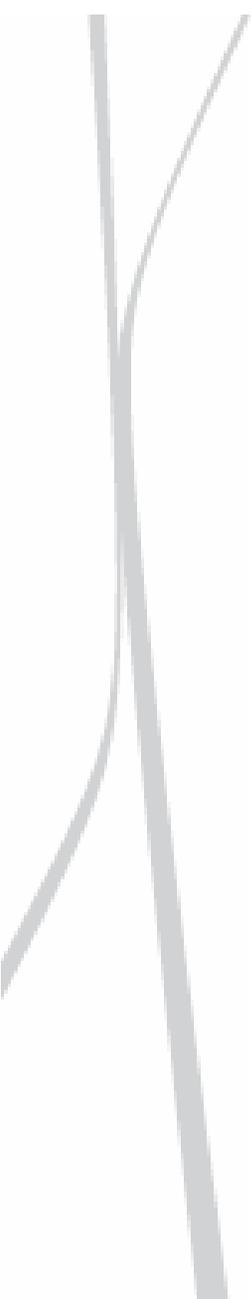
Source : Service Roadmaps

Combined DoD Transformation Systems Dynamics Model as defined by each Service

- ▶ The model shows a complex web of factor effects and an ad hoc effort of joint concept development



THE PILLARS
 1 – Joint Ops
 2 – Intelligence
 3 – Concept Dev
 4 – Transform Cap



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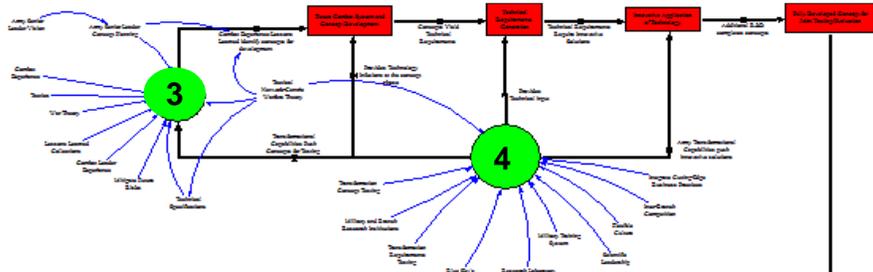
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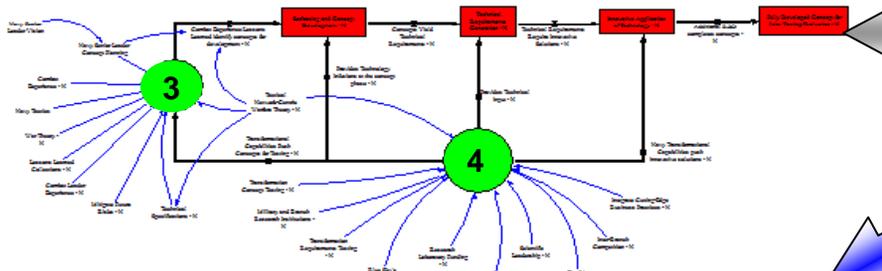
Recommended new acquisition process organization “The New Model”

“Born Joint” occurs when two-way communication occurs during concept development

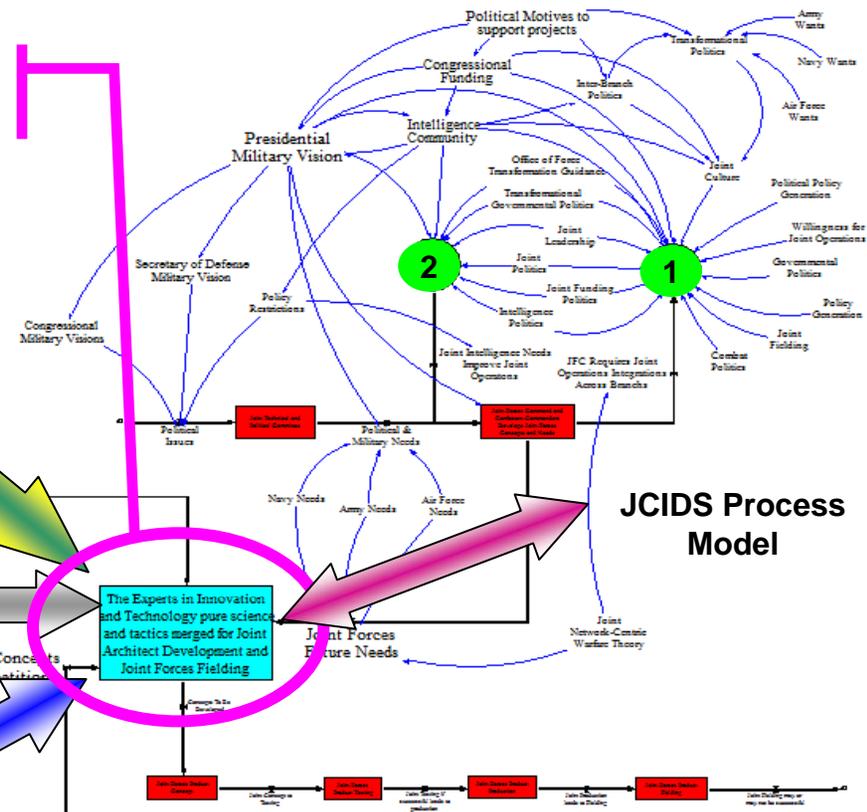
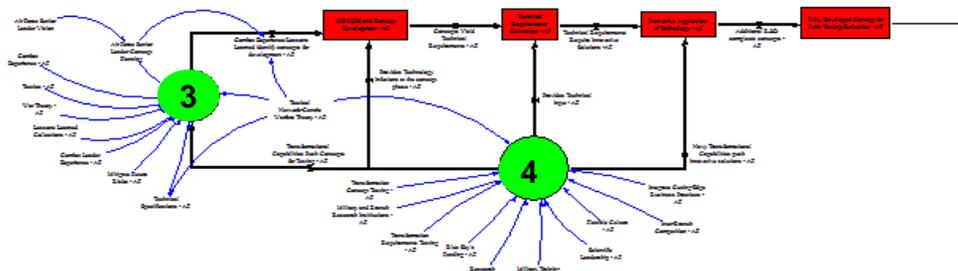
Army Concept Development



