

BUILDING CAPABILITY

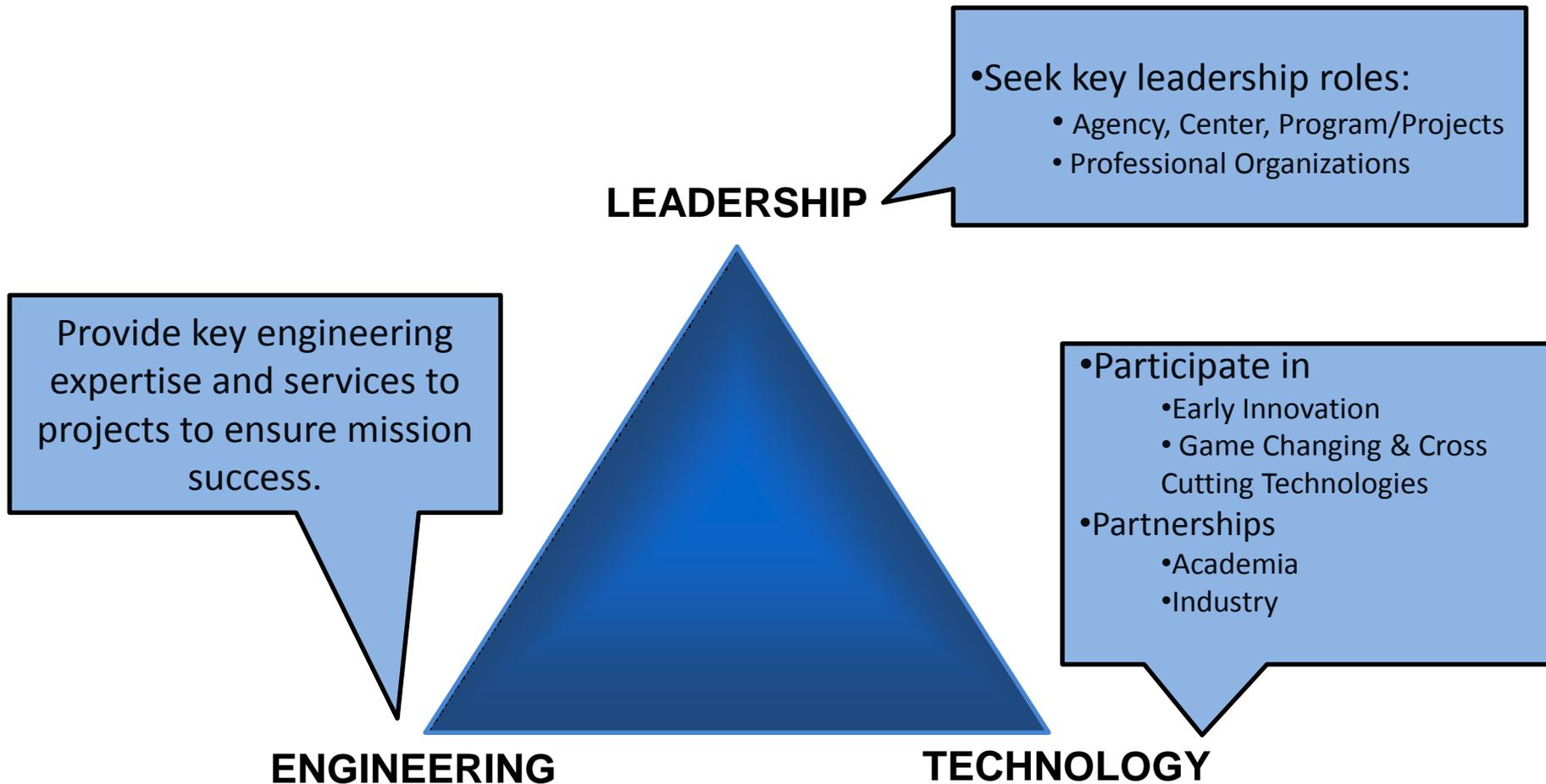


Adding Value

Mark Hutchinson



Capability Strategy



Deliberate Excellence



- Overarching strategy for technical excellence and quality that is being worked regularly despite the day-to-day activities
- Establish Organizational long term strategy as a growth in technical capability
- Invest in People
 - Most Valuable Resource
 - Build Technical Expert/Technical leadership
- Invest in Tools/Procedures/Practice



