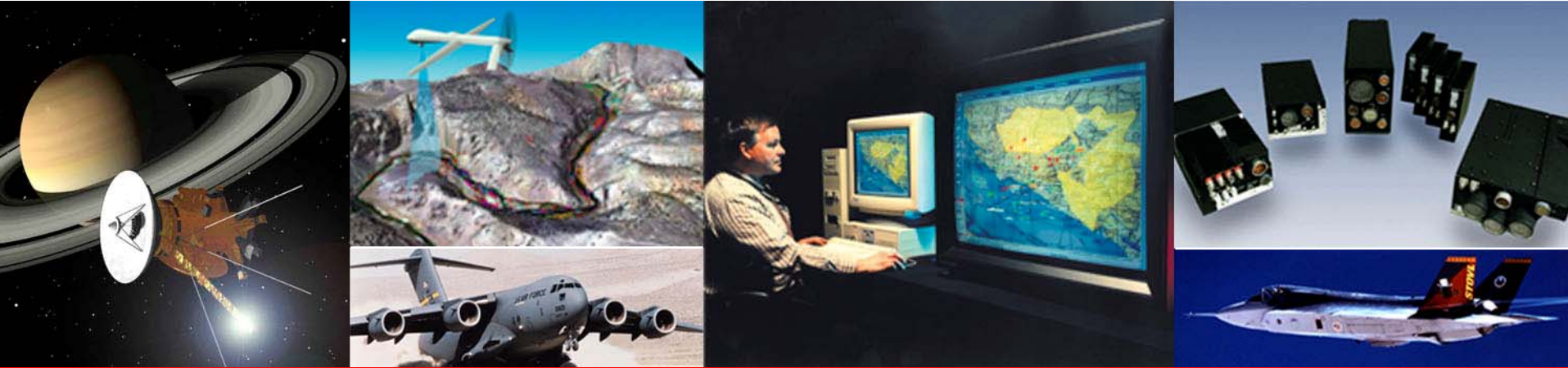# Common Taxonomy Fuels a Learning Engine

Electronics, Intelligence and Support Operating Group

John M. Johnston
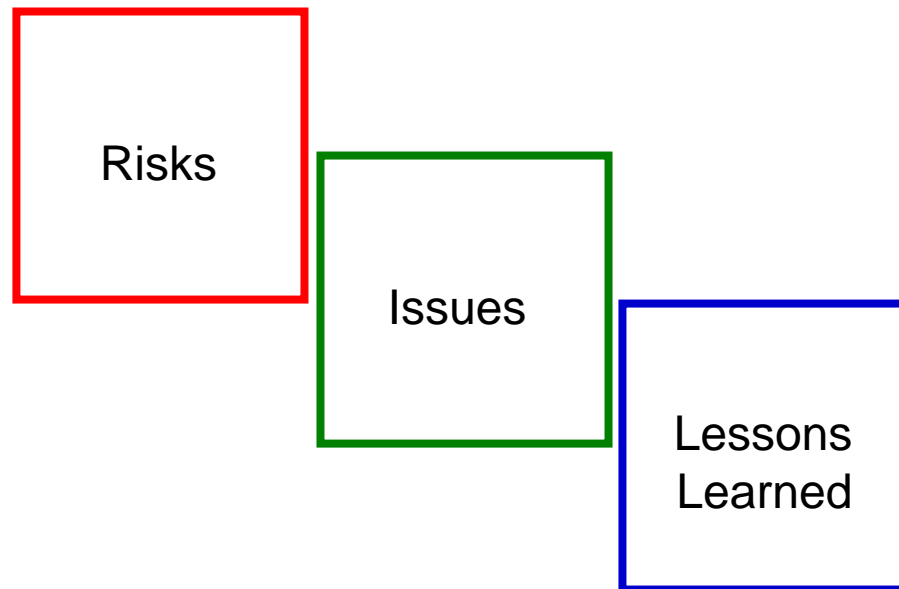
Agenda

- Concept Overview

- Concept Details

- Summation

- Questions

Concept Overview

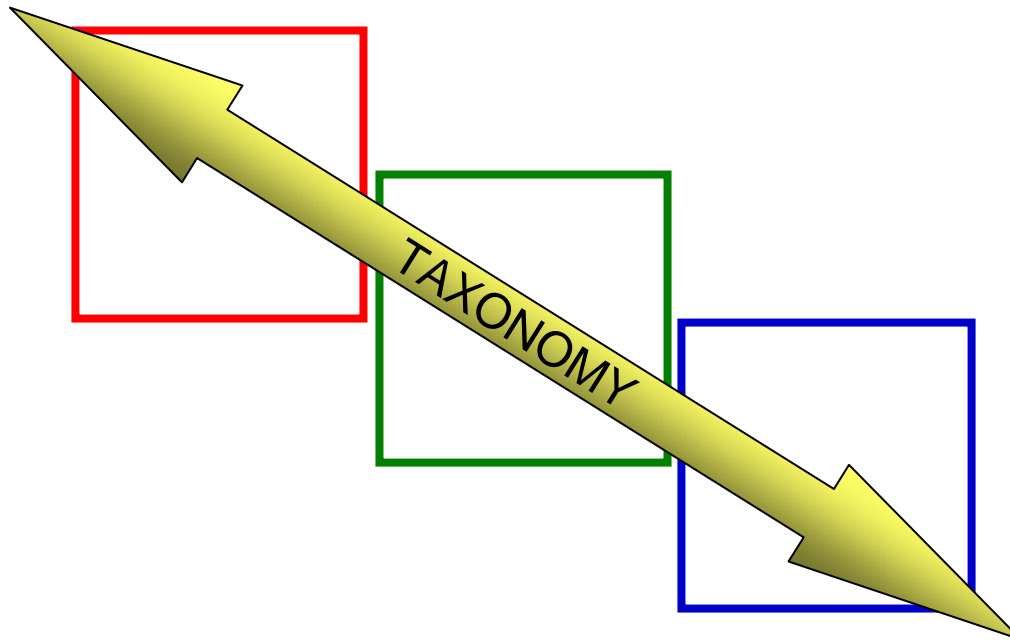- The briefing will describe the connection among risks, issues, and lessons learned

