Enterprise Capability Assessment and Prioritization

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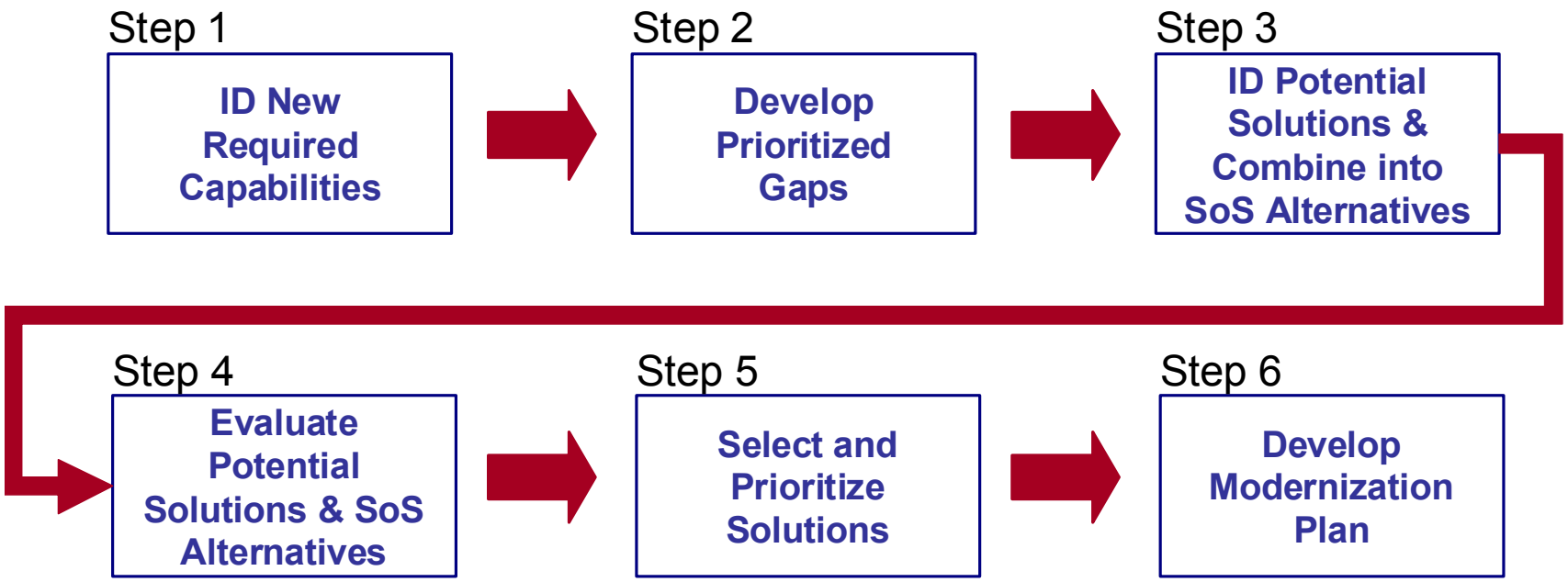
Mission Accomplishment

- An enterprise has existing capabilities
  - Physical resources
  - Skilled personnel
  - Organizational knowledge (polices, tactics & procedures)
- Required capabilities
  - Create value for the enterprise
  - Core competency when effectively integrated
- Integration of capabilities under the right circumstances may be a SoS
- Factors impacting desired level of performance

