

Introduction to Project Management

This course provides good understanding of the fundamentals of project management

Ron Caldwell PMP, P.Eng, CEM, CBCP

Module 7

Lesson 7: Planning 5 Risk and Procurement

- **Define and identify Project Risks**
- **Assess and plan for Project Risks**
- **Organize and plan for Project Procurement**

- **7.1 Risk Management**
 - Identify Risks
 - Risk Categories
 - Risk Register
 - Plan for Risk, Contingency
 - Risk Value
 - Probability Impact Matrix
 - Risk Response Strategies
- **7.2 Procurement Management**
 - Make or Buy
 - Contract Types
- **7.3 Review and Next Module**

The definition of *Risk is as follows:

“Risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more of a project’s objectives.”

You are managing a gas pipeline expansion project in Canada. The project funds are allocated in US dollars even though most of the expenses are in Canadian dollars. Exchange fluctuations are a risk to the project budget. Shortly after the project starts, the Canadian dollar depreciates significantly which contributes to a budget surplus. This is an example of a positive risk.

If a major storm delays the construction of a commercial office tower, the project timelines may be delayed. This is an example of negative risk.

Risk exists at two levels within every project:

- **Individual project risk**– It is an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives.
- **Overall project risk**– It is the effect of uncertainty on the project as a whole, arising from all sources of uncertainty including individual risks, representing the exposure of stakeholders to the implications of variations in project outcome both positive and negative.

Some of the evolving trends in Project Risk Management include:

Non-event risks

- **Variability risk**

Project resilience

- Uncertainty exists about some key characteristics of a planned event or activity or decision.
 - Examples include over or under productivity, high or low defects, and unseasonal weather condition.

Integrated risk management

Ambiguity risk

Uncertainty exists about what might happen in the future. Imperfect knowledge in certain areas of the project, such as elements of technical solution, future developments in regulatory framework, and inherent complexity, might affect achieving the project objectives.

Considerations for tailoring the way Project Risk Management Processes are applied:

- **Project size**—Risk process to be used is based on size of budget, duration, scope, and team size.
- **Project complexity**—Robust risk approach is needed when the project calls for innovation, new technology, and external dependency.
- **Project importance**—Level of risk for the project increases when there are breakthrough opportunities and major product innovation.
- **Development approach**—For waterfall project, risk processes can be sequential and iterative; for agile approach, the risk is addressed at the start of every iteration and during execution.

- Frequent reviews of incremental work product and cross-functional project teams must be done to manage risk.
 - Risk identification, analysis, and management are done during each iteration of the review.
 - Work may be reprioritized based on understanding of risk exposure.

Module 7 Section1

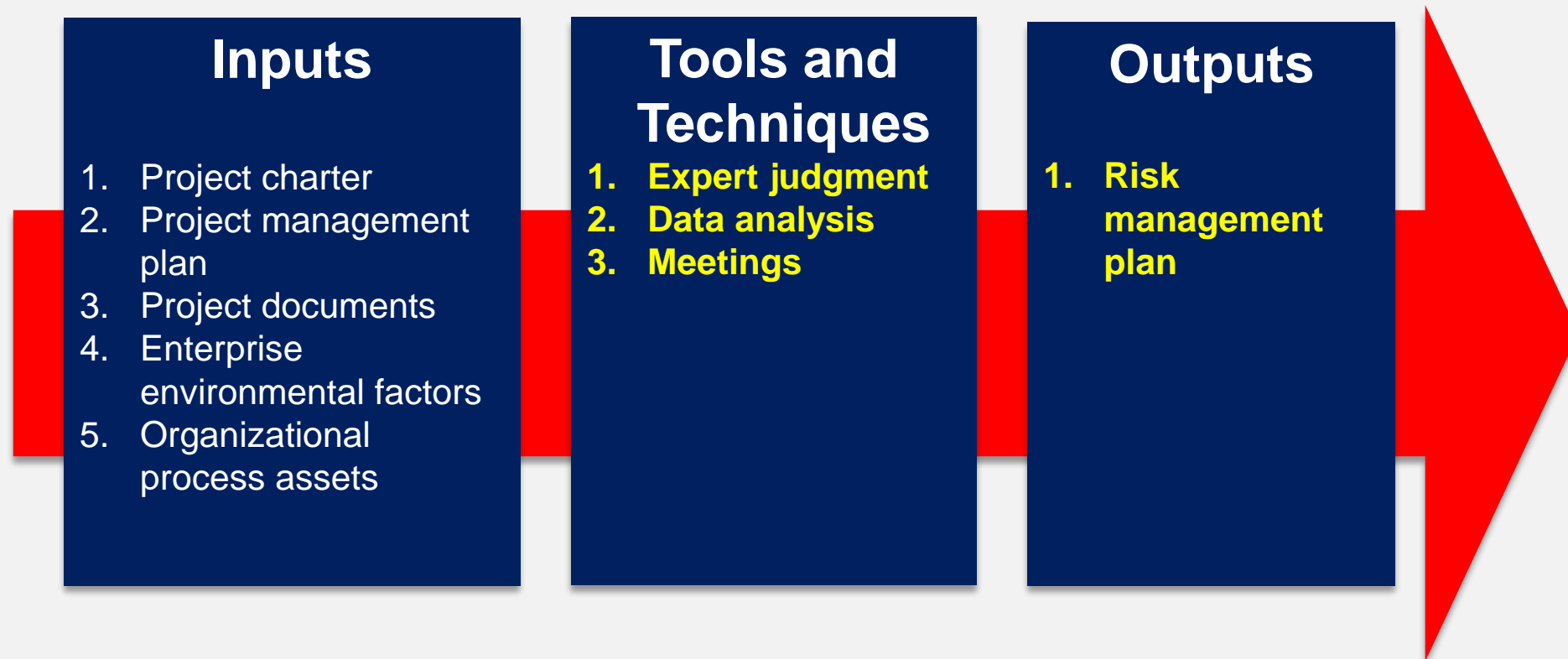
Risk Management

Project Risk Management

	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Integration					
Scope					
Schedule					
Cost					
Quality					
Resource					
Communications					
Risk		Plan Risk Management Identify Risks Perform Qualitative Risk Analysis Perform Quantitative Risk Analysis Plan Risk Responses			
Procurement					
Stakeholder					

- **Uncertainty:** The possibility of unexpected events which will impact the project (Wideman)
- **Risk:** An uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives
- **Risk Event:** A discrete occurrence that may affect the project for better or worse
- **Threat:** A negative risk event
- **Opportunity:** A positive risk event

Process of defining how to conduct risk management activities for a project



- **Expert judgment**

- Ensures a comprehensive approach to risk management
- A group or individuals with specialized training or knowledge in the subject area, such as management, stakeholders, project managers who have worked on similar projects, consultants, professional and technical associations, and other subject matter experts (SME's)

- **Data analysis**

- Used to understand and define risk management context
- Combination of stakeholder risk attitudes and the strategic risk exposure of a project

- **Meetings**

- Should address the identification of risks, their probability and impact, and the risk response strategies and plans

