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Crucial Factors in the Design of Net-Centric Systems

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Creating a Tech/Product Pipeline

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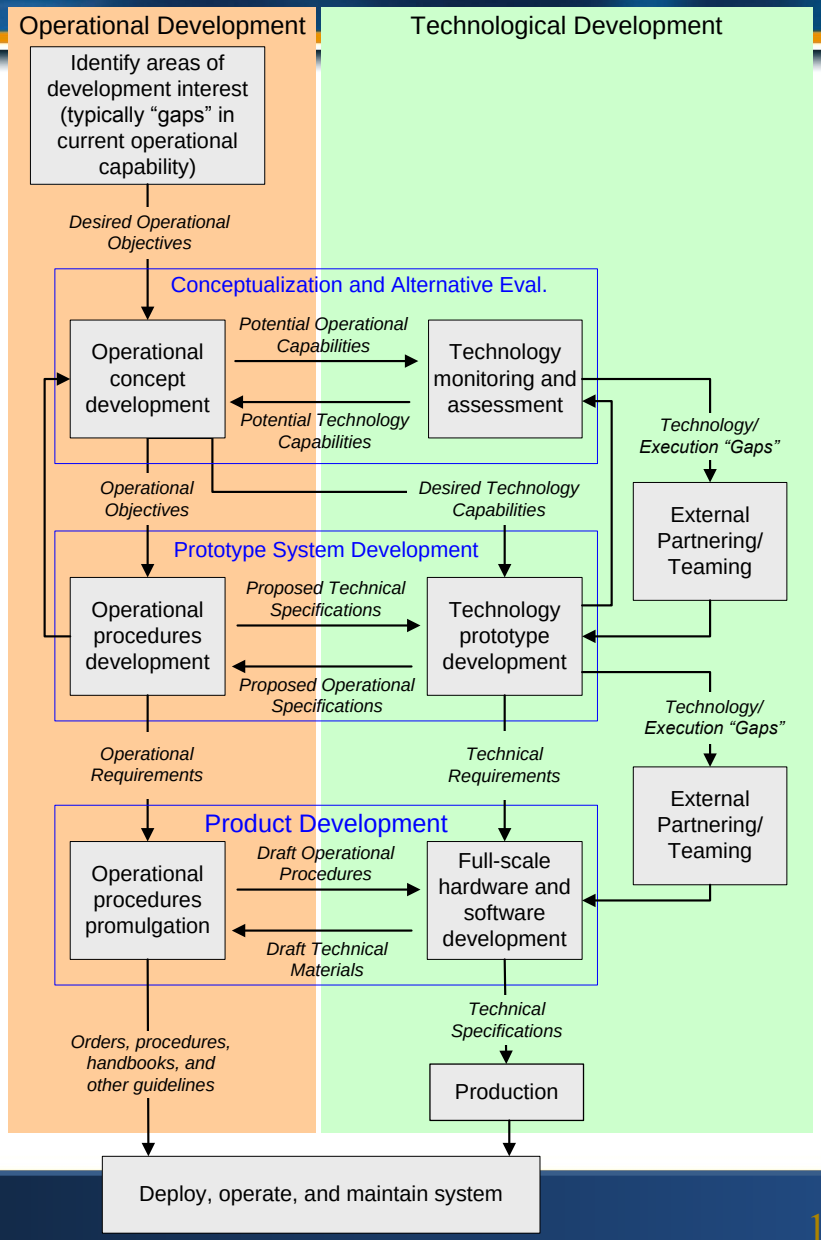
PRODUCT DEVELOPMENT – ENGINEERING PERSPECTIVE

- Goal: To create a disciplined engineering framework which supports customer focus, sustained innovation, and quick time-to-market



