



SE 2025

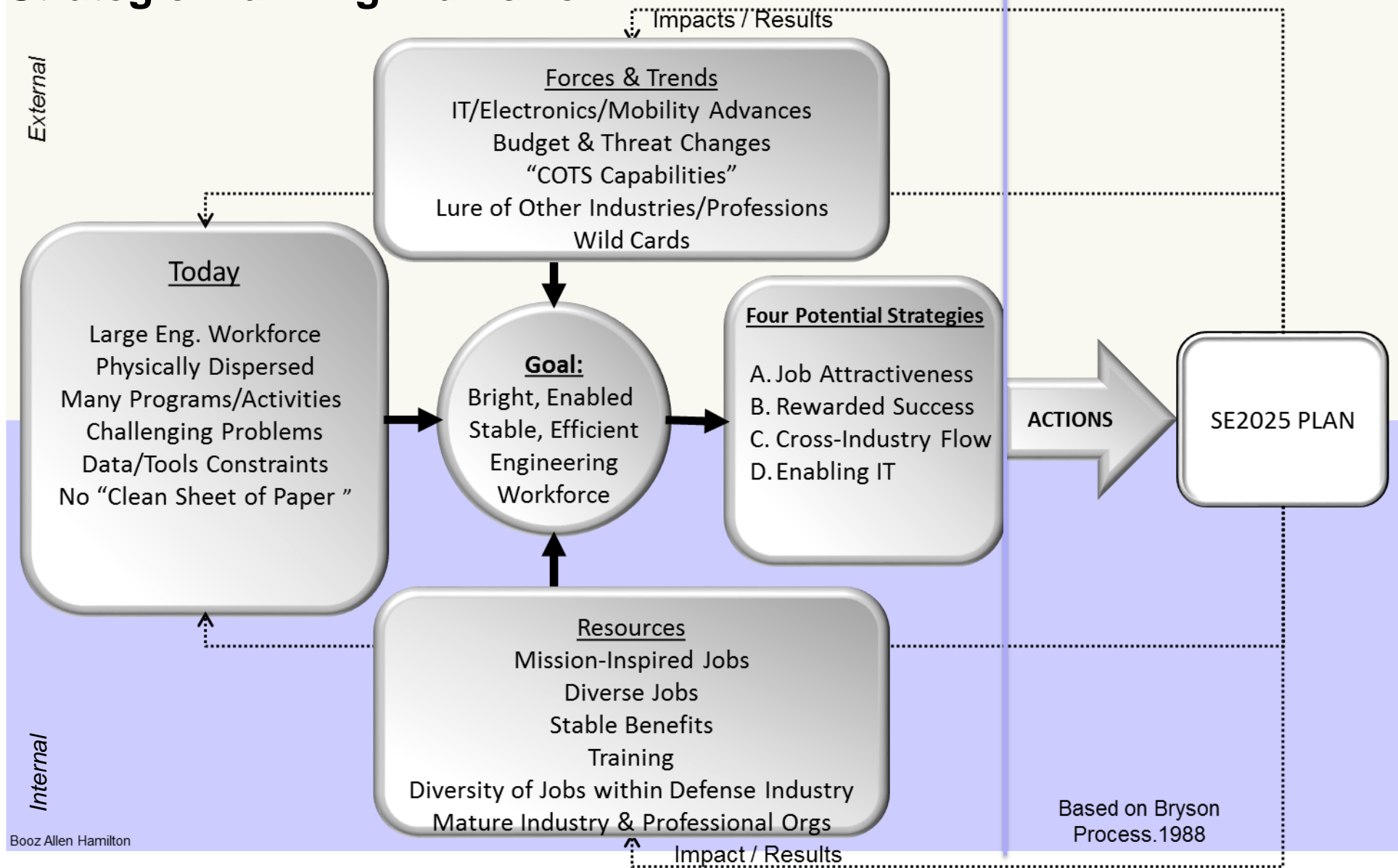
– Preparing for Next Generation Engineering

***NDIA Systems Engineering Division Meeting
22 April 2015***

Angela Wallace
Vice President

Strategic Planning Framework

<- Strategy Formulation Implementation ->



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Potential Strategies:

A. Job and Industry Attractiveness

- ▶ Workpath Diversity - Lots of Opportunities across Defense
- ▶ Reputation & Excitement – Many Amazing Things in Development and Missions that Matter
- ▶ STEM – Can we reach HS Juniors and Seniors as they choose career tracks?