Risks

Issues

Lessons Learned

Concept Overview

- The briefing will describe the connection among risks, issues, and lessons learned, using a common taxonomy

Concept Overview

- It will describe how to build an integrated approach that will enable a more effective feedback system

Lessons Learned
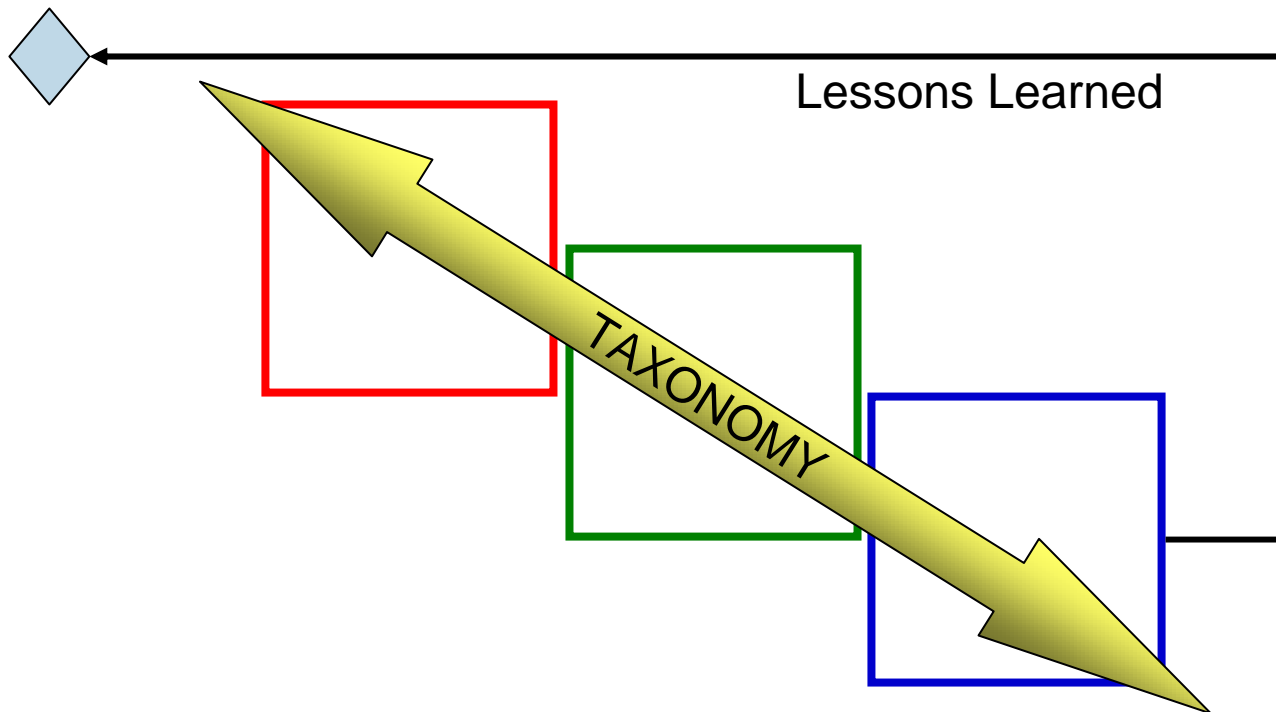
TAXONOMY

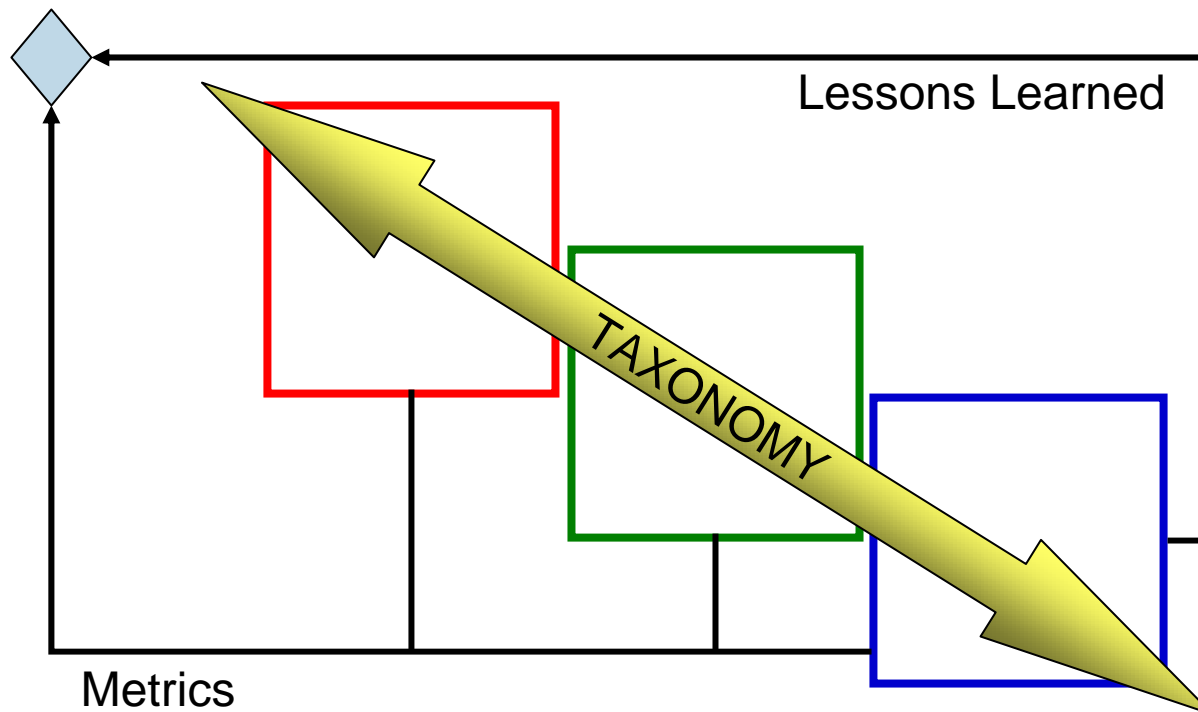# Concept Overview

- It will describe how to build an integrated approach that will enable a more effective feedback system that provides for process improvement

Risk Taxonomy

- Simple definition:

  - A list of possible sources of risks
    - Areas of uncertainty on the project

  - Based upon expert judgment or past experience
    - Logical selection that projects endorse (agreed to)

  - Standardized for the organization
    - Not changing from project to project

A standardized, agreed-to list of possible risk areas

Risk Taxonomy Example

Collocation / Communication	Planning / Estimating
Customers	Political
Design	Regulatory
Environmental	Reliability / Maintainability
Facilities	Requirements
Information Technology	Security
Integration & Test	Staffing
Interfaces	Stakeholders
Management Experience	Subcontracts
Monitor & Control	Training

Risk Breakdown Structure (RBS) Example

Project

Technical	External	Internal	Project Management
Requirements	Regulatory	Staffing	Management Experience
Design	Political	Facilities	Collocation / Communication
Integration & Test	Stakeholders	Training	Planning / Estimating
Reliability / Maintainability	Customers	Security	Monitoring & Controlling
Interfaces	Subcontracts	Information Technology	
	Environmental		

Risks to Lessons Learned Spectrum

Lessons Learned Retrieval; Risk Identification; Risk Mitigation

- A: It is easy to search for relevant lessons learned, prior to starting the project planning or next-phase planning activities
- Z: Relevant lessons learned are not easily found, since they were not set up with sorting and retrieval in mind

- A: The risk identification process is well organized; enabled by the use of a common taxonomy and tagged by likelihood of occurrence