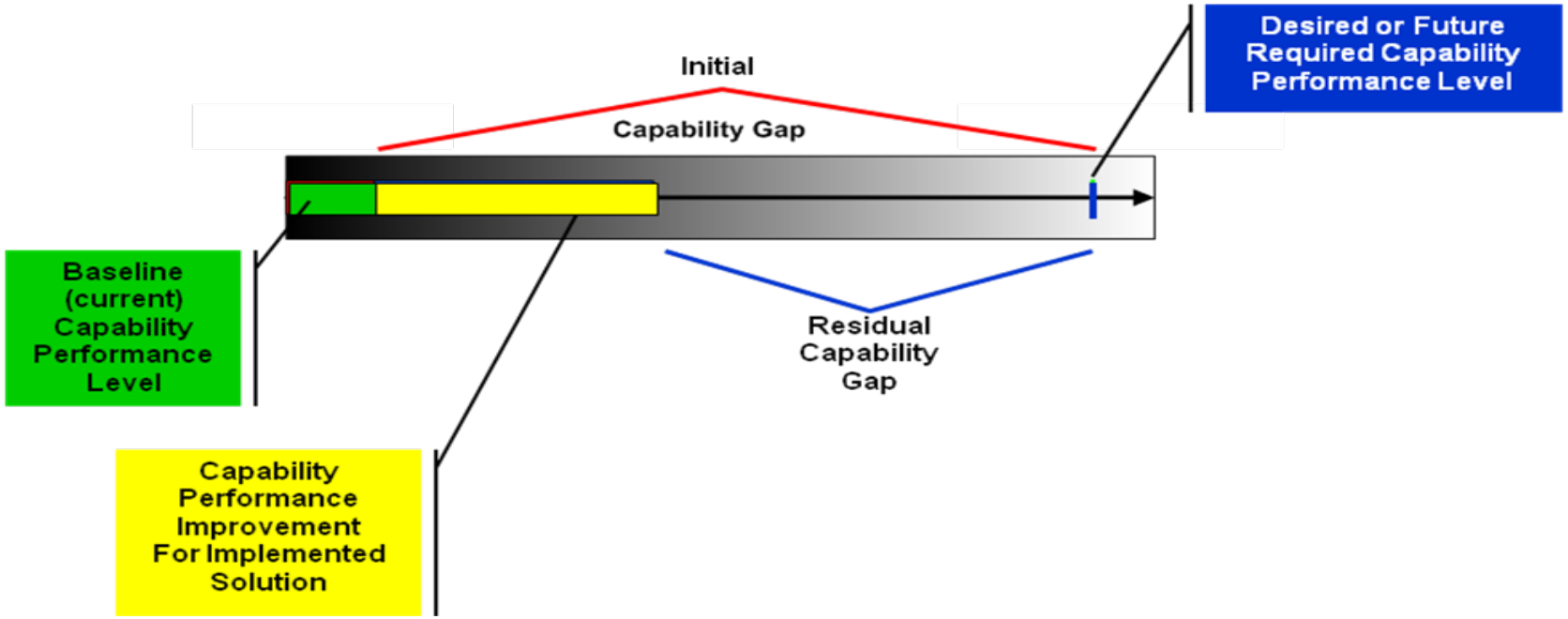
Systematic Six-Step Process



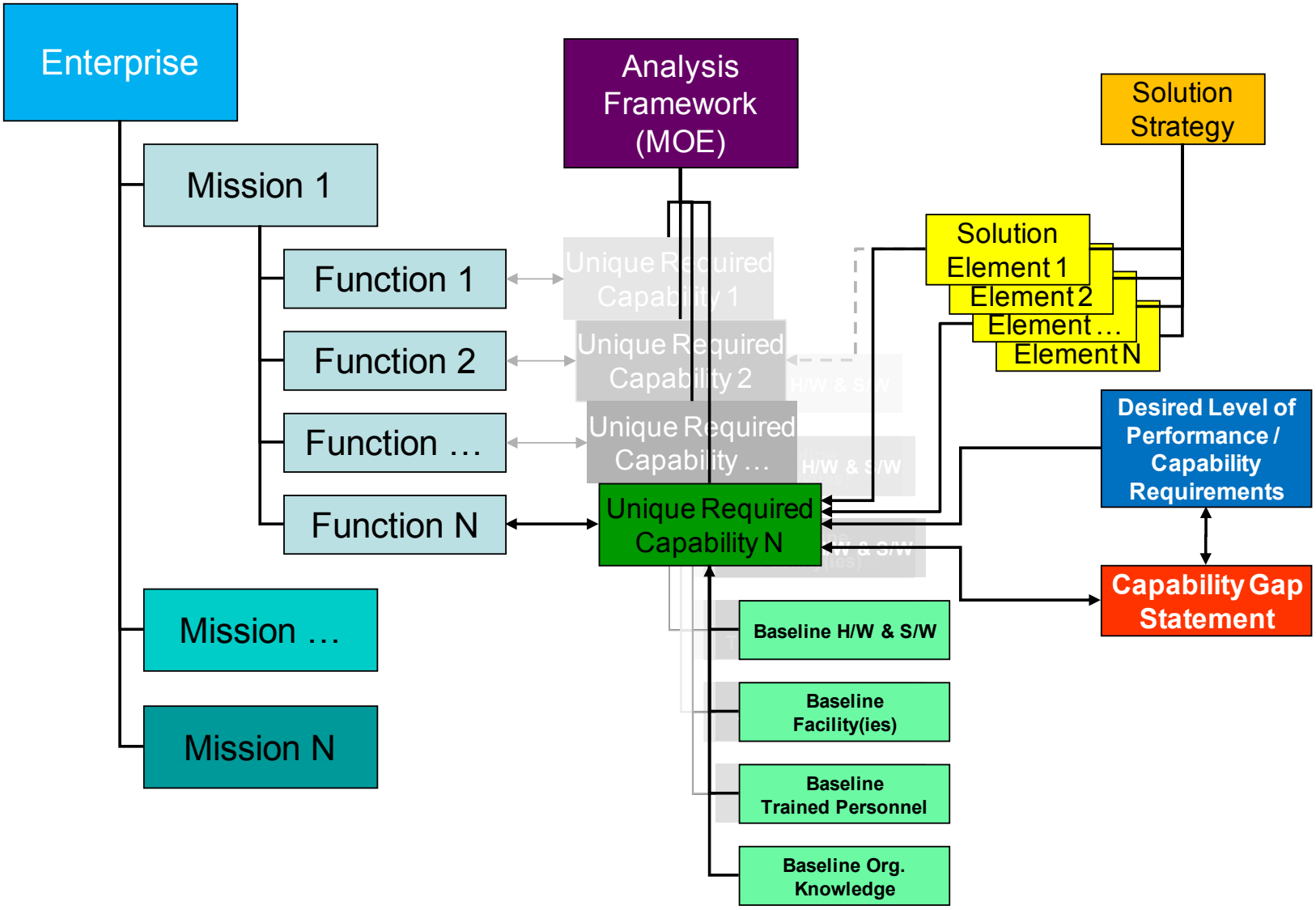
Challenge to Overcome

- Ability to identify and measure capability gaps
  - In order to more effectively adapt to changing conditions
  - Improve performance toward completing the mission
- What we learned:
  - Can't move forward without knowing where you are
  - Must accurately identify and prioritize required capabilities and gaps
  - Technology and non-technology based solutions
  - Impact must be measured – positive and negative
  - Finite resources make ranking solutions essential
- What's needed:
  - Analysis framework in the context of a mission
    - Organizing and representing the challenge/problem
    - Common language