Leveraging STEM for DoD – Just the Beginning...



Robots4Us

DARPA Student Video Contest on Societal Implications of Robotics

- ▶ **DARPA Launches Robots4Us Video Contest for High School Students.** February 11, 2015
- ▶ *Winners Will Earn Opportunity to Attend DARPA Robotics Challenge, Discuss Future Implications of Robotics on Society*

www.darpa.mil/NewsEvents/Releases/2015/02/11.aspx

Booz Allen Workforce Pays it Forward: FIRST - A STEM Program



- ▶ Goal: To inspire young people to become science and technology leaders through STEM-related programs
- ▶ Booz Allen employees volunteering as *FIRST* coaches and mentors help young people analyze problems, improvise possible solutions, collaborate with team members, and lead under pressure—important skills our employees apply in their work for clients every day



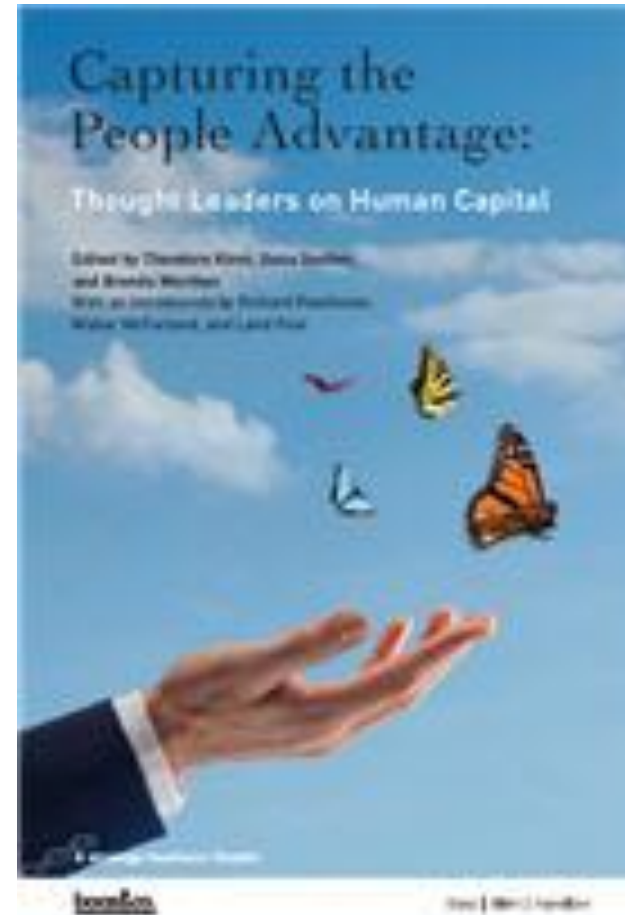
FIRST
FIRST® (For Inspiration and Recognition of Science and Technology)

Better Buying Power 3.0: Increase DoD Support for Science, Technology, Engineering and Math (STEM) Education

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Potential Strategies: B. Rewarding Success

- ▶ Government, Industry and Professional Associations make Significant Progress
- ▶ Movies are helping glamorize Importance of Engineering and Science
- ▶ Equitable pay scales for Rare Talent may not be achievable but the Mission is Important



Potential Strategies:

