

SYSTEMS

Development &  
Maturity Laboratory

# Analyzing Component Importance in Multi-Function Multi-Capability Systems Developmental Maturity Assessment

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**STEVENS**  
INSTITUTE of TECHNOLOGY  
THE INNOVATION UNIVERSITY



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Systems & Enterprises



## Human Maturity

- Emotional
- Physical
- Intellectual



## System Maturity

- Functional
- Physical
- Logical

### *Emotional-Functional*

Indicates how a system responds to the circumstances or environment in an appropriate and adaptive manner.

### *Physical-Physical*

This response is designed (in some instances learned) and not determined by the system's age.

### *Intellectual-Logical*

Encompasses being aware of the correct time and place to deploy and knowing when to operate appropriately according to the situation



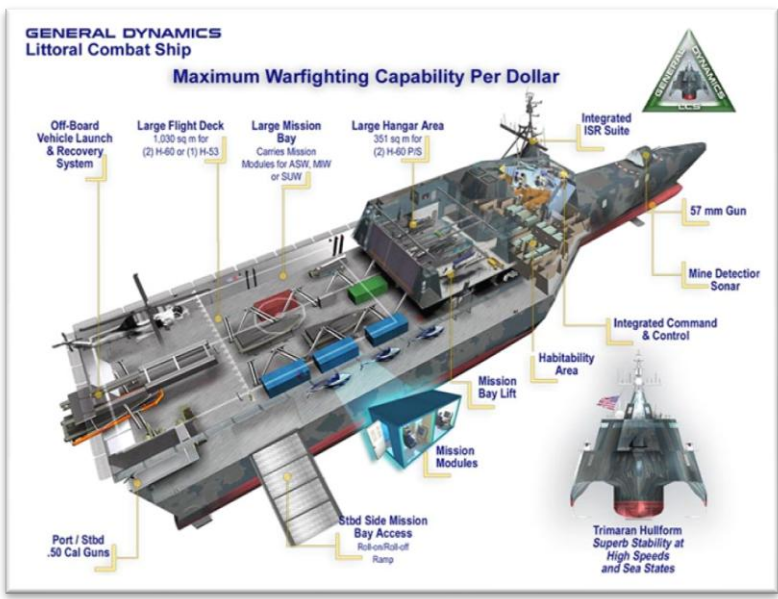
<http://www.talash.com/online-gardening-utilities-store-india>



[www.microsoft.com](http://www.microsoft.com)








<http://dailymobile.se/2010/07/28/iphone-4-vs-iphone-2g-3g-3gs-speed-comparison/>



<http://www.defenseindustrydaily.com/the-usas-new-littoral-combat-ships-updated-01343/>