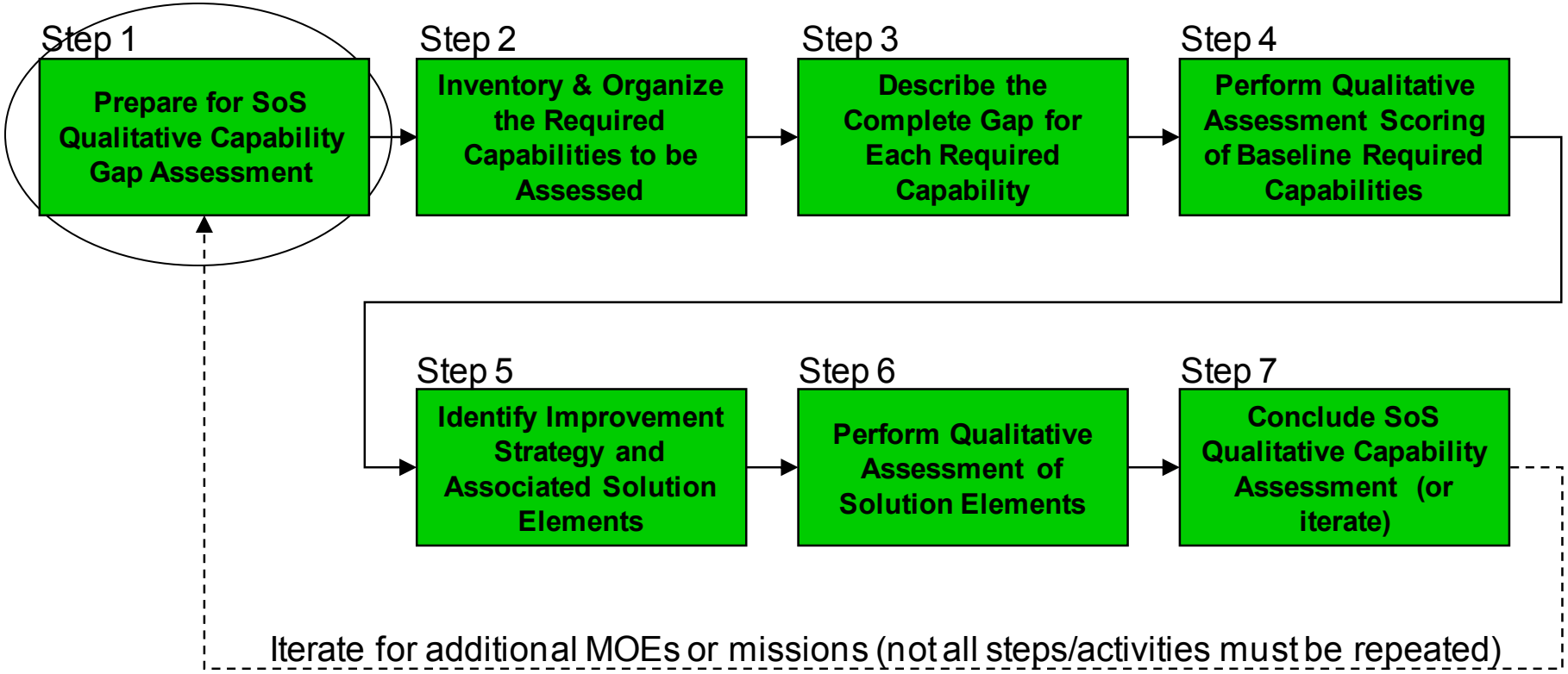
Notional Depiction of Capability Gaps



Notional Context for Enterprise Capability Gap Assessment



Suggested approach for SoS Qualitative Capability Gap Assessment

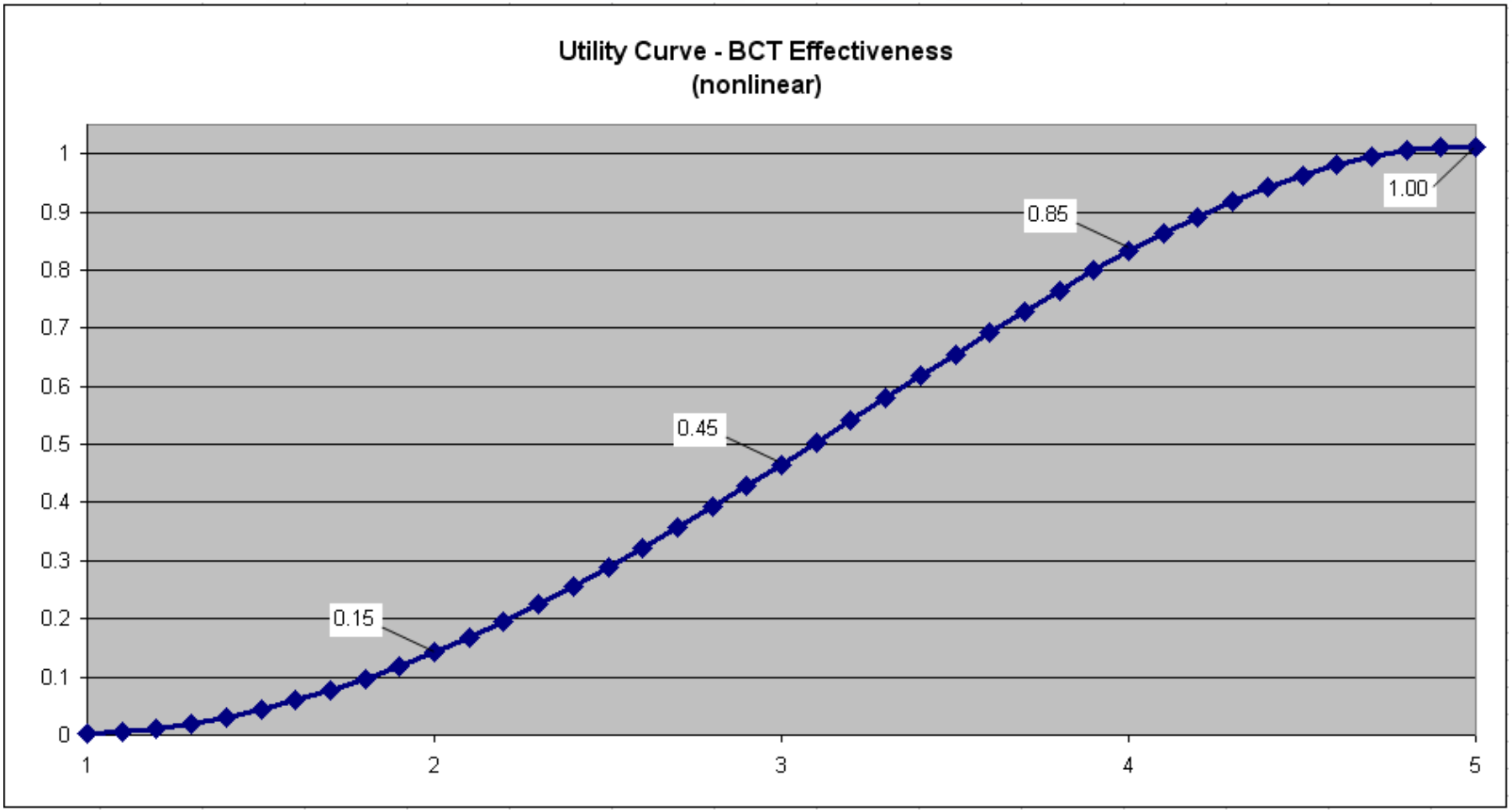


Example Criteria for Scoring Capability

Effectiveness Score Guidance	Importance Score Guidance
5. The ability to perform or provide the unique capability meets objective requirements.**	5. Unique capability is CRITICAL to BCT's mission effectiveness; mission cannot be successfully accomplished without the capability.
4. The ability to perform or provide the unique capability meets threshold requirements** Materiel solutions employed within the BCT need only evolutionary improvement or broader fielding to fill remaining gap.	4. Unique capability is VITAL to BCT's mission effectiveness; BCT's mission still can be accomplished, however, its effectiveness in doing so is severely degraded without the capability.
3. The ability to perform or provide the unique capability does not meet threshold requirements**- Supplementary materiel solutions are needed to satisfy the desired threshold level of performance. These supplementary materiel solutions exist, but require integration into the BCT.	3. Unique capability is IMPORTANT to mission effectiveness; BCT's mission can be accomplished, however, its effectiveness in doing so is significantly degraded without the capability.
2. The ability to perform or provide the unique capability does not meet requirements** and cannot be adequately improved or supplemented. A revolutionary materiel solution change is needed to replace the current materiel solution.	2. Unique capability SUPPORTS mission effectiveness; BCT's mission can be accomplished, however, its effectiveness in doing so is noticeably or moderately degraded without the capability.
1. There are no materiel solutions present to perform this unique capability. A new materiel solution must be developed and incorporated.	1. Unique capability FACILITATES or ENHANCES mission accomplishment; BCT's mission can be accomplished, however, its effectiveness in doing so is slightly or somewhat degraded without the capability.
	0. Unique capability is NOT APPLICABLE to BCT's mission

**The term "requirements" as used here refers to the future set of requirements (as envisioned) that must be met for the Current Force BCTs to be interoperable with and fight along side the FCS BCT in the year 2015.

