Accelerating Technology Insertion through Effective Test and Evaluation

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A caution: beware semantic solutions

Conceptual Process

- Mission Need identified
- Solution defined (operational requirements)
- Preliminary design
- Critical Design
- Low rate Initial production
- Full rate production
- Initial Operating Capability / Need Satisfied

Years and Years, $$$ & $$$$

The criticism: It takes too long and costs too much

- Do the critics have unreasonable expectations?
- Why?
- PMs pressured by competition for funds to underestimate cost and schedule
  and
  overestimate performance.

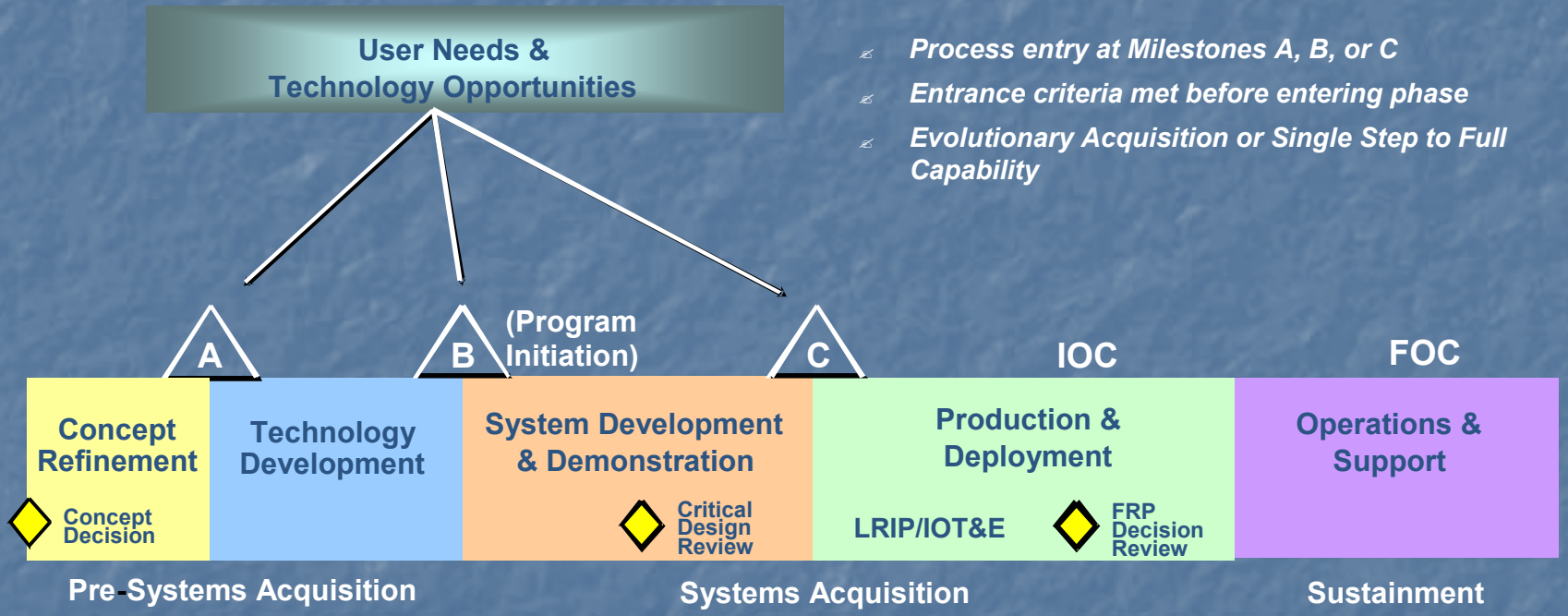
- First PM response is to "play a game"

"Play the game," second responses

- Get rid of requirements
- Don't start calling it a program till as late as possible.
- Declare success as early as possible

- Game theory can dominate.
- Examples: ATF requirements
  FCS requirements
  "protection" from "information"

The Defense Acquisition Management Framework



- *Process entry at Milestones A, B, or C*
- *Entrance criteria met before entering phase*
- *Evolutionary Acquisition or Single Step to Full Capability*

Caution

- The real measure of time is from identification of need to delivery of military capability to meet need.
- The rest is public relations.

What Can really Help?