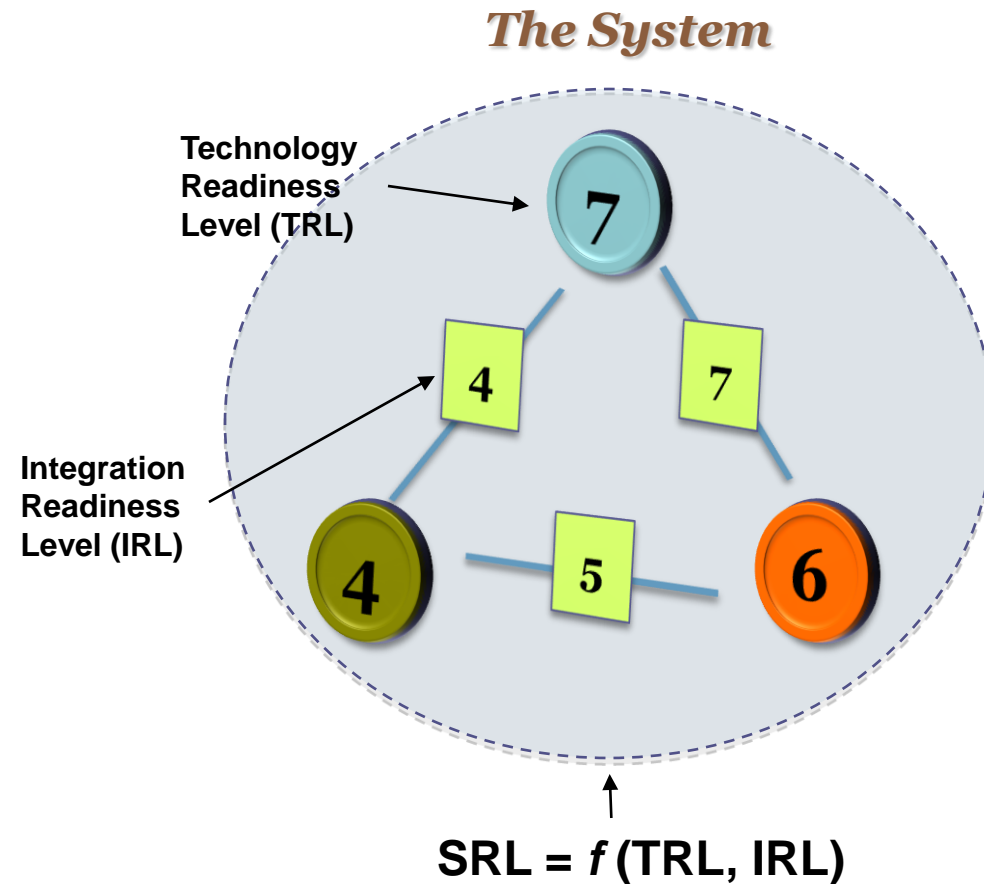
# iPhone Evolution

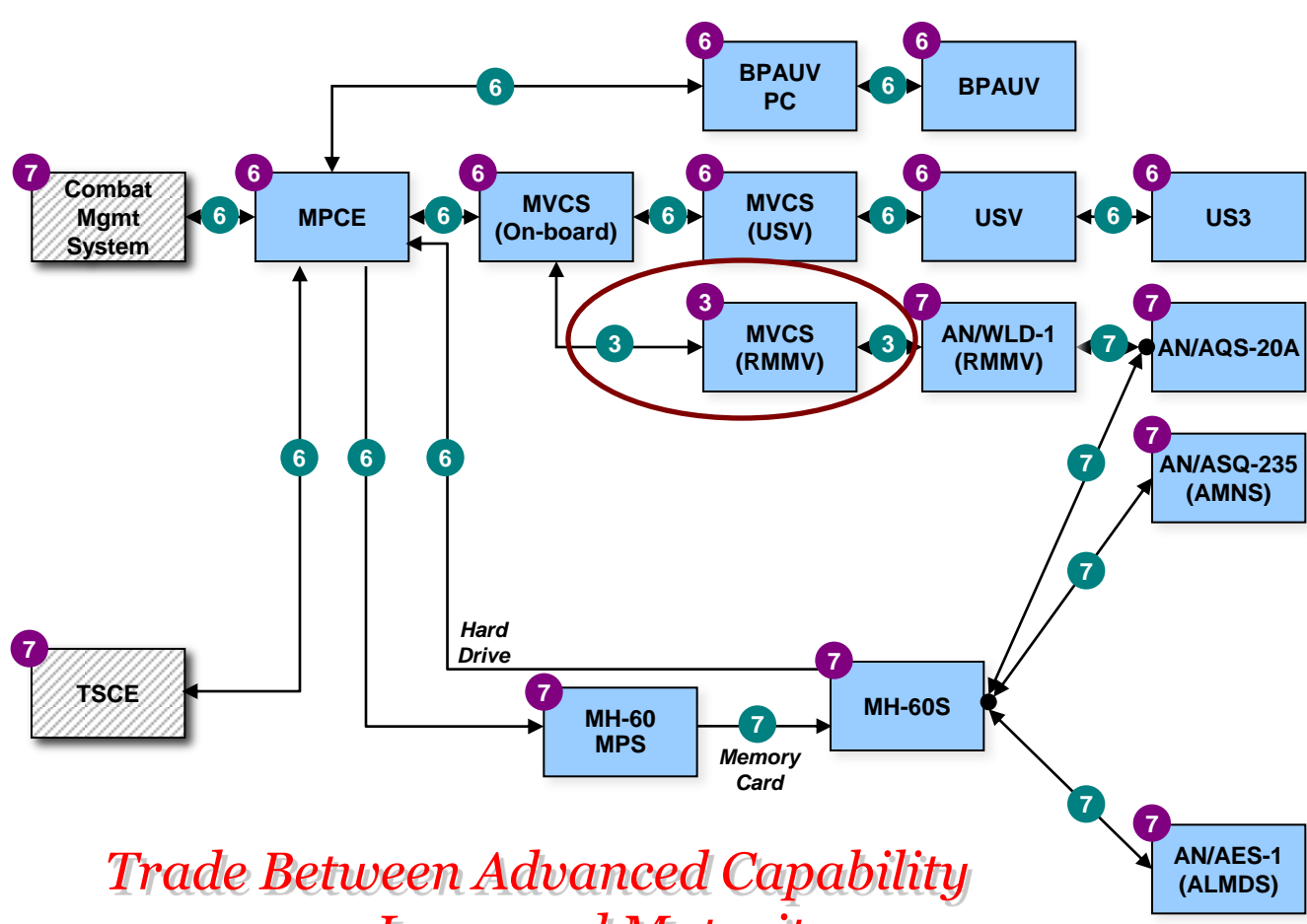
Launch Time	2007, Jun	2008, Jul	2009, Jun	2010, Jun	2011, Oct
Generation	<p>2G</p> 	<p>3G</p> 	<p>3GS</p> 	<p>4G</p> 	<p>4GS</p> 
New Features (not exhaustive)		<ul style="list-style-type: none"> <li>• 3G connectivity</li> <li>• GPS</li> </ul>	<ul style="list-style-type: none"> <li>• Video recording</li> <li>• Voice control</li> <li>• Nike+ support</li> </ul>	<ul style="list-style-type: none"> <li>• Face time</li> <li>• Retina Display</li> <li>• Front and back cameras</li> </ul>	<ul style="list-style-type: none"> <li>• Siri</li> <li>• iCloud</li> <li>• Video stabilization</li> <li>• Face detection</li> </ul>