Utility Function



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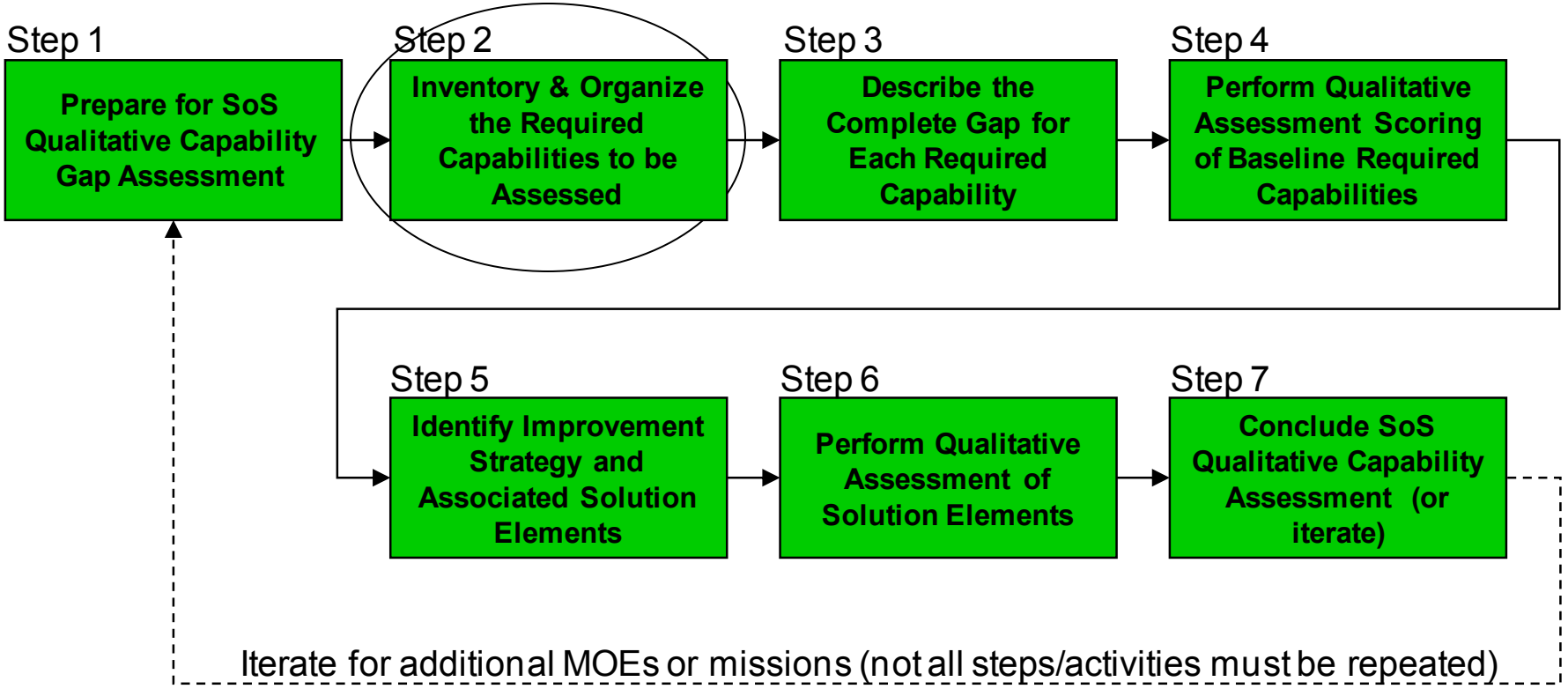
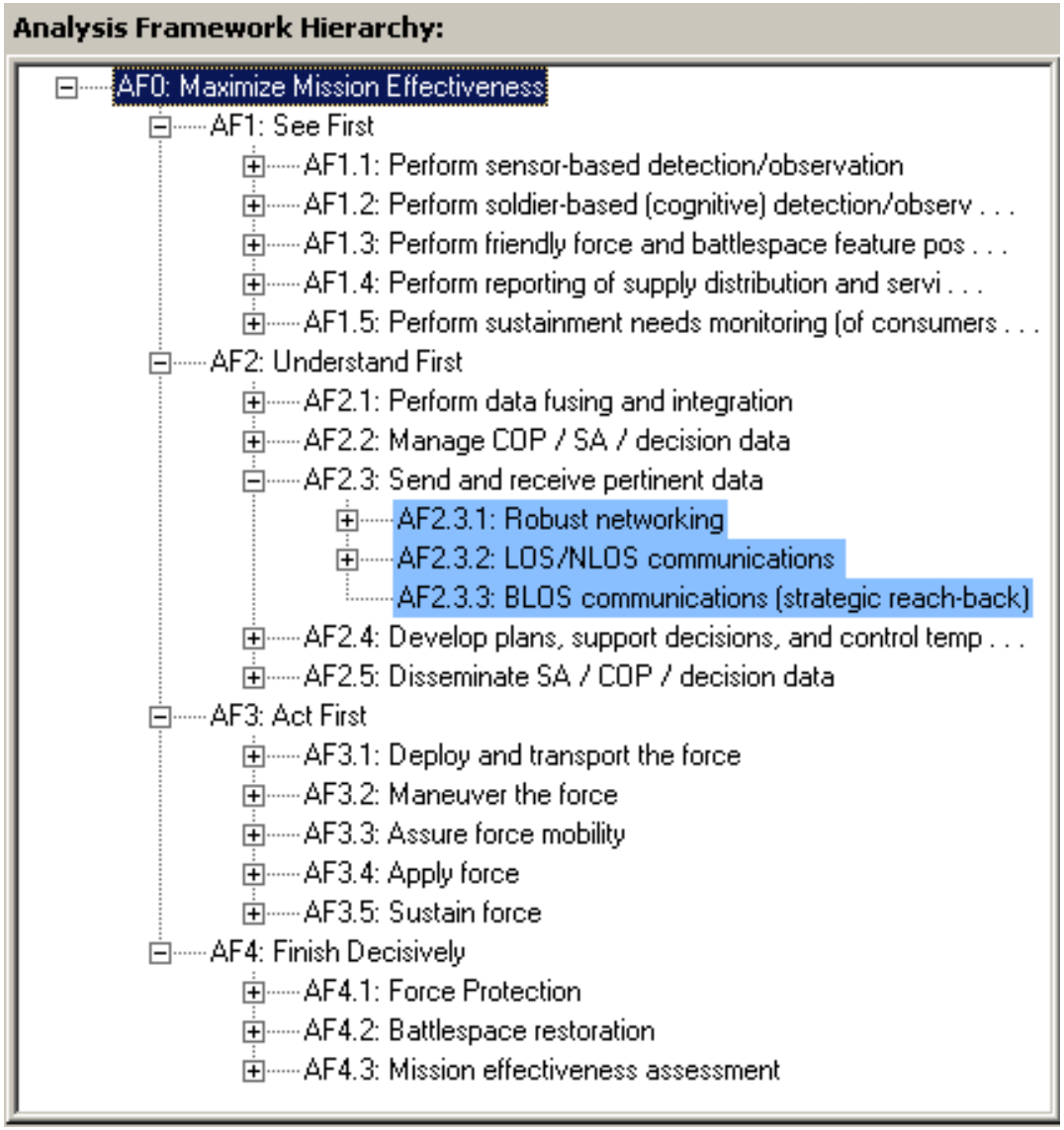