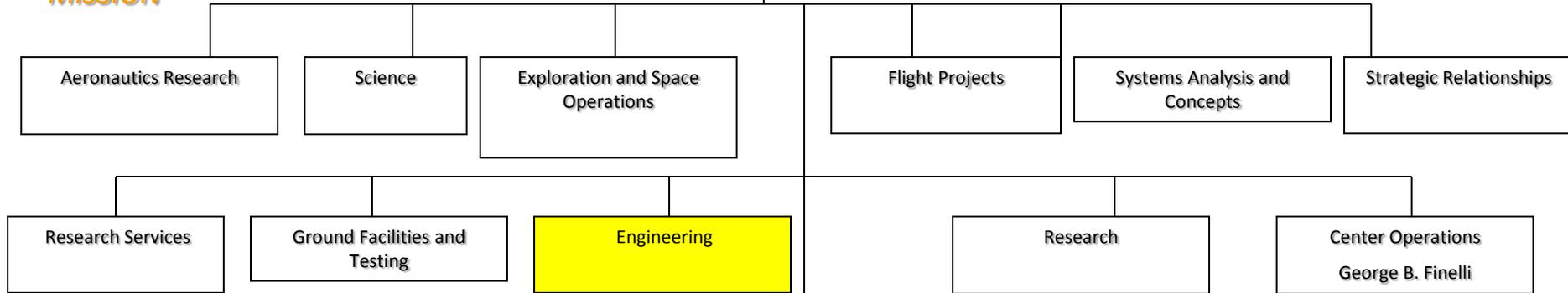
Director
Lesa Roe

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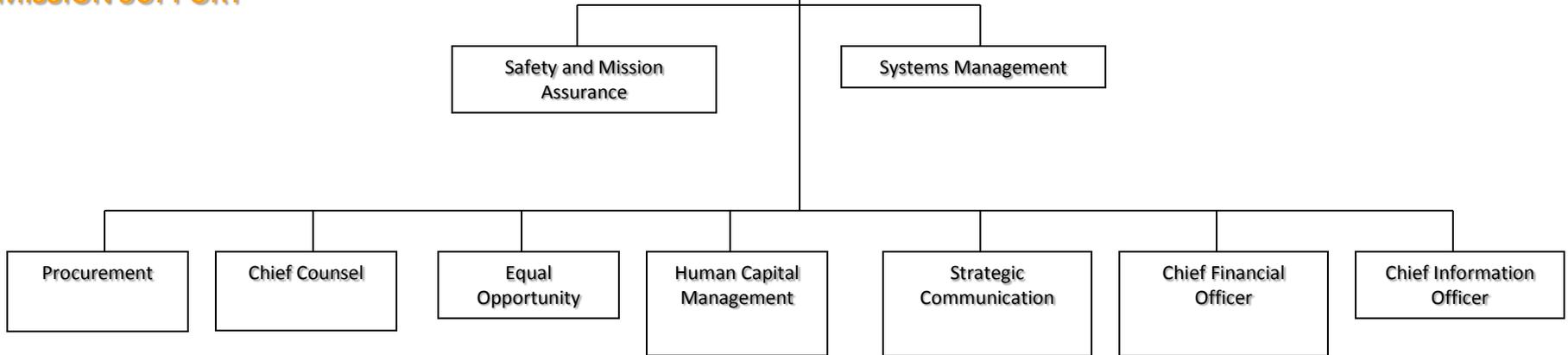
