IT Project Risk Management

Agenda

- Introduction
- Project Risk Defined
- Risk Management Challenges
- Risk Management Process
- Critical Success Factors
- Conclusion

Project Risk Defined

- Published standards
  - PMI's Project Management Body of Knowledge (PMBOK)
  - Australia-New Zealand ANZ-4360
  - International Standards Organization (ISO) 31000 Risk Management -- Guidelines on Principles and Implementation of Risk Management
  - National Institute of Standards and Technology (NIST) 800-30 Risk Management Guide for Information Technology Systems
  - Factor Analysis of Information Risk (FAIR)
  - Institute of Electrical and Electronics Engineers (IEEE) 1540
  - Many others

Project Risk Defined

- Webster's defines risk as "exposure to the chance of injury or loss; a hazard or dangerous chance"
- ANZ-4360 defines risk as "the chance of something happening that will have an impact on objectives."
- PMBOK defines project risk as "an uncertain event or condition that, if it occurs, has a positive or negative effect on at least one project objective, such as time, cost, scope or quality."

Risk Management Challenges

- Defined process is too complex
- Improperly identified risks
- Improperly quantified risks
- Ineffective mitigating strategies
- Insufficient documentation regarding the effectiveness of the mitigating strategy

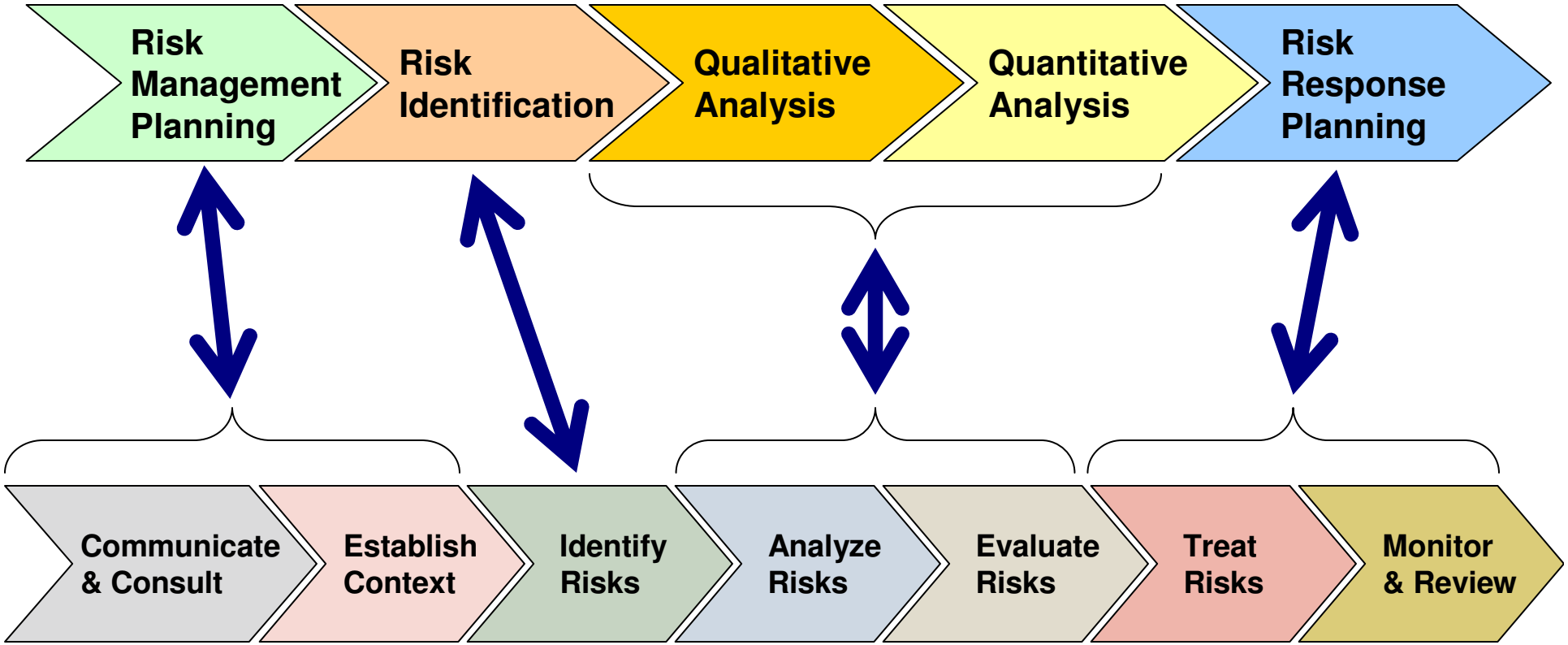
Risk Management Process

- ANZ-4360 lists seven components of risk management
  - Communicate and consult
  - Establish the context
  - Identify risks
  - Analyze risks
  - Evaluate risks
  - Treat risks
  - Monitor and review

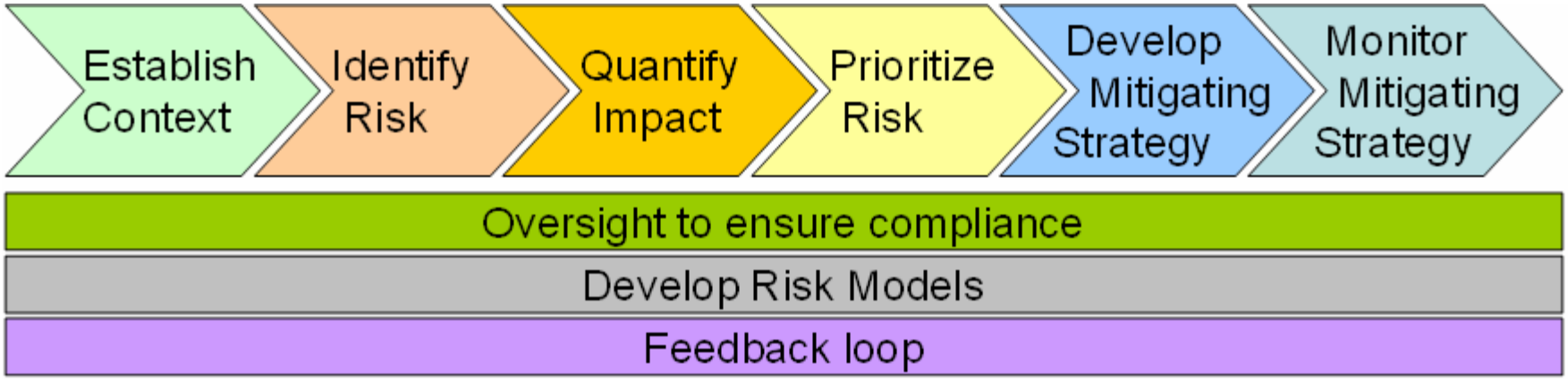
Risk Management Process

- PMBOK lists five components of risk management
  - Risk management planning
  - Risk identification
  - Qualitative risk analysis
  - Quantitative risk analysis
  - Risk response planning

PMBOK vs ANZ-4360



Risk Management Process



Risk Management Process

- Establish the context
  - Budget, schedule, quality, mission accomplishment

Risk Management Process

- Identify risks
  - Symptoms, conditions, and events are frequently identified as risks.
  - Issues are often confused with risks and end up on the risk log
  - The danger of mis-identification is that countless hours of effort is wasted on conditions, events, or symptoms that can not actually be mitigated and the actual risk goes unmitigated.

Risk Management Process

- To properly identify risks, ask these 5 questions
  1. Is there a schedule impact?
  2. Is there a budget impact?
  3. Is there an impact to quality?
  4. Is there an impact to our ability to accomplish the mission?
  5. Can impact be objectively quantified?

