Expedited Systems Engineering for Rapid Capability and Urgent Needs

SYSTEMS ENGINEERING Research Center

STEVENS INSTITUTE of TECHNOLOGY THE INNOVATION UNIVERSITY

AFIT The Air Force Institute of Technology

USC UNIVERSITY OF SOUTHERN CALIFORNIA

RT-34
(work in progress)

Challenge

- DoD Acquisition often plagued by cost and schedule growth

- Traditional Acquisition Process is not responsive to warfighter's changing asymmetric threats environment

  - Some 7000+ Joint Urgent Operational Needs staffed over last few years ($50+billion from 2005-09)

- As a result, over 30 rapid reaction, rapid prototyping, non-traditional acquisition organizations have been created.

  - Army Prototype Integration Facility (PIF)
  - AFRL Center for Rapid Product Development
  - Space & Missile Systems Center Rapid Reaction Branch
  - AF Rapid Acquisition Development Integration

What critical success factors from rapid can be learned and applied to traditional acquisition?

4 Potential Critical Success Factor Areas

Final Database
Over 30 ）with Gov't/ Industry
Rapid Development Organizations
Over 23,500 words from discussion notes

Product, Process, People … all in a Project Context

Research Finding: Expedited Systems Engineering Framework
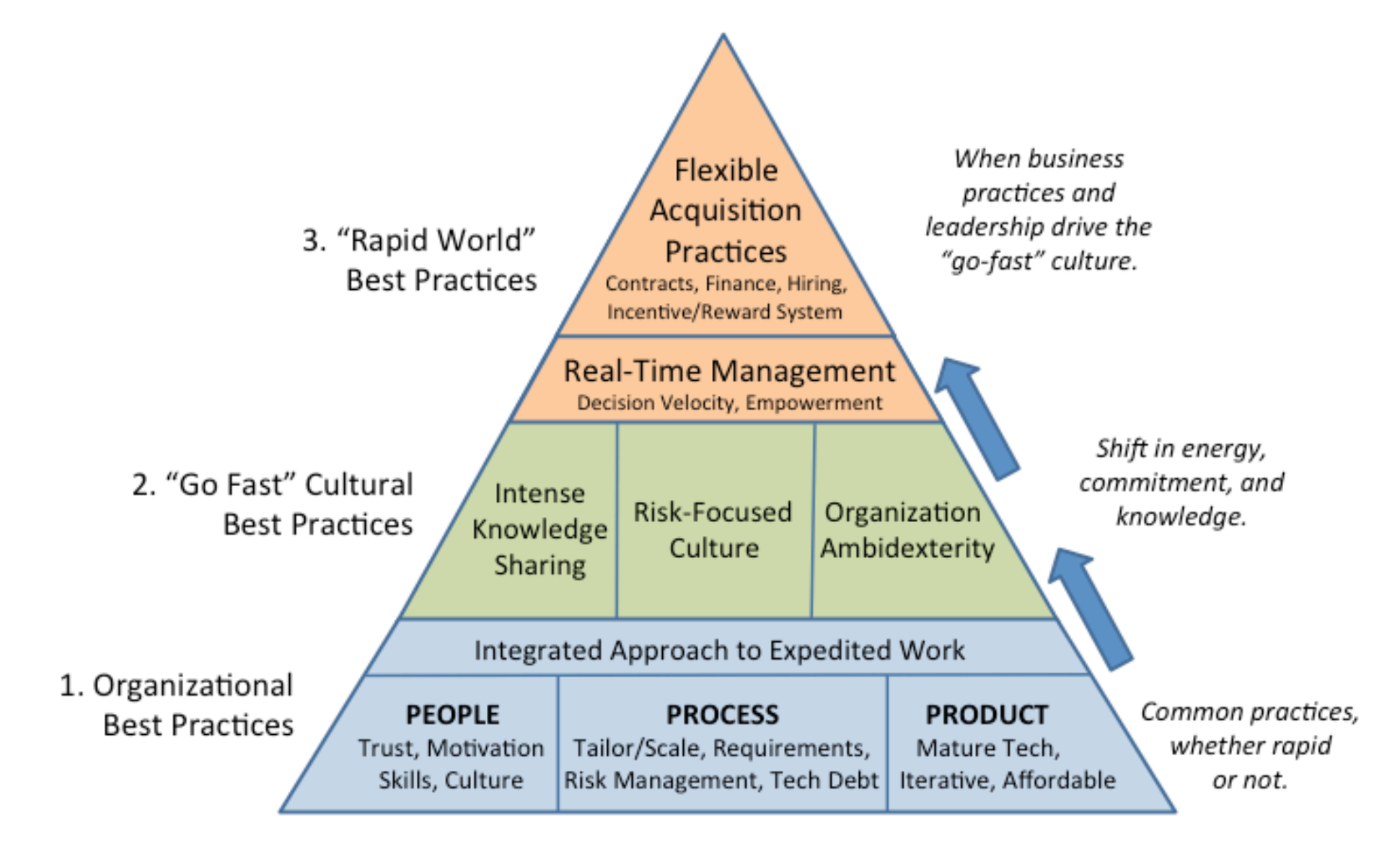
Level 1 "Organizational Best Practices" are common practices found in both rapid and traditional programs.

