

**BUSINESS PROCESS IMPROVEMENT
METHODOLOGIES:
COMMON FACTORS AND THEIR RESPECTIVE
EFFICACIES**

Winston R. Nickerson

A thesis submitted to
The University of Gloucestershire
in accordance with the requirements of the degree of
Doctor of Business Administration
in the Faculty of Business, Education & Professional Studies



10 November, 2014

ACKNOWLEDGEMENTS

My heartfelt thanks go to my supervisor, Professor Gerald Watts. His expertise provided both insight and motivation - the two key factors which moulded this thesis into the final form that it has taken. His understanding of both the academic and business worlds helped me move beyond my preferred paradigms and enabled me to produce a dissertation that is acceptable to the academic community and benefits the business world. I acknowledge that, at times, I tried his patience with my resolve and proclivity to focus predominantly on this research's contributions to business practices.

I would also like to take this opportunity to acknowledge the business managers, consultants and practitioners who participated in the initial survey as well as the subsequent interview sets. The information they provided filled the enormous voids in evidence left by the available literature. This gap closure enabled me to analyse business process improvement methodologies in a unique manner and to an extent previously not available to the business community.

ABSTRACT

Business process improvement (BPI) methodologies play an important role in increasing a business's performance and its competitiveness. Since World War II, a number of these methodologies have been developed. Each of these held to a different philosophy as to what drives process improvement. Therefore, each focused on a seemingly unique aspect or parameter of business processes. These leverage points included, amongst others, process cycle time, quality, process efficiency, on-time delivery and error rates. The methodologies were delineated from one another not only by these focal points but also the terminology, structure and emphasis used by their creators. The result was a spectrum of seemingly unique approaches. This spectrum was enlarged by practitioners (consultants and businesses) who tweaked the base methodology so as to make their product offerings stand out. This palette of business improvement approaches was further augmented by certain techniques, tools and methods being presented as complete methodologies. The result was that business managers are confronted with a seemingly confusing array of ostensibly unique options.

The author, being a business process improvement consultant, felt that these options were not as unique as they might appear. He believed that beneath these individualistic exteriors lays a common set of factors that enable the methodologies to bring about sustainable improvements. Therein lays the theoretical framework of this thesis. The author further felt that identifying these common key factors and their respective importance to business process improvement would contribute significantly to both knowledge and practice. Upon completing the research, it became evident that the contribution was not just limited to the enlightenment regarding composition, commonality and efficacy. It also involved ways of delineating targets such as methodologies from a chaotic population. Most importantly, a significant contribution to knowledge was made by showing how to synthesize information out of a set of seemingly unique data points. This uniqueness having been created by the different terminologies structures and emphasises found in the evidence.

In the thesis, four unique challenges were encountered. The first was to identify the current, core business process improvement methodologies out of the total field of offerings. The subsequent challenge was to analyse these methodologies for possible common constructs and components. The third challenge involved evaluating the efficacy of these common key factors. The final challenge was to characterize these key factors in the context of a theoretical, model-based methodology. The intended result was to create a holistic perspective of process improvement practices with justification at the constituent level.

A lengthy literature review was required in order to identify the current methodologies. Surprisingly, the sources normally rich in research evidence such as journals and articles did not give a comprehensive overview of business process methodologies. The candidates had to then be further researched via books and other lengthy publications. The end result was that six unique and sustaining families of methodologies were identified during the systematic literature review. Each of these had been developed by a different business improvement innovator using a different orientation associated with the methodology's core philosophical position. It appears that, for marketing reasons, each had strived to develop unique selling points and intellectual property that set their methodology apart from the others. As a result, the language, style and emphasis applied in each methodology were seemingly distinctive. These conditions made further analysis for commonality of key factors amongst the six methodologies difficult and time-consuming.

Further research involved analysing the six BPI methodologies and synthesizing qualitative evidence in order to identify the key factors common amongst those methodologies. Again, journals and articles played only a minor role in this activity. For the most part, these sources focused more on application than on composition. In addition, those dealing with application of the methodologies tended to avoid justifying applicability in terms of critical composition factors. Other sources such as books provided a framework for the composition analysis but with significant voids and confusing entries. Therefore, in addition

to the series of literature reviews, interviewing intellectual property owners and BPI practitioners from both business and consulting firms was necessary. Once the interviewing process had closed the gap and provided clarification of entries, a research method had to be found which could extract the common factors and make them apparent. The appropriateness of various research, analysis and synthesis approaches were reviewed and evaluated. As a result of this ancillary literature review, a form of reciprocal translations was viewed as the best means of dealing with the research evidence as well as the issues of languages, styles, cultures and subjectivity. The final results of the synthesis, after a follow-up round of literature reviews and interviewing, showed that 12 common key factors existed amongst the six BPI methodologies.

Research into the efficacy of these 12 common key factors required yet another series of literature reviews and additional interviewing. Due to the nature of the topic, interview respondents outside of the business process improvement community also had to be included. Those respondents included individuals from human resource and industrial psychology disciplines. The result of this descriptive research enabled characterization of the key factors' efficacies independently as well as holistically in the context of a theoretical, model-based methodology. These characterizations indicate that the 12 key factors appear to form the backbone of BPI methodologies in general.

The research process and its findings have contributed to both knowledge and practice. It has provided insight into using a holistic approach in delineating targeted elements of a mixed population. It also contributed to the understanding of how to apply the reciprocal translation technique to qualitative evidence outside the field of ethnography. Additionally, it enables improved business practices by demystifying the various methodologies and furthering the understanding of their value adding components.

DECLARATION

I declare that, except where noted and credited, the content of this thesis is my own work. I further declare that this DBA thesis was created in accordance with the guidelines and regulations of the University of Gloucestershire. I affirm that this thesis has not been submitted to any other educational institution in the United Kingdom or abroad or as part of any other academic award.

All views and opinions tendered in this DBA thesis are solely mine and not, in any way, those of the University of Gloucestershire.

Signed..... Date.....

TABLE OF CONTENTS

| | |
|-----------------------------------------------------------------------------|------|
| ACKNOWLEDGEMENTS..... | i |
| ABSTRACT..... | ii |
| DECLARATION..... | v |
| TABLE OF CONTENTS..... | vi |
| LIST OF TABLES..... | xi |
| LIST OF FIGURES..... | xii |
| LIST OF ABBREVIATIONS..... | xiii |
| | |
| CHAPTER 1: INTRODUCTION..... | 1 |
| 1.1 Background..... | 1 |
| 1.2 Evolution of the Research Topic..... | 2 |
| 1.3 Thesis Intent and Orientation..... | 4 |
| 1.4 Research Goals and Objectives..... | 5 |
| 1.4.1 Research Aim..... | 5 |
| 1.4.2 Research Objectives..... | 6 |
| 1.4.3 Research Questions..... | 8 |
| 1.4.4 Research: Conceptual Framework..... | 10 |
| 1.4.5 Research and Thesis Structure..... | 11 |
| 1.4.6 Summary..... | 12 |
| 1.5 Descriptive versus Explanatory Research..... | 13 |
| | |
| CHAPTER 2: RESEARCH APPROACH AND METHODS..... | 14 |
| 2.1 Introduction..... | 14 |
| 2.2 Research Challenges and Opportunities..... | 14 |
| 2.2.1 Hidden Driving Forces..... | 15 |
| 2.2.2 Nomenclature and Terminology..... | 16 |
| 2.2.2.1 Clear and Disciplined Usage..... | 17 |
| 2.2.2.2 Restricted Use of the Term “Methodology”..... | 18 |
| 2.2.2.3 Scope of the Term “Practitioner”..... | 18 |
| 2.2.2.4 Action Research Convention..... | 19 |
| 2.2.3 Dealing with Researcher Bias..... | 19 |
| 2.2.3.1 Employing the Bracketing Tool..... | 21 |
| 2.2.3.2 Enhancing the Bracketing Tool..... | 22 |
| 2.2.3.3 Reflecting on the Effectiveness of Bracketing..... | 23 |
| 2.2.4 Challenge of Identifying the Methodologies..... | 23 |
| 2.2.4.1 Apparent Closeness and Overlapping..... | 24 |
| 2.2.4.2 Hybridization of methodologies..... | 25 |
| 2.2.5 Challenge of Identifying Components and Constructs..... | 25 |
| 2.2.6 Challenge of Structuring the Components and Constructs..... | 26 |
| 2.2.7 Challenge of Identifying Efficacies of Components and Constructs..... | 26 |
| 2.2.7.1 Opportunity: Input External to the BPI Community..... | 27 |
| 2.2.7.2 Opportunity: Input from Foreign-Language Sources..... | 27 |
| 2.3 Strategy..... | 28 |
| 2.3.1 Use of a Cross-Sectional Type Study..... | 31 |
| 2.3.2 Dealing with Qualitative Research..... | 31 |
| 2.3.3 Application of Inductive Reasoning..... | 32 |
| 2.3.4 Application of Radical Inquiry..... | 32 |
| 2.3.5 Acknowledging Ontological Considerations..... | 33 |
| 2.3.6 Contextualization of Research Findings..... | 34 |
| 2.4 Research Methods and Process..... | 35 |

| | | |
|-------------------------------------|-----------------------------------------------------------------|----|
| 2.4.1 | Initial Survey..... | 37 |
| 2.4.2 | Context and Assumptions | 38 |
| 2.4.3 | Systematic Literature Reviews | 39 |
| 2.4.3.1 | Gap Analysis..... | 39 |
| 2.4.3.2 | BPI Methodologies Reviews | 40 |
| 2.4.4 | Interviewing | 41 |
| 2.4.4.1 | Process Design..... | 41 |
| 2.4.4.2 | Sample Design | 43 |
| 2.4.5 | Determining the Common Factors..... | 46 |
| 2.4.6 | Efficacy Determination | 46 |
| 2.5 | Development of Research Instruments | 47 |
| 2.5.1 | Interview Schedule..... | 47 |
| 2.5.1.1 | Type of Questions | 48 |
| 2.5.1.2 | Language and Timeframe Considerations | 49 |
| 2.5.1.3 | Effectiveness and Validity | 50 |
| 2.5.2 | Request for Interview..... | 51 |
| 2.6 | Data Analysis..... | 52 |
| 2.6.1 | Synthesis of Evidence | 53 |
| 2.6.1.1 | Gap Analysis Phase | 54 |
| 2.6.1.1.1 | Use of Narrative Summary | 54 |
| 2.6.1.1.2 | Clarification of Parameters and Criteria | 55 |
| 2.6.1.2 | Synthesis of Methodology Composition Evidence..... | 56 |
| 2.6.1.2.1 | Use of Content Analysis | 57 |
| 2.6.1.2.2 | Identifying, Analysing and Synthesizing for Commonality | 58 |
| 2.6.1.2.2.1 | Evaluating Meta-Synthesis Techniques..... | 59 |
| 2.6.1.2.2.2 | Adaptation of a Meta-Ethnography Approach..... | 60 |
| 2.6.1.3 | Synthesis of Efficacy Evidence | 61 |
| 2.7 | Context Descriptions: Epistemological and Ontological..... | 62 |
| 2.7.1 | Systematic Literature Reviews | 63 |
| 2.7.1.1 | Epistemological Assumptions for Gap Analysis Data..... | 64 |
| 2.7.1.1.1 | Location and Dissemination of Evidence | 64 |
| 2.7.1.1.2 | Existence of “Black Literature” | 65 |
| 2.7.1.1.3 | Nature and Characteristics of Evidence..... | 66 |
| 2.7.1.1.3.1 | Qualitative Versus Quantitative..... | 66 |
| 2.7.1.1.3.2 | Maturity: Reliability and Robustness | 67 |
| 2.7.1.1.3.3 | Granularity: Broad Versus Detailed | 68 |
| 2.7.1.1.3.4 | Composition: Homogeneity versus Heterogeneity | 68 |
| 2.7.1.1.4 | Summary | 68 |
| 2.7.1.2 | Ontological Positioning of Gap Analysis Evidence | 69 |
| 2.7.1.3 | Epistemological Assumptions for Methodologies Review Data | 70 |
| 2.7.1.3.1 | Nature and Characteristics of Evidence..... | 71 |
| 2.7.1.3.2 | Summary | 72 |
| 2.7.1.4 | Ontological Positioning of Methodologies Review Evidence..... | 72 |
| 2.7.2 | Interview Sets..... | 72 |
| 2.7.2.1 | Contextual Parameters of Methodology Composition Evidence..... | 73 |
| 2.7.2.2 | Contextual Parameters of Efficacy Evidence | 74 |
| 2.8 | Ethics and Confidentiality | 75 |
| CHAPTER 3: LITERATURE REVIEWS | | 77 |
| 3.1 | Introduction..... | 77 |
| 3.2 | Literature Review: Initial Survey | 78 |

| | | |
|-----------------------------------|------------------------------------------------------|-----|
| 3.3 | Literature Review: Gap Analysis..... | 80 |
| 3.3.1 | Capturing and Screening the Initial Input..... | 81 |
| 3.3.2 | Characterization of Retained Information..... | 87 |
| 3.3.3 | Summary..... | 93 |
| 3.4 | Literature Review: Methodologies Review..... | 94 |
| 3.4.1 | Inclusion and Exclusion Criteria..... | 95 |
| 3.4.2 | Identifying the Methodologies to Be Examined..... | 96 |
| 3.4.3 | Identifying and Selecting Composition Evidence..... | 99 |
| 3.4.3.1 | Volume and Relevancy Considerations..... | 100 |
| 3.4.3.2 | Retention of Composition Data..... | 101 |
| 3.4.4 | Summary..... | 111 |
| 3.5 | Literature Review: Efficacy Review..... | 113 |
| 3.6 | Summary..... | 115 |
| CHAPTER 4: RESEARCH FINDINGS..... | | 119 |
| 4.1 | Introduction..... | 119 |
| 4.2 | Initial Survey..... | 120 |
| 4.2.1 | Identification of Current BPI Methodologies..... | 120 |
| 4.2.2 | Identification of Common Key Factors..... | 122 |
| 4.2.3 | Research's Contribution to Practice..... | 122 |
| 4.2.4 | Summary..... | 124 |
| 4.3 | Literature Reviews..... | 124 |
| 4.4 | Interviews: Methodology Composition..... | 126 |
| 4.4.1 | Organizational Issues..... | 145 |
| 4.4.2 | Researcher Bias Issues..... | 146 |
| 4.4.3 | Data Acquisition..... | 147 |
| 4.4.4 | Process Cycles of Learning..... | 148 |
| 4.5 | Synthesis for Common Factors..... | 150 |
| 4.5.1 | Tabularizing the Evidence..... | 152 |
| 4.5.2 | Data Compression..... | 153 |
| 4.5.2.1 | Aggregation and Reciprocal Translation Example..... | 160 |
| 4.5.2.2 | Data Refinement..... | 162 |
| 4.5.2.3 | Data Synthesizing: Process Example..... | 165 |
| 4.5.3 | Results: Common Key Factors..... | 165 |
| 4.5.4 | Process Cycles of Learning..... | 168 |
| 4.6 | Efficacy Analysis by Individual Factor..... | 170 |
| 4.6.1 | Creation of a Value Proposition..... | 172 |
| 4.6.2 | Management Coaching..... | 173 |
| 4.6.3 | Policy Deployment..... | 176 |
| 4.6.4 | Methodology Training..... | 179 |
| 4.6.5 | Cross Functional Team Infrastructure..... | 180 |
| 4.6.6 | Process Mapping..... | 182 |
| 4.6.7 | Repetitive Change Management Process..... | 185 |
| 4.6.8 | Root Cause Elimination..... | 188 |
| 4.6.9 | Process Flow Optimization..... | 191 |
| 4.6.10 | KPIs Driven Improvement..... | 196 |
| 4.6.11 | Visual Management..... | 198 |
| 4.6.12 | Business Culture Change..... | 201 |
| 4.6.13 | Process Cycles of Learning..... | 205 |
| 4.7 | Characterization of a Methodology's Composition..... | 208 |
| 4.7.1 | Use of a Model-based Methodology..... | 209 |

| | | |
|------------------------------------------------------------|------------------------------------------------------------------------|-----|
| 4.7.2 | Creating a Value Proposition | 210 |
| 4.7.3 | Management Coaching | 211 |
| 4.7.4 | Policy Deployment..... | 212 |
| 4.7.5 | Methodology Training | 212 |
| 4.7.6 | Cross Functional Team Infrastructure | 213 |
| 4.7.7 | Process Mapping..... | 213 |
| 4.7.8 | Repetitive Change Management Process..... | 214 |
| 4.7.9 | Root Cause Elimination and Process Flow Optimization..... | 215 |
| 4.7.10 | KPIs Driven Improvement..... | 215 |
| 4.7.11 | Visual Management | 216 |
| 4.7.12 | Business Culture Change | 216 |
| 4.8 | Summary..... | 217 |
| CHAPTER 5: CONCLUSIONS..... | | 218 |
| 5.1 | Introduction..... | 218 |
| 5.2 | Identification of Unique and Current Methodologies..... | 218 |
| 5.3 | Identification of Common Key Factors | 219 |
| 5.4 | Efficacy of Individual Key Factors..... | 220 |
| 5.5 | Efficacy of Key Factors as a System | 220 |
| 5.6 | Contribution to Knowledge | 221 |
| 5.7 | Contribution to Practice | 227 |
| 5.8 | Subsequent Research Potential | 231 |
| 5.9 | Closing Statements | 232 |
| CHAPTER 6: DISCUSSIONS OF LIMITATIONS AND REFLECTIONS..... | | 233 |
| 6.1 | Reflection on the Overall Research | 233 |
| 6.2 | Subjectivity and Bias | 235 |
| 6.3 | Issues Surrounding Sample Construction | 238 |
| 6.4 | Data Collection Issues: Interviews | 239 |
| 6.5 | Literature Reviews Issues | 241 |
| 6.6 | Maturity Considerations | 243 |
| 6.7 | Expert Panel’s Barrier List | 244 |
| 6.8 | Personal Reflections | 247 |
| CHAPTER 7: REFLECTIONS ON LEARNING..... | | 250 |
| 7.1 | Scope and Boundary Issues | 250 |
| 7.2 | Data Sourcing and Referencing Issues | 253 |
| 7.3 | BPI Philosophy Driven Filtering | 257 |
| 7.4 | Understanding the Model-Based Methodology Construct | 260 |
| 7.5 | Linkage between Research Outcomes and BPI Implementation Practice..... | 262 |
| 7.6 | Application of Qualitative Research Techniques to the DBA Context..... | 268 |
| REFERENCES..... | | 272 |
| APPENDICES..... | | 280 |
| Appendix 1: Interview Research..... | | 280 |
| App 1.1 | Generic Interview Schedule for IP Owners..... | 280 |
| App 1.2 | Generic Interview Schedule for Consulting Practitioners..... | 281 |

| | |
|---------------------------------------------------------------------|-----|
| App 1.3 Generic Interview Schedule for Business Practitioners | 282 |
| App 1.4 Example of Interview Notes: TBM Practitioner | 283 |
| Appendix 2: Glossary of Key Terms..... | 291 |

LIST OF TABLES

| Table No. | Title | Page |
|-------------------|---------------------------------------------------------------|-------------|
| Table 2.2.3.1-1 | Data for Bracketing – Dealing with Researcher Bias | 21 |
| Table 2.6.1.1.1-1 | Inclusive/Exclusive Criteria for Gap Analysis SLR Stage | 55 |
| Table 2.6.1.1.2-1 | Key Words for Gap Analysis Review | 56 |
| Table 3.3.1-1 | Summary of Search Results for Stage 2 (Gap Analysis) | 82 |
| Table 3.3.1-2 | Overview of Works Selected for Stage 2 (Gap Analysis) | 84 |
| Table 3.3.1-3 | Overview of Works Retained for Stage 3 (Methodologies Review) | 85 |
| Table 3.4.1-1 | Inclusive/Exclusive Criteria for Methodologies Review | 95 |
| Table 3.4.2-1 | Overview of Practices to be considered in Stage 3 | 97 |
| Table 3.4.3-1 | Key Words for Methodologies Review | 100 |
| Table 3.4.3-2 | Summary of Search Results for Methodologies Review | 100 |
| Table 3.4.3.2-1 | Overview of the Total Quality Management Methodology | 102 |
| Table 3.4.3.2-2 | Overview of the Six Sigma Methodology | 103 |
| Table 3.4.3.2-3 | Key Principles for Management (Deming, 1986/2000) | 104 |
| Table 3.4.3.2-4 | Overview of the Total Cycle Time Methodology | 107 |
| Table 3.4.3.2-5 | Overview of the Theory of Constraints Methodology | 108 |
| Table 3.4.3.2-6 | Overview of the Business Process Reengineering Methodology | 109 |
| Table 3.4.3.2-7 | Overview of the Lean Management Methodology | 110 |
| Table 3.4.4-1 | Chronology and Genealogy of Key BPI Events | 112 |
| Table 4.4-1 | BPR Key Factor Data | 128 |
| Table 4.4-2 | Lean Management Key Factor Data | 131 |
| Table 4.4-3 | Six Sigma Key Factor Data | 135 |
| Table 4.4-4 | TCT Key Factor Data | 137 |
| Table 4.4-5 | ToC Key Factor Data | 140 |
| Table 4.4-6 | TQM Key Factor Data | 142 |
| Table 4.5.2-1 | Composite of Key Factors | 155 |
| Table 4.5.2.2-1 | Synthesized Key Factors | 164 |

LIST OF FIGURES

| Figure No. | Title | Page |
|-------------------|----------------------------------------------------------|-------------|
| Figure 1.4.4-1 | Conceptual Framework | 10 |
| Figure 2.4-1 | Overview of the Research Process | 36 |
| Figure 2.4-2 | Overview of Evidence Gathering Sequence | 37 |
| Figure 3.1-1 | Key Actions and Deliverables per SLR Stage | 78 |
| Figure 3.6-1 | Overview of Evidence Gathering Sequence (repeated) | 116 |
| Figure 4.1-1 | Breakdown of Overall Research Findings | 119 |
| Figure 4.5-1 | Determining Key Factors common amongst BPI Methodologies | 151 |
| Figure 4.7.1-1 | Overview of Relationships within a BPI Initiative | 210 |
| Figure 5.6-1 | Linkage of Research Findings to Contributions | 222 |

LIST OF ABBREVIATIONS

| | |
|------------|---------------------------------------------------------------------|
| 5 I | Five “I” Process (See Appendix 2: Glossary of Key Terms) |
| 5 S | Five “S” Process (See Appendix 2: Glossary of Key Terms) |
| 5 Ws | Five-Whys Process (See Appendix 2: Glossary of Key Terms) |
| 6 σ | Six Sigma (See Appendix 2: Glossary of Key Terms) |
| BIT | Business Process Team |
| BPI | Business Process Improvement |
| BPM | Business Process Management |
| BPR | Business Process Reengineering |
| BRT | Barrier Removal Team |
| BRIC | Brazil, Russia, India and China |
| CEO | Chief Executive Officer |
| CFT | Cross-functional Team |
| CIP | Continuous Improvement Process |
| DMAIC | Define-Measure-Analyse-Improve-Control cycle |
| EFQM | European Foundation for Quality Management |
| FMEA | Failure Mode & Effects Analysis |
| IP | Intellectual Property |
| ISO | International Standards Organization |
| IT | Information Technology |
| JIT | Just in Time |
| KPI | Key Performance Indicator |
| MBM | Model Based Methodology |
| MBO | Management by Objectives |
| OECD | Organization for Economic Co-operation and Development |
| PDCA | Plan-Do-Check-Act cycle |
| PDSA | Plan-Do-Study-Act cycle (Deming cycle) |
| PPMO | Parts per Million Opportunities |
| PVM | Process Value Management (successor to TCT) |
| R&D | Research and Development |
| RFI | Request for Interview |
| SIPOC | Supplier, Input, Process, Output & Customer (a type of process map) |
| SLR | Systematic Literature Review |
| SMED | Single Minute Exchange of Die |
| TBM | Time-Based Management (synonymous with TCT) |
| TCT | Total Cycle Time [®] methodology |
| ToC | Theory of Constraints (a BPI methodology) |
| TPS | Toyota Production System (synonym for Lean and Lean Management) |
| TQM | Total Quality Management (a BPI methodology) |
| USP | Unique Selling Point |

CHAPTER 1: INTRODUCTION

1.1 Background

Authors such as Jestin and Nelis (2008) credit the work of Frederick Taylor and Adam Smith in the early 1900s with not only being the first wave of scientific management, but also introducing a scientific approach to organizing business processes. Jestin and Nelis (2008) associate the works of Hammer and Champy (1993) and Hammer (2001) with a second wave of business process management. As evidenced by the volumes of works pre-dating the 1990 publications of Michael Hammer's article in the Harvard Business Review and Thomas H. Davenport's one in the Sloan Management Review regarding re-engineering of business processes, the focus on improving business process performance had started long before 1990. Additionally, none of these works appear to a simple re-incarnation of Frederick Winslow Taylor's "Taylorism" of the 1880's. Practitioners may argue that the works of Hammer and that of Davenport did not proffer a totally independent methodology but rather highlighted the need for a holistic view and a process orientation. From this argument, it could be concluded that the works were substantial cogs in an evolution of business performance enhancements based on process management and not revolutionary in their own right as one might imagine when reading those works. Other key figures in this evolution of process management appear to be Henry Ford in the early 1900's, W. Edwards Deming in the 1950's and Motorola in the 1980's. Collectively, their works appear to fall into the general category of business process improvement (BPI) strategies.

Each of these BPI strategies appears to have given rise to a family of BPI methodologies. Each member of these families subscribe to a common philosophical tenet as to what drives process improvements. Some have even been married with others (George, 2002) to form clans of their own. In the business world, it appears that a geometric growth pattern such as this one typically continues until the limiting "nutrient" (usually capital, sales growth, or margin) is reached or a significant mutation occurs which branches the

development off into a new domain. Maybe as a result of this phenomenon, it appears that the development process for BPI methodologies may be shifting from fission, fusion and mutation towards dissection. Of late, the BPI innovators, such as Kotter (2008) appear to be scrutinizing the existing methodologies for internal attributes or qualities on which to write.

It can be argued that the business community's development of methodologies is similar to the evolution which goes on in the academic world. That is, theories, hypotheses, constructs and intellectual positions spawn numerous studies. Regardless of their absolute distance from academic studies, the BPI methodologies lend themselves to scrutiny, criticism, and synthesis just as those studies do. Although it may be more prescriptive and less descriptive, a BPI methodology is still a culmination of man's effort targeted at improving the understanding and furthering the knowledge of its community. Practitioners point out that BPI methodologies play a significant role in shaping the development, organization and evolution of the business world in which they exist (Thomas, 1994).

1.2 Evolution of the Research Topic

In April 2010, as Chief Executive Officer and co-founder of a German consulting firm specializing in business process improvement and interim management, the author presented "A Whitepaper on BPI Market Development" to the company's stakeholders. Preparing this whitepaper and, in particular, reflecting on root causes for the business trends detailed in it, fostered an interest in the research topic. The study had indicated that business managers were unsatisfied with the counselling they were receiving and the end results obtained from BPI initiatives. The research further indicated the businesses were continuously moving further away from holistic approaches to process improvement and long-term BPI commitments. Additionally, consultants and the clients appeared to be applying BPI methodologies inappropriately or in a piecemeal fashion. The author, taking a high-level view of these issues, envisioned that a common root cause exists for 1) the gaps and inconsistencies in consulting advice found by Argyris (2000); 2) the acceptance of outsourcing and point solutions for

seemingly inappropriate applications, and 3) the common failure for businesses and consultants to suitably align treatment with symptoms. The hypothesis was that both the buyers and sellers of BPI consultancy work are not fully aware of what really makes the methodologies effective. As a result, they appear to view the methods, techniques and tools in those methodologies somewhat superficially and/or apply them inappropriately. Details and background material for these statements were grounded in the previously mentioned whitepaper.

These business dilemmas and the quest to determine if there was, in fact, a common root cause give rise to the question if there is a common core amongst BPI methodologies. Therein lays the author's key interest: what, if any, are the key constructs and components common amongst these BPI methodologies? The theoretical framework being, understandably, that these key factors exist. Casual observers, external to the BPI community, might mistakenly believe that this question is both trivial and easy to answer. However, given that these methodologies are intellectual properties (IP) and were developed so as to create a degree of uniqueness, the resolution is not a transparent one. While a few popular BPI experts, authors and practitioners may have given the business community hard messages and clear direction, it appears that the mass of BPI consultants, their firms, and even their clients have given the business community a long list of acronyms and a confusing set of methodologies from which to choose (Ramdass & Pretorius, 2008). The result is that the field of business process improvement is cloaked by a myriad of different terminologies, acronyms, paradigms, unique selling points (USPs), application parameters and tools. A research method had to be found which would analyse for common factors and make those factors visible.

Hammer's (2001) breaking one of those paradigms serves as a means to illustrate the author's motivation. Hammer showed that the rapid pace at which today's business environment changes is driven not just by globalization. Being a management consultant, executives keep telling the author that they can no longer just outsource their costs to

someone else, or stretch their supply chains even further. Those business tactics have created enormous process risks. Mitigating these process risks is perhaps becoming as essential as mitigating a business's financial ones. From a practitioner's perspective, this process risk mitigation means that the processes themselves have to be improved. In doing so, those in the business process improvement field are expected to provide a methodology that executives can understand, that they can believe in, and that their people can successfully operationalize. Strengthening this understanding and thereby enhancing the utility of business process improvement methodologies was a major driving force for the author's research.

1.3 Thesis Intent and Orientation

The intent of this thesis is to distil these seemingly unique methodologies into a manageable framework containing the "active ingredients" common to the members of the original set. Some discernible targeted results are language clarity, process transparency and facilitated benchmarking amongst the methodologies. The aim is to establish a basis whereby the business community can reset the clock; focusing on the core competencies of the BPI consulting sector, and improving the value proposition to this sector's clients. The intent is to capture and safeguard the essence of the BPI methodologies rather than to create a new superior methodology or to lay the groundwork for a new super BPI expert. This safeguarding is essential for those methodologies such as Total Quality Management, Lean Management and Six Sigma that are not intellectual property, are subject to profit-driven mutation and whose value-adding cores could be compromised.

Perceiving and then treating each of the BPI methodologies as if it were a study is important to this thesis's research. This mindset not only opens the doors to the usage of academic approaches but also gives the academic reader an anchor within his comfort zone. These methodologies do not need to be, and are often not, independent from one another. Just as with any study, they feed off one another, branch off and may even fall out of favour. What is important is that they have a degree of uniqueness, comprise a set of constructs and

components which lead to a discernible conclusion and embody a holistic mindset in dealing with the overriding business process improvement theme.

1.4 Research Goals and Objectives

1.4.1 Research Aim

As with any doctoral dissertation, this DBA thesis was focused on contributing to knowledge – particularly to that in the business community. The aim of this dissertation was aligned with “the primary goal of a DBA ... to advance professional practice” (University of Liverpool, 2013:1). The practice in question is implementing change - that of optimizing business processes within the constraints of the individual business, its industry and its business environment. The contribution being made is the improved understanding of BPI methodologies and role in enhancing business performance. The author’s intent was to

1. discover the mutual composition amongst methodologies, thereby attempt to
2. clarify and describe the joint functional constructs of those methodologies and
3. endeavour to demystify the BPI processes’ efficiency and effectiveness.

This intent targets a contribution to knowledge and literature dealing with change management and implementation. This focus appears to be consistent with the opinion voiced by Argyris in 2000 about research in the academic literature. He states that “most research on implementation is quite weak” (2000:ix). This statement appears to be supported by the results of the literature reviews performed as part of this research. Very little evidence was gleaned from articles and journals. Therefore, the mainstay of the evidence came from books and interviews. As sources, books were habitually problematic. The view that, “The various BPI books on the market remind me of getting a favourite recipe from a restaurant, but with some key ingredient missing.” (Page, 2010:6) endorses the need to perform interviews.

It was felt that the research’s contributions to the business community’s body of knowledge will enable more transparent value propositions of the BPI methodologies and thereby enhance management’s evaluation capabilities. Improvements in the BPI process’s

efficiency and effectiveness are also targeted. In monetary terms, such improvement could be very significant. According to Moldvay (2011) management consulting revenues should reach \$203.6 billion in 2016 and correspondingly, Poór, Milovecz and Király (2012) estimate that business (operation) consulting is 52% of the management consulting activities with 34% of that being process improvement. These estimates would then value BPI at about \$36 billion annually. If, according to Argyris (2000), most advice offered to business managers is flawed, the targeted subject of improving the BPI process's efficiency and effectiveness could carry a value in excess of \$18 billion annually. Although the impact attributable to the enablement of a more transparent value proposition and enhancing management's evaluation capabilities cannot be estimated, the author feels that the contribution of creating a more informed buying environment could be very significant.

As will be detailed later when dealing with the literature review, six current business process improvement (BPI) methodologies were identified and studied. These six BPI methodologies were examined along with their methods and tools. The thesis's primary goal was to determine to what extent those six methodologies exhibit common key factors at the component or construct level - in layman's terms, the common active ingredients. Its secondary goal was to describe the apparent added value of these factors in terms of their efficacy in bringing about those sustainable improvements. As a sequel to this goal, the tertiary aim of the thesis was to describe the apparent impacts of those factors as a system within the context of a modelled methodology. Consideration was given to the possible deletion or perfunctory/superficial application of these common factors.

1.4.2 Research Objectives

Compliant to the research aims and the three thesis goals, the following research objectives were generated;

1. Identify the core and fundamental BPI methodologies out of the overall population of BPI approaches, methods, tools and techniques.

2. Establish the salient key factors (constructs and/or components) common to sustainable business process improvement methodologies.
3. Describe the fundamental deliverables for each common key component and construct.
4. Characterize the apparent impact and importance of these common key factors within the context of a modelled BPI methodology.

Identifying fundamental BPI methodologies out of a population that also contained methods, tools, techniques, secondary BPI approaches and hybrids of these was both an enabler and a contributor. It enabled the research to focus on a limited number of methodologies. It also enabled the research to proceed toward finding the common key factors and ultimately to discover their importance. Delineating those methodologies from the overall population also contributed to knowledge and practice. It provides a more in-depth understanding of BPI methodologies as well as a means of evaluating these against elements such as methods and techniques that are mislabelled as methodologies. A contribution to knowledge is also made by highlighting the need for a methodology to have a total process scope and holistic approach business process improvement.

Attainment of the second research objective contributes to knowledge, literature and business practices dealing with implementing change. Identifying the common key factors augments the existing literature by describing BPI methodologies in terms of their core components. Furthermore, by focusing on the commonality amongst the methodologies rather than their uniqueness, a clearer insight into the product offering is afforded. In turn, this provides the business community with a clearer value proposition. Identifying the key factors also inhibits exclusion of those components and constructs from literature dealing with business process improvement methodologies. The business corollary to this is that exclusion of those key factors from improvement initiatives would be inhibited as well as inappropriate applications.

Documenting the significance of each key component and construct augments the existing literature by going beyond the apparent impacts by describing the core efficacy elements. A contribution to knowledge is also made by documenting these for all key factors instead of a selected few. The combined impact on business practices should be a paradigm shift in the business community away from the apparent importance in favour of the root-cause justification for these key components and constructs. In addition, since the full spectrum of common key factors is identified and the importance of each factor is documented, exclusion from literature and practice will be further inhibited.