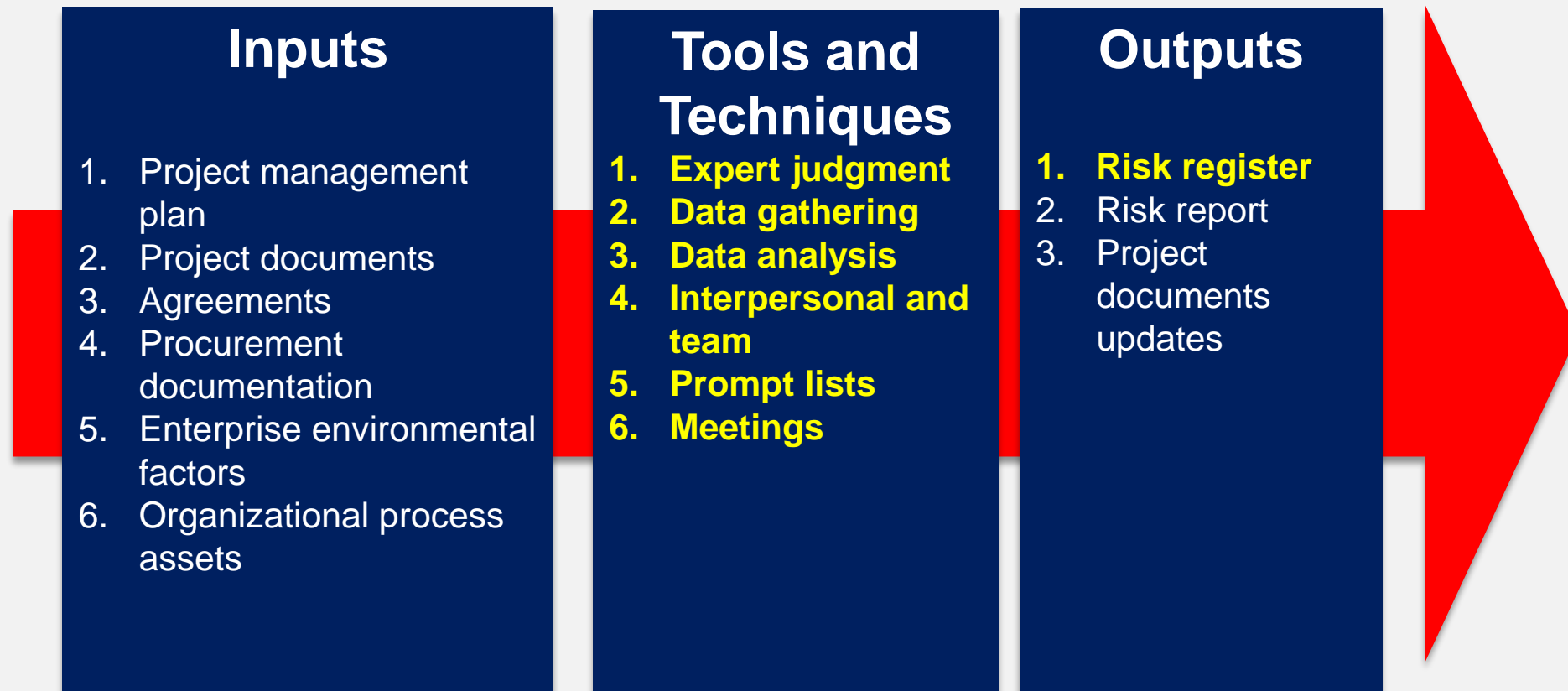
- **The main output of risk management planning is a Risk management plan**
- **This plan documents the procedures for managing risk throughout a project**
- **The project team should review project documents and understand the organization's and the sponsor's approaches to risk**
- **The level of detail will vary with the needs of the project**

- **Risk management plan**
 - **Risk strategy**
 - General approach for managing risk
 - **Methodology**
 - Defines the approaches, tools and data sources used for management of risks
 - **Roles and responsibilities**
 - Defines the lead, support, and risk management team for each type of activity and clarifies their responsibilities
 - **Funding**
 - Identifies the funds needed to perform activities and establishes protocols for application of contingency and reserves
 - **Timing**
 - Defines when and how processes will be performed and establishes risk management activities in project schedule
 - **Risk categories**
 - Grouping of project risks. Most common is with a Risk Breakdown Structure (RBS)

- **Risk management plan (cont'd)**
 - **Stakeholder risk appetite**
 - Expressed as measurable risk thresholds, determine acceptable level of risk exposure
 - **Definitions of risk probability and impact**
 - Specific to the project context, reflect risk appetite and threshold
 - May include scales with percentages, time limits, or high/medium/low
 - **Probability and impact matrix**
 - Opportunities and threats represented in a table
 - Scores may be assigned established
 - **Reporting formats**
 - Defines how outcomes documented, analyzed, communicated
 - **Tracking**
 - Documents how risk activities will be recorded and audited

- In addition to risk management plan, many projects now include:
 - Contingency plans: Predefined actions that the project team will take if an identified risk event occurs
 - Fallback plans: Include an alternative set of actions and tasks available in the event that the primary plan needs to be abandoned because of issues, risks, or other causes (*PMBOK® Guide*)
 - Workarounds: Unplanned responses to risk events, when there is no contingency plans in place
 - Contingency reserves: Funds included within cost baseline that can be used to mitigate cost or schedule overruns if the risk occurs
 - Management reserves: Funds held by the organization for unknown risks

Process of identifying individual project risks as well as sources of overall project risk, and documenting their characteristics



Dimensions of Risk

Definitions

Cause of Risk:

Aspect of the project or its environment

Risk Event:

Uncertain situation that if it occurs can have an impact on the project's objectives

Risk Effect:

Contingent effect of risk on project objectives

Relationships



Example

Trigger: Use of unproven new supplier



Risk Event: Cash flow problems occur with the new supplier



Impact: Delays in the timely delivery of crucial supplies for the project

Identify Risks

- **Process of identifying, discussing and understanding what potential events might hurt or enhance a particular project**
- **Brings together information so that the team can respond appropriately**
- **Process is performed throughout the project**
- **Considers both individual project risks and sources of overall project risk**
- **Presented in consistent format to ensure risk is understood**

Identify Risks – Tools

- **Expert judgment**
 - From similar projects or business areas
- **Data gathering**
 - **Brainstorming**
 - Led by PM or facilitators and attended by team and external experts
 - Risk Breakdown Structure (RBS) and other tools used
 - Risks categorized by type and more clearly defined
 - **Checklists**
 - List of items, actions or points to be considered
 - May be based on historical information of similar projects (e.g. lessons learned)
 - Customized for current project
 - **Interviews**
 - Interviewing experienced project participants, stakeholders and SMEs
 - Conducted in an environment of trust and confidentiality to encourage honest and unbiased contributions

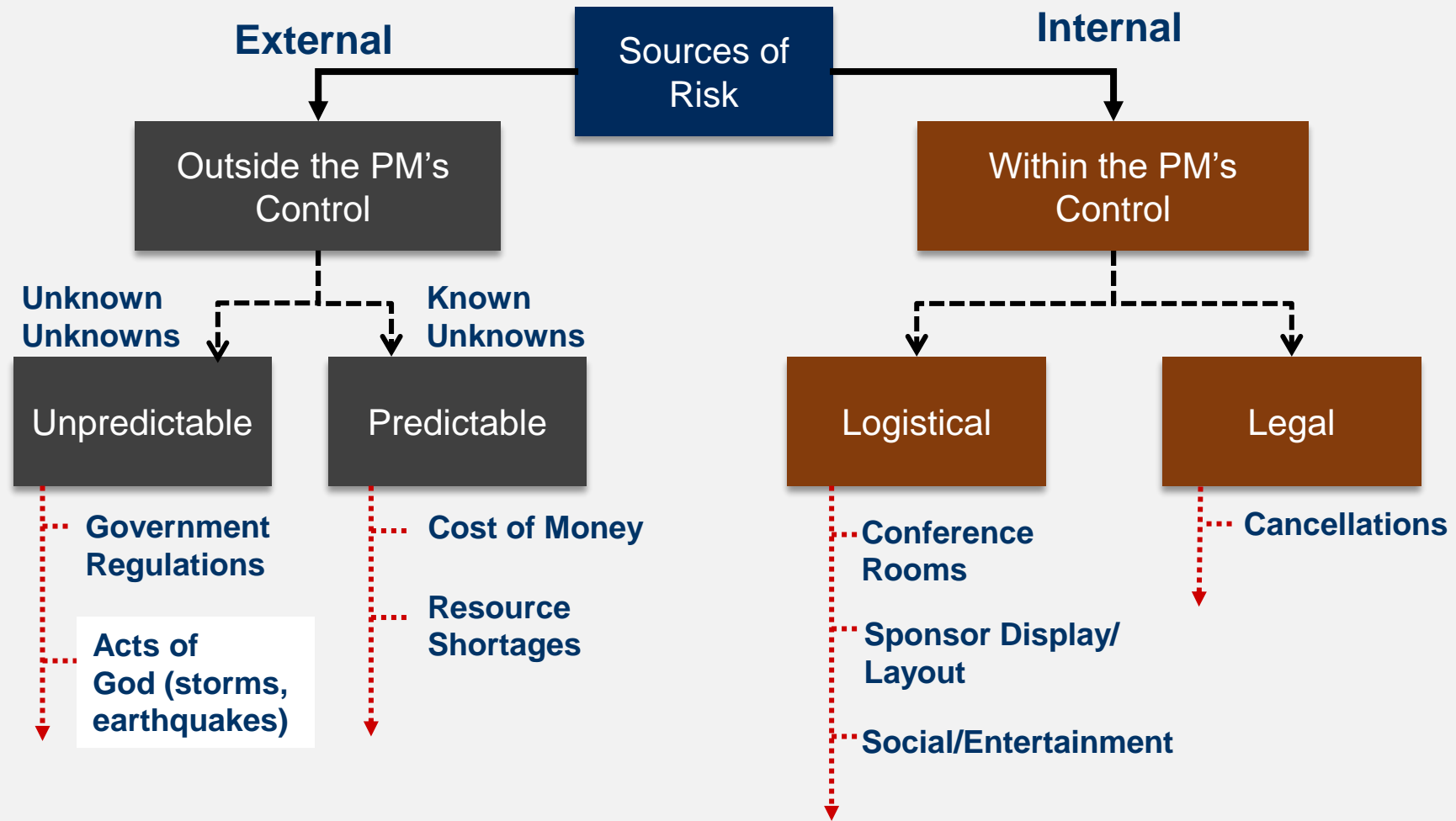
Identify Risks – Tools (cont'd)