Navy Concept Development



Air Force Concept Development



Joint Production Development and Fielding Process

- THE PILLARS**
- 1 – Joint Ops
 - 2 – Intelligence
 - 3 – Concept Dev
 - 4 – Transform Cap

The “Blue Box” represents a new organization in the government, is established from existing government organizations, but operates differently

- ▶ **There are five primary functions in the “Blue Box”**
 - 1. To act as the single DoD wide acquisition manager.** This organization also reduces the number of major acquisition processes from four to one. Since the large projects are slower, having more running in one location increases the likelihood of cross project learning.
 - 2. To act as the DoD joint architect.** What allowed the internet to grow and produce the benefits we are hoping to build into our defense infrastructure are standardized interfaces and formats. This is no different than what the military is trying to do with intelligence information: develop a standard which will allow all branches to view and use timely intelligence in a secure format.
 - 3. To collect the concepts for testing and competition.** The idea here is to provide a reason why each of the branches should work to incorporate the other branches requirements into its concept design process to help the concept have a better chance of selection by the “Blue Box”.
 - 4. To provide two-way requirements communication between the “Blue Box” and the Joint Forces Command, the branches, and the Defense Industry**
 - 5. To package the military acquisition lessons learned for use in other government agencies**

There are eight key objectives the “Blue Box” is designed to achieve

1. **Improve the efficiency** of the realization of large joint acquisition projects
2. **Provide a better process** which supports the development of DoD products which embody NCW Theory and the transition to the Information Age
3. Minimize political influence on technical decisions with package decision authority still given to the Secretary of Defense
4. Provide a process which maximizes the consideration of strategic requirements on the acquisition system
5. **Better manage the Defense Industry:** To ensure continued survival of current Defense Industry Partners and to build resilience in national defense capability strategies
6. Integrate and facilitate inter-branch communication, cooperation and competition
7. Give the branches reasons to better support their transformational capabilities through competition
8. Develop a process that **maximizes the integration of technology**, experts, innovation, and requirements to produce the best weapons system architecture in support of military operations in the Information Age

There are numerous acquisition process changes recommended in the paper some of the highlights are presented here... (1 of 2)

- ▶ **The acquisition system should be grouped into three major divisions, the Concept Development Process, The Joint Operational Concept Development and the “Blue Box”**
- 1. The Concept Development Process will be a re-organization of the concept development and research capabilities already established in each service but not collaboratively organized. It will be responsible for:**
 - Testing and evaluating technology and concepts for service specific needs
 - Providing rapid acquisition capability to the combatant commander (tactical flexibility)
 - Establishing a clear and organized interface between Industry Partners and the technology they provide for use (integrate Industry formally into the purchasing system)
- 2. The Joint Operational Concept Development process requires an improved process for integration of congressional concerns, intelligence community coordination and joint requirements identification**
 - “Born Joint” occurs when operational concepts, strategic objectives, tactical requirements and technical capabilities are all integrated before a concept is tested
 - Controlled integration of industry technology capabilities at this level is also critical in the creation of realistic goals and expectations
- 3. The “Blue Box” is the modification of the acquisition system to allow effective operation in the Information Age**

There are numerous acquisition process changes recommended in the paper some of the highlights are presented here... (2 of 2)

- ▶ **Any changes must ensure that current organizations and capabilities are not lost**
- ▶ **Creation of the “Blue Box” is the most important step in a sustained transformation capability**
 - The fundamentally different staffing rules of the “Blue Box” are critical in attracting the best and brightest staff
- ▶ **Increase the “Born Joint” capability by providing a centralized organization for concept and requirement sharing and integration**
- ▶ **Increase tactical funding at combatant commander level – for rapid purchasing capability**
- ▶ **Create inter-service concept development and innovation competition**
- ▶ **Establish a single oversight organization for the entire process to remove redundant oversight as much as possible**
- ▶ **Remove major system acquisition responsibility from the Services to a single joint service acquisition organization**

Summary Recommendations

- ▶ **The need for re-organization of the current DoD acquisition process is becoming ever more obvious and is illustrated with constantly increasing acquisition costs and project delays; especially in the development of network-centric operations in the Information Age**
- ▶ **System dynamics models offer a innovative way to review policy and process design decisions to ensure the re-organization is optimized**
- ▶ **The recommended re-organization of the acquisition process offers the revolutionary changes required in order to ensure transformational capabilities are embedded in the acquisition process (the “Blue Box”)**
- ▶ **The proposal actively ensures proper management of the Defense Industry which is of strategic importance**
- ▶ **The proposal explains how Combat Commander purchasing flexibility will be improved**

