IDENTIFYING SOFTWARE PROJECT RISKS
IN THE CANADIAN FINANCIAL SERVICES SECTOR:
AN INTERNATIONAL COMPARATIVE STUDY

by

John A. Estrella

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About John A. Estrella, Ph.D.

As a management consultant, project manager, and professional speaker, John specializes in complex IT projects in the areas of project management, business analysis, and software testing. Over the past seventeen years, John worked on various consulting engagements for some of the world’s most respected organizations in Asia, North America, and Europe including Allstate, Asian Development Bank, BMO Financial Group, R-M Trust (CIBC Mellon), SunTrust, Dell, General Motors, Honda, Sikorsky Aircraft (United Technologies), USAir, Delta, Continental, Learning Tree International, World's Finest Chocolates, and San Miguel Corporation, to name a few.

John is the author of Learning Tree International’s *Software Testing and Inspection Methods* course, and the technical editor for the *Project Quality Management* course. Both courses are offered in Canada, U.S., U.K., France, Sweden, and Japan. His industry certifications include Certified Management Consultant (CMC), Project Management Professional (PMP), Microsoft Certified Professional (MCP), ISEB ISTQB Foundation Certificate in Software Testing, and Sun Certified Programmer for the Java 2 Platform.

John was named to the National Dean’s List and Pi Mu Epsilon (National Honorary Mathematics Society) while working on his Bachelor of Science degree in Computer Science. He completed both Master of Science in Computer Science and Doctor of Philosophy in Organization and Management degrees with a 4.0 GPA while on a teaching fellowship and scholarship. He was also awarded a scholarship by the PMI Educational Foundation for his doctoral studies.
Take risks: if you win, you will be happy; if you lose, you will be wise.

—Author Unknown
Abstract

Frequent occurrence of software project failures has created two general streams of research. One theme analyzed the common causes of cost overruns, late schedules, and unmet scope. With the belief that project failures are avoidable through proactive means, another group of researchers investigated software project risks. With such intent, comparative studies were conducted in Finland, Hong Kong, and the United States. Subsequent research in Nigeria determined the impact of the socioeconomic context. To further extend the coverage of prior studies, the research in the current study focused specifically on the Canadian financial services sector. Project managers were solicited for input to discover, determine, and rank risk factors in software projects using the same research design that was used in previous comparative research studies—a three-phase Delphi survey that uses nonparametric statistical techniques. In sharp contrast to prior studies, however, this research aimed not for general applications of the results at the country level but for specific collective relevance to software projects in banks, trust companies, insurance companies, mutual fund companies, and similar organizations. The composite rankings of the studies in Hong Kong, Finland, and the United States listed lack of management commitment, inability to get user commitment, and misunderstanding of the requirements as the top three risk items in software projects. Given that only the misunderstanding of requirements made it into the top three risk items in Nigeria, it would be of value to scholars and practitioners to determine how the results would differ if the study was conducted in a specific sector in the industry. Except for one risk factor (lack of dedicated, full-time project resources), this study confirmed that the previous list of risk factors captured the top risk factors in the Canadian financial services sector.
Dedication

This doctoral dissertation is dedicated to my grandmothers, Pelagia and Asuncion, for serving as endless source of inspiration; to my parents, Juanito and Felisacion, for always believing in my abilities; and to my sisters, Grace and Josephine, for their support. Most especially, I extend my sincerest appreciation to my wife, Maria, and my children, Joshua, Jacob, and Clara, for their unconditional understanding and persistent motivation throughout my doctoral journey.
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If you don't risk anything, you risk even more.