Analysis Framework



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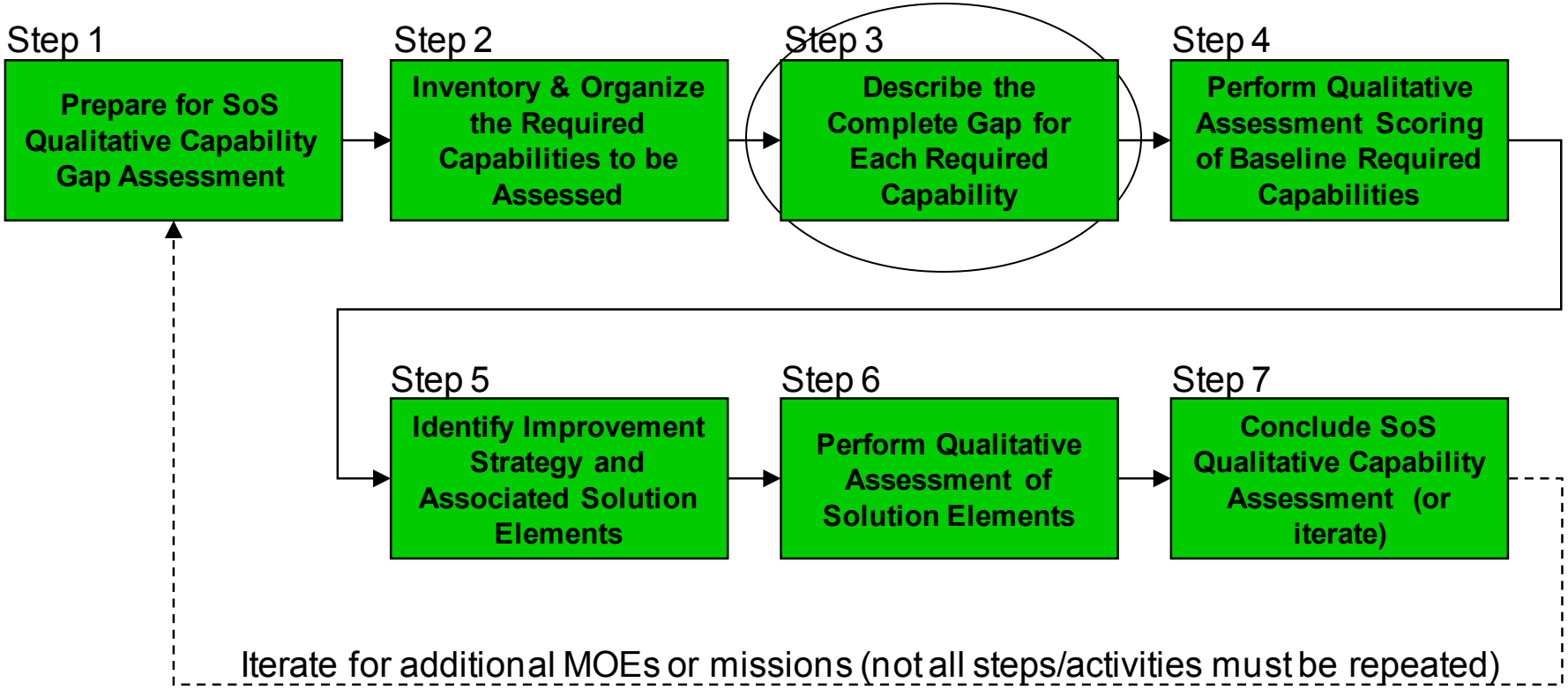
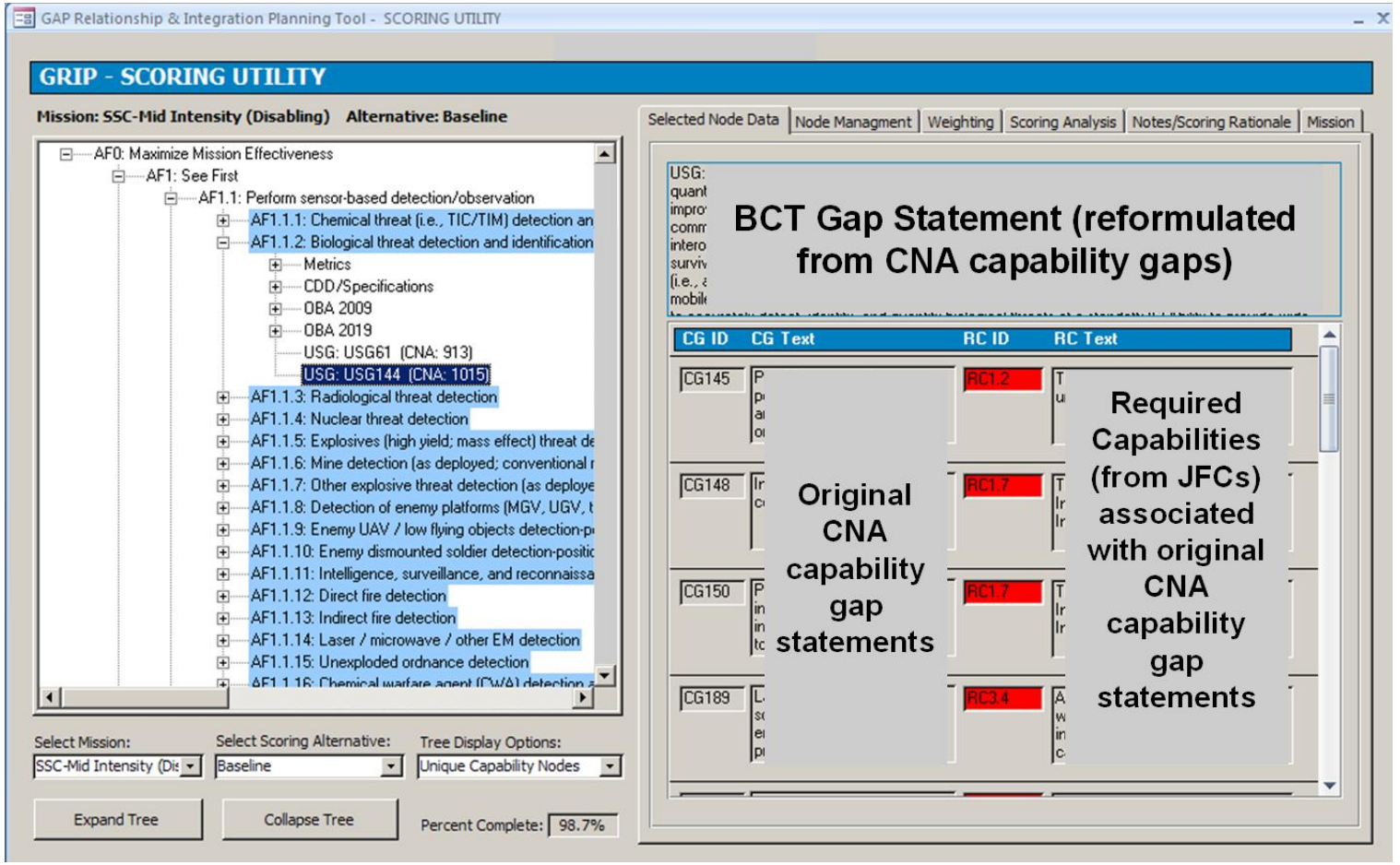


