Technology Acquisition Readiness Index and Processes

Lance Flitter

David Bartlett

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
SEP 2007		**00-00-2007 to 00-00-2007**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Technology Acquisition Readiness Index and Processes	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Naval Surface Warfare Center, Carderock Div,PEO Ships S&T Directorate,8500 Macarthur Blvd,West Bethesda,MD,20817-5700**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADM002182. Presented at the AFRL Technology Maturity Conference held in Virginia Beach, VA on 11-13 September 2007.

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			
unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**35**	

Outline

- Technology Assessment Challenge
- Proliferation of new metrics and processes
- Technology Acquisition Readiness
- PEO Ships efforts - TAREP and TARI
- TAREP
- TARI
- Summary
- POCs

Technology Assessment Challenge

Technology Acquisition Readiness

- Technology and systems can be highly complex
- Subjectivity impossible to eliminate
- S&T and Acquisition have different perspectives

New Metric and Processes

Technology Acquisition Readiness

- Proliferation of new technology assessment / management metrics and processes in recent years

- Address some issues but raise others

Technology Acquisition Readiness

- Need metrics and processes that support program and project management in assessing technology in an acquisition context and making acquisition decisions

PEO Ships Efforts

Technology Acquisition Readiness

- PEO Ships S&T Directorate staff work S&T within an acquisition organization

- Have been working on developing two approaches to address technology management issues:
  - Technology Acquisition Readiness Evaluation Process
  - Technology Acquisition Readiness Index tool

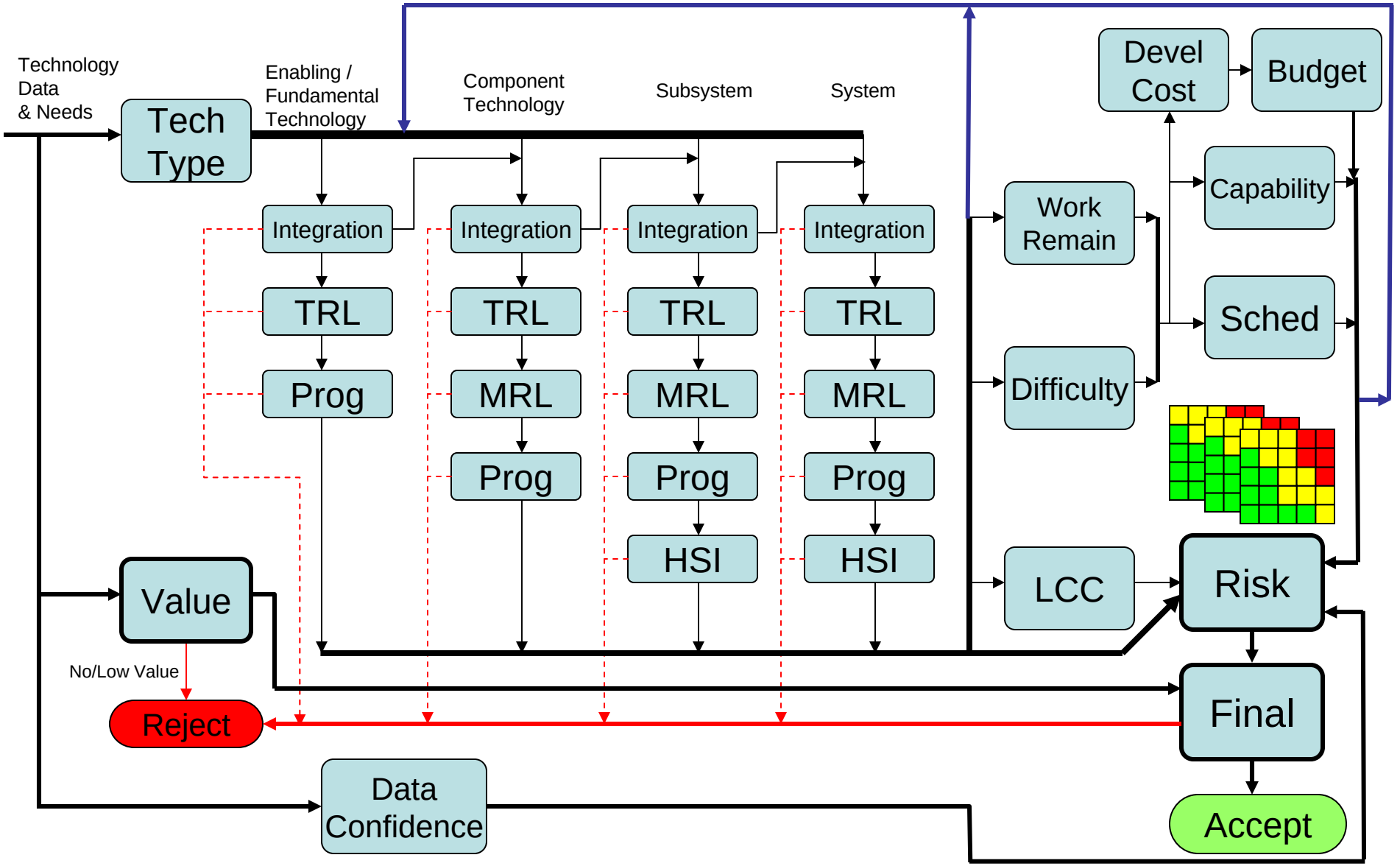
Technology Acquisition Readiness Evaluation Process

Technology Acquisition Readiness

- Strongly driven from an acquisition perspective
- Objective is to provide a **context** for technology assessment / evaluation that feeds acquisition program / project management
- **Not** intended to reinvent the wheel
- Is a work in process

