A CONTINUOUS PROCESS VIEW OF SYSTEMS ENGINEERING FOR THE Sustainment Phase

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The views and opinions presented here are the author’s. They are not necessarily representative of any official position of the US Government or any of it’s organizations.
What’s this about?

- The acquisition lifecycle framework shows sustainment as a small and somewhat linear part of the lifecycle.

- An alternative view is useful to aid understanding of the sustainment phase.
Where is this going?

- Why have alternative views?
- What are the current views?
- What is the alternative view?
- What do we do with it?
Why have alternative views?

- Different vantage points
- “Pre-sustainment” phases emphasized
- There is much to be gained
Why have alternative views?
(Different Vantage Points)

- People have:
  - Different backgrounds
  - Different situations
  - Different understanding

- Example:
  - Accident witnesses
Why have alternative views?
(Different Vantage Points)

What Did YOU See?
Why have alternative views?
(Different Vantage Points)

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What Did YOU See?
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(Different Vantage Points)

What Did YOU See?
Why have alternative views?
(Different Vantage Points)

- Look at all sides of the issue
- Different views ring with different people
  - Different backgrounds
  - Different situations
  - Different understanding
- Both of these can clarify the common view
Why have alternative views?
(Different Vantage Points)

Example: $2 \times 3$

1. Memorize it. $=6$
2. Explain it as $2+2+2$ or
3. Explain it as $3+3$ or
4. Explain it as
Why have alternative views?
(Different Vantage Points)

- Systems Engineering is loaded with many view points
  - Role (Government, Contractor)
  - Mission
  - Etc
  - Etc
  - Etc
  - ……..Position in Life Cycle!……..
Why have alternative views?
(“Pre-Sustainment” Phases emphasized)

- LCSE, “Life-cycle ….”
- In vogue to say it
- Hard to grasp!
- Harder to do!!
- There are reasons to focus on early phases
- Where is SUSTAINMENT? – an example
Why have alternative views?
(“Pre-Sustainment” Phases emphasized)

- **DAU SYS302**
  - Capstone SE Leadership Course
  - 80 Hrs, Six Team Exercises – Nice Course
    - Entry into Acquisition
    - Requirements Development
    - Technical Organization
    - Technical Baselines and Earned Value
    - Technical Reviews
    - Transition to Production
Why have alternative views?
(“Pre-Sustainment” Phases emphasized)

- Reasons ---
- Start at the beginning
  - Hard to start at end, etc
- Concept, Design, Mfg – $1, $10, $100

- These are good reasons!
Why have alternative views?
(Much to be gained)

Program Life-Cycle (Illustrative)
Why have alternative views?
(Much to be gained)
Why have alternative views?

(Much to be gained)
Why have alternative views?
(Much to be gained)
Why have alternative views?
(Much to be gained)

- $1, $10, $100 – Concept, Design, Mfg
  - What about cost in operation? – 1000?
  - Fuel, Parts, Mission loss
- Future program avoidance $!
  - Ability to Modify – ‘Modifiability’ as an ‘-ility’
  - B-58 & F-111 – avoid B-1?
  - KC-135 – avoid KC-next?
Where is this going?

- Why have alternative views?
- What are the current views?
- What is the alternative view?
- What do we do with it?
What are the current views?

DoD Decision Support Systems

- CJCS 3170.01 Series
- Joint Capabilities Integration & Development System (JCIDS)
  VCJCS/JROC Oversight
- Defense Acquisition System
  Milestone Decision Authority (MDA) Oversight
- Planning, Programming, Budgeting & Execution (PPBE) Process
  DEPSECDEF Oversight
- MID 913 PPBS to PPBE

DAG, Chp 1
What are the current views?

Program Life-Cycle (Illustrative)

DAG, Chp 2
What are the current views?

DAG, Chp 5
What are the current views?

DAG, Chp 4
What are the current views?
Where is this going?

- Why have alternative views?
- What are the current views?
- What is the alternative view?
- What do we do with it?
What is the alternative view?

- Utility Curve view
- Utility is “the state of being useful”
- Consider all the operational “usefulness” as the system’s “Utility”
- Consider what the user needs to be the “Need”
What is the alternative view?
What is the alternative view?
What is the alternative view?

- DAG – Chp 5 indicates iterative monitoring
- SE not once and done
- When Utility does not match Need
  - Either- Effect a ‘non-material’ change
  - Or- Begin the modification process
- Need an iterative engine during sustainment
What is the alternative view?

Utility Curve Engine for Sustainment

- Is it Time to Iterate?
  - Yes → Does Utility = Need?
  - No → Effect correction

- Does Utility = Need?
  - Yes
  - No → Is a Config Change Needed?
  - Yes → Initiate Modification
  - No → Effect correction

A → B
Where is this going?

- Why have alternative views?
- What are the current views?
- What is the alternative view?
- What do we do with it?
What do we do with it?

- A different point of view?
- How are we answering these questions?
- What drives the cycle to start?
- Do we know the current ‘Need?’
- Do we know the current ‘Utility?’
- How complete are our answers to these?
What do we do with it?

- BIG QUESTION

What can we do to improve our answers?
Where have we been?

- Why have alternative views?
- What are the current views?
- What is the alternative view? – Utility Curve
- What do we do with it?
QUESTIONS?