

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.

Contents

CERTIFICATE	i
ACKNOWLEDGEMENTS	ii
ABSTRACT	iv
Contents	vi
List of Figures	x
List of Tables	xi
List of Appendices	xiii
LIST OF ABBREVIATIONS	xiv
 Chapter 1: INTRODUCTION TO THE STUDY	 1
1.1 Background.....	1
1.2 Need for Research.....	4
1.3 Objectives of the study.....	6
1.4 Issues Covered in Study.....	6
1.5 Scope of the Study	7
1.6 Brief outline of Methodology	7
1.7 Organization of the Thesis	8
1.8 Concluding Remarks.....	10
 Chapter 2: REVIEW OF LITERATURE	 11
2.1 Introduction.....	11
2.2 Rise of E-Government	11
2.3 E-Government in India	14
2.4 Issues of E-Government System Development	17
2.5 Risks in E-Government Projects.....	19
2.6 Risk and Performance of the project.....	22
2.6.1 Risk dimensions	22
2.6.2 Project Characteristics	24
2.6.3 Project Performance.....	25
2.7 Risk Management Strategies.....	25
2.8 Identification of Research Gaps.....	27
2.9 Concluding Remarks.....	28
 Chapter 3: EVOLUTION OF RESEARCH PLAN	 29
3.1 Introduction.....	29
3.2 Research Questions.....	29
3.3 Objectives of the study.....	30
3.4 Issues of the Study	30
3.5 Scope of the Study	34
3.6 The Research Model	35

3.7 Formulation of Hypotheses.....	40
3.7.1 Risk level and Risk Dimension Variables – First Set of Hypotheses.....	40
3.7.2 Size and Risk Dimension variables – Second set of hypotheses.....	41
3.7.3 Timeline and Risk dimension variables – Third Set of hypotheses.....	42
3.7.4 Ownership and Risk dimension variables – Fourth Set of hypotheses.....	43
3.7.5 Risk and performance oriented outcome – Fifth Set of hypotheses.....	45
3.8 Research Methodology	47
3.8.1 Questionnaire Design.....	51
3.8.2 Questionnaire format	51
3.8.3 Validation of Questionnaire.....	52
3.8.4 Reliability of Instrument.....	54
3.8.5 Administering the Questionnaire.....	55
3.8.6 Questionnaire Scrutiny.....	56
3.9 Concluding Remarks.....	57
 Chapter 4: ANALYSIS OF DATA AND STATISTICAL FINDINGS*	58
4.1 Introduction.....	58
4.2 Construct Validity by Factor Analysis.....	59
4.2.1 Risk factors	60
4.2.2 Project Performance factors.....	63
4.3 Reliability of the Instrument.....	64
4.4 Discriminant Validity of Instrument.....	65
4.5 Testing of Hypotheses.....	67
4.6 Clustering among risk dimension and performance variables.....	68
4.6.1 Clustering on Risk Dimension Variables.....	69
4.6.2 Clustering on Performance Variables	70
4.6.3 Discussion on Hypotheses testing using Cluster Analysis	72
4.7 Correlation among Risk Dimension and Project Characteristic Variables.....	73
4.8 Regression Analysis on Risk Dimension Variables.....	74
4.8.1 System Specifications as Dependent Variable.....	75
4.8.2 Planning as Dependent Variable.....	78
4.8.3 Technology and Technical aspects as Dependent Variable.....	80
4.8.4 E-Government Organization as Dependent Variable	83
4.8.5 E-Government Stakeholders as Dependent Variable.....	85
4.8.6 Discussion on Hypothesis Testing of Risk Dimension Variables	88
4.9 Correlations among Risk Dimension and Project Performance Variables	90
4.10 Regression Analysis of Project Performance Variables	92
4.10.1 Product Performance as Dependent Variable	93
4.10.2 Process Performance as Dependent Variable	97
4.10.3 Discussions on Hypothesis Testing of Performance Variables	100
4.11 The Risk Assessment Model.....	103
4.12 Concluding Remarks.....	104
 Chapter 5: CASE STUDIES ON PUBLIC SECTOR PROJECTS.....	106
5.1 Introduction.....	106
5.2 Methodology.....	106

