

The background features a series of vertical panels with rounded ends. The first panel shows hands typing on a laptop. The second panel shows a graduation cap icon. The third panel shows a target icon, a play button icon, and a group of people icon. The fourth panel shows an open book icon and a magnifying glass icon. The fifth panel is a solid light blue color.

Enterprise Risk Management

PMG 611

Lecture 2

Risk Management Fundamentals

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Session Outline

What Is Risk

Risk in a
Business
Context

Risk
Management
Phases

Summary

What Is Risk

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What Is Risk - Dictionary Definition

- “(Exposure to) the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility.”
- “the possibility of something bad happening”.

What Is Risk

- The term risk is generally used to refer to a situation where the outcome is uncertain and there is a possibility of loss.
- The loss is random in nature.
- It occurs by chance and may happen to anybody and any property.

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What Is Risk

- The word evokes elements of chance, uncertainty, threat, danger, and hazard.
- These connotations include the possibility of loss, injury, or some other negative event.
- It would be natural to assume that one should simply minimize risks or avoid them altogether.
- In fact, risk managers have applied this negative definition for many years.
- Risk was simply a barrier to business objectives, and the object of risk management was to limit it.

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Definitions from different industries and standards

- An ongoing or upcoming concern that has a significant probability of adversely affecting the success of major milestones. “Rational Unified Process 2000”
- A probability or threat of damage, injury, loss, or any other negative occurrence that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action. “Business Dictionary”
- A possible event that could cause harm, loss, or affect the ability to achieve objectives. “ITIL”

Risk in a Business Context

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Risk in a Business Context

- Risk has an upside as well as a downside.
- Without risk there would be no opportunity for return.
- A proper definition of risk, then, should recognize both:
 - its **cause** (a variable or **uncertain** factor)
 - its **effect** (**positive** and **negative** deviation from an expected outcome).

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Pure and Speculative Risk

	Pure Risk	Speculative Risk
Meaning	Pure risk is the risk which involves only the possibility of loss or no loss.	Speculative risk involves both the possibility of gain as well as possibility of loss.
Possibility of Profits/ Loss	Occurrence of this risk may result in loss only and no gains.	Occurrence of this risk may result in possibility of both gain as well as loss.
Risk Coverage	Insurance services provides coverage of such risks.	such risks cannot be covered under insurance provisions.

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Risk in a Business Context

*“Risk is a variable that can cause **deviation** from an expected outcome, and as such may affect the achievement of business objectives and the performance of the overall organization.”*

- To understand this definition, we need to clarify seven key fundamental concepts.
- It is important not to confuse any of these with risk itself.

Seven Key Fundamental Concepts

1. Exposure
2. Volatility
3. Probability
4. Severity
5. Time Horizon
6. Correlation
7. Capital

1. Exposure

- Risk exposure is the maximum amount of economic damage resulting from an event.
- This damage can take the form of *financial* and/or *reputational* loss.
- All other factors being equal, the risk associated with that event will increase as the exposure increases.
- Exposure measurement is a hard science for some risks—those which result in direct financial loss such as credit and market risk—but is more qualitative for others, such as operational and compliance risk.

2. Volatility

- Volatility is a measure of uncertainty, the variability in potential outcomes.
- More specifically, volatility is the magnitude of the upside or downside of the risk taken.
- Generally, the greater the volatility, the greater the risk.

3. Probability

- The more likely an event.
- In other words, the greater its probability—the greater the risk it presents.
- Take the case of a modern data center.
- Among potential risks are cyberattack and fire, with the probability of the latter considerably lower than that of the former.

4. Severity

- Whereas exposure is defined in terms of the worst that could possibly happen, severity, by contrast, is the amount of damage that is likely to be suffered.
- The greater the severity, the greater the risk.
- Severity is the partner to probability.
- If we know how likely an event is to happen, and how much we are likely to suffer as a consequence, we have a pretty good idea of the risk we are running.