Realizing the fourth research objective (characterizing the apparent impact and importance of the common key factors as a system) functions as both an enabler and contributor. Viewing the key factors as components in a system, their synergistic and interfacing effects are considered as well as their individual importance. This treatment enables the documentation to be judged on its content validity. That is, do the common factors cover the entire spectrum required of a BPI methodology? Additionally, will the modelled BPI methodology fulfil the requirements of a BPI initiative? The viewpoint and treatment associated with the fourth research objective contributes to the knowledge and literature pertaining to implementing a BPI initiative. It adds a perspective and understanding not previously found in the BPI literature. Additionally, it links certain aspects of industrial psychology with the construction of BPI methodologies.

1.4.3 Research Questions

The first three research objectives gave rise to three research questions. Since each of those research objectives requires identification or determination of an entity (methodologies, key factors or efficacy drivers), the respective research question concerns itself with what the content of that entity is. Likewise, an associated question arises as to how that content is to be identified. Therefore, each of the three research questions has both content and procedural components. The three research questions to be answered are therefore;

1. What are the core and fundamental BPI methodologies and how might they be identified out of a population which also contains methods, tools and techniques?
2. What are the key factors within those unique methodologies and how may they be identified, analysed and synthesized for commonality?
3. What are the efficacies of the resulting common key factors and how might those factors be analysed and described in terms of their efficacy or added value to the implementation of a BPI methodology?

Regarding each of the research questions, solving the procedural component enables resolution of the content component. Attainment of the respective research objectives are direct consequences of resolving those content components. Therefore, because of these interdependencies, solving the procedural components is essential to both answering the research questions and attaining the research objectives.

Each of the three research questions requires a problem-solving exercise. The first mandates going beyond establishing and applying a set of objective inclusion/exclusion criteria. It requires subjective evaluations based on those criteria as well as the element's objective, scope and hierarchical positioning. In order to answer the second question, a technique had to be found that would allow comparison of seemingly unique terms, statements, elements and concepts. The third question necessitates a means of delineating the apparent impacts from the root efficacies. It also requires evaluating the importance of the common key factors both individually and as a system.

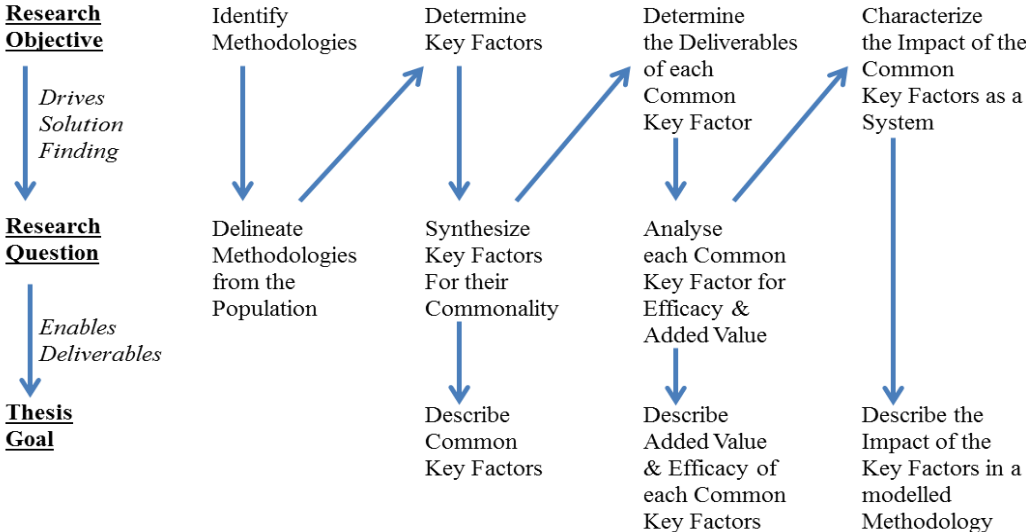
As detailed later, a non-experimental research approach was taken to answer these three questions. The reader should recognize that a single BPI initiative typically requires a minimum of two to three years to complete (Thomas, 1990). This estimate does not include time for longitudinal studies of long-term impacts. Additionally, depending on the size and geographical considerations of the firm executing the initiative, the costs can, from the author's experience, be in excess of \$5 million. As an extreme example, the author

participated in a three-year, international BPI initiative which was contracted for \$58.65 million. Given the temporal and cost considerations of experimenting with each of the six methodologies and the requirement of using multiple replications, a research approach based on analysing and synthesizing existing data about actual applications was selected. This descriptive research approach combines information about the methodologies’ designs and claims found in the literature with the real-life results from BPI initiatives gained by interviewing practitioners. Details regarding each of these components as well as the process of collecting, evaluating and synthesizing the data are presented in the respective chapters which follow.

1.4.4 Research: Conceptual Framework

The thesis’s conceptual framework is defined by the scope of its three thesis goals, the four research objectives and the three research questions. Figure 1.4.4-1 below is a schematic representation of that framework. It depicts how the research objectives drive resolution of the respective research questions. It also illustrates how resolution of the research questions enable realization of the thesis goals and how that resolution leads into the next research objective.

Figure 1.4.4-1 Conceptual Framework



1.4.5 Research and Thesis Structure

Figure 1.4.4-1 provides only a high-level overview of the research process. The research structure followed a more detailed process. This process commenced with an initial study to determine the project scope. This study involved both a preliminary literature review and input from a group discussion. The initial study was followed by a more detailed and focused literature review aimed at estimating the extent to which the thesis goals and research objectives were open issues. Designated as the “Gap Analysis”, this process step also provided preliminary evidence for the subsequent step - a literature review to determine the current sustainable BPI methodologies and their compositions. This third literature review showed that the population of BPI methodologies also contained methods, tools and techniques as well as hybrids of these. Each of these population elements were labelled as methodologies. The situation mandated a process step involving finding a way to delineate methodologies from the other population elements and then to determine the current sustainable BPI methodologies from that subset. Once those methodologies were ascertained, the third literature review proceeded further with the objective of identifying their compositions. Toward this aim, the literature review provided insufficient evidence to proceed with an analysis for common constructs and components. A set of interviews with BPI experts was required to clarify the existing evidence and to fill in the voids. The resulting set of data was rich in unique terminologies, structures and perspectives. Therefore, an ancillary literature review was required in order to find a method to synthesize and compress this heterogeneous set of data into information regarding the common key factors amongst the methodologies.

The research process structure’s second phase was focused on the importance of the common key factors ascertained in the previous phase. Again, the literature review failed to provide sufficient evidence and therefore a second set of interviews were mandated. Due to the nature of the evidence required, human resource experts and an industrial psychologist

were also included as respondents. The amassed information was used to describe the efficacy of the common key factors independently and also to characterize them as components of an overall system - a modelled BPI methodology.

The thesis structure differs significantly from the research structure. Unlike the research, it is not process-based and does not follow a temporal sequence. The thesis has a reporting structure focused on providing the reader with an introductory overview followed by details of the research approach, issues and findings. The final chapters in this reporting structure involve drawing conclusions from those research findings and discussing cycles of learning captured during the research and thesis writing phases. Since a reporting structure does not necessarily follow the timeline of events, the reader may encounter both previews and flashbacks. This means that issues or conditions could be mentioned in chapters preceding those where they are discussed or justified in detail. This also means that activities and findings could be discussed, in detail, in chapters preceding the considerations of their temporal counterparts. One example of this is that the literature reviews, although being an integral part of the research findings and having been performed over multiple phases of the research, is reported in a dedicated chapter preceding that of the research findings in general.

1.4.6 Summary

This thesis, being part of a DBA award, is targeted at the business practices and is subject to the approval of the academic community. As a result, readers from both populations were considered with respect to issues such as the design, focus and content of the research as well as the thesis. The aim was to enlighten both sets of readers as to what a BPI methodology is in terms of composition and characterize how key elements contribute to the effectiveness of a BPI initiative. This enlightenment could not be realized without creating a holistic perspective of process improvement practices with justification at the constituent level.

The research's conceptual framework is comprised of 10 elements - four research objectives, three research questions and three overall thesis goals. The research objectives

drive resolution of the research questions. Resolution of those questions and attainment of the respective objectives enable achievement of the respective thesis goals.

Structure of the research and that of the thesis differ significantly. The former is process-based while the latter has a reporting structure. The research followed a multi-step process having two phases - one focused on the methodologies and their composition and the other dealing with efficacies of the common key factors. The thesis's reporting structure has introductory, research scheme, research findings, conclusions and discussions subdivisions.

1.5 Descriptive versus Explanatory Research

During the research, it was imperative to recognize the difference between descriptive research into what makes up a BPI methodology and explanatory research into what makes the implementation of that methodology successful. This thesis focuses solely on identifying and describing the common key factors within the methodologies and characterizing their importance. It does not attempt to explain the application parameters that might enable or possibly assure successful implementation. During the literature reviews, the author found that a myriad of texts have been written about these latter parameters. The apparent popularity of explanatory research into the field of business process improvement may be the reason why the author found so little evidence amongst journals and articles to support his descriptive research. This perceived priority for explanatory research over descriptive research appeared to be less pronounced in books and lengthy manuscripts. Jestin and Nelis (2008) attempted to highlight some of the key parameters associated with implementing Business Process Management (BPM) but stated that these were simply part of an exhaustive list. From their viewpoint, successful implementation required sound project management, organizational management, people change management, communication structure, leadership skills, controlling and measurement systems as well as appropriate use of technology and information technology (IT) systems. Each of these, by itself, could have a dimension suitable for a thesis or even a book.

CHAPTER 2: RESEARCH APPROACH AND METHODS

2.1 Introduction

This research is not like those studies that are based on the findings of previous research discoveries. To the author's knowledge, there were no such previous works. In fact, the systematic literature review's first stage (Gap Analysis) focused precisely on determining if such previous studies existed. This research is also in contrast to principles of grounded theory. In particular, the author had both an appreciation for the character of the research topic and a vision of what the outcome might be.

The author, as a BPI professional with over 24 years' experience in BPI consulting, enjoyed significant insight into the subject matter of the research as well as the probable requirements and limitations afforded by the research itself. Therefore, it came as no great surprise that experimental research would be time and cost prohibitive or that the literature reviews would yield only a limited amount of relevant information. It was also well understood that the descriptive research would rely on qualitative evidence derived mainly from interviewing and personal conversations.

The research was designed to initially treat each methodology as a distinct BPI methodology while analysing their compositions and then to group them as a set when determining commonalities. Each of these common factors was then scrutinized individually to determine the underlying drivers for efficacy and value adding in terms of bringing about sustainable change.

2.2 Research Challenges and Opportunities

Examining the challenges, opportunities and limitations imposed on the research is analogous to performing a Strength-Weakness-Opportunity-Threat (SWOT) analysis in business. Both enable a better understanding of the "environmental" conditions and issues that impact the subsequent strategy and tactics development. In research, these conditions include

the backdrop of philosophies, ontological issues and epistemological considerations found in the field of study. Discussing these challenges and opportunities prior to presenting the research approach and research findings also provides the reader with contextual factors and rationale for certain decisions, orientations and sub processes utilized during the research. Two examples of this are the author's decision to segregate interviews regarding efficacy of the key factors from those dealing with methodology composition and to augment the former interview set with respondents outside the BPI community. For the stated reasons, key issues and considerations are presented here prior to discussing the research strategy and research design.

The insight afforded the author by his extensive BPI experience and his access to non-published works regarding process improvement provided an exceptionally strong basis for the research strategy and design. Nevertheless, during the research, the author encountered numerous hurdles and conditions which had to be overcome. Surmounting these issues contributed to an emerging research strategy and design. Some of these also provided a chance to gain a different perspective or to realize a paradigm shift. Although examining these issues is somewhat reflective in nature, the author does not feel that they belong at the end of the thesis in the discussions chapter. The reason for presenting them upfront along with the foreseen challenges and opportunities is that, collectively, they set the stage on which the research is performed. Both the anticipated and unexpected issues are proffered here so as to afford the reader insight into the context and conditions encountered during the research. An example of this is the relatively few articles and papers dealing with descriptive research into business process improvement methodologies.

2.2.1 Hidden Driving Forces

Radnor (2010) stated that the task of synthesizing literature is a very complex and lengthy task. During the research interviews, it was found that these attributes also apply equally well to evidence regarding BPI methodologies in the non-written form. The driver for

writing, giving conferences, talks and promoting methodologies as well as simply discussing attributes of a methodology seems to be far from an altruistic one – nearly everyone appears to be selling something. Research showed that this type of driver has not only given rise to bias, but also poor use of logic and drawing unjustified conclusions. Evidence in this regard will be presented later. Another, even more difficult problem area was that the information showed a lack of consistency in the use of terminology. This situation was exacerbated by the BPI practitioners and the academic communities frequently not explicitly stating definitions for key words and their habitual failure to adhere to those that were documented. This subjective orientation and lack of clarity or precision may be one of the reasons that no one had previously tried to examine these methodologies for commonalities. That is, the possibility of commonalities existing may not have been apparent or the task of analysing for those commonalities may have been viewed as too difficult.

2.2.2 Nomenclature and Terminology

A word of caution is warranted regarding terminology that bridges across business and academia. Both communities utilize certain words quite differently. Their frequent use often gives rise to distinctly different connotations. This situation is analogous to the gap between American and British English. An extremely trivial example is the common business usage of the word “leverage” as a verb instead of solely as a noun. On the other end of the spectrum, a critical example is the use of the word “paradigm”. As with terms such as baseline, drivers, key performance indicators (KPIs) or entitlement, the word paradigm is an integral part of the terminology used in the world of BPI methodologies. As often seen in academic literature and heard in academic discussions, it appears that the word paradigm is strongly associated with ontological positioning. Oddly, Thomas Kuhn, who introduced the concept of paradigms, reportedly used the term in 21 different ways (Guba, 1990). In business, there appears to be a common application of the word paradigm to mean the mindset or model on which evaluation or judgement is based. This association may or may not be directly attributable to an

ontological position on the continuum between positivism and constructivism. It could have, amongst others, been derived from work experience or driven by business culture and politics. Therefore, caution is warranted when reading quotes and text while having preconceived connotations – especially when key words might be used in business and academia differently. It is beyond the scope of this text to recognize or enumerate all of the disparities in terminology which might give rise to such misunderstanding. It is important however, to acknowledge that they exist and to question, when confusion occurs, the root cause. The reader is asked to bear in mind that this is, as a DBA thesis, addressing business issues as well as those from academia.

2.2.2.1 Clear and Disciplined Usage

The author feels that defined nomenclatures as well as comprehensible and disciplined use of terminology are required in this thesis for reasons of clarity and understanding. The first issue to be dealt with in this context is that both the academic community and the consulting arm of the business community appear to use the terms “methodology” and “method” unremittingly. They also do so without much discipline. They appear to avoid the hierarchical structure of methodologies, constructs, methods, techniques and tools - choosing instead to use the terms somewhat interchangeably. Griesberger, Leist and Zellner’s statement that, “In literature the terms method, technique and tool are often used inconsistently or synonymously, even though they have different meanings.”(2011:4) supports this view. One example of this lack of discipline is Sokovic, Pavletic and Pipan’s (2010) treatment of four improvement “methodologies”. Other authors (e.g. Moen & Norman, 2009 and Radnor, 2010) regard these same elements as methods or techniques. In this thesis, the hierarchical structure amongst the constructs will be observed and the term methodology will refer to a system of methods that is composed of a set of concepts, constructs, tools and techniques. A methodology has to be based on a BPI philosophy that can be applied to all business processes. For clarity, a definition is provided in the glossary of key terms (Appendix 2) to

establish not only the meaning of methodology as used in this text, but also to indicate the delineation between it and its components. In addition, for clarity and contrast, Noorderhaven's (2004) definition of research methodology and research methods is also included in the glossary.

2.2.2.2 Restricted Use of the Term “Methodology”

A second concern arises in that this thesis and its underlying research employ an academic research methodology and research methods that will be stated and justified later. In discussing these, a complication arises in that the subject of this thesis is a set of methodologies – BPI methodologies to be precise. So as to avoid the confusing situation of describing the academic or research methodology utilized to examine the BPI methodologies, throughout the remainder of this thesis the term “methodology” will be used strictly in reference to a BPI methodology. This convention is necessary to provide overall clarity and continuity in terminology. This practice was also logical since the entire thesis is about BPI methodologies and methods while only a portion of it deals with research methods and methodologies. Whenever appropriate, the abbreviation “BPI” will be applied for the sake of clarity and to minimize the amount of reflecting required of the academic reader on this convention. In addition, the research methodology will be detailed in terms of its approach and its two components, ontological and epistemological assumptions (Noorderhaven, 2004). As such, it will be labelled as the “research approach”. Likewise, discussion of the research method will be done in terms of the particular strategy for collecting and analysing data which is in keeping with Noorderhaven's (2004) definition of the term.

2.2.2.3 Scope of the Term “Practitioner”

A third convention which requires elucidation is the use of the term “practitioner”. Since a BPI methodology is an approach used by business experts to improve a business's processes, all of these experts are practitioners. Therefore, the term will be used to encompass

consultants, business managers and those who actively apply a methodology. This convention is in contrast to usage often found during the literature review where the term appeared to denote just business people as opposed to academics or advisors/consultants. The disciplined usage of the term practitioner plays an important role during the research design concerning interview respondents.

2.2.2.4 Action Research Convention

Another issue requiring explanation deals with the view taken in this thesis regarding action research. In general, action research is carried out to identify areas of concern, develop possible solutions, test alternatives and experiment with new approaches (Kumar, 2005). However, action research seems to follow two traditions (Kumar, 2005). The British tradition tends to view action research as a means of improvement and advancement of practice (Carr & Kemmins, 1986), whereas in the American tradition it is aimed at systematic collection of data that provides the basis for change (Bogdan & Biklem, 1992). The tradition followed here will be that of the American tradition. The subject matter of the thesis was the deciding factor in making this choice. The thesis deals with BPI methodologies aimed at improving business performance. These methodologies are about change. Some of the methods used in those methodologies are very similar to the basic process followed by the American tradition of action research. Therefore, it was felt that following that tradition would present a clearer and more concise alignment in the thesis.

2.2.3 Dealing with Researcher Bias

Researcher bias posed the single largest challenge in the research. Most authors dealing with the subject of bias in qualitative research appeared to advocate the use of reflexivity and, in particular, the bracketing technique. Furthermore, they seemed to associate the usage of these tools only with the interviewing method. In this thesis, it was felt that the subject of researcher bias was a theme to be dealt with throughout the entire research process.

It was believed to be equally important to consider this bias during the literature review and the synthesis phases as it was in the interviewing ones. Granted, it could be argued that researcher bias might carry somewhat higher impact during the interviewing since it could influence the interviewees' responses and thereby the foundation upon which the research findings are based. However, it was felt that a biased filter during the literature review and a biased evaluation during the synthesis were also significant issues. For that reason, the issue of researcher bias was addressed at the onset of the research and was considered routinely throughout.

Holloway and Wheeler (2002) pointed out that researchers must reflect on their beliefs, feelings, views and experiences throughout the research phase in order to deal with their biases. The difficulty in recognizing one's own paradigms and evaluating their impact on the research is a key problem in implementing reflexivity. Holloway and Wheeler (2002) justified this effort based on a yield of credibility from the reader, assistance in monitoring/correcting the in-process research and added value in data analysis. Other authors focused on tools and techniques of implementing reflexivity. Parahoo (2006:68) defined reflexivity's bracketing tool as "the suspension of the researchers' preconceptions, prejudices and beliefs so that they do not interfere with or influence [the] description of the respondent's experience". Burns and Grove (2003) view bracketing as a way for researchers to break free from what they know about the subject being researched. Streubert and Carpenter (1999) added that bracketing involves not passing judgment on that which the researcher senses or experiences and thereby remaining open to all data and information being acquired. All of these authors appear to set very high expectations for both reflexivity and, in particular, the bracketing tool. Although full attainment of these goals was not felt to be practical, bracketing was viewed as an appropriate countermeasure to manage and suppress researcher bias. Therefore, bracketing was applied at the beginning of the literature review and maintained throughout the research processes and the thesis writing.

2.2.3.1 Employing the Bracketing Tool

Insight into how to use the bracketing tool was primarily obtained from three sources. Brink and Wood (1998) stated that bracketing requires the researchers to document everything they know or have experienced pertaining to the subject matter being researched. This requirement posed a dilemma for the author. Although this advice may be practical for PhD researchers carrying out third-party research, the author feels that its applicability to DBA researchers may be limited. The latter, almost by definition, research in areas pertaining to their business life or professional interests. The author himself provides a good example of the limitations being confronted. The author's nearly 45 years of business experience include 11 years in process engineering, 33 years of project management, 32 years in top management and 24 years in business process improvement. Therefore, attempting to document everything known or experienced which pertains to business process improvement would be extremely difficult. Advice that appeared more appropriate for DBA researchers was given by Ahern (1999). Ahern advocates minimizing the influence of researcher bias by identifying the potential sources and causes of that bias. Once this task is accomplished, the researcher can then bracket those sources and causes so as to suppress bias. Chrzanowska (2011) on Genesis Consulting's QualitativeMind website provided a detailed and practical process for realizing this concept. That process was used to generate Table 2.2.3.1-1 below.

Table 2.2.3.1-1 Data for Bracketing – Dealing with Researcher Bias

- I. Biographic data:
 - 1. Male, 64 years old, white-American
 - 2. Philosophy of life: self-reliant, survivalist, practical
 - 3. Political orientation: independent that identifies with US Republicans & German FDP
 - 4. Motivational beliefs: people are motivated according to a hierarchy of drivers
 - 5. Four keyword indicators: US Marine, daring, easily bored, non-chauvinistic

- II. Possible characteristic-based and experience-based sources of bias:
 - 1. Looking for the common threads and abnormalities,
 - 2. Assuming people are not ignorant but maximize their payback,
 - 3. Searching for the root causes and hidden drivers,
 - 4. Avoiding overly repetitive or mechanistic activities,
 - 5. Striving for high first pass yield and sustainability

6. Trained process engineer with 11 years' experience,
7. 33 years of project management experience,
8. 32 years of top management experience,
9. 24 years of business process improvement experience.

III. Possible countermeasures to suppress biases:

1. Listen instead of talking,
2. Avoid analysing or evaluating data during data acquisition activities
3. Asking questions instead of being descriptive,
4. Don't try to help people you are observing - let them answer the questions,
5. Allow differences – don't try to close the gap,
6. Prioritize effectiveness over efficiency,
7. Avoid inducing respondent bias (via researcher age, skills and experience)
8. Showing tolerance for lack of discipline, skills, experience, judgment and approach.

IV. Possible countermeasure-induced bias considerations:

1. Inadequate research; not going far enough in questioning, interviewing or analysis - assuming that differences are real - failing to translate and find commonalities.
2. Inferior research results; overburdening with non-qualified input - failure to detect inadequate responses - prolonged synthesis requirements.
3. Misrepresentation of researcher's skills and experience; avoidance of discussions regarding skills and experience – understatement of skills and experience.

2.2.3.2 Enhancing the Bracketing Tool

It was felt that Chrzanowska's (2011) comment regarding the individual's characteristics (listed in the biographical data section of Table 2.2.3.1-1) being at the root of the most evident biases did not go far enough. They may, as Chrzanowska (2011:2) pointed out, "underlie the ethnocentric and egocentric tendencies", but the research here also involved value judgments about the sources and evidence. These judgments include aspects of credibility, validity and applicability. It could be argued that training, skills and experience could also play a role in how or to what end these judgments are carried out. Inexperience could, for example, create a filter or yardstick based on naivety, thus allowing poor or erroneous information to enter the system. On the other hand, excessive experience would likely create a filter or yardstick with a bias for that which is practical, proven, transparent, or within the comfort zone of the researcher's experience. For this reason, Chrzanowska's (2011) approach was expanded to include researcher experience in Table 2.2.3.1-1's data.

2.2.3.3 Reflecting on the Effectiveness of Bracketing

Although the reflexivity process and its bracketing tool may have failed to attain the ultimate theoretical goal set by Parahoo (1997) or Burns and Grove (2003) of setting aside researcher bias, this process and tool were found to be very useful in recognizing and managing this bias. The exercise involved in generating Table 2.2.3.1-1 increased the researcher's awareness of the sources, impacts and secondary ramifications of researcher bias. This activity also heightened the author's sensitivity to the potential for this bias and a necessity to repeatedly examine or critique judgments made during the research.

The practice of reflecting on the content of Table 2.2.3.1-1 and the overall topic of bias was made on both a temporal and milestone basis. As part of that practice, the work performed during a calendar month was reviewed before the beginning of the next month. Additionally, reflection over the work, progress, and process was made upon attainment of each milestone in the research process. The practice of reflecting on researcher bias and that from sources of evidence is credited with detecting author bias during the literature review and researcher bias during the interviewing phase. Both of these and the respective countermeasures are detailed later.

2.2.4 Challenge of Identifying the Methodologies

Studying the methodologies posed four distinct challenges. The first challenge is linked directly to the first research objective – identifying the methodologies to be analysed. This involved more than just delineating the methodologies from one another. In order to settle on the six current methodologies mentioned earlier, each had to be delineated from its near and distant cousins sharing the same BPI philosophy as well as from tools, methods and techniques labelled as methodologies. This challenge gave rise to the first research question - how might the core and fundamental BPI methodologies be identified out of a population which also contains methods, tools and techniques? Details of how this question was

answered and the, thereby the research objective attained are described in subsequent chapters.

2.2.4.1 Apparent Closeness and Overlapping

There were three important incidences of this delineation challenge which need to be detailed here. Each of these deals with methodology “candidates” having the same, or very similar, BPI philosophy. In the first case, Business Process Management (BPM) appeared very close to Business Process Re-engineering (BPR) in terms of concept and philosophy. This was confirmed by evidence in the BPM literature linking that approach to the BPR methodology (Justin & Nelis, 2008). Justin & Nelis explicitly stated that “BPM projects still have a stigma attached to them from the BPR days” (2008:109). Second, in some geographical regions and languages, Total Cycle Time (TCT) was referred to as Time-Based Management (TBM). The final example dealt with Lean Management often being referred to by the name of some of its methods and tools such as Kaizen or Just-In-Time (JIT) (Koch, 2011). Also, another pseudonym for Lean Management found during the research is Toyota Production System (TPS) which apparently arose after Toyota successfully championed Lean Management and made the methodology well known (Womack, Jones, & Roos, 1990). In each case, a call had to be made as to whether these were unique methodologies or enjoyed a parent and offspring relationship. This decision required a subjective appraisal as to how different the two methodologies were from one another and which methodology is more representative or comprehensive. The single largest problem came in dealing with Kaizen versus Lean Management. Kaizen is apparently a forerunner of Lean Management. Since Kaizen events and other methods currently make up Lean Management and none of these methods came from other methodologies, the title “Lean Management” was selected over Kaizen as the representative for that methodology. This decision also made sense since Kaizen, unlike Lean Management, is not a comprehensive methodology having a universally applicable BPI philosophy and because Lean Management is so renowned.

2.2.4.2 Hybridization of methodologies

A separate issue arose with methodologies being blended by practitioners in order to create a “new” methodology. One incident of this merger activity is practitioners enhancing TCT by embedding methods and tools from other methodologies (Koch, 2011) to create what they called Process Value Management (PVM). In another case, a consulting practitioner combined the Six Sigma methodology with that of Lean Management to create Lean Six Sigma (George, 2002). Based on these two examples, a selection rule was generated whereby only the parent methodology onto which another methodology or its tools and methods were grafted would be considered. This approach seemed appropriate since the objective of the research was to discover commonality amongst the methodologies and not the supreme combination or blend of methodologies.

2.2.5 Challenge of Identifying Components and Constructs

The second challenge when studying the methodologies involved identifying the components and constructs within each unique methodology. This endeavour was the first step leading toward the second research objective - establish the salient key factors (constructs and/or components) common to sustainable business process improvement methodologies. This second research objective further required equating the unique terminology used within each methodology to describe their respective components and constructs in order to distil out the common factors across the methodologies. One example of this use of unique terminology is that in BPR authors talk about “Case Teams”, in TCT they mention “Barrier Removal Teams” and Total Quality Management (TQM) practitioners uses the term “Quality Circles”. Although they vary significantly in name, all of these involve cross-functional teams tasked with improving business processes. A similar experience was made with each of the components and constructs discovered in the methodologies. The technique used to identify and then equate the key factors found amongst the methodologies answered the second research question - How may the key factors within these unique methodologies be analysed

and synthesized for commonality? This techniques as well as its selection process will be detailed in subsequent chapters. The author noted that the activity of breaking down each methodology into its components, while simultaneously identifying the tools, also highlighted how loosely some methodologies were defined.

2.2.6 Challenge of Structuring the Components and Constructs

The third challenge associated with studying the methodologies involved structuring the methodologies' components and constructs into the framework of a BPI initiative. Although this structuring was not necessary in the determination of commonality, it helped in understanding the usage and efficacy as well as judging the content validity of the common key factors found. The problem was that the literature, intellectual property (IP) owners, business practitioners and consulting practitioners were not consistent in which of the process phases they placed these factors. For instance, some sources placed the development of the team structures in the start-up phase, others had it in the deployment phase and yet others listed it in the implementation phase. A related problem was created when IP (Intellectual Property) owners or practitioners failed to list or mention the factor at all. This omission created a sparse matrix which had to be reconciled via additional research.

2.2.7 Challenge of Identifying Efficacies of Components and Constructs

The fourth, and perhaps most taxing challenge, was delineating between the apparent or superficial value-adding qualities of each common factor and its actual intrinsic efficacy driver(s). This delineation was necessitated by the third research objective - describe the fundamental deliverables for each key component and construct. This differentiation also provided the foundation for attaining the fourth research objective – characterize the apparent impact and the possible risk of non-sustainable results associated with null or superficial applications of these common key components and constructs within a modelled BPI methodology. The key to attaining both of these afore mentioned objectives was answering

the third research question - how might the resulting common key factors be analysed and described in terms of their efficacy and added value to the implementation of a BPI methodology? Details of how this question was resolved appear in the subsequent chapters.

In the process of analysing the common key factors for their intrinsic efficacy drivers, the author discovered that, as the respondent type changed from IP owner to consulting practitioner and finally to business practitioner, the apparent value-adding qualities were mentioned more and the fundamental efficacy drivers less. Consequently, little or no mention of these drivers was made by either of the practitioner types. In general, the focus of all BPI experts interviewed could be characterized as being on the value-adding qualities of the constructs and components within their respective methodology. Additionally, this evidence appeared to be highly subjective and possibly even biased. Regardless if the reason behind this lack of subjectivity was overly enthusiastic ownership of the methodology, maintaining a sales focus, avoiding detail insight or simply a lack of understanding at the efficacy level, the inability to glean sufficient insight about the efficacy drivers from these respondents led to the first of two opportunities.

2.2.7.1 Opportunity: Input External to the BPI Community

The first opportunity involved having to go outside the BPI community to discuss the efficacy of the common factors - both constructs and components. Focused interviews were made with both industrial psychology and human resource management experts. This opportunity afforded reflection on BPI methodologies from a totally different perspective. It also allowed these respondents to critique the researcher's views and question areas of possible misunderstanding or bias.

2.2.7.2 Opportunity: Input from Foreign-Language Sources

The second opportunity also arose as a result of the interview process. Eleven of the thirty respondents interviewed regarding the composition of the six methodologies were from

France, Germany, Japan or Switzerland. During these interviews, issues surfaced regarding process management maturity and the related topic of a methodology's appropriateness to certain types of businesses, industries or geographical regions. Although these issues lay essentially outside this thesis's scope, their existence and nature prompted literature reviews in French and German. These reviews were necessary in order to assure that the six original methodologies were sufficient to cover the entire field of BPI methodologies.

2.3 Strategy

The research strategy was to perform primary, qualitative research in the area of each methodology in a non-experimental manner. Experimental analysis would have required designing a set of multiple BPI initiatives for each of the six methodologies. From the author's experience and that of intellectual property owners such as Philip Thomas (1990), initiatives that deliver sustainable change require changing the business culture over a period of at least two or possibly three years. Also, as detailed earlier in the introduction, for the purpose of experimental analysis each of these BPI initiatives would also be cost prohibitive. Therefore, the use of action research or similar experiment-based research methods was judged inappropriate for this research. Alternatively, capturing qualitative evidence from the literature and practitioners (businessmen and consultants) regarding their BPI initiatives and experiences was considered more feasible. It was recognized, at the onset, that this approach would require a greater effort in synthesizing multiple inputs across each of the individual methodologies and that subjectivity or bias in the evidence would have to be carefully considered. Additionally, the author also acknowledged that there was a risk of voids in the evidence. This concession was a major reason for describing the impact of the common key factors in terms of a modelled, holistic BPI methodology. The author felt that this characterization of a methodology's composition would permit him, as a BPI practitioner, to evaluate the content validity. That is, to detect voids or gaps in the evidence used to define that methodology.

In part, the research design was shaped by an emerging research strategy. These design enhancements materialized as a result of examining each of the four research objectives using the following five step process;

1. Identify the phenomenon associated with the objective. For example, in the first objective, this was BPI methodologies.
2. Identify the key philosophical issues related to this phenomenon. Furthering the example from the previous step, the key issues dealt with the definition of the methodologies and the philosophy of each methodology.
3. Identify the main ontological considerations. Those considerations associated with the example of attaining the first objective focused on the nature of the available evidence. This evidence was a confusing blend of methodologies, methods, tools and techniques often proffered from a “selling” mode.
4. Identify the epistemological considerations (e.g. how can a contribution to knowledge concerning this phenomenon be made?). Pertaining to the BPI methodologies example, considerations had to be first made for delineation of the methodologies according to their respective philosophy as to how process improvements are driven. Subsequently, a disciplined application of inclusion and exclusion criteria had to be made.
5. Determine the research design requirements (e.g. the approach required to discover and synthesize evidence associated with the phenomenon). With respect to the first research objective example, sufficient evidence could be sourced from the literature (including grey and black literature). This evidence was then categorized according to the methodology’s philosophy and qualified using inclusion and exclusion criteria.

Examining the research objectives in this manner indicated the need for multiple sources of evidence as well as utilizing sources outside the BPI community.

From the onset, it was felt that the first research objective could be reached based on the literature reviews and personal experience. However, going beyond identifying the methodologies was an open issue. The need for primary research was envisioned, but became a necessity when voids in the literature became apparent. These voids posed barriers to attaining the second, third and fourth research objective that even the author's extensive BPI experience could not overcome. As a result, interviewing became part of the research strategy.

Examining the second research objective by the previously mentioned 5-step method yielded further research design requirements and an update of the research strategy regarding respondent selection. The objective's phenomenon being BPI methodology composition constrained the respondent selection to BPI experts – IP owners, consulting practitioners and business practitioners. Each of these three had their own philosophical and ontological issues. The IP owners could be viewed as promoters of their methodology and concerned with its philosophy, purpose and design. In contrast, it could be argued that the consultants are primarily involved in marketing applications of the methodology and the subsequent implementation of a BPI initiative. The business practitioner's concern for realizing sustainable results from usage of the methodology would likely differentiate this respondent type from the other two ontologically. The epistemological considerations associated with these ontological ones indicated that respondents should be selected from all three types of BPI experts. The research strategy and design were enhanced accordingly.

A similar examination of the third and fourth research objectives resulted in even further enhancements to the research strategy and design. These objectives share a common phenomenon – efficacy of the common key factors. The nature of this phenomenon, its subject matter and the philosophical issues related to it indicated that respondent selection pool was not limited to the BPI community. Driven by ontological and epistemological considerations, the research strategy was expanded to include evidence from human resource and industrial psychology experts.