- Z: The risk identification process is less organized; hindered by risk categories that are different from project to project

- A: Risk mitigation is more effective due to classification; allowing multiple risks to be mitigated by a single response plan
- Z: Risk mitigation is more disjointed, due to the inability to see the similarities among identified risks

Risks to Lessons Learned Spectrum

Issues; Lessons Learned Submittal; Process Improvement

- A: Issues are efficiently classified, due to the use of a common taxonomy
- Z: Issues classification varies from project to project; each re-inventing classification terms

- A: Lessons learned are efficiently recorded, due to a standard template and taxonomy reference; both aiding lessons learned development and retrieval
- Z: Lessons learned submittals are not developed in a consistent manner form project to project

- A: Risk analysis and future process improvements are possible, due to categorization and measurement collection
- Z: Risk analysis and future process improvements are not possible, due to inability to categorize or measure occurrences of risks

Recommendations

- Risk
  - Use a standard set of risk sources / categories
    - Can be grouped into a hierarchical Risk Breakdown Structure

- Issues
  - Use the same categories that were used to classify risks

- Lessons learned
  - Use common lessons learned template
  - Identify risk categories; if they are embedded in the lessons learned

- Capture metrics based upon common taxonomy use
  - Keep database current and effective for the organization and projects

Note: Presentation does not distinguish between the terms "sources" and "categories"

Concept Details

- Risks
- Issues
- Lessons Learned
- Measurements and Refinements

- Will include references from:
  - Capability Maturity Model Integration (CMMI®) Process Areas (PA)
    - Specific Practices (SP)
    - Generic Practices (GP)
  - A Guide to the Project Management Body of Knowledge; Third Edition (PMBOK® Guide) Knowledge Areas

CMMI® is a registered trademark of Carnegie Mellon University
PMBOK® Guide is a registered trademark of the Project Management Institute, Inc.