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5. Time Horizon

- Time horizon refers to the duration of risk exposure or how long it would take to reverse the effects of a decision or event.
- The longer an exposure's duration, the greater its risk.
- For example
 - Extending a one-year loan is less risky than extending a 10-year loan to the same borrower.
 - A fire that burns a computer center to the ground will leave a company exposed until backup facilities come online

6. Correlation

- Correlation refers to how risks in a business are related to one another.
- If two risks behave similarly—that is, they increase for the same reasons or by the same amount—they are considered highly correlated.
- The greater the correlation, the greater the risk.
- Examples
 - include loans to a particular industry, investments in the same asset class, or operations within the same building.
 - use of redundant systems

7. Capital

- Companies hold capital for two primary reasons: The first is to meet cash requirements such as investments and expenses, and the second is to cover unexpected losses arising from risk exposures. Called ***Economic Capital***.
- ***Human Capital*** (management talent, experience, and track record)
- ***Liquidity Reserves*** relative to a company's risk profile.
- The combination represents the "***Risk Capacity***" of the company.

Risk Management Phases

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Risk Management Fundamentals

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Risk Management Phases

- Risk management encompasses the identification, analysis, and response to risk factors that form part of the life of a business.
- Effective risk management means attempting to control, as much as possible, future outcomes by acting proactively rather than reactively.
- Therefore, effective risk management offers the potential to reduce both the possibility of a risk occurring and its potential impact.



(1) Risk Identification

- Management should endeavor to identify all possible risks that may impact the success of their enterprise.
- The risk identification process requires **a studied, deliberate approach** to looking at potential risks in each area of operations and then identifying the more significant risk areas that may impact each operation in a reasonable time period.

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(1) Risk Identification

- The idea is not to just list every possible risk **but** to identify those that might impact operations, with some level of probability, within a reasonable time period.
- A good approach is to identify people at all levels of the enterprise who would be asked to serve as risk assessors.
- Brainstorming is often a good approach to get a group with different backgrounds to focus on some subject.

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(1) Risk Identification

Strategic Risks

External Factors Risks

- Industry Risk
- Economy Risk
- Competitor Risk
- Legal and Regulatory Change Risk
- Customer Needs and Wants Risk

Internal Factors Risks

- Reputation Risk
- Strategic Focus Risk
- Parent Company Support Risk
- Patent/Trademark Protection Risk

Operations Risks

Process Risks

- Supply Chain Risk
- Customer Satisfaction Risk
- Cycle Time Risk
- Process Execution Risk

Compliance Risks

- Environmental Risk
- Regulatory and Government Compliance Risk
- Policy and Procedures Risk
- Litigation Risk

People Risks

- Human Resources Risk
- Employee Turnover Risk
- Performance Incentive Risk
- Training Failure Risk

Sample Types of Enterprise Business Risks

Finance Risks

Treasury Risks

- Interest Rate Risk
- Foreign Exchange Risk
- Capital Availability Risk

Credit Risks

- Capacity Risk
- Collateral Risk
- Concentration Risk
- Default Risk
- Settlement Risk

Trading Risks

- Commodity Price Risk
- Duration Risk
- Measurement Risk

Information and Technology Risks

Financial Risks

- Accounting Standards Risk
- Budgeting Risk
- Financial Reporting Risk
- Taxation Risk
- Regulatory Reporting Risk

Operational Risks

- Pricing Risk
- Performance Measurement Risk
- Employee Safety Risk

Technological Risks

- Information Access Risk
- Business Continuity Risk
- Virus and Improper Systems Access Risk
- Availability Risk
- Infrastructure Risk

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(1) Risk Identification

- The ERM team should analyze each of these brainstorm-session identified risks in a bit more detail asking such questions as:
 - Is the risk common across the overall enterprise or is it unique to just one business group?
 - Will the enterprise face this risk because of internal events within the company or through external events?
 - Are the risks related? That is, will one risk cause another to occur?
- The idea is to gain a strong understanding of the nature of the and then to highlight those risks that can be considered to be core/major risks.

(2) Risk Assessments

1. Qualitative Assessments

- a relatively quick best-guess qualitative assessment to some detailed

2. Quantitative Assessments

- mathematical quantitative approaches
- The whole idea here is to help management to better decide which of a series of potentially risky events should give the most to worry about.

(2) Risk Assessments

- In both Qualitative and Quantitative Assessments, we need to determine for each risk:

1. Likelihood / Probability

- What is the likelihood of this risk occurring over the time period?

2. Significance / Impact / Consequence / Severity

- What is the significance of the risk, in terms of cost to the enterprise?

