Chapter 8
Agile Cost Overhead Prioritization With ML For Effective Software Project Management

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ABSTRACT

Now a days, almost all industries who are working on software have a set process to use Agile as a software development method. Such software companies are practicing various kinds of agile versions (like-Scrum, XP, Kanban, etc.) When progressing on achieving organizational goals with Agile, there are quite significant challenges like planning difficulties, prioritizing the work, estimating costs, overhead costs, etc. These challenges are faced by management people - Budgeting, costing analysis and estimating things during different phases of the project execution are critical factors of project management. Hence, focusing on such factors which are helpful for the optimization of costs gains more importance. Alternatively, FAHP which is operated on the principle of 'Fuzzy Set' theory. An AHP process happens to be a competent way to solve some complex decision-making problems. ML can become a crucial component of this entire ecosystem, if it's equipped with Fuzzy. The hybrid model combining fuzzy and ML can support in predicting the cost and prioritization effectively.

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1. INTRODUCTION

The adaptability, iterative process and responsiveness to change makes agile methodology a cornerstone of modern project management, specifically with regards to software development (Godbole & Neve, 2017). It fosters collaboration, flexibility and continuous improvement, all which are required in managing our complex projects. Handling the project cost overhead scales the Agile teams with more projects (Junaid et al., 2021). In the agile practices, having speed to deliver, that also provides a reasonable level of accuracy in the resource allocation and cost management is quite a tete a tete challenge and cost overhead prioritization forms an important part of the success of a project delivery (Pressman, 2010).

The challenge is, on the one hand, to be efficient on managing scarce resources, on the other, to anticipate costs, last but not least, with data driven decisions, in an Agile environment that is characterized by continuous changes (Malgonde & Chari, 2019). This overhead doesn't add up when there are lots of small changes that happen quickly, or if there are a bunch of small projects that a team is dealing with that have varying task priorities and sometimes fluctuating resource constraints (Kolasani, 2023). It can be because if traditional cost management techniques don't work, they lack that necessary dynamic adaptability for an Agile project (Kumari, 2024).

However, these challenges are addressed by Machine Learning (ML), which provides an improvement over decision making, as well as over allocating resources and predicting cost overhead with higher accuracy. Just by analyzing large datasets, ML can identify patterns and automate the decision making processes, helping Agiles teams to make faster and better decisions (Dakić et al., 2024). More importantly, this integration enables teams to streamline their processes, provide priorities for faster execution, and eliminate inefficiencies in cost management by means of ML models. The focus of this article is to present a comprehensive framework for applying ML that leverages predictive modeling, task clustering and optimization techniques to increase the performance of Agile cost overhead prioritization.

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