Level 2 represents the "Go Fast" Culture, where rapid organizations start to differ from traditional ones through a shift in energy, commitment, and knowledge. Trust (from Level 1) is inherent in Level 2. Rapid organizations employ intense knowledge sharing, have a risk-focused culture where everyone knows what risks to take and when and how, and display organizational ambidexterity through a balance of exploration and exploitation.

Level 3 represents organizations that "Live in a Rapid World," where business practices and leadership drive the "Go Fast" culture. Cultural practices of Level 2 enable the Real-Time Management of Level 3. And in a rapid world, all business is based on acquisition flexibility, whether it be contract or finance type, program management approach, documentation required, level of insight/oversight, etc.

RT-34 Goals

- Examine expedited systems engineering best practices from rapid organizations

- Develop framework for rapid SE

- Consider ability to be applied to DoD acquisition programs

Observations: Organizational Best Practices

Product
- Use Mature Technology – Focus on the State of the Possible
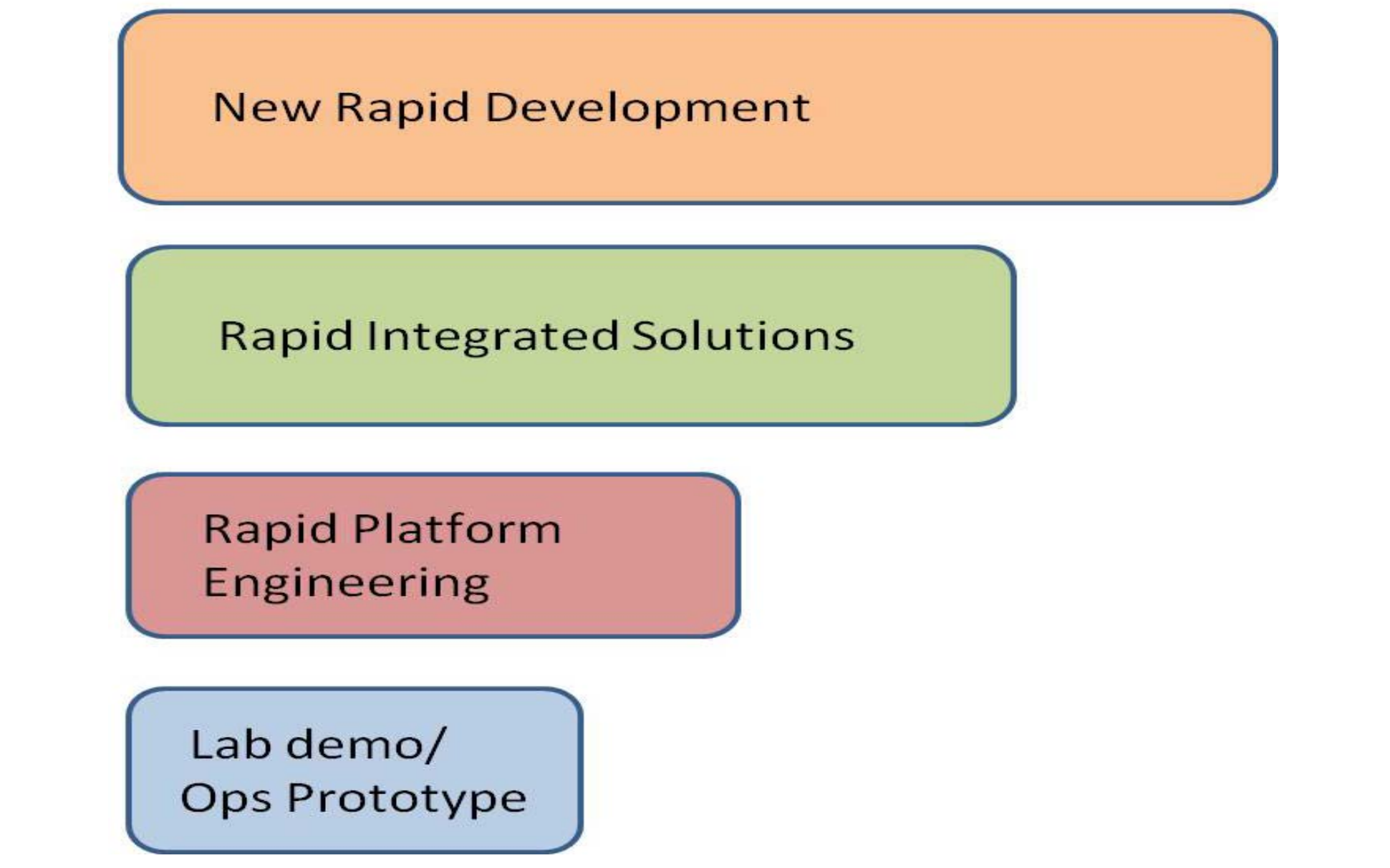- Incremental Development is Part of the Product Plan

Process
- Strive to define Set of Tailorable and Stable Requirements focused on Warfighter Needs
- Work to Exploit the Maximum Flexibility Allowed
- Designing out All Risk Takes Forever...Accept Some Risk of Failure
- Keep an Eye on "Normalization"

People
- Build and Maintain Trust
- Populate Your Team with Specific Skills and Experience
- Maintain High Levels of Motivation and Expectations
- The Government Team Leads the Way
- Right Size the Program – Eliminate or Reduce Major Program Oversight

What's Next? # 1 – Lanes of Acquisition

New Rapid Development

Rapid Integrated Solutions

Rapid Platform Engineering

Lab demo/ Ops Prototype

- **Not a Single Rapid, But Many Different Flexible Rapids.** Lanes of DoD Acquisition found in the RT-34 research may relate to new acquisition lanes under consideration for updated DOD 5000. [Ref: Kendall, NDIA 2012.]

How do the principles and attributes from rapid apply to different domains and different lanes of acquisition. And do they apply equally?