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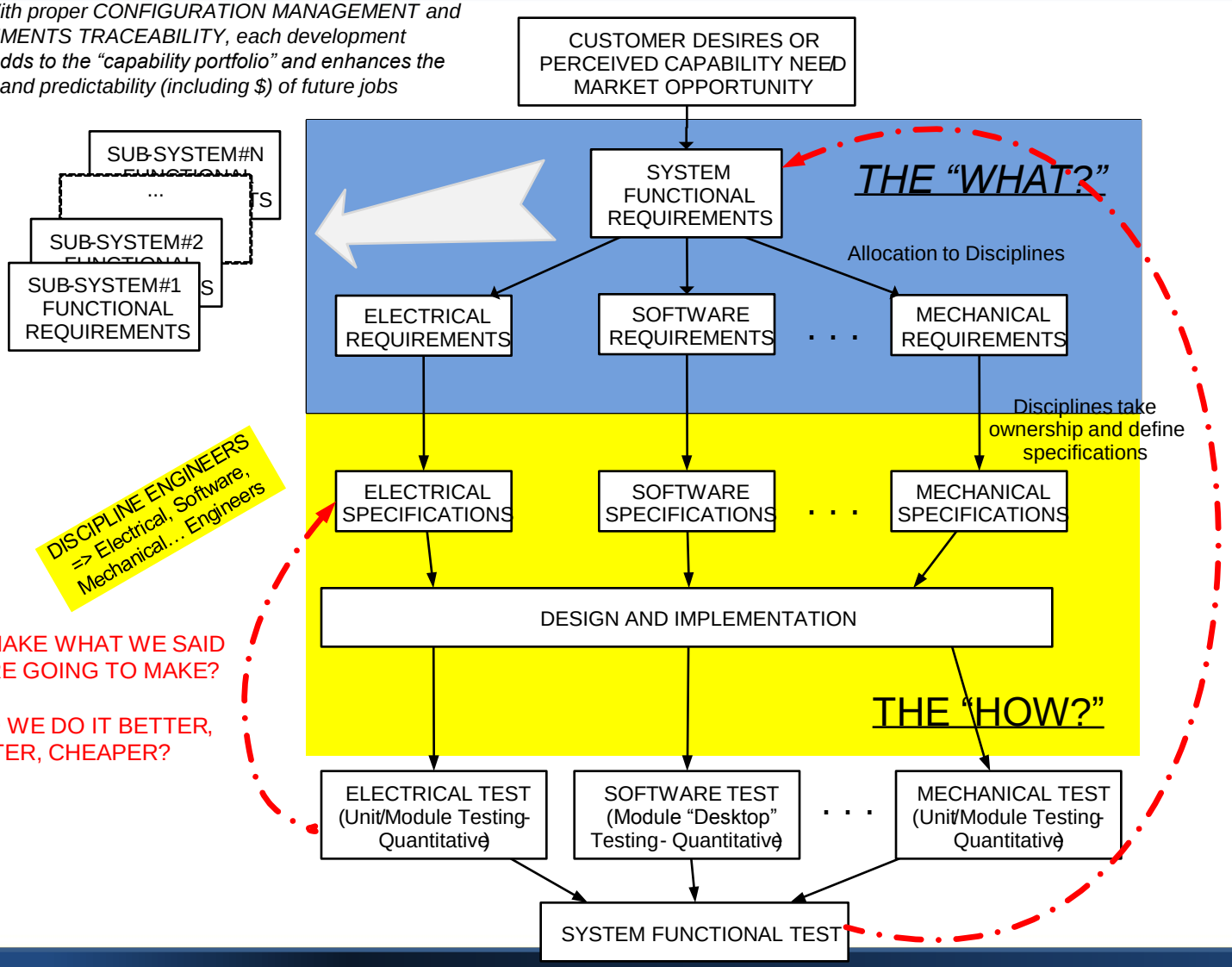
Divide and Conquer

- The Two Components of Success:
  - "Doing the right things" *and* "Doing things right"
  - Focus and Execution

