Software Project Management and Estimation Techniques

Jaidev Shriram

2018101012

1 Introduction

Software forms the backbone for today's activities across all imagine able dimensions. The idea of reliable, secure, and efficient software is hence a necessity now more than ever. Sadly, this is easier said than done. In 2004, Sainsbury had to let go off a $526 million$ contract with an automated supply chain due to glitches in the system.[1] In simple words, as the user base enlarges, the consequences of bad code exponentially grow. Software Project Management is the entire process of planning the project, it's scope and estimating various parameters.

2 Project Planning

This is the stage that precedes the actual development of the product. Planning includes but isn't limited to:

2.1 Scope Management

Defining the scope of a project is essential as it provides a clear cut direction for developers and project managers to go in. It also boils down the idea to a series of tasks which saves time while giving project managers ease when it comes to dividing the team into teams.

2.2 Scheduling and Work flow

Often, large and meaningful projects have a massive list of sub-tasks. Prioritizing them in a way that sets up a solid base for all developers to work on is crucial if a team wants to save time while increasing efficiency. Furthermore, communicating the work flow model that will be used is necessary to reap the benefits of good scheduling. Work flow refers to the many ways in which developers collaborate and work on projects. A bad work flow can have significant consequences on a company and the projects it unveils due to suppression of good ideas, non-optimal use of team resources.

2.3 Project Leadership and Management

Frequently, inefficient leadership or project management can have detrimental effects. Managers have a responsibility to hold realistic expectations, manage expenses, and keep the workforce motivated. Shortcuts may seem like a way out but that is in fact the root cause of error.[2] The primary role of a Project Manager would be allocating resources as he/she is solely responsible for quality management, risk management, communications, etc.[3]

[1] Robert N.Charette, *Why Software Fails.* IEEE, 2 Sep. 2005, https://spectrum.ieee.org/computing/software/why-software-fails/3

[2] ibid

[3] ibid

3 Estimation

Estimating is a critical part of project planning, involving a quantitative estimate of project costs, resources or duration. One conundrum in estimating, especially for public-sector projects, is that bidders sometimes make overly optimistic estimates in order to win the business. It cannot be stressed enough that laziness or shortcuts have negative impacts on the end product. Good estimation prepares the team for what's ahead.

3.1 Bias

Project Managers and Planners have the burden of viewing the project without any filters. While estimating, optimistic biases must be avoided to prevent roadblocks/difficulties in the future.[4]

3.2 Parameters in Estimation

Estimation isn't just about expenditure, it might also include sales, feasibility and more. A good estimation process looks into all the estimations with parameters such as the role of external agents, market factors, quantity/quality commitments and more. Covering all bases, improves the chances of the end product being stable, and functional.[5]

3.3 Techniques[6]

As estimation is crucial to any project, techniques to estimate a task have already been devised. Here are a few of them:

1. Delphi Technique: Survey based information collection from experts,
2. Work Breakdown Structure: Project broken down into sub-modules for analysis,
3. Three Point Estimation: Statistical Data used for Optimistic, Realistic, and Pessimistic estimates,
4. Function Point Estimation: Weightage given to functions from user point of view.

4 Conclusion

Project Management is not necessarily the most glamorous process for developers but as the classic saying goes, 'Prevention is better than cure'. Putting considerable effort into planning a project guarantees that the process of development would be faster and efficient. After all, software developers know how to implement things, but implementation is just half the story.

[4]Meyer, Werner G., *Estimating, the science of uncertainty*, Project Managment Institute, 13 May 2016, https://www.pmi.org/learning/library/estimating-science-uncertainty-10186

[5]ibid

[6]Software Testing Class, 27 January 2013, https://www.softwaretestingclass.com/software-estimation-techniques/