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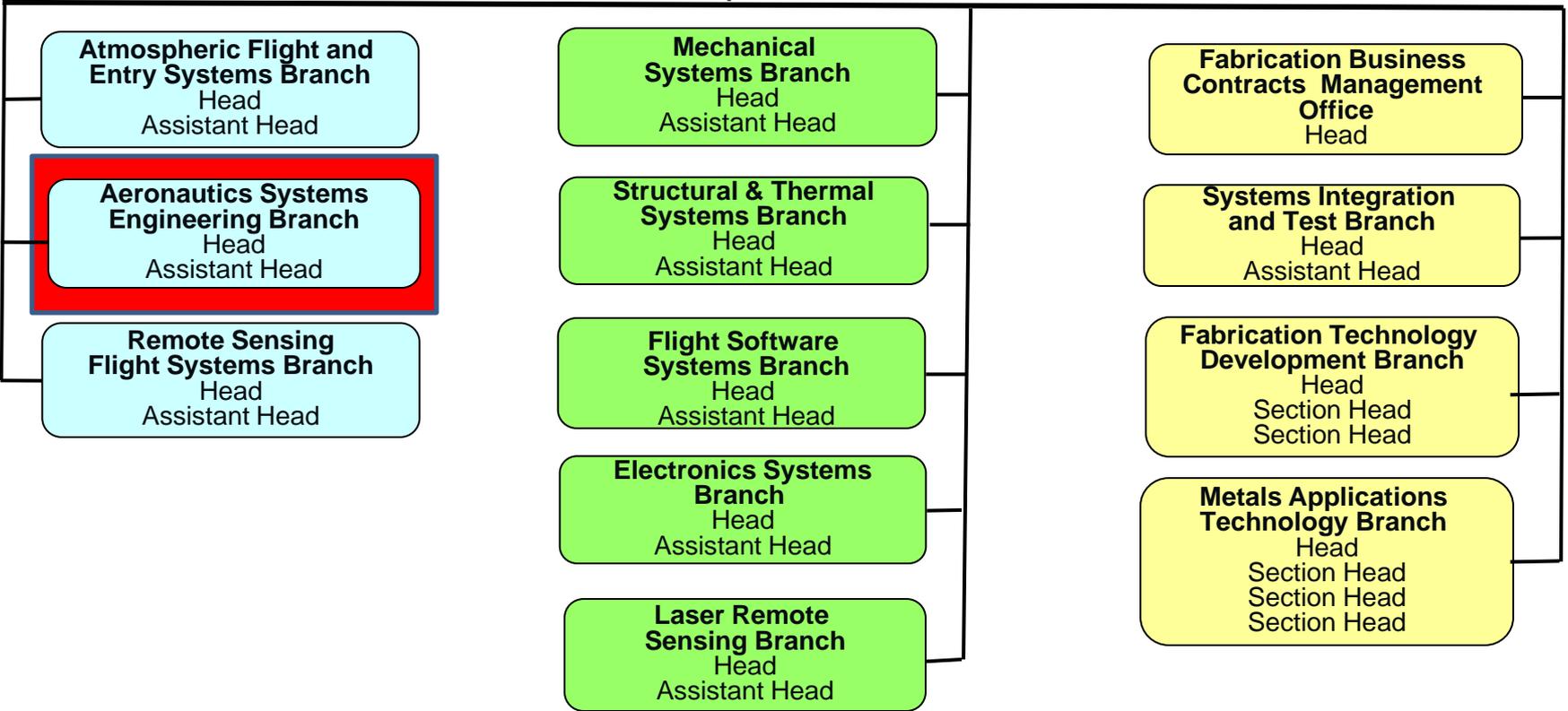
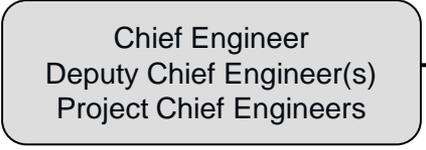
MISSION



