

Ch:1 Risk Identification

Process for Managing Risk in Supply chain

- Identify
- Assess / classify
- Develop Risk response plan
- Execute Risk response plan.

Identify the Risk

Brainstorm Assign the attribute

/ / / / /	atributes	A-2	A-3
Risk			

Assess / classify

- Qualitative Risk Assessment
- Quantitative Risk (optional)

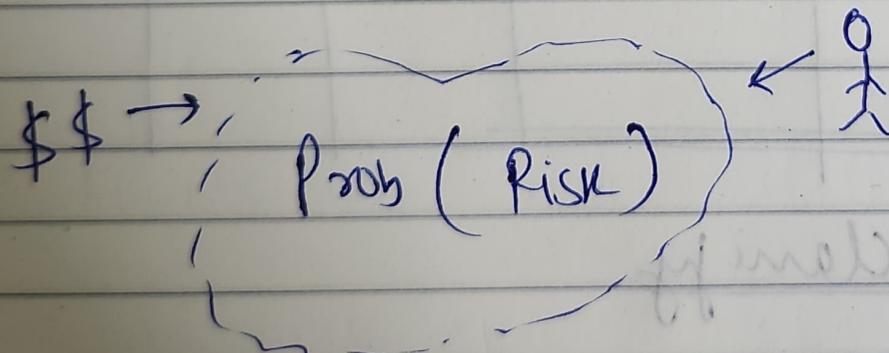
- Developing Risk Response plan

↳ Risk → Risk Response owner
get fund.

- ⚡

Executing the Risk Response plan

↳ Implementing RRP
Analyze Trends
Analyze Risk Budget
Regular meeting



Topic 1 Risk Management

"The identification, assessment and prioritization of risk followed by coordinated and economical application of resources to minimize, monitor and control the probability or impact of unfortunate events or to maximize the mitigation of opportunity"

End to End concern

Supply Chain Risk Management

"the systematic identification, assessment and quantification of potential supply chain disruptions with the objective to control exposure to risk or reduce the negative impact on supply chain performance"

→ ALSO end-to-end model * supply chain
also system?

Accenture's set of principles

- Integrate
- Model
- Diversify and add flexibility
- Quantify
- Perform due diligence
- Insure

→ Tools

- Predictive Analytic Tool
- Performance Risk Management
- Time to Recovery (KPI)
- Benchmarking against competitor
- Multi tier due diligence
 - Tier -1 ≈ 40% of all disruption
Root cause
 - 50% issue = Weather Related
↓
"Insurance"
 - 40% issue = IT / Telecommunication

Risk Manager

Role

- Help the S.C. process
- Identify potential failure
- Create Risk Awareness

Also

- Prioritize funds
- Implement risk prevention plan
- Gather feedback
- Chair Meeting

Risk Mgt Maturity Level

Highest level of Risk Maturity = 50% less chance of price volatility
= +ve Return

Low risk Maturity = High Cons

Risk Level

lowest

- Supplier Risk

Rationale

- Tools like SRM, Spend Mgt
- Supplier Risk Assessment
- Cloud based Software to detect Malfeasance

- Demand Risk

- CAPP, CIPR
- S&OP

- Process Risk

- Inv. planning and scheduling

- Env. Risk

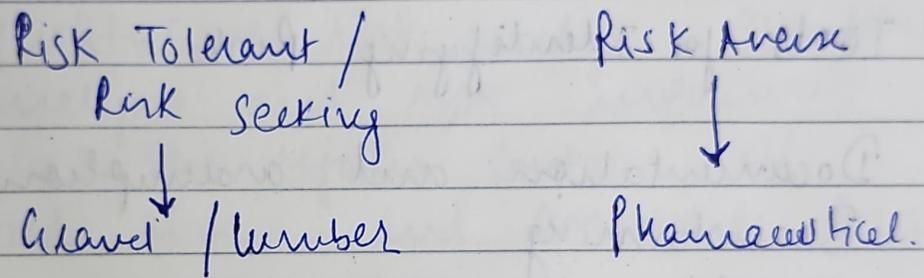
Tolerance
Supply chain strategies
Diversification
Redundancy

Risk Management Strategy

→ Known Vis Unknown Risk

↳ putting funds in reserve account

→ Risk Management attitude



3 ways of expressing Risk attitude

- Risk ~~Affili~~ Affili
- Risk Tolerance
- Risk threshold. : a cutoff point below which a risk will be accepted and above which some type of proactive response is required.

cost effective
response!