Risk Management

Risks

Issues

Lessons Learned
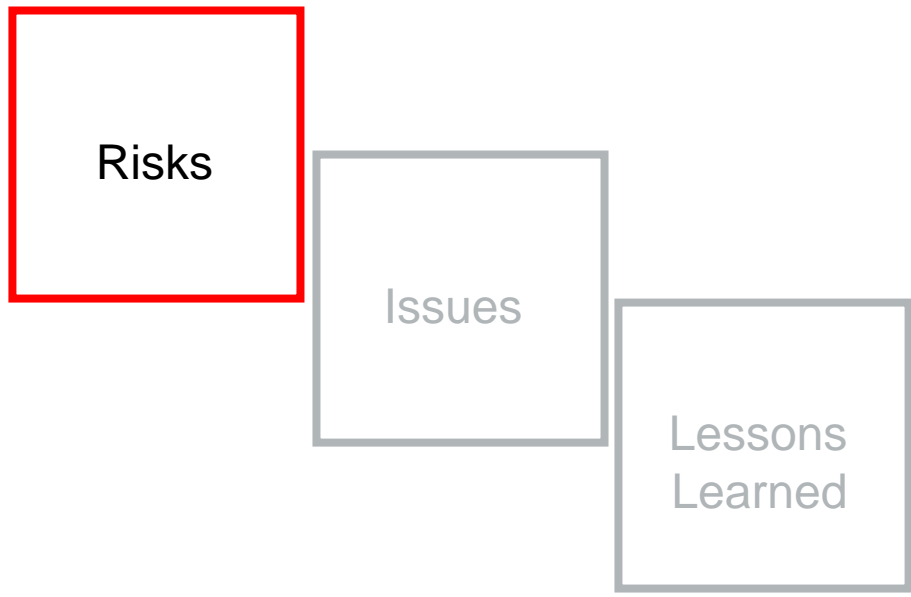
CMMI® and PMBOK® Guide Views of Risk

CMMI® v 1.2		**PMBOK® Guide Third Edition**	
RSKM	**Risk Management**	**11**	**Project Risk Management**
SG 1	Prepare for Risk Management		
SP 1.3	Establish a Risk Management Strategy	11.1	Risk Management Planning
SG 2	Identify and Analyze Risks		
SP 2.1	**Identify Risks**	11.2	**Risk Identification**
SP 2.2	Evaluate, Categorize and Prioritize Risks	11.3	Qualitative Risk Analysis
		11.4	Quantitative Risk Analysis
SG 3	Mitigate Risks		
SP 3.1	Develop Risk Mitigation Plans	11.5	Risk Response Planning
SP 3.1	Risk Avoidance	11.5.2.1	Avoid
SP 3.1	Risk Transfer	11.5.2.1	Transfer
SP 3.1	**Risk Control**	11.5.2.1	**Mitigate**
SP 3.1	Risk Acceptance	11.5.2.3	Accept
SP 3.1	Contingency Plans	11.5.2.4	Contingent Response Strategy
SP 3.2	Implement Risk Mitigation Plans	11.6	Risk Monitoring and Control

Risk Identification Guidance

- CMMI[®] – Risk Management (RSKM)
  - SP 1.1 Determine Risk Sources and Categories
    - "A risk taxonomy can be used to provide a framework for determining risk sources and categories"
  - SP 2.1 "Identify Risks"
    - "Typical [risk] identification methods include the following:
      - Conduct a risk assessment using a risk taxonomy
      - Examine lessons-learned documents or databases"

- PMBOK[®] Guide – Project Risk Management
  - 11.1.1 Risk Management Planning: Inputs
    - "Organizations may have predefined approaches to risk management such as risk categories, …, standard templates…"
  - 11.1.3 Risk Management Planning: Outputs
   - "Risk Categories. A Risk Breakdown Structure is one approach …"

Risk Mitigation Guidance

- CMMI® – Risk Management (RSKM)
  - SP 1.1 Determine Risk Sources and Categories
    - "Categories are used to group related risks that can often be addressed by the same mitigation activities, thereby increasing risk management efficiency."

- PMBOK® Guide – Project Risk Management
  - 11.3.3 Qualitative Risk Analysis: Output
    - "Risks grouped by categories. Risk categorization can reveal common root causes or risk or project areas requiring particular attention. Discovering concentrations of risk may improve the effectiveness of risk responses."