- **Data analysis**
 - **Root cause identification**
 - Examines root causes of risks and clarifies their definition
 - Groups risks by their causes and develops potential responses based on these identified causes
 - **Assumption and constraint Analysis**
 - Explores validity of assumptions and constraints for consistency and completeness
 - Analyzes their potential for becoming risk events if unmanaged
 - **SWOT analysis**
 - Adaptation of a strategic management tool for risk management
 - Helps identify the broad negative and positive risks that apply to a project
 - **Document analysis**
 - Structured review of project documents
- **Interpersonal and team skills**
- **Prompt lists**
 - Predetermined list of risk categories, framework to aid team
- **Meetings**

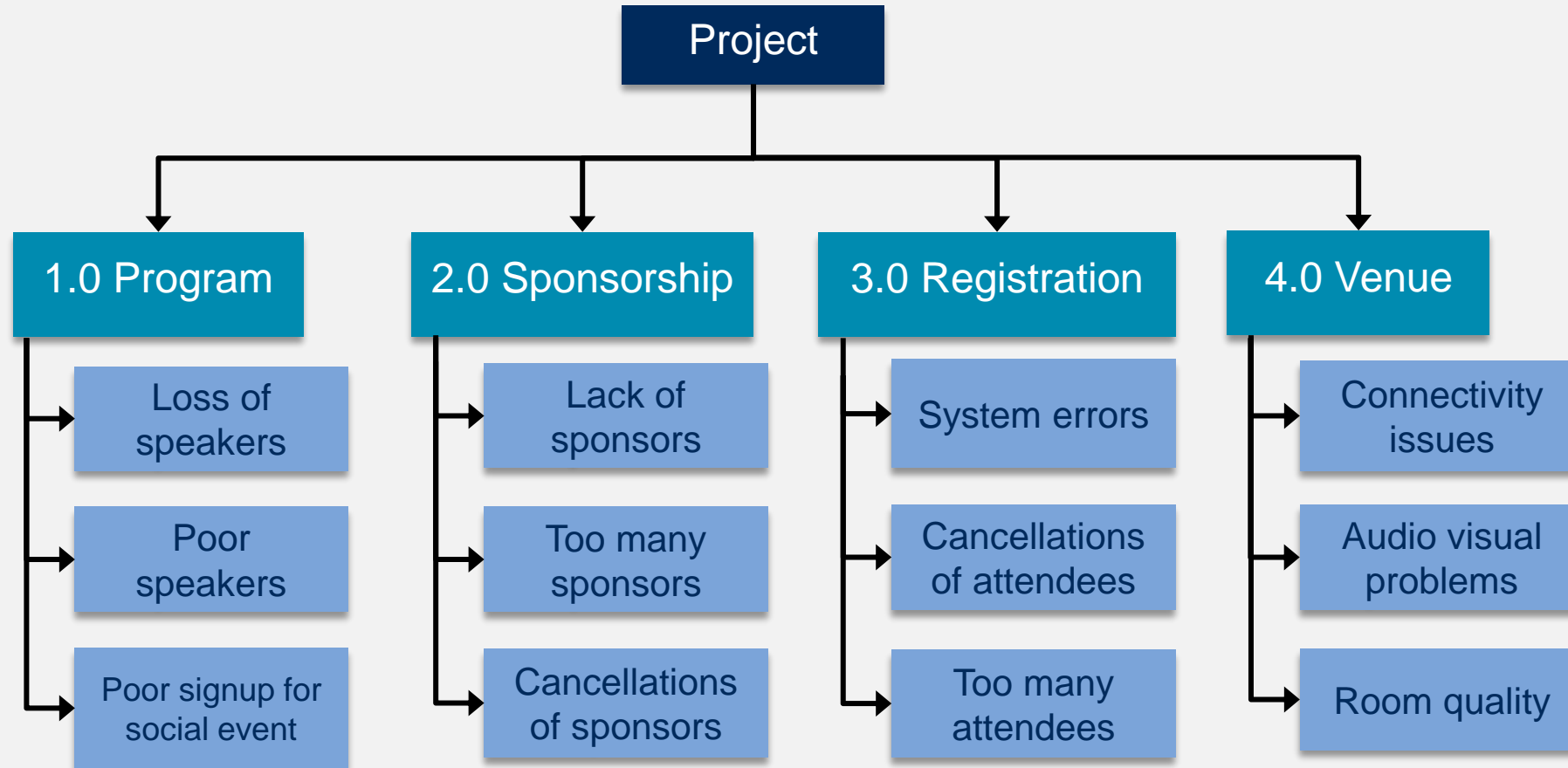
Potential Risk Events With Knowledge Areas

Knowledge Area	Risk Conditions
Integration	Inadequate planning; poor resource allocation; poor integration management; lack of post-project review
Scope	Poor definition of scope or work packages; incomplete definition of quality requirements; inadequate scope control
Schedule	Errors in estimating time or resource availability; poor allocations and management of float; early release of competitive products
Cost	Estimating errors; inadequate productivity, cost, change, or contingency control; poor maintenance, security, purchasing, etc
Quality	Poor attitude toward quality; sub-standard design/materials/workmanship; inadequate quality assurance program
Resource	Poor conflict management; poor project organization and definition of responsibilities; absence of leadership
Communications	Carelessness in planning or communicating; lack of consultation with key stakeholders
Risk	Ignoring risk; unclear assignment or risk; poor insurance management
Procurement	Unenforceable conditions or contract clauses; adversarial relations
Stakeholders	Lack of consultation with stakeholder

Risk Categories by Source



Risk Categories by WBS



Identify Risks – Outputs

- **Risk register**

- Captures details of risks
 - List of identified risks
 - Potential risk owners
 - List of potential risk responses
- May include short risk title, risk categories, current status (e.g. new), one or more causes, potential effects on project and timing information
- May also include risk triggers:
 - Risk symptoms that are indirectly related to risk events
 - Indications that a risk has occurred or is about to occur
 - May be specified as continuous or discrete

- **Risk Board**

- Used on Agile projects as a white board or software tool where current risks, obstacles, and issues are tracked and reviewed daily