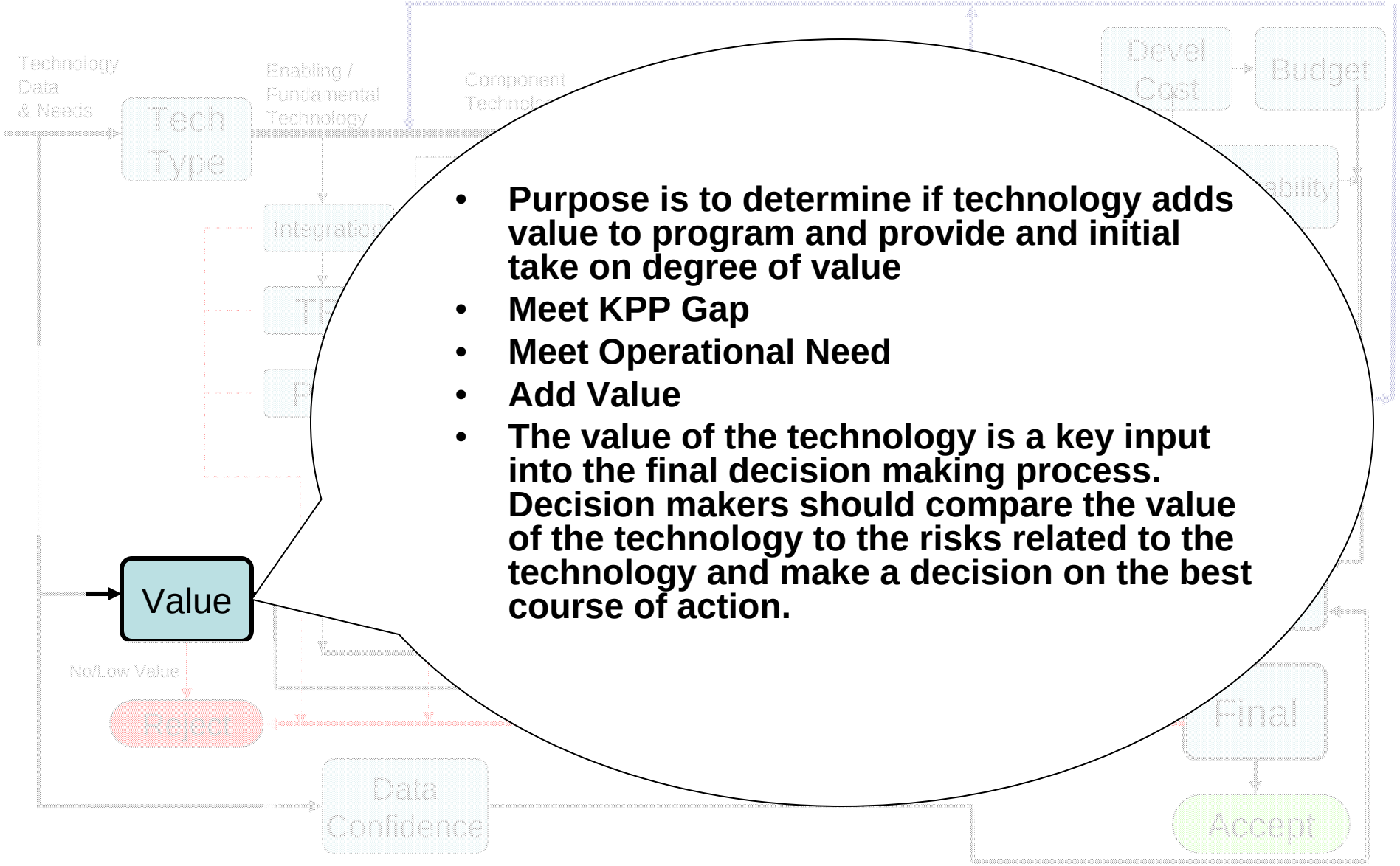
TAREP Overview

Technology Acquisition Readiness



Determine Value

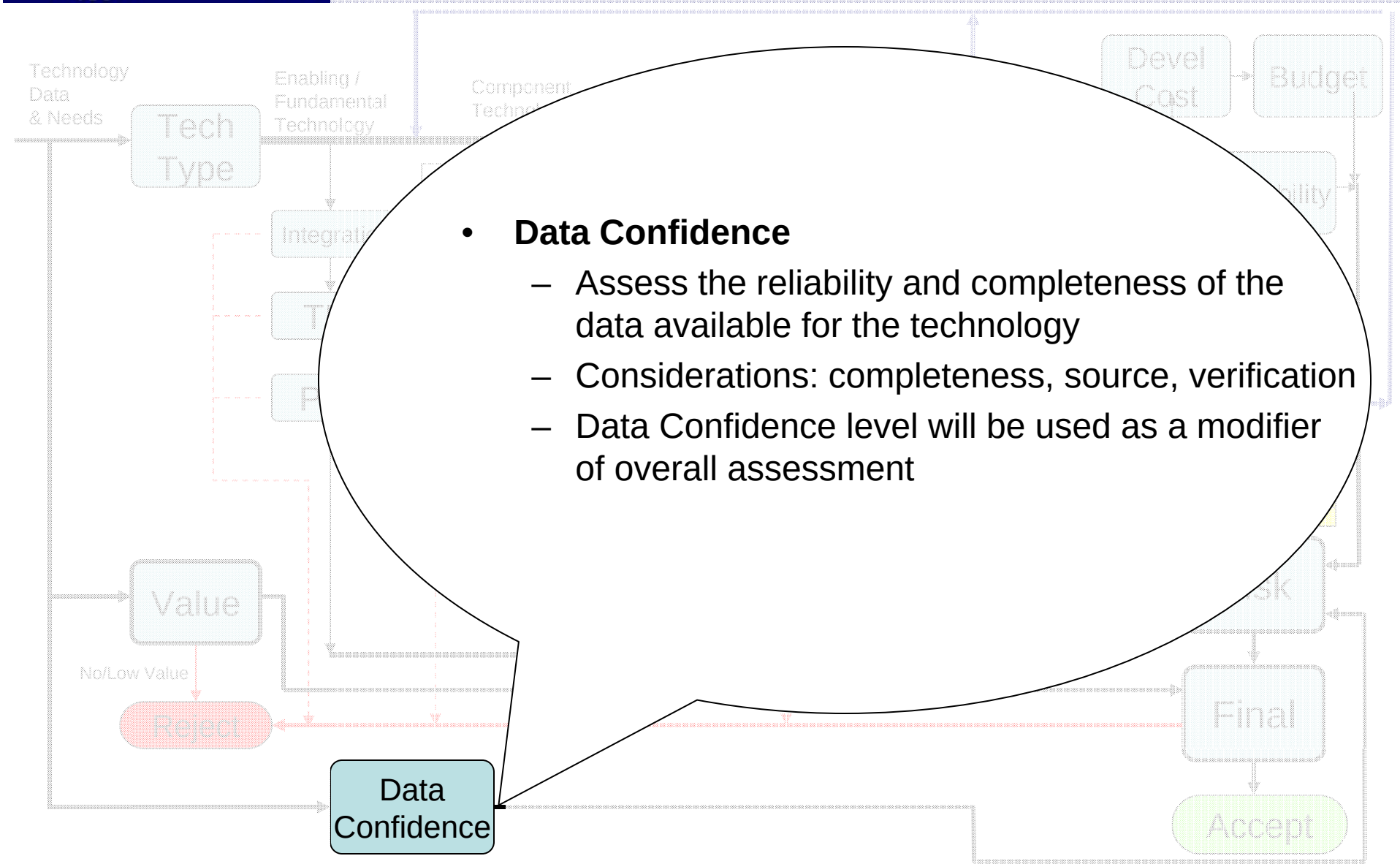
Technology Acquisition Readiness



- **Purpose is to determine if technology adds value to program and provide and initial take on degree of value**
- **Meet KPP Gap**
- **Meet Operational Need**
- **Add Value**
- **The value of the technology is a key input into the final decision making process. Decision makers should compare the value of the technology to the risks related to the technology and make a decision on the best course of action.**

Evaluation Processes

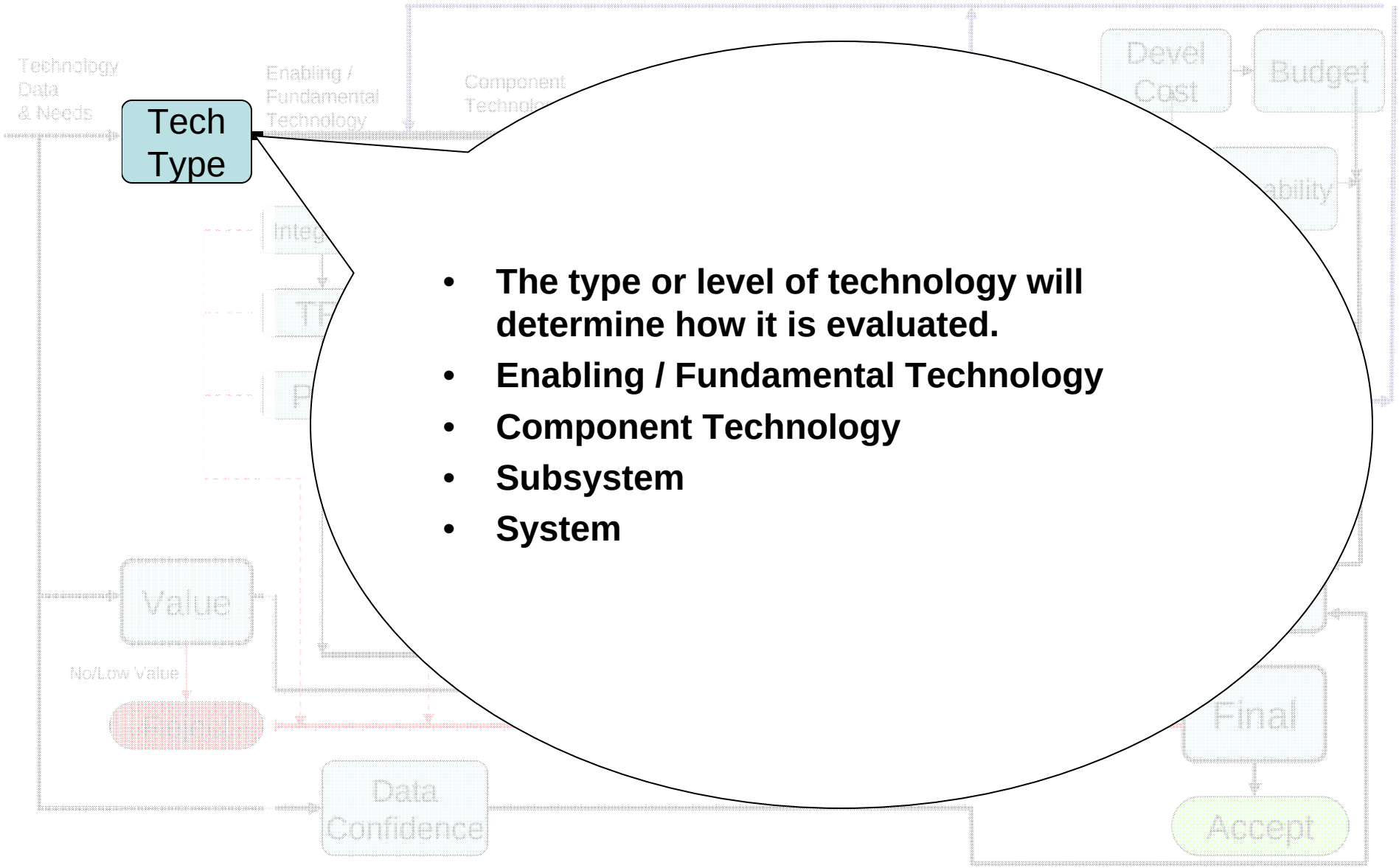
Technology Acquisition Readiness



- **Data Confidence**
  - Assess the reliability and completeness of the data available for the technology
  - Considerations: completeness, source, verification
  - Data Confidence level will be used as a modifier of overall assessment