Risk Management plan

(RISK) — Proactively ; consistent

Topic #2 Risk Identification and Documentation

Tools for Identifying Risk

- Documentation and assumption review.
- Brainstorming
- Delphi Technique
- Interviews
- Root Cause Analysis
- RISK checklist
- RISK diagramming (Ishikawa)
- SWOT Analysis

Risk Identification

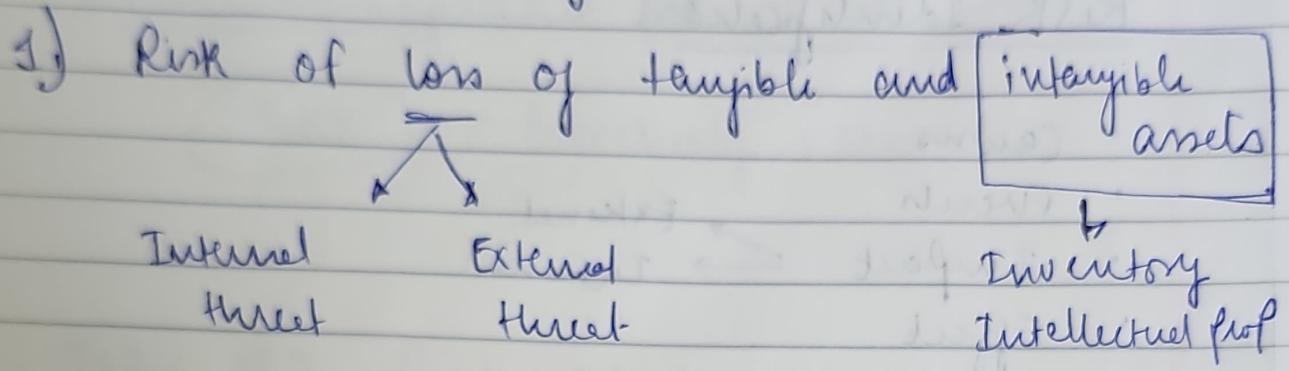
- Causes
- Events
- Impact \longleftrightarrow External
Internal
- Effect

Risk Register

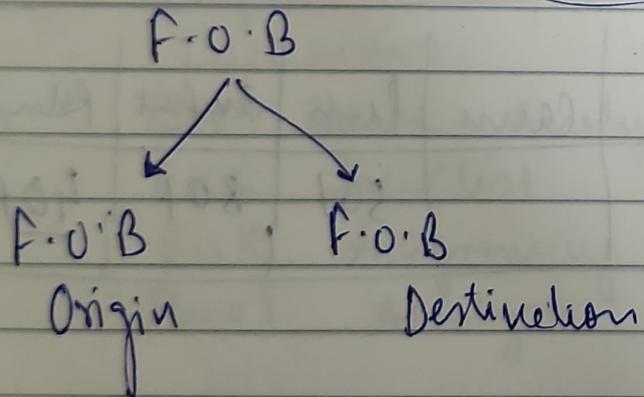
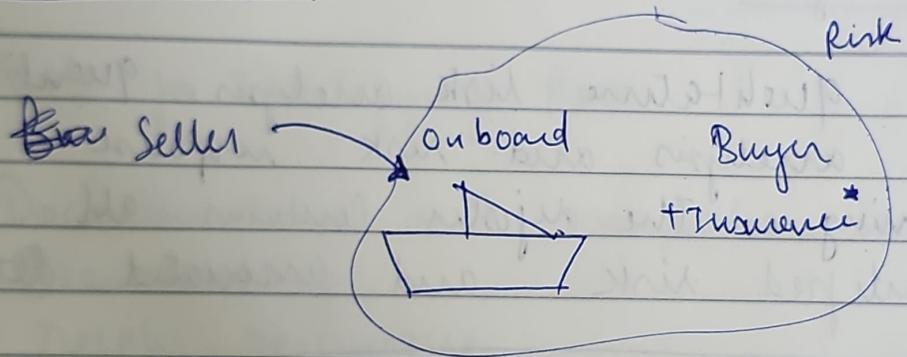
"On qualitative risk analysis, quantitative risk analysis and risk response planning. The register contains all identified risk and associated details"

Risk ID	Category	Identified Risk	Cause	Prob	Impact	Reliability
				50%	80%	40%

Topic H3 Supply chain Risk



Free on board



2) Loss of Good.

