Software Project Management

Learning Journal

Name: Adarsh Manojkumar Pawar

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Concepts Learned

Chapter 4 - Risk Management

In this chapter, we are introduced to risk management and how to reduce or mitigate the risks to ensure that the project does not fail.

Risks can be categorized as **internal and external**. If a risk to the project arises due to an aspect being dealt with by the project team, then it is an internal risk. Eg- Budget, time, resources, quality, and technology risks. All other risks are external risks. Eg - Regulatory changes, environmental factors etc.

Main causes of risk

- **Quality Constraints -** Software vendors realize that it is much cheaper to make a good quality software product with low support costs than to produce a software product of poor quality and end up with high support costs. So an elaborate set of quality constraints are imposed from the start of the project to the finish

- **Resource Unavailability -** Software professionals are in great demand and as a result, finding, procuring and retaining talented software professionals is becoming a great challenge

- **Disinterest -** Many working professionals tend to lose their interest in their work and their productivity takes a huge hit. Project managers can help by organizing programs to motivate people who aren't interested.

- **Attrition -** Due to the high demand for software professionals, they tend have many job offers in hand and pose a risk of quitting and leaving a project midway to join another organization for better compensation. Companies have started to formulate special programs to deal with this problem.

- **Scope Creep -** Requirements keep changing and new requirements keep piling up even after the project has completed the testing phase and is into the implementation phase which impact the project severely. To handle this, it's important to have a good system for managing changes.

- **Cost constraints -** When a project begins, it gets a budget. Sometimes, the budget might be limited due to certain reasons. In such cases, the project can't continue because there's not enough money. If we know about this problem early, we might be able to stop the project before it's too late.

- **Bad Negotiation -** A project manager can get more money or resources by negotiating well. But if the negotiation isn't good, the project might suffer. This happens when the customer doesn't provide enough support.

- **Unrealistic Estimate -** Sometimes, project estimates are not realistic, especially for software projects. It's hard to predict how much effort something will take. So, it's smart to plan for unexpected problems by keeping some extra time or resources.

- **Human Error -** Human brains are powerful, but they can make mistakes when doing repetitive tasks. Distractions can cause errors in the work which can lead to defects in the project. To avoid this, we need to review our work carefully to find and fix any problems.

The above risks can actually be broadly grouped into categories of **budget risks, resource risks, quality risks, schedule risks, and technology risks.**

Risks and their mitigation techniques

I. Budget Risk

- Risks impacting the project budget require consistent attention and control measures throughout the project lifecycle.
- If the budget surpasses its limit, immediate action is crucial to prevent cost overruns.
- While reducing project features is common, it's preferable to address budget risks early to avoid escalation.
- Continuous monitoring and management of project expenses are essential for maintaining budget adherence.
- External factors like market-driven salary increases can affect project costs beyond the project manager's control.
- Management may need to adjust budgets to retain team members in such situations, impacting the project's financial outlook.
- Allocating reserve funds within the budget allows for timely interventions, safeguarding the project against unforeseen challenges.

II. Time/Schedule Risk

- In today's fast-paced business environment, timely project delivery critical. Missing the targeted deployment date can result in significant business opportunity losses for the customer
- Unforeseen circumstances, such as unexpected rework or misunderstandings of customer requirements, can affect project timelines.
- These issues can lead to schedule slippages and the need for complete rework, further delaying the project and increasing costs.
- To mitigate the impact of schedule slippages, it's advisable to allocate schedule allowances for each time-related risk, allowing for flexibility in project planning.
- Additionally, effective communication and stakeholder engagement are crucial to prevent misunderstandings and ensure alignment with project objectives.
- Proactive risk management strategies, including regular monitoring and adjustment of project schedules, can help anticipate and address potential delays.
- By prioritizing timely delivery and implementing robust risk management practices, projects can enhance their competitiveness and maximize business opportunities in dynamic market conditions.

III. Resource Risk

- Project team members are the most costly resources in software projects, making it challenging to create reserved resources for the project.
- Software professionals are in great demand, posing a risk of team members leaving for better offers during project execution.
- Losing a team member midway through a project can disrupt tasks, especially those not yet started or only partially finished.
- While keeping a paid reserve on the project adds to costs, maintaining a pipeline for potential replacements is prudent.
- However, finding the right replacement may take time, impacting project timelines.
- To mitigate this risk, a reserve in the project schedule can be allocated for any delay in resource replacement.
- Team members leaving mid-project pose significant risks, as they take knowledge and project task insights with them.

- Implementing a knowledge management system can mitigate this risk by storing acquired knowledge and project work, ensuring continuity even when team members leave.