2.3.1 Use of a Cross-Sectional Type Study

A cross-sectional type study was designed to examine the identified six methodologies and to capture their existing developmental status in terms of key constructs and components. Based on the author's experience, it was felt that gaining this information solely from the literature could lead to the introduction of bias and/or failure to perceive the complete picture. The author also felt that, in the literature, there was a tendency for presenting the methodologies using a "sales and marketing filter" and that there was insufficient information there regarding methodology composition analysis, actual BPI initiatives or results. It appeared that there were very few academic studies of the methodologies and that the mainstay of the available literature stemmed from the consulting industry. Because of these limitations and conditions, interviews of practitioners and intellectual property owners were also performed. The strategy was to gain a broader information base, a more rounded perspective and to incorporate actual, practical experience into the database.

2.3.2 Dealing with Qualitative Research

In 2007, Davies made a number of descriptive statements which apply to the research's purpose and, ultimately, to his research design. Davies pointed out that qualitative research explores attitudes, behaviour and experiences in a dynamic and interactive manner. He further stated that "qualitative research involves an interpretive, naturalistic approach to the world" (Davies, 2007:10). Davies described qualitative research as one that "uses gathered data to create theoretical ideas, compared to experimental research that starts with a theoretical position and accumulates data in order to test its validity" (Davies, 2007:135). All three of these statements are appropriate ones for framing the overall intention of this research – to explore the construction of the methodologies in a dynamic and interactive manner. This intent required taking an applied approach to interpreting the acquired data. Ultimately, this work led to the characterization of a theoretically configured BPI methodology based on that information.

2.3.3 Application of Inductive Reasoning

The research design utilizes the philosophical construct of inductive reasoning. Deductive reasoning would have required that there be a rule such as, “BPI methodologies have certain common factors” before commencing the research. Had this rule existed, there might not have been a need for the research. Davies’s (2007:238) description of inductive reasoning being a style of research whereby the researcher employs a “doctrine of curiosity” to collect data relevant to a fixed subject and then, on the basis of its analysis, postulates theoretical conclusions fits very well to this research. Here, the composition of multiple BPI methodologies was used to determine the existence of the rule stated earlier.

It could be argued however, that an abductive research strategy instead of an inductive reasoning one could have been applied. The author felt that there are three aspects of abductive reasoning which would have hindered its use in the research design. First, even though on-going improvement of the data acquisition process could likely occur and the data analysis could run concurrently with that process, the feasibility of constructing positions that accurately reflects the empirical evidence while simultaneously conducting data acquisition and analysis is very low. Secondly, the sequence of content and then comparative analysis at the methodology case level followed by a higher order comparative analysis across all methodologies would block the abductive research strategy. Lastly, proving a statement such as, “Since BPI methodologies have these common factors and this methodology has those factors, then this approach is a BPI methodology” was not the objective of this research. Therefore, because of these three barriers, abductive reasoning was not considered.

2.3.4 Application of Radical Inquiry

Another aspect of this research’s design was that of radical enquiry – in particular, radical looking, radical reading and radical questioning. Radical looking in that exploration was made beyond the roots of the situation to the point of making the familiar strange (Clough & Nutbrown, 2010). Since non-ontological paradigms associated with the individual

methodologies had to be questioned and root-cause drivers had to be discovered, radical reading as a process which exposes the purposes of practices (Clough & Nutbrown, 2010) was necessary. Often, the methodology descriptions had to be stripped of their sales-driven shrouds and the hidden mechanisms made transparent. Those authors whose works were sales-driven tended to create unique selling points (USP) that concealed the underlying mechanisms. Finally, radical questioning was required to reveal gaps in knowledge and to understand why particular characteristics were necessitated (Clough & Nutbrown, 2010). This type of enquiry was vital to identifying the voids in evidence mentioned earlier in this chapter. Additionally, since BPI methodologies are marketed on their apparent qualities and the expected improvement results, radical questioning was required to break through this superficial layer or perception.

2.3.5 Acknowledging Ontological Considerations

The thesis goals as well as the three research questions and their associated four research objectives are aligned with the Constructivist's end of the philosophy spectrum. Although the qualitative research approach, procedures and analysis were excessively dependent on interpreting activities, the Interpretivist's position appears to be too extreme for this research. Ontologically, the research topic appears very much aligned with the verbiage used to describe that of a Constructivist. That is, "reality is independent of human thought, but meaning or knowledge is always a human construction" (Crotty, 1998:42). The research also seems aligned with aspects of the Critical Realist perspective in that analysis of underlying mechanisms and structures validate theories except for also having the Constructivists' position that realities exist as multiple mental constructions (Guba, 1990). Mechanistically, this qualitative research was aligned with some attributes of grounded theory. As in grounded theory, the opinions of key players (IP owners and practitioners of the methodology) were valuable sources of information. Moreover, the research followed a sequence quite analogous to that often found in grounded theory. That is, after data collection (literature review and

interviews), the key elements (constructs and components of the methodology) were identified. They were then grouped (according to the commonality with other key elements found in other methodologies). Finally, like in grounded theory, these groups were then turned into categories (key factors common amongst the BPI methodologies). However, unlike in grounded theory, these categories were not used to create a theory but rather to simply characterize a BPI methodology model. A detailed treatment of the epistemological assumptions and the ontological positioning is found in a later in this chapter.

2.3.6 Contextualization of Research Findings

The author found that it was important that the research not only provided the necessary building blocks for the thesis but also in a usable format and context. Only identifying the key constructs and components that are common to the BPI methodologies was not sufficient. The findings also had to be contextualized. Proffering a set of disjunctive elements was unacceptable. The common factors had to be defined and described in the context of a seamless process. Missing sub-processes had to be identified and explained. Accented or weighted ones had to be justified and placed in perspective. As a result, the findings were ultimately cast as a system in a modelled, holistic BPI methodology.

Terminology played a key role in the research. During instrument development and data acquisition, the use of methodology-specific terminology was required. During the analysis, reciprocal translation of terms and jargon had to be made. In finalizing the deliverables for the thesis, unique but related terminology and operational definitions had to be employed. There was a potential danger from using terminology found in one or more of the BPI methodologies. Their usage could have been interpreted as apparent bias or perceived as promoting/marketing a particular methodology. Therefore, as part of the deliverables development, neutral nomenclature was utilized.

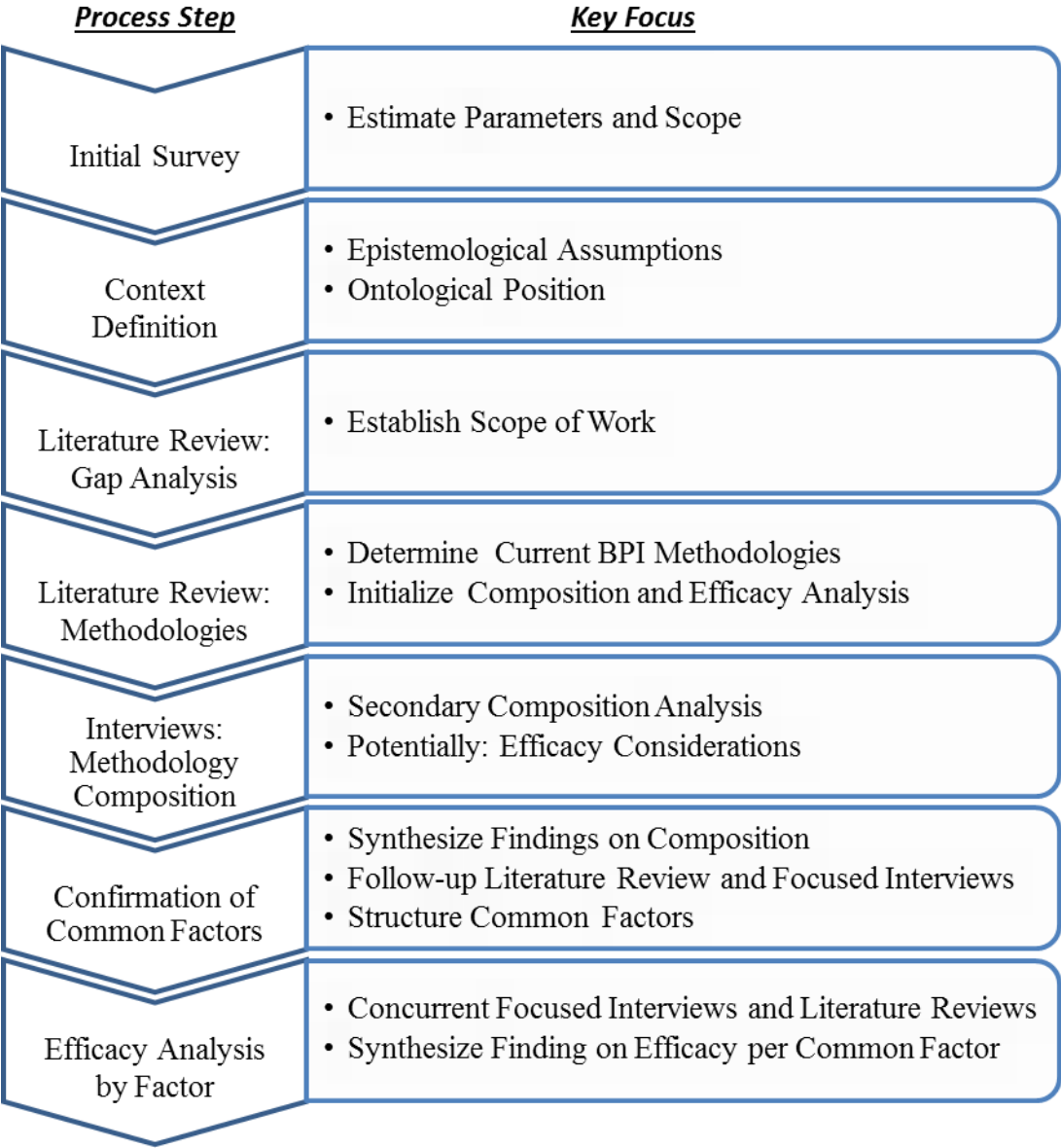
2.4 Research Methods and Process

In keeping with the interpretative approach according to Cohen, Manion and Morrison (2007), a small-scale, non-statistical research aimed at understanding process composition rather than causes or effects was performed. The focus was on practical interests in the methodology construction (constructs, components, meanings and definitions).

Notwithstanding an initial survey used to scope out the thesis project, the research involved two sets of literature reviews, two sets of interview sequences and synthesis of evidence from three different subject matters. In order to retain clarity and comprehend-ability, documentation of the tactics and research considerations will follow a process model.

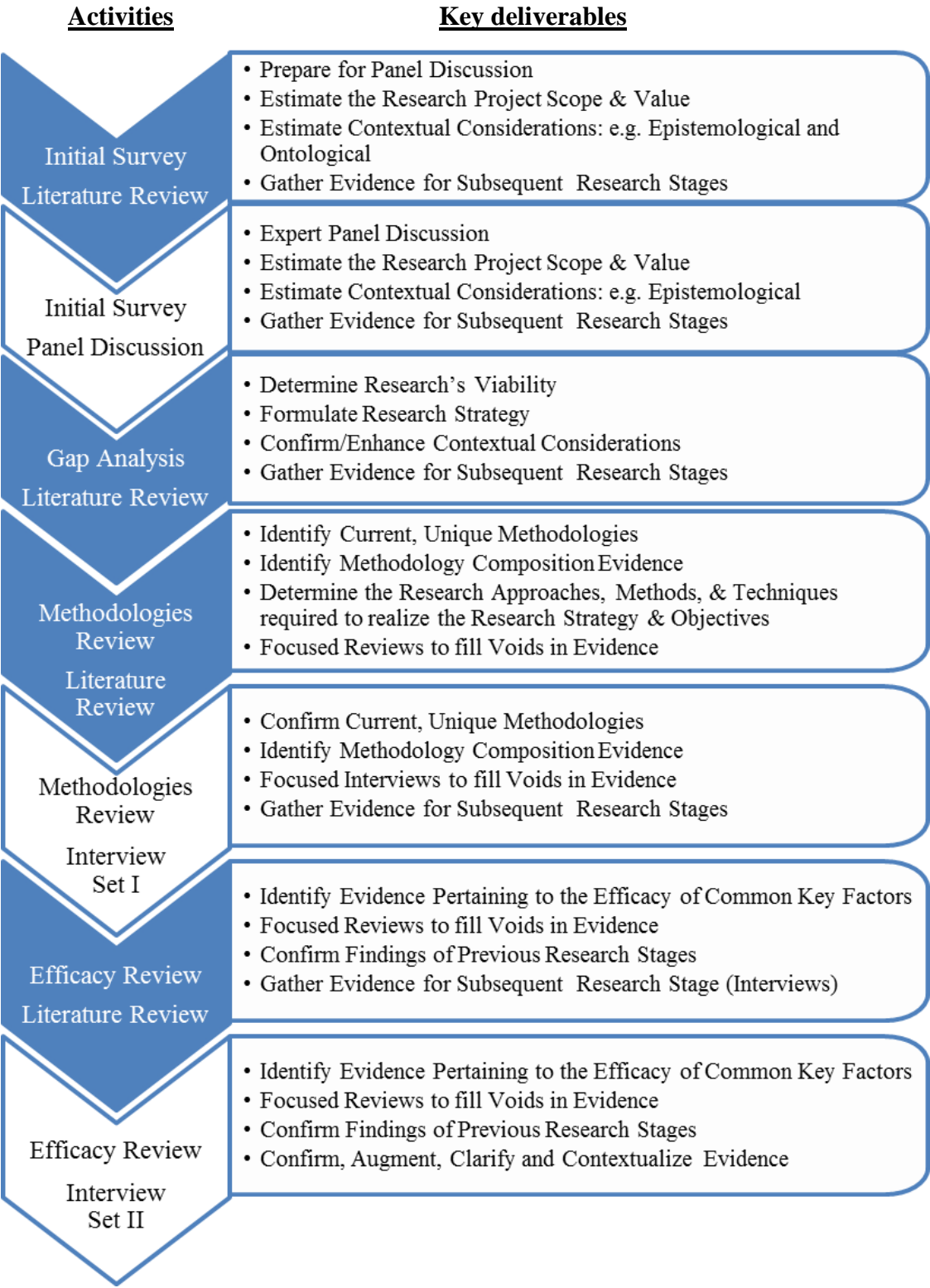
The research process entailed seven distinctive process steps as is depicted in Figure 2.4-1 shown below. In contrast to the more detailed evidence gathering sequence depicted in Figure 2.4-2, only one interview set (Interviews: Method Composition) is depicted in Figure 2.4-1. This is due to the overall importance of that interview set in relation to the entire research process. Each of these steps in Figure 2.4-1 had a key focus and key deliverables. Details of these parameters will be discussed in their respective sequence. Specifics regarding the results attained in each process step as well as the methods, tools and techniques utilized to secure their respective key deliverables are given in the next two chapters. Chapter 3 focuses on the literature reviews and Chapter 4 presents an overall view of the research findings. These chapters are structured in the same sequence as the process description here. This structure provides the reader with a one-to-one relationship between these process step descriptions and the respective findings.

Figure 2.4-1 Overview of the Research Process



As depicted in Figure 2.4-2, the evidence gathering sequence within the research process was a hybrid of literature review stages, panel discussion and interview sets. For the sake of clarity, those activities based on literature reviews are shaded. Comparing the sequence in Figure 2.4-2 against the process in Figure 2.4-1, the need for multiple evidence gathering activities per process step becomes apparent.

Figure 2.4-2 Overview of Evidence Gathering Sequence



2.4.1 Initial Survey

Step one, the initial survey, involved input from a literature survey as well as surveying a panel of BPI experts. The key focus was on the scope and utility of the subject of

this research. For the panel survey, an open invitation was posted on three BPI websites for a web-based meeting and discussion. BPI experts were encouraged to participate. They were given a synopsis of the thesis goals and research objectives. They were asked to reflect on these in terms of the scope and utility of the research prior to the meeting. They were also given a preliminary list of inclusion and exclusion criteria as well as possible keywords and “uniform resource locators” for web searches. From the panel, it was ascertained that, with all likelihood, the research objectives had not yet been answered and that the business community could benefit from a demystification of the BPI methodologies. The group also felt that the scope of this research was neither trivial nor outside the boundaries of a thesis.

2.4.2 Context and Assumptions

Once the scope and parameters were estimated in the initial survey, the next logical step in the research process was to describe the context and assumptions under which the research activities (literature reviews and interviewing) would be carried out. This step required reflecting on the thesis’s theoretical framework as well as on its conceptual framework. The underlying epistemological assumptions made about the targeted bodies of knowledge and the parameters dealing with the ontological standpoint from which the research was launched also had to be addressed. Finally, before the actual research and subsequent analysis could begin, the research’s approach had to be acknowledged. These three intermediate steps set the framework for identifying and synthesizing evidence.

A supplier, input, process, output, and customer (SIPOC) model was used as an aid in considering the context in which the research is placed. Suppliers would be selected from the population of authors, IP owners, business practitioners, and consulting practitioners. The input would be primarily published works, interview data, and “black” literature (works that are neither formally or informally published but rather closely held by firms or authors). The use of grey literature was considered to be limited. In terms of the overall research process, qualitative research employing an iterative application of literature reviews and interviews

was envisioned. The need to utilize both thematic and multi-tier comparative analysis was also considered. The output for this SIPOC model was characterized as the synthesized information sufficient to answer the research questions with content validity in terms of the research objectives. On the basis of this SIPOC model, reflection was made on the appropriate epistemological assumptions and ontological position. Detailed descriptions regarding these context factors and assumptions are detailed in later in this chapter.

2.4.3 Systematic Literature Reviews

The first set of main research activities involved systematic literature reviews (SLR). Establishment of the design rules for the systematic literature reviews was guided by Noblit and Hare's comments regarding literature reviews, as usually practiced, being of little value. These authors stated that, "The study-by-study presentation of questions, methods, limitations, findings and conclusions lacks some way to make sense of what the collection of studies is saying. As a result, literature reviews in practice are more rituals than substantive accomplishments." (Noblit and Hare, 1988:14-15). So as to enhance clarity and understanding of the objectives, the process of data acquisition, synthesis and concluding the results of the SLR activities was broken down into two stages according to the objective to be attained. The author believed that this separate treatment was more structured, less confusing and provided the value proposition sought by Noblit and Hare.

2.4.3.1 Gap Analysis

The first of the two systematic literature review stages is depicted in Figure 2.4-1 above as the third research process step. Its objective was to identify existing works that would terminate, accelerate or modify the research. The focus was on determining the scope of work yet to be done. The intent was to accomplish what Buckley, Buckley & Chiang (1976:19) listed as one of the five attributes of a research problem – that "the problem has been screened against the existing body of knowledge to assure its uniqueness." It was

imperative to determine, to a high degree of confidence, that the research questions had not already been answered or the research objectives superseded. The evidence obtained during this literature review was utilized in a gap analysis wherein the extent to which the thesis's goals had already been met by publicly available information was gauged. This gap analysis dealt with the status of existing works rather than with the research questions – thus leaving those questions unanswered. Subsequent to the gap analysis, those works that, while not having answered the research questions, could contribute toward that goal, were reviewed and synthesized. Lastly, this initial literature review also provided some insight into which methodologies may be current as well as an overview of their genealogy and limited understanding of their composition.

2.4.3.2 BPI Methodologies Reviews

In the fourth research process step, the second stage of the systematic literature review dealt with the BPI methodologies themselves. This SLR stage's objective was to identify the methodologies and review their respective descriptions. This was the first of the four research objectives. The focus was on which methodologies were unique, truly current and apparently sustainable. This focus relied on the ability to answer the first research question - How might the core and fundamental BPI methodologies be identified out of a population which also contains methods, tools and techniques? The solution to this question involved categorizing the candidates according to their BPI philosophy and applying inclusion/exclusion criteria. Details as to how this question was answered and how the first research objective was achieved are given in Chapter 3.4.2.

These identified methodologies were then the subject of further analysis. The identification of constructs and components that might be found common amongst all methodologies was an ancillary objective of the SLR's second stage. This goal required gaining an initial understanding of the targeted methodologies' structures and compositions as well as the value these components bring. Unfortunately, evidence regarding the utility of

these structures and compositions was found to be aimed at the value adding (to the businesses utilizing the methodology) aspects rather than at the underlying efficacy considerations. The final synthesis of composition findings was performed after the SLR and interview phases were completed. Therefore, the synthesis technique will be detailed later as part of Chapter 4, Section 4.5.

2.4.4 Interviewing

2.4.4.1 Process Design

The fifth step of the research process involved, subsequent to completing the SLR activities, acquisition of additional data through interviewing. It appears trivial to point out that these interviews were voluntary. The interactive interviewing approach was chosen over the passive questionnaire one due to the complexity of the BPI methodologies and the likelihood of respondents requiring clarifications of questions, terminologies or intent. One-on-one, semi-structured interviewing was employed as the research method. Selection of the semi-structured form was based on the requirements of asking the same questions, insuring coverage, staying focused, and not wasting the respondent's time. This selection necessitated the creation of instruments as well as a process for respondent selection.

The interviews were, subject to respondents' approval, done either in their office or in an appropriate, on-site conference room. The author felt that this non-threatening environment promoted candid responses while affording the respondent access to backup material, in-house resources and support staff. This venue also eliminated respondent travel and minimized disruption to their daily activities.

The manner and style of interviewing was as critical as the venue. A number of factors had to be considered while executing the interviews:

1. First, a maximum of 2 hours was established for the initial interview. A follow-up session was not anticipated, but could be requested by either party.

2. Since the respondent, aware of the questions and time requirements involved, agreed to the interview well in advance, mitigating business or personal circumstances could negatively impact the respondent's mood or stress level. The author's responsibility was to acknowledge this situation at the onset of the interview and postpone the interview if necessary. Such a postponement was not only a common courtesy to the respondent but also assurance that the quality of the evidence to be received was not degraded due to interruptions or time pressure.
3. The questioning style (tone, wording, etc.) could have had influence on both the rapport and the respondent's responses. Attempts were made to maintain a friendly, professional style which maximized the rapport. Additionally, "warm-up" topics were addressed first in the interview so as to establish a friendly and more informal atmosphere.
4. The author, being a BPI practitioner, could cause subjectivity to creep into the interview. In keeping with presenting a neutral position, openness to opposing interpretations, paradigms and patterns had to be upheld. Reflection on the bracketing data (Table 2.2.3.1-1) was made before each interview.
5. Note taking was done during the interview in order to capture appropriate quotes and to motivate the respondent to engage further and deeper in details.

After each interview, reflection on the interview and bracketing practices provided a means of optimizing both the interview schedule and the interview process.

The deliverables from this interview step were the enhanced understanding of the methodology's composition and some insight into the efficacy factors. Unfortunately, as in the previous process step, this insight was more at a value adding level rather than at the root efficacy one. In terms of time and effort, the interviewing phase was the most intensive one in the entire research process.

2.4.4.2 Sample Design

The research required gaining insight into each methodology to explain its composition and structure but not to identify success or failure criteria. This approach, in turn, required selecting those respondents with the highest understanding of the methodology. These individuals were the ones most likely to see the hidden drivers and nuances as well as the methodology's essential constructs and components. This requirement appeared to mandate IP owners and consulting practitioners as respondents. It was anticipated that the IP owners would promote their methodologies and elaborate on the methodology design or purpose. In contrast, consultants were expected to focus on application of the methodology and implementation issues. The author also felt that, together, these respondents might also bring in the similarities/contrasts to other methodologies - thus possibly tapping their black literature (documentation not made public by businesses or individuals) to some extent. Unfortunately, there was very little of this comparative analysis done during the interviewing. Since consultants were thought to live the methodology almost as much as the IP owners themselves, interviewing non-consultant practitioners from organizations where the methodology had been applied was required in order to get a more rounded and balanced view of that methodology. This classification of respondents included those working in the businesses as internal consultants. Collectively, these respondents were deemed business practitioners so as to delineate them from the external consultants. It was anticipated that the business practitioner's perspective would be that of realizing sustainable results from the methodology.

The target group's population was therefore comprised of IP owners, consultants applying the methodology and business experts who have or are utilizing the methodology to improve business performance. The latter two have been grouped together under the term "practitioners". A separate population exists for each methodology. From a practitioner's experience, there is virtually no inter-methodology overlap between populations for IP owners

but some for the practitioners. The interview schedules were designed to also explore the existence of these overlaps.

The size of the sample taken from these populations was guided by Kumar's (2005:165) view that, "In qualitative research the issue of sampling has little significance as the main aim of most qualitative inquiries is either to explore or describe the diversity in a situation, phenomenon or issue". Given that this thesis involved 1) exploration into the common factors within the methodologies, 2) describing the efficacy of these factors, 3) not seeking to make a generalized statement about a population (therefore no need for a random or representative sampling) and 4) no statistical demands being placed upon the research, the use of purposive respondent selection and small sample sizes per methodology were appropriate. The detection of bias and balancing off subjective views was the main concern in determining how small was small. Ultimately, five interviews for each one of the six methodologies identified in the SLR (making a total of thirty respondents) were judged sufficient to satisfy the research objectives. Potential respondents were approached until each quota was reached.

Given that the evidence sought dealt with the composition of methodologies and the importance of their key components, the population from which the 30 respondents were selected had to have BPI expertise. This population was made up of the three types of respondents – IP owners, consulting practitioners and business practitioners. As detailed in section 2.3, respondents from each of these types could be expected to have philosophical alignment with their respective methodology as well as ontological issues and epistemological considerations associated with their type. This appeared to mandate respondent selection from each of the three types. As described in section 2.3, the emerging strategy involved a quota sampling of one IP owner and four practitioners per methodology. Ultimately, the research design called for interviewing two practitioners from consulting and two practitioners from business.

For each methodology, the selection started with the IP owner and moved to the practitioners via a snowball (referral) technique. IP owners were identified from the literature and personal knowledge. Consulting practitioners were not only identified from the literature and personal knowledge but also from referrals by the IP owners. Business practitioners were located through client or reference lists of the methodology's IP owner and consultants as well as personal knowledge. Each potential respondent was approached under the guidelines of the request for interview (RFI) letter detailed later.

Selecting IP owners was complicated by some methodologies having single IP owners and others having distributed IP ownership. For methodologies having single IP owners, such as TCT and ToC, respondent selection was a given. However, for methodologies such as TQM and Lean Management that have multiple IP owners, guidelines for respondent selection had to be created. In these instances, consideration was given to those IP owners that provided the most comprehensive coverage, the best representation and the most current description of their methodology. The intent was to obtain evidence having the highest validity and broadest scope.

Selection issues also arose regarding the practitioner respondents. It was anticipated that some variation may occur between BPI initiatives from a given methodology. Although similar in application, the scope and business environment could impact the application of the methodology - in particular, the full use of all its constructs and components. This concern resulted in selecting different practitioner respondents from different BPI initiatives for each given methodology.

Interviewing 30 respondents from the population of BPI experts provided adequate evidence regarding methodology composition but not regarding the efficacy of the common key factors amongst those methodologies. The author concluded that interviewing even more respondents from that population would not close the gap in evidence nor would it promote the convergence of data. Therefore, subject matter expertise pertaining to the efficacy of the

key factors was also obtained from outside the field of BPI experts. To this end, experts in human resource management and industrial psychology were interviewed. Their input, coupled with that from the BPI experts, provided a balanced and more comprehensive coverage regarding the efficacy of the common key factors.

2.4.5 Determining the Common Factors

The next research activity, process step number six, focused on finalizing the common factors found in each of the subject methodologies – the second research objective. This task required first synthesizing, per methodology, the combined information gathered from the interviews and the literature review. Subsequent to that, they had to be a synthesis across all six methodologies. This two-tier synthesis required both interpretation and comparative analysis. In order to carry out these synthesis steps, the second research question had to be answered - How may the key factors within these unique methodologies be identified, analysed and synthesized for commonality? Gaps, conflicts and ambiguities in the evidence were resolved via focused literature reviews and follow-up interviews. Once the common factors were determined, they had to be characterized while avoiding terminology utilized in any of the six methodologies. Subsequent to that, they were placed in a project framework common to BPI initiatives. This last step permitted an assessment of the content validity regarding the synthesis of the common factors. This structuring answers the questions as to how well those factors would cover an entire initiative and if there are any clear voids. Specifics as to how this second research question was answered are found later in this chapter (Section 2.6). Information regarding achievement of the second research objective is given in the respective section of Chapter 4.

2.4.6 Efficacy Determination

The final research process step focused on determining the efficacy of each common factor – the third research objective. The author felt that it was imperative that this evaluation

be done at a root-cause level. Failure to do so could allow the introduction of superficial value-adding attributes. The evidence obtained from the literature reviews and the interviews appeared quite shallow as well as being focused at how these factors added value to the businesses employing the methodologies. It could be argued that the claims made in the literature and interviews were targeted more at selling the methodology than at explaining the efficacy of its components or constructs. Focused follow-up interviews with the practitioners proved to be non-value-added. Additionally, follow-up interviews with the IP owners provided some, but not enough, additional evidence regarding efficacy. Therefore, a series of three focused interviews with industrial psychologist and human resource experts as well as a focused literature review were required in order to resolve the efficacy questions. This iterative sequence of follow-up literature searches and interviews formed the mainstay in answering the third research question - How might the resulting common key factors be analysed and described in terms of their efficacy and added value to the implementation of a BPI methodology? Particulars about the resolution of this third research question are found later in this chapter (Section 2.6). Information regarding research findings and attainment of the third research objective is found in Chapter 4.

2.5 Development of Research Instruments

2.5.1 Interview Schedule

The primary research instrument was an interview schedule. A schedule was sent with the request to interview as a courtesy to the respondent and to ensure that the right person (one capable of answering the listed questions) would be interviewed. Because three different types of respondents were involved in the interviews, each of these received a tailored version of a generic schedule. The considerations taken into account when creating these three versions will be discussed in the next two sections. The appropriate schedule was followed during the semi-structured interviews so as to ensure that the interviews stayed on track and that the same questions were asked across all interviews of similar respondents. The

employed schedule and the interview technique were reviewed and updated as necessary after each interview.

2.5.1.1 Type of Questions

A combination of closed and open questions was asked. Since the objective was to determine the composition while avoiding leading questions, the use of closed questions was limited to questions leading into a new topic area. These were designed not to yield a simple closed response. The majority were open questions that;

1. Placed the respondent at ease and presented a relaxed atmosphere
2. Explored the non-documented nuances and workings of the methodology as well as those more recognizable
3. Promoted the raising of new issues, themes and topics by the respondents.
4. Motivated respondents to embrace the interview objectives and to continue going further – both temporally and in details.

The wording of the questions used in the interview schedule was difficult and went through multiple iterations. A concerted effort was made to avoid subjectivity, bias, emotive words, and leading questions as well as to tailor the wording according to the respective type of respondent. In contradiction to the advice offered by some authors dealing with research project design (Davies, 2007; Dawson, 2009; Kumar, 2005), the author viewed the appropriate and judicious use of jargon when developing the methodology-specific interview schedule and executing the interviews as an advantage. Not only was the wording tailored to the type of respondent being interviewed, but it was also synchronized with the jargon employed in their respective methodology. In the case of the IP owner, use of his methodology's jargon was thought to promote rapport, reduce the interview time requirements and avoid lengthy explanations or clarifications. The author believed that the owner would feel more comfortable when the interview was carried out in his own

“language”. Similar results and effects were expected when using appropriate jargon while interviewing practitioners. Additionally, the author felt that the prudent use of suitable terminology could provide feedback about the practitioner’s knowledge and view of the methodology. Insufficient knowledge reduced the interview’s effectiveness or wasted time getting to its objectives. Feedback on how the practitioner views the methodology and its constructs or components was extremely valuable. This feedback provided insight into areas where elements of the methodology were inadequate, had to be modified, or were very effective. This feedback from the practitioners seemed to counterbalance the effects of the IP owner’s bias for his own product.

2.5.1.2 Language and Timeframe Considerations

Failure to synchronize the jargon employed in the interview with that of the respondent’s methodology would likely have resulted in severe consequences. In the eyes of the IP owner, the usage of terminology from another methodology would probably have been taken as an affront and, at the very least, imply bias. It could be expected that a lengthy rapport recover time would have been encountered, openness would be reduced and that the interview’s efficiency or effectiveness could have been negatively impacted. Although possible, due to the IP owner’s professionalism, breaking off the interview would have been unlikely. The consequences of using misaligned jargon with practitioners were potentially less serious than those with the IP owner. The author believes that the practitioner would possibly have less emotional ties to the methodology and its constructs than the IP owner. However, interjecting these “foreign” words into the interview could expectedly confuse, annoy, or distract the practitioner. The impact being that the interview efficiency would have been reduced.

The reference period utilized in the interview was respondent dependent. That is, for IP owners, it was contemporary while for the practitioners, it was retrospective. IP owners appeared to have a predisposition for promoting their “latest and greatest” topics and

sometimes resisted discussing dated IP. Business practitioners, on the other hand, talked almost exclusively about the methodologies in the context of their completed BPI initiatives. As expected, the consulting practitioners had a hybridized reference period. That is, they talked about the current aspects of the methodology and sometimes cited completed improvement initiatives as examples or justifications. The temporal reference gap had to be considered when creating the different interview schedules and when synthesizing evidence obtained from IP owners versus practitioners. Because BPI methodologies are continuously evolving, caution had to be taken that evidence taken from the different sources were on par with one another.

2.5.1.3 Effectiveness and Validity

The effectiveness (validity or the ability of the schedule to attain its design objectives) of the interview schedule was a major factor considered when formulating the questions and, after each interview, when reflecting upon that interview. Kumar (2005) cautioned that there are different types of validity to be considered. Face validity being the linkage of the questions to an objective. Content validity relates to the coverage of the full range of objectives by the interview schedule. Concurrent validity being the reproducibility of results compared across multiple interviews. An attempt was made to assure that each of these forms of validity was designed into the interview schedules and considered in each improvement made to those schedules.

Concurrent validity posed some major problems. It was anticipated that each of the three different respondent types would view the methodology from different perspectives – owner, user and customer. It was also anticipated that each could therefore have different biases or paradigms regarding the methodology as well as different levels of ownership and understanding of the methodology. The interview schedules were designed so that these factors of perspective, bias, paradigms, and ownership would be explored upfront – in a warm-up phase. After that, a set of standard questions were posed which would allow

comparison across the interviews. App 1.1, 1.2 and 1.3 in Appendix 1 are the generic interview schedules for the IP owners, consulting practitioners and business practitioners respectively.

2.5.2 Request for Interview

The second research instrument was the request for interview (RFI) letter. A checklist of ten points to consider when asking for participation in data collection was used while writing the RFI. This list, taken from Creswell (2009:89), was:

1. Identification of the researcher
2. Identification of the sponsoring institution
3. Indication of how the participants were selected
4. Identification of the purpose of the research
5. Identification of the benefits for participating
6. Identification of the level and type of participant involvement
7. Notion of risks to the participant
8. Guarantee of confidentiality to the participant
9. Assurance that the participant can withdraw at any time
10. Provision of names of persons to contact if questions arise

The RFI introduced the researcher as well as the University of Gloucestershire and the DBA program. The research topic, main objective of the study and relevancy of the study were explained in the RFI letter also. Before asking for their participation, the respondent selection process was briefly described along with the time requirements, desired venue, and request for a one-on-one interview. Assurance was given that no business performance or personal data would be collected and that the interview would not be tape or video recorded. Reference was made to an attached interview schedule and its questions. Before requesting voluntary participation, an outline of confidentiality and data/information handling measures

were also given. Important parts of those measures were codification to prevent an audit trail back to the respondent, storage security, retention period and disposal technique for the interview data as well as interim data on which the thesis was based. These aspects of ethics and confidentiality are detailed later in this chapter (Section 2.8). The RFI clearly stated that the respondent could withdraw from the interview at any time. In closing, contact information (name, address, telephone numbers and email address) along with a statement of appreciation for considering the request were given.

