Parul® University

Software Engineering

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What is Risk ?

❖ An uncertain event or condition that, if it occurs, could have a negative or positive effect on a project's objective.

❖ It's not a guarantee of failure, but a possibility we need to consider.

❖ It's not a matter of "if" something will go wrong, but "when" and how severely.

❖ By acknowledging potential risks, we can move from a reactive to a proactive stance, taking control of the situation and mitigating potential damage.

Image source : Google

Type Of Risk ?

- **Business Risk:** Building a product that no one wants or loosing budgetary commitment.
- **Technical Risk:** Concern with the quality design, implementation, interface, maintenance problem
- **Project Risk:** Concern with the schedule, costs, customer related issue.

Image source : Google

Why Risk Management?

- ❖ Reduces project delays and cost overruns.
- ❖ Improves project predictability and quality.
- ❖ Enhances communication and collaboration within the team.
- ❖ Fosters a culture of proactive problem-solving.

Image source : Google

The Risk Management Process

❖ Identify risks: Brainstorm potential issues through workshops, brainstorming sessions, and historical data analysis.

❖ Analyze risks: Assess the likelihood and impact of each risk.

❖ Prioritize risks: Focus on high-probability, high-impact risks that pose the greatest threat to the project.

❖ Mitigate risks: Develop contingency plans to address identified risks.

❖ Monitor risks: Track the status of each risk and update mitigation plans as needed.

Image source : Google

Risk Identification Techniques

- **Brainstorming sessions:** Encourage open discussion and participation from all team members.
- **Checklists:** Utilize pre-defined lists of common software development risks.
- **SWOT analysis:** Analyze strengths, weaknesses, opportunities, and threats to identify potential risks.
- **Delphi technique:** Gather anonymous expert opinions on potential risks.

https://www.wrike.com/blog/delphi-technique-and-project-management/#:~:text=To%20put%20it%20simply%2C%20the,summary%20report%20by%20the%20facilitator.

- **Experience-based analysis:** Leverage past project experiences to identify potential risks.

Image source : Google

Risk Matrix

Likelyhood	Consequences				
	Insignificant *Risk is easily mitigated by normal day to day process*	**Minor** *Delays up to 10% of Schedule Additional cost up to 10% of Budget*	**Moderate** *Delays up to 30% of Schedule Additional cost up to 30% of Budget*	**Major** *Delays up to 50% of Schedule Additional cost up to 50% of Budget*	**Catastrophic** *Project abandoned*
Certain *>90% chance*	High	High	Extreme	Extreme	Extreme
Likely *50% - 90% chance*	Moderate	High	High	Extreme	Extreme
Moderate *10% - 50% chance*	Low	Moderate	High	Extreme	Extreme
Unlikely *3% - 10% chance*	Low	Low	Moderate	High	Extreme
Rare *<3% chance*	Low	Low	Moderate	High	High

Project Monitoring Plan

❖ The monitoring plan of a project consists of keeping track and monitoring of all the data related to the project.

❖ Project Manager can always have control of the situation, identify potential problems, and put the corrective actions into practice

❖ The monitoring plan assures that the project is within the field of application and respects the specified deadlines and budget.

❖ The monitoring phase should be performed together with the execution of the project, so that to have useful information on the project

❖ Project monitoring helps to keep track of project performance and progress using key performance indicators (KPIs) given during project planning.

Image source : Google

Why Project Monitoring Plan is Important?

❖ There are some basic questions to ask during the project monitoring phase:

1. Are the activities performed as planned?
2. Are there unintended consequences that arise as a result of these activities?
3. Are there any elements of the project that need to be modified and if so which ones?
4. What is the impact of these changes?
5. Will these corrective actions lead to the expected results?

Image source : Google

Elements of a Project Monitoring Plan

- **Project scope baseline:** Defines the approved functionalities and features of the software.
- **Project schedule baseline:** Outlines the timeline for completing project tasks and milestones.
- **Project budget baseline:** Establishes the approved financial resources allocated to the project.
- **Risk management plan:** Identifies potential risks, assesses their likelihood and impact, and outlines mitigation strategies.
- **Issue tracking system:** Provides a centralized platform for logging, tracking, and resolving project issues.
- **Communication plan:** Defines communication channels and protocols for keeping stakeholders informed of project progress.

Image source : Google

Monitoring Techniques

❖**Earned value management:** Tracks project performance by comparing planned value with actual accomplishments.