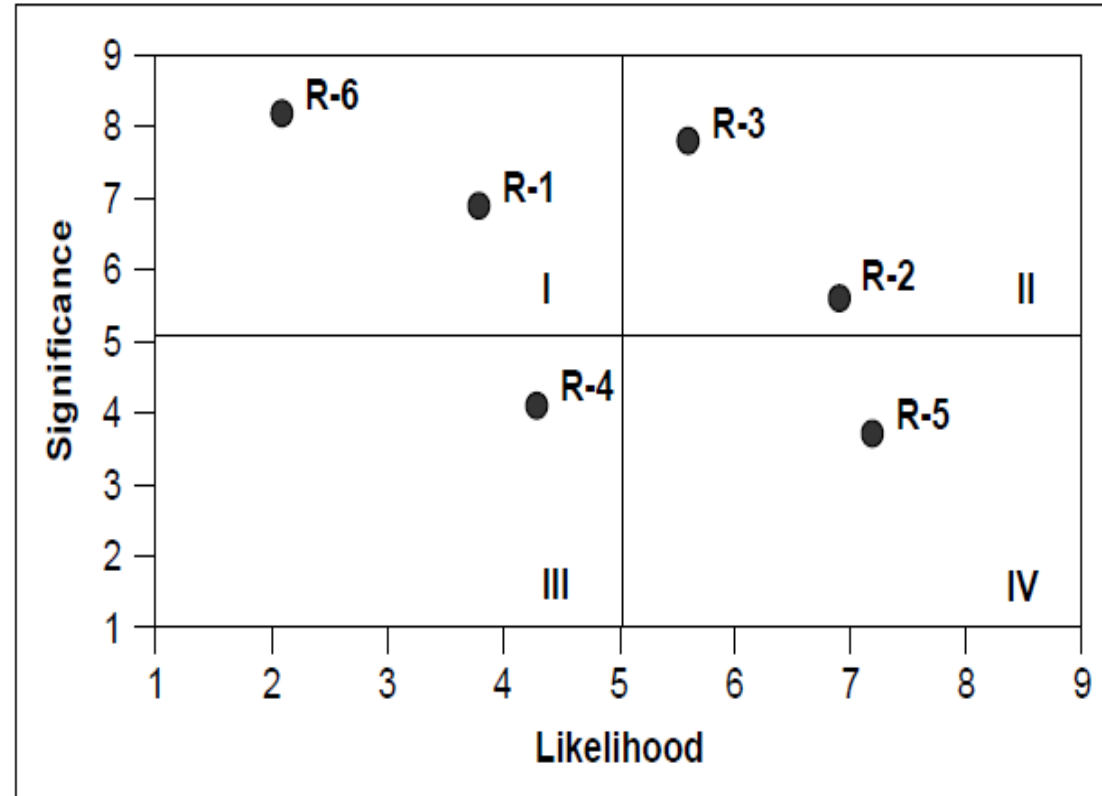
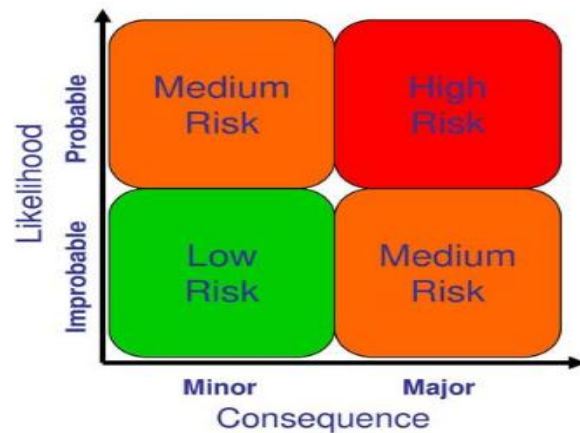
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(2) Risk Assessments - *Qualitative Assessments*

- What is the **likelihood** of this risk occurring over the next one-year period?
- Using a score of 1 to 9, assign a best-guess single-digit score as follows:
 - Score 1 if you see almost no chance of that risk happening during the period.
 - Score 9 if you feel the event will almost certainly happen during the period.
 - Score 2 through 8 depending on how you feel the likelihood will fall between these two ranges.
- What is the **significance** of the risk, in terms of cost to the enterprise?
 - 1-to-9 scale,
 - Scoring ranges should be set depending on the financial significance of the risk to the enterprise.