2.6 Data Analysis

In order to realize proper analysis of the qualitative research evidence, four factors had to be considered throughout the evaluation:

1. Avoidance of slipping into quantitative analysis and evaluation mode.
2. Avoidance of numbers: Variables and their comparisons had to be described using Nominal or Ordinal scaling – not Interval or Ratio ones.
3. Data had to be used reflectively and in a narrative format.
4. Validity of the synthesis.

Factors one and two played an important role in guiding the tier-one comparison analysis of data from the three types of respondents and the literature. For example, weighting of one respondent's data over that of another's had to be avoided. Although the assumption that the IP owner has more insight into the methodology might be a logical one, the author felt that the information derived from this type of interviewee should not be judged more important than that from one of the practitioners. Of the three aspects of validity (Face, Content and Concurrent) detailed earlier in relation to development of the interview schedule, face and content validity were important regarding the synthesis activities. There had to be an acceptable linkage between the data and the results of the synthesis (face validity) as well as sufficient coverage of the data spectrum by the synthesized results (content validity).

2.6.1 Synthesis of Evidence

The context in which this thesis's synthesis of evidence is placed varies in accordance with the respective research objectives and type of evidence being processed. Within the main body of the research, synthesis was carried out on evidence regarding three different subject matters. This gave rise to there being three research questions to be answered – one dealing with each the three subjects. The first topic, considered in the gap analysis and focused on in the methodology review, dealt with identification of BPI methodologies. This focal point required answering the first research question: How might the core and fundamental BPI methodologies be identified out of a population which also contains methods, tools and techniques? The second subject matter, in the methodology review, concerned the composition of those fundamental methodologies. This mandated solving the second research question: How may the key factors within these unique methodologies be identified, analysed and synthesized for commonality? The third type of evidence to be synthesized, in the efficacy analysis, involved information regarding the efficacy of the key common factors. Accordingly, a third research question had to be considered: How might the resulting common key factors be analysed and described in terms of their efficacy and added value to the implementation of a BPI methodology? There were contextual parameters for each of the three synthesis activities.

Based on the task to be completed as well as the anticipated volume and characteristics of the evidence to be encountered within the two SLR stages, the gap analysis appeared to require a less complex and rigorous synthesis technique than that for the methodology review stage. A review of numerous approaches was made in order to determine the best fitting technique for each of these two SLR stages. The eleven approaches described by Dixon-Woods et al (2005) as well as the methods for the thematic synthesis of qualitative research detailed by Thomas & Harden (2008) were considered. A subjective assessment based on the technique's transparency, complexity, flexibility, and appropriateness was made for each.

Appropriateness was judged against the epistemological conditions, the ontological position taken and the task in the given stage. The result was that different synthesis schemes were utilized in these two stages of the SLR.

2.6.1.1 Gap Analysis Phase

Since the gap analysis activities were designed simply to judge the degree to which the research objectives had already been met, their contextual setting was somewhat trivial. The gap analysis did not require data manipulation or translation. Although some amalgamating of evidence would be required, the process was a straightforward analysis of the evidence's content. Therefore, this stage's task was essentially an aggregated synthesis of qualitative evidence requiring interpretation and summation. Aside from the binary issue as to whether or not the research objectives had already been met, identification of the gap, toward those aims, to be filled was also considered. Evaluating this breach required identifying, organizing, extracting and interpreting information found in the evidence. The gap analysis was not the mainstay of the thesis, but rather a vital precursor to the more important methodologies review and subsequent interviews. This analysis did not have to be a lengthy nor elaborate activity, but had to produce viable and accurate results.

2.6.1.1.1 Use of Narrative Summary

Dixon-Woods et al (2005) positioned narrative summary as a technique which could handle the given mandates for the gap analysis. Therefore, it was considered as the overall approach. In terms of this research, the most important quality of a narrative summary was that it allowed flexibility in describing and ordering the evidence as well as in interpreting and commenting on the findings without undo complexity. Therefore, for the gap analysis stage, a narrative summary approach was utilized. Details of the process steps in the gap analysis as well as the implementation parameters and the results obtained will be given later in Chapter 3.

Narrative summary is open to criticism for a lack of transparency (Dixon-Woods et al, 2005). In the gap analysis, this weakness was mitigated by applying explicit inclusion/exclusion criteria, by utilizing systematic assessment procedures and by avoiding unsubstantiated presentations or descriptions of the findings. Stating the inclusion and exclusion criteria explicitly not only increased transparency as to how the evidence was selected, but also clarified and harmonized the various epistemological assumptions which were made. In several cases, the exclusion criteria was simply a Boolean “not” operator for the inclusion criteria. Table 2.6.1.1.1-1 shows the criteria used for evidence screening in the gap analysis phase. For the most part, they were derived directly from the epistemological assumptions and the tactical approach for the gap analysis stage.

Table 2.6.1.1.1-1 Inclusive/Exclusive Criteria for Gap Analysis SLR Stage

| Parameters | Inclusive Criteria | Exclusive Criteria |
|-------------------|---------------------------|------------------------------------------------|
| Subject of work | BPI Methodologies | Non-BPI methodologies |
| Time frame | 1980 to present | Prior to 1980 |
| Language | English* | Non-English* |
| Study type | Comparison or Analysis | Declarative |
| Geographic region | Triad countries | Non-triad regions |
| Applications | General business | IT, Healthcare, Medicine, Pharmaceutical |
| Improvement focus | Process | Functional, organizational structure, strategy |

*German is not excluded if an English translation is unavailable and all other criteria for inclusion are met.

2.6.1.1.2 Clarification of Parameters and Criteria

Some parameters and criteria appearing in Table 2.6.1.1.1-1 require clarification. Study type is one of these. Here, the term was used to mean the manner in which the study was handling the BPI methodologies – were they being compared, analysed or just described. Declarative treatment of a methodology was of interest in the methodologies review stage but not in the gap analysis one. The applications and improvement focus parameters are two others requiring explanation. The two are linked in that many methodologies are designed for

specific types of businesses (especially IT service providers) and/or concentrate on performance improvements other than through process optimization. The targeted works were those that are applicable to business processes in general and focus on process improvement. A final comment deals with the footnote to Table 2.6.1.1.1-1. Being a resident of Germany, some of the evidence was more readily available in German than English. For example, books translated from English are easier to acquire and on-line search engines are setup to prioritize the local language. For this reason, evidence in German was not automatically excluded.

Table 2.6.1.1.2-1 shows the key words, listed by their respective Boolean operators, which were used in the gap analysis literature search. These keywords stem directly from the inclusion/exclusion criteria described earlier. Their selection was made considering the objectives of the gap analysis stage and the nomenclature or terminology used by BPI practitioners. Initially, a broader set of key words was employed so as to confirm the relevancy of this more restricted set. This test determined that the former yielded little, if any, applicable results beyond that provided by the latter.

Table 2.6.1.1.2-1 Key Words for Gap Analysis Review

| Boolean operation | Key words and/or word groups |
|--------------------------|-----------------------------------------------------------------------------|
| Baseline String | business process improvement |
| And (Or) | methodology (methodologies), comparison (contrast) (review) (evaluation) |
| Not | IT, medical, health |

2.6.1.2 Synthesis of Methodology Composition Evidence

The synthesis of methodology composition evidence from the second SLR stage, together with that from the interviews, was much more complicated and demanding than the synthesis requirements in the gap analysis stage. The research data had to be first analysed using a combination of interpretative content analysis and comparative analysis. During the literature review, a thematic analysis of the methodology descriptions identified a list of

construct and component related themes for each of the methodologies. These were further explored during the interviewing process and categorized. These categories were augmented as more themes emerged during the interview and analysis phases. These on-going enhancements stemmed from either the content analysis performed after each interview or the comparative analysis. As research continued, refining the research methods, research instruments and analysis process was required. Background and details of these refinements will be reflected upon later in Chapters 3 and 4.

2.6.1.2.1 Use of Content Analysis

The content analysis of the interviews classified the data, provided information about identified themes and highlighted emerging ones from each respondent interview. Initially, this analysis utilized the set of categories provided by the thematic analysis of the literature. These categories were updated as new themes arose during the research. The respondent data, having already undergone content analysis prior to enhancing the categories, were not subjected to re-examination each time an update occurred. This repeated reassessment would have been both time consuming and inefficient. Instead, a blanket reassessment was done on all respondent data using the finalized list of categories at the end of the initial content analysis. This content analysis was designed to extract information about the composition of the methodologies from the respondent data. In the event that a gap in the data was identified, follow-up interviews with some respondents were required for gap closure.

The supplier, input, process, output, and customer (SIPOC) model introduced earlier to describe the research process was also used to help analyse the context in which this synthesis of methodology composition evidence would be carried out and to identify the synthesizing process itself. In the SIPOC model, this synthesis would be the process. Determination of the details of that process was facilitated by starting at both ends of the model and working toward the middle.

Considering the output side of the SIPOC model, customers (business and academic readers) require the results of the synthesis to be valid in all three aspects (face, content and concurrent), understandable and value adding. These requirements dictated that the output had to be linked to the research objectives, provide complete coverage of those objectives, have reproducibility and be homogeneous in the use of terminology and details. This did not dictate that the output had to be either qualitative or quantitative. Since the output had to be presented without showing bias for or endorsing any methodology, an ancillary requirement placed on the output was that the evidence had to be synthesized into methodology-neutral terminology.

On the input side, the suppliers (literature reviews and interviews) generated seven sets of data for each of the six methodologies. Additionally, this body of data contained knowledge pertaining to both methodology composition and efficacy. The evidence in this body of data had been characterized as being reliable, qualitative and non-homogeneous in both terminology and levels of detail. Additionally, a prerequisite placed on the input was that this data be valid in terms of the research objectives.

Due to different definitions, conventions and terminology usages amongst the data sources for each of the six methodologies, the synthesis of the resulting data required a means to compare and compress the data in order to assess commonalities. This dilemma created the second research question: How may the key factors within these unique methodologies be identified, analysed and synthesized for commonality?

2.6.1.2.2 Identifying, Analysing and Synthesizing for Commonality

Returning to the SIPOC model, comparing the input data characteristics with those required of the output information, the author recognized that the transformation in the synthesis process required comparison and compression at the methodology level followed by comparison and compression across the methodologies. This two-tier comparative and compression analysis made responding to the second research question somewhat more complicated. First, on the methodology level, the category-based information about the given

methodology (derived from the SLR stages as well as IP owner and practitioner interviews) had to be compared and harmonized so as to create a universal set of themes per methodology. Then, at the upper level, a second and more complicated comparative analysis was done across all methodologies based on the results from the lower level comparisons and harmonization activities. This two-tier comparative analysis was intended to harmonize the inputs from the literature and the respondents at the individual methodology level and then to synthesize these for the common constructs and components amongst the methodologies. The harmonizing and synthesizing steps required a subjective interpretation technique that would not only compress the data, but also consider the different aspects of validity.

This process would also have to convert the various levels of detail into one while distilling the wide spectrum of terminology into an understandable set that was not aligned with any parent methodology. It was imperative that validity be maintained across all conversions. Since there was no requirement to convert the qualitative data into quantitative information, this transformation was not made. This situation led to the view that a form of meta-synthesis was more appropriate than a meta-analysis approach.

2.6.1.2.2.1 Evaluating Meta-Synthesis Techniques

Exactly which meta-synthesis technique should be employed was deliberated. Dixon-Woods et al (2005:49) laid the groundwork for debating this issue by questioning if the “apparent differences between the strategies reflect superficial differences in the terminology or the degree to which the methods have been specified.” They further added that over time, the useful constructs of the approaches may be combined to create a better hybrid. This on-going evolution could fuel the fire of debate in approach selection due to outdated paradigms and terminology usage. A noteworthy example of this developmental process was Dixon-Woods et al’s (2005) treatment of Noblit and Hare’s (1988) term “integrative synthesis” which was used in the 1988 work to mean combining or amalgamating data. In 2005, Dixon-Woods et al purposely broke the link between this term and quantitative data. Their

interpretation was one of summarising, pooling, or even providing a descriptive account. Their conclusion that integrative synthesis can be carried out on qualitative evidence was an important one for determining the technique used here to synthesis the methodology composition evidence.

In 1988, Noblit and Hare pointed out that synthesizing qualitative research is not easy or straightforward. Amongst others, the characteristics (uniqueness, etc.) of the underlying qualitative works must be maintained. Their comments also helped guide selection of the synthesizing approach

2.6.1.2.2.2 Adaptation of a Meta-Ethnography Approach

Although the subject matter of this thesis was not an ethnographic one, the synthesizing techniques in the meta-ethnographic review approach seemed to fit the requirements of the research quite well. The meta-ethnography approach provides a rigorous procedure for deriving substantive interpretations about a set of studies (Noblit & Hare, 1988). Beyond the requirements of having a thorough understanding of the nature of the comparison and interpretation objectives, the meta-ethnographic approach requires a careful portrayal of the studies to be synthesized. In meta-ethnography, categories are identified in the evidence. These then undergo an interpretive aggregation to synthesize a single description of the evidence. Noblit and Hare (1988) proffered an approach which, while creating a holistic interpretation, provided a way to perform these comparative and interpretative tasks. Noblit and Hare also argued that meta-ethnography should be interpretive rather than aggregative. Tranfield, Denyer and Smart (2003:218) stated that, “Meta-ethnography is a method of meta-synthesis that offers three alternative techniques for synthesising studies. 'Refutational synthesis' can be used when reports give conflicting representations of the same phenomenon, 'reciprocal translations' can be used where reports address similar issues and 'lines of argument synthesis' can be used if different reports examine different aspects of the same phenomenon.”. Although the subject matter was very different, the process, especially the

reciprocal translations technique, was an interesting one for this research and therefore considered in answering the second research question.

It should be noted again that the various BPI methodologies are, in effect, unique studies which were being analysed, evaluated, translated and synthesized for commonality in constructs and components. Reflecting on the words of Tranfield et al (2003), they can be seen as reports that address similar issues. Therefore, the activities and goals of this research corresponded very well with these attributes of the meta-ethnography approach's reciprocal translation technique. This technique involves qualitative research having studies with comparable elements. The reciprocal translation technique was therefore utilized when synthesising data regarding key methodology components and constructs into information about factors common to all six BPI methodologies. This technique, borrowed from the meta-ethnography synthesis approach described by Noblit and Hare (1988), was therefore the key to resolving the second research question: How may the key factors within these unique methodologies be identified, analysed and synthesized for commonality? Details of the process steps, implementation parameters and the results obtained from the reciprocal translation technique will be given later in Chapter 4.

2.6.1.3 Synthesis of Efficacy Evidence

The context considerations for the synthesis of evidence in the efficacy analysis were much less complex than that for the previous methodology composition synthesis. On the other hand, unlike in the gap analysis, the contextual parameters are not trivial. The need to perform a synthesis on the efficacy data gave rise to the third research question: How might the resulting common key factors be analysed and described in terms of their efficacy and added value to the implementation of a BPI methodology?

Again, referring to a SIPOC model wherein the synthesis of efficacy evidence is the process, the input and output sides have certain aspects to be considered. Evidence concerning efficacy would be derived from four types of suppliers: literature, methodology IP owners,

human resource experts and industrial psychologists. The epistemological and ontological considerations regarding these types of sources are detailed later in this chapter (Section 2.7). The input from the suppliers would be a hybrid of anecdotal and social science evidence. The output to the academic and business customers had to be an amalgamation of this evidence into an understandable composite. Additionally, that output had to show the efficacies of the common key factors both independently and as a system within a modelled BPI methodology.

The process in this SIPOC model is basically an evidence consolidation technique. The process is repetitive in that it must be carried out for each of the 12 common key factors. The merger of evidence is simplified by each of the 12 factors having been addressed individually by the four types of suppliers. This eliminated the need to synthesize across the factors as was required in determining the common key factors earlier. Consolidation could require elimination of duplicate information and/or comparison of one piece of evidence with another. This comparison may require subjective translations but the use of full reciprocal translations are not foreseeable nor excluded. The amalgamation techniques employed in the SIPOC's process resolve the third research question: How might the resulting common key factors be analysed and described in terms of their efficacy and added value to the implementation of a BPI methodology?

2.7 Context Descriptions: Epistemological and Ontological

There were many structural, perspective and approach parameters that formulated and described the context in which the research was carried out. Perspectives were characterized by the epistemological assumptions made and the ontological position taken. The approach taken was also influenced by these. Given that the assumed starting point and the perception in some way induced the approach, it appears logical to conclude that the end result was also impacted by all of the preceding elements. Therefore, context was a very influential factor.

The research process outlined earlier called for a sequence of two literature reviews followed by another sequence of two interview sets. Each of these had unique focal points as

well as unique deliverables. Therefore, it was assumed the body of knowledge and other contextual factors encountered in each of these could differ somewhat. For this reason and for the sake of clarity, the context definition and statement of the assumptions have been delineated per process step rather than grouped or amalgamated.

Statements regarding epistemology focus on the dimensions that circumscribe and characterize the body of knowledge being investigated in the respective stages. In the literature review stages, the term “body of knowledge” refers to the understanding and wisdom proffered in published works (journals, books, etc.) or in “grey literature” (unpublished reports, conference material, etc.) which are currently available and germane to each respective stage of that review. In the interviewing stages, the term “body of knowledge” refers to the understanding and wisdom proffered by those being interviewed. Since the bodies of knowledge being scrutinized are neither tangible, nor simple and straightforward, assumptions were made about the critical characterizing dimensions. Logically, the initial and most important assumption made was that these bodies of knowledge exist. After that, the epistemological assumptions for each stage are discussed separately. A set of preliminary searches in the Business Source Complete (EBSCO), Education Research Complete (EBSCO), Sage Journals Online, and grey literature available to BPI practitioners was conducted in the initial survey process step. This set of searches, coupled with the author’s experience and accessible non-published literature, substantiated the framework for the assumptions being made prior to commencing the SLR and interview phases.

2.7.1 Systematic Literature Reviews

The context in which any systematic literature review is executed is characterized by both epistemological assumptions and ontological positioning. They directly influence the perspective and approach taken in the review. Therefore, they are important contextual parameters that must be considered here.

2.7.1.1 Epistemological Assumptions for Gap Analysis Data

The preliminary literature searches, done as part of the initial survey phase, indicated that a sufficient body of knowledge existed for the SLR's gap analysis stage (described previously in this chapter). Therefore, the most basic epistemological assumption that a body of knowledge exists is a valid one. However, the evidence appeared to be meagre, anecdotal (George, 2002) and rely heavily on comparative analysis (Howald, 2006) instead of exploration of common constructs and components. More in-depth searches failed to find any works that satisfied the research objectives in their entirety - thereby terminating this SLR. The work of Radnor (2010) may have gone the furthest toward those research objectives. In this work, four major business process improvement methodologies were reviewed and compared but not analysed for commonality in terms of composition. The comparison was focused on the orientation and application of the four methodologies. In short, the first epistemological assumption that the research objectives and research questions were yet unanswered appeared sufficiently valid to proceed with the SLR.

2.7.1.1.1 Location and Dissemination of Evidence

The next assumption addressed was the location of this body of knowledge. In order to answer this, the most significant economies within the Organisation for Economic Co-operation and Development (OECD) were considered. In 1991, Ohmae applied the term "triad" (a group of three) to the economies of North America, Western Europe and Japan. Ten years later, Jim Oneill coined the acronym "BRIC" – standing for Brazil, Russia, India and China (*Wikipedia Encyclopaedia. BRIC*, 2010). Reflecting on annual financial data from the Kennedy Consulting Research and Advisory newsletters as well as the gross national product and gross domestic product breakdowns issued annually by individual OECD nations, businesses within both the triad and BRIC nations appear to be the major consumers of consulting knowledge. Additionally, this data also indicates the triad as being the major source. Based on this information, it appeared to be a plausible assumption that the bulk of the

body of knowledge on which the gap analysis could be based was within the triad. The expansion of search engines utilized in the SLR, such as Google™, to well beyond the boundaries of the OECD makes the issue of where the body of knowledge resides far less significant in terms of acquisition. Nevertheless, location itself remained a relevant issue since it set parameters for the language assumption.

The third conjecture dealt with the degree of dissemination of this information. In other words, was this knowledge closely held (including IP) or broadly available knowledge? In terms of the SLR activities, this assumption was actually more about the extent of accessibility. Acknowledging that the methodologies scrutinized by works to be reviewed in the gap analysis stage are openly marketed, sold and implemented by BPI practitioners, a logical assumption would be that these works themselves would enjoy a similar degree of exposure. This line of logic meant that those works would be widely disseminated and readily assessable. Unfortunately, this conjecture proved not to be the case.

2.7.1.1.2 Existence of “Black Literature”

As practitioners know, BPI consultancy’s, like their counterparts in nearly every other branch of the business community, dedicate a significant amount of their resources to analysing and evaluating their competitor’s offerings. BPI methodologies and initiatives are not exempt from this practice. Objectives of the gap analysis stage are precisely aligned with the objectives of those analysing and evaluating activities. Howald’s (2006) work is one example of this. He demonstrates that, like the product developers who perform a degree of reverse-engineering on their competitor’s products, the knowledge workers perform benchmarking and value analysis as part of their value engineering activities. The author feels that nearly all of those results are never disclosed for legal or competitive advantage reasons. Instead, they are held internally as “black literature” (see Appendix 2: Glossary of Key Terms), and used by the business internally. Given the size of the management consulting industry and its BPI subset, it appears very likely that, in absolute terms, this non-disclosed

black literature could substantially outweigh the body of knowledge available for review in the gap analysis stage. Potentially, if all of this black literature were public knowledge, the thesis goals might either be a straightforward synthesis or, possibly, would have already been satisfied.

Although the absolute bulk of the total knowledge is assumed to be inaccessible, the body of knowledge in the public domain and in the accessible grey literature was believed to be sufficient enough to support the gap analysis. This assumption simply meant that the defined gap maybe larger than the actual one.

The issue of language was linked with the epistemological assumption as to where the knowledge for the gap analysis resides. The assumption made was that English would suffice. This position was supported by two main factors: English is a dominant language within the triad and, as global practitioners are aware, English is widely used as the business language within trans-national companies. This background implies that the significant works within the body of knowledge will either originate in English or be translated into it. Therefore, the language assumption seemed realistically valid.

2.7.1.1.3 Nature and Characteristics of Evidence

The final set of epistemological statements dealt with the nature and characteristics of the evidence within the body of knowledge. The descriptors of these were limited to qualitative vs. quantitative, level of maturity, level of granularity and composition (extent of homogeneity). Although it could be argued that other factors could also be included, this list appeared to be sufficient enough to characterize the studies under review in the gap analysis.

2.7.1.1.3.1 Qualitative Versus Quantitative

The first characterization made was that the evidence was essentially qualitative in nature (Hammer & Champy, 1993; Howald, 2006; Thomas, 1990). Given the nature of the topic (a consultant's proprietary product) and that the sales environment in which these

methodologies (as products) are leveraged in a highly competitive, the overwhelming preference for qualitative evidence was expected. From the author's experience, quantitative studies would likely be too costly, too disclosing and too vulnerable to attacks by competitors. Since the underlying BPI methodologies are essentially qualitative, the induced expectation was that works evaluating and synthesising these methodologies are also fundamentally qualitative in nature. Practitioners would probably argue that the time and cost involved in introducing a quantitative nature is not required. To those developing the comparisons, the important aspect would be showing adequate delineation, or unity amongst the BPI methodologies – all of which can be done effectively and efficiently using qualitative terms. Lastly, the initial database searches appeared to support the assumption that the gap analysis's body of knowledge was essentially qualitative.

2.7.1.1.3.2 Maturity: Reliability and Robustness

The second characterization vector dealt with assumptions about the maturity (reliability and robustness) of this knowledge. Here, a rough prediction was made based on the age of the BPI consulting industry and the large number of major players in that market. The Total Cycle Time (TCT) methodology was there when the Thomas Group was founded in 1978 (Martin, 1992) and Imai (1986 & 1997) links the “Lean” methodology to William Edward Deming's post-war work in the 1950's. This timeline places at least some of the methodologies as being between 30 and 60 years old. As a rough indicator of the BPI industry size, as of 1 December 2010, Wikipedia yielded 2485 hits for “business process consulting” companies. Given the age and indicated size of the industry, the accessible evidence forming the basis for the gap analysis was judged to be quite mature. The caveat was that the inaccessible black literature could be even more robust and possibly more reliable, due to the effort and resources employed by the industry to generate and maintain that information.

2.7.1.1.3.3 Granularity: Broad Versus Detailed

The third characterization centres on the granularity (broad vs. detailed) of the information that the body of knowledge contains. From a practitioner's vantage point, it could be stated that the black literature contains much more detail than that in the accessible material. The reader should recognize that the sponsors of this black literature are BPI methodology owners or practitioners. As such, they enjoy an insider's advantage. Comparatively, the accessible studies are therefore likely to be less detailed and somewhat general. However, granular evidence should not preclude a valid gap analysis.

2.7.1.1.3.4 Composition: Homogeneity versus Heterogeneity

The fourth, but not necessarily the last, demarcation attribute to warrant conjecture is the composition (homogeneity vs. heterogeneity) of the knowledge contained within this body. All search results from the initial survey phase showed that the composition of material for the gap analysis was highly heterogeneous. That is, a mixture of: 1) comparative studies highlighting individual unique selling points (USPs) within the subject methodologies, 2) declarative studies promoting facets of a selected methodology, and 3) explanatory works expounding upon the procedures and facets of implementing a given methodology were found. Although the sample size was small, only 29, this quantity appeared sufficient enough to support the assumption that the composition of evidence for the gap analysis, on the whole, was heterogeneous.

2.7.1.1.4 Summary

In summation, the epistemological assumptions regarding the evidence to be reviewed in the gap analysis were that, within the triad, there existed an accessible body of knowledge containing mature, qualitative evidence in heterogeneous studies written in English that were ample and sufficiently granular.

2.7.1.2 Ontological Positioning of Gap Analysis Evidence

Having addressed the issues of epistemological assumptions for the gap analysis stage, context in terms of the ontological position could then be stated. While linked to one another, it is disadvantageous if the two are not compatible (Zelić & Stahl, 2005). Zelić and Stahl showed that an entire project can be at risk when a non-compatible ontological position is taken. These authors further stated that one of the major reasons why the realist perspective is problematic is that people view and describe the world through their paradigmatic lenses. This attribute applies equally well to a work's author as to its reader.

It could be argued that in the business world there are many legal regulations which govern the community, but few 'hard and fast' physical laws. Granted, numerous mathematical equations such as sales minus costs equals profit, oversee all businesses. However, these are results oriented and serve as drivers of change or acceleration (Thomas, 1990; Thomas & Gallace, 1992). These can hardly be viewed as physical laws which govern business culture or organizational effectiveness. Considering the nature of the domain from which the research evidence ultimately stems, the possible compatibility issue and the filtering issues, it could be argued that, regarding works for the gap analysis, trying to force fit the type of evidence detailed in the epistemological assumptions through a positivist's filter would not be appropriate.

A constructivist's perspective appeared to be more compatible with the types of studies being reviewed in the gap analysis stage than that of a positivist. This statement is supported by Zelić and Stahl's (2005) assertion that, in a constructivist view, context is an overriding factor. Context encompasses the basic concepts on which the BPI methodologies were developed. This setting solicits answers to the questions of: how those methodologies were created and what dominate criteria governed during the processes of development, deployment and utilization. It appears that, in BPI consulting, the methodology employed is utilizes a technology which is open to updating and modification during deployment as well

as in the implementation phase of an improvement initiative. From a consultant's perspective, when a BPI methodology is used by a firm to improve its processes, the methodology cannot be applied simply as a rubber stamp. A given methodology is not a universal physical law that fits all situations in the same way. The company's size, structure, culture, history, location and the targeted processes are but a few of the numerous parameters which have to be taken into account. This framework means that the context in which a methodology was created may well vary from that in which it is utilized. Therefore, the former has to be sufficiently general and non-restrictive so as to allow the latter. The constructivist's position fits both the creation and the study of BPI methodologies since neither the developer nor the researcher can uncover an ultimate reality (Zelić & Stahl, 2005). Therefore the constructivist's position is anticipated.

2.7.1.3 Epistemological Assumptions for Methodologies Review Data

Having dealt with the context of the SLR's gap analysis activities in terms of epistemological assumptions and ontological position, the contextual parameters for the SLR's methodologies review has to be addressed. The same arguments and logic that applied to the body of knowledge for the gap analysis were applied to that for the methodologies review. Therefore, for the methodologies review the location was also taken as the Triad and the language as English. In contrast to the body of knowledge for the gap analysis, where the bulk of the comparative analysis and evaluations are closely held by methodology owners and BPI practitioners, it seemed logical that the body of knowledge about the actual methodologies themselves should be widely disseminated and readily accessible. Arguments supporting this hypothesis could be based on the public marketing of these methodologies requiring description and disclosure. Additionally, numerous authors such as Womack, Jones, and Roos, (1990) have documented applications of these methodologies.

2.7.1.3.1 Nature and Characteristics of Evidence

The nature and characteristics of the individual studies within the body of knowledge for the methodologies review stage was thought to mirror those (qualitative, mature, and non-detailed) for the gap analysis. Childe et al in 2001 indicated that BPI methodologies are essentially qualitative studies supported by statistics from one or more KPIs. Although the study was qualitative, the authors used a statistical technique (a paired t-test) to show the effectiveness of the methodology based on a “before and after” comparison. Other evidence (Hammer & Champy, 1993; Howald, 2006; Thomas, 1990) also indicated that works to be reviewed in the methodologies review stage were essentially qualitative in nature.

Assumptions regarding information granularity was based on the author’s BPI experience and evidence found during the initial survey phase. While reviewing works dealing with the BPI methodologies of TCT (Thomas, 1992), Theory of Constraints (Goldratt, 1985 & 1990), Balanced Scorecard (Kaplan & Norton, 1993 & 1996), Lean (Krafcik, 1988), Six Sigma (Brue, 2002), and Lean Six Sigma (George, 2002), one common attribute became very clear – the granularity of the information was not excessively detailed. There was a tendency for all authors to give a general description of their products and to essentially give specifics only in terms of BPI initiative examples and credibility-building improvement data. Although these works were not too superficial for the purposes of the methodologies review, it appeared that grey (or even black) literature as well as the interviews would be required in order to gain a detailed insight into one or more methodologies.

These same six works used to judge the granularity also seemed to support an epistemological assumption that the works subject to this second literature review were surprisingly homogeneous in their structure, composition and ontological position. However, language, style and terminology appeared to vary greatly amongst these works. The most extreme example of these appears in the treatment of the Theory of Constraints by Goldratt

(1985 & 1990). Examples of this nonconformity will be stated later in Chapter 4 when discussing the Theory of Constraints composition.

2.7.1.3.2 Summary

In summation, the epistemological assumptions regarding the evidence to be examined in the SLR's methodologies review stage were that there existed an accessible body of knowledge containing mature, qualitative evidence in homogeneous studies written in English that were ample and sufficiently granular.

2.7.1.4 Ontological Positioning of Methodologies Review Evidence

The same logic, situations and settings for the ontological position used in the gap analysis was also applied to the methodologies review stage. As a result of this, the author feels that having multiple ontological positions within the same SLR series would have been confusing, awkward and seemingly inappropriate. Therefore, the context of a constructivist's perspective was foreseen in the methodologies review stage as well as in that for the gap analysis.

2.7.2 Interview Sets.

The basis for assumptions made regarding contextual parameters of information accessible in the interviewing processes stemmed more from 24 years' experience in the BPI consulting field than from the initial survey. This sourcing was especially true regarding the initial set of interviews dealing with the methodologies and their compositions. There, it was evident that the body of knowledge exists since the respondents are either practitioners or IP owners of the respective methodology. Beyond this, discussions pertaining to each set of the two interviewing sequences will be dealt with sequentially starting with the interviews focused on composition and then considering the ones regarding efficacy.

2.7.2.1 Contextual Parameters of Methodology Composition Evidence

The context (epistemological assumptions, ontological positioning, etc.) for the first interviewing sequence (exploring methodology composition) was assumed to be virtually the same as that for the second literature review (exploring methodology composition). Not only did the two share the same objective but the respondents being interviewed were either authors of works reviewed or professionals in the BPI field. Therefore, the same arguments and logic that applied to the body of knowledge for the methodologies review were applied to that for this first interview set. This correlation meant that the location was taken as the Triad and the language as English. Likewise, the author assumed that the body of knowledge held by the respondents about their respective methodology would be freely divulged and therefore readily accessible. The main arguments supporting this hypothesis were that the respondents were aware of the interview objectives and were being interviewed voluntarily. Additionally, it appeared logical to assume that the nature and characteristics of the evidence available from the interviewing process would essentially be the same type as that available through literature reviews. This correlation meant that the evidence would also be qualitative, mature (robust and reliable) and homogeneous in structure, composition and ontological position but could vary greatly in, language, style and terminology.

Granularity (level of detail) was expected to be a process variable rather than a fixed characteristic of the respondent's body of knowledge. This expectation meant that, during the interviewing process, certain evidence could be explored in more detail. This hypothesis appeared reasonable since trade secrets, personal information, business information, etc. were not being discussed. Again, since all respondents were aware of the questions on the interview schedule and were being interviewed voluntarily, it was logical to assume that they were prepared to answer the questions in the appropriate level of detail necessary to further the research.

The logic, situations and settings regarding the ontological position of the respondents was assumed to be the same as that from the literature review. It seemed reasonable to assume that the position taken by the respondents in the interviews would be similar to that expressed by themselves and their professional colleagues in the literature.

2.7.2.2 Contextual Parameters of Efficacy Evidence

Establishing the context for the second set of interviews dealing with the efficacy of the common factors within the methodologies was complicated by the fact that the respondents would be a mixture of BPI experts, industrial psychologist and human resource experts. On the surface, it would appear trivial to state that, collectively, they understand why these common factors are effective and efficient in terms of bringing about sustainable process improvement. However, considering the volumes of works published each year regarding change management, organizational management and human resource management, one could speculate that the respondents may not fully comprehend, or at the very least, not agree upon the true root causes of the efficacy. It appeared logical to assume that their knowledge was, at least, not perfect in this regard.

Apart from the complexities posed by the non-homogeneity of the respondents, the author felt that many of the contextual factors and conditions in this interview set would be similar to those in the first interview set dealing with methodology composition. Therefore, it was believed that selecting the respondents from the triad would be sufficient and that these respondents would openly share their body of knowledge. One caveat to this notion might be that the IP owners and consulting practitioners could be reluctant to share some content of their black literature regarding efficacy impact and drivers. Furthermore, based on the same arguments presented regarding the first interview set, it was anticipated that the evidence would be qualitative in nature, have a high degree of sophistication and maturity. The author also felt that, within the interviewing process, a sufficient level of detail could be reached.

Finally, due to the non-homogeneity in the respondent's professional backgrounds, the author further reasoned that the epistemological context within the interview set would also be heterogeneous. This assumption was based on the belief that their different professional backgrounds would give them different insights into the efficacy factors (the subjects of the interviews). This line of thought does not say that their ontological positions could not be the same. What it does say is that these different insights could give rise to different viewpoints and understanding regarding the efficacy drivers at the root-cause level. Therefore, in an epistemological context, the body of knowledge held collectively by these respondents would be heterogeneous.