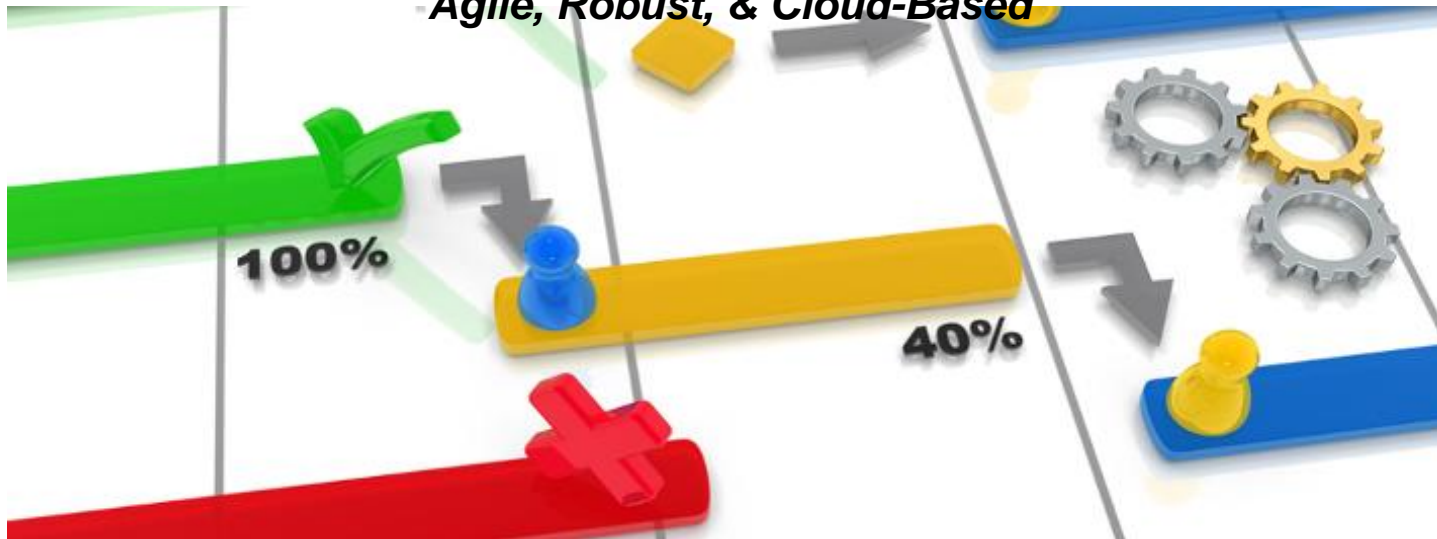
C. Enabling Cross-Industry Career Track Flow

- ▶ Emerging Engineers expect to work for many employers and would like to be valued and employable across industries --“mobile” skill sets
- ▶ INCOSE certifications help begin to pave a path where skills can cross-over from one industry to another
- ▶ What can we put in place to make cross-industry career tracks more viable and desirable?

Potential Strategies:

D. IT Evolution/Effectiveness/Efficiencies (EEE)

*A Desired Future State for Acquisition & Systems Engineering:
Agile, Robust, & Cloud-Based*