—Erica Jong
# Table of Contents

Acknowledgments vii

List of Tables xii

List of Figures xiii

CHAPTER 1: INTRODUCTION 1

Introduction to the Study 1

Background to the Study 2

Statement of the Problem 4

Purpose of the Study 6

Theoretical Basis 7

Research Questions 8

Significance 8

Definition of Terms 9

Assumptions and Limitations 12

Remaining Chapters 13

CHAPTER 2: LITERATURE REVIEW 15

Risky Proposition: Anatomy of Project Failures 19

Theoretical Foundations 25

Approaches, Frameworks, and Models 35

Project Risk Management 58

CHAPTER 3: METHODOLOGY 95

Introduction and Overview 96
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methodology Description</td>
<td>96</td>
</tr>
<tr>
<td>Study Design</td>
<td>100</td>
</tr>
<tr>
<td>Population and Sample</td>
<td>101</td>
</tr>
<tr>
<td>Informed Consent/Assent, Anonymity, Privacy, and Confidentiality</td>
<td>103</td>
</tr>
<tr>
<td>Data Instrumentation</td>
<td>104</td>
</tr>
<tr>
<td>Data Collection</td>
<td>108</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>108</td>
</tr>
<tr>
<td>Delphi in Information Systems Research</td>
<td>110</td>
</tr>
<tr>
<td>Conclusion</td>
<td>125</td>
</tr>
<tr>
<td>CHAPTER 4: DATA PRESENTATION AND ANALYSIS</td>
<td>127</td>
</tr>
<tr>
<td>Composition of the Panels</td>
<td>127</td>
</tr>
<tr>
<td>Risk Factors List</td>
<td>133</td>
</tr>
<tr>
<td>Ranking of Risk Factors</td>
<td>138</td>
</tr>
<tr>
<td>Discussions and Implications</td>
<td>140</td>
</tr>
<tr>
<td>Implication for Research</td>
<td>153</td>
</tr>
<tr>
<td>Implication for Practice</td>
<td>154</td>
</tr>
<tr>
<td>CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS</td>
<td>157</td>
</tr>
<tr>
<td>Limitations of the Study</td>
<td>159</td>
</tr>
<tr>
<td>Directions for Future Research</td>
<td>161</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>163</td>
</tr>
<tr>
<td>APPENDIX A: INVITATION E-MAIL</td>
<td>175</td>
</tr>
<tr>
<td>APPENDIX B: WELCOME E-MAIL</td>
<td>176</td>
</tr>
</tbody>
</table>
APPENDIX C: INFORMED CONSENT/ASSENT DOCUMENT 177
APPENDIX D: DELPHI SURVEY PHASE 1 178
APPENDIX E: THANK-YOU E-MAIL 184
APPENDIX F: REMINDER E-MAIL 185
APPENDIX G: VALIDATION E-MAIL 186
APPENDIX H: PHASE 2 E-MAIL 187
APPENDIX I: PHASE 2 ATTACHMENT SAMPLE (PARTIAL) 188
APPENDIX J: PHASE 3–ROUND 1 E-MAIL 189
APPENDIX K: PHASE 3–ROUND 1 ATTACHMENT SAMPLE (PARTIAL) 190
APPENDIX L: PHASE 3–ROUND 2 E-MAIL 191
APPENDIX M: PHASE 3–ROUND 2 ATTACHMENT SAMPLE 192
APPENDIX N: PHASE 3–ROUND 3 E-MAIL 193
APPENDIX O: PHASE 3–ROUND 3 ATTACHMENT SAMPLE 194
APPENDIX P: PHASE 3–ROUND 4 E-MAIL 195
APPENDIX Q: PHASE 3–ROUND 4 ATTACHMENT SAMPLE 197
APPENDIX R: FULL LIST OF CONSOLIDATED RISK FACTORS 198
List of Tables

Table 1. Three Categorical Facets of Project Risks Based on Theoretical Foundation 27
Table 2. Three-Phase Conceptual Framework of the Delphi Survey 100
Table 3. Demographic Information on Study Subjects and Subjects in Related Studies 129
Table 4. Organization Type of Panelists 130
Table 5. Job Titles of Panelists 132
Table 6. Shortened List of Risk Factors After Phase 2 136
Table 7. Rankings and Ratings of Risk Factors Between Rounds 137
Table 8. Final Rankings and Composite Ranks 141
Table 9. Classification of Risk Factors in Canada 152
Table 10. Comparison of Software Risk Factors Selection 153
List of Figures

Figure 1. Content breakdown structure of “Chapter 2: Literature Review” 16
Figure 2. Logical grouping of the literature review over the past 10 years 17
Figure 3. Four-stage project de-escalation model 36
To get what you want; stop doing what isn’t working.