Establishing the context of the second interview set with regards to the ontological position was also complicated by the heterogeneity in the respondent's professional backgrounds. Although the same logic, situations and settings from the first interview set were applied to the second one, consideration had to be given to the factors of different insights, different understandings and thereby, perhaps different paradigms. The author's reflection focused on the BPI community's focus on business and processing technology, the social and behavioural emphasis of industrial psychologists and the human resource managers having a social and/or legal orientation. Looking for commonalities, the respondents were collectively categorized as contemporary professionals working in the social science fields rather than natural science. Based on this, it was assumed that their ontological positions regarding the efficacy drivers behind key elements of the BPI methodologies would be broadly clustered on the constructivist's end of the continuum. However, this belief does not say that their positions would necessarily be identical.

2.8 Ethics and Confidentiality

The research strategy was designed to comply fully with standard ethical research practices and, in particular, to minimize confidentiality issues. Personal and business data were not collected and voice or video recordings were not taken. During the interviews, notes

were taken either by hand or on a laptop computer. As detailed earlier, respondents were informed regarding the purpose of the research, the research process and the results handling. Their involvement was voluntary. Respondent names and their respective identity data were codified in such a way that the audit trail was broken and anonymity assured. This inability to trace back to the source provided confidentiality for the respondents, their organizations and other individuals that may be mentioned or involved. IP owners were afforded the opportunity to critique the results of the lower level (methodology level) comparative analysis before the second-tier (cross-methodology) analysis was performed. This process was deemed appropriate since some methodologies, such as Theory of Constraints, have singular IP owners and therefore, the link between the two cannot be avoided. None of them chose to execute this option.

Detailed ethical and confidentiality measures were stated previously in Section 2.5 of this chapter. As mentioned in Section 2.5.2, it was stated in the RFI letter that all data collected during and subsequent to the interviews will be disposed of upon completion of the DBA requirements or, at the latest, 1 January 2016.

CHAPTER 3: LITERATURE REVIEWS

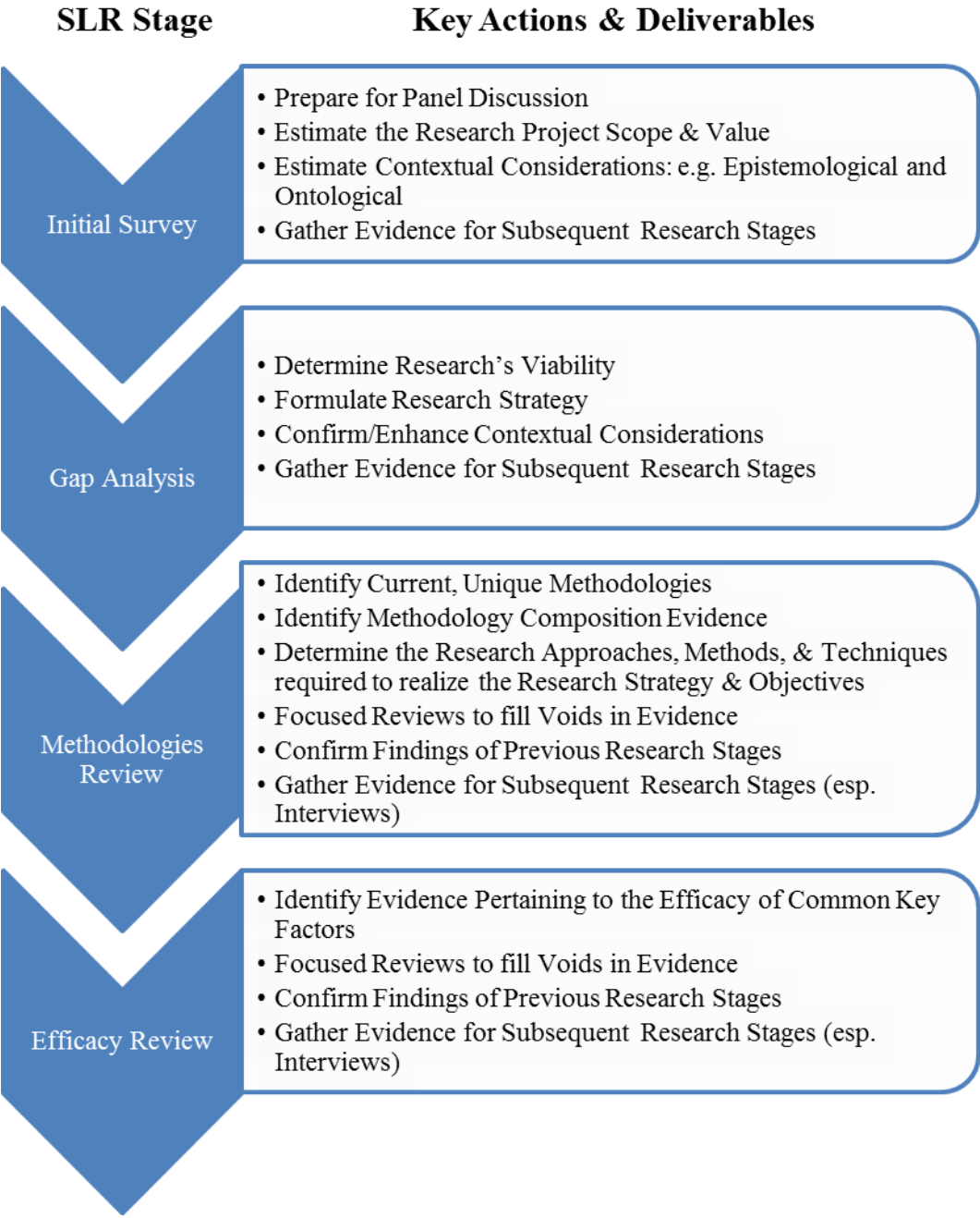
3.1 Introduction

The systematic literature review (SLR) was neither a discrete exercise nor solely focused on the subject matter of this thesis. At times a literature review was the mainstay activity while at other times, it played a background role. As depicted in Figure 3.1-1, the SLR was divided into four main stages according to the essential subject matter requirements. However, the key actions and deliverables of each stage was a combination of research-based as well as subject matter focal points. The reason for this mixture being that the discovery and gathering of evidence (via both literature reviews and interviews) dictated an evolution in the research tactics. In addition, the author's initial concept of the research strategy and research design also underwent development as the nature and volume of the evidence became more evident.

The most vivid example of the research process's evolution and development stems from amassing a large volume of non-homogeneous data about the methodologies' compositions. Since the SLR provided insufficient amounts of this data, the research strategy and approach had to be modified to include a series of interviews. Once the nature and volume of this evidence became known, appropriate research tactics had to be established in order to compare, compress and synthesize this evidence. Literature reviews provided the necessary approaches, methods and techniques required by those activities. Specifically, it was via these reviews that the reciprocal translation technique discussed in Chapter 2, Section 2.6.1.2.2.2 was found. Application of this technique will be detailed in Chapter 4, Section 4.5.

Being an ongoing activity, in each stage of the SLR findings from previous stages had to be confirmed or modified as well as appropriate information for subsequent stages noted. These actions applied as much to research-based as to subject matter based information.

Figure 3.1-1 Key Actions and Deliverables per SLR Stage



3.2 Literature Review: Initial Survey

A preliminary literature review was performed as part of the initial survey detailed in Chapter 2. The main purpose of this review was to prepare for the panel discussion held as part of that survey. Like the survey itself, this literature review was concerned with estimating the scope and value of the research project. The information gathered during this review supplemented the author’s acquired knowledge based on 24 years of BPI experience. It

confirmed that the estimated number of methodologies involved in the study would be less than 10 and that methods, tools or techniques were often mistakenly reported as methodologies. This latter point was also confirmed during the initial survey by the panel's lack of discipline and delineation as to what a BPI methodology is.

The preliminary literature review and the panel discussion confirmed the author's perception as to the value of the research. This value would be derived by its contributions to both knowledge and practice. That is, the research would contribute to the literature regarding methodology offerings and create new literature pertaining to the commonality amongst those methodologies. Additionally, the research would make a contribution to the literature pertaining to methodology effectiveness by highlighting the efficacy of key factors common amongst the methodologies. This would enhance the current literature focused on the methodologies' overall effectiveness pertaining to the desired results for BPI initiatives. These improvements to the knowledge and literature base available to businesses would enable improvements in the business practices. Improved understanding of the methodologies at the composition level provides a clearer value proposition and enables demystification concerning BPI methodologies in general. In turn, this should facilitate improvement in the methodology selection and implementation processes thereby enhancing the effectiveness of BPI initiatives.

The preliminary literature review also enhanced the author's understanding of the research process requirements as well as the process's environmental (contextual) considerations. It became even more apparent that the findings in the literature review would have to be augmented by interviews. This meant a modification to the research process. The literature review also substantiated the author's perceptions regarding the process's epistemological and ontological contextual issues. These issues were detailed in the previous chapter.

There are no discrete, stand-alone findings from the initial survey stage's literature review to be detailed here. Instead, the majority of those findings served to enhance the author's understanding and perception of the research's project, process and milieu. Therefore, these findings were an integral part of the discussions presented in the relevant sections of Chapter 2. The remaining findings from this stage's literature review were associated with the panel discussion performed as the nucleus of the initial survey. As such, these findings are reported in Chapter 4 in the context of the overall findings. In addition, the barriers listed by the expert panel will be discussed individually in Chapter 6, Section 6.7.

3.3 Literature Review: Gap Analysis

The SLR's second stage objective was to determine the viability of the research. This viability encompassed both the feasibility of completing the research project and the opportunity to do so. A major activity in this endeavour was to identify existing works that would terminate, accelerate or modify the research. It was imperative to determine if the research objectives had already been answered. This gap analysis dealt with the status of existing works versus the research objectives. Subordinate to that, those works that, while not having satisfied the research objectives, contributed toward that goal, were reviewed and noted for use in subsequent stages of the research.

The gap analysis literature review provided background information for formulating the research strategy. The review confirmed the author's perception of the literature's ontological positioning and the overall epistemological context for this research. The review clearly indicated that journals and articles provided insufficient subject matter evidence for the purposes of this thesis. It appeared that comparing methodologies based on their compositions was either too lengthy or not a viable topic for those sources. Additionally, the review indicated that more lengthy texts such as books focused primarily on a single methodology instead of comparing multiple ones. It was also noted that authors of such texts tended not to provide a clearly defined and justified composition structure. As a result of these

epistemological considerations, the research strategy had to be updated. In order to fill the information voids, the research had to include two sets of interviews. One set was focused on the composition of the methodologies and the other set dealt with the efficacy of the common key factors amongst those methodologies.

3.3.1 Capturing and Screening the Initial Input

A summary of the results derived from the literature search for the gap analysis stage is shown in Table 3.3.1-1. As can be seen, 15 unique sources were searched. These yielded 801 hits. These results were then screened using relevancy and uniqueness criteria. This screening process will be described in detail later. Of the 40 works retained, 14 were deemed relevant for the gap analysis and 26 were deferred to the methodologies review (stage three of the SLR). Using these 14 relevant works, a set of “what if” scenarios was performed. The 5 original sources for these relevant works were searched again using those scenarios. In each of the scenarios, the keywords and the Boolean operations were adjusted and the search results controlled. A mandatory requirement was that the respective relevant work from a given source had to appear in the respective results. None of the scenarios produced any additional relevant works for either SLR stage two or three.

The screening process applied to the initial 801 hits was based on the content of their summaries and then, as necessary, on a more in-depth reading of the works in question. This process revealed 5 major factors for disregarding 761 (95%) of the hits. Duplication, as would be expected when searching 15 different sources, was one of these.

Table 3.3.1-1 Summary of Search Results for Stage 2 (Gap Analysis)

| Database searched | Hits | Filtered out | Retained in Stage 2 | Deferred to Stage 3 |
|-------------------------------------|-------------|---------------------|----------------------------|----------------------------|
| Business Source Complete (EBSCO) | 231 | 222 | 4 | 5 |
| Cambridge Journals Online | 0 | | | |
| Education Research Complete (EBSCO) | 110 | 108 | | 2 |
| EJS E-Journals (EBSCO) | 6 | 6 | | |
| Emerald Journals | 10 | 4 | 3 | 3 |
| Informaworld | 6 | 6 | | |
| ISI Web of Knowledge (Thomson) | 81 | 72 | 4 | 5 |
| MINTEL | 0 | | | |
| MyiLibrary | 2 | 2 | | |
| Oxford Journals Online | 0 | | | |
| Sage Journals Online | 250 | 247 | 1 | 2 |
| ScienceDirect (Elsevier) | 1 | | | 1 |
| Wiley Interscience Journals | 10 | 9 | | 1 |
| ZETOC (British Library) | 16 | 12 | | 4 |
| Google™ | 78 | 73 | 2 | 3 |
| | | | | |
| Total | 801 | 761 | 14 | 26 |

Surprisingly however, duplicate entries accounted for only 104 (14%) of the discard. One reason for this low count was the fact that the relevancy filter was applied before the redundancy one. Approximately the same number (98) were filtered out because they actually dealt with non-process improvement initiatives (particularly strategic or marketing ones) and only mentioned BPI themes in passing. Another 157 works were filtered out due to the fact

that they were concerned solely with implementations of BPI methodologies and not the methodologies themselves. Those which addressed the methodology and its implementation, such as Radnor (2010) were retained. Another 166 (22% of the excluded) were not retained because they dealt with industry, business or product specific themes rather than comparing or analysing methodologies. The largest single factor for screening out a hit was that the subject matter did not meet the defined criteria for being a methodology. This factor alone accounted for 236 hits (31% of the 761) being rejected. Details of this issue and its impact on the SLR will be covered later. These statistics reinforce the assumptions made earlier about the body of knowledge, it's lack of homogeneity and type of evidence to be encountered.

Tables 3.3.1-2 and 3.3.1-3 provide an overview of the works retained for stage 2 (gap analysis) and stage 3 (methodologies review) respectively. The evidence contained in those works reviewed for the gap analysis was also carried over for use in the methodologies review as appropriate.

Table 3.3.1-2 Overview of Works Selected for Stage 2 (Gap Analysis)

| Title | Author | Date | Source |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------|----------------------------------|
| BPR vs. BPI: Contrasting two constructs | D. Bahn, D. Paper | 1998 | ISI Web of Knowledge |
| Methodology for business process improvement - a practical guide | T. S. Baines S. Adesola | 2000 | ISI Web of Knowledge |
| Structuring business process improvement methodologies | T. Bendell | 2005 | ISI Web of Knowledge |
| Comparative assessment of process improvement methodologies: a case study in the South African clothing industry | K. Ramdass | 2008 | ISI Web of Knowledge |
| The Foundations of Performance Improvement and Implications for Practice | R. Swanson | 1995 | Sage Journals Online |
| A decision aid for selecting improvement methodologies. | N. Thawesaengskulthai, J.Tannock, | 2008 | Business Source Complete (EBSCO) |
| Neely Gardner and Deming's Total Quality Management: Parallels and Connections | J. Wolf | 1992 | Business Source Complete (EBSCO) |
| Commonalities in reengineered business processes: Models and issues | J.Buzacott, | 1996 | Business Source Complete (EBSCO) |
| A review and comparison of six sigma and the lean organisations | T. Bendell | 2006 | Business Source Complete (EBSCO) |
| Role of TQM in business process improvement | C/OM/192 Norwich Union | 2010 | Google™ |
| Review of Business Process Improvement Methodologies in Public Services | Z. Radnor | 2010 | Google™ |
| The development of a best practice business process improvement methodology | B. Povey | 1998 | Emerald Journals |
| Integrating six sigma and theory of constraints for continuous improvement: a case study | I. Ehie, C. Sheu | 2005 | Emerald Journals |
| Critical thinking and business process improvement | A. Ayad | 2010 | Emerald Journals |

Table 3.3.1-3 Overview of Works Retained for Stage 3 (Methodologies Review)

| Title | Author | Date | Source |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------|----------------------------------|
| Methodologies for business process reengineering - The case of DFD versus OO | K. Siau | 1997 | ISI Web of Knowledge |
| An evaluation of BPR methodologies adopting NIMSAD a systematic framework for understanding and evaluating methodologies | T. Husein | 1999 | ISI Web of Knowledge |
| A generic approach for modelling business processes in BPR (Business Process Engineering) projects | L. J. Menzli | 2004 | ISI Web of Knowledge |
| The Practice of Business Process Reengineering to Become International Engineering Company | R. L. Dai | 2008 | ISI Web of Knowledge |
| Combining Six Sigma with Lean Production to Increase the Performance Level of a Manufacturing System | F. Aggogeri | 2009 | ISI Web of Knowledge |
| The Effectiveness of TQM: The Key Role of Organizational Learning in Small Businesses | Micaela Martínez-Costa, Daniel Jiménez-Jiménez | 2009 | Sage Journals Online |
| Reengineering works: Don't report, exhort | Mark Hughes | 2009 | Sage Journals Online |
| HY-CHANGE: a hybrid methodology for continuous performance improvement of manufacturing processes | Michele Dassisti | 2010 | Business Source Complete (EBSCO) |
| Empirical analysis of maintenance performance measurement in Belgian industries | Peter Muchiri, Liliane Pintelon, Harry Martin, Anne-Marie De Meyer | 2010 | Business Source Complete (EBSCO) |
| From value stream mapping toward a lean/sigma continuous improvement process: an industrial case study | Joseph C. Chen, Ye Li, Brett D. Shady | 2010 | Business Source Complete (EBSCO) |
| The Methodologies of NPI | Peter Grundy | 2007 | Business Source Complete (EBSCO) |
| An Overview of the Shainin System™ for Quality Improvement | Stefan H. Steiner, R. Jock MacKay, John S. Ramberg | 2008 | Business Source Complete (EBSCO) |

Table 3.3.1-3 (continued)

| Title | Author (Journal) | Date | Source |
|--------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------|-------------------------------------|
| Performance improvement: Towards a method for finding and prioritising potential performance improvement areas in manufacturing operations | International Journal of Productivity & Performance Management | 2004 | Education Research Complete (EBSCO) |
| Prioritization of key performance indicators: An integration of analytical hierarchy process and goal setting | Arash Shahin, M. Ali Mahbod | 2007 | Education Research Complete (EBSCO) |
| Business Process Change: A Guide for Business Managers and BPM and Six Sigma Professionals | Paul Harmon, Tom Davenport | 2007 | ScienceDirect (Elsevier) |
| Issues and Dilemmas Facing Organizations in the Effective Implementation of BPR | Ashley Braganza, Andrew Myers | 1996 | Wiley Interscience Journals |
| Developing and evaluating a methodology for business process improvement | S. Adesola, T. Baines | 2005 | ZETOC (British Library) |
| Developing a methodology for business process improvement | S. Adesola, T. Baines | 2000 | ZETOC (British Library) |
| A Super Methodology for Business Process Improvement - A Practical Guideline for HK/China Managers | K. T. Lee, K. B. Chuah | 1999 | ZETOC (British Library) |
| A business process improvement methodology which incorporates learning organization concepts | R. McAdam, S. McIntyre | 1997 | ZETOC (British Library) |
| Total Quality Management at Motorola | C/OM/268 | 2010 | Google™ |
| Business Process Improvement Toolbox | Bjrn Andersen | 2007 | Google™ |
| The Power Of Business Process Improvement | Susan Page | 2010 | Google™ |
| An integrated business improvement methodology to refocus business improvement efforts | Rodney McAdam | 1996 | Emerald Journals |
| A weakness determination and analysis model for business process improvement | Semih Coskun, Huseyin Basligil, Hayri Baracli | 2008 | Emerald Journals |
| SUPER improvements in business performance | Strategic Direction Vol. 18 | 2002 | Emerald Journals |

3.3.2 Characterization of Retained Information

All of the epistemological assumptions made earlier about the body of knowledge for the gap analysis stage were born out by the literature search. As expected, the research objectives were still an open issue. Only two works (Koch, 2011; Radnor, 2010) offered a substantial treatment of multiple BPI methodologies. Both took a survey approach of the methodologies and their overall effectiveness. This effectiveness was more a factor of the BPI initiatives than the BPI methodologies themselves. Neither of the authors examined all six methodologies nor attempted to discover the common key factors of those methodologies being studied. Koch (2011) failed to give a direct comparison of the methodologies. Instead, a synopsis of each methodology, its methods, its tools and its impact on the business was given. Radnor (2010) focused on those methodologies utilized in the public sector and offered a comparison of value adding attributes. According to evidence presented by Radnor, 85% of the relevant works she reviewed pertained to Lean (41%), Six Sigma (21%), BPR (10%), TQM (8%), Lean Six Sigma (4%) and Theory of Constraints (1%). This information was used later in the methodologies review stage to support identification of relevant BPI methodologies for analysis. The overall results of Radnor`s literature review in 2010 also supported the assumptions made earlier by finding that 89% of the relevant works found dealt with case studies, conceptual explanations, description of techniques and surveys. None analysed the methodologies by comparing or contrasting their contents.

Radnor`s (2010:9) review “draws conclusions from a literature review of BPI methodologies [regarding their] successes and shortcomings [as well as the] practicalities associated with using these methodologies”. The evidence presented by Radnor was neither an analysis of the concepts, constructs or components of the methodologies nor a cross translation or comparison of these. The work did, however, provide some insight into seven “business improvement techniques” in terms of their focus, benefits and areas of leverage to improving processes. Only four BPI methodologies were dealt with in any detail: Lean, Six

Sigma, BPR, and TQM. As stated in the 2010 review, Radnor explicitly ignored the Theory of Constraints (ToC) as a methodology.

In 2010, Radnor utilized an “expert panel” in addition to a literature review. This panel was composed of 28 experts in the field of business process improvement. The panel was a mixture of academics, practitioners and those who span the two. The input from this panel was noteworthy in two aspects. First was their recognition that “the number of publications within this topic was fairly limited” (Radnor, 2010:65). This condition coincided with the epistemological assumptions made earlier. Second was their response to Radnor’s (2010:90) question about what they would “describe as process improvement and efficiency methodologies”. Of the 22 responses mentioned, only four fulfil the criteria used in this thesis for being a methodology. The other 18 were also mentioned by only one or two respondents. Radnor did not state from which community any of these responses stemmed.

Radnor (2010:10) stated that “business process improvement methodologies are based on established tools and techniques” but failed to provide explicit definitions or delineation of these three terms. She alluded to the fact that there was a hierarchical difference and stated that tools were “usually focused at individual processes rather than at the system or organization level” (2010:10) – which seemed to imply that methodologies are focused on the later. All other works listed in Tables 3.3.1-2 and 3.3.1-3, like Radnor (2010), employ only implicit definitions of methodology, tool, technique, procedure, practice and construct. In spite of this, all works assumed a general appreciation for the word methodology that is aligned with this research. In 2010, Radnor tacitly excluded the 18 non-methodology (as defined in this thesis) responses from the expert panel by focusing only on four. Each of these four could be classified as methodologies. As already stated, after being recognized as a methodology, ToC was explicitly ignored in Radnor’s review. It should be noted that ToC was also not included in the methodologies examined by Koch in 2011. The reason for ToC’s

omission from these two significant works dealing with multiple BPI methodologies is still unclear.

Literature, other than Radnor's work in 2010, whose titles suggested that they compared or contrasted two or more BPI methodologies were either much more superficial in their evidence or deviated significantly from what their title implied. Bahn and Paper (1998) entitled their work "BPR vs. BPI: Contrasting Two Constructs", but focused on the systems and IT issues rather than on the actual components or composition of the methodologies. Aside from that focus and giving the chronology behind both BPR and BPI, most of the paper dealt with the radical approach of BPR versus the more incremental one of BPI. In Grünberg's paper, "A Review of Improvement Methods in Manufacturing Operations" it was stated that, "other than identifying the phases employed by the methodologies and the ways in which they are cyclical, it is difficult to compare them" (2003:90). His paper devoted less space to these comparisons than to introducing the historical development of process improvement approaches. In the middle of his paper, Grünberg (2003:92) explicitly stated that, "the purpose of this paper is to introduce a categorisation of performance factors and a measurement model". This objective did not appear to be aligned with the paper's title.

There were four other works whose titles indicated comparison of multiple methodologies (Ayad, 2010; Bendell, 2006; Ehie & Sheu, 2005; Ramdass & Pretorius, 2008). However, each fell short of the SLR's quest for evidence comparing BPI methodologies in terms of their constructs and components. Ayad (2010:556) focused on comparing tools or techniques and not methodologies. The work referred to Six Sigma and its '5-whys' methodology. Given that the 5-whys and "critical thinking" processes are considered by Ayad to be methodologies, it is unclear what he deemed Six Sigma to be. Bendell (2006) provided evidence of commonalities and deviations between Six Sigma and Lean, but did so at a seemingly philosophical level. He discussed their common roots, process orientation, cost reduction impact and even their common orientation toward left-brain thinking. His contrasts

appeared equally abstract. Bendell's paper in 2005, from which much of the content for his 2006 paper was drawn, added only high-level selection and application schemes for the two methodologies. Ehie and Sheu (2005) evaluated how two methodologies, ToC and Six Sigma, were complementary in somewhat more detail. They argued that the two methodologies follow the same basic sequence of events and that their unique orientations were valuable to attain a broader application. They suggested that, in their six-stage change sequence, there will naturally be a dominant and subordinated methodology. Their work provided some insight into the application sequence, although it could be argued that the identified sequence simply follows the scientific method outlined by Sir Francis Bacon in 1620. In 2008, Ramdass and Pretorius identified that various BPI methodologies appear to be in conflict with one another and proffered a comparative assessment of four methodologies. Their assessment was not directed at the components, but rather at the strategic focus taken by each methodology.

The literature review also found works which appeared to be promoting newly developed tools or techniques rather than examining BPI methodologies. One of these, Baines and Adesola (2000), was focused on giving evidence of new techniques to support BPI initiatives. The paper appears to assume Lean Management or Six Sigma was the methodology being applied. This was not explicitly stated. The work of Thawesaengskulthai and Tannock (2008) provided a set of selection criteria within an evaluation process which aimed to promote rational decision-making regarding improvement methodologies. They described and justified their decision aid without going into the structure or composition of the methodologies supported by the aid. Therefore, their work was also judged to be outside the needs of the SLR.

Several of the works reviewed in the gap analysis stage provided excellent evidence as to the background of the BPI movement in general and some methodologies in particular. In 1992, Wolf drew concise parallels between the works of Gardner and Deming. In doing so, a

clear background and foundation for the BPI movement were generated. This information was compiled for later use when presenting the research findings in Chapter 4.

The gap analysis literature review also discovered other evidence useful for later phases of the research. A work from 1996 by Buzacott examined the commonalities of reengineered processes without going into details of the methodology. The work's treatment of Hammer and Champy's (1993) nine original commonalities was a type of mathematical derivation and was only tangentially connected to the research. However, this work did predict a correlation which businesses and practitioners appeared to be discovering over a decade later. That is, "that the reengineering principles are most relevant when the task time variability is relatively high, typical of situations where the task involves cognitive capabilities rather than routine manual procedures" (Buzacott, 1996:781). It was further suggested that "they are probably more useful in office and service situations" (Buzacott, 1996:781). However, practitioners could argue that research and development (R&D) affords the best opportunities. Although these works provided no direct value to the gap analysis or possibly even the methodologies review, they did to the overall research on efficacy. Therefore, this evidence was retained for that phase of the research.

Of all works reviewed in the gap analysis stage of the SLR, one (Povey, 1998) was most striking. Povey's work appeared to be taking a constructivist's ontological position. Its approach to comparing methodologies was very similar to that being taken in the SLR's methodologies review stage. Finally, its synthesizing technique was also akin to that in the methodologies review. That is, Povey identified categories within the evidence and then used an interpretive aggregation to synthesize a single description of the evidence. In some aspects, the structure of Povey's work could have served as a model for the SLR's third stage and a portion of the synthesis activities. As such, Povey's technique was considered while designing the analysis and synthesis approaches.

There were, however, some credibility issues with Povey's 1998 paper in terms of its content. It could be argued that the work was biased, failed to adequately capture the BPI methodologies of the times, and that derived conclusions were based on a skewed table of reciprocal translations. The basis for the bias argument is two-fold. First, 20% of the identified "methodologies" stem from IBM. Povey was an IBM manager in the UK. Secondly, the introduction was heavily weighted toward benchmarking and, throughout the text, benchmarking was repeatedly positioned as an indispensable component of any valid BPI methodology. Povey never questioned this position and sufficient justification was not provided. This apparent bias may have been because the paper was published in the *Benchmarking for Quality Management & Technology Journal*. In regards to the 10 methodologies identified by Povey in 1998 via literature review, survey, and interviews, the names of Lean, Six Sigma, ToC and even TCT did not appear. This omission is rather striking since the publishing dates for each of these methodologies recognized by numerous other authors predate Povey's work by up to 20 years. As to Povey's conclusions, they appeared to be based on his tables wherein the methodologies were compared over multiple stages in their execution. A practitioner could argue that, at any given stage, like activities should be compared across the spectrum of methodologies. However, in Povey's table, at step four for instance, one methodology was at the "formulate proposals" phase and another was already occupied with "implementation and improvement". Later, in step seven, the first was finished with "implement proposals" and another was active with "select processes for improvement". This skewed table for reciprocal translations, coupled with the apparent bias and omitted methodologies appear to have led to some faulty conclusions. Povey (1998:43) stated that, "none of the methodologies in use were robust enough to be able to deliver sustained improvement" although the "Toyota/Nissan" methodology was listed in Povey's work. Povey's conclusion had to be questioned. The Toyota Production System is an application of Lean Management (Womack, Jones & Roos, 1990) and has proven, over the last 50 years, to

consistently improve Toyota's processes. It is so successful and sustainable that it has been the subject of numerous books and articles. Additionally, several automobile manufacturers and many of their tier 1 and tier 2 suppliers have modelled their process improvements on the work done at Toyota (Womack, Jones & Roos, 1990). The credibility of Povey's 1998 evidence was so much in question that the content of this paper (but not its synthesis approach) was ignored.

3.3.3 Summary

In concluding the gap analysis review, the author recognized that no amount of evidence can prove that the gap exists, but one shred of evidence could disprove it. Therefore, the evidence in the 801 works found via the literature review and a search of the author's voluminous BPI consulting library has only increased the probability that a gap against the research objectives still exists. These studies appeared also to have borne out the assumptions made about the assessable body of knowledge. It is important to point out that only 5% of the works found via the literature review were deemed relevant to the SLR. Of this 5%, only a third pertained to the gap analysis stage. It can be argued that issues of bias, credibility, undisciplined use of terminology, inappropriate titles and diversions into implementation factors plagued most of the papers. With two exceptions, Radnor (2010) and Koch (2011), the works averaged less than 9 pages of text each. Koch's 250 page book and Radnor's 94 page review were the only ones lengthy enough to identify and address the studied BPI methodologies in any detail.

In summary, Radnor's 2010 paper was one of two reviews that stood out from the rest. This study served as an excellent example of a literature review. In the review, the implicit meaning and understanding of the term 'BPI methodology' were also at par with those in this research. Radnor (2010) and Koch (2011) appeared, from a practitioner's perspective, to deliver a fair and objective treatment of the methodologies they examined. Unlike most authors, both did not give the impression that they were trying to "sell the subject matter" of

their texts. Although focused on the public sector, Radnor's review provided evidence relevant to both Stage 2 and 3 of the SLR.

The second review, Povey's 1998 paper, was in sharp contrast to Radnor's 2010 study. As stated earlier, it was short and judged to have significant biased content issues. However, Povey's work did have one salient feature – its approach. Its ontological position, approach to comparing methodologies and synthesising technique were very similar to those taken here and in the SLR's methodologies review as well as in the overall research and analysis processes.

The gap analysis literature review provided information regarding the body of knowledge that mandated changes to the research strategy, tactics and process. Those epistemological considerations involved the literature's quality, quantity and sources of research data. The review indicated that authors often confused methods, tools and techniques with methodologies. It also indicated that the literature alone would provide insufficient research data and that the available data would come primarily from sources other than articles and journals. As a result of these contextual conditions, two interview sets were planned - the first to gain evidence pertaining to the methodology compositions and the second to capture information regarding efficacy of key factors.

3.4 Literature Review: Methodologies Review

The most important objective of the SLR's third stage dealt with identifying and reviewing the set of current BPI methodologies. Completion of these activities enabled the identification of key constructs and components common amongst the methodologies. The actual synthesis of evidence pertaining to these key elements was performed after completing the SLR's stage three and the interviews pertaining to methodologies and their composition. The reason for this being that evidence from the literature review alone was insufficient and that from the interviews had to be considered in the synthesis process. Therefore, the detailed process steps, parameters and results of that synthesis activity will be given later in Chapter 4.

The epistemological assumptions about the targeted body of knowledge in this stage of the SLR and the ontological position of that information have been stated previously in Chapter 2.

3.4.1 Inclusion and Exclusion Criteria

The inclusion/exclusion criteria for evidence found in the methodologies review stage depicted in Table 3.4.1-1 is focused on the task of identifying and reviewing the set of current BPI methodologies. They were derived directly from the epistemological assumptions and the tactical approach for this stage of the SLR. Some clarification of Table 3.4.1-1’s content may be required. The first is the exclusion criteria for study types. Client listings, references, and testimonials for BPI methodologies were not germane to the methodologies review. Furthermore, works where the BPI theme was used as a lead into another consulting product were also excluded. The inclusion criteria for study types limited the considered works to those describing or explaining a methodology and excluded those comparing multiple methodologies. The later were already captured and considered in the gap analysis stage. Next, the same clarification as made previously for criteria listed under the application and improvement focus parameters in the gap analysis applied to the respective Table 3.4.1-1 entries. Lastly, the footnote has the same meaning as was detailed earlier for Stage 2 of the SLR.

Table 3.4.1-1 Inclusive/Exclusive Criteria for Methodologies Review

| Parameters | Inclusive Criteria | Exclusive Criteria |
|-------------------|---------------------------|-------------------------------------------------------------------------------------|
| Subject of work | BPI Methodologies | Non-BPI methodologies |
| Time frame | 1980 to present | Prior to 1980 |
| Language | English* | Non-English* |
| Study type | Declarative | Listings, comparative, explanatory or references and links to non-BPI methodologies |
| Geographic region | Triad | Non-triad |
| Application | General business | IT, Healthcare, Medicine, Pharmaceutical |
| Improvement focus | Process | Functional, organizational structure, strategy |

*German will not be excluded if an English translation is unavailable and all other criteria for inclusion are met.

3.4.2 Identifying the Methodologies to Be Examined

In order to ascertain which works would be reviewed and subsequently analysed, the BPI methodologies had to first be identified. Initially, candidates were selected from those singled out in the gap analysis review and from black literature available to the author. As noted in the description of the gap analysis review, while reviewing the literature in that stage, those practices characterized by their authors (or contributors) to be a “methodology” were noted and placed in the “identifiers” column of Table 3.4.2-1 as shown below. Those preliminary results were supplemented by findings from the current stage of the SLR.

A total of 48 candidates for selection as pertinent BPI methodologies were amassed for review in this methodologies review phase. As the footnote to Table 3.4.2-1 states, 13 of the 48 were purged from consideration and not listed in the table. These 13 practices, all suggested by members of Radnor’s (2010) expert panel, were judged, from a practitioner’s perspective, to simply be tools and techniques. It is noteworthy that, in her assessment of methodologies, Radnor tacitly dropped all of these 13 suggestions from her review also. Apparently, Radnor shared the author’s view that these candidates were not methodologies. This view was also supported by Jacka and Keller (2002) regarding one of the thirteen – business process mapping. Additionally, all of the 13 entries were listed as tools or methods in at least one of the BPI methodologies examined by Koch (2011): Unlike the other 35, these 13 did not undergo the full evaluation process.