Technology Type

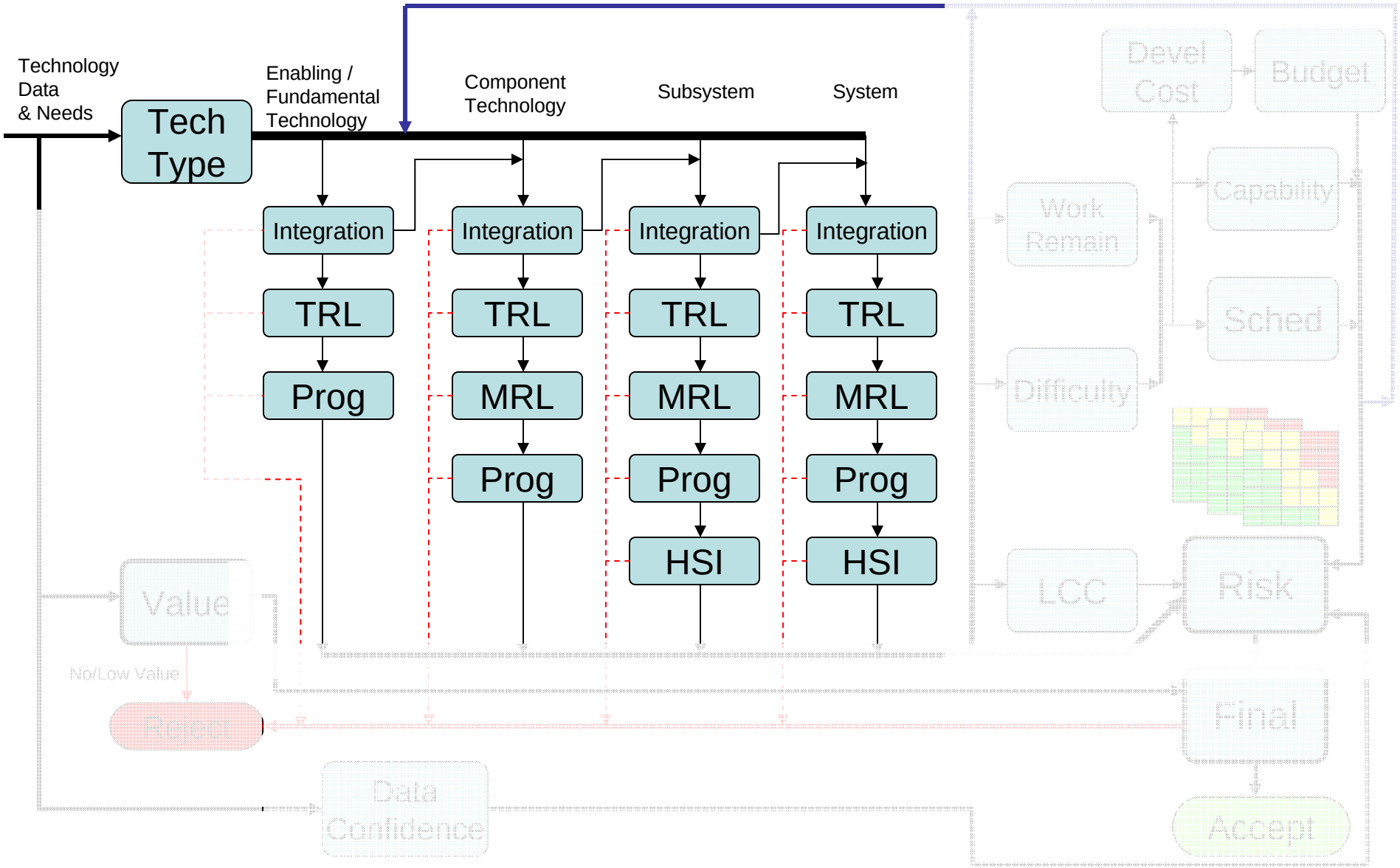
Technology Acquisition Readiness



- **The type or level of technology will determine how it is evaluated.**
- **Enabling / Fundamental Technology**
- **Component Technology**
- **Subsystem**
- **System**

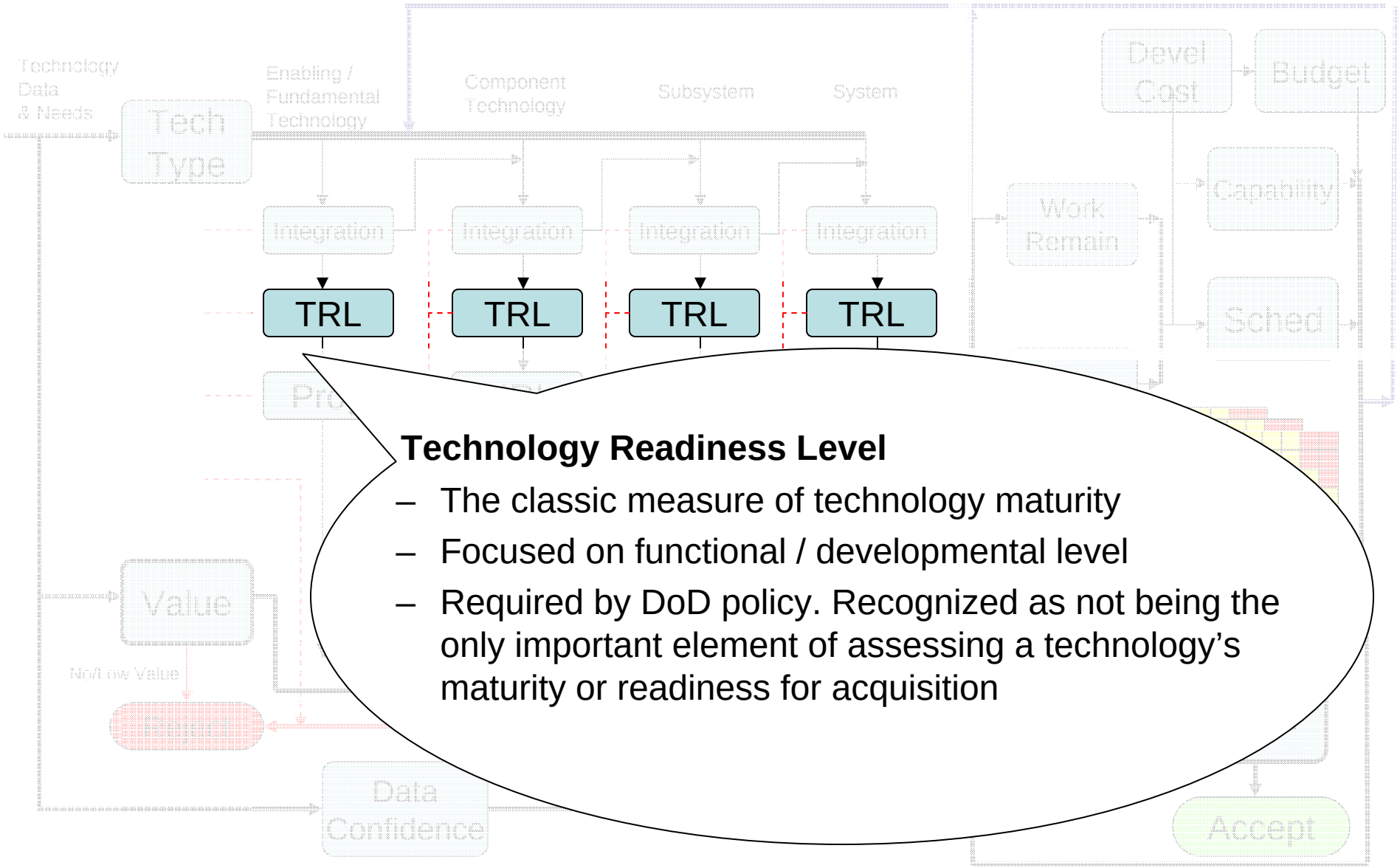
Evaluation by Technology Type

Technology Acquisition Readiness



Evaluation Processes

Technology Acquisition Readiness



Technology Readiness Level

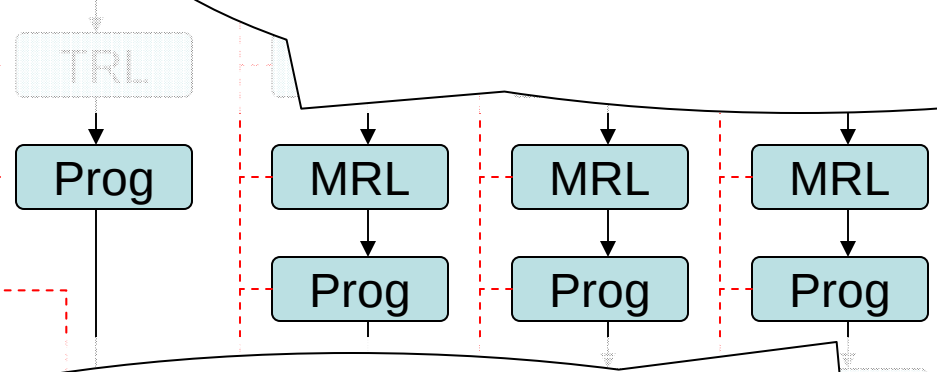
- The classic measure of technology maturity
- Focused on functional / developmental level
- Required by DoD policy. Recognized as not being the only important element of assessing a technology's maturity or readiness for acquisition