Research Methodology
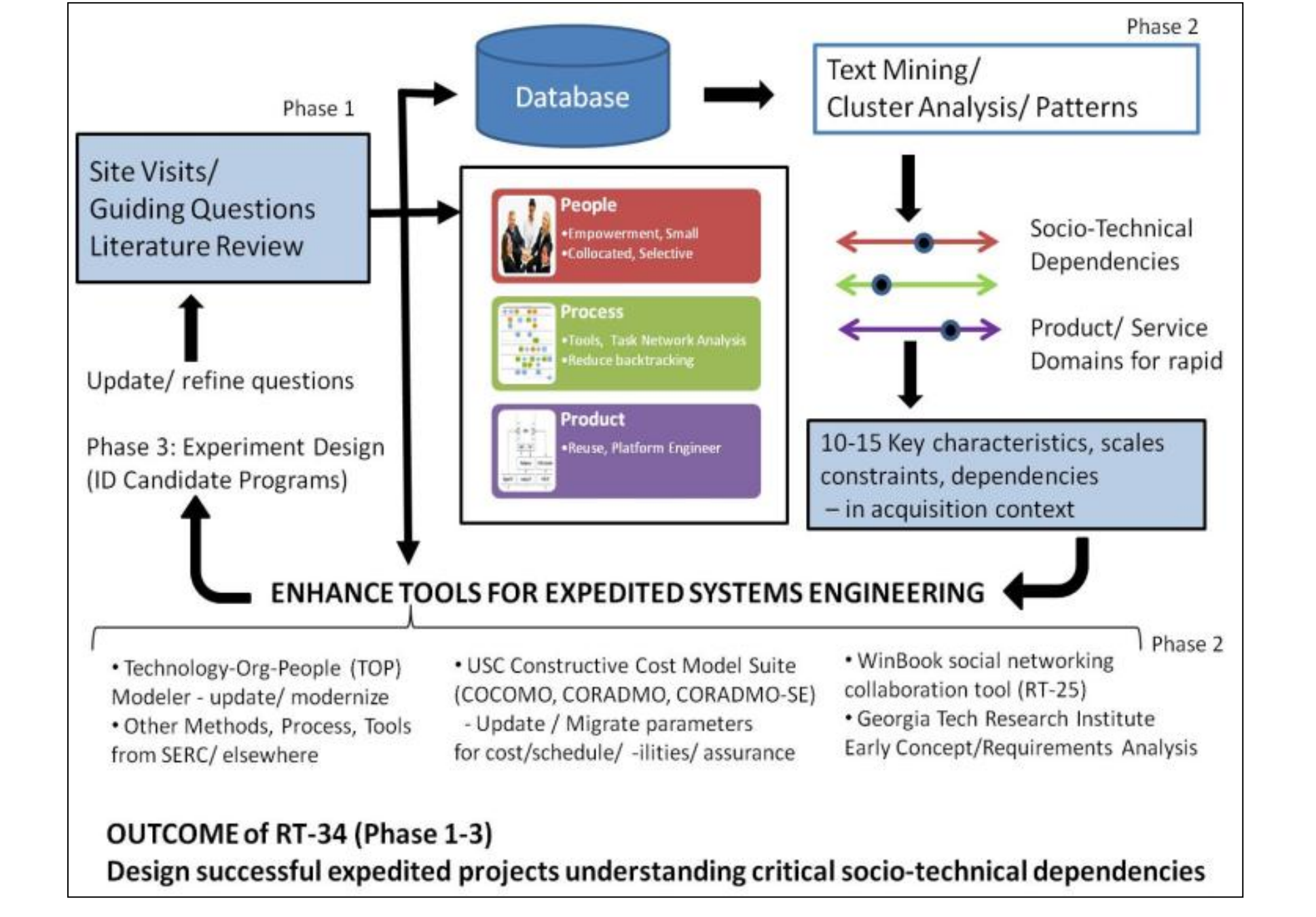