Table 3.4.2-1 Overview of Practices to be considered in Stage 3

| Identifier(s) (Name and/or Acronym) | Relevancy Evaluation Criteria | | |
|---------------------------------------------------|-------------------------------|-------------------------|----------------|
| | (Process Focus) | (Taxonomy) | (Contemporary) |
| Benchmarking | Partially | Tool | Yes |
| BPM | Yes | TQM enhancement | Yes |
| BPR, Business Process Reengineering | Yes | Methodology | Yes |
| Breakthrough BPIM | Yes | 6 σ methodology | Yes |
| Balanced ScoreCard | Partially | Techniques | Yes |
| Business Excellence | Partially | EFQM status | Yes |
| DFD, Data Flow Diagram | Yes | Tool | Yes |
| DMAIC Methodology | Yes | Construct of 6 σ | Yes |
| EFQM (European Foundation for Quality Management) | Partially | Quality Standard | Yes |
| Elzinga Generic Model, BPE | Yes | BPR Methodology | Yes |
| Five S Methodology, 5S | Yes | Lean Component | Yes |
| H&W, Hardaker & Ward | Partially | No (R&D Tool) | Yes |
| HY-CHANGE | Yes | BPR Methodology | Yes |
| IBM 1992 | N/A | N/A | N/A |
| ISO 9000 | Partially | Quality Standard | Yes |
| JIT, Just in Time | Yes | TPS Construct | Yes |
| Kaizen, RIE | Partially | Lean Construct | Yes |
| K&M, Kaplan & Murdock Approach | Yes | BPR Methodology | Yes |
| <i>KLR</i> process improvement | Yes | BPR Methodology | Yes |
| Lean, Lean Management, TPS | Yes | Methodology | Yes |
| NPI | N/A | N/A | N/A |
| OO | N/A | N/A | N/A |
| O&M, Organisation & Methods | Partially | BPR Predecessor | No |
| PDCA, PDSA Cycles | Partially | Tool | Yes |
| POPI, Process of Process Improvement | Yes | TQM Methodology | Yes |
| Process Mapping | Yes | Tool | Yes |
| PVM, TCT | Yes | Methodology | Yes (as PVM) |
| Shainin System™ | No | Tool (6 σ , TQM) | Yes |
| Six Sigma, 6 σ | Yes | Methodology | Yes |
| SSM, Soft Systems Methodology | Partially | Tool | Yes |
| System Thinking | Yes | Tools | Yes |
| Theory of Constraints, ToC | Yes | Methodology | Yes |
| TQM | Yes | Methodology | Yes |
| TQS, Total Quality Standard | Partially | Quality Standard | Yes |
| Value Stream Mapping | Yes | Tool (Lean Mgmt.) | Yes |

Note: 13 practices listed as “methodologies” by only one respondent from Radnor’s (2010) expert panel were not listed. From a practitioner’s perspective, the evaluation and elimination of these as being non-BPI methodologies were judged to be too trivial. These recognizable tools and techniques are: gap analysis, root cause analysis, gathering information, Pareto analysis, brainstorming, team building, learning styles, thematic analysis, visual and environmental cues, capacity and demand analysis, measuring and measurables, problem solving, management and leadership capabilities.

All but four of the remaining 35 candidates listed in the table’s “Identifiers” column were collected from Radnor (2010) and Povey (1998). The rest came via a search of Conseil

GmbH's library (approx. 670 books and abstracts), its black literature (683,412 reports, memorandums and presentations) and input from the initial survey's panel of experts. Conseil GmbH is a German consulting firm specializing in business process improvement and turnaround projects with over 20 years of experience in the Triad and BRIC countries. Evidence regarding Process Value Management (PVM) and Total Cycle Time (TCT) was taken from works by Thomas (1994) and Finkenauer (1995). That for Balanced Scorecard was taken from works by Kaplan and Norton (1996 & 2001). Hybrids proposed by George (2002) and by Ehie and Sheu (2005) were not included since the components of a hybrid should reflect those of its parents. Other possible candidates were considered throughout the entire research process as they surfaced.

At this point in the research process, the first research question came into play: How might the core and fundamental BPI methodologies be identified out of a population which also contains methods, tools and techniques? Initial evaluation of the candidates was made on the basis of four criteria. The candidate had to have a business process improvement focus. It had to meet the defined criterion of being a methodology. The approach also had to be a unique methodology – not an offshoot of one or a hybrid of other methodologies. Lastly, it had to be contemporary, not superseded or abandoned. Those candidates that passed these four criteria and had the same or similar BPI philosophy were subjected to an additional analysis. This analysis involved examining their genealogical relationship, comprehensiveness and reputation. The objective of this additional analysis was to eliminate candidates that were duplicates, fads and non-comprehensive. Results of the candidate's ultimate evaluation are listed in columns two, three and four of Table 3.4.2-1. The reader should note that the second and third criteria results are grouped together in the third column. A total of six candidates (BPR, Lean, TCT, Six Sigma, ToC and TQM) passed all four of the evaluation criteria and the entire analysis. Each of these six methodologies has a different philosophy as to what drives business process improvement. These are:

Business Process Reengineering – radical process redesign reflecting new technologies

Lean Management – elimination of waste or non-value adding steps

Total Cycle Time – cycle time reduction

Six Sigma – error and variance reduction

Theory of Constraints – constraint management

Total Quality Management – workforce's ownership and involvement.

These six methodologies were subsequently scrutinized further for their composition.

3.4.3 Identifying and Selecting Composition Evidence

The second step in the methodologies review was to select evidence about each of these six BPI methodologies. The keywords shown in Table 3.4.3-1 were used along with their respective Boolean operator. Multiple pilot searches were made using more restrictive keywords, but these results were not acceptable. Acceptability was gauged using the 31 works found previously in the gap analysis stage as the minimum to be found in this SLR stage. Any pilot which failed to find these works was judged to be unacceptable and the keywords were subsequently modified. One of the major problems encountered was the inability for the search engines to delineate, using simple keyword searches, between the methodology's approach to the processes and the work's approach to the methodology. The only acceptable set of search parameters was the one of searching for individual BPI methodologies to the exclusion of the other five. This, however, resulted in an incredibly high number of hits to be evaluated.

Table 3.4.3-2 shows the results of the keyword searches by individual methodology. Excel spreadsheets with macros were used to eliminate 1481 of the original 2255 hits. This reduction was based on electronically matching off duplicates and eliminating superseded and non-current works. The residual 774 works were then filtered manually based on title, abstract and publishing date. Those of potential interest were read in more detail and screened. The screening process involved removal of duplicates and out-dated works not detected

electronically, as well as those not passing the screening parameters. Those parameters included adding to the understanding of the methodology’s constructs and components as well as being current. The remaining studies were those judged applicable to the selected methodologies in terms of content and being contemporary.

Table 3.4.3-1 Key Words for Methodologies Review

| Boolean operation | Key words and/or word groups |
|--------------------------|------------------------------------------------------------------------|
| Baseline Sting | (name of targeted BPI methodology) |
| And (Or) | methodology (methodologies), process improvement (BPI) |
| Not | (names of 5 BPI methodologies not being targeted), IT, medical, health |

Table 3.4.3-2 Summary of Search Results for Methodologies Review

| Targeted BPI Methodology (using multiple keywords and designators) | Hits | Filtered out Electronically | Screened out manually | Retained in Stage 3 for synthesis |
|-----------------------------------------------------------------------------------|-------------|----------------------------------------|--------------------------------------|--------------------------------------------------|
| BPR, Business Process Reengineering | 386 | 231 | 147 | 8 |
| Lean, Lean Management, TPS | 315 | 187 | 121 | 7 |
| PVM, (TCT), Process Value Management | 153 | 104 | 44 | 5 |
| 6σ, Six Sigma | 433 | 326 | 96 | 11 |
| ToC, Theory of Constraints | 297 | 254 | 37 | 6 |
| TQM, Total Quality Management | 671 | 379 | 277 | 15 |
| | | | | |
| Total | 2255 | 1481 | 722 | 52 |

Note: Without using the Boolean operators and their keywords, the Google™ search alone for the six methodologies were (8,030), (728,000), (253), (22,900,000), (810,000) and (36,000,000) respectively. These results are a rough indicator of the popularity and/or diversity of the individual methodology.

3.4.3.1 Volume and Relevancy Considerations

While considering evidence pertaining to the composition of the methodologies, questions had to be addressed regarding the number of studies to be examined further and how that number could be limited. Aside from the previously mentioned qualifying process based on the inclusion and exclusion criteria as well as the screening parameters being met, there had to be a means of limiting those candidates which passed the prerequisites. In 2005,

Dixon-Woods et al alluded to a process whereby consideration continues until saturation is reached - that is, until no new relevant information emerges. Their process lacked a rule for determining which study would be reviewed first. Since the studies to be reviewed were based on methodologies undergoing an evolutionary process, it appeared reasonable to use chronology when selecting the reviewing order. The same held true for the synthesizing order used later in the research. So as to avoid the proliferation of new constructs, components, terminologies and usages as the products evolve, a reversed chronological order was utilized. This technique for limiting the volume of considered evidence, based on saturation and applied in a reverse chronological order, reduced the workload by eliminating non-value adding evidence.

Relevancy was judged subjectively, starting with the most recent evidence being considered first. Older evidence was considered sequentially until a subjectively determined degree of saturation was reached. The search for relevant material over the respective methodology was discontinued when the gap between incremental relevant evidence exceeded five years of publishing. From a practitioner's perspective, the process cycle time between the publishing of one work and the publishing of an enhancement, off-shoot, or rebuttal is a maximum of 18 to 24 months. The five year span represented more than two of these cycles. Therefore, this time span was thought to provide more than an adequate safety margin.

3.4.3.2 Retention of Composition Data

The composition analysis within this phase of the SLR was limited to identifying the methodologies' components and tools as evidenced in the literature once the targeted methodologies had been identified. A process phase model similar to that given by König and Volmer (2008) was used to structure the marketing, selling and implementation of BPI methodologies. Each of the six identified methodologies were analysed using that framework. When available, their tools were listed in the respective tables as well.

Tables 3.4.3.2-1 and 3.4.3.2-2 show the process components and tools of TQM and Six Sigma respectively. TQM's components and tools listing were based on Juran's 2004 work and that of Jacowski in 2010. Identification of Six Sigma's components was supported by the works of Brue (2002), George (2002) and Bicheno & Catherwood (2005). The works of Bicheno & Catherwood in 2005 and Koch in 2011 provided tool lists for Six Sigma.

Table 3.4.3.2-1 Overview of the Total Quality Management Methodology

| Model-based Phase | Methodology-specific Constructs |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <u>Assessment</u> : Evaluation of the improvement potential | Not Specified |
| <u>Strategy creation</u> : Establish an overall plan considering financial and temporal requirements | Not Specified |
| <u>Deployment</u> : Establish an infrastructure that will drive the initiative, support the change and control the results | <u>NTG</u> (No Title Given): Employ cross-functional management for job enrichment and improved quality management |
| <u>Enlightenment</u> : Clarification to the workforce of their involvement in the initiative's objectives, approach and results. Objective is to inform and gain workforce buy-in. | <u>NTG</u> : Leverage quality circle to motivate and gain acceptance. |
| <u>Discovery</u> : Determine the specific change requirements, envisagement of consequences | <u>NTG</u> : Use FMEA to determine sources of quality problems and Ishikawa diagrams to find the root causes |
| <u>Justification</u> : Provide rationale for changes to management and the workforce. Objective is gaining support and reducing resistance. | <u>NTG</u> : Prioritize actions and improvements using Pareto analysis |
| <u>Implementation</u> : Effecting the specific changes – including elimination of former practices | Not specified |
| <u>Internalization</u> : Control improvements and conversion to new practices. Objective is assuring change permanency | <u>NTG</u> : Continuous Improvement Process (CIP) requires permanent quality issue identification and resolution |
| | |
| Tools: | Job enrichment, FMEA methods, Ishikawa diagrams, Pareto chart, EFQM Award, Deming Prize, ISO 9001:2008, Quality Circles, CIP |

Table 3.4.3.2-2 Overview of the Six Sigma Methodology

| Model-based Phase | Methodology-specific Constructs |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Assessment</u> : Evaluation of the improvement potential | Not specified |
| <u>Strategy creation</u> : Establish an overall plan considering financial and temporal requirements | <u>Executive Leaders</u> : The management team is responsible for initiating the six sigma initiative and committing resources to it. |
| <u>Deployment</u> : Establish an infrastructure that will drive the initiative, support the change and control the results | <u>“Belts”</u> : Establish an infrastructure of Champion (leader), Master Black Belts (trainers), Black Belts (full-time change agents) and Green Belts (part-time supporters). |
| <u>Enlightenment</u> : Clarification to the workforce of their involvement in the initiative’s objectives, approach and results. Objective is to inform and gain workforce buy-in. | <u>Executive Leaders</u> : These have the key task to publicly endorse the six sigma initiative and promote it throughout the organization. |
| <u>Discovery</u> : Determine the specific change requirements, envisagement of consequences | <u>“DMA” in DMAIC</u> : Define, Measure and Analyse the process to be improved |
| <u>Justification</u> : Provide rationale for changes to management and the workforce. Objective is gaining support and reducing resistance. | |
| <u>Implementation</u> : Effecting the specific changes – including elimination of former practices | <u>“I” in DMAIC</u> : Improve the targeted process |
| <u>Internalization</u> : Control improvements and conversion to new practices. Objective is assuring change permanency | <u>“C” in DMAIC</u> : Control the improvements and take remedial action as required. Repeat DMAIC on sub-optimized processes as required. |
| | |
| Tools: | Process mapping, XY Matrix, Measurement Systems Analysis, Process Capability Tool, Multivariate Study, Hypothesis Testing, FMEA, Design of Experiments, Control Plan, SPC Charts, Dashboard Charts, System of “Belts”, Pareto Analysis, Run Charts, Scatter Diagrams |

The analysis of the TQM and Six Sigma methodologies highlighted two salient points. First, it appears that both of them were initiated from a process control perspective. This orientation is possibly due to their roots being in the Deming era (Deming, 1986; Koch, 2011) and the improvement focus at the time of their conception (see Tables 3.4.4-1 and 3.4.3.2-3). Secondly, Brue’s (2002) position that TQM is a philosophy and that Six Sigma is essentially a methodology was one that required further consideration. It appeared that most authors such as Koch (2011) and Zink (2004), although not stating it so boldly, shared Brue’s (2002)

opinion about TQM. Reflecting on Table 3.4.3.2-1, it could be argued that TQM's lack of precise process steps and delineated terminology were indicators of its not being a defined BPI methodology. From a practitioner's perspective, the language used to describe TQM seemed to be more philosophy oriented than prescriptive. Therefore, the inclusion of TQM in the list of methodologies had to be questioned and examined further during the interviews and synthesis of all evidence.

Table 3.4.3.2-3 Key Principles for Management (Deming, 1986/2000:23-24)

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and stay in business, and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
3. Cease dependence on inspection to achieve quality. Eliminate the need for massive inspection by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move towards a single supplier for any one item, on a long-term relationship of loyalty and trust.
5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of overhaul, as well as supervision of production workers.
8. Drive out fear, so that everyone may work effectively for the company.
9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.
10. Eliminate slogans, exhortations, and targets for the work force asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.

11. a. Eliminate work standards (quotas) on the factory floor. Substitute leadership.
b. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.
12. a. Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.
b. Remove barriers that rob people in management and in engineering of their right to pride of workmanship.
13. Institute a vigorous program of education and self-improvement.
14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

Tables 3.4.3.2-4 and 3.4.3.2-5 depict the composition and tools of the Total Cycle Time and Theory of Constraints methodologies respectively. The works of Thomas (1990, 1991 & 1992), Finkenauer (1995) and Koch (2011) provided both process components and the list of tools for Table 3.4.3.2-4. These were supported by the work of Jennings and Houghton (2000) as well as the black literature of Conseil GmbH. A point worth noting is that the process's components appear to be well defined, delineated from one another and follow the process model very closely. ToC components and tools (Table 3.4.3.2-5) were identified solely from the works of Goldratt (1985 & 1990). Goldratt was the methodology's creator and sole IP owner. Goldratt's language, terminology and overall process structure were sometimes confusing and required multiple readings in order to fully comprehend his meanings. One example is his principle of "evaporating clouds" – a term not found anywhere else in business literature. Synthesis of the ToC evidence was even more difficult than the terminology was to comprehend.

The process component breakdowns and tool lists for the last 2 methodologies, BPR and Lean Management, were recorded in Tables 3.4.3.2-6 and 3.4.3.2-7 respectively. Information in Table 3.4.3.2-6 was presented by Hammer & Champy (1993), Koch (2011) and Hammer (2001). Although the process steps were not sharply delineated through names or

terminology, the activities and objectives of each were. The Lean Management methodology's components and tools shown in Table 3.4.3.2-7 were derived from studies by Bicheno & Holweg (2009), Womack, Jones, and Roos (1990), and Womack & Jones (2003). The work of Bicheno & Holweg provided a clear overview of the tools which were substantiated by the other two works. The lack of terminology and clear delineation within the pre-implementation process steps is, from a practitioner's perspective not unusual. These steps are heavily influenced by the sales and market functions of the consulting firm providing the service and/or the client's top management wherein the BPI initiative is being done.

Table 3.4.3.2-4 Overview of the Total Cycle Time Methodology

| Model-based Phase | Methodology-specific Constructs |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Appraisal</u> : Evaluation of the feasible optimization landscape | <u>Macro-assessment</u> : High-level assessment of the process and financial improvement potentials |
| <u>Strategy creation</u> : Establish an overall plan considering financial and time requirements | <u>CEO Workshop</u> : Four-day, off-site workshop for the CEO and the direct reports with team building and hands-on training in the methodology. Team creates a list of barriers, vision of entitlement and top-level action plan. Team establishes commitment to the financial and time requirements. |
| <u>Deployment</u> : Establish an infrastructure that will drive the initiative, support the change and control the results | <u>Deployment</u> : Setting up the BIT (Business Improvement Team) and chartering them as owners of business improvements. Setting up CFTs (Cross-Functional Teams) and chartering them as process owners. |
| <u>Enlightenment</u> : Clarification to the workforce of their involvement in the initiative’s objectives, approach and results. Objective is to inform and gain workforce buy-in. | <u>Inspiration</u> : Perform training and workshops on a “pull” basis for those directly involved in the infrastructure - BIT, CFTs, BRTs (Barrier Removal Teams). Communicate to the workforce at large about the initiative and their contribution to the effort. |
| <u>Discovery</u> : Determine the specific change requirements, envisagement of consequences | <u>Identification</u> : Actualize the barriers (to entitlement attainment) and estimate the effort requirements & impacts of removal. Prioritize barrier removal and create an action plan. |
| <u>Justification</u> : Provide rationale for changes to management and the workforce. Objective is gaining support and reducing resistance. | <u>Information</u> : Provide actualized hierarchical Cockpit Charts to the respective organization levels - BIT, CFTs, and workforce. Baseline, entitlement and forecast is explained and justified. |
| <u>Implementation</u> : Effecting the specific changes – including elimination of former practices | <u>Implementation</u> : Perform the process changes, control removal of substitute processes and drive financial improvements |
| <u>Internalization</u> : Control improvements and conversion to new practices. Objective is assuring change permanency | <u>Institutionalization</u> : Manage the business culture change for process optimization, financial improvements and increased business competitiveness |
| | |
| Tools: | CEO Workshop, BIT, CFT, BRT, Pull-Training, Push-Communication, Cockpit Charts, Vision of Entitlement, 5Is Process, Fishbone Analysis, Link Charts, Time-based Process Mapping, Barrier Removal Charts, Action-in-Process Management, KPI drivers (CT, First-Pass-Yield, On-Time) |

Table 3.4.3.2-5 Overview of the Theory of Constraints Methodology

| Model-based Phase | Methodology-specific Constructs |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Assessment</u> : Evaluation of the improvement potential | <u>Executive decision making workshop</u> : A 2-day workshop with the heads of all functions. Deliverables are ToC training, consensus on the core problems, analysis using the Effect-Cause-Effect method, and appreciation for the Socratic method to enhance learning |
| <u>Strategy creation</u> : Establish an overall plan considering financial and temporal requirements | |
| <u>Deployment</u> : Establish an infrastructure that will drive the initiative, support the change and control the results | <u>Process selection</u> : Choose process to be analysed and improved |
| <u>Enlightenment</u> : Clarification to the workforce of their involvement in the initiative’s objectives, approach and results. Objective is to inform and gain workforce buy-in. | <u>Training</u> : Provide the organization with ToC training |
| <u>Discovery</u> : Determine the specific change requirements, envisagement of consequences | <u>Identify the system’s constraints</u> : Identify and prioritize the constraints according to their impact on the goals |
| <u>Justification</u> : Provide rationale for changes to management and the workforce. Objective is gaining support and reducing resistance. | <u>Decide how to exploit the system’s constraints</u> : Determine how to manage the constraints and the system’s resources |
| <u>Implementation</u> : Effecting the specific changes – including elimination of former practices | <u>Subordinate everything else to the above decision</u> : Determine a way to reduce the constraints limiting impact. Elevate the system’s constraint: Continuously elevate the constraint until it is broken and another constraint will limit. |
| <u>Internalization</u> : Control improvements and conversion to new practices. Objective is assuring change permanency | <u>If in the previous steps a constraint has been broken, go back to step 1</u> : When the process limitation has shifted to another constraint, return to the “Identify the system’s constraints” step and repeat the “five steps of focusing”. |
| | |
| Tools: | Five steps of focusing, Effect-Cause-Effect analysis, Evaporating Clouds, Executive decision making workshop, Socratic teaching method |

Table 3.4.3.2-6 Overview of the Business Process Reengineering Methodology

| Model-based Phase | Methodology-specific Constructs |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Assessment</u> : Evaluation of the improvement potential | <u>NTG</u> (no title given): Create a Case for Action to show why the company must reengineer. Create a Vision Statement to quantitatively and qualitatively describe how the organization should operate, detail the kind of results it must achieve and how the change will be measured. |
| <u>Strategy creation</u> : Establish an overall plan considering financial and temporal requirements | |
| <u>Deployment</u> : Establish an infrastructure that will drive the initiative, support the change and control the results | <u>NTG</u> : Establish a Leader, a Process Owner, a Reengineering Team, a Steering Committee and a Reengineering Czar to manager appropriate aspects of the initiative. Compress the processes horizontally by implementing Case Workers or Case Teams appropriately. |
| <u>Enlightenment</u> : Clarification to the workforce of their involvement in the initiative’s objectives, approach and results. Objective is to inform and gain workforce buy-in. | <u>NTG</u> : Communicate the need, objectives and approach to the workforce |
| <u>Discovery</u> : Determine the specific change requirements, envisagement of consequences | <u>NTG</u> : Understand and measure the existing processes. Identify areas of leverage. Use brainstorming, inductive thinking, and a green field approach to design and build prototype of new processes. |
| <u>Justification</u> : Provide rationale for changes to management and the workforce. Objective is gaining support and reducing resistance. | Not Specified |
| <u>Implementation</u> : Effecting the specific changes – including elimination of former practices | <u>NTG</u> : Implement new processes |
| <u>Internalization</u> : Control improvements and conversion to new practices. Objective is assuring change permanency | <u>NTG</u> : Control the progress against the vision statement |
| Tools: | Case for Action, Vision Statement, Brainstorming, Green-field approach, Job Enrichment, Benchmarking, Leader, Process Owner, Reengineering Team, Steering Committee, Reengineering Czar, Case Teams, Inductive thinking, Process mapping |

Table 3.4.3.2-7 Overview of the Lean Management Methodology

| Model-based Phase | Methodology-specific Constructs |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u>Assessment</u> : Evaluation of the improvement potential | <u>NTG</u> (no title given): Appraisals and estimations activities are driven by the individual practitioner’s sales process and/or top management’s expectations |
| <u>Strategy creation</u> : Establish an overall plan considering financial and temporal requirements | <u>NTG</u> : Top management create a consensus on the commitment, the project infrastructure and then communicate these to the whole organization |
| <u>Deployment</u> : Establish an infrastructure that will drive the initiative, support the change and control the results | <u>NTG</u> : Most practitioners use a deployment phase to identify the process improvement priorities and set up the implementation teams (5 to 7). |
| <u>Enlightenment</u> : Clarification to the workforce of their involvement in the initiative’s objectives, approach and results. Objective is to inform and gain workforce buy-in. | <u>Lean training</u> : Blanket training of the workforce is used to clarify the project parameters and principles. A Senpai & Kohai (Senior & Junior) approach is used to leverage cycles of learning. |
| <u>Discovery</u> : Determine the specific change requirements, envisagement of consequences | <u>Muda, Muri, Mura</u> : These 3 lean principles target the reduction of wastes, flow levelling, and lessening the amount of overburdening. Time and motion studies are often leveraged to detect improvement potentials. Cost reduction is often the basis for justifying change. |
| <u>Justification</u> : Provide rationale for changes to management and the workforce. Objective is gaining support and reducing resistance. | |
| <u>Implementation</u> : Effecting the specific changes – including elimination of former practices | <u>5S Process</u> : Seiri (Sort) deals with removing unnecessary tools, items, etc. from the workplace. <u>Seiton</u> (Set in Order) structures the workplace to provide efficiency and effectiveness. <u>Seiso</u> (Shine) insures that the workplace is clean. <u>Seiketsu</u> (Standardize) deals with optimizing and standardizing the work process. Pilot projects are commonly used to test implementation of foreseen changes and then a rollout is done to the rest of the organization, <u>Shitsuke</u> (Sustain) strives to change the workplace culture into one of continuous improvement and maintaining high standards. |
| <u>Internalization</u> : Control improvements and conversion to new practices. Objective is assuring change permanency | |
| | |
| Tools: | Value Stream Mapping, Five S, Kanban (pull systems), poka-yoke (error proofing), kanban, Heijunka box, JIT, <u>autonomation</u> (smart automation), Senpai/Kohai (senior/junior), <u>Sensei</u> (using experts) Kaizen (CIP), PDCA (or PDSA), Muda (waste reduction), Genchi Genbutsu (see glossary) |

3.4.4 Summary

Collectively, the information in Tables 3.4.3.2-1, -2, -4, -5 -6 and -7 provided the structure and input for the final synthesis activities. Prior to that synthesis, the first interview set (methodologies composition) was required to fill the voids in the data. The process of synthesizing the combined findings required a detailed assessment of the methodologies, their implementation process and a means of data compression and analysis. That detailed assessment and final synthesis were outside the scope of the literature review because of the required input from the IP owner and practitioner interviews. Therefore, the final examination regarding the composition of the six BPI methodologies was completed after the set of interviews focused on methodology composition. Details of this examination and its results are given later in Chapter 4.

There were three broad suppositions drawn as a result of this second SLR phase. The first focuses on the history of business process improvement. The entries in Table 3.4.4-1 are important because they depict not only the chronology, but also the linkage in the development of business process improvement concepts. Analysis of the evidence seemed to indicate that the first two methodologies (TQM and Six Sigma) were process control based and rely heavily on statistics and statistical control tools. One could also argue that the last two (BPR and Lean Management) were operations based and deal with the process improvement from an organizational perspective. This linkage could be taken as a possible general development path for BPI methodologies. Practitioners would likely view Six Sigma as the dominant methodology coming from the control side and Lean Management as that coming from the organizational one. In support of this, they would possibly note the recent attempts to merge the two by creating an implementation process that “wraps the best of Lean ... around a Six Sigma infrastructure” (George, 2002:62). The possibility of this developmental path and the linkages were taking into consideration in subsequent research activities.

Table 3.4.4-1 Chronology and Genealogy of Key BPI Events

| Event | Chronology | Genealogy | Contributor |
|---------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Founding (documenting) the modern scientific method | 1620 | Inspired by works of Alhazen, Galileo, et al. | Sir Francis Bacon |
| Introducing the ground work for Total Quality Management (see Table 3.4.3.2-3: Deming’s 14 key principles for management) | 1950 | Inspired by Walter A. Shewhart’s statistical process control approaches (Shewhart, 1986) | William Edwards Deming |
| Development of Just-in-Time manufacturing (later expanded and renamed the Toyota Production System) | 1948-1975 | Inspired by W.E.Deming as well as processes at Ford Automotive and “Piggly Wiggly” supermarkets | Taiichi. Ohno at Toyota |
| Start of Six Sigma movement | 1986 | Inspired by work of Shewhart, Deming, Juran, Ishikawa, Taguchi | Bill Smith at Motorola |
| Start of Time-Based Management movement: “Time-The Next Source of Competitive Advantage”, <i>Harvard Business Review</i> | 1988 | Inspired by the work of Japanese firms with Cycle Time reduction (esp. combined process of R&D & new product launch) | G. Stalk Jr, |
| Introducing Theory of Constraints | 1990 | Elaboration of the principles presented in his book “The Goal” printed in 1985 | Eli Goldratt |
| Introducing Business Process Reengineering | 1990 | Observed businesses trying to automate bad processes without optimizing these processes first | Michael Hammer, Prof. Computer Sc. |
| Start of Lean movement: “The machine that changed the world” | 1990 | An account of Just-in-Time and the Toyota Production System approaches | Womack, J. Jones, D. & Roos, D. “Lean” term was coined by John Krafcik (1988) |

The second inference dealt with TQM appearing to be an enigma when compared to the other five. Practitioners and authors (e.g. Zink, 2004) tended to view TQM more as a driver of quality standards such as International Standards Organization (ISO) and European Foundation for Quality Management (EFQM) than as a competitive BPI methodology. This view appeared to be held by many other authors as well. This, coupled with the superficial handling of the TQM process and the lack of crisply defined nomenclature, placed in question

the inclusion of TQM as one of the studies to be analysed further in the research. This issue had to be strongly considered during the interview research phase.

The final deduction was that the research task of synthesizing the evidence for common key factors would be hampered by the broad spectrum of nomenclature and the lack of consensus regarding like terminology such as project, methodology and strategy. The process would also be complicated by the fact that the synthesis would have to consider practitioners' input and interpretation as well as evidence from this literature review. This additional input presented a risk of having an even broader spectrum of nomenclature and terminology. These issues had to be considered with respect to answering the second research question: How may the key factors within these unique methodologies be identified, analysed and synthesized for commonality? Details of how this question was resolved will be given later in Chapter 4.

3.5 Literature Review: Efficacy Review

Evidence regarding efficacy (efficiency, effectiveness, value-added throughput or benefit) of methodology components were captured when they were encountered in any stages of the SLR, panel discussions or interviews. The activity of collecting such evidence during those processes was supplemental to the identification of BPI methodologies and their composition elements. During those phases, it would have been neither logical nor efficient to explore the efficacies of all elements, factors, components and constructs named in association with any of the numerous methodologies mentioned. Instead, a tactical approach was taken to identify the current methodologies first, their common key factors second and then explore the efficacy drivers behind only those factors found to be common to all methodologies. At the end of this sequence, an interview set was devoted to confirming, augmenting, clarifying and placing the amassed data in the proper context.

Ultimately, insight into each of the common factors and understanding their respective efficacy drivers was drawn from the combination of interviews, literature research and

personal experience. The final interview set, focused on the impact of the common key factors previously established, included both BPI professionals and experts external to the BPI field. As part of that set, a series of three focused interviews were made with human resource experts and an industrial psychologist. Concurrent with the interviews in this set, focused literature reviews were carried out to prepare for the interviews, fill voids in the evidence and provide the author with an understanding of the efficacy subject matter, nomenclature or terminology. The knowledge coming from the author's nearly 45 years of business experience and, in particular, 24 years of business process improvement practice and completion of 39 BPI initiatives provided further evidence for gap closure. Additionally, Conseil GmbH's black literature was consulted for evidence regarding efficacy drivers. This activity was not only a gap closure exercise but also one to assure validity, coverage and a degree of bias control.

In total, a very small percentage of the knowledge regarding efficacy of key factors was derived from literature research. The author feels that there are two major reasons for this. First, the literature tended to not be significantly concerned with the structure and composition of the BPI methodologies. Instead, there appeared to be a preference for discussing methodologies in terms of their value and impact on BPI initiatives. Consequently, efficacy type evidence primarily focused on the strategic and tactical levels of the methodology in relationship to BPI initiatives. The second major reason is that efficacy knowledge pertaining to elements of a methodology is an intellectual property which BPI professionals prefer not to share. Instead, it is safer and more lucrative to highlight the methodologies impact on business processes.

Findings regarding efficacy of key factors common amongst the methodologies studied will be presented in Chapter 4 as part of the overall research findings. These findings are presented in the context of the individual factors and those factors as a system. For the latter, a modelled BPI methodology was created using the common key factors.

3.6 Summary

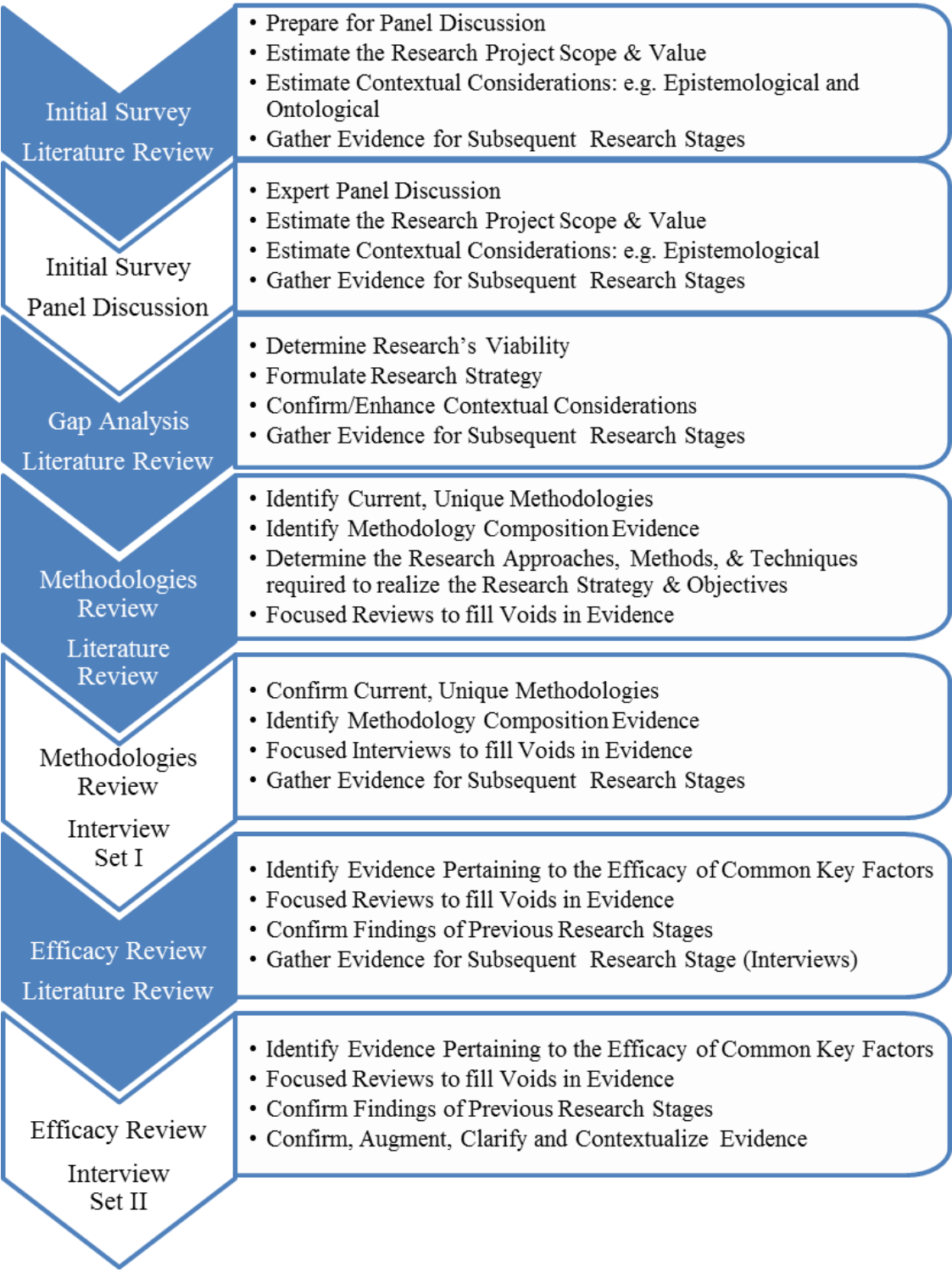
The volume of relevant information discovered during the individual literature review stages varied considerably. That for the initial survey was sufficient to prepare for the panel discussion. During the gap analysis, sufficient evidence was also found to determine that the research questions were yet unanswered and that the research had merit. There was an excessive volume of evidence found regarding identification of BPI methodologies.