# Systems Evolution and Lifecycle Management

## Value Proposition:

- To provide a systemic view of development maturity with opportunities to drill down to element-level contributions
- To allow managers to evaluate system development to take proactive measures
- To create highly adaptive methods, processes, and tools to use on a wide array of system engineering development efforts





	MP SRL	MP SRL w/o Sea Frame
MP 1	0.60	0.57

**LEGEND**

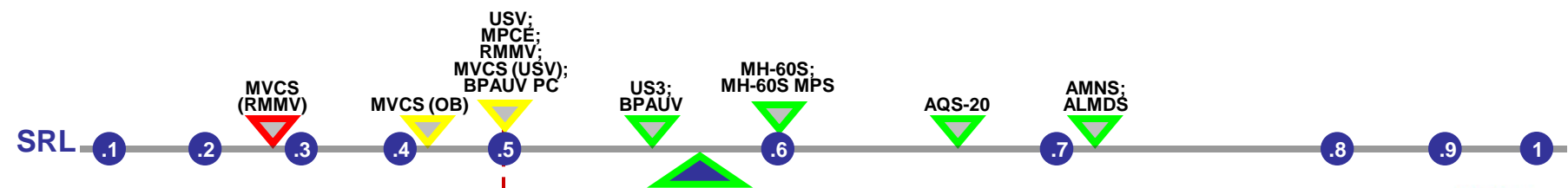
- MP Technology
- Sea Frame System
- Current Mission Package SRL Status
- Previous Mission Package SRL Status
- Current Mission System SRL Status
- 1 Technology Readiness Level
- 1 Integration Maturity Level
- 1 System Readiness Level Demarcation
- Scheduled Position