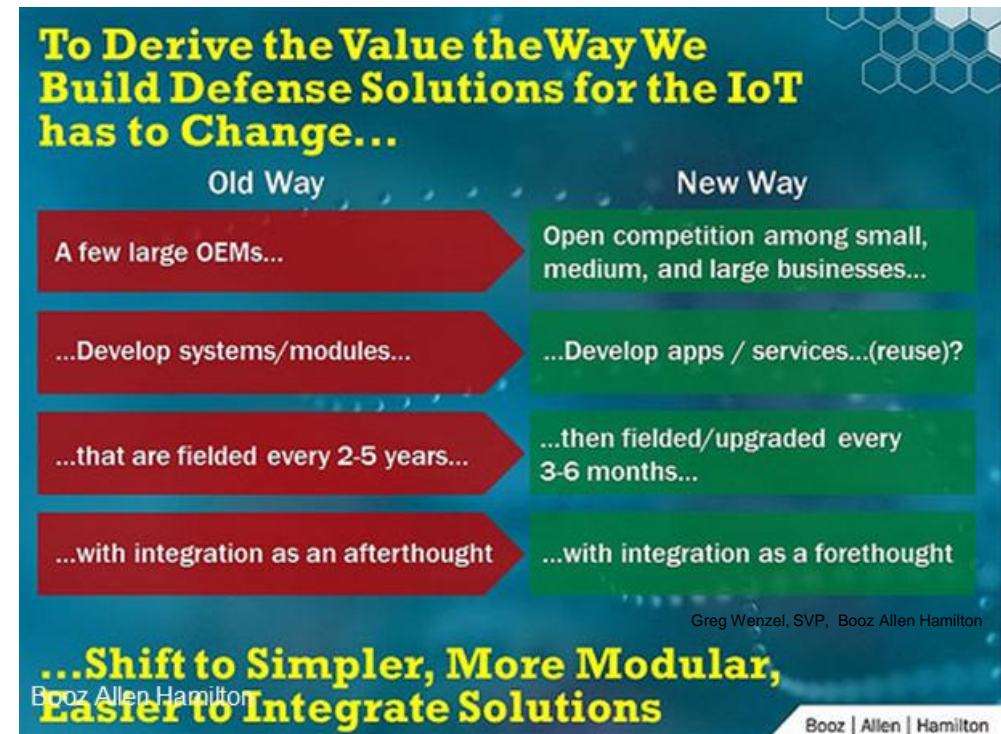


- ▶ **Agile:** Allow insights from DARPA & Service Labs, Industry and Academia
- ▶ **Robust:** Based upon the best available technologies to deliver capabilities
- ▶ **Trustworthy:** Information is pedigreed, authoritative, and secure
- ▶ **Cloud-Enabled:** Provides the capability of knowing (most) anything at anytime

Cloud Enabler: Priorities driven by Near-Real-Time Performance & Data Automatically Reported from IoT

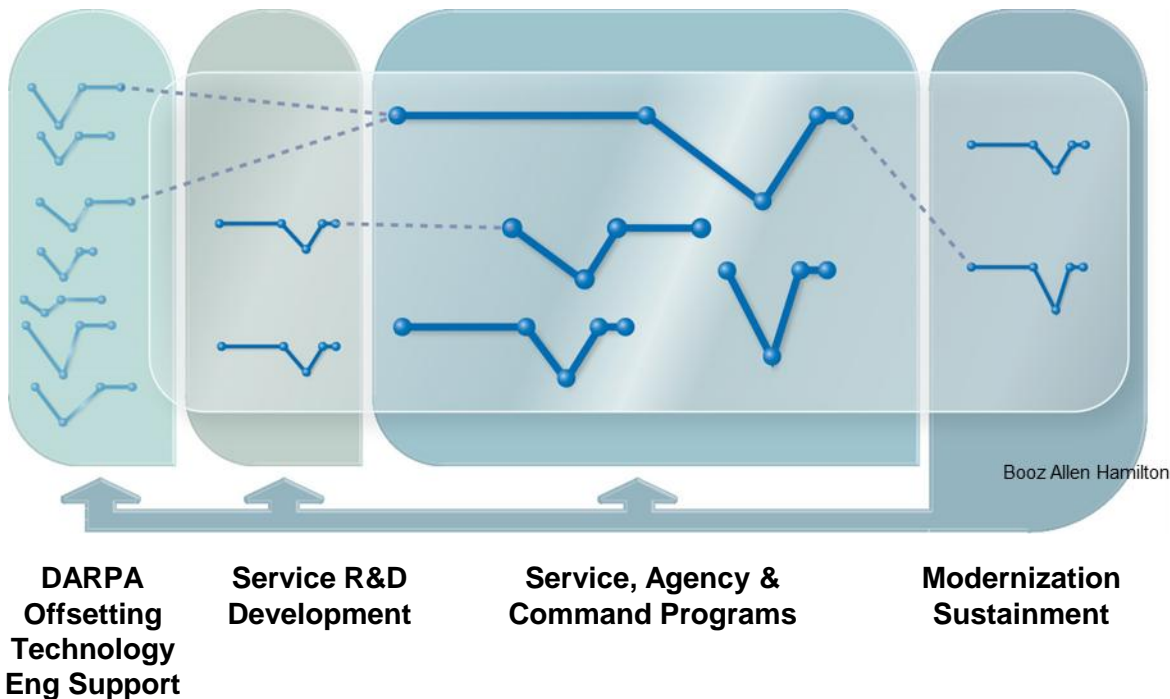
DoD acquisition and performance data are key

- ▶ MBSE can help frame this in a systematic way across organizations
- ▶ Emphasis should be on interoperable data and data models; “not one size fits all”
- ▶ Structured data required by contract, not proprietary tool output
- ▶ Standards when a consensus need exists; commercial best practices otherwise
- ▶ Governance needed to level the playing field and enforce commonality