❖**Status meetings:** Regular meetings to discuss project progress, identify roadblocks, and brainstorm solutions.

❖**Progress reports:** Regularly generated reports that capture project status, key metrics, and upcoming milestones.

❖**Code reviews:** Regular code reviews to identify potential bugs and ensure code quality.

❖**Unit testing:** Unit tests to verify the functionality of individual software units.

❖**User acceptance testing :** Testing conducted by end-users to ensure the software meets their requirements.

Image source : Google

Software Project Scheduling

❖ In the dynamic world of software engineering, a well-defined schedule acts as our roadmap to success.

❖ Software project scheduling involves meticulously planning the sequence of tasks, allocating resources, and estimating timelines for completing a software project.

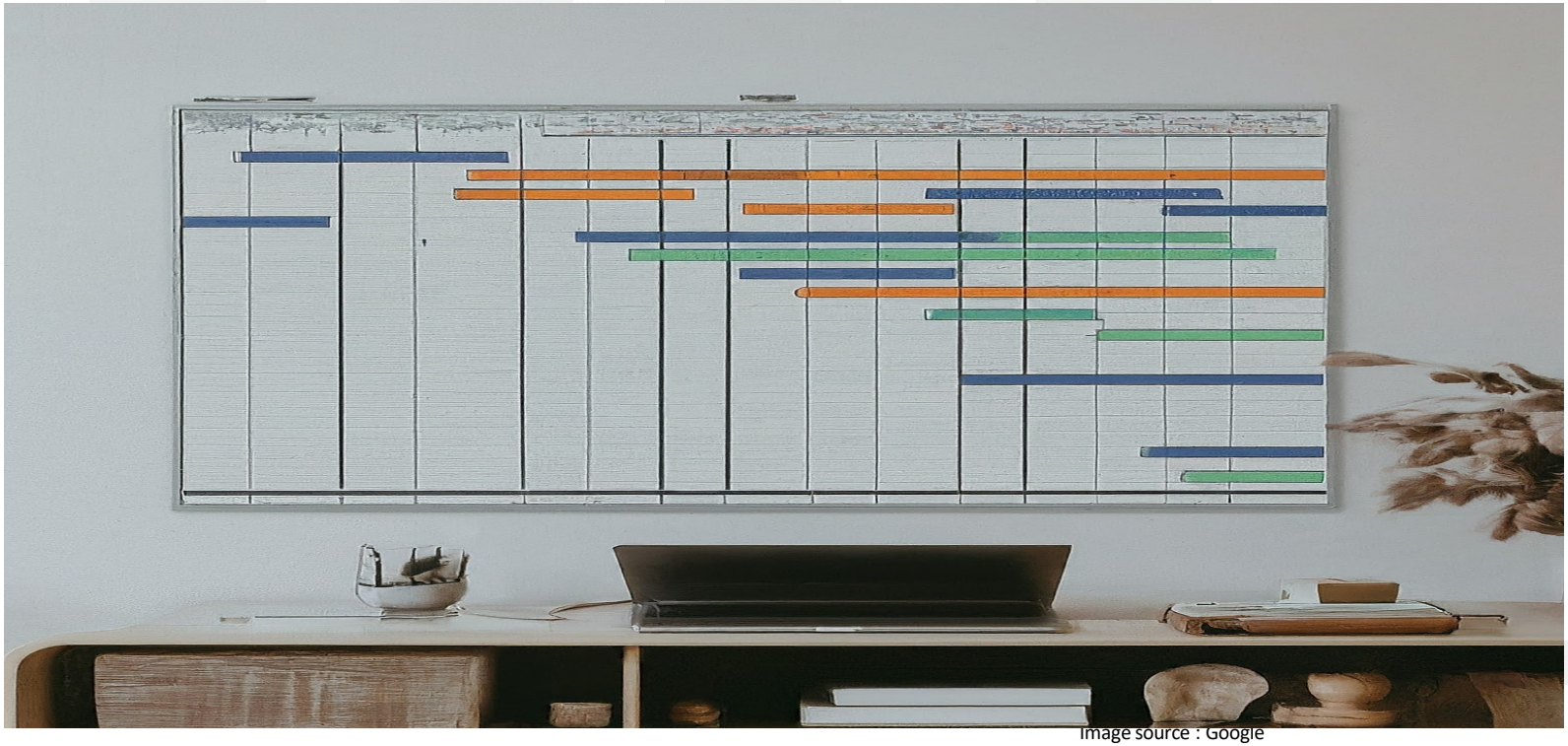

Image source : Google

Why is Scheduling Important?