*Risk to Cost and/or Schedule*

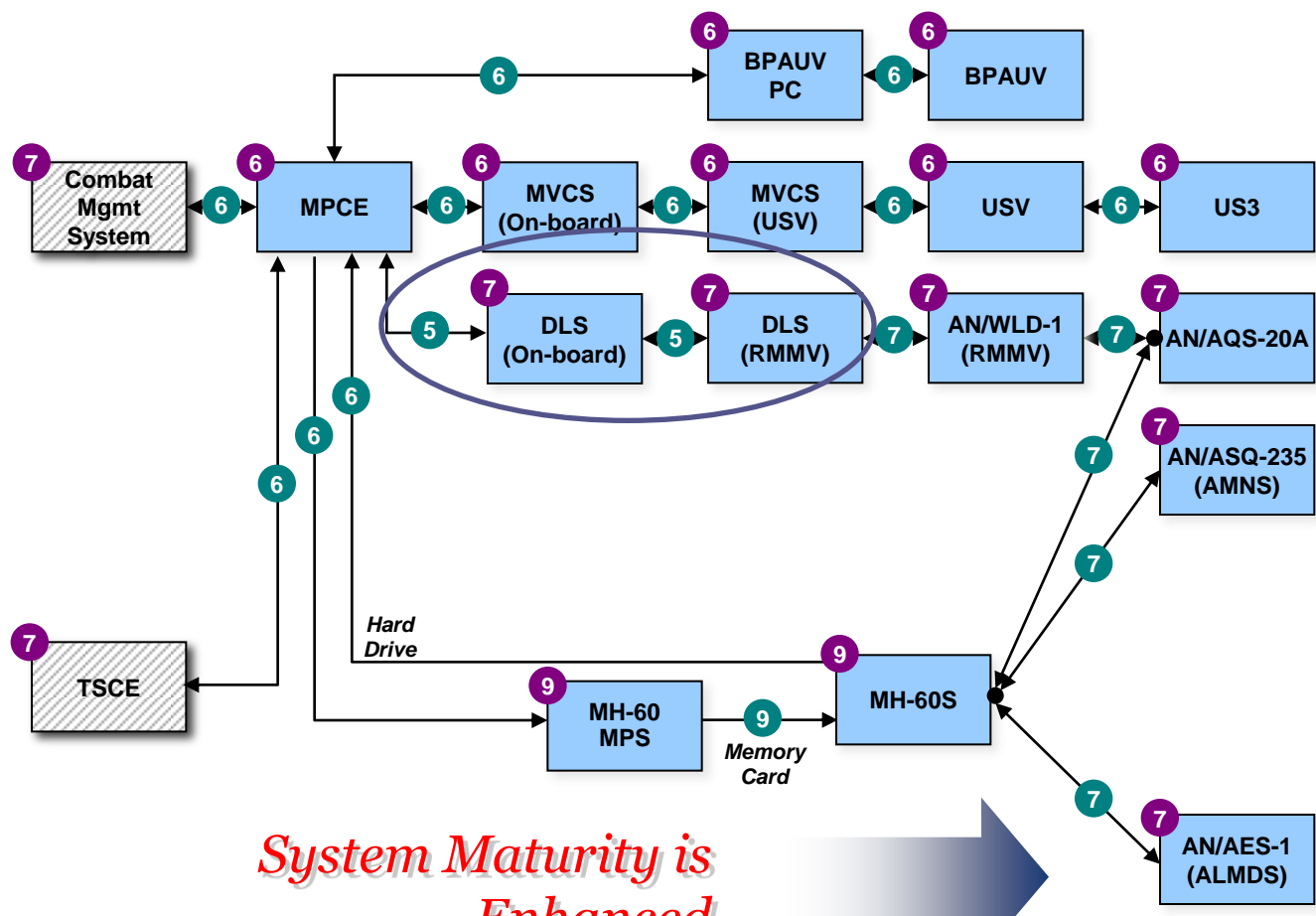
- Low
- Medium
- High

*All Data is Notional*

## Trade Between Advanced Capability or Increased Maturity



Example provided by Northrop Grumman in support of the US Navy PMS 420 Program



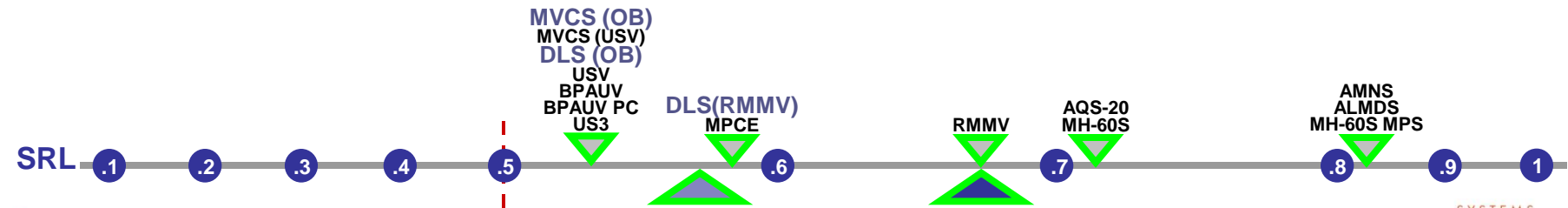
	MP SRL	MP SRL w/o Sea Frame
MP 1	0.64	0.67

**LEGEND**

- MP Technology (Blue box)
- Sea Frame System (Hatched box)
- Current Mission Package SRL Status (Blue triangle)
- Previous Mission Package SRL Status (Purple triangle)
- Current Mission System SRL Status (Grey triangle)
- Technology Readiness Level (Purple circle)
- Integration Maturity Level (Green circle)
- System Readiness Level Demarcation (Blue circle)
- Scheduled Position (Red dashed line)
- Risk to Cost and/or Schedule (Green, Yellow, Red triangles)