Unfortunately, the bulk of this evidence was not relevant since it dealt with methods, tools and techniques instead of complete methodologies. The volume of evidence pertaining to the constructs and components of BPI methodologies was very limited and often quite vague.

Because of this, the need to have an interview set focused on methodology composition was mandated. Likewise, since the evidence found during the literature review's last stage was insufficient, an interview set focused on determining the efficacy and value of the common key factors was necessitated. Ultimately, evidence gathering was a combination of literature reviews, panel discussions and multiple interview sets. The sequencing of those activities is again depicted in Figure 3.6-1.

It could be argued that issues of bias, credibility, undisciplined use of terminology, inappropriate titles and diversions into implementation factors plagued most of the works found. Statistics taken during the gap analysis stage of the SLR support this argument. Of the 761 works removed from consideration, approximately 14% were filtered out because they actually dealt with non-process improvement initiatives (particularly strategic or marketing ones) and only mentioned BPI themes in passing. Another 21% of the works were filtered out due to the fact that they were concerned solely with implementations of BPI methodologies and not the methodologies themselves. Those which addressed the methodology and its implementation, such as Radnor (2010) were retained.

Figure 3.6-1 Overview of Evidence Gathering Sequence (repeated)



Another 22% of the excluded were not retained because they dealt with industry, business or product specific themes rather than comparing or analysing methodologies. The largest single factor for screening out a hit was that the subject matter did not meet the defined criteria for being a methodology. This factor alone accounted for 236 hits (31% of the 761) being

rejected. The issues of bias and credibility surfaced only after this initial screening and while reading the retained works in detail.

The author noted that evidence discovered during the SLR stages came primarily from sources other than journals and articles. The author feels that these sources focused more on application of methodologies and its utility or value. Journal authors appeared to focus on “case studies” highlighting the utility of the methodology, its applications, limitations, and very little on methodology composition or efficacy of key factors within the methodology. The overall results of Radnor`s literature review in 2010 support this conjecture by finding that 89% of the relevant works found dealt with case studies, conceptual explanations, description of techniques and surveys. None analysed the methodologies by comparing or contrasting their contents. It could be argued that examination of methodologies at the component level or comparing them at that level of detail is an inappropriate topic for journals and articles. Inappropriate in that those topics are complex and that, in order to adequately develop the arguments, the works would be too long for such sources. Koch`s 250 page book and Radnor`s 94 page review were the only ones lengthy enough to identify and address the studied BPI methodologies in any detail.

Two major research findings can be attributed primarily to the literature reviews. The first stems from the gap analysis stage which showed that the research objectives are still open issues and that the research has merit. The second comes from the methodologies review stage of the SLR wherein six BPI methodologies were identified as being unique and current. This identification fulfilled the first research objective. Fulfilment of the other three research objectives and their related three thesis goals required evidence from outside the literature reviews and therefore will be reported in Chapter 4.

Evidence gained from the literature reviews enabled resolution of the procedural (but not content) portion all three research questions. With regards to the first research question, it substantiated the author`s process of subjective evaluation based on inclusion and exclusion

criteria. The literature review played a more significant role in answering the second research question: How may the key factors within these unique methodologies be identified, analysed and synthesized for commonality? The literature provided a technique for comparing and compressing composition evidence across the six methodologies. This technique, borrowed from meta-ethnography, enabled identification of common key factors amongst the six methodologies. As with the first research question, the literature findings supported resolution of the last research question: How might the resulting common key factors be analysed and described in terms of their efficacy and added value to the implementation of a BPI methodology? It substantiated both the analysis process and the means of describing the results. Details regarding the overall resolution of the three research questions will be given later in Chapter 4.

The final set of contributions made by the literature reviews to the research strategy and tactics was presented in Chapter 2. The literature provided insight into the topics of cross-sectional studies, qualitative research, inductive reasoning, radical inquiry and research ethics. Findings in the literature reviews enabled the author to determine the epistemological assumptions, and ontological positioning as well as to select the appropriate processes for comparing, compressing, analysing and synthesizing the research evidence.

CHAPTER 4: RESEARCH FINDINGS

4.1 Introduction

The overall research findings deal with more than just the subject matter (methodologies and their composition) of this thesis. As depicted in Figure 4.1-1, those findings also dealt with formation of the research concept and issues concerning the research execution. The results of those findings were reported in Chapter 2. Additionally, their linkage into the literature review was covered in Chapter 3. Chapter 3 also contextualized as to how the first research objective was attained. These descriptions found in Chapters 2 and 3 are not restated or summarized here in Chapter 4.

Figure 4.1-1 Breakdown of Overall Research Findings



Chapter 4 focuses on reporting the research findings regarding the attainment of the four research objectives, resolution of the three research questions and attainment of the three thesis goals. In doing so, the respective contextual considerations will be stated. That is, the

selection of utilized methods, tools and techniques will be justified. Additionally, the research and analysis processes will be explained. The following sections roughly follow the chronological sequence of the research events.

4.2 Initial Survey

In August 2010, an open, web-based conference dealing with the commonality amongst BPI methodologies and the importance of those elements was held. The purpose of this survey was to enable an estimation of this thesis's project scope and the utility of its goals. The author had posted an open invitation to BPI methodologies' stakeholders on three websites dealing with BPI activities. Included in this invitation was a synopsis of the original drafts of the thesis goals, and research objectives as well as the preliminary inclusion and exclusion criteria. A list of possible keywords and "uniform resource locators" for web searches was also provided. Participants were asked to voluntarily prepare themselves for a 30 minute panel discussion. Participation was voluntary and anonymous. Notes were taken during the meeting but the session was not recorded. The meeting, attended by seven participants, was truncated after 45 minutes due to time constraints and a consensus among panel members that further discussions would be non-value adding.

4.2.1 Identification of Current BPI Methodologies

The panel, as a whole, felt that there were numerous commonalities amongst the various BPI methodologies. Although no one disputed this, there was a lack of consensus on which BPI concepts were actually stand-alone and sustainable BPI methodologies. When asked to identify what they considered to be classifiable as a BPI methodology the following list was proffered; Lean Management, Toyota Production Systems, Bosch Production Systems, Kaizen, Total Quality Management, Total Cycle Time, Process Value Management, Theory of Constraints, Six Sigma, Lean Six Sigma, Business Process Reengineering, Business Process Management, and Balanced Scorecard. Subsequent to brainstorming this

list, Bosch Production Systems, Lean Six Sigma and Balanced Scorecard were disqualified as unique BPI methodologies. Since Bosch Production Systems was modelled after the Toyota Production Systems (TPS) and, reportedly, utilized TPS consultants, it was thought not to be a stand-alone methodology but rather an application of the Toyota Production System.

Likewise, Lean Six Sigma was also judged not to be a stand-alone methodology since it was a hybrid of two fundamental methodologies. The participants concluded that balanced scorecard was better classified as a method or tool for establishing and tracking KPI's than as a unique methodology. Furthermore, although again not a consensus, the panel expressed concern over the closeness of Lean Management, Toyota Production System and Kaizen as well as that between Total Cycle Time and Process Value Management. They questioned whether this closeness indicated the lack of uniqueness or excessive commonality. This was an issue that had to be dealt with later in the literature review.

The culling requirements as well as the parameters and justifications used by the panel were as helpful as the final list of methodologies. The need for screening candidates indicated that, when attempting to identify the current sustainable methodologies, a mixture of tools, techniques, methods and off-spring methodologies would be encountered. This situation helped form the basis for the epistemological assumptions. This issue also suggested that a clear definition of a BPI methodology had to be made as well as a disciplined selection process. The parameters and justification applied in the survey were useful in creating that definition and determining the process. Ultimately, all of these factors gave rise to the first research question: How might the core and fundamental BPI methodologies be identified out of a population which also contains methods, tools and techniques? Resolution of this question was highlighted in Chapter 3 and is detailed in a later section of this chapter on research findings.

4.2.2 Identification of Common Key Factors

An attempt to list concepts and constructs thought to be common amongst the methodologies was hampered by the participants' use of different terminologies and their mindsets being at different levels of detail. Nevertheless, the following list was captured; project management, teamwork, KPI measurement systems and cross-functional approach. Once listed, it was argued that the last three entries were all components of the first. The panel thought that the real commonality was in the fact that all methodologies utilized sound project management. This line of argumentation was not pursued further in the discussions.

4.2.3 Research's Contribution to Practice

Not having closure on the common elements amongst the methodologies, discussions regarding efficiency and effectiveness shifted to the methodology level. In particular, the focus was on how this research could improve the effectiveness or efficiency of applying any given methodology. In other words, how might the research impact the barriers to a successful BPI initiative? The panel's responses were noted and presented here as they were proffered – without qualification, evaluation or prioritization. As such, the following list was gleaned from the ensuing panel discussions;

1. Business managers do not understand the time requirements for the improvements they want. The higher their sense of urgency, the more they filter out talk about prolonged engagements. Consultants, focused on getting a signed contract, sense this condition and forgo discussions of the true time requirements. Alternatively, they too may not have an appreciation for the time requirements.
2. Business managers do not understand the magnitude of the changes required. Their paradigm is that the task is finished once the change has been endorsed by management, documented and communicated to the workforce. They do not understand the need for the workforce to internalize the changes. Again, consultants are negligent in either not

understanding these issues themselves or not correcting these misunderstandings by their clients.

3. Business managers do not understand what has to change. They focus on overcoming the symptoms and not on eliminating the root causes. This orientation fits their paradigm of quick fixes and minimal effort. Here, experienced consultants cannot feign ignorance. Therefore, if they do not drive for removing the root causes, they are shirking their responsibilities.
4. Business managers do not understand how things have to change. This situation deals less with the change process itself but more with how the elements to be changed are linked into the process or organization. They look for point or spot solutions when holistic ones are required. This fault is analogous to installing a high performance engine in a vehicle without consideration for the rest of the drive train or even the structural design of that vehicle. Consultants who are ignorant of the interdependencies are not true process consultants. Process consultants who do not correct management's lack of understanding are simply too hungry for a contract.
5. Business managers do not understand the drivers against change. This foible usually goes beyond people's resistance to change and involves hidden drivers such as functional-based KPI's or cultures that prevent the internalization of changes. Consultants would take a superficial approach to implementing BPI methodologies also do not understand these drivers or ignore them for the sake of a contract.
6. Business managers are unable to compare BPI methodologies with one another. They must rely on references or testimonials for the methodology and rapport with the consultants. Buzzwords, marketing hype, unsubstantiated claims and tautological messages enshroud the methodologies in mystique and fog. The buyer simply cannot see through all this haze – there's a definite lack of transparency. On the other hand,

consultants promote this mystique so as to gain an impression of uniqueness and thereby, a marketing advantage.

4.2.4 Summary

The panel concluded that, with all likelihood, the thesis goals had not yet been satisfied and that the business community could benefit from a demystification of the BPI methodologies. The panel also felt that the scope of this research was neither trivial nor outside the range of a thesis.

4.3 Literature Reviews

Details of the findings stemming from the four stages of the systematic literature review were presented in Chapter 3. For the sake of brevity, those findings will not be repeated here. For the sake of continuity, a synopsis of the summarized findings will be given instead. This synopsis is sequenced according to the subject matter, research concept and research execution elements depicted in Figure 4.1-1.

Regarding subject matter, two major research findings can be attributed directly to the literature reviews. The first being that the research objectives are still open issues and that the research objectives have merit. The second outcome was fulfilment of the first research objective by identifying six BPI methodologies as being unique and current. These six currently practiced families of BPI methodologies were represented by Total Quality Management (TQM), Six Sigma (6σ), Total Cycle Time (TCT), Business Process Reengineering (BPR), Theory of Constraints (ToC) and Lean Management. This finding came with a caveat. TQM appeared to be an enigma when compared to the other five. Authors such as Zink (2004) tended to view TQM more as a driver of quality standards such as International Standards Organization (ISO) and European Foundation for Quality Management (EFQM) than as a competitive BPI methodology. These views, coupled with the literature's superficial depiction of the TQM process and its lack of crisply defined

nomenclature, placed the inclusion of TQM in question. This issue had to be strongly considered during other phases of the research.

Evidence gained from the literature reviews enabled resolution of the procedural portion of all three research questions. The review played an even more significant role in answering that for the second research question: ... how may they [the key factors within the unique methodologies] be identified, analysed and synthesized for commonality? The task of synthesizing the evidence for common key factors was hampered by the broad spectrum of nomenclature and the lack of consensus regarding like terminology. The process was complicated by having to consider respondents' input and interpretation as well as evidence from the literature review. A technique, borrowed from the meta-ethnography literature, was found that enabled identification of those common key factors amongst the six methodologies.

An important set of contributions made by the literature reviews was to the research strategy and tactics presented in Chapter 2. The literature provided insight into the topics of cross-sectional studies, qualitative research, inductive reasoning, radical inquiry and research ethics. Findings in the literature reviews enabled the author to determine the epistemological assumptions, and ontological positioning as well as to select the appropriate processes for comparing, compressing, analysing and synthesizing the research evidence.

The literature reviews also provided information regarding the body of knowledge that mandated changes to the research strategy, tactics and process. Those epistemological considerations involved the literature's quality, quantity and sources of research data. It can be argued that issues of bias, credibility, undisciplined use of terminology, inappropriate titles and diversions into implementation factors plagued most of the works found. Furthermore, the reviews indicated that authors often confused methods, tools and techniques with methodologies. The literature also tended to not be significantly concerned with the structure and composition of the BPI methodologies. There appeared to be a preference for discussing methodologies in terms of their value and impact on BPI initiatives. Consequently, efficacy

type evidence primarily focused on the strategic and tactical levels of the methodology in relationship to BPI initiatives. The literature reviews also indicated that the literature alone would provide insufficient research data and that the available data would come primarily from sources other than articles and journals. These latter sources appeared to focus more on application of methodologies and its utility or value. Their authors tended to concentrate on “case studies” highlighting the utility of the methodology, its applications and limitations. As a result of these contextual conditions, only a limited amount of the knowledge regarding methodology composition and the efficacy of key factors common amongst the methodologies was derived from the literature research. Therefore, two interview sets were included in the research process - the first was to gain evidence pertaining to the methodology compositions and the second to capture information regarding efficacy of key factors.

4.4 Interviews: Methodology Composition

The systematic literature review had indicated what methodologies should be considered and had provided some indication as to their compositions. However, the resulting evidence matrixes (Tables 4.4-1 through 4.4-6) were originally (before the interview data was included) sparse matrixes. These voids had to be filled by further research before the synthesis for common factors could be performed. Input regarding composition was required from the methodology’s IP owners and practitioners. This input requirement necessitated establishing the research technique, process and instruments as well as identification of the IP owners and practitioners before that research phase could commence. These strategic, tactical and process considerations were detailed and justified earlier in Chapter 2. There, the rationale for utilizing semi-structured interviews, instrument design considerations, factors regarding respondent selection, overview of the data analysis/synthesis process and issues concerning the handling of ethics and confidentiality were stated.

There were four main objectives in the remaining phases of the research. The first was to identify and exclude any of the six candidate methodologies which were superseded or fail

to qualify as a current, sustainable BPI methodology. Since TQM was the only methodology in question, the author decided to make the inclusion/exclusion decision after the interview phase. It was felt that making that decision based solely on literature reviews might not provide a holistic view of the methodology and its usage. The second objective was to capture adequate, relevant data from sufficient research respondents to enable determination of the key constructs and components common amongst the methodologies. Synthesizing that data into information about those key factors was the third objective. The fourth and last objective of the remaining research phases was to develop an understanding of the roles, contributions and interactions of those common constructs and components from a holistic process perspective. The current section (4.4) pertains only to attaining the first and second mentioned objective. Meeting objectives three and four are detailed in the next three sections (4.5, 4.6 & 4.7) respectively.

Table 4.4-1 BPR Key Factor Data

| Milestone Phase | Literature Reviews | IP Owner | Consulting Practitioner 1 | Consulting Practitioner 2 | Business Practitioner 1 | Business Practitioner 2 |
|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Assessment: Id. Need, Assess potential, Calc. payback. Milestone = Decide on an initiative</p> | <ul style="list-style-type: none"> • <u>Create a Case for Action</u> • <u>Create a Vision Statement</u> • <u>Define how the organization should operate</u> • <u>Detail the results to achieve & how change will be measured</u> | <ul style="list-style-type: none"> • An evaluation to justify why re-engineering is required • Resource planning to determine the project's viability • <u>Strategic plan as to how the project will be realized</u> | <ul style="list-style-type: none"> • <u>SWOT analysis</u> • <u>Strategy analysis and alignment</u> | <ul style="list-style-type: none"> • <u>Market and Strategy analysis</u> | <ul style="list-style-type: none"> • <u>Market analysis</u> • <u>SWOT analysis</u> • <u>Strategy development</u> | <ul style="list-style-type: none"> • <u>Competent Consulting Services</u> • <u>Root Cause analysis of Business problems</u> • <u>Business Strategy linked to business processes</u> • <u>Aligning cure to disease</u> • <u>Project goals</u> • <u>Stop-the-bleeding actions</u> • <u>Communication plan</u> |
| <p>Start-up: Define Strategic plan, Resource plan, and Project plan. Milestone = Kick-off</p> | <ul style="list-style-type: none"> • <u>Communicate the need, objectives and approach to the workforce</u> | <ul style="list-style-type: none"> • Decision on use and selection of outside resources • <u>Assignment of internal champions (BPR Czar) and resources</u> • <u>Tactical planning for the project and resources</u> | <ul style="list-style-type: none"> • <u>Commitment to Strategy</u> • <u>Financial goals setting for BPR</u> | <ul style="list-style-type: none"> • <u>SWOT Analysis</u> • <u>Financial objectives of the initiative</u> | <ul style="list-style-type: none"> • <u>Process Re-engineering and redesign</u> • <u>Organization redesign</u> • <u>Cost – Benefit analysis</u> • <u>Project Charter, Scope and Statement of Work</u> | <ul style="list-style-type: none"> • <u>Hierarchical team infrastructure</u> • <u>Team charters and objectives</u> • <u>Resource allocations</u> • <u>Implementation strategy development</u> • <u>Initiative roadmap</u> |

Table 4.4-1 (continued)

| Milestone Phase | Literature Reviews | IP Owner | Consulting Practitioner 1 | Consulting Practitioner 2 | Business Practitioner 1 | Business Practitioner 2 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Deployment: Communicate to the workforce the initiative & their involvement. Establish initiative infrastructure Milestone = Trained Infrastructure</p> | <ul style="list-style-type: none"> Establish Leader, Process Owner, Reengineering Team, Steering Committee & Reengineering Czar to manager the initiative. Compress the processes horizontally Implementing Case Workers or Case Teams. | <ul style="list-style-type: none"> <u>Detailed process evaluations</u> <u>Benchmarking Process mapping Process selections – rollout planning Change management criteria and parameters</u> <u>Resource assignment</u> | <ul style="list-style-type: none"> <u>Customer Focus linked to BPR</u> <u>Strategy linkage to BPR</u> <u>Process redesign</u> <ul style="list-style-type: none"> Eliminate out-dated processes Reduce the process complexity Eliminate non-value adding steps Organization redesign <u>Resource plan</u> <u>Implementation Plan</u> | <ul style="list-style-type: none"> Value stream mapping <u>IT strategy and business value analysis</u> <u>BPM-BPR decision</u> <u>Implementation plan</u> <u>Communication plan</u> <u>Resource plan and allocation</u> | <ul style="list-style-type: none"> Project plans and schedules <u>Impact analysis</u> <u>Action plans for organization and process changes</u> <u>Communication plan</u> <u>Resource plan and allocation</u> | <ul style="list-style-type: none"> <u>Implementation plan and roadmaps</u> <u>KPIs linked to project and team objectives</u> Responsibility breakdown Review schedule |
| <p>Implementation: Determine change logic, demands & impacts. Effect changes and eliminate former practices Milestone = Project end</p> | <ul style="list-style-type: none"> <u>Understand and measure the existing processes.</u> <u>Identify areas of leverage.</u> <u>Design and build prototype of new processes.</u> <u>Implement new processes</u> | <ul style="list-style-type: none"> Project management Management reviews Steering committee Training | <ul style="list-style-type: none"> Communication <u>Training</u> <u>Cross-functional teams</u> <u>Implementation plan</u> <u>KPIs and reviews</u> <u>Action plan</u> | <ul style="list-style-type: none"> <u>Team infrastructure: Steering committee and Process owners</u> <u>Training and Communication</u> <u>Cross-functional teams</u> <u>Implementation plan execution</u> <u>Action plan</u> <u>KPIs and cockpit charts</u> | <ul style="list-style-type: none"> Team infrastructure <u>Project plan execution</u> <u>KPIs and reviews</u> | <ul style="list-style-type: none"> <u>Execution to plan</u> <u>Progress measurements and reviews</u> <u>Action plans</u> |

Table 4.4-1 (continued)

| | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p><u>Internalization:</u> Control improvements & conversion to new practices - assuring change permanency Objective = internalized methodology</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • <u>Control the progress against the vision statement</u> | <p>IP Owner</p> <ul style="list-style-type: none"> • <u>Contr of the effectiveness of new process implementation</u> • <u>IT implementation planning</u> | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>KPIs and reviews</u> • <u>Action plan</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>Implementation plan execution</u> • Action plan • <u>KPIs and cockpit</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • <u>KPIs and reviews</u> • Cycles of repetition | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • <u>Execution to plan</u> • <u>Progress measurements and reviews</u> • <u>Action plans</u> • BPM or ERP software realization • Celebrating success |
| <p>Footnote:</p> | <p>Font =Type of requirement</p> | <p>(related to the methodology)</p> | <p><u>Explicit</u></p> | <p>Implicit</p> | <p><i>Logical</i></p> | <p>Ancillary</p> |

Table 4.4-2 Lean Management Key Factor Data

| Milestone Phase | Literature Reviews | IP Owner | Consulting Practitioner 1 | Consulting Practitioner 2 | Business Practitioner 1 | Business Practitioner 2 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <p><u>Assessment:</u> Id. Need, Assess potential, Calc. payback. Milestone = Decide on an initiative</p> | <ul style="list-style-type: none"> • <u>Appraisals and estimations activities are driven by the individual practitioner's sales process and/or top management's expectations</u> | <ul style="list-style-type: none"> • <u>Management commitment</u> • <u>Funding</u> • <u>Resource availability and commitment</u> | <ul style="list-style-type: none"> • There aren't any from the methodology side. • <u>Management has to:</u> <ul style="list-style-type: none"> ○ <u>Determine the project's financial payback</u> ○ <u>Decide on its commitment to the project</u> ○ <u>Commit funding and human resources to it.</u> | <ul style="list-style-type: none"> • This is before the methodology starts. • <u>For the project, management sets the parameters for the project P&L.</u> <ul style="list-style-type: none"> ○ <u>operational cost reduction</u> ○ <u>project cost..</u> | <ul style="list-style-type: none"> • Components of the methodology? None. There were just the project or initiative based activities. | <ul style="list-style-type: none"> • <u>Communication</u> • <u>Buy-in by management and the union</u> |
| <p><u>Start-up:</u> Define Strategic plan, Resource plan, and Project plan. Milestone = Kick-off</p> | <ul style="list-style-type: none"> • <u>Top management creates the consensus on the commitment, the project infrastructure and then communicates these to the whole organization</u> | <ul style="list-style-type: none"> • <u>Hoshin kanri [Policy deployment]</u> • <u>Sensei [using experts]</u> • <u>Hancho identification and training</u> | <ul style="list-style-type: none"> • <u>Decision re: use of outside</u> • <u>Commit funding.</u> • Address work team requirements • <u>Project management's control</u> | <ul style="list-style-type: none"> • <u>Resource requirements – both internally and externally.</u> • <u>Establishing reviews and control mechanisms.</u> • <u>Communication to the workforce – especially the union</u> | <ul style="list-style-type: none"> • Again, for the same reason as in the assessment phase – none. | <ul style="list-style-type: none"> • Consultant selection • <u>Resource allocation</u> |

Table 4.4-2 (continued)

| Milestone Phase | Literature Reviews | IP Owner | Consulting Practitioner 1 | Consulting Practitioner 2 | Business Practitioner 1 | Business Practitioner 2 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><u>Deployment:</u> Communicate to the workforce the initiative & their involvement. Establish initiative infrastructure Milestone = Trained Infrastructure</p> | <ul style="list-style-type: none"> • <u>Identify the process improvement priorities</u> • <u>Set up the implementation on teams</u> • <u>Lean training</u> • <u>Senpai & Kohai (Senior & Junior)</u> | <ul style="list-style-type: none"> • <u>Lean training</u> • <u>Senpai/Kohai [senior/junior] concept</u> • <u>Setting up work teams and quality circles</u> • <u>Providing for Visual Management</u> | <ul style="list-style-type: none"> • <u>Populating the work teams</u> • <u>Training at all levels</u> • <u>Rollout planning for the Kaizen events</u> • <u>Measurements</u> • <u>Communication requirements</u> | <ul style="list-style-type: none"> • <u>Work teams assignments and the project infrastructure</u> • <u>Training.</u> • <u>Prioritization of processes and kaizens</u> • <u>KPI data logistics</u> • <u>Policy deployment</u> | <ul style="list-style-type: none"> • <u>Methodology training</u> • <u>Team infrastructure</u> • <u>Policy deployment</u> • <u>The implementation plan.</u> | <ul style="list-style-type: none"> • <u>Policy deployment</u> • <u>Team and infrastructure</u> • <u>Training</u> • <u>Dashboard charts</u> • <u>Kaizen planning</u> |

Table 4.4-2 (continued)

| | | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p>Implementation: Determine change logic, demands & impacts. Effect changes and eliminate former practices Milestone = Project end</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • <u>Muda, Muri, Mura</u> • <u>Reduction of wastes</u> • <u>Flow levelling</u> • <u>Time and motion studies</u> • <u>Cost reduction targets</u> | <p>IP Owner</p> <ul style="list-style-type: none"> • <u>PDCA cycle</u> • <u>3M and 5(6)S processes</u> • <u>Value Stream Mapping</u> • <u>Genchi Genbutsu</u> • <u>Group work (work circles)</u> • <u>5W cause determination</u> • <u>Kaizen events</u> • <u>Cycle and Takt times</u> <p>For manuf.:</p> <ul style="list-style-type: none"> • <u>Line-stop concept</u> • <u>Kanban [pull systems]</u> • <u>poka-yoke [error proofing]</u> • <u>Heijunka box</u> • <u>JIT</u> • <u>automation [smart automation]</u> • <u>And on board/lights</u> • <u>FIFO principle</u> • <u>Line levelling</u> • <u>Supermarket concept</u> • <u>Milk run principle</u> • <u>One piece flow</u> • <u>U-Layout</u> • <u>TPM [total productive maintenance]</u> • <u>SMED [Single Minute Exchange of Die]</u> • <u>Chaku Chaku</u> | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>3 Ms and 6S process</u> • <u>Process mapping</u> • <u>Kaizen events</u> • <u>5 Whys to determine causes</u> • <u>PDCA cycle</u> • <u>Metrics</u> • <u>Visual management or control</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>3 Ms</u> • <u>5S process</u> • <u>PDCA cycle</u> • <u>Value stream mapping</u> • <u>5 Whys</u> • <u>Kaizens</u> • <u>Measurements</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • <u>Visual management</u> • <u>PDCA</u> • <u>3M and 5S processes</u> • <u>Value stream mapping</u> • <u>SMED approach</u> • <u>Kaizens</u> • <u>KPIs and their reviews</u> • <u>Steering committee</u> | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • <u>3Ms and 5S approaches</u> • <u>PDCA cycle</u> • <u>Value Stream Mapping</u> • <u>Dashboard chart reviews</u> • <u>Visual management</u> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 4.4-2 (continued)

| | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p><u>Internalization:</u> Control improvements & conversion to new practices - assuring change permanency Objective = internalized methodology</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • CIP | <p>IP Owner</p> <ul style="list-style-type: none"> • Let me call this the post-implementation phase. • <i>Revisiting/resetting the targets</i> • <i>Resource reallocation</i> • <i>Realizing the process improvements at the business level</i> • Celebrating the successes | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>The 6th S</u> • Resetting targets and objectives • Extending the Kaizen rollout plan • <u>CIP</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>Visual management</u> • <u>6th S</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • Stability of the KPIs | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • Same as for implementation • <u>3Ms and 5S approaches</u> • <u>PDCA cycle</u> • <u>Value Stream Mapping</u> • <u>Dashboard chart reviews</u> • <u>Visual management</u> |
| <p>Footnote:</p> | <p>Font =Type of requirement</p> | <p>(relative to the methodology)</p> | <p>Explicit</p> | <p>Implicit</p> | <p><i>Logical</i></p> | <p>Ancillary</p> |

Table 4.4-3 Six Sigma Key Factor Data

| Milestone Phase | Literature Reviews | IP Owner | Consulting Practitioner 1 | Consulting Practitioner 2 | Business Practitioner 1 | Business Practitioner 2 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><u>Assessment:</u> Id. Need, Assess potential, Calc. payback. <u>Milestone</u> = Decide on an initiative</p> | <ul style="list-style-type: none"> • None specified | <ul style="list-style-type: none"> • <u>Research into Six Sigma and the results it can bring</u> • <u>Estimating the financial targets for the initiative.</u> | <ul style="list-style-type: none"> • <u>Committing to the initiative</u> • <u>Funding the project</u> • <u>Payback target setting</u> | <ul style="list-style-type: none"> • <u>Estimating the impact of the initiative</u> • <u>Commitment by top management to change</u> • <u>Contracting outside SS consultants</u> | <ul style="list-style-type: none"> • <u>Setting the financial targets</u> • <u>Getting the external Master Black Belts under contract</u> | <ul style="list-style-type: none"> • <u>Establishing the targeted financial improvements.</u> |
| <p><u>Start-up:</u> Define Strategic plan, Resource plan, and Project plan. <u>Milestone</u> = Kick-off</p> | <ul style="list-style-type: none"> • <u>Executive Leaders:</u> The management team is responsible for initiating the six sigma initiative and committing resources to it. | <ul style="list-style-type: none"> • <u>Establishing the Executive Leadership</u> • <u>Confirming the financial targets</u> • <u>Resource allocation</u> | <ul style="list-style-type: none"> • <u>Resource assignments and project chartering</u> • <u>Communication to the organization</u> | <ul style="list-style-type: none"> • <u>Communicating the initiative</u> • <u>Establishing the Executive Leadership and Champions</u> • <u>Resource allocation for the Belts</u> • <u>Setting the measurements to be tracked</u> • <u>Project kick-off</u> | <ul style="list-style-type: none"> • <u>Establishing the Executive Leadership and Champion</u> • <u>Defining the processes which will be optimized</u> • <u>Communicating the program to the workforce.</u> | <ul style="list-style-type: none"> • <u>Contracting external consultants for Master Black Belts and possibly Black Belts</u> • <u>Communicating the initiative</u> • <u>Agreeing on the KPIs</u> |
| <p><u>Deployment:</u> Communicate to the workforce the initiative & their involvement. Establish initiative infrastructure <u>Milestone</u> = Trained Infrastructure</p> | <ul style="list-style-type: none"> • <u>“Belts”:</u> Establish an infrastructure of Champion Master Black Belts and Green Belts • <u>Executive Leaders:</u> to endorse and promote the initiative | <ul style="list-style-type: none"> • <u>Defining the Champions</u> • <u>Acquiring the Master Black Belts and Black Belts, if none are currently in the organization.</u> • <u>Naming the Green Belts</u> • <u>6σ Training</u> • <u>Establishing the measurement systems and data logistics</u> • <u>Populating the charts and SPC tools</u> | <ul style="list-style-type: none"> • <u>Setting up and assigning the Champion and Belts</u> • <u>Training at the various levels including Executive Leadership.</u> • <u>Defining the KPIs and their data logistics</u> | <ul style="list-style-type: none"> • <u>Training the Executive Leadership, Champions and Belts.</u> • <u>Selecting the processes to be improved</u> • <u>Establishing the teams</u> • <u>Setting up and testing the measurements system</u> | <ul style="list-style-type: none"> • <u>Setting up the teams</u> • <u>Training</u> • <u>Establishing the measurements, charting and controlling</u> | <ul style="list-style-type: none"> • <u>Setting up the Executive Leadership, Champions and Belts</u> • <u>Training the Executive leadership, Champions and the Belts.</u> • <u>Establishing the measurements system.</u> • <u>Selecting and prioritizing the process to be improved</u> |

Table 4.4-3 (continued)

| Milestone Phase | Literature Reviews | IP Owner | Consulting Practitioner 1 | Consulting Practitioner 2 | Business Practitioner 1 | Business Practitioner 2 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <p><u>Implementation:</u> Determine change logic, demands & impacts. Effect changes and eliminate former practices Milestone = Project end</p> | <p>Implementation: on: Effecting the specific changes – including elimination of former practices</p> | <ul style="list-style-type: none"> • <u>DMAIC (or DMADV for product and process development)</u> • <u>5 Whys</u> • <u>Ishikawa diagrams</u> • <u>FMEA</u> • <u>SIPOC mapping</u> • <u>Hypothesis testing</u> • <u>Piloting</u> | <ul style="list-style-type: none"> • <u>DMAIC</u> • <u>SIPOC mapping</u> • <u>Process variance analysis</u> • <u>5-Whys</u> • <u>Process specific tools and methods as required</u> • <u>Progress reviews</u> | <ul style="list-style-type: none"> • <u>DMAIC</u> • <u>Process mapping</u> • <u>Process analysis for variations</u> • <u>Cause determination</u> • <u>Teamwork</u> • <u>Linkage of changes to metrics</u> | <ul style="list-style-type: none"> • <u>Charts and measurements</u> • <u>Process Mapping</u> • <u>Process analysis</u> • <u>5Ws and FMEA</u> • <u>DMAIC</u> | <ul style="list-style-type: none"> • <u>Charts and measurements</u> |
| <p><u>Internalization:</u> Control improvements & conversion to new practices - assuring change permanency Objective = internalized methodology</p> | <ul style="list-style-type: none"> • None specified | <ul style="list-style-type: none"> • <u>SPC charts</u> • <u>DMAIC (or DMADV for product and process development)</u> | <ul style="list-style-type: none"> • <u>KPIs</u> | <ul style="list-style-type: none"> • <u>Stable measurements</u> | <ul style="list-style-type: none"> • <u>Attainment of 3.4 PPMO</u> • <u>Patience and stamina</u> • <u>Commitment of top management to see it through to the end</u> | <ul style="list-style-type: none"> • <u>Charts and measurements</u> |
| <p>Footnote:</p> | <p>Font = Type of requirement</p> | <p>(relative to the methodology)</p> | <p><u>Explicit</u></p> | <p>Implicit</p> | <p><i>Logical</i></p> | <p>Ancillary</p> |