Risk and a Common Taxonomy

- Allows risks to be more easily, and thoroughly, identified during risk identification sessions

- Provides a method of viewing risks for analysis

- Allows for common mitigation plans to be developed for same-category risks

# Issues Management
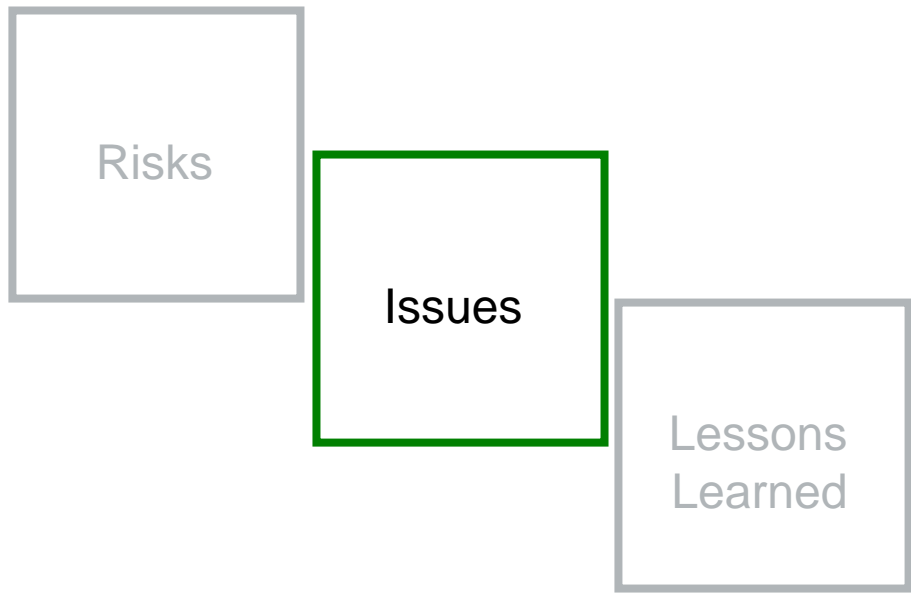
Issues and Action Items Guidance

- CMMI[®] – Project Monitoring and Control (PMC)
  - SP 1.6 Conduct Progress Reviews (and other references)
    - "Identify and document significant issues…"
  - SP 2.1 Analyze Issues
    - "Collect and analyze the issues and determine the corrective actions necessary to address the issues."
  - SP 2.2 Take Corrective Action
    - "Determine and document the appropriate actions needed to address the identified issues."

- PMBOK[®] Guide – Project Communications Management
  - 10.4.3.4 Manage Stakeholders: Output
    - "lessons learned documentation includes the causes of issues…"

    Similar to risk stages of identification, evaluation and response

Issues and a Common Taxonomy

- Issue – Working Definition: A deviation to plan, a concern, or a problem, that if left unresolved, may prevent the project from meeting its objectives

- Are the following true?
  - "Realized risks are issues"
  - "Issues are potential risks"
  - "Unaddressed issues are risks"

- There is a relationship between risks and issues

- Therefore;
  - Simplify the process by using the same (risk) taxonomy as the means to identify or categorize issues

Lessons Learned

Lessons Learned

Risks

Issues
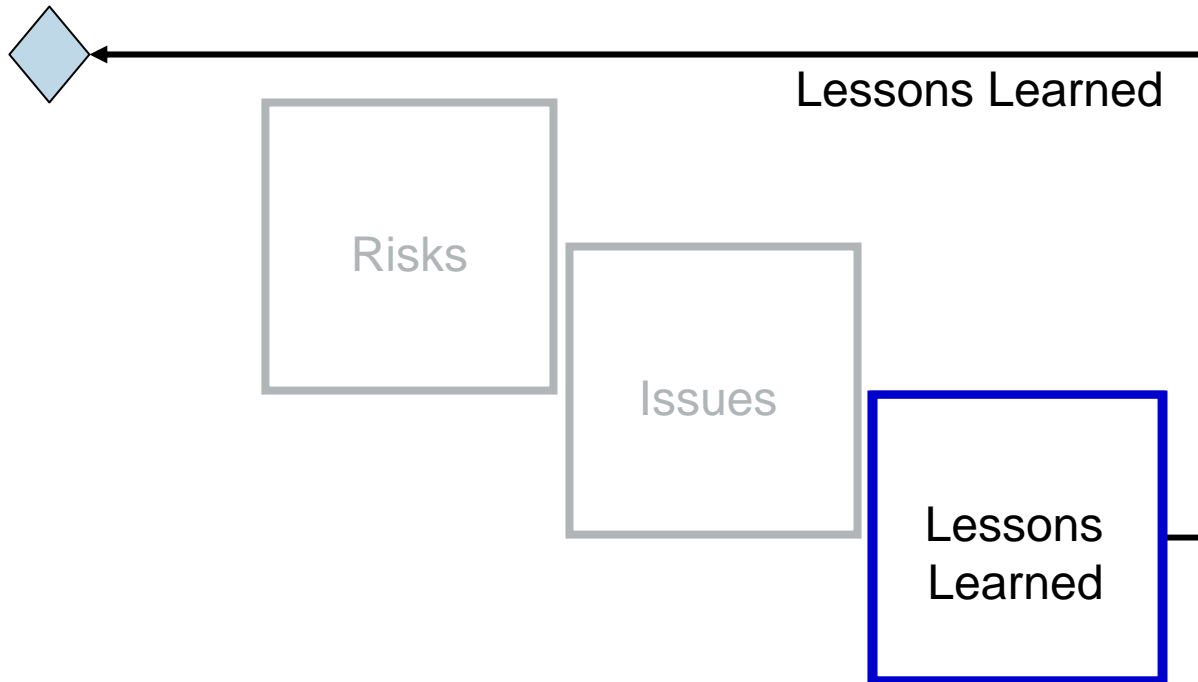
Lessons Learned

Lessons Learned Guidance

- CMMI® – Risk Management (RSKM)
  - GP 3.2 Collect Improvement Information
    - "Document lessons learned from the process for inclusion in the organization's process assets library."