❖ **Ensures timely delivery:** A clear schedule keeps the project on track, reducing the risk of delays and missed deadlines.

❖**Optimizes resource allocation:** Scheduling helps allocate resources effectively, ensuring the right people are working on the right tasks at the right time.

❖**Manages expectations:** A defined schedule sets clear expectations for stakeholders regarding project milestones and delivery timelines.

❖**Identifies potential risks:** Scheduling helps identify potential bottlenecks and resource constraints early on, allowing for proactive mitigation strategies.

Image source : Google

The Scheduling Process

❖ **Define project scope:** Clearly define the functionalities and features to be included in the software.

❖ **Decompose tasks:** Break down the project into smaller, manageable tasks.

❖ **Estimate effort:** Estimate the time and resources required to complete each task.

❖ **Create the schedule:** Utilize scheduling tools and techniques to create a visual representation of the project timeline, including task dependencies.

Image source : Google

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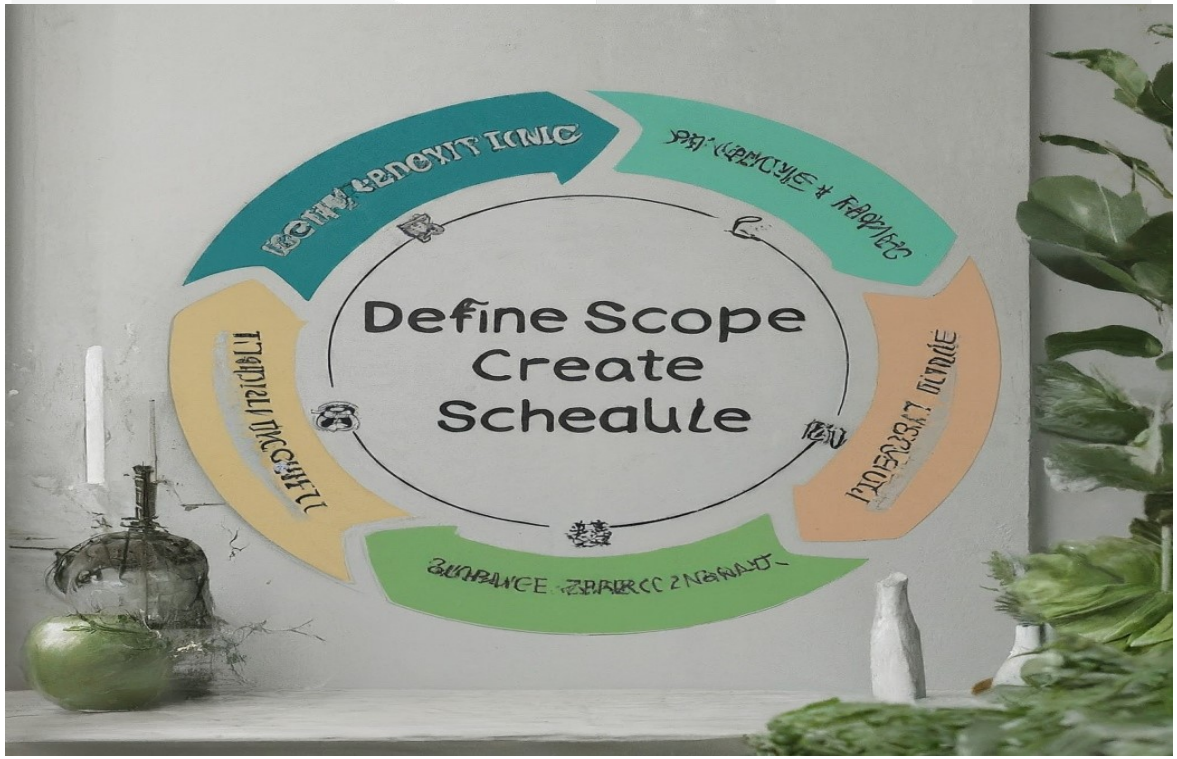
❖ **Monitor & Control:** Continuously monitor progress, identify deviations from the schedule, and make adjustments as needed.



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Scheduling Techniques

❖ **Waterfall Model:** A traditional, sequential approach where tasks are completed one after another.

❖ **Agile Methodology:** An iterative and incremental approach with short development cycles.

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