

**PMG 611**

Enterprise Risk Management

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جامعة الجميع الذكية

تسعى لتكون الكيان الأول الذي يتبنى مبدأ المجتمع التعليمي  
التعاوني ويقدم العلم مقابل العمل لتنمية وبناء المجتمعات.

Lecture 2

Risk Management Fundamentals



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# Lecture 2

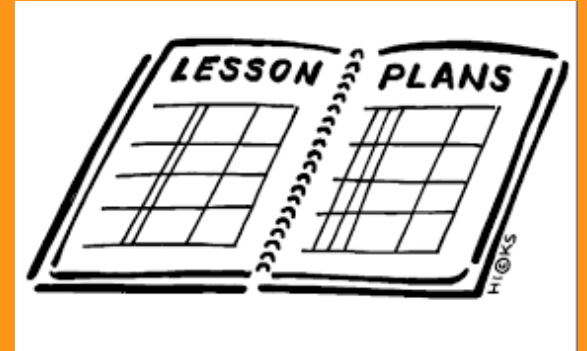
## Session Outline

What Is Risk

Risk in a  
Business  
Context

Risk  
Management  
Phases

Summary



## Lecture 2

# What Is Risk



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- “(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”.

- 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.

- 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.

- 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 or loss, or affect the ability to achieve objectives.

“ITIL”

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# Risk in a Business Context



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# Lecture 2

## 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).

# Lecture 2

## Pure and Speculative Risk

|                                     | Pure Risk                                                                     | Speculative Risk                                                                       |
|-------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|
| <b>Meaning</b>                      | 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. |
| <b>Possibility of Profits/ Loss</b> | 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.        |
| <b>Risk Coverage</b>                | Insurance services provides coverage of such risks.                           | such risks cannot be covered under insurance provisions.                               |

*“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.

1. Exposure

2. Volatility

3. Probability

4. Severity

5. Time Horizon

6. Correlation

7. Capital

- 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.

- 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.

- 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.

- 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.

- 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

- 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

- 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.

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# Risk Management Phases



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- 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.

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## Risk Management Phases



- 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.

- 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.

# Lecture 2

## (1) Risk Identification

### Sample Types of Enterprise Business Risks

#### 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

#### 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

- 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.

### 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.

- 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

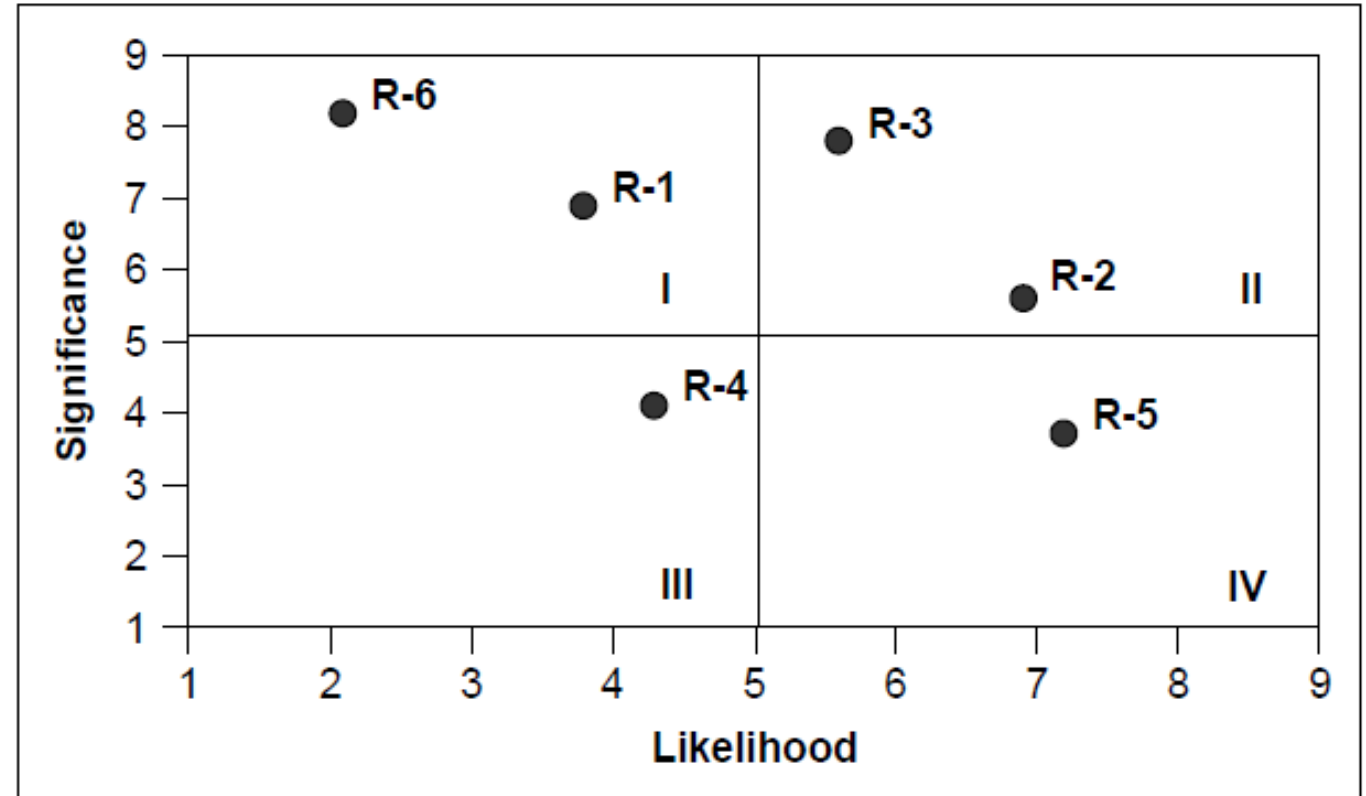
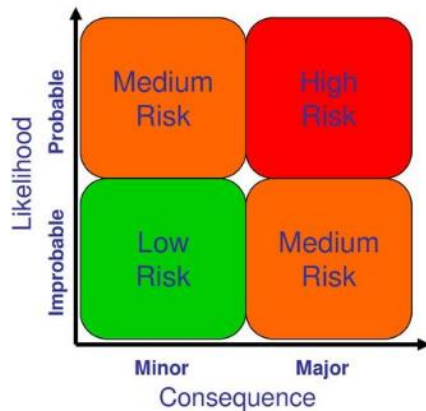
- What is the significance of the risk, in terms of cost to the enterprise?