- PMBOK® Guide – Project Integration Management
  - 4.4 Direct and manage Project Execution
    - "Collect and document lessons learned, and implement approved process improvement activities."

- PMBOK® Guide – Project Risk Management
  - 11.6.3 Risk Monitoring and Control: Outputs
    - "Lessons learned from the project risk management activities can contribute to the lessons learned knowledge database of the organization."

Lessons Learned and a Common Taxonomy

- Develop common lessons learned template
  - Provides structure to lessons learned submittals
    - Common approach may simplify submittals

- Need to include "search word" to enable retrieval of lessons learned
  - Provides structure to lessons learned retrievals
    - Examples could be:
      - Project Phases; spiral completion
      - Project Level; Systems Engineering; Software Engineering
      - Taxonomy categories

Key is to be able to search for relevant information

Measurements and Refinements
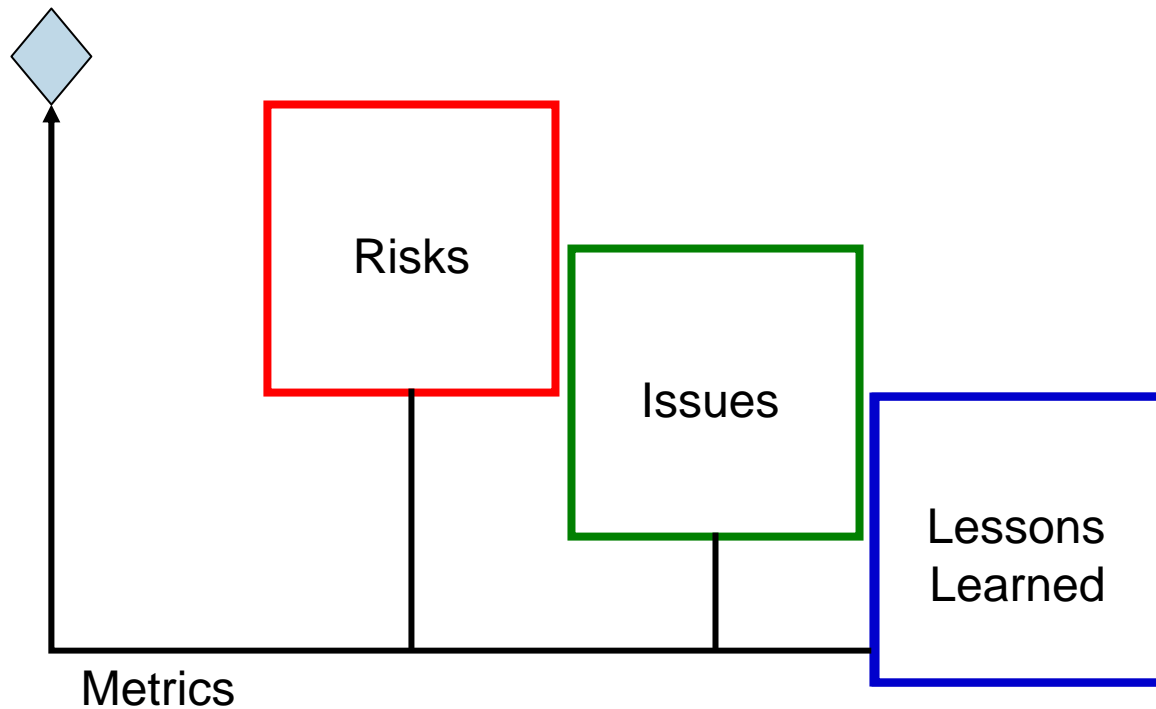
Measurement Guidance

- CMMI[®] – Risk Management (RSKM)
  - GP 3.2 Collect Improvement Information
    - "Collect work products, measures, and measurement results, and improvement information derived from planning and performing the risk management process…."
    - "Examples of work products, measures, measurement results, and improvement information include the following:
      - Risk categories"

- PMBOK[®] Guide – Project Risk Management
  - 11.6 Risk Monitoring and Control
    - "Determine if: Project assumptions are still valid"

Gathering Measurements

- Supports objective management; enabling fact-based management

- Measurements can be as simple as counting the number of times a risk category was used in the risk register
  - Subsets could include:
    - Severity of risks
    - Risks sorted by response activities
    - Risks that could not be avoided

- Measurement can also be collected in a similar fashion for the number of times a category is used in the issues list or the lessons learned template

- Once "counted," the data can be represented in a variety of ways to determine trends and to identify areas of importance