Evaluation Processes

Technology Acquisition Readiness

Manufacturing Readiness Level

- Assess the maturity and risk of a technology's underlying manufacturing processes

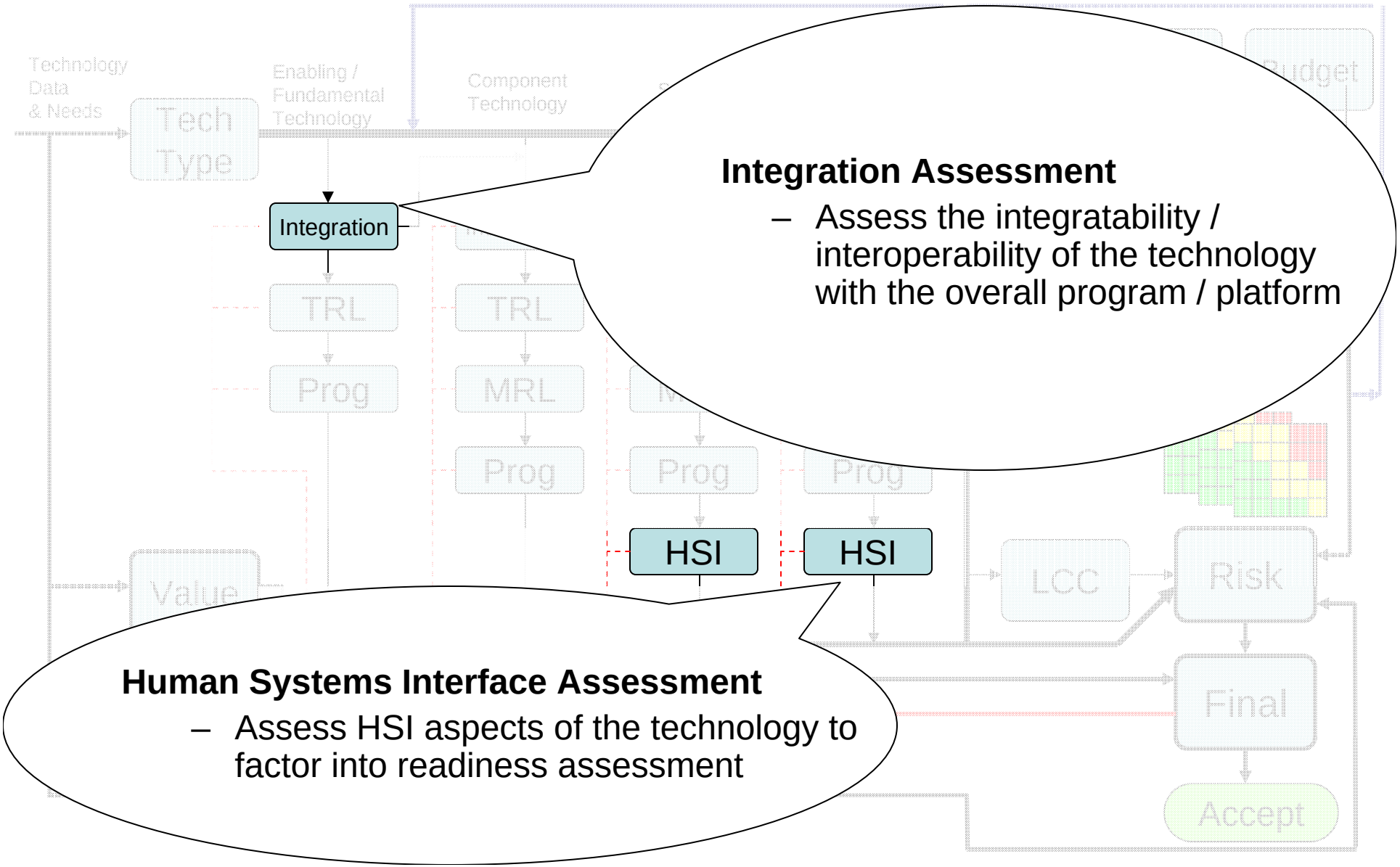


Programmatic Assessment

- Evaluate degree to which technology project / program has satisfied programmatic requirements for getting technologies on ships

Evaluation Processes

Technology Acquisition Readiness



Integration Assessment

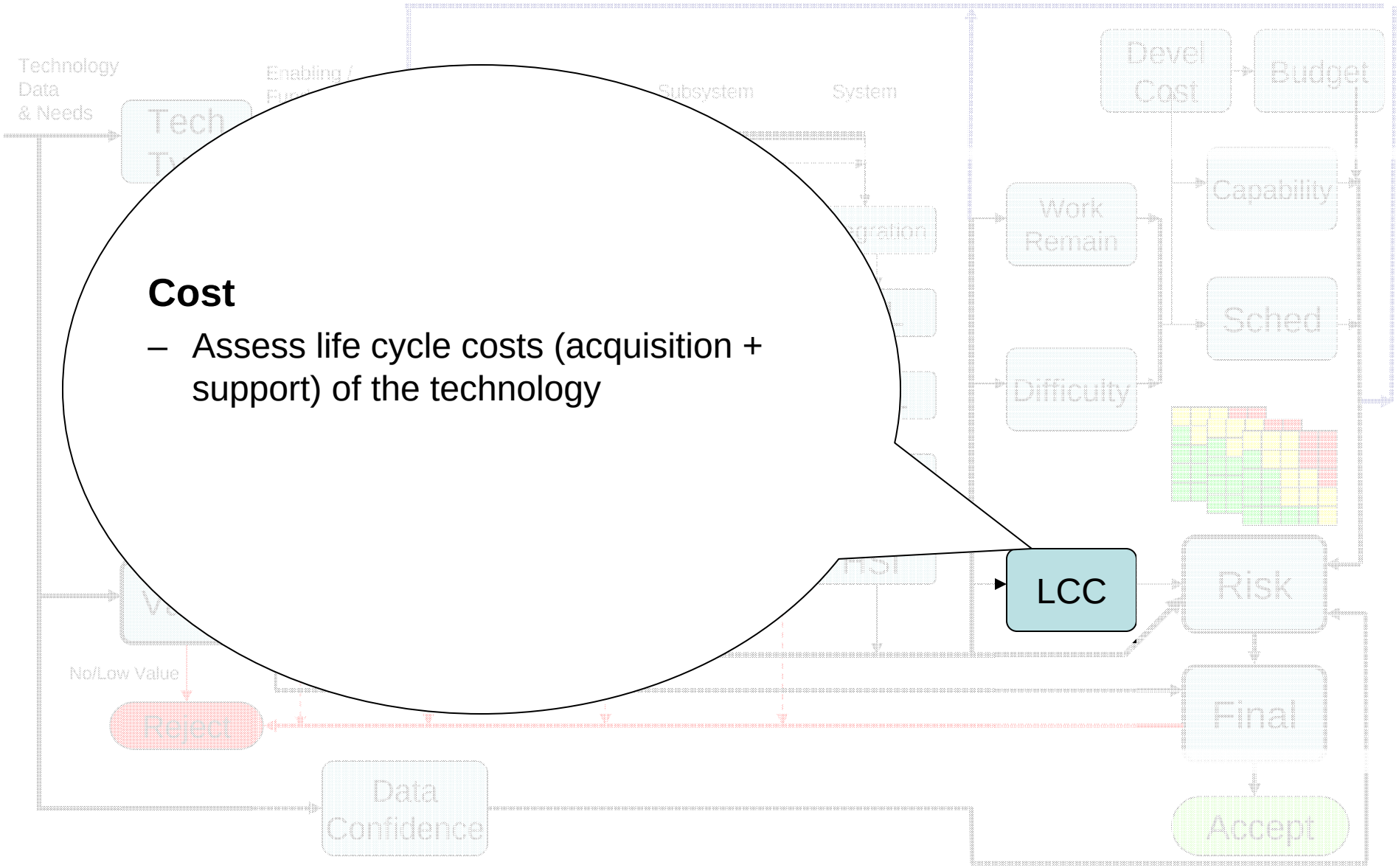
- Assess the integratability / interoperability of the technology with the overall program / platform