→ Loss | damage | theft | Vandalism | Terrorism

3) Loss from other form of Malfeasance

Wrong doing
Bribery, Fraud,

Sales ↓ ← Corruption

Quality ↓ Reputation ↓ ← Counterfeiting

↓

Intellectual Prop +

4) Fraud and Corruption

§) Bribery

→ Commercial Bribery : New business / Price info

→ Bribery of Public → public official serving
Private sector

→ bribery of Foreign Mf.

6.) Abduction

= Kidnapping → Ransom

7.) Loss of intellectual prop

design - patent

Grey Market

legal good - Unknown source

→ Corporate Espionage !

8.) Losses from lawsuits

→ Potential law suit !

Ch:2 Risk Assessment and Classification

T#1 Qualitative Risk Analysis

⇒ Classification and prioritization : qualitative Risk Analysis

Primary factor

→ Probability + Impact

→ Risk Tolerance of organization

Method and tool used

1. Risk Categorization
2. Probability and Impact assessment
3. Risk Urgency assessment
4. Data quality assessment.

1. Risk Categorization

" A cluster of risk comes with a label such as internal, environmental, technical or organizational "

GARP Risk

- Personnel Risk :- Found | human error
- Physical assets :- loss of business env.
- Technology :- Visos
- Relationship :- Liabilities | Lawsuit / Reputation
- External / regulatory :- fraud, govt restriction

(Supply | demand) → Operational
Invent | Env. RISK

Internal Risk

External Risk

- | | |
|----------------------|---------------------|
| → Service failure | → Political |
| → Compliance failure | → Consumer pressure |

Other Way to categorize Supply chain Risk

→ Strategic Supply Chain Risk
Brand image, reputation

→ Supply Risk	→ Demand Risk
- Pricing	- Shipping delay
- quality	- Transp. delay
- Lead time	- Quality
- custom	- Lost customer

→ Process Risk	→ Env. Risk
- Capacity	- Legislation
- Yield	- Country Regulation
- Inventory	- conflicts Mineral
- I.P / I.T	- Voluntary Reporting
- Mismanagement	- Interest group attention

⇒ Voluntary Reporting = Voluntary sustainability
Reporting used to highlight Negative

→ Hazard risk

- Force Majeure / Act of God
- War / Hostile terrain

→ Financial Risk.