Histogram of Risk Sources
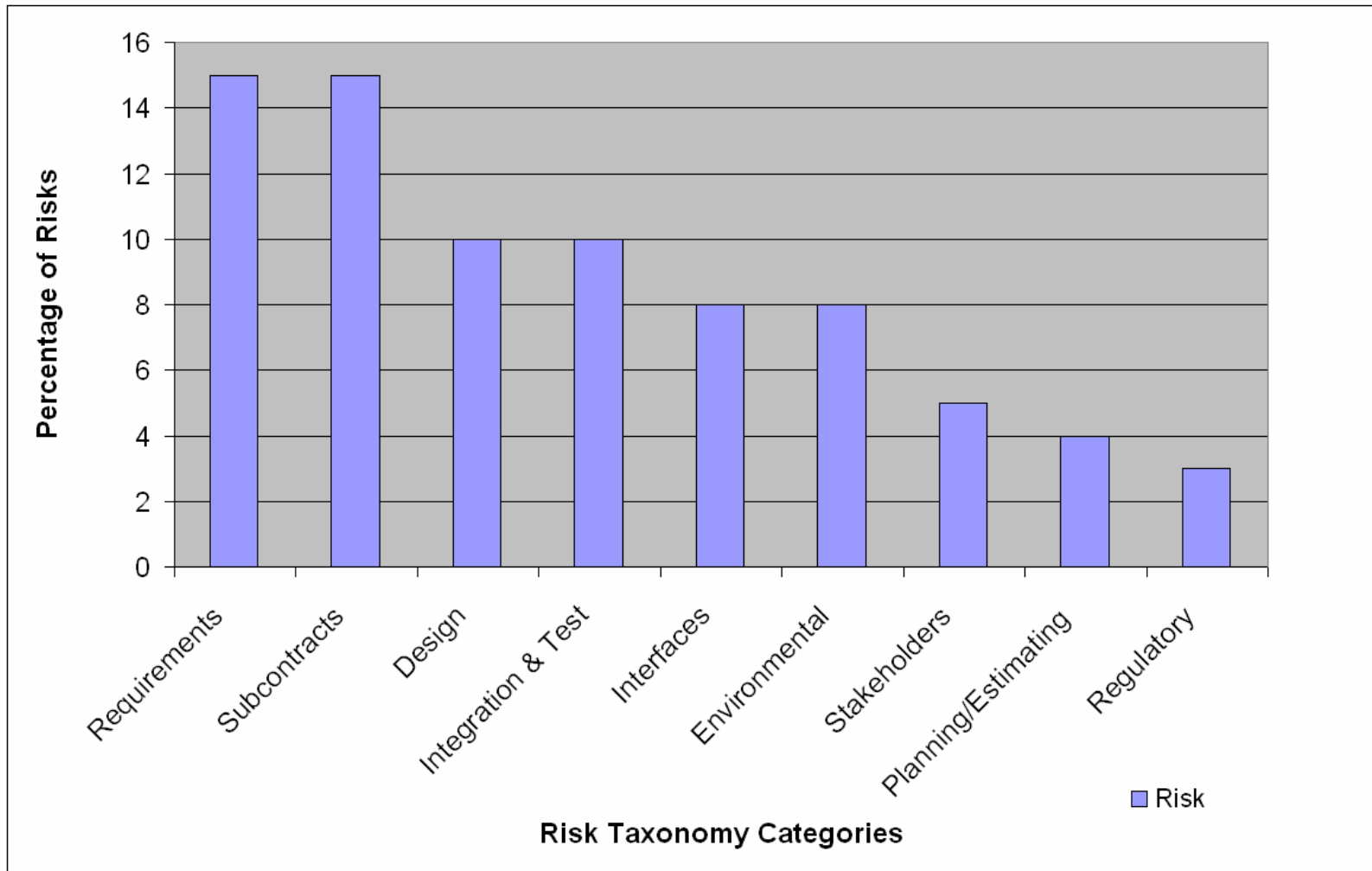
Refinement Guidance

- CMMI[®] – Risk Management (RSKM)
  - SP 2.1 Identify Risks
    - "The list of risks should be reviewed periodically to reexamine possible sources of risks and changing conditions to uncover sources and risks previously overlooked or nonexistent when the risk management strategy was last updated."
  - GP 3.2 Collect Improvement Information
    - "Examples of work products, measures, measurement results, and improvement information include the following:
      - Risk categories"

- PMBOK[®] Guide – Project Risk Management
  - 11.6.3 Risk Monitoring and Control: Outputs
    - "Risks can be documented and the RBS updated."

BAE SYSTEMS

"Statused" Risk Breakdown Structure Example


```
                              ┌──────────────┐
                              │   Project    │
                              └──────────────┘
        ┌──────────────┬──────────────┼──────────────────┐
┌──────────────┐ ┌──────────────┐ ┌──────────────┐ ┌──────────────┐
│ Technical [45]│ │ External [35]│ │ Internal [7] │ │   Project    │
└──────────────┘ └──────────────┘ └──────────────┘ │Management [8]│
                                                    └──────────────┘
```

Technical [45]	External [35]	Internal [7]	Project Management [8]
Requirements [15]	Regulatory [3]	Staffing [2]	Management Experience [0]
Design [10]	Political [2]	Facilities [1]	Collocation / Communication [2]
Integration & Test [10]	Stakeholders [5]	Training [1]	Planning / Estimating [4]
Reliability / Maintainability [2]	Customers [2]	Security [1]	Monitoring & Controlling [2]
Interfaces [8]	Subcontracts [15]	Information Technology [2]	
	Environmental [8]		