Gap Statement Association and Traceability in GRIP



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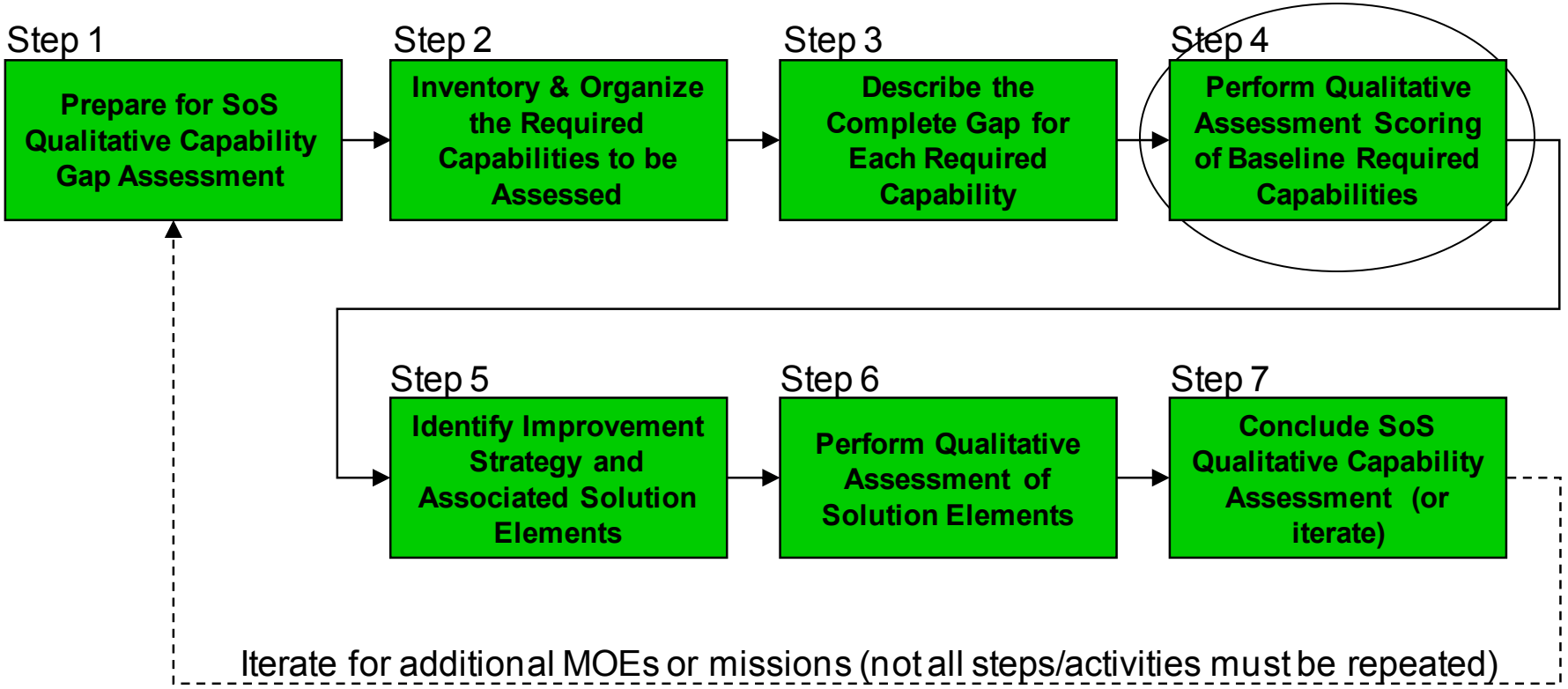
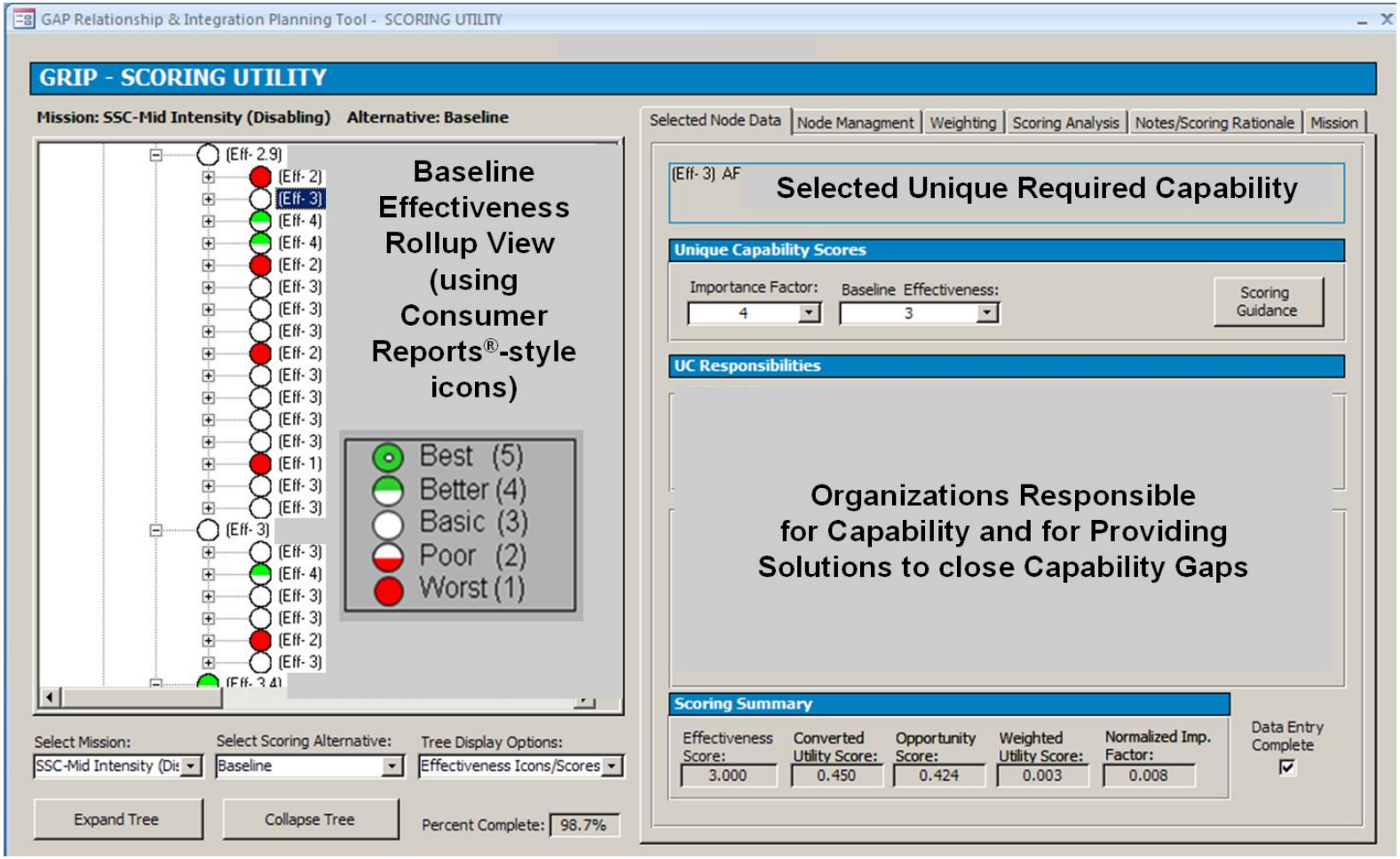