Cloud Enabler: Efficiently Connecting the “V”s

Science & Technology Discovery, System Design & Development, Capability Delivery & Sustainment need to connect in a meaningful and affordable way



Better Buying Power 3.0: *Institutionalize stronger DoD level long range research and development (R&D) planning*

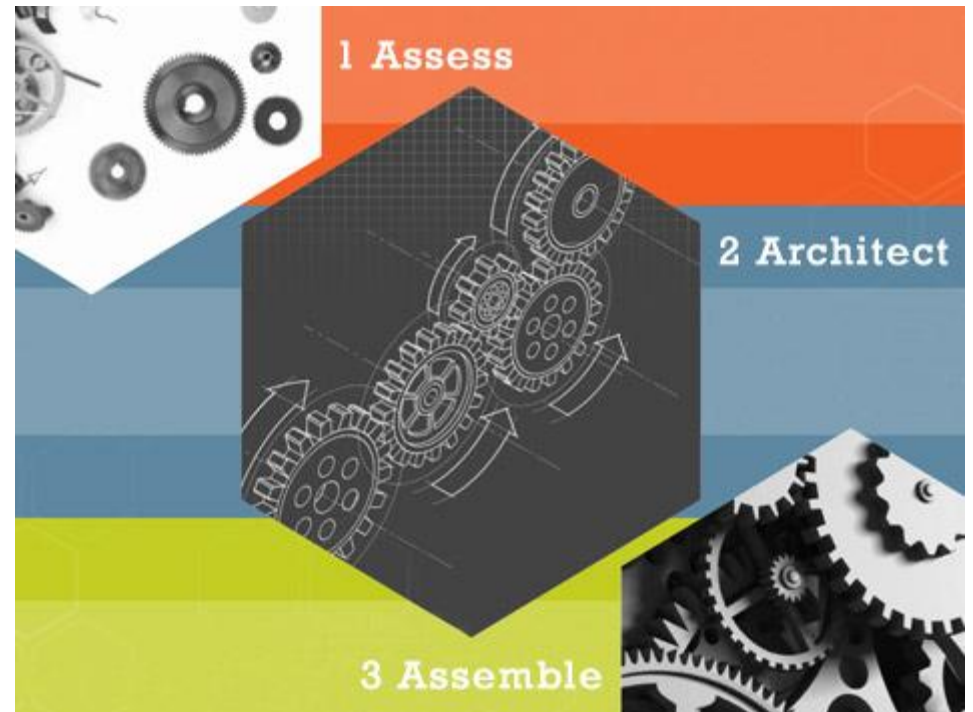
The need for an integrated acquisition life cycle view and supporting framework is understood

- ▶ Many studies have encouraged change
- ▶ Helpful NDIA industry studies and research have documented potential desired end states
- ▶ To-Date, Government and Industry have struggled to find the middle ground and enable change
- ▶ Significant policy and cultural impediments remain

SE Data and Tools need Role Based, Secure Access in the Cloud

DoD acquisition data is restricted in some ways, cloud architectures need to enforce this

- ▶ Reimagining the key processes and essential information is likely required
- ▶ Cloud architectures can be private, but common data models and cloud hw/sw across distinct enclaves allows interoperability when authorized
- ▶ Cyber and Information Assurance considerations are important
- ▶ International collaborations and associated constraints will add additional layers of complexity



Better Buying Power 3.0:

*Anticipate and plan for responsive and emerging threats.
Increase the use of prototyping and experimentation*

SE Acquisition Digital Archives, Common Data and Tools can Enhance Sustainment and Lower Costs

DoD acquisition data needs to be purchased along with the system capability

- ▶ MBSE can help frame this in a systematic way
- ▶ Digital CAD, manufacturing (CNC), performance, cost and risk model data needs to be retained, to assist in sustainment
- ▶ Testing/troubleshooting shortfalls
- ▶ Analysis for multiple purposes including mission effectiveness & performance based logistics
- ▶ Reuse as needed by other programs
- ▶ Digital “pedigree” of program
- ▶ Restart of manufacturing as needed



Better Integrated & Interoperable Processes: Rapid Prototyping Services to Meet Demanding & Emerging Warfighter Needs

DoD Capability needs change rapidly in today's environment due to constantly changing threats and mission needs