Risk Management Process

- Objectively quantify the impact to the project of each individual risk
  - Use objective measures (e.g. three-week schedule delay, $50,000 budget overrun, 500 hours of rework).
  - Quantify risks in terms of budget, schedule, quality or mission accomplishment
  - Not properly quantifying risks can lead to the project team spending more on $$ and effort mitigating the risk than the impact to the project is worth (e.g. spending $100K to mitigate a $50K risk)

Risk Management Process

- Prioritize risks
  - Don't make it complicated, keep it simple (e.g. 9-box model)
  - Based on impact and probability with emphasis on IMPACT

		Cost	Size	Functionality	Ease of installation	Ease of operation	Aesthetics	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTALS
		1	2	3	4	5	6															
Cost	1		1	0.2	5	0.2	10															16.4
Size	2	1		0.2	1	0.1	1															3.3
Functionality	3	5	5		0.1	1	10															21.1
Ease of installation	4	0.2	1	10		0.1	0.2															11.5
Ease of operation	5	5	10	1	10		0.1															26.1
Aesthetics	6	0.1	1	0.1	5	10																16.2
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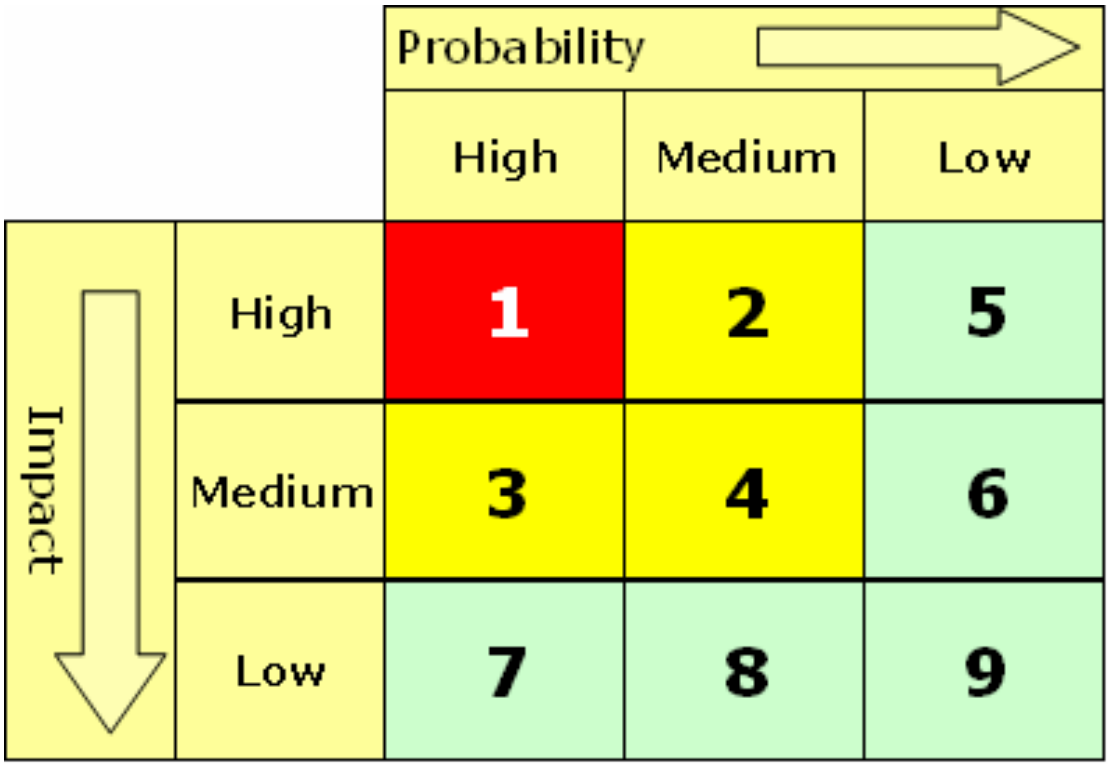
Figure 2-Advanced Prioritization Matrix

- Total each row to determine the score for each item.
- A rank and/or percentage score can be determined for each item in the same manner as the simple prioritization matrix. The item with the greatest score ranks #1, such as "Ease of operation" in the example above. It is possible that two or more items may have the same score. These items can be assigned the same rank or the items can be re-compared against each other if having multiple items with the same rank is not desired.
- Determine the percentage scores by determining the overall score total then divide the score for each item by this overall total. The percentage score for "Functionality" in the example above is 22% (94.6 ÷ 21.1 x 100%).