Baseline Results with Rollup Icons



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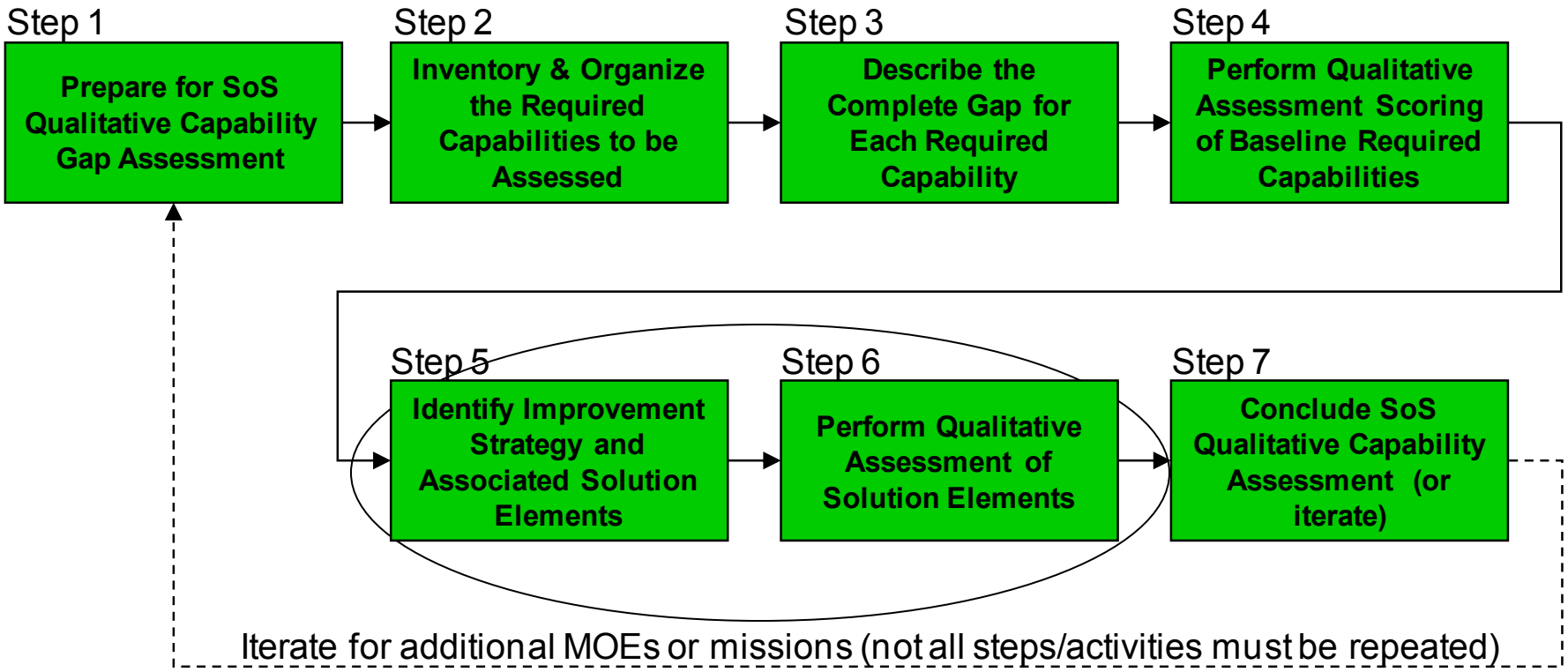
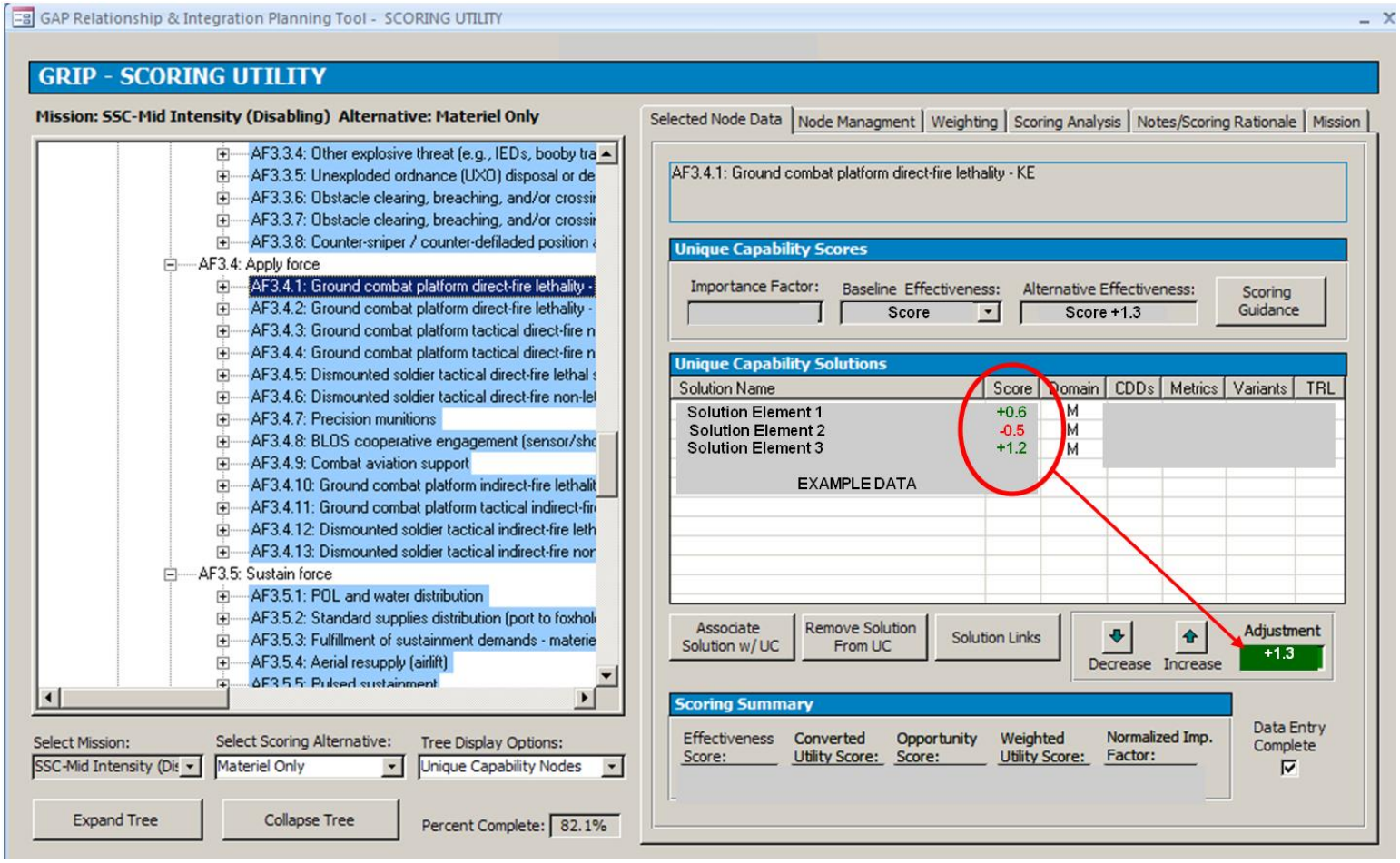
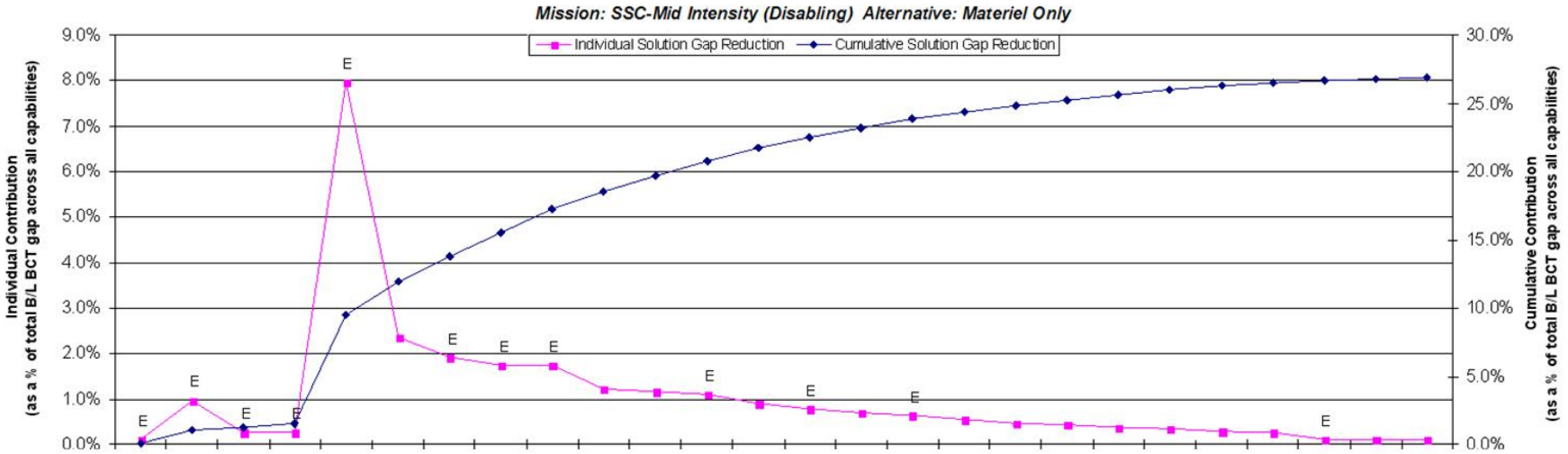


Solution Element Association and Scoring of Impact on Capability



Solution Ranking Accounting for Precedence Relationships



Solution Elements →

Note: "E" denotes that this solution is an enabler for another solution in the chart.

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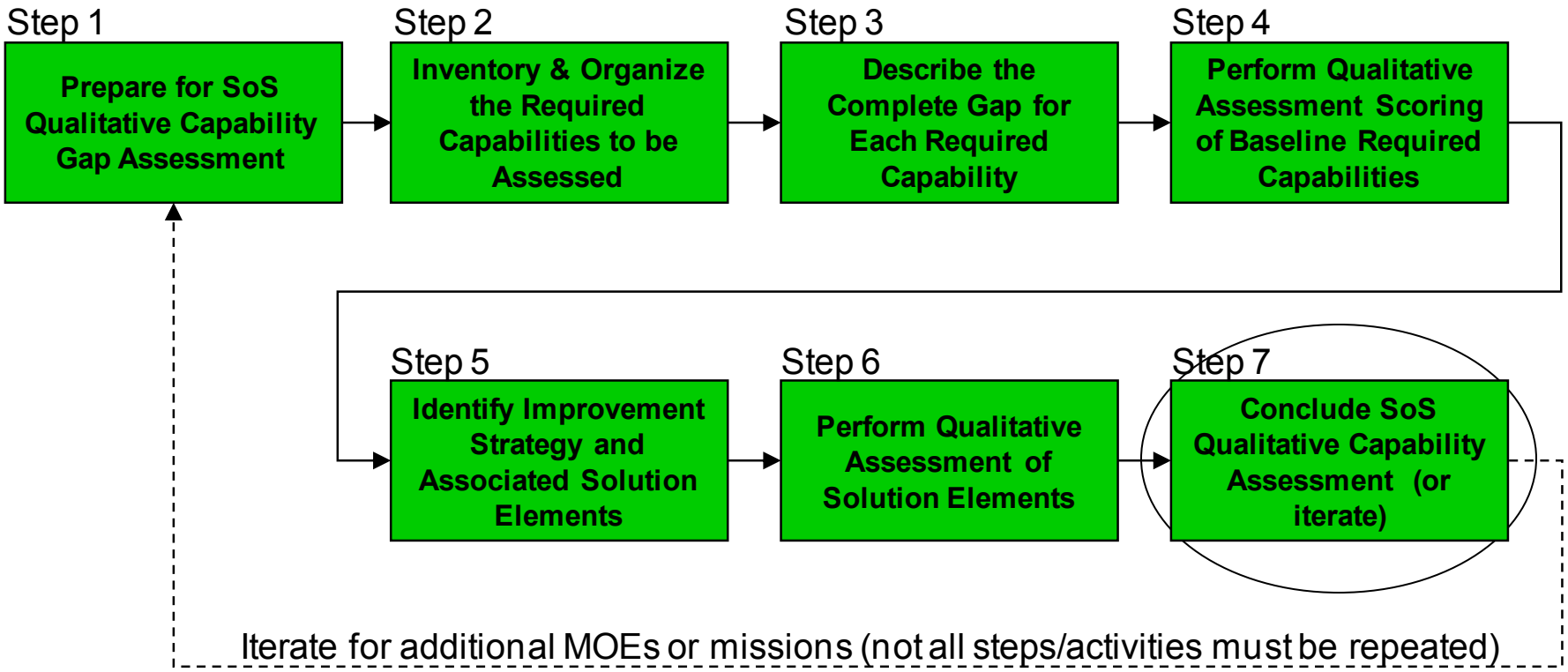