Human Systems Interface Assessment

- Assess HSI aspects of the technology to factor into readiness assessment

Evaluation Processes

Technology Acquisition Readiness

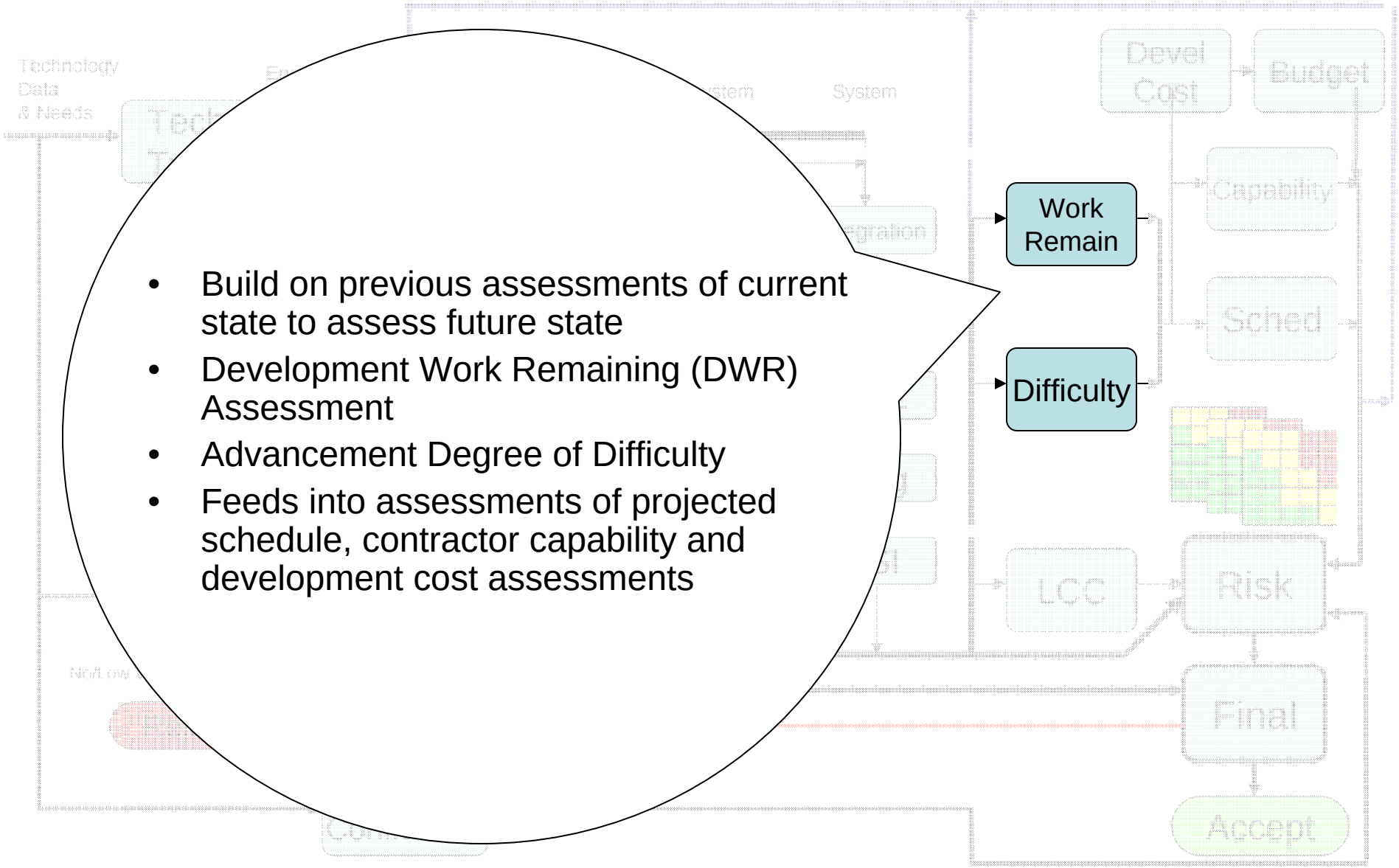


Cost

– Assess life cycle costs (acquisition + support) of the technology

Evaluation Processes

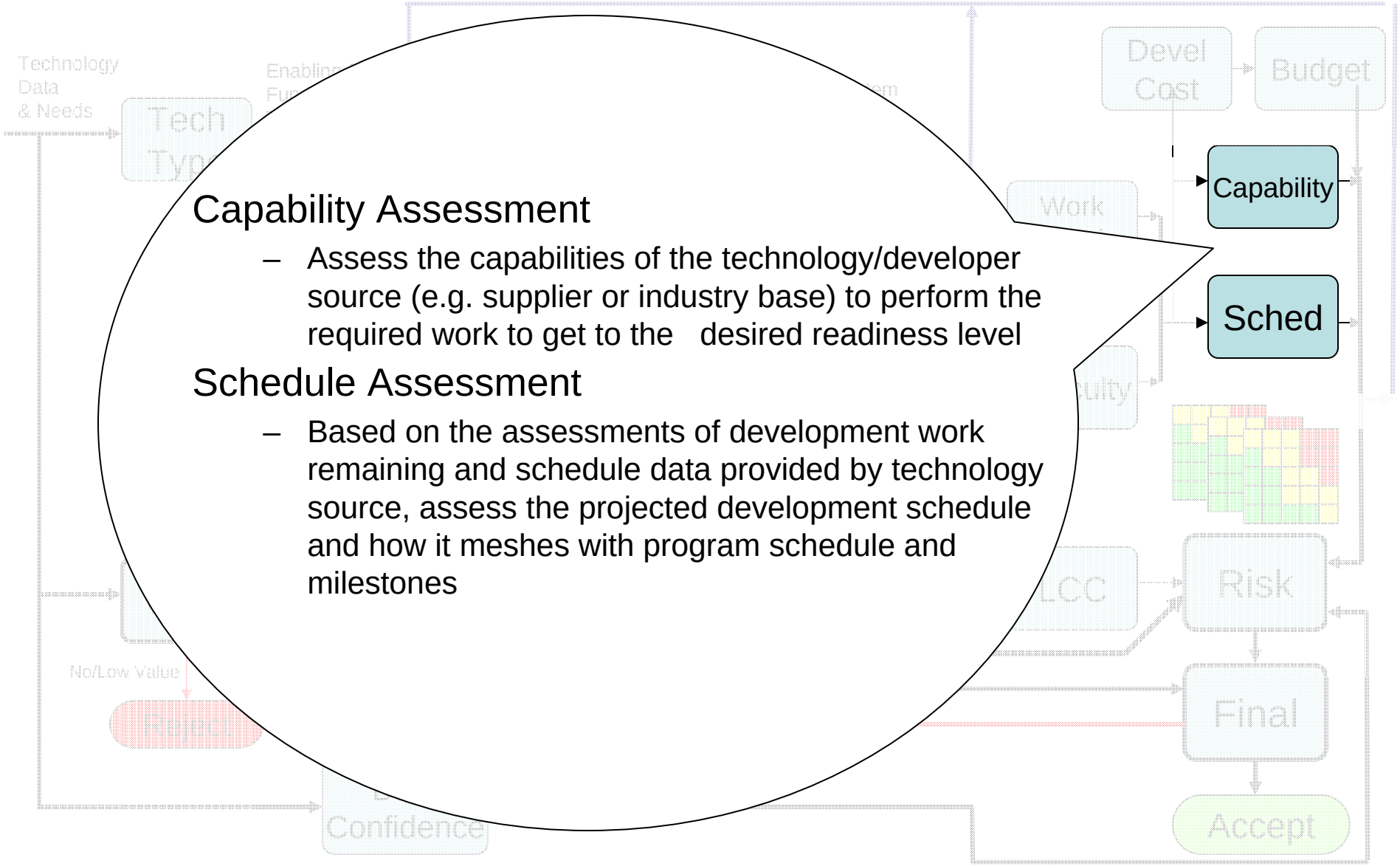
Technology Acquisition Readiness



- Build on previous assessments of current state to assess future state
- Development Work Remaining (DWR) Assessment
- Advancement Degree of Difficulty
- Feeds into assessments of projected schedule, contractor capability and development cost assessments