Risk Register Contents

No	Rank	Category	Risk	Description	Root Cause	Triggers	Risk Owner	Probability	Impact	Risk Score	Risk strategy	Potential Responses	Status
44	1	1.0 Program	Program Change	Cancelled speakers	One of your speakers has a death in the family and has to cancel at the last minute	Speaker Cancels	Program manager					Find/hire another speaker. Adjust Program	
21	2	3.0 Registration	Refunds	Cancelled attendees	Due to work commitments, several of your confirmed attendees want to cancel	Attendee Cancels	Project Manager					Process refunds. Lower revenue goals	
7	3	1.0 Program	Event management	Offsite social event at local restaurant	Several of the attendees notify you are vegetarians or have food allergies	Poor registrations for social event	Event Manager					Adjust menu. Increase food budget	

Identify Risks – Risk Canvas

- A Risk Canvas is a risk identification tool used in adaptive projects
- It identifies major categories of risks and allows for a big picture of all identified risks and mitigation plans

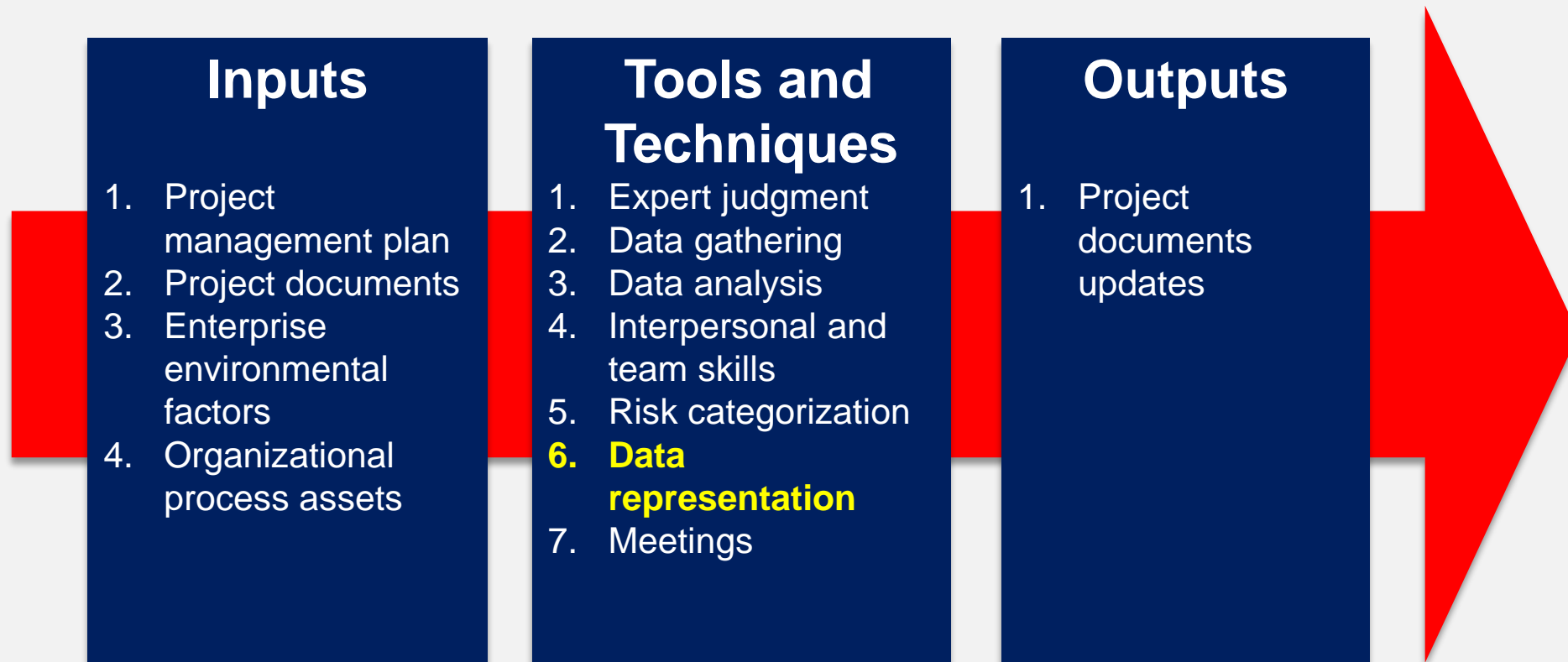
Risk 1: People (Stakeholders)	Risk 2: People (Resources)	Risk 3: Value (Topic or Proposition)	Risk 4: Relationship (Relevance)	Risk 5: Customer (Demographic/ Profile)
	Risk 6: Systems (Types and Technology)		Risk 7: Channel (Distribution)	
Risk 8: Expense (\$ Cost)			Risk 9: Revenue (\$ Income)	

Risk Management – Questions

- 1. In reviewing the risk register for your project, you notice the team has identified several risks. What is the next thing you should do?**
 - a. Develop a fallback plan
 - b. Increase the management reserve
 - c. Develop contingency plans
 - d. Do nothing, you are still just planning
- 2. A project _____ is an uncertainty that can have a negative or positive effect on meeting project objectives.**
 - a. risk
 - b. opportunity
 - c. contingency plan
 - d. fallback plan
- 3. Paul is reviewing the risk register for his project. The project has been going well and he is looking at the risk register to see what symptoms of risk events he should be looking for. Which column in the risk register should he be looking at?**
 - a. Category
 - b. Responses
 - c. Trigger
 - d. Owners

1. C
2. A
3. C

Process of prioritizing individual risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics



Perform Qualitative Risk Analysis

- **Used to prioritize risks according to their probability of occurrence and impact on project objectives (scope, time, cost, quality)**
- **Assess the likelihood and impact of identified risks to determine their magnitude and priority**
- **Prioritized risks lay the foundation for quantitative analysis and risk response planning**
- **Allows organizations to categorize and create a risk hierarchy and therefore focus on high-priority risks**

- **Data representation**
 - **Probability: The likelihood of occurrence**
 - The ratio of the number of chances that an event may happen, to the sum of the chances of it both happening and not happening
 - **Impact: The magnitude of consequences**
 - The amount at stake; the extent of adverse, or positive consequences which might affect the project

$$\text{Risk Score} = \text{Probability} \times \text{Impact}$$

- **Probability Scales**

	Low (1)	Medium (2)	High (3)
Probability	< 30%	30% to 70%	> 70%

- **Impact Scales**

Objective	Low (1)	Medium (2)	High (3)
Cost	No impact	< \$40,000 (10%)	> \$40,000 (10%)
Time	No impact	1 to 7 days	> 7 days
Scope	None	Minor	Major
Quality	None	< 10 complaints	> 10 complaints

