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* Qualitative & Quantitative Risk Assessment:-
Risk Assessment broadly categorized into 2 parts:

① Qualitative Risk Assessment:-
- evaluated risks based on subjective judgement, expert opinions & categorical scales (ex. high, medium, low)
- it doesn't involve numerical analysis.
- it focused on prioritizing risks based on their severity & likelihood.

* Characteristics:-
- uses descriptive scales (low, medium, high)
- involve expert judgement, brainstorming & historical data.
- Use tools like Risk Probability & Impact Matrix.
- Quick & cost effective

* Common Techniques:-
i) Risk Probability & Impact Matrix:-
- A visual tool that ranks risks based on their probability of occurring & their impact on the project.
- Helps in identifying which risks need immediate attention.

i) Risk Categorization:-
Risks are grouped based on their nature such as:
• Technical Risks: software failure, sm bugs, h/w issues.
• Financial Risks: Budget overruns, cost escalation, inflation.
• Operational Risks: Resource shortage, process failure.
• Strategic Risks: Market competition, regulatory changes.

iii) Risk Urgency Assessment:-

- Determined how soon a risk might occur & its potential impact ^{on} timeline.
- Helps in prioritizing risks that require immediate action.

② Quantitative Risk Assessment:-

- It assigns numerical values to risks & uses statistical methods to calculate their probability & impact.
- It helps in making data-driven decisions.

* Key Features:-

- Uses mathematical models to analyze risks.
- Helps in estimating cost overruns, delays & potential losses.
- Provides a more objective & precise evaluation.
- Often used for high-budget or complex projects.

* Common Techniques:-

i) Monte Carlo Simulation:-

- It is a computer-based technique that runs multiple simulations to predict the probability of diff. outcomes.
- ex. simulating 1,000 possible scenarios to predict a project's final cost.

ii) Expected Monetary Value (EMV) Analysis:-

- It is used to calculate the potential financial impact of risk.

$$\text{Formula} = \text{EMV} = P \times I$$

where,

$P \Rightarrow$ probability of risk occurring

$I \Rightarrow$ impact or cost of the risk if it occurs

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ex. If a project delay has a 20% chance of occurring & the cost of the delay is \$50,000 then EMV is:

$$EMV = 0.2 \times 50,000$$

$$= 10,000$$

it means risk should be budgeted as a \$10,000.

iii) Sensitivity Analysis:-

- determines which risk factors have the most impact on the project.
- ex. identifying whether labor cost fluctuations or material price changes contribute most to budget overrun.

iv) Decision-Tree Analysis:-

- helps in evaluating diffⁿ risk response strategies.

- ex. A company choosing betⁿ two suppliers where one has a higher cost but lower risk and the other has a lower cost but higher risk.