—Dennis Weaver
CHAPTER 1: INTRODUCTION

The main objective of this Delphi research was to identify software project risks in the Canadian financial services sector. Previous studies in Finland, Hong Kong, and the United States (Schmidt, Lyytinen, Keil, & Cule, 2001) and Nigeria (Mursu, Lyytinen, Soriyan, & Korpela, 2003) utilized a methodology developed by Schmidt (1997) for conducting Delphi surveys using nonparametric statistical techniques. This study utilized the same Delphi techniques. In sharp contrast, however, the study aimed not for general applications of the results at the country level but for specific collective relevance to software projects in banks, credit unions, trust companies, insurance companies, mutual fund companies, securities dealers, and other related services in Canada.

The research report comprises five chapters, namely the introduction; literature review; methodology, data presentation and analysis; and summary, conclusions, and recommendations. The key components of Chapter 1 consists of an introduction to the study, background to the study, statement of the problem, purpose of the study, theoretical basis, research questions, importance and significance, definition of terms, assumptions and limitations, and a brief description of the remaining chapters.

Introduction to the Study

Since the initial publication of the CHAOS Report about a decade ago, with new reports published every 2 years, The Standish Group International (2004) has analyzed more
than 50,000 information technology (IT) projects worldwide. The most recent report indicated that 29% of the 9,236 IT projects studied were completed on time, on budget, and on scope. Because of cost overruns, late schedules, and unmet scope (not delivering all products and services as agreed upon), a significant 53% were considered “challenged” projects. Other reasons such as cancellation, abandonment, or obsolescence accounted for the remaining 18% of failed projects. The incongruity of project failures from prior years has been fueling an uninterrupted succession of information systems (IS) research literatures that compare, contrast, synthesize, and integrate themes and trends on the potential causes of cost overruns, project delays, and unmet requirements (Barki, Rivard, & Talbot, 1993; Cule, Schmidt, Lyytinen, & Keil, 2000). Consequently, a separate stream of research beginning in the 1970s focused on software project risk management (Alter & Ginzberg, 1978; Boehm, 1991; Charette, 1989; Cule et al., 2000; Lyytinen & Hirschheim, 1987). The latter stream rested on the belief that failures are avoidable through apposite identification, qualification, quantification, and management of risk factors inherent in most software projects.

Background to the Study

Researchers have argued that if software project risks can be identified, then appropriate measures can be put in place to minimize, if not eliminate, their impact on project success. In the initial international Delphi study, Schmidt, Lyytinen, et al. (2001) identified software project risks in three culturally diverse countries. The composite rankings of the studies in Hong Kong, Finland, and the United States listed lack of management commitment, inability to get user commitment, and misunderstanding of the requirements as
the top three risk items in software projects. A follow-up comparative study in Nigeria discovered socioeconomic factors that were not uncovered in the previous studies (Mursu, Lyytinen, et al., 2003).

Given that only the misunderstanding of requirements made it from the top three risk factors in the initial study to the top three risk items in Nigeria (the other two in the Nigerian study being the lack of effective development process/methodology and the lack of requirements knowledge/skills) scholars and practitioners can gain substantial insights by conducting similar studies in specific sectors in yet more countries. The current study extends previous research to a Canadian context. It was hoped that the results, from a more specialized and restricted context, would either support or refute the generalizations and conclusions from the previous studies.

