

Software Risk Assessment & Estimation Model using Fuzzy Functional Points

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Abstract—The assertion of this work is developing innovative methodology to assist companies in dealing with cost estimation and risk management problems based on micro level of tracking via membership function of the fuzzy logic along with Function Point calculation. Software cost estimation process is a set of techniques and procedures that is used to derive the software cost estimate. A set of inputs to the process and then the process uses these inputs to generate or calculate a set of outputs. Software projects are notorious for going past their deadline, going over budget, or both. Studies within the last few years have shown that a great deal more money is often spent on projects than is initially anticipated. IBM's Consulting Group did a survey of 24 leading companies in 1994 and found that 55% of the software developed cost more than the initial cost estimates. The Standish Group also did a study in 1994 of 8,380 projects in the United States and found that 53% of the software projects that were completed cost 189% of the original estimates. Although these numbers are from a few years ago, they likely have not changed much recently. The Fuzzy Cost Estimation and Risk Assessment (FCERA) method is based on both the heuristic knowledge of software project along with the expertise team and already existing project data. Due to the systematic use of expert knowledge, Fuzzy Cost Estimation and Risk Assessment (FCERA) can even be used in situations where only very little data is available about past projects within an organization. With the help of Fuzzy Cost Estimation and Risk Assessment (FCERA), we developed a prediction model that captured and quantified the experiences of the organization's best project managers. The resulting model was characterized by a very high level of estimation accuracy (9% - 14% estimation errors). The Fuzzy Cost Estimation and Risk Assessment (FCERA) model did not only help our customer to assess the risk (probability) a given project has of exceeding the planned budget, but also to plan a realistic budget with the lowest possible risk of exceeding costs.

Keywords: Risk Analysis, Fuzzy Cost Estimation and Risk Assessment (FCERA) Model, estimation errors, Function Point.