A STUDY OF RISK DIMENSIONS OF INFORMATION TECHNOLOGY PROJECTS WITH SPECIFIC REFERENCE TO E-GOVERNMENT

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A Study of Risk Dimensions of Information Technology Projects with specific reference to E-Government

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CERTIFICATE

This is to certify that the thesis entitled **"A Study of Risk Dimensions of Information Technology Projects with specific reference to E-Government"** is being submitted by R.D.Choudhari to the Indian Institute of Technology Delhi for the award of the degree of **Doctor of Philosophy (Ph.D.)**, is a record of bona fide research work carried out by him. He has worked under our guidance and supervision, and has fulfilled the requirements for the submission of the thesis, which has attained the standard required for a Ph.D. degree of the institute. The results presented in this thesis have not been submitted elsewhere for the award of any degree or diploma.

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ABSTRACT

This research is about studying the Risk Dimensions of E-Government Projects in India with a particular focus on identifying and profiling them across low, medium, and high risk projects. The study addresses the queries, like what is the relationship between project risk and performance, and how do project characteristics, such as *timeline*, *size*, and *ownership* of the project influence risk. The learning from the empirical as well as case study research, the risk mitigation strategies had been derived. Based on the literature review, research variables have been identified and defined, including five risk dimensions: *system specifications*, *planning*, *technology and technical aspects, e-government organization,* and *stakeholders*. Further, a conceptual framework for risk assessment has been evolved, and the research hypotheses have been formulated based on this framework.

The study has been divided into three phases, namely the pilot study, questionnaire based survey study for validation of the risk assessment model, and case studies of select organizations in India to verify and refine the model. The pilot test was conducted to bring out issues related to the risk dimensions and further improvement of scales, and to determine the problems in finalizing the instrument. It also authenticated the face and content validity, and reliability of the instrument. The discriminant validity of instrument was tested using correlation matrix and Cronbach alpha. The Seven Point Likert Scale was used to collect data on risk dimensions and performance variables. The fact based data about basic information of the projects have also been compiled on project characteristics, such as size, timeline, and ownership.

The quantitative data gathered through a structured questionnaire survey were analyzed using various statistical techniques, such as factoring, clustering, correlation, and regression analysis. The statistical analyses were used to test the hypotheses on distinct research variables and validate the research model. Empirical research demonstrates that project characteristics are positively related with risk dimension variables. All five risk dimension variables have the negative correlation coefficients for product and process performance variables of the project. This indicates that project performance and risk dimensions have the

inverse relationship. It also demonstrated that the risk level was increasing when moving from low to high risk clusters.

Select case studies have been carried out on four e-government projects drawn from the two states: Delhi, and Haryana. These cases were analyzed using SAP-LAP (Situation, Actor, Process - Learning, Action and Performance) framework to see efficiency and effectiveness in providing the service after e-government and examination of risk involved. The case study research illustrated that the greatest risk driver was often overlooked. Eventually, one such driver gets inappropriate attention over others, while a risk driver may impact all facets of risk: cost, schedule, and technical. Thus, the integrated result may be improperly estimated. Risk identification is the most critical step in risk assessment, yet often is poorly done. The problem lies in ranking methodology that entails subjective qualitative measures resulting in excessive expenditure of risk management resources. Faster, better, cheaper, as well as any other competitive initiative may exacerbate the risk. All projects must include sufficient resources in the project's planning activity to adequately provide for training in the risk management process.

The learning from questionnaire survey and case study research has been synthesized using correlation and interpretive matrices. The major findings of the study are summarized as per research objectives, and these are reflected upon to generate main recommendations for e-government project managers for implementation of the project successfully. Implication and relevance of research are discussed. The limitations of study are outlined and specific suggestions have been made regarding the future direction of research work reported in this thesis. This research would be useful in assessment and control of risks in e-government projects.

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