The Canadian financial services sector encompasses banks, credit unions, insurance companies, securities dealers and exchanges, and other related services such as financial advisors and insurance representatives. The sector contributed significantly to the economy by employing more than 600,000 Canadians in 2003 with an annual payroll of $35 billion. Furthermore, the sector accounted for 6% of Canada’s gross domestic product and paid $13 billion in taxes to all levels of government (Department of Finance Canada, 2005). The effects of fast-moving economic globalization, legislative regulations, and technological innovations necessitated additional spending in larger and complex information technology projects, all of which carry greater financial, operational, cultural, organizational, and technical risks.
The succeeding eight sections of this chapter address various elements that introduce and explain the study, its rationale, and its methodology. The last section summarizes the chapter and presents the key points of the remaining chapters.

Statement of the Problem

Cooper and Schindler (2003) presented the management-research question hierarchy to help translate and successively break down a basic management dilemma into specific measurement questions. The six hierarchy levels of management dilemma, management question, research question(s), investigative questions, measurement questions, and management decision progressively refine the management dilemma into a management decision.

A management dilemma leads to the exploration of management questions, which in turn leads to additional exploration to define the research questions. After the research questions have been defined, subsequent refinements can lead to a research proposal. The discussions below present the management research question hierarchy from management dilemma to measurement questions that eventually will lead into the statement of the problem. With a well-defined statement of the problem, management can then make informed decisions based on the results of studies.

_Hierarchy Level 1: Management Dilemma (MD)_

Symptoms and environmental stimuli help generate concerns that lead to the management dilemma. With respect to this research, the frequent occurrences of software project failures prompted management to devise preventive measures that can minimize, if
not eliminate, the financial impacts of such failures on the continued viability of the company. MD: Past and recent studies show that software projects frequently encounter cost overruns, late schedules, and unmet scope (The Standish Group International, 2004).

*Hierarchy Level 2: Management Question (MQ)*

Based on the management dilemma, management questions restate the dilemma in question form (Cooper & Schindler, 2003). The negative symptoms of the management dilemma can be minimized or avoided by learning the potential causes of cost overruns, late schedules, and unmet scope. Aptly labeled MQ1 and MQ2, two management questions emerged from the management dilemma: (a) MQ1: “How can we better understand the common causes of cost overruns, late schedules, and unmet scope?” and (b) MQ2: “How can we prevent such negative instances from occurring?”

*Hierarchy Level 3: Research Question(s) (RQ)*

At the research question hierarchy level, the focus is on gathering factual information. Two general approaches can be used to address problems of frequent software project failures. One approach analyzes the common causes of cost overruns, late schedules, and unmet scope. Following from the belief that project failures are avoidable, another approach investigates software project risks—a proactive instead of reactive approach. For this research, the focus will be on the proactive approach. The research questions are (a) RQ1: “What are the risks associated with costs?” (b) RQ2: “How can management better allocate resources so that schedule contingency can be met most appropriately?” and (c) RQ3: “How can the project team improve the process of gathering requirements?”
*Hierarchy Level 4: Investigative Questions (IQ)*

To address the research questions, management needs to identify software project risks that project managers perceived have the highest impact on project failures. The two investigative questions are: (a) IQ1: “What risks contribute the most to project failures?” and (b) IQ2: “If such risks can be addressed early, can the probability and impact of project failure be diminished?”

*Hierarchy Level 5: Measurement Question (ME)*

Measurement questions are the actual questions that will be presented to the panelists. Schmidt, Lyytinen, et al. (2001, p. 7) and Mursu, Lyytinen, et al. (2003, pp. 182-183) used two similar measurement questions: (a) ME1: “What are the typical risk factors software project managers face?” and (b) ME2: “Which risk factors do software project managers consider more deserving of their attention?” For comparative purposes, similar measurement questions will be used to maintain consistency. This study involves identifying software project risks in the Canadian financial services sector and comparing the results to previous international studies.

**Purpose of the Study**

The four main objectives of the study are to (a) identify software project risks in the Canadian financial services sector; (b) aggregate the findings with the results from Finland, Hong Kong, the United States, and Nigeria; (c) compare the results across countries; and (d) distinguish risks that are unique to the Canadian financial services sector. The first objective involves three phases: validating a list of grouped risk factors with panelists, selecting the