Data Analysis
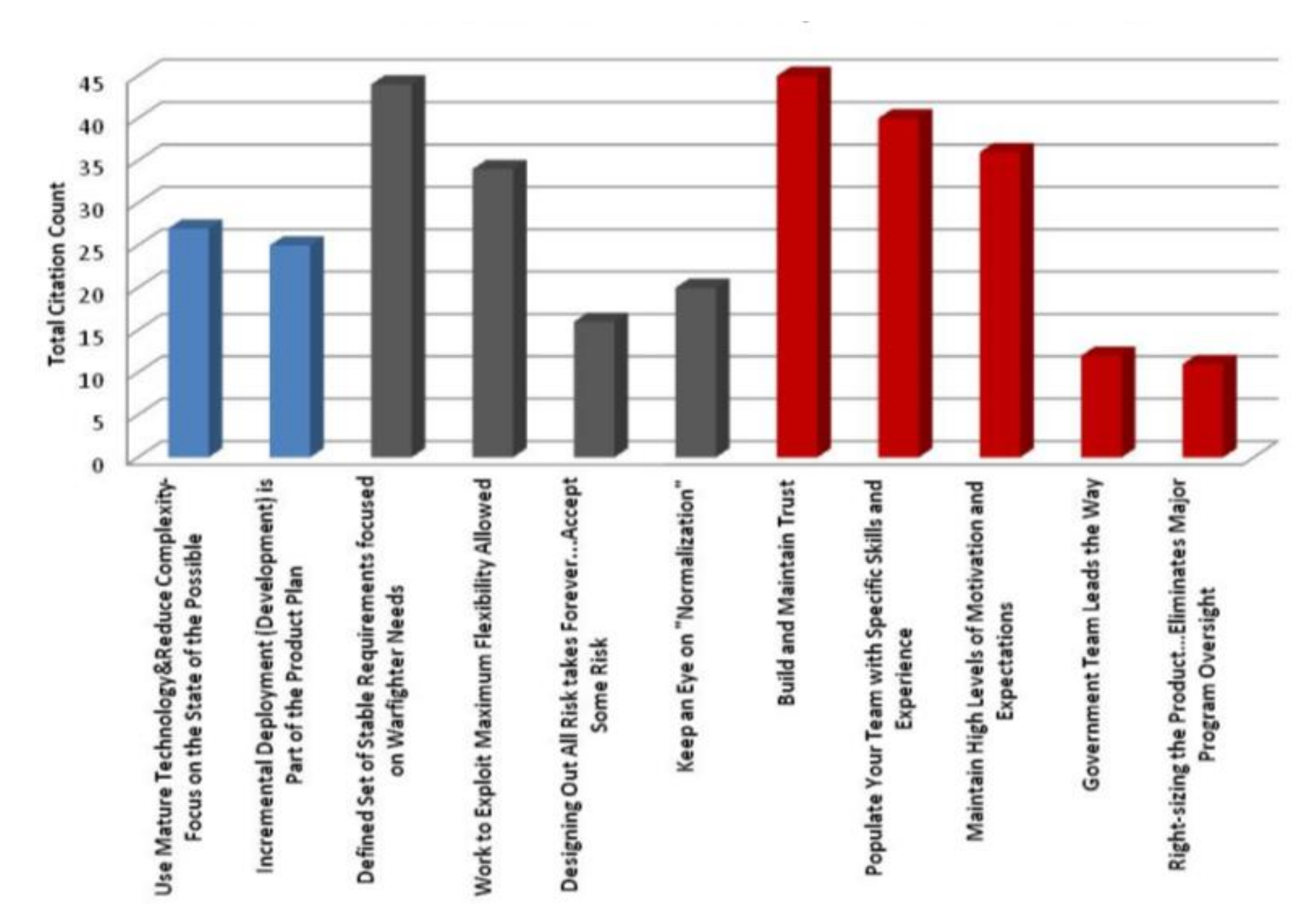