Accomplishments

- Successfully distilled the CNA RCs and capability gaps
- Developed an effective analysis framework
- GRIP facilitated the cross-correlation of data previously maintained separately
- Quality of work motivated SME participation without a tasker
- Workshops were very aggressive and productive
- Helped to shift the paradigm from platforms to the BCT (SoS) level
- Supported development of the Capabilities Description Document (CDD)
- Provided prioritized solutions based on gap closure while accounting for the critical enablers

Lessons Learned

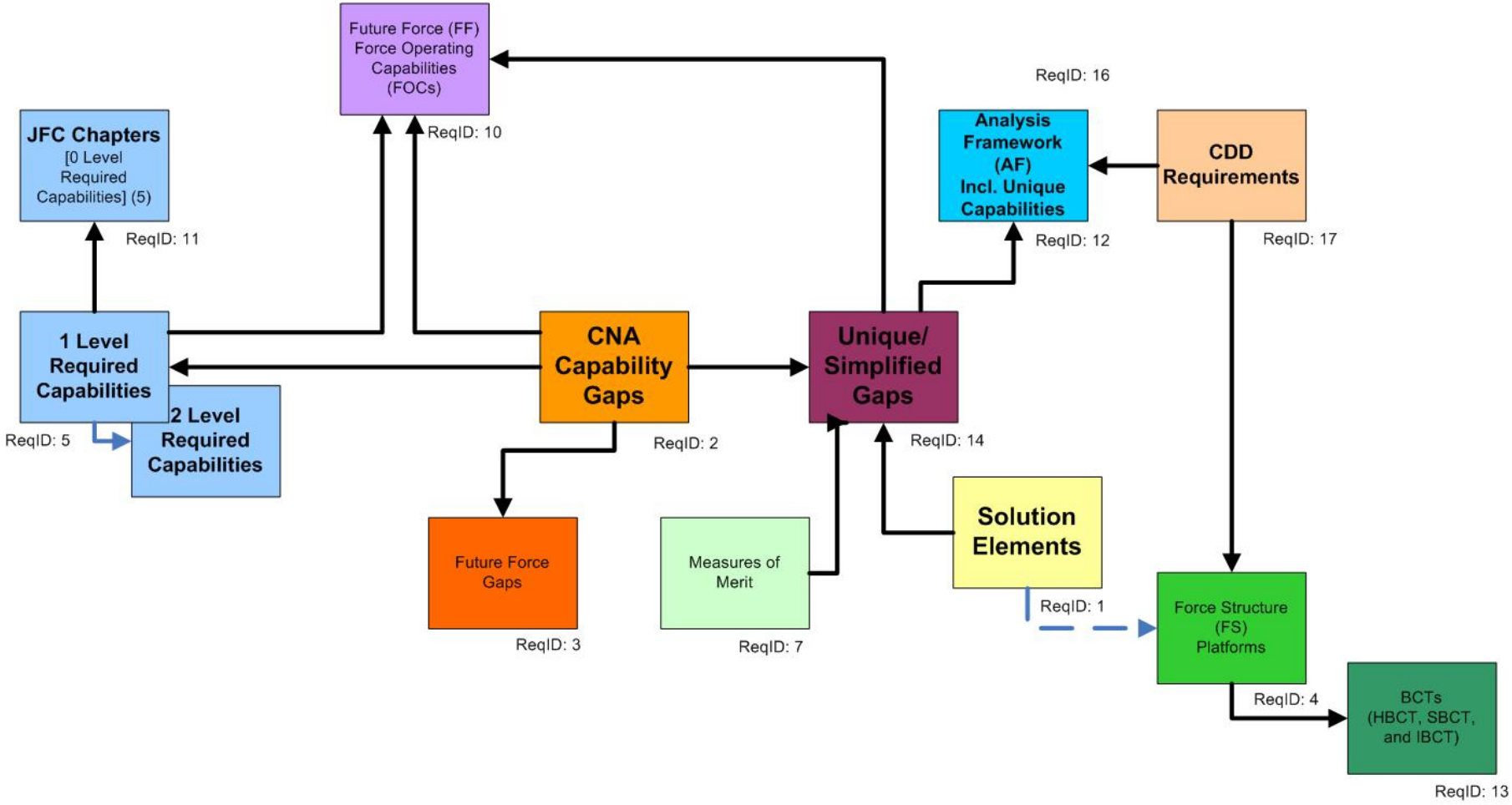
- Committed support & teaming
- Defining the mission
- Information updates
- Utility function
- Accounting for solution precedence relationships
- SoS level assessment results
- Workshops
- Tools

Conclusion

- This capability assessment and prioritization approach can be applied to almost any enterprise
- Provides the ability to:
  - Identify and measure capability gaps in the context of a mission
  - Evaluate and prioritize solutions
  - Produce analysis results to support a deliberate path forward
- GRIP
  - Cross-correlates and helps to integrate formerly disparate data
  - Enables aggressive and productive workshops
  - Contains the algorithms necessary to apply utility theory
  - Produces reports that underpin the enterprise's investment decisions

Back Up

Partial GRIP Data Relationship Schema



What is a System-of-Systems?

A System-of-Systems (SoS) is an assemblage of components which individually may be regarded as systems and possess three additional properties:

1. Operational independence of the components: If the System-of-Systems is disassembled into its component systems, the component systems must be able to operate independently. That is, the component systems fulfill customer or operator purposes on their own.

2. Managerial independence of the components: The component systems not only *can* operate independently, they *do* operate independently. Component systems are separately acquired and integrated, and maintain a continuing operating existence independent of the System-of-Systems.

3. Collective Behavior: The systems interact in a manner providing greater performance than the sum of the individual systems.

A SoS can be viewed as multiple systems, each capable of independent operations, but must interact in order to fulfill a global mission.

Understanding a System-of-Systems

- Key to understanding a SoS is the notion that a SoS performs a function not possible with any or all of the individual systems acting independently
- In this context, a SoS can be viewed as a collection of interdependent systems that are integrated to provide an enhanced capability
- The loss of individual systems within the SoS will degrade the performance or capabilities of the SoS
- However, individual systems within the SoS can provide a capability or function independent of the other systems within the SoS

System-of-Systems Attributes

Typical attributes that distinguish an assemblage of Systems as a System-of-Systems:

- Large trade space exploration/optimization
- High-degree of functional redundancies
- Extensive communications & data networks
- High-degree of interdependencies
- Typically includes a large number of individual systems