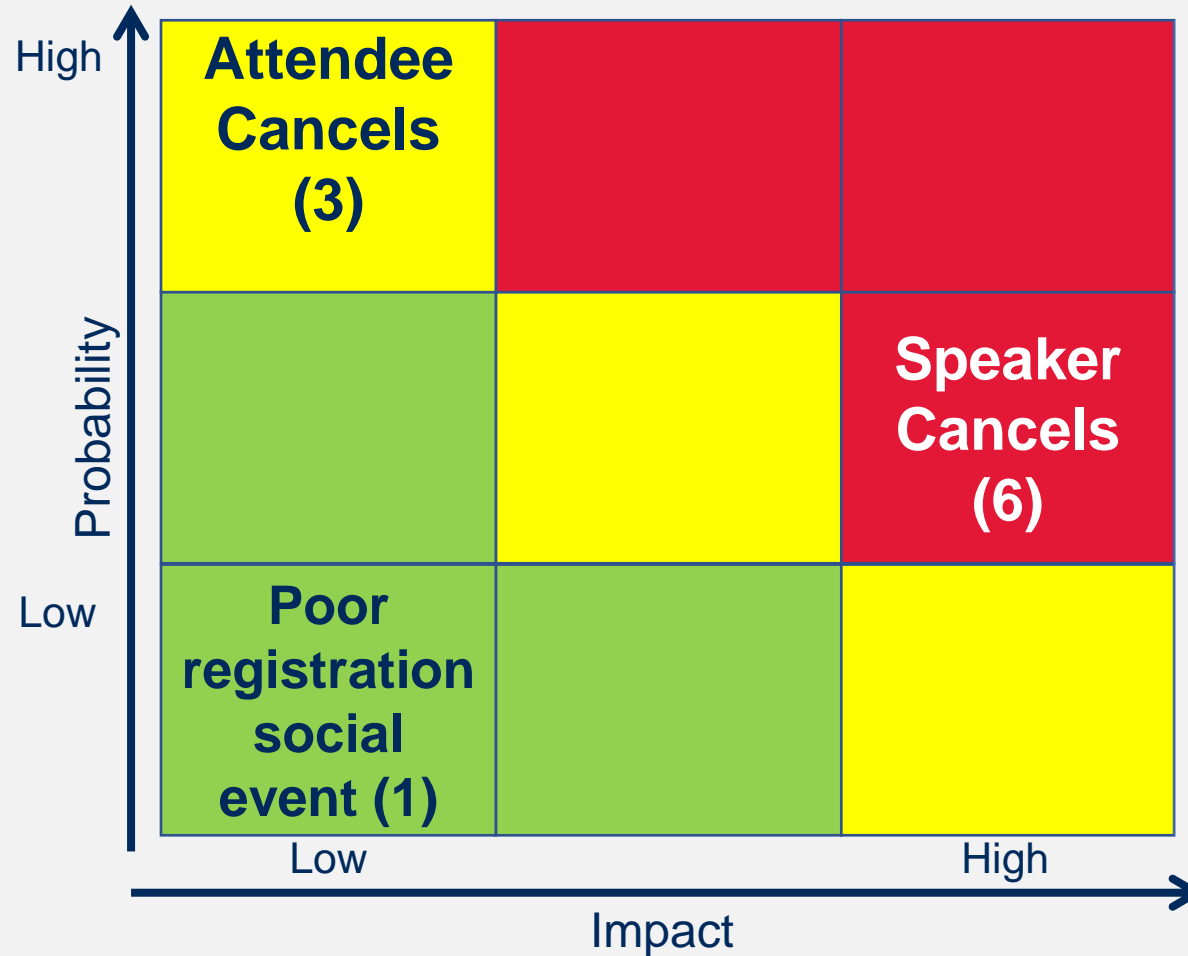
- **Probability and Impact scores**
 - Risk score = Probability x Impact
 - Using the previously stated risks, the established risk scales for this project, the risk scores are below
 - The risk threshold is 3
 - Any risk scoring 3 and below will not require further action

Risk Event	Probability	Impact	Risk Score
Speaker Cancels	Medium - 2	High - 3	6
Attendee Cancels	High - 3	Low - 1	3
Poor registration for social event	Low -1	Low -1	1

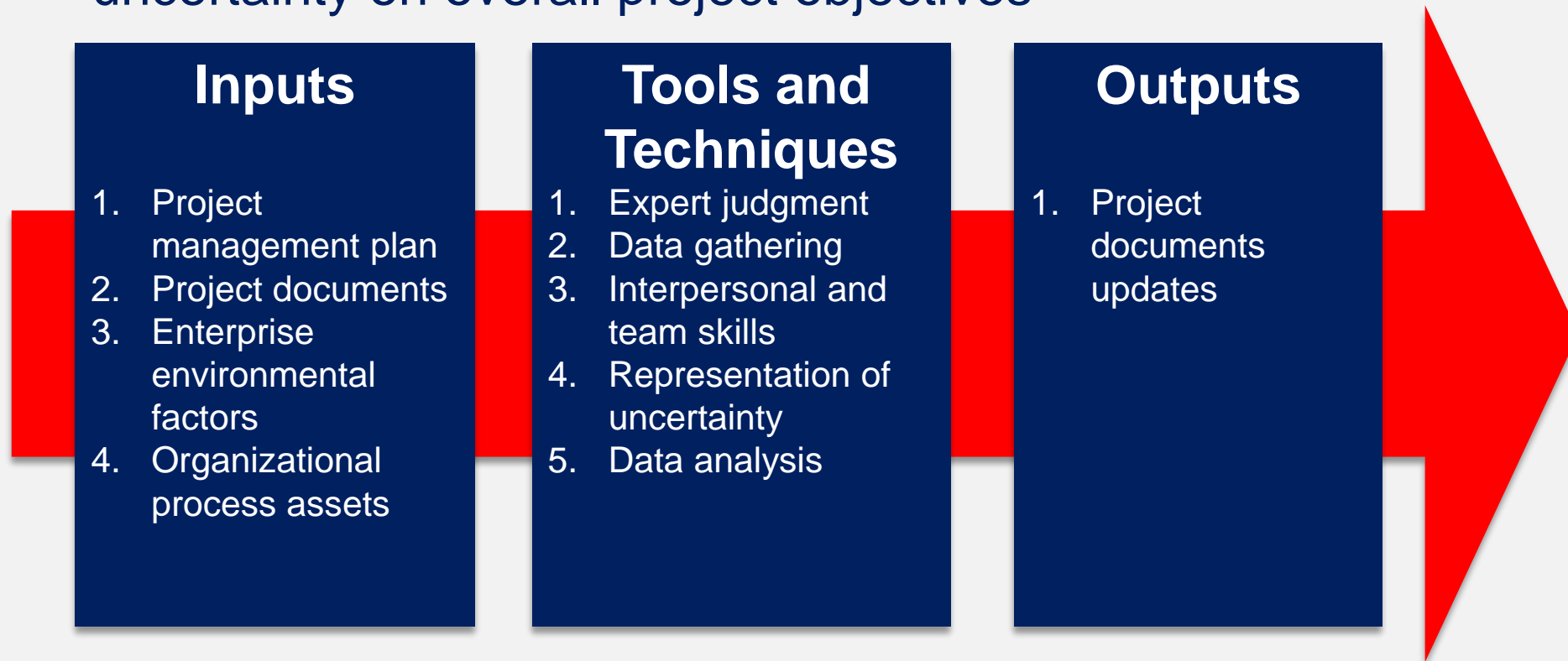
- **Probability – Impact Threat Matrix**

Probability	Impact		
	Low (1)	Medium (2)	High (3)
High (3)	3	6	9
Medium (2)	2	4	6
Low (1)	1	2	3

- **Probability – Impact Threat Matrix**



Process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives



Plan Risk Responses

Process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure, as well as to treat individual project risks



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Plan Risk Responses

- **After identifying and quantifying risks, determines actions to address them**
- **Focus on minimizing threats, maximizing opportunities and reducing overall risk exposure**
- **Plans should be appropriate based significance and cost**
- **May be a mix of strategies**

- **Strategies for threats and opportunities**
 - **Five main response strategies for threats**
 - Escalate
 - Avoid
 - Transfer
 - Mitigate
 - Accept
 - **Fives main response strategies for opportunities**
 - Escalate
 - Exploit
 - Share
 - Enhance
 - Accept

- **Strategies for threats**

1. Escalate

- Outside scope of the project or if proposed response exceeds project manager's authority
- Project Manager determines who should be notified and communicates details
- Managed at program level or portfolio level
- Escalated threats should be accepted by relevant person within the organization
- Example: Major market change (e.g. Surprise price drop and launch of new product by largest competitor)

2. Avoid

- Eliminate a specific threat, usually by eliminating its causes
- Change project scope and/or plan to:
 - Eliminate the risk condition
 - Protect project objectives from the impact
- Example: Choose alternative (e.g. less risky technology)

- **Strategies for threats**

3. Transfer

- Transfer the impact of a risk and ownership of its response to a third party
- Use insurance, performance bonds, warranties, guarantees to transfer risks
- Use of appropriate contract types (fixed price) to transfer liability to seller
- Example: Buy insurance

4. Mitigate

- Reduce the consequences of a risk by reducing its probability and/or its impact to an acceptable threshold
- Act early, use proven technology or simple processes
- Example: Select a proven supplier, and test samples of supplies

5. Accept

- Accepting the consequences should a risk occur
- No changes are made to the project plan

- **Strategies for opportunities**

1. Escalate

- Outside scope of the project or if proposed response exceeds project manager's authority
- Project Manager determines who should be notified and communicates details
- Managed at program level or portfolio level
- Escalated opportunities should be accepted by relevant person within the organization
- Example: Major product failure by largest competitor

