Risks are a common phenomenon in software development and have negative impact on the development process. A software process is considered mature, if it can identify, prioritize and mitigate the risk factors before they have become harmful. This research is focused to propose and validate a model that can reduces the risks and improves the resource allocation for software projects. The research study identifies prominent risk factors, project factors and gages the impact of all identified risk factors along with their probability. The association among the risk factors and project factors is established in result of an elaborated study. This research consequently determines that how a model can be developed, implemented and tested to ensure that by applying that model the risks are reduced / eliminated and the resource allocation is improved. This study identifies a list of prioritized risk factors by conducting a detailed literature review followed by the application of quantitative methods to verify the findings. The project factors are identified based on similar exercise.

The software project scales have been established to help in categorizing the scale of the project by conducting a quantitative study. Because of this quantification process, the large-scale projects have been identified to possess a range of values for the project factors, like Time, Cost, Team size and Computational resources. The probabilities and impact of the software risk factors have been identified and the association among the project factors and risk factors have been established and validated by mixing the results of quantitative and qualitative methods. Several major and minor contributions can be identified in this study, the major contributions include: Identification and validation of risk factors and project factors based on the frequency and quantitative analysis, establishment of the project scales, Identification and consolidation of weak and strong association between the project factors and risk factors, and design, implementation and testing of a least assumptive model for risk reduction and resource rationalization based on identified project factors.

The minor contributions include the methodological contributions in the study, the literature review, identification of observatory and participatory project factors, the average wage analysis of the software developers by taking a sample from developing and developed countries, and identification of computational resource's proportion in the overall budget. The outcome of this research is of special significance to the software engineering literature. As risk reduction, cost estimation and software cost rationalization is an area of prime interest in the software engineering this research plays a vital role in addressing the issues.

The research is beneficial as the outcome ensures that by using the proposed model the risks are reduced and the cost of developing the software is rationalised by decreasing the cost of risk handling and other insignificant allocation. A software model has been proposed and implemented that aims to improve the resources utilization by decreasing the risks in the software development lifecycle. The model's performance has been verified by running test cases bearing data of diversified nature where the model has performed reasonably well and has not only reduced the risks but also improved the resource allocation, in most cases.