- 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.

# Lecture 2

## (2) Risk Assessments - *Qualitative Assessments*

| 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

# Lecture 2

## (2) Risk Assessments - *Qualitative Assessments*

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

- 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.

# Lecture 2

## (2) Risk Assessments - *Quantitative Assessments*

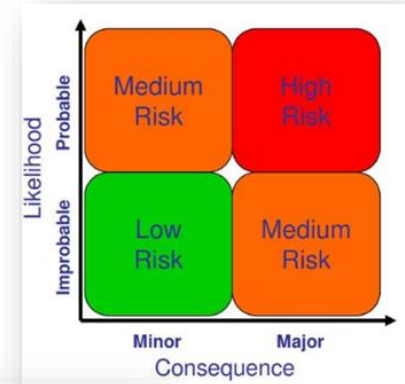
| Identified Risk | Significance Probability (P) | Likelihood Probability (L) | Risk Score (P × L) | Rank |
|-----------------|------------------------------|----------------------------|--------------------|------|
| A               | 0.55                         | 0.30                       | 0.17               | 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**

- 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.

- 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.

- 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        |
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- 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.

# Lecture 2

## (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**

# Lecture 2

## (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.

| Identified Risk | Significance Probability | Likelihood Probability | Risk Score (P x L) | Rankings | Cost Impact | Expected Value of Cost | Risk Response Planning? |
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- 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.

Lecture  
2

# Summary



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## Lecture 2

### 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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## Lecture 2

### Pure and Speculative Risk

|                                     | Pure Risk                                                                     | Speculative Risk                                                                       |
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| <b>Possibility of Profits/ Loss</b> | 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.        |
| <b>Risk Coverage</b>                | Insurance services provides coverage of such risks.                           | such risks cannot be covered under insurance provisions.                               |



L2 - 10

## Lecture 2

### 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.



L2 - 11

## Lecture 2

### Seven Key Fundamental Concepts

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



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## Lecture 2

### Risk Management Phases

- (1) Risk Identification.
- (2) Risk Assessments.
- (3) Risk prioritization and response planning.
- (4) Risk monitoring.



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## Lecture 2

### (3) Risk Prioritization and Response Planning

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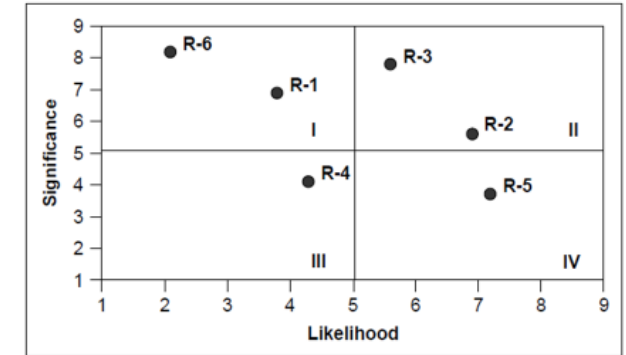
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## Lecture 2

### (2) Risk Assessments - *Qualitative Assessments*

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| 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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# Lecture 2

## References

- COSO Enterprise Risk Management: Establishing Effective Governance, Risk, and Compliance Processes. *Robert R. Moeller.*
- Implementing Enterprise Risk Management: From Methods To Applications.  
*James Lam.*



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