Financial Solvency Credit Risk
II

Org cannot meet financial obligation

- currency exchange rate Risk

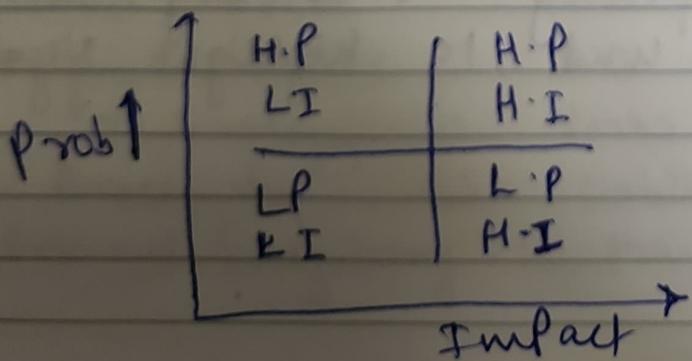
→ Malfeasance Risk

→ Litigation Risk

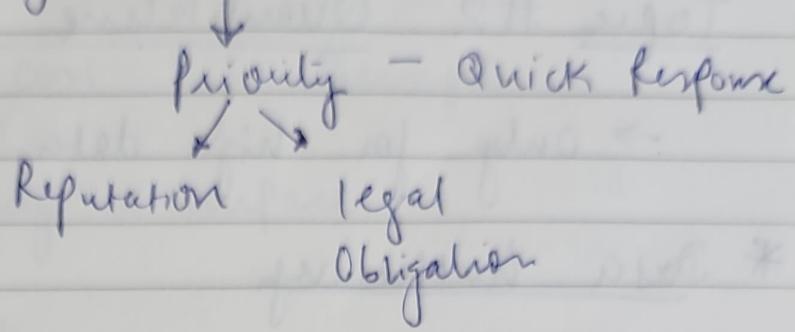
2. Probability and Impact Assessment

↓ ↓
Prob of occurrence Magnitude of loss/gain

Risk Rating = Probability × Impact



3. Risk Urgency Assessment



4. Data Quality assessment

→ Reliability / Integrity / accuracy of data

* circling Back

- Re-evaluete Risk

Topic #2 Quantitative Risk Analysis

→ Only for high data quality!

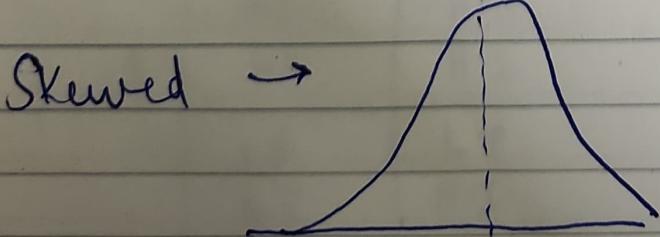
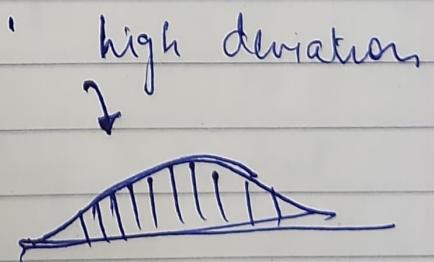
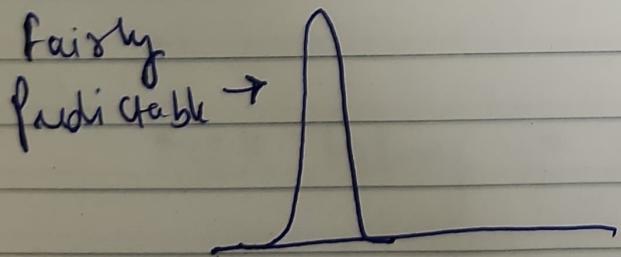
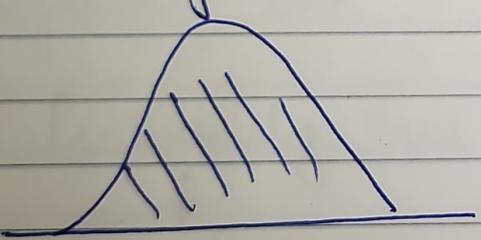
* Data gathering

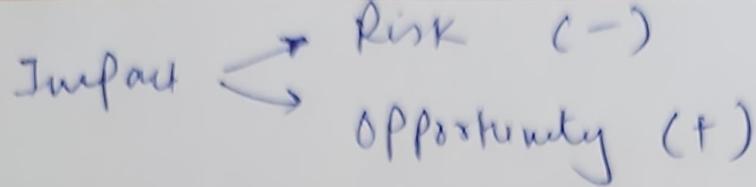
$$\text{Avg} = \frac{x_1 + x_2 + x_3}{3}$$

$$\text{Weighted Avg} = \frac{\text{optimistic} + 4(\text{Most likely}) + \text{Pessimistic}}{6}$$

PERT = Program Evaluation and review tech.

* Probability distribution





- Expected Monetary Value (EMV)

- Risk Response cost v/s Benefit

$$\text{EMV} = \text{Probability} \times \text{Impact}$$

Risk response cost.

- EMV for multiple outcome of a risk (decision)

$$\left\{ \begin{array}{l} - \text{Best case } (75\%) = 750,000 \\ - \text{Worst case } (25\%) = 250,000 \end{array} \right.$$

- Net Impact (EVUM)

Let assume \$5M \rightarrow upfront cost.