MISSION SUPPORT



The Langley Research Center (LaRC) pioneers the future in space exploration, scientific discovery, and aeronautics through research and development of technology, scientific instruments and investigations, and exploration systems.



ASEB's Functional Statement



The *Aeronautics Systems Engineering Branch* provides a lead role in providing experimental hardware, advanced sensors and measurement systems using a systems engineering approach that enable our customers to *gain knowledge* by simulation of aerospace concepts for aerodynamic and structures research.

Investment in People

- **Encouragement of**
 - Innovation
 - Education
 - Professional Society Participation
 - Affiliation with Academia
 - Mentorship with Students
- **Publish**
- **Difficult Technical Challenges**
 - Is it a big enough problem?



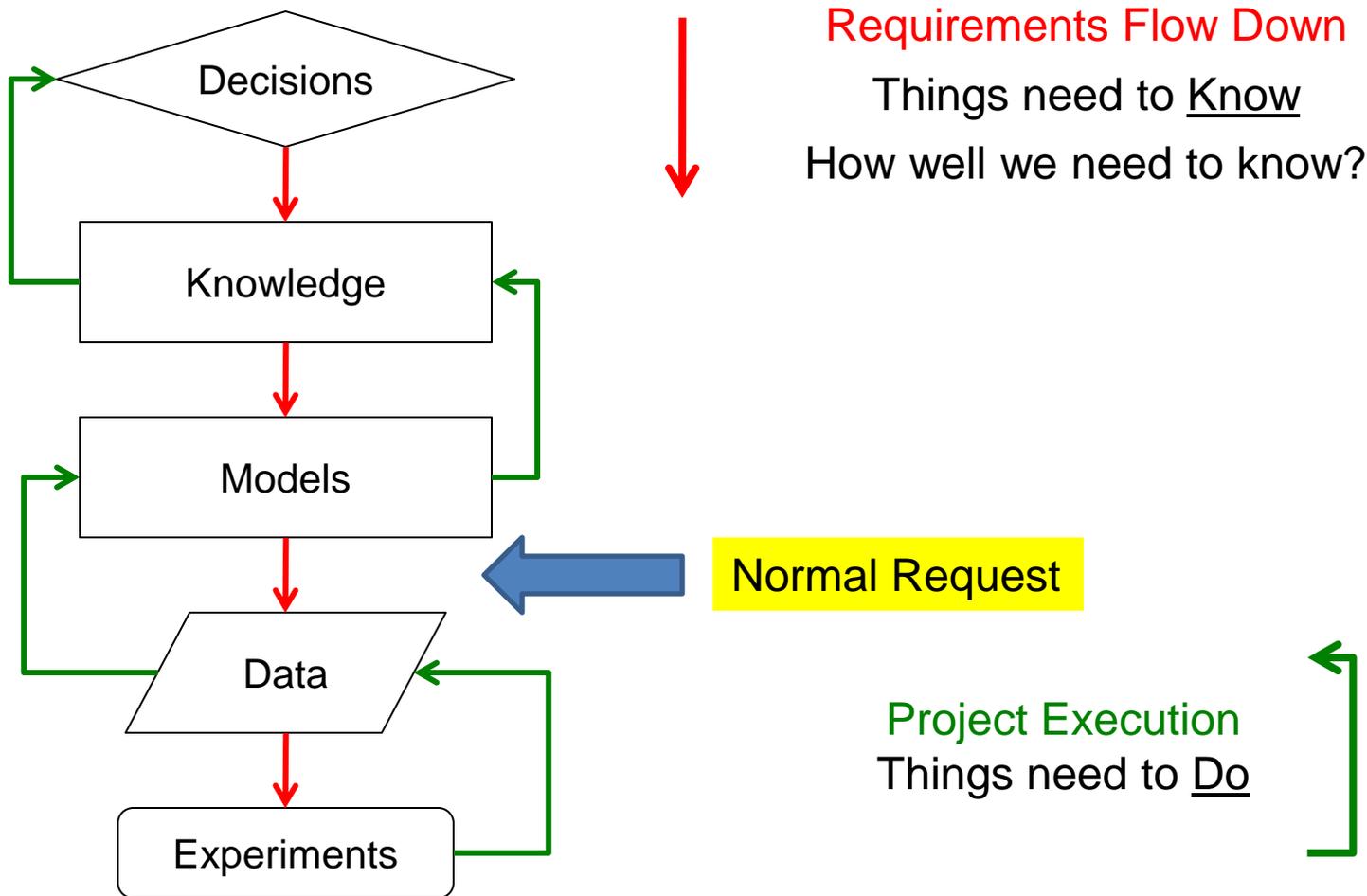
80/20 Rule



- 20% of employee's time dedicated to capability growth
 - Training
 - Publishing
 - Mentoring
- 80% to Product Delivery



Planning and Execution Model



Heilmeier Questions

Excerpt from IEEE Spectrum Article, June 1994

- **What are you trying to do?**
 - Articulate your objectives using absolutely no jargon
- **How is it done today, and what are the limitations of current practice?**
- **What's new in your approach, and why do you think it will be successful?**
- **Who cares?**
 - If you are successful, what difference will it make?
- **What are the risks and the payoffs?**
- **How much will it cost? How long will it take?**
- **What are the midterm and final “exams” to check for success?**



Statistical Engineering Questions

Program and Project Definition

- **What are the precise objectives?**
 - Are the objectives quantifiable, detectable, measurable?
 - What are we seeking to learn, new knowledge sought?
 - How will we know when we have learned it?

Technical Risk Management

- **How well do we need to know the answer(s) (precision)?**
 - What risk are we willing to accept if we are wrong about our conclusions?
 - What are the consequences if we are wrong?

Planning and Execution

- **Do the methods support rigorously link to the objectives and risk?**
- **Does the allocation of resources support the objectives and risk?**
 - Are the resources justifiable and defensible?

Questions apply recursively in the vertical direction through systems and subsystems and horizontally throughout project phases



Building Capability

- Vision
 - Where are you going?
- Deliberate Excellence
 - Plan to Excellent
- People-
 - Most Valued Capability
- Challenging work-
 - Hard to solve problems