2. Exploit

- Eliminate uncertainty that may hinder an opportunity to be realized
- Example: Allocate expert project team member to finish early and collect on an incentive

3. Share

- Team up with a third party in a joint venture to realize an opportunity and reap the benefit
- Example: Develop partnership with a seller

- **Strategies for opportunities**

4. Enhance

- Increase the probability and/or impact by identifying and maximizing key drivers of the risk to ensure it occurs.
- Example: Hire cutting edge software game developer to be the first on the market to introduce an interactive new game

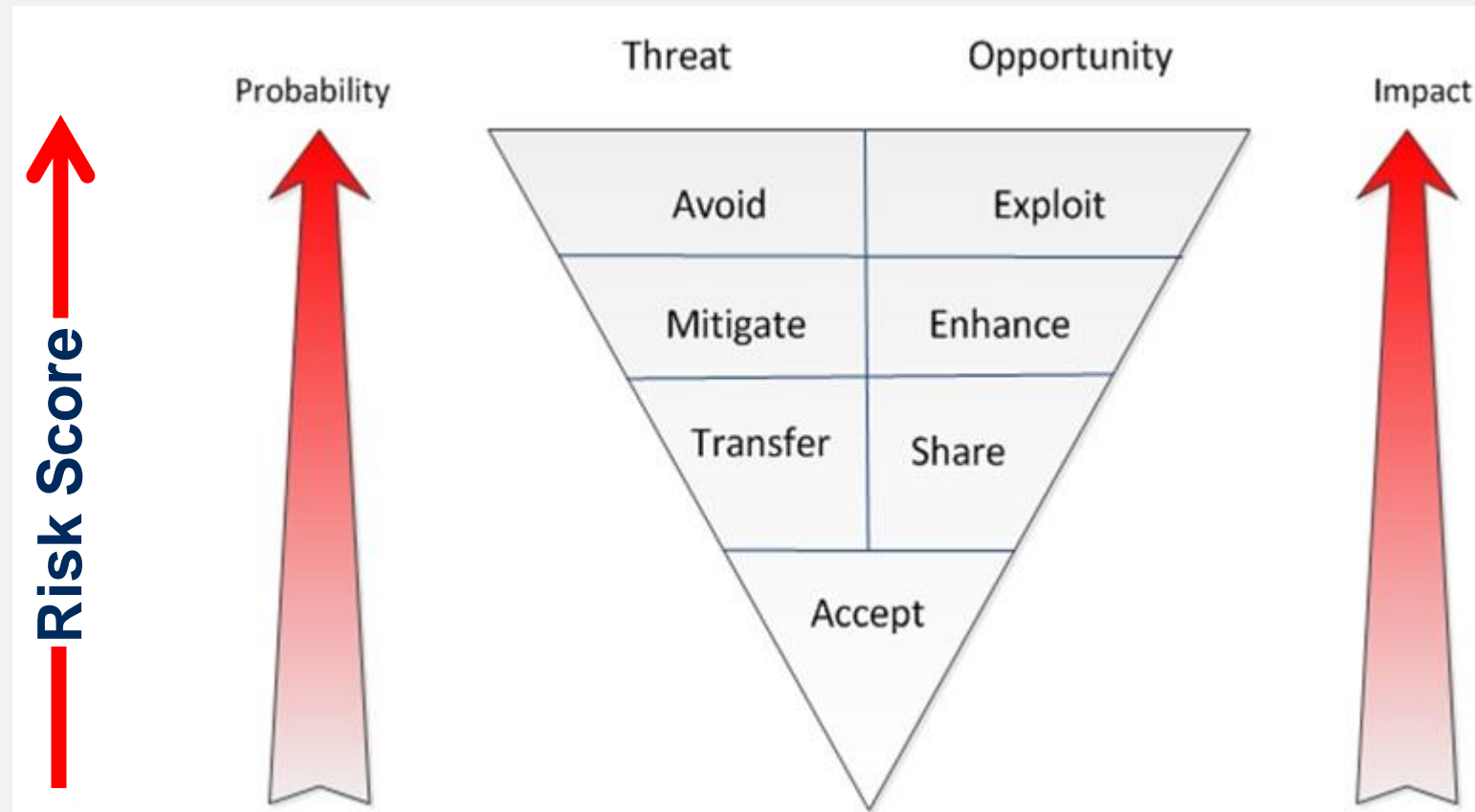
5. Accept

- Accepting the consequences should a risk occur
- No changes are made to the project plan

Project Management Expo Examples

- **Share**
 - One of the keynote speakers has 50 copies of their book that they are willing to supply as part of their speaker fee
 - Promote these as free to those attendees who register early
- **Enhance**
 - The audio-visual team at the hotel will also tape and record breakout presentations
 - Make these available to registered attendees after the event
- **Exploit**
 - If they get additional exposure, sponsors are willing to donate products or services
 - Have sponsors present these as daily door prizes, take their photos and circulate these in post conference marketing

- **Strategies for responses**



Risk Response – Questions

1. The _____ displays the relative probability of risks occurring and the relative impact of risks.
 - a. Top Ten Risk Item Tracking chart
 - b. Requirement's traceability matrix
 - c. Probability/impact matrix
 - d. Expectations management matrix

2. You are reviewing your qualitative risk analysis. You have established that the risk threshold for your project is 5. On the list of identified risks, three have a risk score of 2, three have a risk score of 4, five have a risk score of 6, and two have a risk score of 9. How many risks should be accepted?
 - a. 3
 - b. 6
 - c. 7
 - d. 10

3. _____ involves minimizing the risk score by reducing the probability of its occurrence.
 - a. Risk avoidance
 - b. Risk acceptance
 - c. Risk transference
 - d. Risk mitigation

1. C
2. B
3. D

Module 7 Section2

Procurement Management

The definition of a *Contract is as follows:

A contract is a mutually binding agreement that obligates the seller to provide the specified products, services, or results; obligates the buyer to compensate the seller; and represents a legal relationship that is subject to remedy in the court.

The two parties involved in a contract are the buyer and the seller. A seller provides the goods and services and the buyer buys these for a compensation.

Key Concepts for Project Procurement Management

- Project manager need not be a trained expert in procurement management laws and regulations but should be familiar enough with the procurement processes to make intelligent decisions regarding contracts and contractual relationships.
- ***The project manager is typically not authorized to sign legal agreements binding the organization; this is reserved for those who have the authority to do so.***
- Project manager should understand the culture and local laws when dealing with international contracts.