Risk#	Likelihood	Significance
R-1	3.75	7
R-2	7	5.5
R-3	3.75	7.5
R-4	4.25	4
R-5	7.25	3.5
R-6	5.75	7.75



Risk Assessment Analysis Chart

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(2) Risk Assessments - *Qualitative Assessments*

		CONSIDER THE LIKELIHOOD OF A HAZARDOUS EVENT OCCURRING				
CONSIDER THE SEVERITY OF INJURY/ILLNESS	RISK ASSESSMENT MATRIX	Very unlikely to happen	Unlikely to happen	Possibly could happen	Likely to happen	Very likely to happen
	Catastrophic (e.g fatal)	Moderate	Moderate	High	Critical	Critical
	Major (e.g Permanent Disability)	Low	Moderate	Moderate	High	Critical
	Moderate (e.g Hospitalisation/Short or Long Term Disability)	Low	Moderate	Moderate	Moderate	High
	Minor (e.g First Aid)	Very Low	Low	Moderate	Moderate	Moderate
	Superficial (e.g No Treatment Required)	Very Low	Very Low	Low	Low	Moderate

(2) Risk Assessments - *Quantitative Assessments*

- The assessment teams should think of the individual risk **likelihoods** and **occurrences** in terms of two-digit probabilities ranging from *almost* 0.00 to 0.99.
- Risks essentially never have a zero chance or 100 percent chance of occurring.

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(2) Risk Assessments - *Quantitative Assessments*

Identified Risk	Significance Probability (P)	Likelihood Probability (L)	Risk Score (P × L)	Rank
A	0.55	0.30	0.17	8
B	0.88	0.24	0.21	7
C	0.79	0.66	0.52	1
D	0.77	0.45	0.35	4
E	0.35	0.88	0.31	5
F	0.54	0.49	0.26	6
G	0.62	0.72	0.45	2
H	0.66	0.20	0.13	9
I	0.90	0.45	0.41	3
J	0.12	0.88	0.11	10

Risk-Ranking Chart Example

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(2) Risk Assessments

- When estimating occurrences and likelihoods, the ERM team should take care to assure that all estimates are made over the ***same period of time***.
- Usually, a one-year interval or at least until the end of the next fiscal year is a reasonable interval of time.
- There is typically not enough information to make reasonably accurate estimates much beyond those periods.

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Qualitative Vs. *Quantitative* Assessments

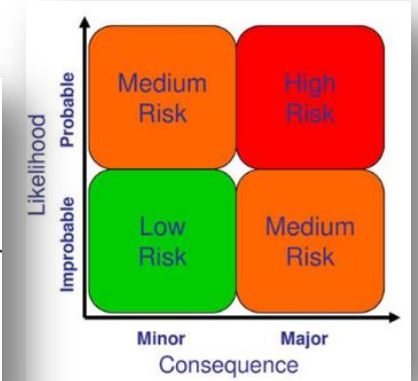
- A quantitative risk management methodology is best suited for a ***detailed*** look at comparing risks. (more costly)
- A qualitative risk assessment is quick best-guess based more so on subjectivity and the knowledge of the assessor. (less costly)
- You can combine the two methodologies to enhance an existing risk assessment.
- Start with qualitative method to determine the top risks list and then use quantitative method to carry more ***detailed*** look at risks in this list.

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(3) Risk Prioritization and Response Planning

- Risk Prioritization / Risk Ranking
 - A typical enterprise that goes through a risk assessment process will end up with a very long list of potential risks.
 - A next step is to find risk rankings and identify the most significant risks across the entity reviewed.

Identified Risk	Significance Probability	Likelihood Probability	Risk Score (P x L)	Rankings
C	0.79	0.66	0.52	1
G	0.62	0.72	0.45	2
I	0.90	0.45	0.41	3
D	0.77	0.45	0.35	4
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J	0.12	0.88	0.11	10



(3) Risk Prioritization and Response Planning

- Response Planning
 - process requires significant management input and support to recognize the various alternative risk responses and to have action plans in place to satisfy the appropriate responses.
- Cost Impact (Exposure)
 - Cost of risk is the cost of managing risk and incurring losses due to risk.
 - It can be forecast for a future period.