Acquisition/SE focus on the System and Requirements needs to shift to System-of-Systems and delivered capability – on shorter timelines

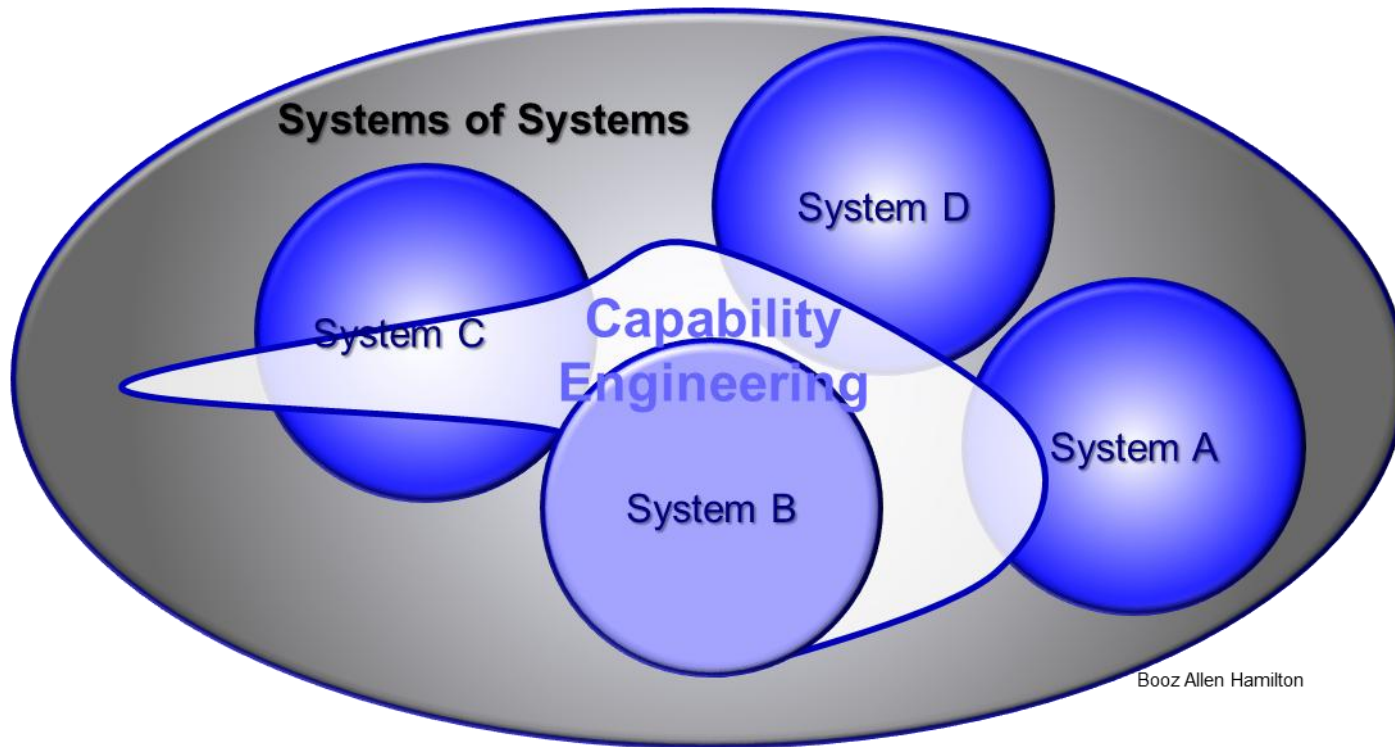
- ▶ Need agile SE tools and processes to adjust to requirements refinements due to capability needs or operational environment changes
- ▶ Cloud enabled SE tools can help predict performance and delivered capability early, and help programs responsively adjust to changes
- ▶ Cloud digital data can (and should) replace document/database centric data packages



Better Buying Power 3.0:

*Anticipate and plan for responsive and emerging threats.
Increase the use of prototyping and experimentation*

The Combination of IT Advancements and Improved Analytics may take us a step closer, enabling Capability Engineering, on our pathway to to full SoS Engineering...