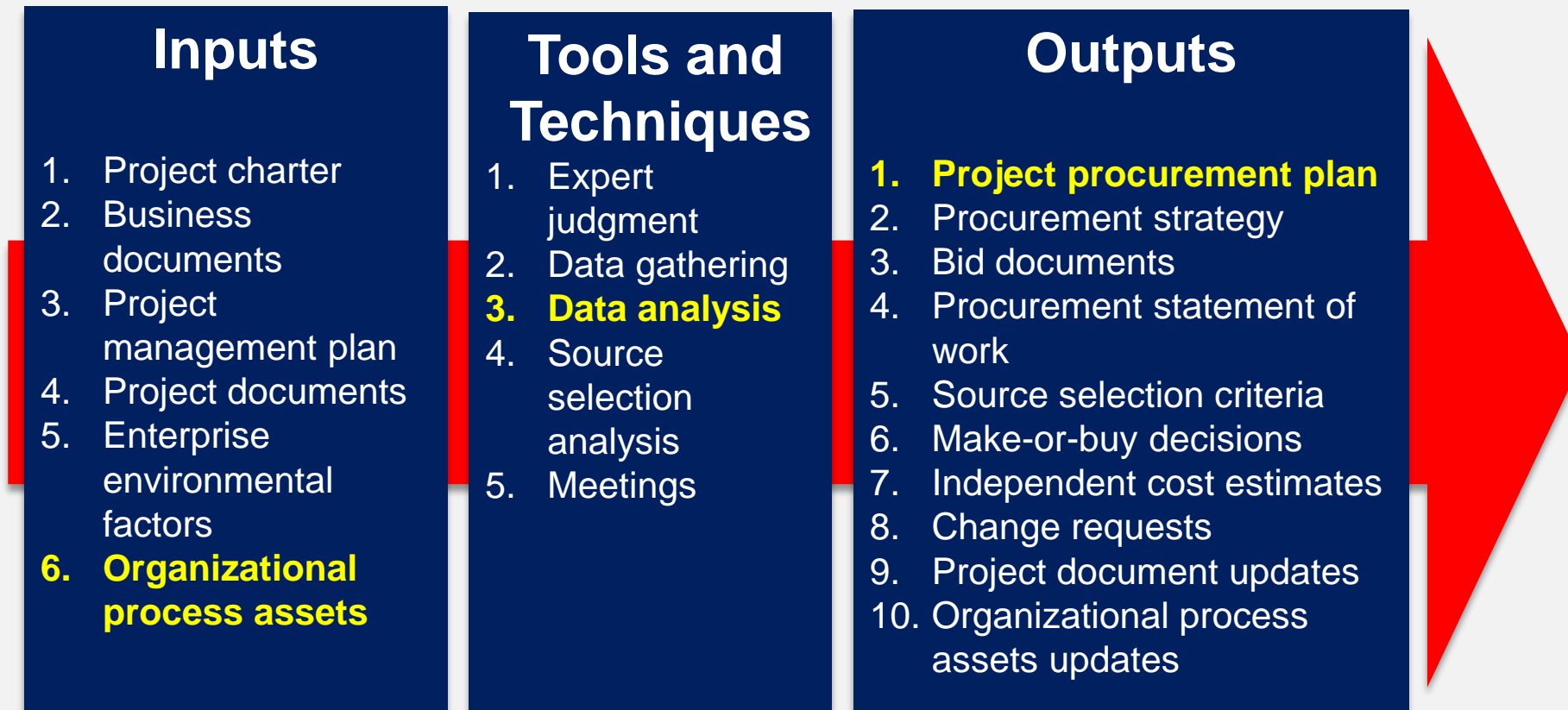
- **Complexity of procurement:** Is there one main procurement or are there multiple procurements at different times with different sellers that add to the complexity of the procurements?
- **Physical locations:** Are the buyers and sellers in the same location, or reasonably close, or in different time zones, countries, or continents?
- **Governance and regulatory environment:** Are local laws and regulations regarding procurement activities integrated with the organization's procurement policies? How does this affect contract auditing requirements?
- **Availability of contractors:** Are there available contractors who are capable of performing the work?

Project Procurement Management

	Initiating	Planning	Executing	Monitoring & Controlling	Closing
Integration					
Scope					
Schedule					
Cost					
Quality					
Resource					
Communications					
Risk					
Procurement		Plan Procurement Mgmt			
Stakeholder					

Project Procurement Management

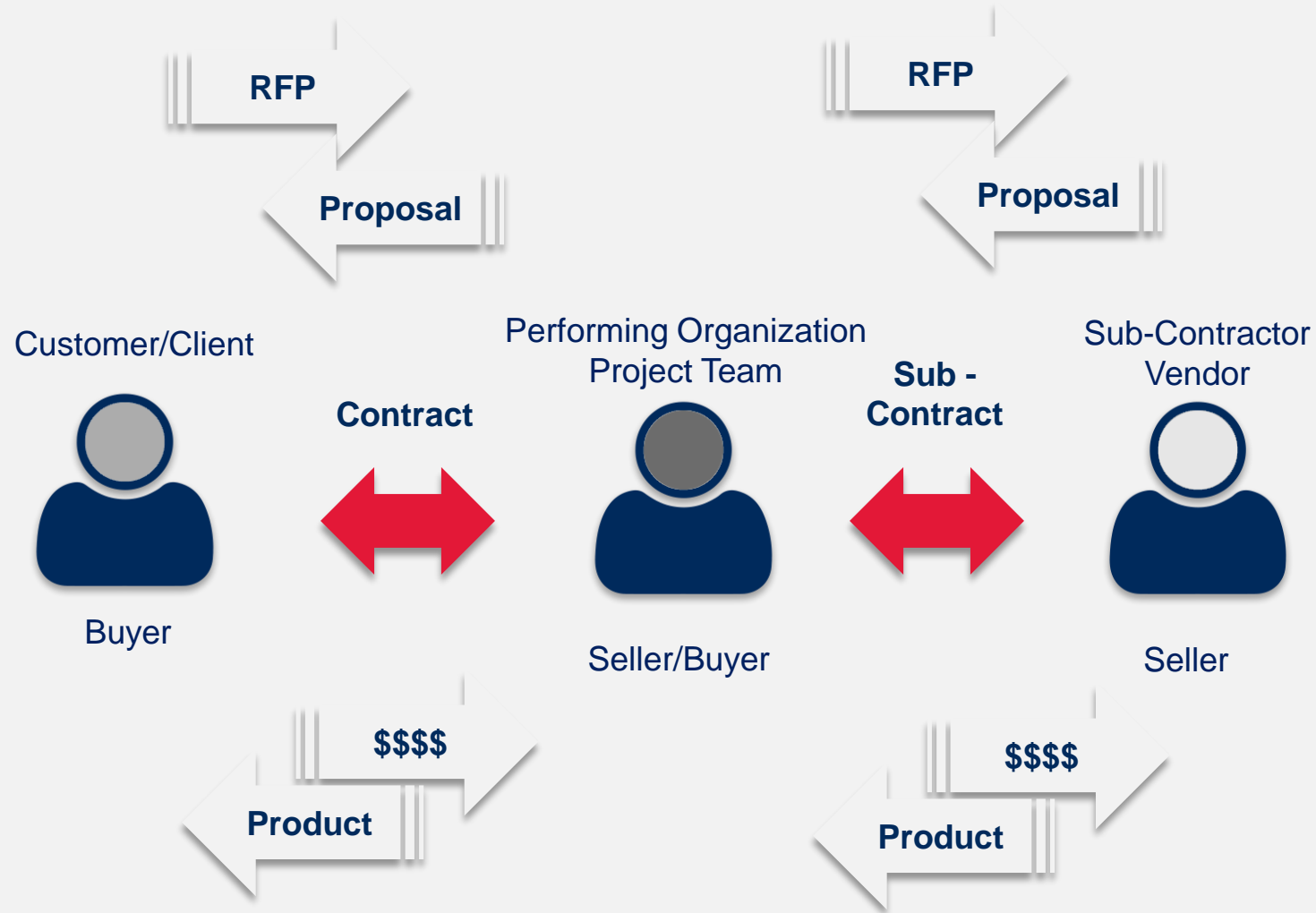
Processes of documenting project procurement decisions, specifying the approach and identifying potential sellers



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The Buyer-Seller Relationship

- When Buyer and Seller are independent organizations



Plan Procurement Management

- **Focuses on needs that can best be met by acquiring products, service or results outside of the project organization**
- **Includes:**
 - Documenting project purchasing decisions
 - Preparing high-cost estimate to determine the budget
 - Advertising the opportunity
 - Identifying potential sellers
 - Preparing and issuing bid documents
 - Preparing and submitting proposals by sellers
 - Conducting a technical evaluation of proposals
 - Performing a cost evaluation of proposals
 - Finalizing negotiations and signing contracts

- **Organizational process assets**
 - **Contract types:**
 1. **Fixed Price Contracts**
 2. **Cost Reimbursable Contracts**
 3. **Time and Materials Contracts**

1. Fixed Price Contracts

- Also referred to as lump sum

Firm Fixed Price (FFP)

- Most commonly used
- Very well-defined statement of work
- Assures potential seller that both scope and cost are fixed
- Assures client that all aspects of the work package are covered

2. Cost Reimbursable Contracts

Cost Plus (CP)

- Actual costs plus fixed fee or % fee, etc.
- The fee covers the sellers administrative expenses and is calculated on the direct and indirect costs
- Incentives are possible for meeting time or cost targets
- Used when buyer cannot produce well-defined statement of work

