

Software Project Management

① Explain Risk assessment in detail.

⇒ Risk Assessment is a systematic process used to identify, analyze, and evaluate potential risk that could negatively affect a project, system, or organization. It helps in minimizing uncertainty and improving decision-making.

② Risk Identification :- This step involves identifying all possible risk that may occur during a project.

③ Risk Analysis :- In this stage, the identified risk are analyzed to determine their likelihood of occurrence and potential impact.

④ Risk Evaluation / Prioritization :- Risk are compared against predefined criteria to prioritize them. High-impact and high-probability risk are given more attention, while low-level risk may be accepted or monitored.

⑤ Risk mitigation / Control :- Appropriate strategies are developed to reduce or control risks. Common strategies include risk avoidance, risk reduction, risk acceptance.

⑥ Risk monitoring and review :- Risk are continuously monitored throughout the project lifecycle. New risk may emerge, and existing risks may change, so regular review ensure effective risk management.

② Describe in brief about FMEA.

→ Failure Mode and Effects Analysis (FMEA) is a systematic technique used to identify possible failures in a process, product, or system and analyze their effects in order to prevent defects and improve reliability.

① Failure Mode - identifies how a component or process might fail.

② Effects of Failure - examines the impact of the failure on system performance or customer safety.

③ Causes of Failure - determines the reasons behind the failure.

④ Risk Priority Number (RPN) - calculates risk using severity, occurrence, and detection ($RPN = S \times O \times D$).

⑤ Corrective Actions - recommends actions to reduce or eliminate high risk failures.

(Q3) Which are the emerging trends in project evaluation?

⇒ Emerging Trends in Project Evaluation focus on improving accuracy, transparency, and decision-making using modern techniques.

① Data - Driven Evaluation:- use of real - time data, analytics, and dashboards to measure project performances.

② Agile and Continuous Evaluation:- frequent review instead of end stage evaluation to support agile project.

③ Risk - Based Evaluation:- greater emphasis on risk analysis and uncertainty management.

④ Sustainability and ESG Metrics in Evaluation based on environment social and governance impacts.

⑤ Use of AI and Automation - AI tools for predicting cost estimation, and performance prediction.

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(Q4) What are the software quality factors.

→ Software quality Factors are attributes that define the quality and effectiveness of a software project/product.

Software Quality Factors.

- ① Correctness :- Degree to which the software meet specified requirement.
- ② Reliability - Ability of the software to perform consistently without failure.
- ③ Efficiency :- optimal use of system Resources such as memory and processing time.
- ④ Integrity :- Protection of data and Resources from unauthorized access.
- ⑤ Usability :- Ease of use and user friendliness.
- ⑥ Maintainability :- Ease with which the software can be modified and fixed.

(Q5) Explain the Standards and Certification For SQA.

- ⇒ Standard and certifications for software quality assurance (SQA) provide guidelines and frameworks to ensure high-quality software development and maintenance.
- ⇒ ISO 9001 :- An international standard for quality management systems. It ensures organizations follow defined processes for consistent quality in software development.
- ⇒ ISO / IEC 25010 :- Defines software product quality models such as functionality, Reliability, usability, efficiency, maintainability and portability.
- ⇒ CMMI (Capability Maturity Model Integration) A process improvement model that measures the maturity level of software development. Processes from Level 1 to Level 5.

(Q6) Explain Risk control in detail.

⇒ Risk Control is the process of planning and implementing action to reduce, eliminate or manage risk identified during risk assessment. It ensures that risk do not adversely affect project objectives.

- ① Risk Avoidance - Eliminating risk by changing plans or methods.
- ② Risk mitigation - Reducing the likelihood or impact of risk.
- ③ Risk Transfer - shifting risk to a third party (insurance, outsourcing).
- ④ Risk Acceptance - accepting low-impact risks with contingency plans.
- ⑤ Risk Monitoring - continuously tracking and reviewing risks.

(Q7) Describle in brief defect management.

→ Defect Management is a structured process used in software development to identify, track, fix, and prevent defects to maintain Product quality.

- ① Defect Identification :- Defects are identified during testing, reviews, or inspections. track, fix, and Prevent defects to maintain Product quality.
- ② Defect Reporting :- Each defect is logged with details such as description, severity, priority, and status.
- ③ Defect Analysis - The Root cause of the defect is analyzed to understand why it occurred.
- ④ Defect Resolution - Developers fix the defect and make necessary code changes.
- ⑤ Verification and closure - The defect is retested, verified, and formally closed.

(Q8) what are the different product metrics.

⇒ Product Metrics are measurement used to evaluate the quality and characteristics of a software product.

① Size Metrics - Measure the size of the software such as Lines of code (LOC) and Function Point (FP)

② Complexity Metrics - Measure code complexity.
eg. cyclomatic complexity.

③ Quality Metrics - Measure defects, defect density, and failure rates.

④ Performance Metrics - Measure Response time, throughput, and resources usage.

⑤ Maintainability metrics - Measure ease of modification, such as a code modularity, and documentation quality.