IV. Quality Risk

- Industry-strength software requires strong reliability to minimize support costs during operations.
- Poor-quality software products can lead to unsustainable support costs, making quality a significant risk.
- Quality issues may arise from bad software design, construction, or unintended defects due to complexity or design changes.
- To address quality risks, integrating quality checks into the project schedule (quality planning) is essential.
- Quality planning ensures that work products meet desired quality levels, enhancing overall product quality.
- Peer reviews, code reviews, and formal quality review processes should be rigorously implemented for all work products.
- Quality planning must be tightly integrated into the entire project plan to mitigate quality-related risks effectively.

V. Technology Risk

- Enterprise software requires strong reliability to minimize support costs during operations.
- Poor-quality software products can lead to unsustainable support costs, making quality a significant risk.
- Quality issues may arise from bad software design, construction, or unintended defects due to complexity or design changes.
- To address quality risks, integrating quality checks into the project schedule is essential.
- Quality planning ensures that work products meet desired quality levels, enhancing overall product quality.
- Peer reviews, code reviews, and formal quality review processes should be rigorously implemented for all work products.
- Quality planning must be tightly integrated into the entire project plan to mitigate quality-related risks effectively.

Reflections on case study

I wanted to get a clearer picture of risk management in an enterprise when I came across this case study where a large financial institution worked on the development of a mobile banking application. The project scope included account management, fund transfers, bill payments, and mobile deposit services. Given the sensitive nature of financial transactions and personal information involved, a thorough and strict risk mitigation strategy had been formulated

Security Vulnerabilities:

- **Risk:** Potential vulnerabilities in the application's code or infrastructure could be exploited by hackers to gain unauthorized access and steal user data.
- **Mitigation Strategy:** Implement robust encryption protocols, secure authentication mechanisms, and regular security audits to identify and patch vulnerabilities. Conduct penetration testing to proactively identify and address security weaknesses.

Regulatory Compliance:

- **Risk:** Failure to comply with financial regulations and industry standards could result in legal penalties, damaged reputation, or loss of customer trust.
- **Mitigation Strategy:** Establish a compliance framework based on regulatory requirements. Conduct regular audits and assessments to ensure adherence to compliance standards.

Communication Delays:

- **Risk:** Communication delays or disruptions between the mobile application and backend servers could result in transaction failures, service interruptions, or bad user experience.
- **Mitigation Strategy:** Implement redundant communication channels and failsafe mechanisms to ensure continuous connectivity and minimize the impact of communication failures.

Third-party Integration Risks:

- **Risk:** Integration with third-party services or APIs may introduce vulnerabilities or compatibility issues.
- **Mitigation:** Perform thorough due diligence on third-party providers, conduct security assessments, and implement proper authentication and authorization mechanisms.

Collaborative Learning

- Our project group met for two times this and we went over the market analysis portion our project, Community Skill Exchange platform together. Previously, I used to have a hard time identifying the psychographic characteristics of our target audience, but after having had discussions, examining audiences for different projects with my teammates.
- I am now able to accurately identify and describe their demographic and psychographic characteristics of the target audience. We also learned how important having strong business values which helps us stand out in the crowd
- My friend and I tried to understand risk management through the lens of popular social media websites such as TikTok and Instagram. We understood that due to their popularity, type of risks and the number of risks that these applications are exposed to very different.
- We then tried to list out such risks and formulate their risk mitigation plans if we were the project manager of the application. This gave us great insight into the importance of setting up risk management system in the project

Further Research/ Readings

- The discussions with my friend fuelled my interest into further research about the topic and I came across the paper, "Social Media Risk Management: Challenges and Strategies" which provides a thorough examination of the challenges associated with managing risks in social media platforms. It offers insights into various risk categories, including cyber threats, data privacy concerns, reputation management, and regulatory compliance.
- The paper identifies and analyzes specific challenges that organizations face in the context of social media risk management and explores the dynamic nature of social media platforms, highlighting the rapid proliferation of content, the prevalence of cyberattacks, and the complexities of maintaining brand reputation in an online environment.
- It proposes effective strategies for mitigating social media risks through proactive monitoring, crisis communication plans, rapid response mechanisms to address emerging threats and vulnerabilities.

- I was able to gain valuable insights into inherent complexities in managing risks in social media platforms and guidance to navigate the dynamic landscape of social media risk management effectively

Adjustment to goals

I was able to thoroughly understand how to conduct market research and hence, I was able to significantly contribute to market analysis documentation for the project.

My goal was to go through both chapter 4 and 5, however I could find time to go through only chapter 4 and hence will be adjusting my goal to cover chapter 5 material before I attend the class the coming week. Apart from this, I plan to meet with the professor during her office hours to get her thoughts on our project plan and incorporate her feedback to complete the first deliverable of the project and submit by the deadline.