Stop sprinkling the timeline with "events"

- TEST CONTINUOUSLY
  - Kern, Coyle
  - To do that Need Embedded Instrumentation
    - will help with training and logistics too
    - Easy to do "test throughout the life-cycle"
- Blows away the RAND analysis
- Blows away the FCS chart

PM UA Master Schedule

[As of 1 MAR '05]

FY2004 | FY2005 | FY2006 | FY2007 | FY2008 | FY2009 | FY2010 | FY2011 | FY2012 | FY2013 | FY2014 | FY2015 | FY2016 | FY2017

CY2004 | CY2005 | CY2006 | CY2007 | CY2008 | CY2009 | CY2010 | CY2011 | CY2012 | CY2013 | CY2014 | CY2015 | CY2016 | CY2017

MS B Update
SoSFR
IPDR
ICDR
PDR
CDR
DRR
IV2 LUT
MS C
IV 3 LUT
IV 4 LUT
IOC
PD LUT
FDTE
IOTE
FRP

Integrated Phase = Engineering Iteration + Integration, Verification + Spiral Out

Integration Phase 0
- Initial SoSCOE
- Battle Command TestBed
- PS-MRS Functionality
- Platform Simulations
- NLOS-C Firing Platform
- APS

IP 1
- UAV/UGV Simulations
- IMS Full Functionality
- Standard SoSCOE
- Initial Battle Command Integrated
- Embedded Training Capabilities
- Sensor Fusion
- Networked Lethality

IP 2
- MGV/UGV/UGS Prototypes
- NLOS-C/LS Full Functionality
- UAV Simulation
- Real Time SoSCOE
- Network Planning
- Logistics Services

IP 3
- Complete Battle Command
- MGV/UGS/ICS/ISR Full Functionality
- Individual Training
- Real Time SoSCOE
- Complete Logistic Services
- Complete Training

IP 4

IP 5
- UA Full Functionality
- Regression Testing

Training — Task Analysis, Training Support Package Development, TADSS Development

Logistics — Supportability Assessments, Logistics Product Development and Production, Prototype and Production Fielding

Increment 1 Mat. Release

S1
- SoSCOE
- ICS
- Battle Command
  - UGS/IMS Control
- UGS
- IMS
- NLOS-LS

Spiral 1 — Eval — MS C — EBCT — LUT

S2
- SoSCOE Update
- Battle Command
  - Sensor Management
- Embedded Training
- Communication Relay payload

Spiral 2 — Eval — MS C — EBCT — LUT

S3
- SoSCOE Update
- Battle Command
  - DCGS-A
- UGV Family

Spiral 3 — Eval — MS C — EBCT — LUT

Spiral 4 — Eval — MS C — EBCT — LUT

S4
- SoSCOE Update
- Network Update
- Battle Command
  - WMI
  - Mission Planning
  - Sustainment Tools

UA Unit Set Fielding

Stop "Success Oriented" Planning

- If there is risk, have multiple paths.
  - "What if JTRS doesn't make it?"
- This has budget implications (at start)
  - Kendall: we need
    Budget reform, and
    Requirements reform, not just
    Acquisition Reform
- Try "Pilot Programs" and "ACTDs"

Learn Faster: More realistic early testing

- RAdm Jeff A. Wieringa
  - Ran a big test first time out. *Tires, Long Range, Thermal crossover.*
  - "I failed that day"
  - What if it had worked? Be a risk taker….
- More realistic Early testing --- Kwai Chan

Learn Faster: Better early analysis

- Mission and Means Framework
  - To some extent, this is really good "Systems Engineering"
    - There is a recognition that the Department needs better Systems Engineering.

Learn Faster: Do T&E evaluations at PDR and CDR

(Early Operational Assessments)

- Technology Maturity Review
- Apply Mission and Means Framework

Relieve Unrealistic Pressures

- Change Funding Structure -- Bob Levin
- Institutionalize Independent DT&E
- Have Independent DT&E and OT&E
  - Independence means Organization and Funding

Ideas from the National Academies

- Think about a program as "a failure mode factory"
- Mature technology outside of programs
- Do predictions: Models
- Prognostics & embedded instrumentation
- Use "Clear Box" analysis -- vs –proprietary interests
- Test design Factors and Scenario factors
- Have Archives
- Be aware of conflict between Fiscal Responsibility and Spiral Development
- Think up contract incentives

THE END

Requirements/Acquisition Process