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(3) Risk Prioritization and Response Planning

Identified Risk	Significance Probability	Likelihood Probability	Risk Score (P x L)	Rankings	Cost Impact	Expected Value of Cost	Risk Response Planning?
C	0.79	0.66	0.52	1	\$ 120,600	\$ 62,881	Yes
G	0.62	0.72	0.45	2	\$ 785,000	\$350,424	No
I	0.90	0.45	0.41	3	\$ 15,000	\$ 6,075	Yes
D	0.77	0.45	0.35	4	\$ 27,250	\$ 9,442	Yes
E	0.35	0.88	0.31	5	\$ 52,350	\$ 16,124	Yes
F	0.54	0.49	0.26	6	\$ 1,200	\$ 318	Yes
B	0.88	0.24	0.21	7	\$ 12,650	\$ 2,672	Yes
A	0.55	0.30	0.17	8	\$ 98,660	\$ 16,279	Yes
H	0.66	0.20	0.13	9	\$1,200,980	\$158,529	No
J	0.12	0.88	0.11	10	\$ 88,600	\$ 9,356	Yes

Risk-Ranking Response-Planning Example

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(3) Risk Prioritization and Response Planning

- Risk C has a high likelihood and significance as well as a fairly high expected cost to correct. This is the type of risk that management should identify as a candidate for corrective actions.
- Risk G has a relatively high cost to implement. This may be the type of risk where management decides to accept the risk or to develop some other form of remediation plan.

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(4) Risk Monitoring

- Keep track of the identified risks, including the watch list.
- Monitor trigger conditions for contingencies
- Monitor residual risks and identify new risks arising.
- Determine if risk responses have been implemented as planned.
- Determine if risk exposure has changed from its prior state, with analysis of trends.

Summary

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Risk Management Fundamentals

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- Risk has an upside as well as a downside.
- Without risk there would be no opportunity for return.
- A proper definition of risk, then, should recognize both:
 - its **cause** (a variable or **uncertain** factor)
 - its **effect** (**positive** and **negative** deviation from an expected outcome).

2-9

	Pure Risk	Speculative Risk
Meaning	Pure risk is the risk which involves only the possibility of loss or no loss.	Speculative risk involves both the possibility of gain as well as possibility of loss.
Possibility of Profits/ Loss	Occurrence of this risk may result in loss only and no gains.	Occurrence of this risk may result in possibility of both gain as well as loss.
Risk Coverage	Insurance services provides coverage of such risks.	such risks cannot be covered under insurance provisions.

2-10

- Risk has an upside as well as a downside.
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2-9

1. Exposure
2. Volatility
3. Probability
4. Severity
5. Time Horizon
6. Correlation
7. Capital

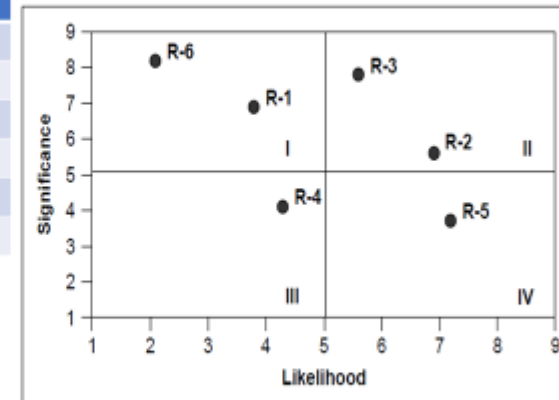
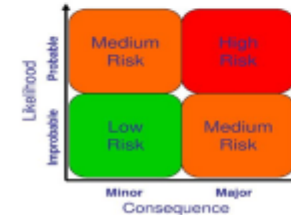
2-12

Risk Management Phases

- Risk management encompasses the identification, analysis, and response to risk factors that form part of the life of a business.
- Effective risk management means attempting to control, as much as possible, future outcomes by acting proactively rather than reactively.
- Therefore, effective risk management offers the potential to reduce both the possibility of a risk occurring and its potential impact.

2-21

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Risk Assessment Analysis Chart

2-30

(3) Risk Prioritization and Response Planning

- Risk C has a high likelihood and significance as well as a fairly high expected cost to correct. This is the type of risk that management should identify as a candidate for corrective actions.
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2-39

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- Implementing Enterprise Risk Management: From Methods To Applications. *James Lam.*



Thank You