3. Time and Material Contracts

- Hybrid with aspects of costs-reimbursable and fixed-price

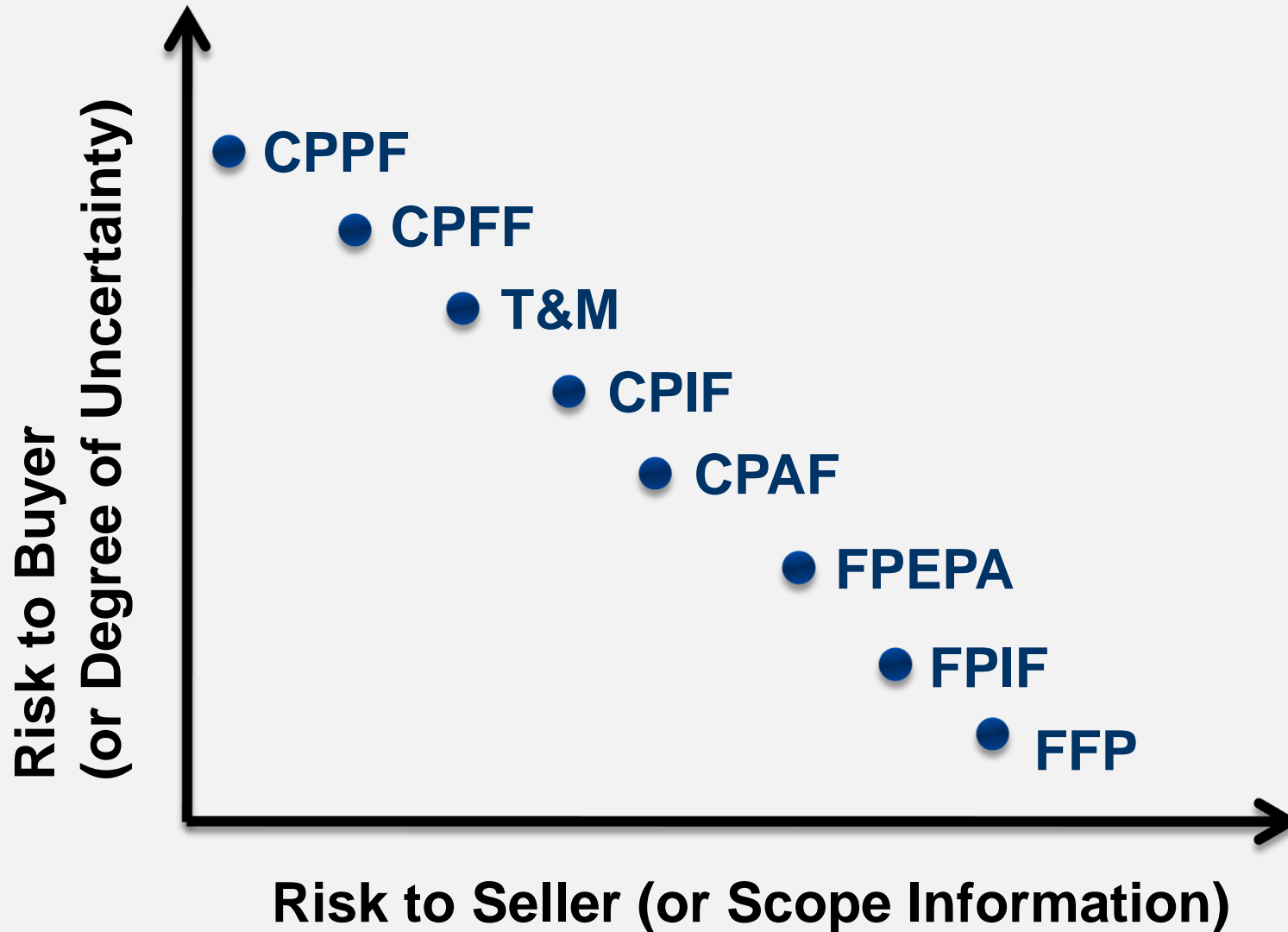
Unit Price

- Preset amount per unit of product or service
- Useful when the scope of work is not known at outset
- Similar to cost reimbursable type contract because of the open-ended arrangement with no maximum cost
- Similar to fixed-price type contract because unit rates are agreed upon in advance

Time & Material (T&M)

- Total value of the contract depends on the quantities needed to complete the work
- Can be converted to other types
- Possible to convert to a fixed-price or cost-reimbursable contract once the scope of work is known
- Upper limit may be required especially for government contracts

Buyer and Seller Contracts Risks



- **Data analysis**
 - **Analyzing the benefit of making or performing work in-house or buying the service or product**

Make-in-House Criteria

- Do we have the necessary human resources?
- Do we have the technical and management competencies and skills?
- Are they available for this project when they are needed ?
- Are they cost effective?

Buy Criteria

- Is the project component an off-the-shelf item and is available when needed ?
- How closely does it match the requirements?
- What, and how long would it take to customize it?
- What is the reputation of, and how reliable is (are) the sellers(s)
- Is there potential for long term relationship in other projects

- **Procurement management plan**

- Timetable for key procurement activities
- Legal jurisdiction and currency
- Metrics to be used to manage contracts
- Standardized procurement documents
- Management of multiple providers and coordination with other aspects of the project

- **Procurement strategy**

- Delivery methods
 - Different for various projects (e.g. construction versus professional services)
 - Need to consider impact if buyer or seller are using agile
- Contract types
- Payment phases
 - May include performance and milestone details for payments

- **Bid documents**
 - **Request for Information (RFI)**
 - Sellers are invited to submit information about their firm and services
 - **Request for Proposal (RFP)**
 - Sellers prepare and present proposals on how they will meet project requirements
 - **Request for Quote (RFQ)**
 - Items to be purchased or procured clearly identified by buyer
 - Quote or bid submissions
 - Sellers then quote or bids submitted

Procurement – Questions

1. **You want to have the least risk possible in setting up a contract to purchase goods and services from an outside firm. As the buyer, what type of contract should you use?**
 - a. Fixed price
 - b. Unit price
 - c. Cost reimbursable
 - d. Time and materials

2. **Your organization plans to hire an outside firm to develop a new marketing campaign for a major product. What type of procurement document would you send to potential sellers?**
 - a. RFQ
 - b. RFP
 - c. SOW
 - d. BAFO

3. **The process of choosing sellers is known as _____.**
 - a. source selection
 - b. a bid
 - c. WBS
 - d. a change order

1. A
2. B
3. A

Quiz

1. Purchasing insurance coverage for your project equipment is an example of _____ risk response.
- A. Transfer
 - A. Mitigation
 - B. Acceptance
 - C. Avoidance

Correct Answer is : **A**

This is an example of transfer as the financial risk is transferred to the insurance company

2. What action should a project manager first take when an unidentified risk event occurs?

- A. Inform the customer of the possible consequences
- B. Inform the senior management of the possible consequences
- C. Redo the risk identification process to prepare for other 'known-unknowns'
- D. Create a work-around

Correct Answer is : **D**

The right project management practice is to create a work-around as a response to the event.

3. You are a project manager at a financial firm that has multinational dealings. You feel the financial meltdown in one of the client countries could affect your project adversely, so you want to hedge your risks. Although the probability of occurrence of the event is low, you are advised to play it safe. In terms of risk attitude, your organization could best be described as?
- A. Risk Seeker
 - B. Risk Averse
 - C. Risk Neutral
 - D. Risk Mitigator

Correct Answer is: **B**

Someone who doesn't want to take risks is called risk averse, and the attitude of the organization seems to be the same.

5. How early can comprehensive risk analysis be done on a project?

- A. During project initiation
- B. After scope decomposition
- C. During scope validation
- D. After the project management plan has been baselined

Correct Answer is: **B**

A comprehensive risk analysis can be done only after the entire scope has been defined in the Work Breakdown Structure (WBS).

Key Takeaways

- **Define and identify Project Risks**
 - **Assess and plan for Project Risks**
 - **Organize and plan for Project Procurement**
- A contract is a mutually binding agreement that obligates the seller to provide the specified products, services, or results and obligates the buyer to provide the monetary or other valuable consideration in return.

Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.

Questions