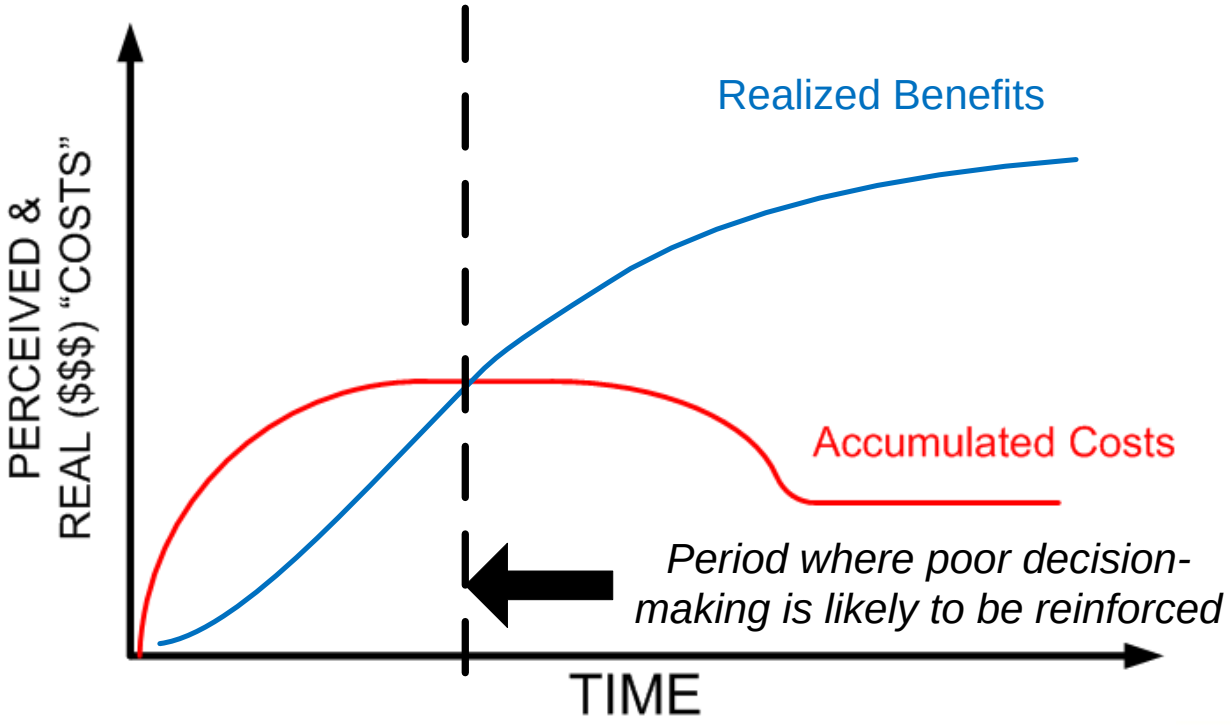
Systems Engineering – Divide and Conquer

NOTE: With proper CONFIGURATION MANAGEMENT and REQUIREMENTS TRACEABILITY, each development program adds to the "capability portfolio" and enhances the execution and predictability (including $) of future jobs



Commitment to Discipline

- Implementing a Disciplined Engineering Framework will initially make things appear qualitatively “slower”, “harder”, “more bureaucratic”, “less responsive”…
- The “startup costs” associated with this approach can often elicit significant resistance from staff and management, however the cumulative effect is a more efficient organization and quicker speed to market



What Makes Engineering "Net-Centric" Different?

- Goal of "Net-Centricity": Get the right information to the right decision-makers at the right time, irrespective of physical/organizational boundaries
- Net-Centric Operations aim to provide:
  - Shared situational awareness across the battlespace, resulting in:
    - Increased ability to self-synchronize & self-task resulting in:
      - Increased agility in executing the mission and carrying out "commander's intent"

What Makes Engineering "Net-Centric" Different?

- Systems Engineering entails:
  - Defining desired customer/stakeholder capability
  - Defining specific system requirements
  - Allocating those requirements to specific sub-systems/software modules

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What Makes Engineering "Net-Centric" Different?

- In the case of Net-Centricity, the "sub-systems" we seek to integrate may already exist
- Consider the much-maligned "stovepipes":
  - Represent investment in developing technologies/platforms to carry out specific tasks effectively, sometimes refined over years of field deployment
  - Represent significant resource expenditure in training personnel to use these tools
  - Net-Centric sub-systems may be separated by great physical distance, but more importantly, "virtual distance"
  - Technologies underlying Net-Centric capabilities – communications/information dissemination – are relatively dynamic compared to other technologies ("internet pace")

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- Leverage existing capabilities

- Leverage existing personnel familiarity

- Respect differences – adapt to the mission need

- Take advantage of changes in technology as they come, on-the-fly

What Makes Engineering "Net-Centric" Different?