...and Easier, Better and More Efficient Acquisition

- 1) Better Integrated and Interoperable Processes
- 2) More Powerful and Comprehensive Tools and Analytics
- 3) Better Qualified, Motivated, and Involved Workforce

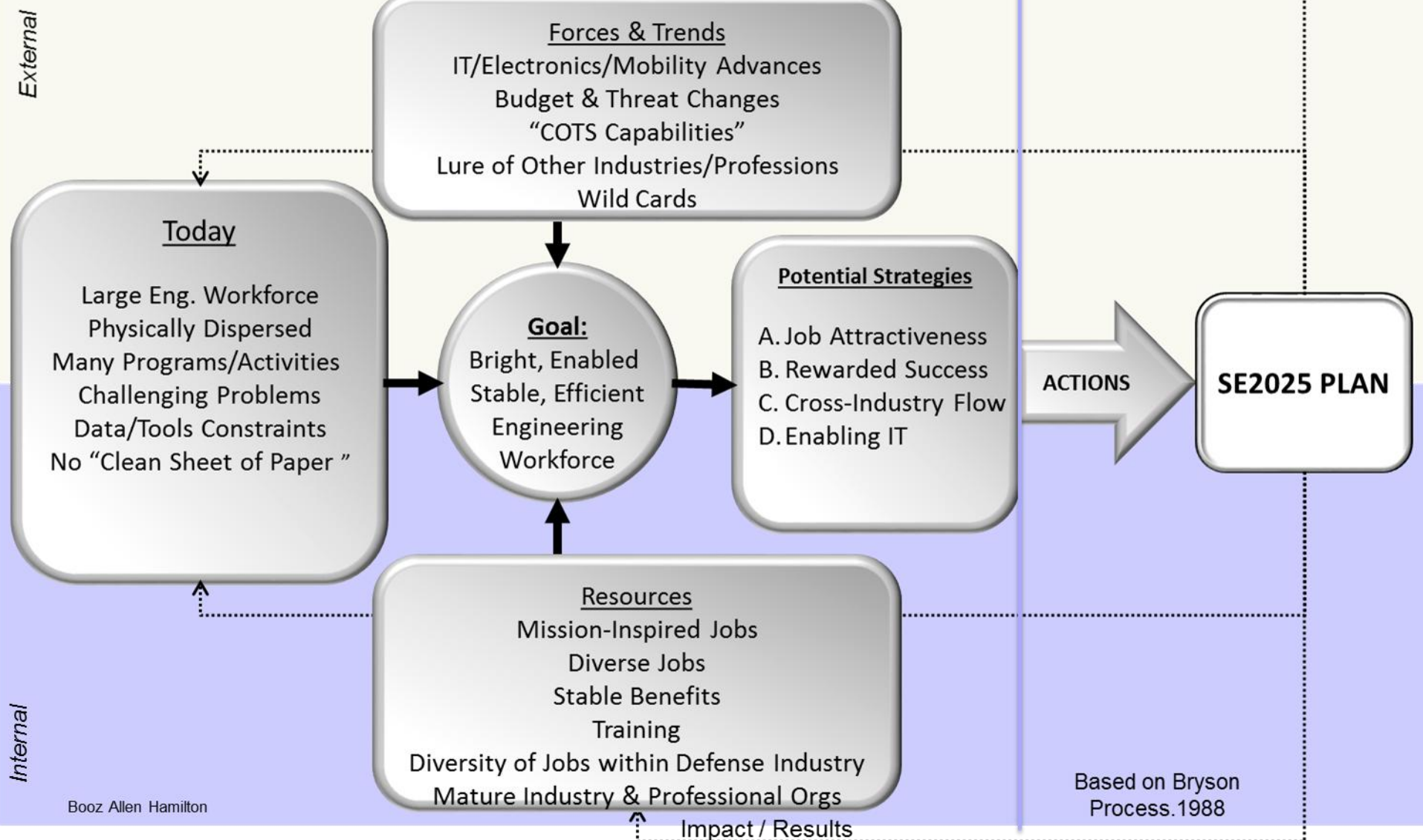


<http://www.boozallen.com/content/dam/boozallen/media/file/Bridging%20the%20Disconnect%20%E2%80%93%20Executive%20Summary.pdf>

Together, We Can Enable Next Generation Engineering

<- Strategy Formulation Implementation ->

Impacts / Results



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