

Project Management - 5th Semester CS (IA Notes)

Introduction

Project management is a structured approach to planning, organizing, and controlling resources to achieve specific objectives. In Computer Science, it is crucial for handling software development projects efficiently by balancing time, cost, quality, and scope.

Risk Management

Risk management is the practice of identifying potential problems before they occur, so that project activities can be planned to reduce the likelihood or impact of risks. It ensures project stability and smooth progress in CS projects like software development, networking, and AI systems.

Risk Management Process

The risk management process in project management includes four key steps: 1. Risk Identification 2. Risk Analysis 3. Risk Planning 4. Risk Monitoring. This process is iterative and continuous throughout the project lifecycle.

Risk Analysis

Risk analysis is the evaluation of identified risks to estimate their potential impact on the project. Techniques include qualitative analysis (priority ranking, probability-impact matrix) and quantitative analysis (decision tree analysis, Monte Carlo simulation).

Risk Planning

Risk planning involves developing strategies to deal with risks. Approaches include: - Avoidance: eliminating the risk - Mitigation: reducing the likelihood or impact - Transfer: shifting responsibility (e.g., insurance, outsourcing) - Acceptance: acknowledging the risk without specific action.

Risk Monitoring

Risk monitoring is the continuous observation of identified risks and responses. It ensures risk strategies are effective and helps detect new risks through periodic project reviews, testing, and performance indicators.

Risk Indicators

Risk indicators are measurable signals that provide early warnings of potential problems. Examples: increase in defect rate, delay in milestones, resource unavailability, or frequent scope changes.

Managing People

Managing people in project management requires leadership, delegation, communication, and conflict resolution. A project manager ensures team coordination, productivity, and a positive work environment.

Motivating People

Motivation is critical for team success. Techniques include:

- Recognition and rewards -
- Professional growth opportunities
- Clear communication of project goals
- Providing a supportive and inclusive work culture.

Teamwork: Selecting Group Members

Team formation requires selecting members based on technical skills, domain knowledge, and interpersonal compatibility. An effective project team balances roles such as developers, testers, analysts, and coordinators to achieve project objectives collaboratively.