Learning Journal Template

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Course: Software Project Management

Journal URL: https://github.com/HaniMLK/Soen-6841-/wiki/Learning-Journal-1

Dates Rage of activities: 21 Jan - 26 Jan

Date of the journal: 28 Jan

Key Concepts Learned In this week, we have learned Effort and Cost Estimation from a software project management view. Here is a list of key concepts learned and what models or tools applied to them:

1- Effort Estimation Techniques: Function Point Analysis (FPA), Wideband Delphi, COCOMO, and Estimation by Analogy.

- FPA: A method to estimate the size of a software project based on its functionality.
- Delphi: A consensus-based estimation technique where experts provide estimates, discuss, and refine them iteratively.
- COCOMO (Constructive Cost Model): A model that uses project size (in SLOC) and other factors to estimate effort and cost.
- Estimation by Analogy: Comparing the current project with similar past projects to estimate effort.

2- Cost Estimation Techniques: Activity-based costing and cost factor analysis [will be done after the effort estimation]

3- Potential Obstacles: Effort estimations are difficult first because of the intangible nature of the software. Unlike physical products, software development involves abstract tasks that are harder to quantify. Moreover, using experienced-based approaches like Delfi for inexperienced teams also makes it difficult to provide accurate estimates. Other prevention factors could be changing requirements, unclear project scope, and unfamiliar technologies (e.g., programming languages, frameworks, tools).

4- Impact factors on estimation in general: Project size, team, and technology.

Besides, I learned a lot when I was working on topic analysis as I always worked with small teams and I had no idea of how to deal with large teams. Doing research and exploring HBR, HP and Google best practices opened my horizons. For instance, HBR suggested as teams grow, managers must shift from direct managing to indirect managing to a more strategic role, focusing on setting vision and empowering sub-leaders. So, Delegating Decision-making Authority to sub-project leaders develops accountability and accelerates their program progress. HP also formed a core program team using this approach to delegate some authority from the program manager to project leaders. More interestingly they shaped a matrix structure which is an organizational framework that combines two or more types of reporting relationships. Unlike a traditional hierarchy where employees report to a single manager, a matrix structure allows employees to

have dual reporting lines—one to a functional manager (e.g., head of marketing) and one to a project leader. Google also uses AI for people analysis to measure employee satisfaction, identify productivity issues, and make data-backed decisions about team restructuring.

Application in Real Projects I took a look at the case study chapter 3 because I have no hands-on experience with any of the approaches/methods covered this week to talk about. I will share my understanding of the case study in chapter 3

it is said the SaaS vendor decided to build and sell the product with a bare minimum of features initially, and the project team estimated 500,000 lines of code (SLOC) system requires 22 developers with a $3.2M budget over 2 years- but then over time, they reassessed their needs and wanted to speed up their development so they came up with the idea to scale up to a team of 50 developers. Therefore, they used incremental software development.

They explored different options to increase the size. One choice is to hire more local staff which costs $1,000,000 per quarter for 50 people in total while hiring contractors is even more expensive. In contrast, they saved two-thirds ($730,000) by hiring offshore development staff. So they picked this option and were able to reduce the overall development cost significantly.

This is what exactly happens in real-life projects when we need to decide whether cost or speed of the project. So we need to sacrifice some resources at each end based on choosing what side. Here outsourcing to offshore service providers served the cost side but made me think of challenges like time zone differences, cultural barriers, and potential communication gaps that may happen.

The good idea is utilizing bottom-up effort estimation in the case study. Breaking down functionalities into smaller components, estimating the effort for each, and then summing them up provides a more accurate and realistic project timeline and cost.

Peer Interactions

First of all my friend and I formed a group for topic analysis and selected the topic "How I can deal best with teams over twenty?" and started working on that. We also made our parts for presentation and poster for topic analysis together and practiced with each other on Discord.
We also talked to several other classmates and finally formed our group for the project. During the week we explored project topics and finally decided to go for "Crowdsourcing mental health data platform". Apart from personal interests, I also have expertise in data analysis and AI-driven decision-making. However, We didn't have time to discuss the assignments or lessons learned, but I practiced examples in the slides and book managed to read 3 chapters of the book.

Challenges Faced

Actually, for the course or materials I didn't face challenges although these effort and cost estimation techniques were new for me as I believe I have a strong foundation in math and problem-solving but I didn't practice the book examples to see the results. I'm working on a business idea so I find this course very helpful and interesting till now.

Personal development activities

I'm working on a business idea that is in the pre-seed stage and I'm planning to use the knowledge and understanding of this course on that. GreenLink is an online platform connecting farmers, consumers, distributors, and exporters**.** Since it will have a website and database, the best estimation techniques for GreenLink would be first FPA because a lot of user interaction will take place and I can estimate effort cost based on functionalities. Moreover, I can get expert opinions from software developers and agribusiness experts to apply the Delphi method. COCOMO and Estimation by Analogy at this stage are useless for me since I don't have past experience with similar businesses or huge lines of code to produce. I'll use bottom-up estimation and incremental development as well to increase efficiency.

Final Journal............................

Final Reflections:

Overall Course Impact:
Summarize the overall impact of the course on your understanding.
Highlight key insights and transformations from your perspective.

Application in Professional Life:
Discuss how the knowledge gained in this course can be applied in your professional life.
Consider specific scenarios or projects where these skills would be valuable.

Peer Collaboration Insights:
Reflect on the value of peer collaboration throughout the course.
Consider how interactions with classmates contributed to your learning.

Personal Growth:
Share insights into your personal growth as a learner.
Identify areas where you have seen improvement or development.

Note: Ensure that the journal is updated weekly, at least once a week and that the publicly accessible cloud service URL is provided for easy access by teaching assistants and for potential test-related inquiries. The learning journal should be no longer than 2 pages. Keep your content precise and to the point.