Evaluation Processes

Technology Acquisition Readiness



Capability Assessment

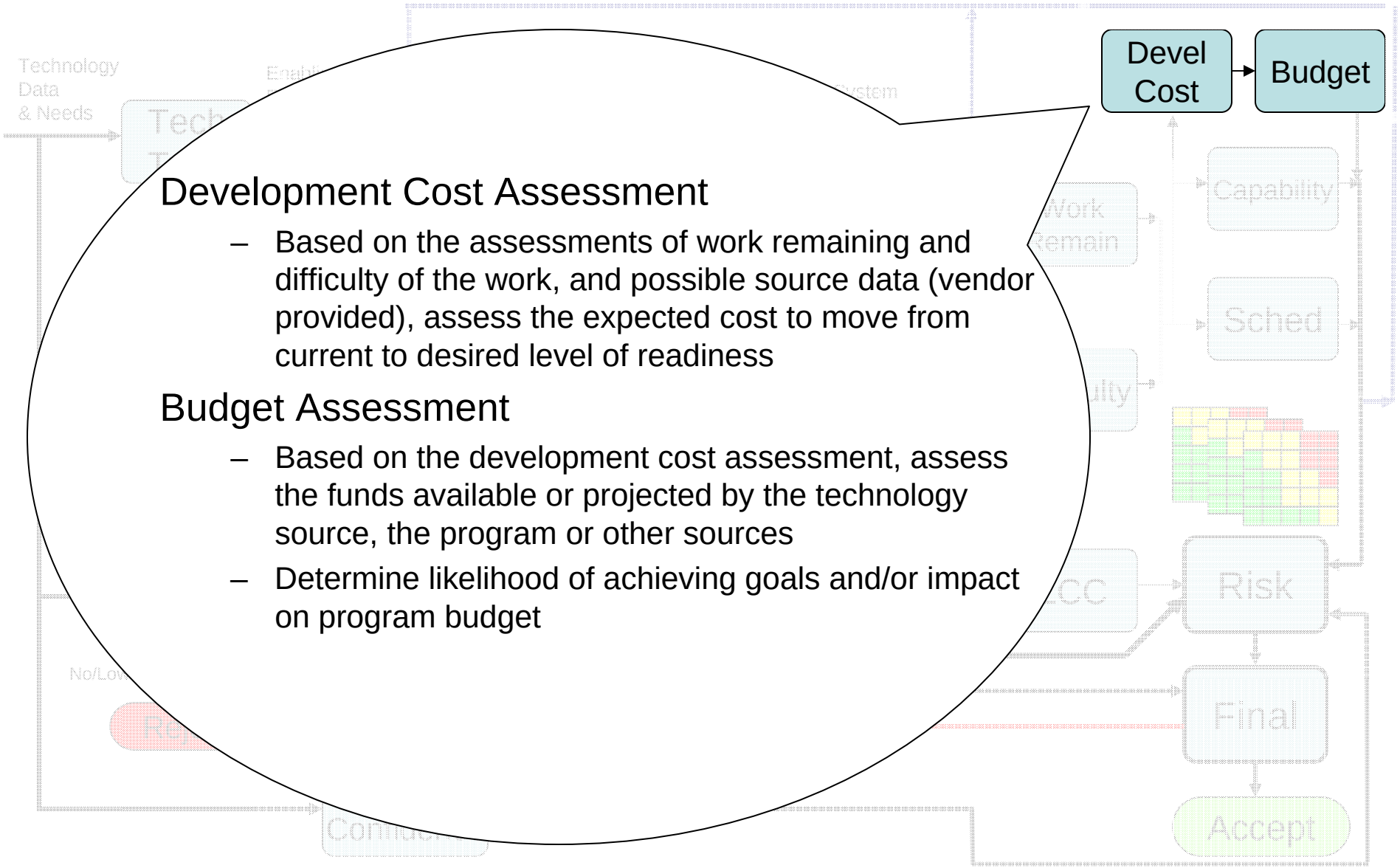
- Assess the capabilities of the technology/developer source (e.g. supplier or industry base) to perform the required work to get to the desired readiness level

Schedule Assessment

- Based on the assessments of development work remaining and schedule data provided by technology source, assess the projected development schedule and how it meshes with program schedule and milestones

Evaluation Processes

Technology Acquisition Readiness



Development Cost Assessment

- Based on the assessments of work remaining and difficulty of the work, and possible source data (vendor provided), assess the expected cost to move from current to desired level of readiness

Budget Assessment

- Based on the development cost assessment, assess the funds available or projected by the technology source, the program or other sources
- Determine likelihood of achieving goals and/or impact on program budget

Evaluation Processes

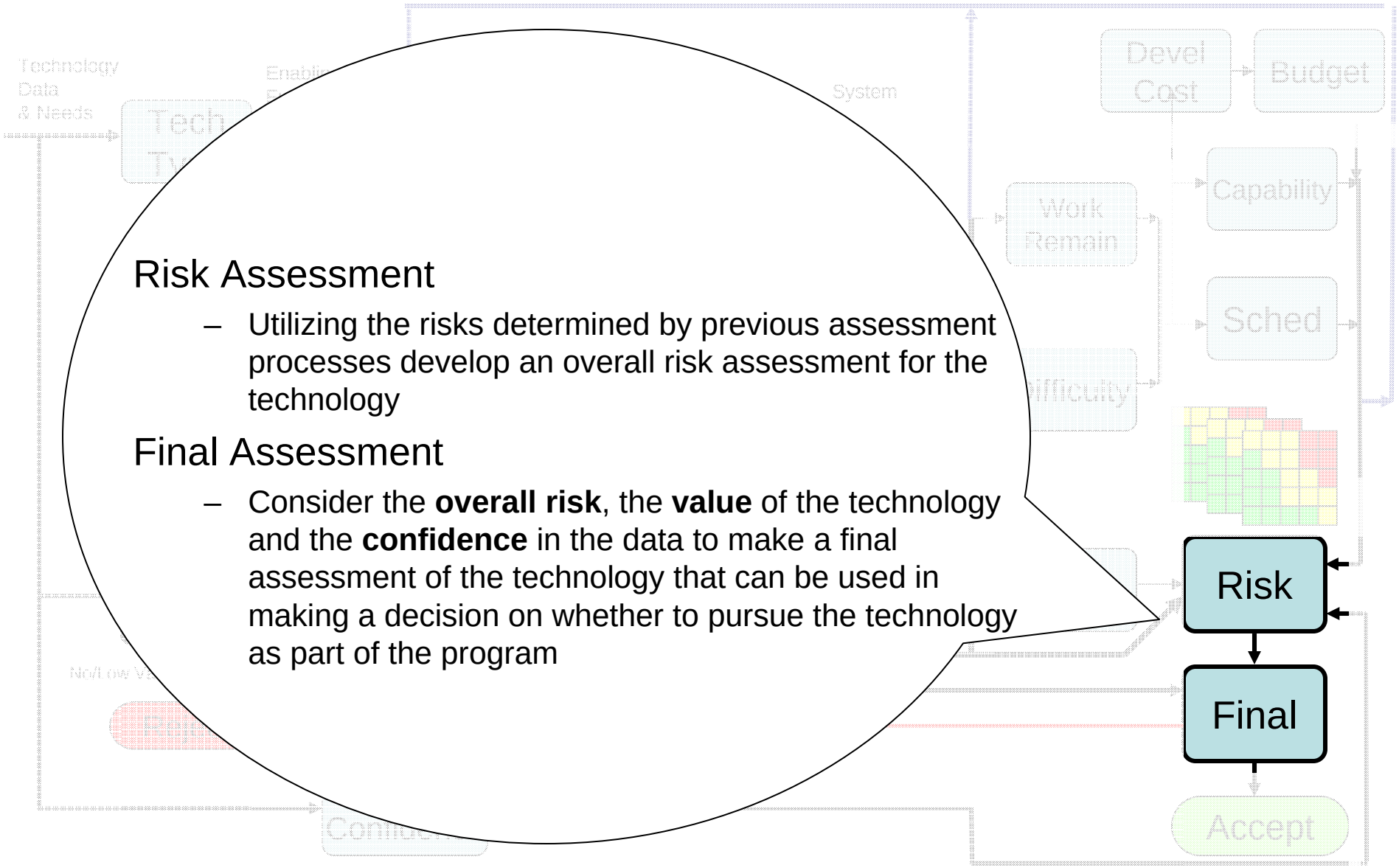
Technology Acquisition Readiness

Risk Assessment

- Utilizing the risks determined by previous assessment processes develop an overall risk assessment for the technology

Final Assessment

- Consider the **overall risk**, the **value** of the technology and the **confidence** in the data to make a final assessment of the technology that can be used in making a decision on whether to pursue the technology as part of the program



TAREP Summary

Technology Acquisition Readiness

- Provides a process flow and context to guide technology assessments with acquisition focus
- Utilize existing metrics and processes. Define relationships between assessment metrics and processes.
- Technology evaluation process and subprocesses feed into risk analysis and provide the needed data to support decision making
- Basic process laid out. Next step is to refine and specify the interfaces / relationships to provide mechanism to enable / facilitate linking of metrics and processes.

Technology Management Discussion

- Natural void between development and procurement
- Mismatch between commercial viability and Military requirements
- Resources are becoming scarcer