Other / Misc [5]

Cumulative Percent

A Continually Improving System

- Addition of new risk categories
  - The use of "Other" and "Miscellaneous" categories allows previously unidentified categories to be introduced
    - If the "Other" or "Miscellaneous" category is selected, then a write-in box must be completed stating the new category

  - If there is a correlation of write-in categories from project to project, then a new standard category can be added to the taxonomy

- Deletion of risk categories
  - If one of the standard categories is repeatedly not used, then that category can be deleted from the risk list

- The risk taxonomy or Risk Breakdown Structure is kept current by watching trends in category usage over time

Summation

Risk to Lessons Learned Vision

- A project team should be able to easily search for relevant lessons learned

- An effective risk identification / mitigation approach should be in place

- An issue categorization approach should not add complexity to the process

- An easy to use lessons learned submittal process should be available

- A measurement and process improvement system should be in place

**A common taxonomy will enable all the above**

Recommendations

- Risk
  - Use a standard set of risk sources / categories
    - Can be grouped into a hierarchical Risk Breakdown Structure

- Issues
  - Use the same categories that were used for risks

- Lessons learned
  - Use common lessons learned template
  - Identify risk categories if they are embedded in the lessons learned

- Capture metrics based upon common taxonomy use
  - Keep database current and effective for the organization and projects

Common Taxonomy Fuels a Learning Engine

"Lessons learned as a result of taking corrective action can be inputs to planning and risk management processes."

CMMI® v1.2; Project Monitoring and Control PA; SP 2.3 Manage Corrective Action

TAXONOMY

Lessons Learned

Risks

Issues

Lessons Learned

Metrics
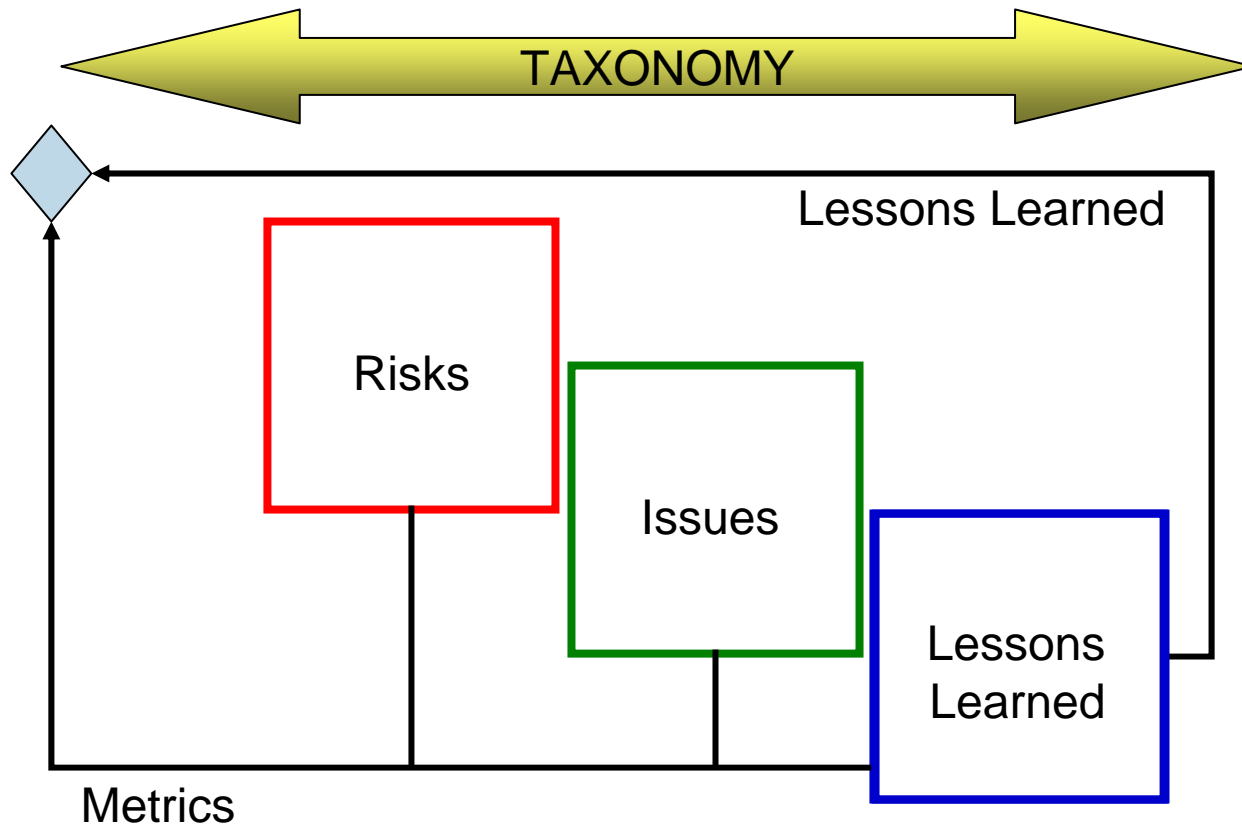
Questions?

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