Predictive Analytics Models Using AI for Estimating Software Development Effort and Cost Management

Mr. Thorat Saurabh Sudam[1] and Mr. Nehe Abhijit Govind[2]

Student, M.Sc. Computer Science, Department of Computer Science[1,2]

S. M. B. S. T. College, Sangamner, Maharashtra, India

Abstract: *Accurately estimating software development effort and associated costs is a critical challenge in project management. Traditional estimation methods, such as expert judgment or algorithmic models like COCOMO, often suffer from subjectivity, limited adaptability, and low precision, especially in complex or large-scale projects. This study explores the application of Artificial Intelligence (AI) and Predictive Analytics to enhance software effort and cost estimation. By leveraging historical project data—including project size, complexity, team experience, and timelines—various machine learning models such as linear regression, decision trees, random forests, and neural networks are trained to predict project effort and budget requirements. The proposed system provides more accurate and reliable predictions compared to traditional methods, enabling project managers to make data-driven decisions, optimize resource allocation, minimize cost overruns, and improve overall project planning. The study demonstrates that AI-based predictive models can significantly enhance the efficiency and success rate of software development projects.*

Keywords: Predictive Analytics, Software Effort Estimation, Cost Management, Artificial Intelligence, Machine Learning