*All Data is Notional*

*System Maturity is Enhanced*



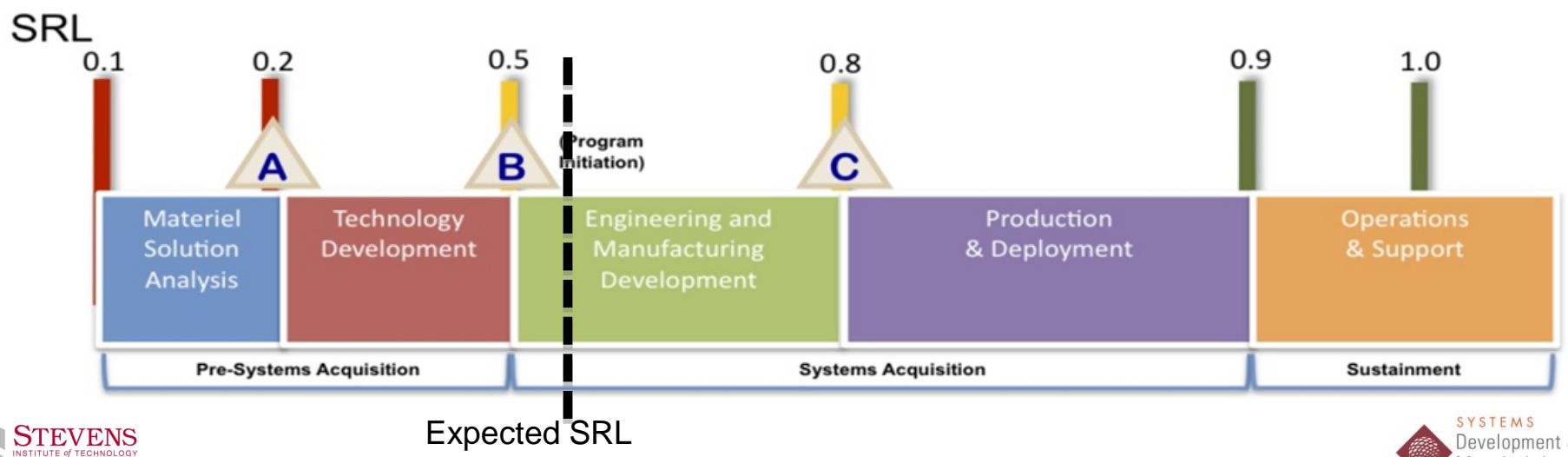
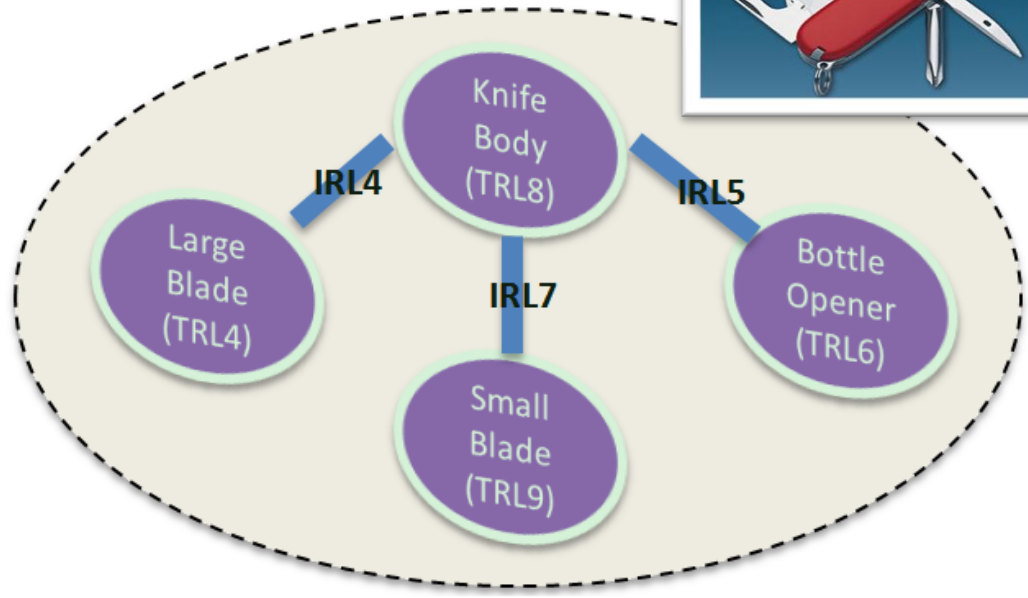
Example provided by Northrop Grumman in support of the US Navy PMS 420 Program