Definition: What is Rapid?

- Rapid fielding programs typically deliver capabilities within a 2-year window

  - Shorter than lead time to simply budget for normal acquisition programs
  - Time begins when a need emerges in the field and concludes at the initial capability fielding
  - Transition to a program of record, where appropriate, typically occurs beyond this two year window

RT-34 Contacts

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What's Next: #2 - Experience Development through Rapid Programs

Identify and Assess Programs, Orgs and Experience Opportunities

Assignment/ PCS Cycle
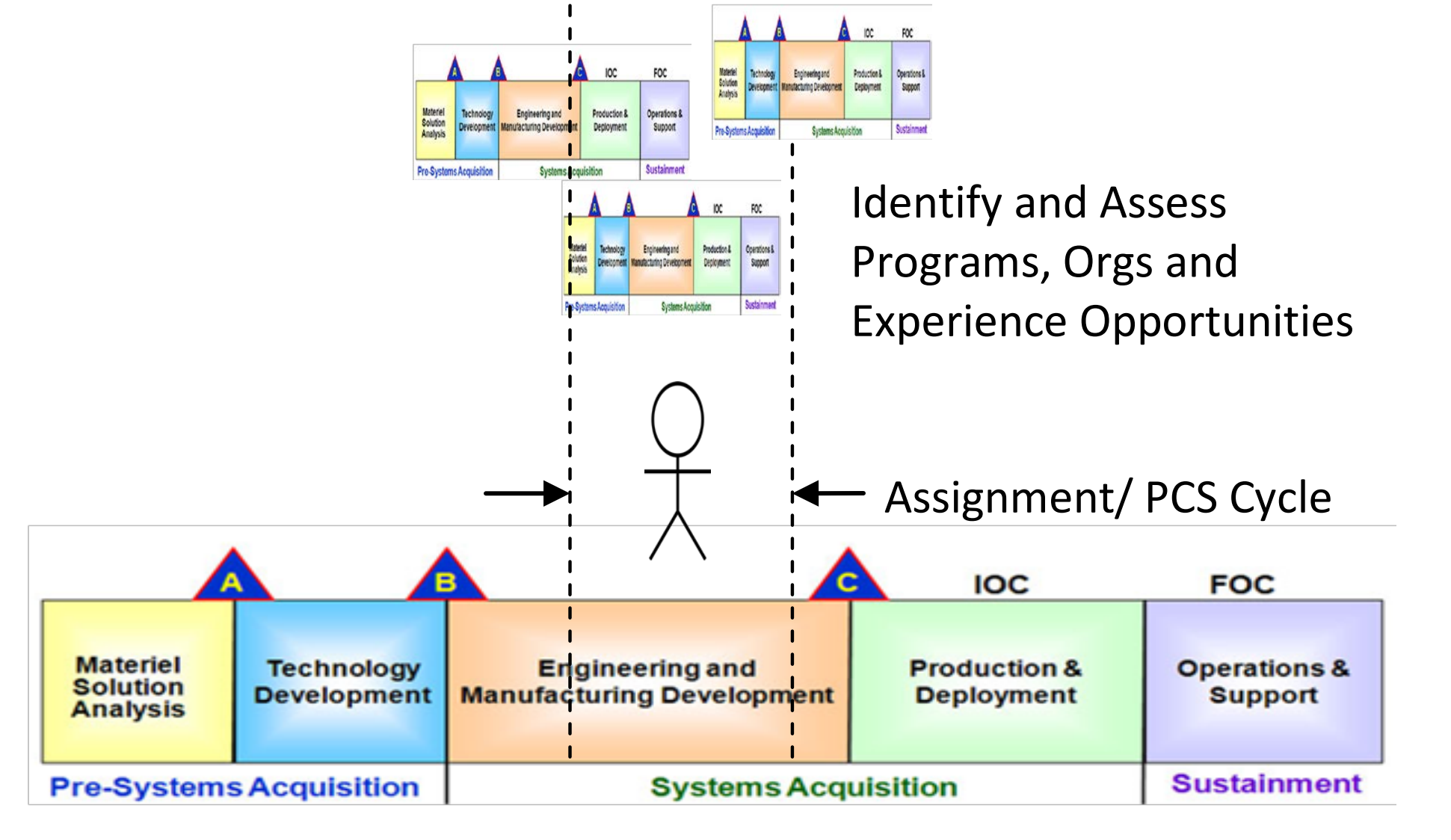
How can embedding acquisition personnel in rapid programs enhance workforce development?