

Learning Journal 2

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Course: Software Project Management (SOEN 6841)

Journal URL: <https://github.com/GowthamNalluri7/SPM-2025/LearningJournals>

Dates Range of activities: 27/01/2025 - 07/02/2025

Date of the journal: 07/02/2025

Key Concepts Learned:

This week's sessions focused on **effort and cost estimation (Chapter 3)** and **risk management (Chapter 4)**. Key topics included different estimation techniques such as **Function Point Analysis (FPA)**, **COCOMO**, and **Estimation by Analogy**, each providing a structured way to estimate software development effort. We also learned about **algorithmic cost modeling**, which mathematically determines the required resources based on project attributes. In risk management, we explored how to identify, analyze, and mitigate risks in software projects. **Risk assessment** involves identifying potential risks (such as budget overruns, attrition, or schedule delays), analyzing their impact, and prioritizing them using qualitative and quantitative approaches. We also studied **risk response strategies**, including **acceptance**, **avoidance**, **transference**, and **mitigation**. A key takeaway was that software projects must anticipate risks and integrate **contingency planning** (e.g., schedule buffers) to handle uncertainties.

Case Studies (3 & 4):

The case study followed a SaaS software vendor managing effort estimation, cost planning, and risk mitigation. Initially estimating 500,000 SLOC with a \$3.2M budget, they later expanded their team offshore, reducing costs but introducing risks like communication gaps and schedule delays. To mitigate these, they implemented structured communication, a 10% schedule buffer, and feature prioritization. This case study highlighted the importance of continuous estimation adjustments, strategic scaling, proactive risk management, and iterative quality assurance. I learned that successful project execution depends on refining estimates, adapting to challenges, and integrating structured mitigation strategies.

Application in Real Projects:

The concepts from this week are essential in real-world software development. Effort estimation techniques like FPA and COCOMO help in creating accurate project timelines and budgets, crucial for resource allocation and cost management. Risk assessment frameworks ensure that potential issues are identified early, allowing teams to develop contingency plans to minimize disruptions. Key points:

1. Estimation Challenges: Open-source projects require unconventional estimation methods due to their collaborative nature.
2. Approach: Expert judgment and community consensus play a major role.
3. Effort Estimation: Relies on volunteer contributors, skills, and project complexity, tracked on platforms like GitHub.

4. Cost Estimation: Involves non-monetary resources, e.g., volunteer time. Examples include Apache Software Foundation's community-driven cost management.
5. Linux Kernel Project Example: Highlights complexities, Linux Foundation's reliance on
6. community input, historical data, and financial records.
7. Methodology: In open source, a blend of qualitative and quantitative methods, community input, and historical data is crucial for effective estimation.

Peer Interactions:

This week, my team focused on our AI-based academic advisor project. During discussions, a team member shared insights from a similar project he had implemented, highlighting its weak points. We analyzed it from a project manager's perspective and brainstormed improvements. Additionally, I collaborated with a classmate on the chapter 3 case study, delving into the SaaS vendor's project progress, specifically on appointment scheduling with complex logic. Having already covered chapters 1 and 2, we plan to discuss case studies weekly and integrate learning into our project.

Challenges Faced:

Understanding algorithmic cost modeling was challenging, as it involves complex calculations and relies on historical project data. I struggled with differentiating between Function Point Analysis (FPA) and COCOMO models, as both estimate effort but use different input metrics. Another challenge was risk prioritization—determining which risks require immediate attention vs. which can be monitored. The qualitative vs. quantitative risk analysis approach was initially confusing, but the case study clarified how real-world projects use risk exposure formulas to assign numerical values to risk impact. To overcome these challenges, I plan to review additional case studies and practice estimation techniques using real-world datasets.

Personal Development Activities:

To improve my estimation skills, I experimented with COCOMO II models using sample project data. This helped me understand how different effort multipliers (EM) and scale factors (SF) influence cost estimation. Additionally, I explored real-world risk management strategies used in large-scale IT projects, including NASA's software development processes. I also studied how tech giants like Google and Amazon handle risk mitigation, particularly in cloud-based services, where security risks are critical. These insights deepened my understanding of risk response planning in high-stakes environments.

Goals for Next Week:

Next week, I plan to revise previous chapters (1-4) to reinforce my understanding of key concepts while also reading Chapters 5 and 6 in preparation for upcoming sessions. Additionally, I will collaborate with my teammates on our project, refining our ideas and preparing for the project pitching session. With the midterm approaching, I will begin gradually reviewing course materials to ensure I stay on track. Lastly, I aim to complete all assigned activities for the week, ensuring a thorough grasp of the topics covered.