5.3 E-Government in the state of Haryana.....	109
5. 4 Case 1: A Study on Project ‘Haryana Registration Information System’ (HARIS).....	111
5.4.1 Background of the Project	111
5.4.2 The Existing Manual Process.....	112
5.4.3 The Objectives of HARIS.....	113
5.4.4 HARIS Technology	113
5.4.5 Organizational change	114
5.4.6 Business Process Re-Engineering through HARIS	115
5.4.7 Citizen Centricity	117
5.4.8 Sustainability and Cost effectiveness.....	118
5.4.9 SAP Analysis of HARIS.....	119
5.4.10 LAP Synthesis of HARIS	122
5.5 Case 2: A Study on Project ‘Haryana Land Record Information System’ (HALRIS) ...	125
5.5.1 Background of Project	125
5.5.2 Importance of Land Records in India	127
5.5.3 Manual System of Land Records.....	128
5.5.4 The Objectives of HALRIS Project.....	132
5.5.5 System Architecture and Technology.....	132
5.5.6 Organizational Change.....	134
5.5.7 Business Process Re-Engineering through HALRIS.....	135
5.5.8 Citizen Centricity	137
5.5.9 Sustainability and Cost Effectiveness.....	138
5.5.10 Benefits to the citizens	139
5.5.11 Benefits to the Government	139
5.5.12 SAP Analysis of Project HALRIS	140
5.5.13 LAP Synthesis of HALRIS.....	145
5.6 Concluding Remarks.....	146
 Chapter 6: CASE STUDIES ON PUBLIC PRIVATE PARTNERSHIP PROJECTS	148
6.1 Introduction.....	148
6.2 Public Private Partnership for E-Government	148
6.3 The Organizations involved in development and implementation of project.....	150
6.4 Methodology	151
6.5 Case 3: A Study on Project ‘Property Tax Information System’ (PTIS).....	152
6.5.1 Background of the Project	152
6.5.2 Overview of the Existing Property Tax Process	153
6.5.3 The Objectives of PTIS Project	156
6.5.4 System Architecture and Technology.....	156
6.5.5 Organizational Change.....	158
6.5.6 Business Process Re-Engineering.....	159
6.5.7 Citizen Centricity	159
6.5.8 Sustainability and Cost Effectiveness.....	160
6.5.9 SAP Analysis of Project PTIS	160
6.5.10 LAP Synthesis of PTIS	162
6.6 Case 4: A Study on Project ‘Factory Licensing Information System’ (FLIS).....	164
6.6.1 Background of the project.....	164

6.6.2 Delhi Factory Act.....	165
6.6.3 Eligibility Criteria for getting license	166
6.6.4 The Existing Licensing Process	167
6.6.5 Objectives of FLIS Project.....	168
6.6.6 System Architecture and Technology	169
6.6.7 Organizational Change.....	169
6.6.8 Business Process Re-Engineering.....	169
6.6.9 Citizen Centricity	170
6.6.10 Sustainability and Cost Effectiveness	171
6.6.11 SAP Analysis of Project FLIS	172
6.6.12 LAP Synthesis of FLIS	174
6.7 Concluding Remarks.....	175
 Chapter 7: SYNTHESIS OF STUDY AND CONCLUSION	177
7.1 Introduction.....	177
7.2 Learning from Empirical Research.....	177
7.3 Learning from Case Study Research.....	179
7.4 Comparative Analysis of Empirical Research and Case Study Research.....	181
7.5 Correlation and Interpretive Matrices for E-Government Projects.....	183
7.5.1 Correlation and Interpretive Matrices for Characteristics and Risk Dimensions ..	184
7.5.2 Correlation and Interpretive Matrices for Risk Dimensions and Performance.....	193
7.6 Validated Model for Risk Assessment.....	198
7.7 Summary of Research	202
7.8 Major Recommendations	206
7.9 Significant Research Contributions	208
7.10 Implications and Relevance of Research	209
7.11 Limitations of the Study.....	210
7.12 Suggestions for Future Work.....	211
7.13 Concluding Remarks.....	212
 References.....	214
 Appendices.....	A1
 Publications	
 Curriculum Vitae	