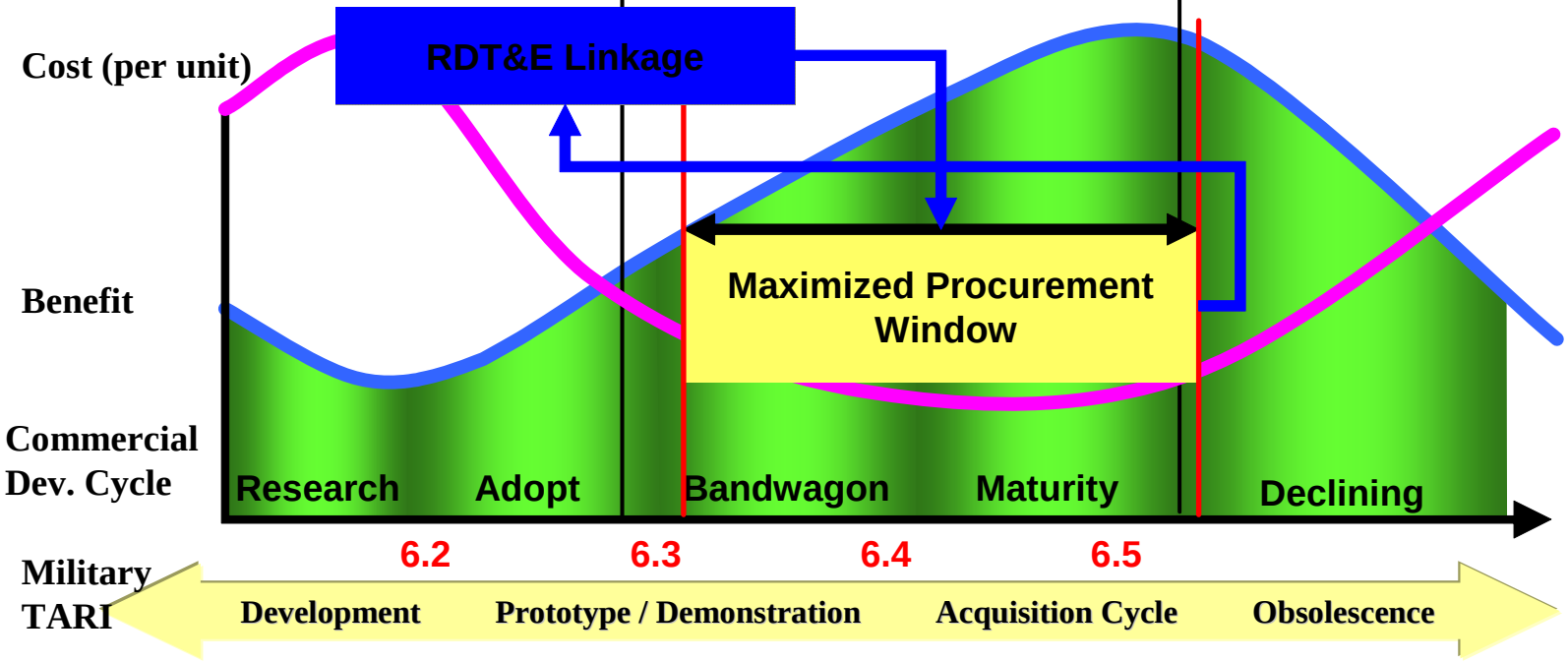
Technology Mgmt Goals

Technology Acquisition Readiness

BLEEDING EDGE
- High purchase cost
- High training cost
- Lack of Support

LEADING EDGE
- Reasonable purchase cost
- Training and support readily available

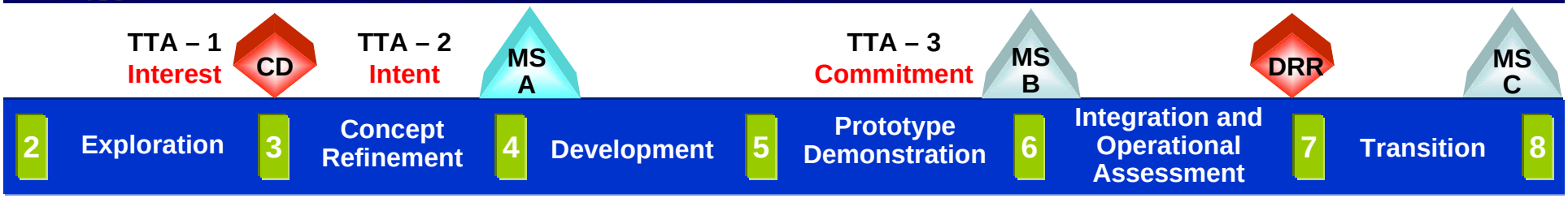
TRAILING EDGE
- High cost of maintenance
- Increased training cost
- Multiple system baseline
- Reduced performance



Push initial procurement to leading edge… Pull replacement within trailing edge

Interaction of Technology & Acquisition

Technology Acquisition Readiness



Peak Involvement

Development Scale

Acquisition Management

- Establishes Exit criteria & Deliverables for each TRL
- Reinforces System Engineering Principles
- Focuses on successful transitioning
- Provides the criteria supporting TTAs
- Defines each TRL as a phase
- Aligns to DoD 5000

Technology Management

Minimal Involvement

Transition Management Model For Technology Maturation

Technology Acquisition Readiness Index
Basic Principles

Technology Acquisition Readiness

Process:

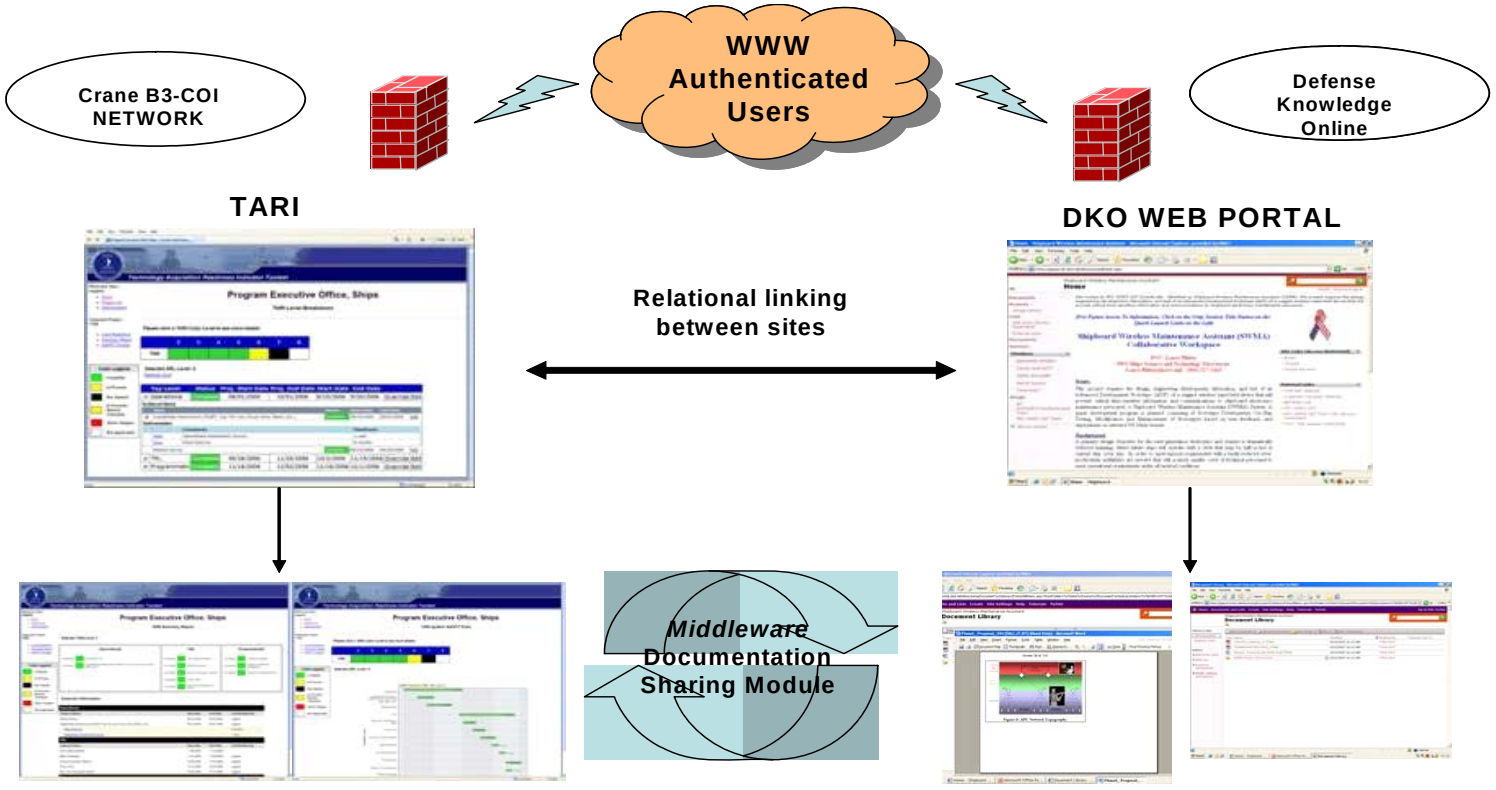
- Make Development Cycle Visible at multiple levels
- Utilize fundamental Systems Engineering Principals
- Establish End Goals, Communication methods and Transition paths early
- Identify / Align Resources
- Think in terms of Portfolio Mgt
- Concentrate on Developing Critical Mass

Tools:

- Web based
- Scalable
- Tailorable
- Automated as much as possible

TARI Framework

Technology Acquisition Readiness



Non- DoD Document Library

- Summary View
- Milestone Documentation
- Industry/Academia Partner Data

DoD Document repository

- Community of Interest
- Project Overviews
- TPOC/Gov't Partner Data

TARI Discussion

Technology Acquisition Readiness

Welcome User:
nsgates

- Home
- Project List
- Administration

Program Executive Office, Ships

Please click a TARI Color Level to see more details

	2	3	4	5	6	7	8
TSM							

Color Legend

- Complete
- In Process
- Not Started
- In Process / Behind Schedule
- Show Stopper
- Not Applicable