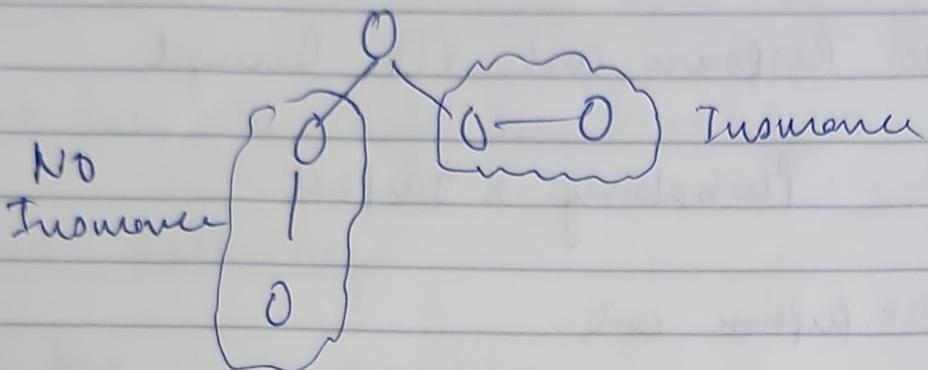
$$\begin{aligned} \text{Value} &= \text{Probability} \times (\text{Impact} + \text{Cost}) \\ &= \text{Prob} \times (\text{Net Impact}) \end{aligned}$$

$$\rightarrow \text{Best Case} = \$10M \times 0.75 \times (\$10M - \$5M)$$

$$\rightarrow \text{Worst Case} = 0.25 \times (\$10M - \$5M) = 1M$$

$$\begin{aligned} \text{Net EMV} &= \text{Best Case} - \text{Worst Case} \\ &= \underline{\underline{2.75M}} \end{aligned}$$

Decision tree



⇒ Modelling
Sensitivity Analysis and Simulation

Sensitivity Analysis

"a Technique for determining how much an expected outcome or result will change in response to a given change in an (input) variable"

→ One Variable is changed. // Isolation Study

Simulation

What If Analysis?

Set of assumptions → Multiple → Model

Input Variable

Eg : Monte Carlo Simulation

↓
Random / Stochastic process.

↓
1000 time simulation

↓
Analyze

↓
Result !

Ch:3 Risk Response

Topic #1 Risk Response planning

Basic Risk Response

- Accept

a decision to take no action to deal with a risk or inability to form a plan to deal with risks.

- low probability
- low impact
- high cost of proactive response

- Avoid. (Pharma company)

Changing a plan to eliminate risk or to protect plant objective from its impact.

- Transfer (Insurance / supplier)

- Mitigate (Preventive measure to reduce the prob / impact)

⇒ Responding to Supply chain Risk

- Risk Response plan → Document
- Risk Response planning → Process
↓
Business process.

Risk + Risk = Database
Risk Register + Risk Response Plan

⇒ Preventive and contingent (corrective) Action

Preventive Action → Before event
contingent → After event
+ \$\$

Preventive Action

- Preventive Maintenance
- Insurance
- Safety lead time
- Compliance myth
- Security

Top 2 Preventive and Contingent Action

Plan for Supply Chain

1. Responds to Strategic Supply Chain Risk

→ Design for "x"

2. Responding to Supply Risk

Quality

P.A

C.A

Penalty Clause

CAPA

Transp["]

Outsource to 3PL

Benchmark and
Notify

Custom.