Probability	Threats					Opportunities				
0.9	0.05	0.09	0.18	0.36	0.72	0.72	0.36	0.18	0.09	0.05
0.7	0.04	0.07	0.14	0.28	0.56	0.56	0.28	0.14	0.07	0.04
0.5	0.03	0.05	0.2	0.2	0.4	0.4	0.2	0.2	0.05	0.03
0.3	0.02	0.03	0.06	0.12	0.24	0.24	0.12	0.06	0.03	0.02
0.1	0.01	0.01	0.02	0.04	0.08	0.08	0.04	0.02	0.01	0.01

9-Box Model Prioritization



9-Box Model Prioritization

Context	Impact	Parameter
Schedule	High	> 6 Weeks
	Medium	2 – 5 Weeks
	Low	< 2 Weeks
Budget	High	> $100,000
	Medium	$50,000 - $99,999
	Low	< $50,000

Context	Impact	Parameter
Quality	High	> 1,000 Hrs Rework
	Medium	500 – 999 Hrs Rework
	Low	< 500 Hrs Rework
Mission	High	Failure chance >65%
	Medium	Failure chance 35%-65%
	Low	Failure chance < 35%

Risk Management Process

- Develop a mitigating strategy for each individual risk
  - Webster's dictionary defines strategy as "a plan, method, or series of maneuvers or stratagems for obtaining a specific goal or result".
  - A mitigating strategy consists of multiple mitigating actions
  - Identify "triggers" to determine when to invoke the mitigating strategy

Risk Treatment Plan

Risk	Resources Requirements	Proposed Action	Timing	Performance Measures	Reporting and Monitoring
Schedule delay > 2 weeks due to late delivery by supplier	Contract Specialist (CS) Project Manager (PM)	Develop performance based contract with supplier(s)	Prior to project start		N/A
		Establish weekly milestones	Prior to project start		N/A
		Conduct weekly progress reviews	Weekly - ongoing		Weekly Progress Report
		Identify alternate supplier(s)	30 days prior to the trigger point		Project Schedule
		Establish a trigger point for engaging alternate supplier(s)	Prior to project start		Project Schedule
		Engage alternate supplier(s)	•Earned value is < 90% at the trigger point OR •Earned value is < 75% at weekly progress review	Earned value	IAW Communication Plan

Risk Management Process

- Monitor the effectiveness of the mitigating strategy
  - Continuously monitor the ROI of mitigating actions.
  - It doesn't make sense to spend $100K mitigating a risk that will result in $50K loss.

Risk Management Process

- Provide oversight to ensure process compliance
  - Ensure that the risk management process is being utilized on all projects
  - Ensure that risks are properly identified and quantified
  - Ensure that risk triggers are being utilized

Risk Management Process

- Develop Risk models
  - Develop models based on project size, technology stack, team size, etc.
  - Requires investment in risk analysis to understand which mitigating strategies are effective, which strategies are ineffective and which strategies have never been attempted

Risk Management Process

- Feedback loop to ensure that lessons learned, models are disseminated to new project teams
  - Empirical modeling, Plan-Do-Check-Act (PDCA)

Critical Success Factors

- Must have a defined process
- Risk management must be implemented at the project level
- Must have oversight to ensure compliance
- In order to deliver maximum value to the Enterprise you must conduct risk analysis and develop reusable risk models

Conclusion

- Keep the process simple
- Monitor to ensure compliance
- Foster innovation by developing multi-action mitigating strategy
- Invest significantly in risk analysis in order to deliver maximum value to the enterprise and ultimately to the customer

Risk Management at a Glance

Keys to effective project risk management
Implement a defined process
Properly identify project risks
Quantify risk impact using objective measures
Prioritize risks based on impact and probability
Develop a mitigating strategy
Monitor mitigating strategies
Develop reusable risk models
Provide oversight to ensure compliance
Implement an active feedback loop

Software Assurance Workshop

Security-Enhanced Quality Assurance, Testing and Project Management

September 9th, 2008 QAAM - Baltimore, MD

Joseph W. Mayo

Keane Federal Systems, Inc.

McLean, VA

804-310-9661

joseph.mayo@keane.com

Additional References

- ANZ-4360 – http://www.saiglobal.com/shop/Script/Details.asp?DocN=AS564557616854
- PMBOK – http://www.pmi.org/Marketplace/Pages/default.aspx?Category=PMBOKBooks
- Effective Project Risk Management – http://www.north-country.net/publications/Effective_Project_Risk_Management.pdf