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Notice for the PhD Viva Voce Examination

Mr Ramakrishnan N (Reg. No. 1247001), PhD scholar at CHRIST (Deemed to be University), will defend his PhD thesis at the public viva-voce examination on Thursday, 11 February 2021 at 2.30 pm on the Webex Meeting platform.

Title of the Thesis	:	**Improvised Process Model for Prediction of Software Development Effort by Integration of Risk**
Discipline	:	**Computer Science and Engineering**
External Examiner (Outside Karnataka)	:	**Dr S V Gumaste** Professor & Head Department of Information Technology MET's Institute of Engineering, Bhujbal Knowledge City, Adagaon, NASHIK Maharashtra - 422 003
External Examiner (Within Karnataka)	:	**Dr Mamatha G** Professor and Head Department of Information Science and Engineering Nagarjuna College of Engineering and Technology Mudugurki, Venkatagiri Kote, Post Devanahalli, Bengaluru Karnataka - 562110
Supervisor	:	**Dr Girijamma H A** Professor Department of Computer Science and Engineering RNS Institute of Technology Bengaluru Karnataka
Co Supervisor	:	**Dr Balachandran K** Professor Department of Computer Science and Engineering School of Engineering and Technology CHRIST (Deemed to be University) Bangalore Kengeri Campus Bengaluru 560074

The faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva.

Registrar

Place: Bengaluru
Date: 6 February 2021

ABSTRACT

Software development involves usage of a finite quantum of resources in accordance with the estimated effort and schedule. The Software Development Lifecycle comprises activities pertaining to software engineering. The software engineering activities could be carried out using any of the various models available in practice. The process of estimating size and effort accurately is vital in a software project since it could influence the success of the project. However, the realistic estimation of time and resources required for a project continues to be a challenge. Risks exist in any software project, and hence Risk management is required to be considered across various processes throughout the project. The risks could be quantified by arriving at the risk score based on the probability of occurrence of the risk and its impact. This research focused on the aspect that risk factors need to be considered in software effort estimation. A total of 503 software projects were considered, and from this dataset, projects which had risk score information were extracted and utilized for further analysis. This research work proposed an improvised effort estimation process by including risk scores in the standard estimation process. It also analysed the relationship existing between risk score in the project and other parameters considered in the effort estimation process.

Regression analysis that was done on the dataset revealed an improvement in the model fitment by inclusion of risk score. An ensemble machine learning approach was utilized through deployment of Extreme Gradient Boosting algorithm. This algorithm was chosen after a model selection process by comparing various algorithmic models. The results indicated a better model fit by including risk as one of the parameters in the effort estimation process. A validation for the proposed risk-integrated effort estimation model was done through responses from industry practitioners to a research instrument. The ranking of variables done using Feature selection indicated Risk score to be the most important variable among those considered for effort estimation. The data obtained from respondents was used to generate Neural network models without and with inclusion of risk score as a predictor. This was done to establish that the difference or gap between estimated and actual efforts could be minimized with the inclusion of risk score. The analysis of model performance revealed that the model accuracy improved when risk score was considered. Hence, validation of the model brought out the significance of including risks in the effort estimation process. It also established the relevance of a risk-integrated software development effort estimation process.

Keywords: Effort estimates, Risk score, Risk-integrated effort estimation process, Extreme Gradient Boosting, Machine learning