Outsource

Govt. contacts

3. Responding to Demand Risk

Forecasting

P.A

CA

Error

S&OP

Benchmarking

Quality

Audits

Reschedule, Rework

Unprofitable
Customers

Profitable
Metrics

Win back
Programs

→ Unplanned Customer promotion - Risky

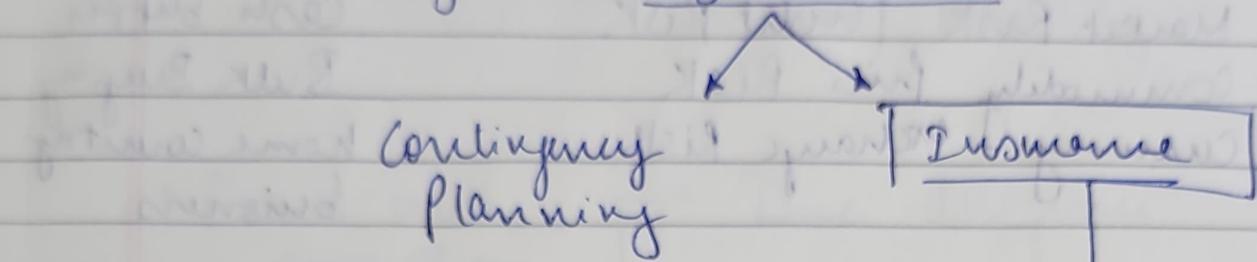
4. Responding to process Risk

RISK	P.A	C.A
Capacity	\$\$	Reschedule Prod ⁿ
Inv.	Control safety stock	Write off spoiled inventory
Mismanagement	Collaboration - Goals	K.P.I

5. Responding to Env. Risk

RISK	P.A	C.A
Regulation	Hire expert	Acquire Industry Contractors
Conflict Mineral	Find Alternative Sources	Disclose facts in Public
Voluntary Reporting	Adopt Std. Report ON Global Confid	Refuse rebuttals to negative Representation

6. Responding to Hazard Risk



Commercial prop
Insurance

Business Interruption
Insurance

Contingent Business
interruption Insurance

Cargo Insurance

Trade disruption
Insurance

Global Logistics
Insurance

Cyber Insurance

3.) Responding financial Risk

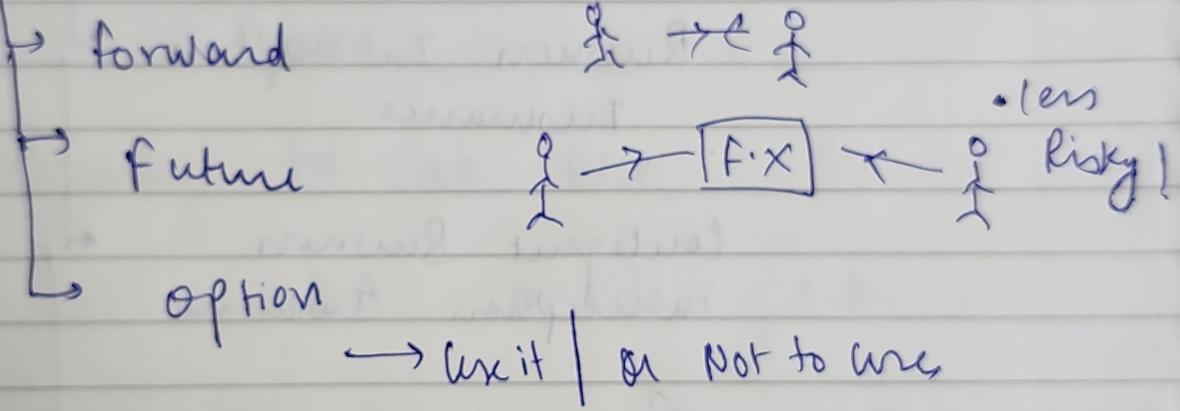
- Market Risk / credit Risk
- Commodity price Risk
- Currency exchange Risk

To do

Cash buffer
Bulk Buying
home country business.

8)

Hedging = lock the price!



9.) Responding to Malfeasance risk

Security Management
Risk

- Theft, damage, Vandalsim

Security
Insurance
Segregation of
duty

- Beiberg
 - Cloud based software
 - \$\$ in visibility

- Fraud and corruption
 - "U.S. Center Conf Board and the Center for Responsible Enterprise and Trade"
 - Due diligence
 - Contractual Rights
 - Monitor and Audit
 - Set and enforce policy
 - Set and enforce procedures
 - Governance.

7 - Part compliance program

- Abduction → Remonstrance
- Counterfeiting and Intellectual Property
 - Regular Audits

10) Responding to lawsuit Risk

Truth - ethics - standard.

admitted (ambiguity)

reject 2.0

reject true intent of defendant

reject intent of

plaintiff (true intent of injured defendant)
plaintiff has true intent → plaintiff was
unaware

plaintiff true intent

reject

unaware normally → result which

plaintiff intended how plaintiff
acted → plaintiff → plaintiff's behavior