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WEB EFFORT ESTIMATION TECHNIQUES: A SYSTEMATIC LITERATURE REVIEW

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Abstract: Web Effort Estimation is an important estimation measure for predicting the effort required to develop a web application. The completion of web projects within stipulated time and budget is not possible without accurate effort estimation. The numerous effort estimation models are present these days and they have achieved a pinnacle of success, but the uncertainty features are daunting its progress due to deviations in the data set collected, types of projects, and data set characteristics. The literature studied for this research task elaborated that this field still lacks in a significant direction for consolidated documentation, which guides the researchers to choose a specific technique in order to predict the effort required for web application development. The wide and versatile nature of this domain daunting the researchers to mine the literature in a more appropriate way and deploy ensemble techniques of effort prediction models in order to achieve better results for web application viz., schedule delays, budget overruns. The systematic literature review (SLR) in this research task has been done to inspect the various aspects affecting the prediction accuracy of web applications and these identified characteristics lead to a better effort estimation model. The literature review is conducted on a collection of 143 papers retrieved from online journals and conference proceedings. Only 53 relevant papers are selected for broad investigation. The study reveals that the expert judgment and algorithm-based models are very popular and used frequently for effort prediction, instead the machine learning (ML) based models are rare in use but cater comparatively better prediction accuracy. The authors suggest taking cognizance of this research domain for developing ensembles of early effort prediction models to overcome delays in schedule and budget.

Keywords: Effort Estimation, Machine Learning, Web applications, Algorithmic, Expert Opinion.

I. INTRODUCTION

Approximation of the development effort is an important management activity for planning and monitoring software development projects [1]. Effort estimation consists of anticipating how many hours of work and how many persons are required in a team to develop a project [2]. A successful software project management predicts the effort and its use to ascertain prices as well as allocation of resources effectively and lead projects to be handed over within budget and stipulated time [3]. A survey on Web-based projects, published by the Cutter Consortium in 2000, revealed that a large number of web-based projects are delivered with schedule delay (about 79%), budget overruns (approx. 63%), lack of needed functionality (almost 53%), lack of core requirements (over 84%) and suggested that software development is different from web application

development in a certain way. The literature reveals that there are many reasons behind the completion of web projects with unexpected cost, backlog of schedule and budget overruns. Nowadays, the competition in the web application development market is growing day by day. During the web project development process, the customer's request for frequent changes in their requirements according to the market trends, which results in a delay in the completion of projects. Sometimes, that delayed web project serves no purpose to the market when compared to the growing technology of hardware/software. It is necessary to deliver the web projects within the stipulated time period together with an eye on upgrading technology otherwise this may lead to an obsolete web project. The productivity growth of