PEO SHIPS S&T WLAN Transition

Technology Acquisition Readiness

CD · MS A · MASON Install · COLE Install · MS B · DRR

FISCAL YEAR	2	1999	3	2000	4	2001	2002	5	2003	2004	2005	6	2006	7	2007	8	2008
	Formulation		Proof of Concept		Refinement		Development			Demonstration / Transition				Integration/Production			

Phase I

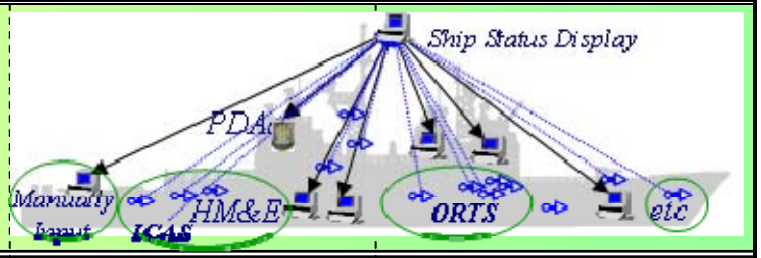
TSM Devel

WLAN Technology

Wireless Sensor Tech

Other Critical Tech

- Define Concept Requirement
- Identify underlying Capability Needs
- Explore technical authority/ Guidance
- Establish Operational value



Phase II

Lab Accreditation

Interoperability Testing

Prototype Development

Initial Prototype Tests

- Design AP Prototype
- Define Technical Guidance
- Perform component I accreditation

Component Design

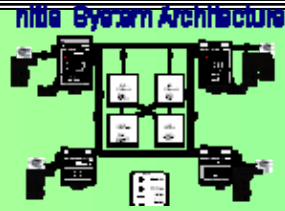
Phase III

- Design/Develop System Architecture
  - Extension to ISNS LAN
- Perform System Accreditation
  - SSAA/ IATO
- Demonstrate Technical Feasibility in operational environment

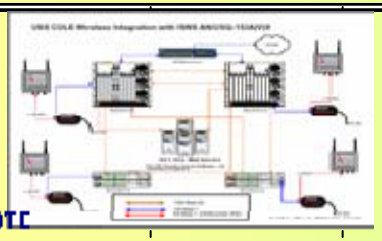
Sys Design · Manufacture · Initial Install

Sys Arch | Assembly. & Ground Test | Evaluate

System Architecture



Transition



- LOE Operational Assessment
- Integrated Design Architecture
- Integrated System Accreditation
- Business Case Assessment
- ATO…

Accredit · MUA · Acquire

T&E | Integrate | POM

Integrated Architecture

Summary

- TAREP and TARI yet one more attempt to tackle aspects of the technology assessment challenge
- TAREP provides a means to define relationships between tech assessment metrics in an acquisition context
- TARI provides a technology project tool to aid project managers in achieving technology transition to acquisition
- Both are works in progress and are open to comment

POCs

- Lance Flitter
  (301) 227-3161
  Lance.Flitter@navy.mil

- David Bartlett
- (812) 854-2285
- David.Bartlett@navy.mil

TARI Slide Transitions

Welcome User:
nsgates

- Home
- Project List
- Administration

Selected Project
TSM

- Level Breakdown
- Summary Report
- GANTT Timeline

Program Executive Office, Ships

TARI Level Breakdown

Please click a TARI Color Level to see more details

	2	3	4	5	6	7	8
TSM							

Color Legend

- Complete
- In Process
- Not Started
- In Process / Behind Schedule
- Show Stopper
- Not Applicable

Selected ARL Level: 5

Refresh Grid

	Top Level	Status	Proj. Start Date	Proj. End Date	Start Date	End Date		
−	Operational	Complete	06/04/2007	06/27/2007	6/4/2007	6/20/2007	Override	Edit

Sublevel Items

	Item	Status	Start Date	End Date	
−	Conduct Assessment Surveys	Complete	06/04/2007	06/18/2007	Edit

Deliverables

		Comments	Timeframe
	View	Operational Assessment Survey	

+	Request Authority To Operate	Complete	06/13/2007	06/16/2007	Edit
	Initiate SCD and Shipmain processes	Complete	06/13/2007	06/20/2007	Edit

TRL	Complete	06/20/2007	07/18/2007	6/17/2007	7/15/2007	Override	Edit
Programmatic	Complete	06/28/2007	08/14/2007	7/1/2007	8/5/2007	Override	Edit

Ability to view associated documents

PEO SHIPS
Science and Technology Office

USS COLE Wireless Local Area Network (WLAN)

USAGE EVALUATION SURVEY
DECEMBER 2005

FINAL TABULATIONS

Prepared for:

Trident Warrior 05
Military Utility Assessment
(TW05 MUA)

Welcome User:
nsgates

- Home
- Project List
- Administration

Selected Project
TSM

- Level Breakdown
- Summary Report
- GANTT Timeline

Color Legend

- Complete
- In Process
- Not Started
- In Process / Behind Schedule
- Show Stopper
- Not Applicable

Program Executive Office, Ships

TARI Summary Report

Selected TARI Level: 5

Operational		TRL		Programmatic	
Complete	Initiate SCD and Shipmain processes	Complete	Test Prototype as System in Simulated Operational Setting	Complete	Establish Exist Criteria
Complete	Request Authority To Operate	Complete	Produce Prototype Hardware for a Relevant Environment	Complete	Cost & Risk Assessment
Complete	Conduct Assessment Surveys	Complete	Demonstrate Increased Capabilities	Complete	Transition Agreement (commitment)
		Complete	Demonstate Prototype Ready for Operations	Complete	LCC

Sublevels / Deliverables:

Operational

Sublevel Name	Start Date	End Date	Last Modified By
Initiate SCD and Shipmain processes	06-13-2007	06-20-2007	nsgates
Request Authority To Operate	06-13-2007	06-16-2007	nsgates
Authority To Operate			
Conduct Assessment Surveys	06-04-2007	06-18-2007	nsgates
Operational Assessment Survey			

TRL

Sublevel Name	Start Date	End Date	Last Modified By
Test Prototype as System in Simulated Operational Setting	06-30-2007	07-04-2007	nsgates
Produce Prototype Hardware for a Relevant Environment	06-25-2007	06-29-2007	nsgates
Demonstrate Increased Capabilities	06-22-2007	07-15-2007	nsgates
Demonstate Prototype Ready for Operations	06-17-2007	06-24-2007	nsgates

Programmatic

Welcome User:
nsgates

- Home
- Project List
- Administration

Selected Project
TSM

- Level Breakdown
- Summary Report
- GANTT Timeline

Program Executive Office, Ships

TARI System GANTT Chart

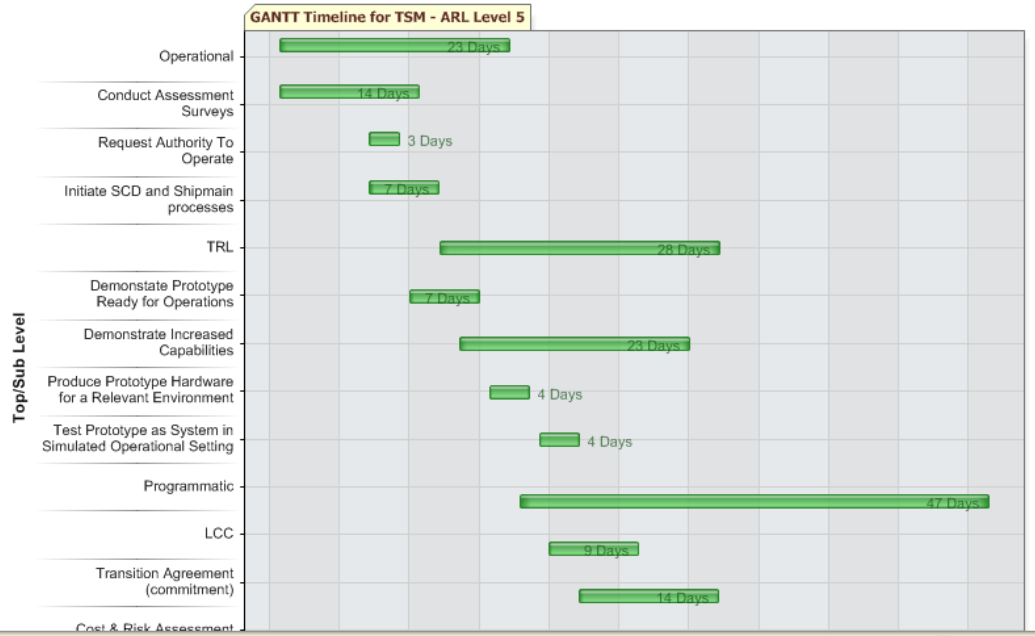
Please click a TARI Color Level to see more details

	2	3	4	5	6	7	8
TSM							

Color Legend

- Complete
- In Process
- Not Started
- In Process / Behind Schedule
- Show Stopper
- Not Applicable

Selected ARL Level: 5



Local intranet 100%