# Multifunction Multicapability System Maturity Assessment

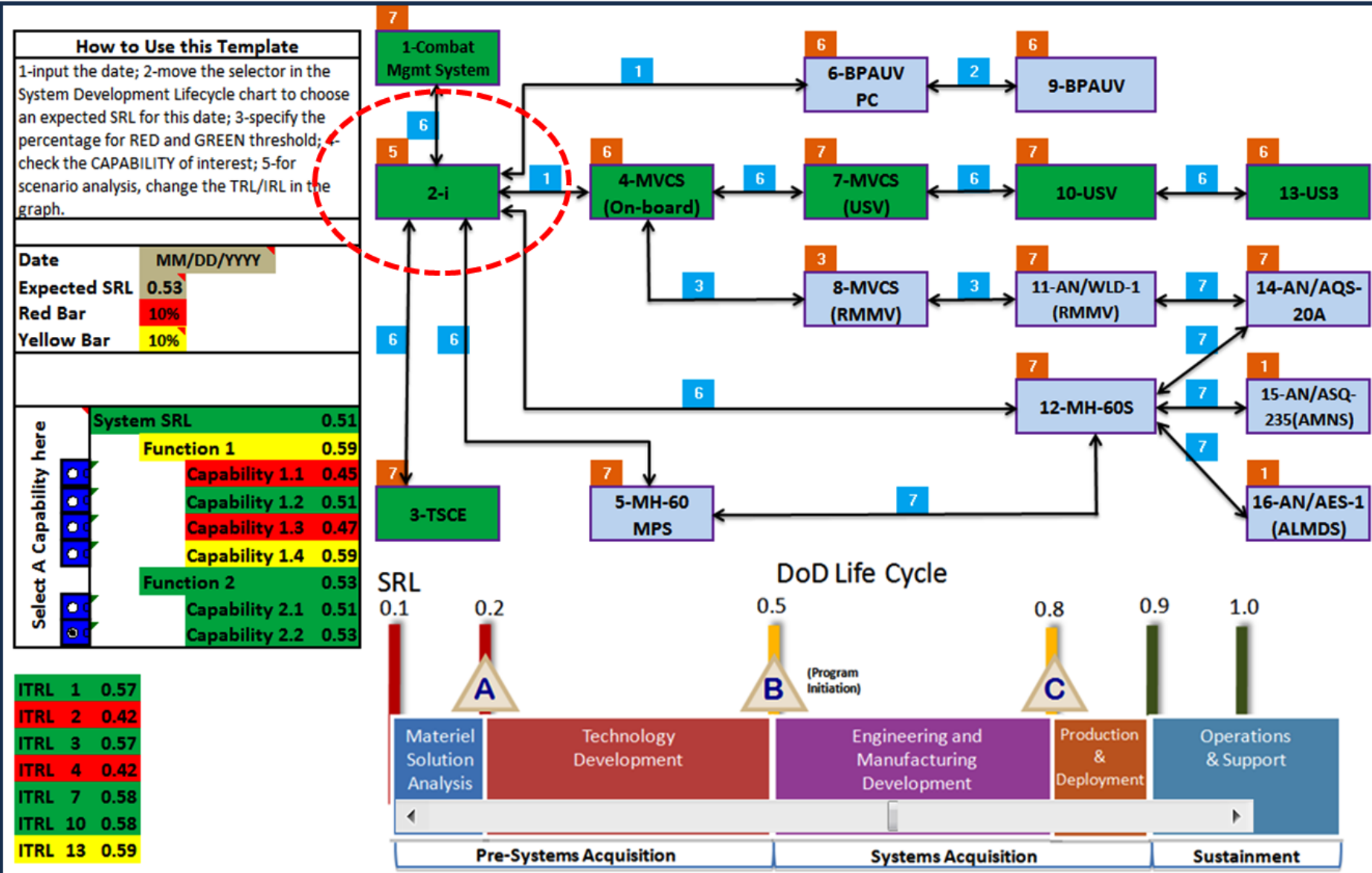


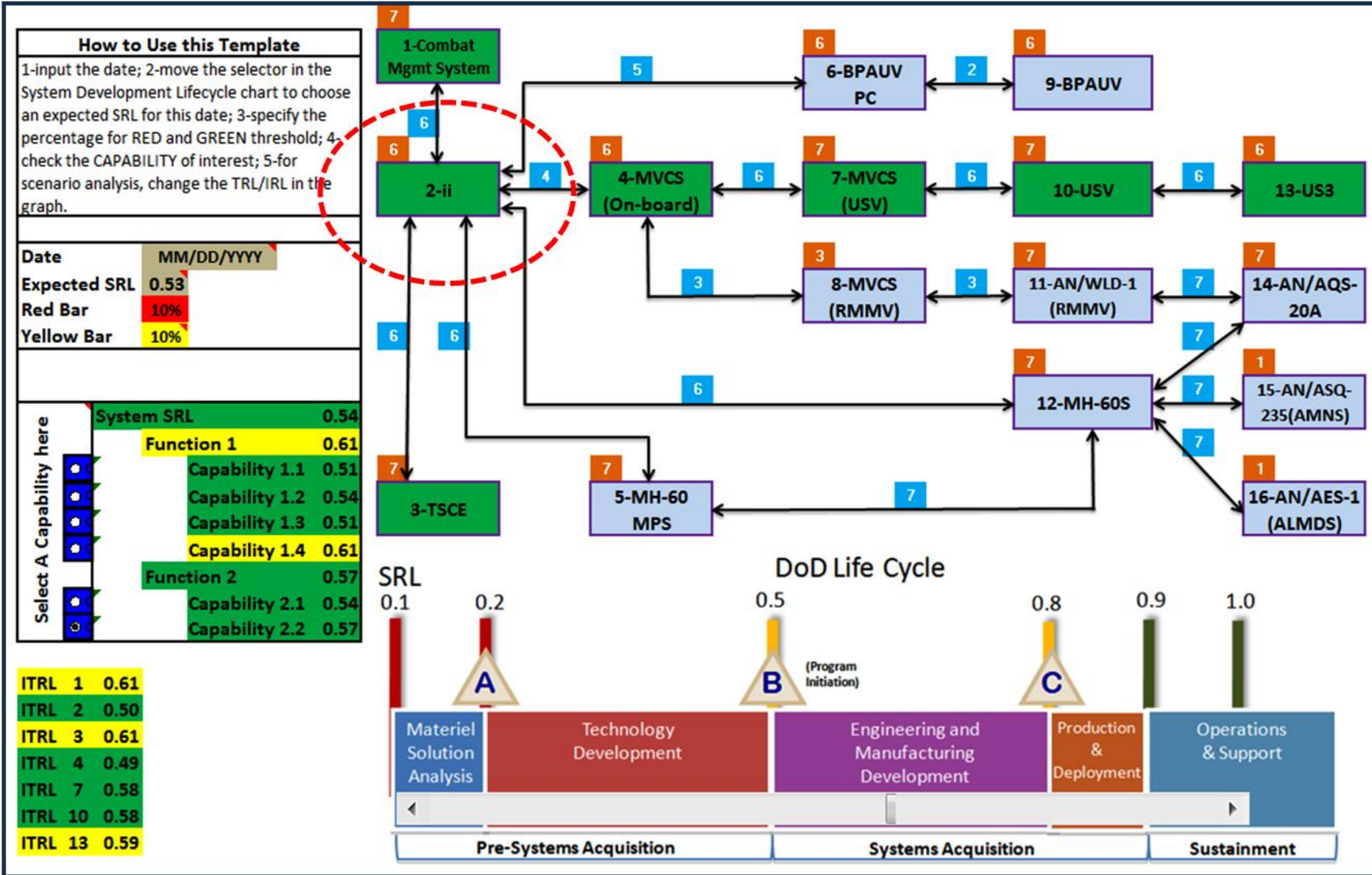
Date MM/DD/YYYY  
Expected SRL 0.55

System SRL 0.64









WARNING  
WARNING  
WARNING  
WARNING

# This is RESEARCH...

- *Component importance is significantly dependent on interest: component importance should be situation-dependent*
- *Discernibility in components importance determination: difference between important components is very small, largely due to the inconsistency of estimates across all technologies*
- *Technologies that have more integration rank relatively higher than those having less integration when all other factors are the same: With out a proper weighting of component importance, intergration will drive risk*
- *Maturity of one system is not the same as maturity for another system: SRL for one system cannot be compared to the SRL of another system unless they are the same system.*