- Approach:
  - Leverage components that have been developed, deployed, and refined through field testing
  - Maximally leverage knowledge and training that is in place to get capabilities into the field quicker
  - Account for differences across user groups, rather than forcing adaptation, by allowing for tailoring to specific use cases
  - Make systems extensible to incorporate new capabilities

This Approach Applies Across Technology Areas

- Tactronics' Products Areas Where this Approach to Systems Engineering is Being Applied:
  - Fixed Computing/Processing
  - Human-Machine Interfacing and Displays
  - Mobile Computing
  - Navigational/Mapping and Sensor Processing
  - Networking Infrastructure
  - Power Management
  - Radio Management
  - Specialized Data Manipulation/Transport
    - Audio Intercommunications
    - Beyond-Line-of-Sight Communications
    - Data Acquisition/Monitoring (including Platform Telemetry)
    - Radar Processing/Display
    - Video Processing/Manipulation
  - Networked/Fixed Storage Devices

Example: "Off-the-Shelf" Software

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Case Study: Computing/Displays

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Case Study: Data Distribution

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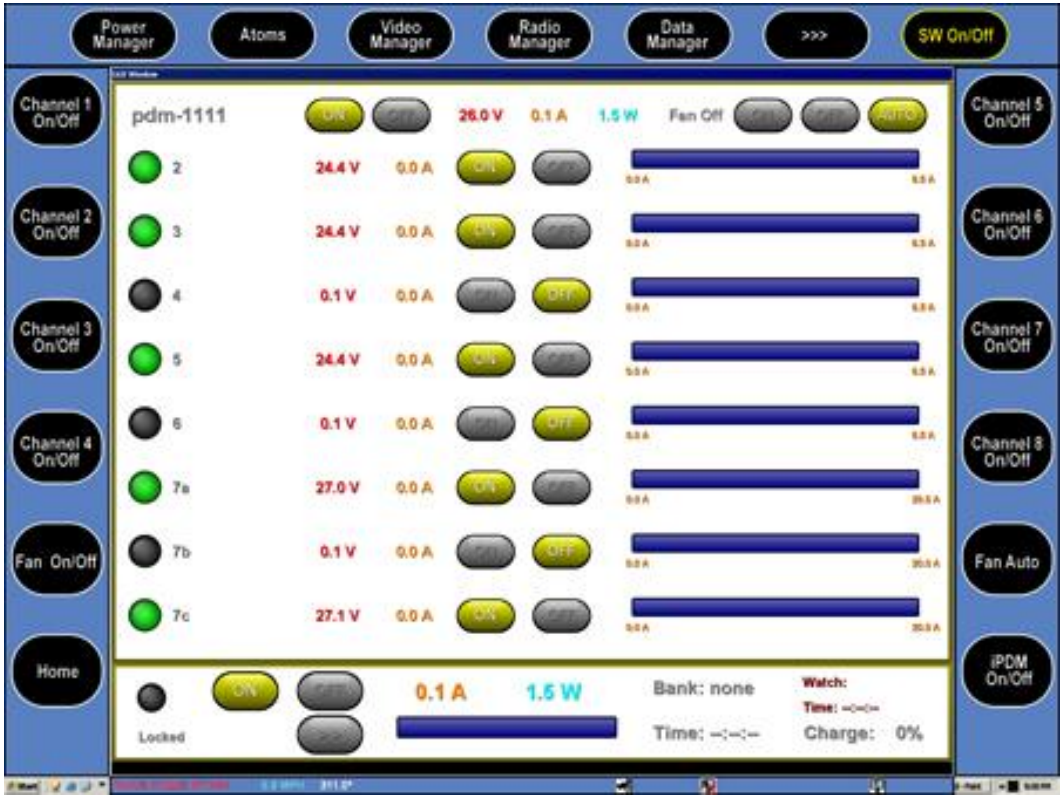
Case Study: Radio Management

Case Study: Power Distribution



Case Study: Systems Integration

TACSINe™
TACTICAL SYSTEMS INTEGRATION NETWORKS

Any or All Components Interchangeable / Upgradeable

Standards-Based Computing & Networking Components

Operation In Multiple Rugged Environments

"Shopping List" For Integrated System Solutions

Platform Immaterial Common Line Replaceable Units For:

- **Man Portable**
- **Vehicular Platforms**
- **Maritime Platforms**
- **Rotary Wing Aircraft**
- **Fixed Wing Aircraft**
- **Forward Staging Bases FSB's**

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ANY QUESTIONS?

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