Table 4.4-4 TCT Key Factor Data

| | | | | | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p>Assessment: Id. Need, Assess potential, Calc. payback. Milestone = Decide on an initiative</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • <u>Macro-assessment:</u> High-level assessment of the process and financial improvement potentials | <p>IP Owner</p> <ul style="list-style-type: none"> • <u>CEO commitment</u> • <u>Recognition of a need to improve</u> • <u>Belief in driving with time</u> | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>Macro-Assessment</u> • <u>CEO workshop</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>Macro-Assessment</u> • <u>CEO workshop</u> • <u>Vision of Entitlement</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • <u>Macro-Assessment</u> • <u>Vision of Entitlement</u> | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • <u>Pre-assessment done by the consultants</u> • <u>Management workshop</u> • <u>Scope definition – agreement to chase down the root causes regardless of in what department they are</u> |
| <p>Start-up: Define Strategic plan, Resource plan, and Project plan. Milestone = Kick-off</p> | <p><u>CEO Workshop:</u></p> <ul style="list-style-type: none"> • <u>Team building</u> • <u>ICT training</u> • <u>List barriers</u> • <u>Vision of entitlement</u> • <u>Action plan.</u> • <u>Financial and time commitment</u> | <ul style="list-style-type: none"> • <u>Macro-assessment</u> • <u>The CEO workshop</u> • <u>Vision of the entitled performance level</u> • <u>Barrier list</u> | <ul style="list-style-type: none"> • <u>Barrier Identification</u> • <u>Baseline and entitlement analysis</u> • <u>Team Infrastructure, BRIs, CFTs and BIT. All of which are cross-function in their makeup.</u> | <ul style="list-style-type: none"> • <u>Root Cause Barrier Identification</u> • <u>Baseline and entitlement analysis</u> • <u>Cross-functional team infrastructure, BRIs, CFTs and BIT.</u> | <ul style="list-style-type: none"> • <u>Baseline and entitlement analysis</u> • <u>Barrier Identification</u> • <u>Team training</u> | <ul style="list-style-type: none"> • <u>Cockpit charts development</u> • <u>Avoidance of people measurements</u> • <u>Establishing the teams</u> • <u>PVM Training</u> |
| <p>Deployment: Communicate to the workforce the initiative & their involvement. Establish initiative infrastructure Milestone = Trained Infrastructure</p> | <ul style="list-style-type: none"> • <u>Setting up & chartering the BIT</u> • <u>Setting up & chartering the CFTs</u> • <u>Training and workshops</u> • <u>Communicate initiative & expectations to workforce</u> | <ul style="list-style-type: none"> • <u>BIT and CFTs</u> • <u>ICT training</u> • <u>ICT metrics</u> • <u>Cockpit charts</u> • <u>16 step change process</u> | <ul style="list-style-type: none"> • <u>Team chartering and training</u> • <u>Process mapping of the baseline and the entitled processes</u> • <u>Barrier ranking & prioritization for removal</u> • <u>Baseline performance evaluation</u> | <ul style="list-style-type: none"> • <u>Team training</u> • <u>Process mapping of the baseline and the entitled process</u> • <u>Barrier ranking and prioritization</u> • <u>Baseline performance of KPIs</u> | <ul style="list-style-type: none"> • <u>Team infrastructure</u> • <u>Process mapping</u> • <u>Barrier ranking</u> • <u>Barrier prioritization</u> • <u>Hierarchical metrics</u> | <ul style="list-style-type: none"> • <u>Team responsibilities and ownerships</u> • <u>Process mapping</u> • <u>Barrier management</u> • <u>Establishing measurements</u> |

Table 4.4-4 (continued)

| | | | | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p><u>Implementation:</u> Determine change logic, demands & impacts. Effect changes and eliminate former practices Milestone = Project end</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • <u>Prioritize barrier removal</u> • <u>Create an action plan</u> • <u>Provide Cockpit Charts with Baseline & Entitlement forecast</u> • <u>Implement process changes</u> • <u>Control removal of substitute processes</u> • <u>Drive financial improvement</u> | <p>IP Owner</p> <ul style="list-style-type: none"> • <u>The 5I's process</u> • <u>Performance reviews</u> | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>Cockpit charts having linked hierarchical process and financial metrics</u> • <u>Barrier Removal</u> • <u>Weekly team meetings</u> • <u>Cockpit chart reviews</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>Cockpit charts with hierarchical metrics</u> • <u>Barrier Removal</u> • <u>Weekly team meetings</u> • <u>Cockpit chart reviews</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • <u>Barrier Removal</u> • <u>Cockpit chart & KPIs</u> • <u>Weekly reviews</u> | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • <u>Root-cause Barrier elimination</u> • <u>Review of Cockpit charts & daily measurements</u> • <u>Periodic progress reviews</u> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Table 4.4-4 (continued)

| | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p><u>Internalization:</u> Control improvements & conversion to new practices - assuring change permanency Objective = internalized methodology</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • <u>Manage the business culture change for process optimization, financial improvements and increased business competitiveness</u> | <p>IP Owner</p> <ul style="list-style-type: none"> • <u>ICT culture change</u> • <u>CIP</u> | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>Team infrastructure reviews and corrective actions to handle stalls</u> • <u>Barrier removal</u> • <u>Barrier identification on a continuous basis</u> • <u>Resetting of entitlement as the process is optimized – continuous improvement</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>Team infrastructure</u> • <u>Cockpit chart reviews and corrective actions</u> • <u>Barrier removal</u> • <u>On-going Barrier identification</u> • <u>Revisiting entitlement</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • <u>Barrier removal</u> • <u>Cockpit chart & KPIs</u> • <u>Team infrastructure</u> • <u>Drumbeat reviews</u> | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • <u>Continuation of Barrier managements and reviews</u> • <u>Process viewpoint instead of departmental orientation</u> |
| <p>Footnote:</p> | <p>Font =Type of requirement</p> | <p>(relative to the methodology)</p> | <p>Explicit</p> | <p>Implicit</p> | <p><i>Logical</i></p> | <p>Ancillary</p> |

Table 4.4-5 ToC Key Factor Data

| Milestone Phase | Literature Reviews | IP Owner | Consulting Practitioner 1 | Consulting Practitioner 2 | Business Practitioner 1 | Business Practitioner 2 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><u>Assessment:</u> Id. Need, Assess potential, Calc. payback. Milestone = Decide on an initiative</p> | <ul style="list-style-type: none"> • <u>Executive decision making (EDM) workshop:</u> A 2-day workshop with the heads of all functions. | <ul style="list-style-type: none"> • <u>Scope of work definition</u> • <u>Consultant contracting</u> | <ul style="list-style-type: none"> • <u>Need analysis and problem definition</u> • Initiative charter and objectives • <u>Resource and skill sets assessment</u> • Make or buy decision • <u>Mgmt workshop</u> • <u>Mgmt training</u> | <ul style="list-style-type: none"> • <u>Discussions about the division management's dilemma</u> • <u>Determination of the initiative's financial impact</u> • Assignment of the internal consulting team • <u>Communicate the initiative and kick-off</u> | <ul style="list-style-type: none"> • <u>Understanding the business dilemma</u> • <u>Defining the scope of the initiative</u> | <ul style="list-style-type: none"> • <u>Defining the need and dilemma</u> • Defining the strategic approach for the solution |
| <p><u>Start-up:</u> Define Strategic plan, Resource plan, and Project plan. Milestone = Kick-off</p> | | <ul style="list-style-type: none"> • <u>Executive workshop</u> • <u>ToC mgmt. training</u> • <u>Effect-Cause-Effect analysis</u> • <u>Paradigm Training</u> • <u>Thinking Processes</u> • <u>Communication</u> | <ul style="list-style-type: none"> • <u>Project charter and objectives</u> • <u>Project plans and schedules</u> • <u>Resource allocation</u> • <u>Communication to the workforce</u> • <u>Kick-off</u> | <ul style="list-style-type: none"> • <u>Management workshop and ToC training</u> • Establish the steering committee • <u>Establish the process owner teams</u> • <u>Project plans</u> • <u>Culture & paradigm analysis</u> • <u>Calc. payback and financial impacts</u> | <ul style="list-style-type: none"> • <u>Management workshop</u> • <u>Root cause analysis</u> • <u>ToC training</u> • <u>Project planning</u> • <u>Resource planning</u> • <u>Communication to the workforce</u> | <ul style="list-style-type: none"> • <u>Resource management</u> • <u>Management training</u> • <u>Communicating the need and dilemma</u> • <u>Communicating the solution</u> • <u>Initiative planning and scheduling</u> • <u>Establishing initiative KPI's</u> |
| <p><u>Deployment:</u> Communicate to the workforce the initiative & their involvement. Establish initiative infrastructure Milestone = Trained Infrastructure</p> | <ul style="list-style-type: none"> • <u>Process selection:</u> Choose process to be analyzed and improved • <u>Training:</u> Provide the organization with ToC training | <ul style="list-style-type: none"> • <u>Thinking Processes</u> • <u>Identify the targeted process(es)</u> • <u>Strategic & Tactic plans</u> • <u>Action plan development</u> • <u>Extension of ToC training to the workforce</u> • <u>Strategic and operative KPI's</u> | <ul style="list-style-type: none"> • <u>Team infrastructure, BIT and CFT's, charter and objectives</u> • <u>Team training in ToC</u> • <u>Establish all KPI's and data logistics</u> | <ul style="list-style-type: none"> • <u>Project plans</u> • <u>ToC training</u> • <u>Identifying the underperforming process or processes</u> • <u>Create action plans including pilots and rollouts</u> | <ul style="list-style-type: none"> • <u>Pilot and rollout planning</u> • <u>Detailed project plan and schedules</u> • <u>Setting up team infrastructure</u> • <u>Training and communications</u> • <u>Establishing KPI's</u> | <ul style="list-style-type: none"> • <u>Resource allocation</u> • <u>ToC training</u> • <u>Implementation planning</u> • <u>Establishing change management teams</u> • <u>Establishing implementation KPI's</u> • <u>Communicating the implementation plan</u> |

Table 4.4-5 (continued)

| | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p><u>Implementation:</u> Determine change logic, demands & impacts. Effect changes and eliminate former practices Milestone = Project end</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • <u>Identify system's constraints</u> • <u>Exploit the system's constraints</u> • <u>Subordinate everything else</u> • <u>Elevate the constraint until it is broken</u> | <p>IP Owner</p> <ul style="list-style-type: none"> • <u>Thinking Processes</u> • <u>Strategic & Tactic plans</u> • <u>ToC's 5-step process</u> • <u>Drum-Buffer-Rope</u> • <u>Strategic and operative KPIs</u> | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>ToC's five step process</u> • <u>Root cause analysis</u> • <u>KPI measurements and reviews</u> • <u>Action plan development</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>Project plans</u> • <u>ToC cyclic five-step process</u> • <u>KPI measurements and reviews</u> • <u>Execution of communications plan</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • <u>Utilization of the thinking processes</u> • <u>Execution of project plans</u> • <u>Execution of pilot and rollout plans</u> • <u>Utilization of ToC's five step process</u> • <u>Utilization of the drum-buffer-rope concept</u> • <u>Tracking and reviewing KPI's</u> • <u>Communication</u> | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • <u>Executing implementation plan</u> • <u>Executing ToC's five step constraint management</u> • <u>Implementing ToC's project management methods</u> • <u>KPI tracking and reviews</u> • <u>Remedial action plans</u> • <u>Communicating and celebrating progress</u> |
| <p><u>Internalization:</u> Control improvements & conversion to new practices - assuring change permanency Objective = internalized methodology</p> | <ul style="list-style-type: none"> • <u>When the process limitation has shifted to another constraint, repeat the "five steps of focusing".</u> | <ul style="list-style-type: none"> • <u>Thinking Processes</u> • <u>KPI review</u> • <u>Action plan development</u> | <ul style="list-style-type: none"> • <u>ToC's five step process</u> • <u>KPI measurements and reviews</u> • <u>Action plan development</u> | <ul style="list-style-type: none"> • <u>Monitor culture changes</u> • <u>Monitor continuous improvement changes</u> | <ul style="list-style-type: none"> • <u>Execution of pilot and rollout plans</u> • <u>Tracking and reviewing KPI's</u> • <u>New action plan development</u> | <ul style="list-style-type: none"> • <u>KPI tracking and reviews</u> • <u>Remedial action plans</u> |
| <p>Footnote:</p> | <p>Font =Type of requirement</p> | <p>Explicit</p> | <p>Implicit</p> | <p>Logical</p> | <p>Ancillary</p> | |

Table 4.4-6 TQM Key Factor Data

| | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p>Assessment: Id. Need, Assess potential, Calc. payback. Milestone = Decide on an initiative</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • None Specified | <p>IP Owner</p> <ul style="list-style-type: none"> • <u>The goal setting</u> • <u>Commitment by management</u> • <u>Funding</u> • <u>Timeframe expectations</u> • <u>Resource allocation</u> | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>Completion of management's homework; need and what can fulfill it?</u> • <u>What is TQM and is it feasible to implement it?</u> • <u>What is our vision for the future state?</u> • <u>What would the project and resource plans look like?</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>Hiring the correct consultancy – one that has the experience and resources to see the project through to completion.</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • Analyse the business dilemma • <u>Analyse the options including TQM</u> • <u>Evaluate the feasibility to realize</u> • <u>Set intelligent goals and expectations</u> • <u>Obtain full management commitment</u> • Create a draft of the project and resource plans • <u>Evaluate the initiative against the business dilemma – will it close the gap? If not, rework it.</u> | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • <u>Situation analysis</u> • <u>Study feasible options</u> • <u>Organizational commitment to TQM</u> • <u>Establish goals and timetable</u> • <u>Communicate situation, TQM initiative and commitment</u> |
| <p>Start-up: Define Strategic plan, Resource plan, and Project plan. Milestone = Kick-off</p> | <ul style="list-style-type: none"> • None Specified | <ul style="list-style-type: none"> • <u>Communication of the goals, objectives and timing</u> • <u>Communication of the commitment and resource assignments</u> • <u>Pre-assessment</u> | <ul style="list-style-type: none"> • <u>Enterprise-wide commitment to completing the TQM conversion.</u> • <u>Contracting outside help to change the company culture to TQM</u> • <u>Finalizing the project and resource plans</u> • <u>Communication to all stakeholders</u> | <ul style="list-style-type: none"> • <u>Communicating the organization's commitment to attaining the EFQM award.</u> • <u>Having a project roadmap based on successful completions in other organizations</u> | <ul style="list-style-type: none"> • <u>Communicate the dilemma, goals and solution</u> • <u>Communicate the commitment and resource allocation to the initiative</u> • <u>Evaluate the need for external coaching or consulting to help change to a TQM company culture</u> • Initiative kick-off • Communication matrix | <ul style="list-style-type: none"> • Project Planning • <u>Resource allocation – including outside consultants</u> • <u>Communicate project and resource allocation</u> |

Table 4.4-6 (continued)

| Milestone Phase | Literature Reviews | IP Owner | Consulting Practitioner 1 | Consulting Practitioner 2 | Business Practitioner 1 | Business Practitioner 2 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><u>Deployment:</u> Communicate to the workforce the initiative & their involvement. Establish initiative infrastructure Milestone = Trained Infrastructure</p> | <ul style="list-style-type: none"> • <u>Employ cross-functional management for job enrichment and improved quality management</u> | <ul style="list-style-type: none"> • <u>Delta list or action plan</u> • <u>Change schedule</u> • <u>Training</u> | <ul style="list-style-type: none"> • <u>Resource allocation planning</u> • <u>Training, training and re-training</u> • <u>Communication and more communication</u> • <u>Plotting and rollout planning</u> | <ul style="list-style-type: none"> • <u>Training the workforce</u> • <u>Communicating the project plan and schedule</u> • <u>Naming the resources that will do the implementation</u> | <ul style="list-style-type: none"> • <u>Resource allocation</u> • <u>Training and more training</u> • <u>Communication and more communication</u> • <u>Create action plan – who does what and when</u> • <u>Create a responsibility breakdown matrix</u> • <u>Create a KPI system covering both business and initiative</u> • <u>Update the project and resource plans</u> | <ul style="list-style-type: none"> • <u>Management training</u> • <u>Employee training</u> • <u>Pilot and rollout plans</u> • <u>Detailed project plan</u> • <u>Detailed action plan – who what and when</u> • <u>Create a communication plan</u> • <u>Create a responsibility matrix</u> • <u>Establish quality teams</u> |
| <p><u>Implementation:</u> Determine change logic, demands & impacts. Effect changes and eliminate former practices Milestone = Project end</p> | <ul style="list-style-type: none"> • <u>Quality circle</u> leverage to motivate and gain acceptance. • <u>FMEA</u> to determine sources of quality problems • <u>Ishikawa diagrams</u> to find the root causes • <u>Pareto analysis</u> to prioritize actions and improvements | <ul style="list-style-type: none"> • <u>Training</u> • <u>FMEA methods</u> • <u>Quality circles</u> • <u>Pareto charts</u> • <u>Project management</u> • <u>Project reviews</u> | <ul style="list-style-type: none"> • <u>Adherence to plans and schedules</u> • <u>Providing for repetitive learning cycles</u> | <ul style="list-style-type: none"> • <u>Knowing the award requirements</u> • <u>Following the schedules and plans</u> • <u>Measuring the progress against completion of the checklist</u> • <u>Follow-up training and communication</u> • <u>Ultimately 100% completion of the checklist</u> | <ul style="list-style-type: none"> • <u>Management workshops: Their new role as coaches</u> • <u>On-going training and communication according to plan and needs</u> • <u>Create Quality Circles</u> • <u>Utilize FMEA methods and Pareto analysis</u> • <u>Plan for the use of pilots and rollouts</u> • <u>Project management and KPI driven project reviews</u> • <u>Utilization of the Deming cycle</u> | <ul style="list-style-type: none"> • <u>Follow up training and communication to plan</u> • <u>Utilize FMEA and root cause analysis tools</u> • <u>Utilize the Deming cycle</u> • <u>Maintain project plans and schedule</u> • <u>Drive implementation with KPIs</u> |

Table 4.4-6 (continued)

| | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase</p> <p><u>Internalization:</u> Control improvements & conversion to new practices - assuring change permanency Objective = internalized methodology</p> | <p>Literature Reviews</p> <ul style="list-style-type: none"> • <u>Continuous Improvement Process (CIP)</u> requires permanent quality issue identification and resolution | <p>IP Owner</p> <ul style="list-style-type: none"> • <u>Final assessment by external (EFQM) auditors</u> • <u>Financial goal attainment</u> • Celebration of success | <p>Consulting Practitioner 1</p> <ul style="list-style-type: none"> • <u>More training</u> • <u>More communication</u> • <u>The Deming cycle</u> • <u>Measuring progress and status</u> • <u>Setting the stage for the optimization phase</u> | <p>Consulting Practitioner 2</p> <ul style="list-style-type: none"> • <u>Validation of the (e.g. EFQM) self-assessment</u> • <u>Obtaining the (e.g. EFQM) award</u> | <p>Business Practitioner 1</p> <ul style="list-style-type: none"> • <u>Management workshops: Maintaining a continuous improvement culture</u> • <u>On-going training and communication according to plan and needs</u> • <u>On-going process management and KPI driven progress reviews</u> • <u>Internalization of the Deming cycle and the TQM philosophy</u> | <p>Business Practitioner 2</p> <ul style="list-style-type: none"> • <u>Internalize the use of TQM tools and methods</u> • <u>On-going training and communications</u> • <u>On-going KPI reviews and action plan development</u> |
| <p>Footnote:</p> | <p>Font =Type of requirement</p> | <p><u>Explicit</u></p> | <p><u>Implicit</u></p> | <p><i>Logical</i></p> | <p>Ancillary</p> | |

4.4.1 Organizational Issues

Establishing an interview timetable (time, venue and respondent) was initiated by sending a request for interview and the appropriate interview schedule to each potential respondent. The request for interview (RFI), in addition to introducing the researcher, the university and the research, described the interview objectives and ethical/confidential issues. The request also presented the interview schedule (list of interview questions). Details about the RFI, instruments, respondent selection considerations and the ethics issues were stated earlier in Chapter 2.

The “snowball” technique was employed to select the potential respondents. The starting point was the intellectual property owner and the client list for each methodology. A quote of one IP owner and four practitioners per methodology was used. The number of practitioners was equally divided between business experts and BPI consultants. To the extent possible, the experts were selected from different BPI initiatives. Preferably, all interviews per methodology were held contiguously. In order to maintain confidentiality, names and other identifiers were codified. Ethical considerations included the right of the respondent to withdraw from participating in the research and their right not to answer one or more of the questions. These confidentiality and ethical considerations and those detailed in Chapter 2 were honoured throughout the research.

All of the foreseen thirty face-to-face interviews took place either in the respondent’s office or an on-site conference room. The interviews were guided by the respective interview schedule (methodology and respondent-type specific) and each required approximately two hours. Notes were taken manually or electronically during the interview. Audio or video recordings were not utilized. Two elements of the respondent’s views and understanding were gleaned from each interview: 1) the methodology’s composition and 2) the added value derived from aspects of that composition. In addition, practitioners were queried as to the adaptations (additions, deletions, substitutions or interpretations) required to implement the

methodology. The cycles of learning gained from each interview were reflected upon immediately after that interview. This reflection drove optimization of the interview schedule and the interview techniques as well as actualization of the two category matrixes containing composition and efficacy data. For confidentiality reasons, the names of the respondent were coded to prevent identification. The names of other individuals and the names of firms mentioned by the respondent during the interview were replaced with generic descriptors such as “boss” or “colleague”, and “automotive supplier” or “common carrier” so as to assure confidentiality. All information and data amassed during the research interviews were stored on a password protected flash-memory stick and protected from internet access.

The targeted interviewing process was set up to complete one methodology’s interviews after the other using the interviewing order of IP owner, consulting practitioners, and then business practitioners. Although, with minor exceptions, the interviews for each methodology were contiguous, the interviewing order had to be inverted after the first methodology interviews.

4.4.2 Researcher Bias Issues

Through the use of bracketing and the routine reflection on potential biases, an issue with the interviewing order was detected. The original sequence seemed to foster the introduction of bias on part of the interviewer. Fortunately, this phenomenon was observed immediately after interviewing the first IP owner and practitioner. It was also fortuitous to have started with a methodology where the gradients of knowledge and methodology ownership between the IP owner and the practitioners were minimal. The researcher bias manifested itself in anticipating responses by the practitioners and interpreting these from the viewpoint of the IP owner. In addition, when posing requests for clarifications to practitioners unable to articulate responses as clearly or concisely as the IP owner, excessive care was necessary so as to avoid using leading questions. It became apparent to the author that obtaining a seemingly in-depth understanding of a methodology’s concepts and composition

upfront with the IP owner was not advantageous. Having such a level of understanding apparently suppressed the need-to-discover mindset. Therefore, the order was reversed and the IP owners were interviewed last. This change meant that the researcher's level of knowledge (thereby proficiency) and involvement (thereby insight) in the given methodology increased over the sequence of interviews. This new sequence helped to change the author's mental orientation from "confirming the previous results" back to one of "discovering new evidence". The new sequence made the conscious and continuous effort to avoid introducing bias considerably easier.

4.4.3 Data Acquisition

Although updating of the data matrixes (Tables 4.4-1 through 4.4-6) shown in Section 4.4 for input to the synthesis process proceeded as new information was acquired, the need for a concerted follow-up effort was necessary to fill the data gaps. This follow-up was analogous to the remedial actions taken after the SLR except that these sources of evidence were interviews. A total of four focused follow-up interviews with IP owners had to be made. These were aimed at clarifications regarding methodology composition and/or further exploration of efficacy considerations. All for these were performed via some form of telecommunications rather than in face-to-face meetings. This media was appropriate since the recipients were already familiar with the research and their approval for follow-up interviews had been obtained during their initial interviews. The use of telecommunications shortened the process cycle time and avoided additional international travel.

In total, 34 interviews were made and 170 typed pages of interview notes were collected. App 1.4 in Appendix 1 is an example of those interview notes. It shows the input from a consulting practitioner of the TBM (TCT) methodology. Information from this and the other 33 interviews were added to Tables 4.4-1 through 4.4-6 respectively. The aggregated data from the interviews and the SLR were subsequently synthesized to determine the common key elements amongst the methodologies. Before going into the details of that

synthesis, it is appropriate to comment on the cycles of learning received from the interview research and the incremental conclusions drawn about the process.

4.4.4 Process Cycles of Learning

Given the task of setting up and executing these interviews again, there are two noteworthy changes which would be made for the sake of efficiency and effectiveness. The first being that the interview schedule would be called something else – list of interview questions, interview topics, etc. The reason for this change is that a significant number (10 to 12) of the 30 respondents asked if there was a time allocation to each of the questions or asked why the list had been called a schedule without containing a time frame. The time utilized to discuss this matter could have been better spent.

The second cycle of learning gleaned from the interview process was that the interviewees' responses was a mixture of elements from the methodology, an improvement initiative and business dilemmas. This amalgamation occurred in spite of the fact that each respondent was briefed beforehand about the nature and purpose of the research. Even the IP owners' responses were not purely methodology based. Changing the interview schedule was contemplated. However, the author felt that changing the interview schedule so as to create a strict focus on the methodology could cause some respondents to question their subject matter knowledge. This self-doubting would have likely applied more to the practitioners than the IP owners. The result could have been that those respondents who questioned their abilities refused the interview, had a methodology specialist involved or formulated a set of stock responses to the questions in preparation for the interview. None of these would have been beneficial to the research. The object of the interviews was not to get synthetic responses or those which had already been obtained via the SLR. After the third interview was conducted, a minor change to the interview process was made instead of changing the interview schedule. Under the improved process, at the end of the interview, the interviewees were asked impromptu to reflect upon their given responses regarding the key elements. They were asked

to comment on the relationship these elements had to the methodology itself. Aside from providing a natural closure to the interview, this approach afforded the interviewees an opportunity to reflect on their responses. In doing so, they often enhanced or extended their responses and allowed the interviews to explore new ground or perspectives.

After having completed the interviewing process, an optimization potential was identified. This improvement is that the number of interviews per methodology could have been limited to only three instead of the five assumed necessary. While having cross-sectional views from IP owners, consulting practitioners and business practitioners proved beneficial, the author believes that one of each would have sufficed. Interviewing the second consulting and second business practitioners provided very little incremental information. Instead of rigidly planning for two interviews of each practitioner type, it would have been more efficient to perform these on an “as needed” basis. That is, when the first interview provided poor quality or insufficient information, a second interview would be made. It is estimated that this change would have eliminated 8 to 10 of the 12 secondary interviews thus reducing the total number of planned interviews from 30 down to between 20 and 22. The impact of this approximately 30% reduction in interviews would have been even more significant in the “synthesis for common factors” phase of the research than the interviewing and data acquisition one. That is because the number of elements to be considered and synthesized would have been significantly reduced.

Reflecting on the interviews themselves, the sales orientation of the respondents was sometimes so well packaged or suppressed that it became almost undetectable. This observation is best supported by an example. During the interview of a consulting practitioner, the author was impressed by the respondent’s clear, concise and seemingly neutral replies. It was not until the author thanked the consultant for the interview and taking time to participate in the research that the respondent’s sales inclination became transparent. To the author’s closing remarks, the respondent replied, “Sie brauchen sich nicht zu

bedanken. Wir suchen immer nach guter PR.” (personal conversation, June, 2012). Loosely translated this means, “You do not need to thank me. We are always looking for good, free publicity.” The author was forced to question what subjectivity or bias he may have missed during this and other interviews. As a result, all interview notes were again reviewed for possible bias.

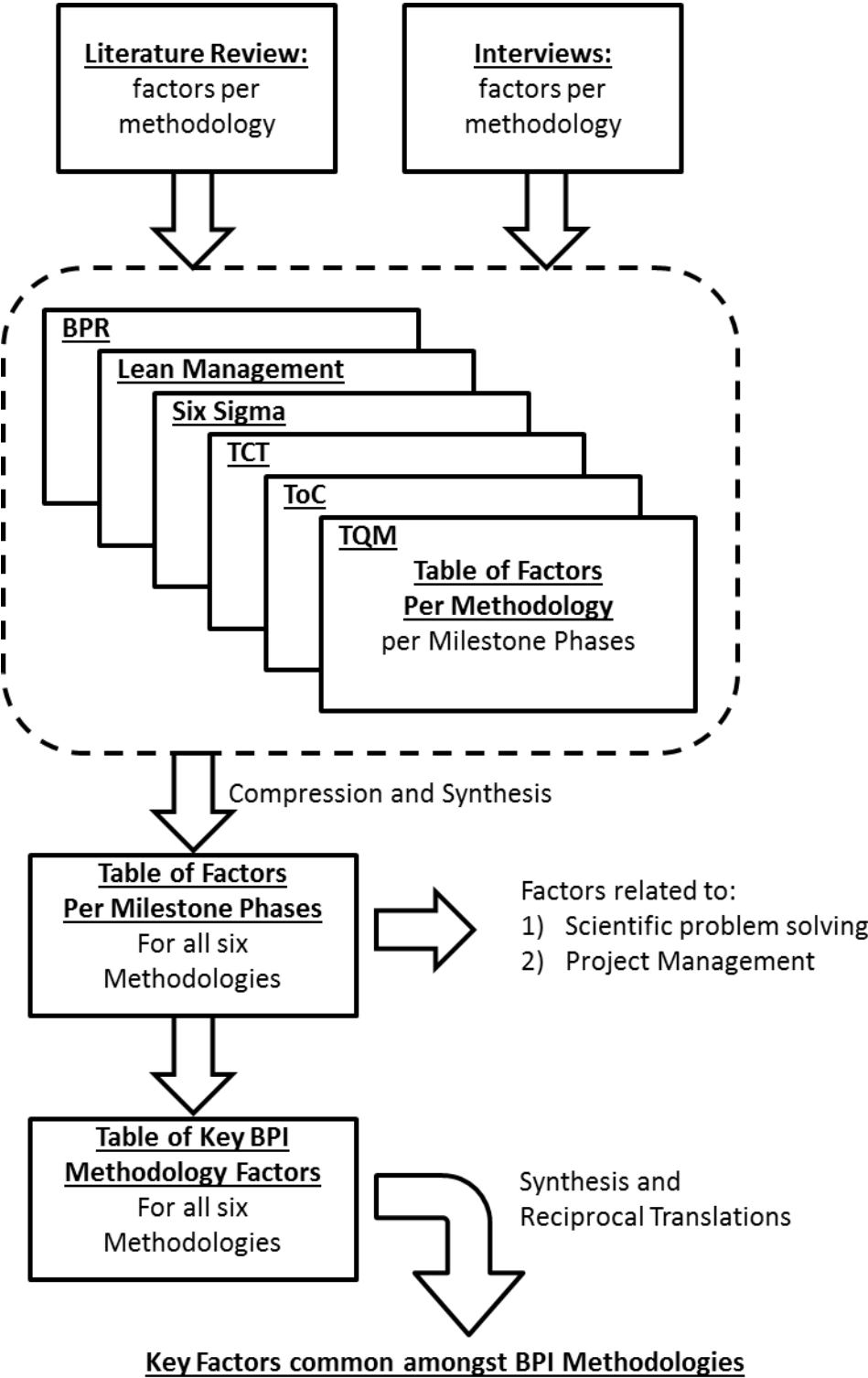
4.5 Synthesis for Common Factors

The reciprocal translation technique selected for synthesis of composition evidence and detailed in Chapter 2, requires the meaning of one work to be translated into that of another and vice versa (Noblit & Hare, 1988). This procedure was an essential feature for the analysis of the methodology compositions in that the owners, proponents and practitioners of the various BPI methodologies appeared to strive for uniqueness. Apparently, they did not want their methodology to be viewed as a facsimile of any other. This apparent desire to create unique selling points (USP) resulted in the respondents using unique terminologies or creating seemingly distinct constructs and components. Only in rare cases, such as with Lean Six Sigma (George, 2002), did the evidence show that a methodology could be linked, identified and integrated with another methodology. In these works, the resulting methodology was presented as a hybrid of the parents – utilizing the best of both methodologies. This hybrid representation created a USP which provided the customer with a distinguishable value proposition based on its parent methodologies.

The drive to create uniqueness mandated reciprocal translations between the methodologies on multiple levels: languages, concepts, process, components, measurements (KPIs), implementation constraints and internalization parameters. The bi-directional translation, as difficult and time consuming as it was to implement, was viewed as essential in order to compress the evidence for each of the six methodologies from their respective six sources (literature review, IP owner, two consulting practitioners, and two business practitioners) into common descriptions and then to extract the common constructs and

components from these descriptions. Figure 4.5-1 shown below depicts the process flow utilized in accomplishing this task. Each of the process steps will be described in the order in which they appear in the figure.

Figure 4.5-1 Determining Key Factors common amongst BPI Methodologies



4.5.1 Tabularizing the Evidence

The mechanics of the first step involved tabularizing the key components and constructs obtained from each of the six sources into a table for each methodology. Evidence found during the literature reviews had already been placed in an initial grid structured using an 8-step process phase model similar to that given by König and Volmer (2008). In the model, the process phases (categories of interest) formed the vertical axis. Inputs from the respective sources were placed along the horizontal axis. Evidence gained from the SLR about each methodology is shown in Tables 4.4-1 through 4.4-6. These being sparse matrixes were driven by the inability to identify the key components and constructs or the failure to recognize alignment between these and elements of the phase model based solely on the literature review. Both required a focused literature review as the initial remedial action for gap closure.

While preparing the interview schedule, the author realized that the 8-step process phase model used to organize the acquired evidence from the literature review should be replaced by a 5-stage milestone-based structure. The expert panel used during the initial survey had recommended this latter format. While the process phase model had facilitated structuring the data derived from the literature review, the milestone-based structure was one to which both IP owners and practitioners could more easily relate. This may have been because the process-model was aligned with the development process for a methodology and the milestone-based structure mimicked the project phases of BPI initiatives. Since the thesis focus was on methodology content and not on structure of its use, the change was irrelevant to the research objectives. In terms of effort, conversion to the new structure was insignificant since only the SLR data had to be recast. While reorganizing the SLR data, it was also synthesized and condensed to make it more readily align with the data acquired during the interviews. In order to accomplish this, the literature review data was reciprocally translated against the IP owner's input for the respective methodology.

Tables 4.4-1 through 4.4-6 show, per methodology, data regarding components and constructs obtained from each of the six sources – SLR and five interviews. Each table places the data for the respective methodology in a two-dimensional matrix according to the milestone phases. These tables provide an overview per methodology across the six sources.

Two aspects of the interview respondent data in Tables 4.4-1 through 4.4-6 require clarification. The first is that the sources did not consistently link the key elements of a given methodology to the same milestone phase. Again, these inconsistencies were not important since the objective was to determine common key factors and not to establish in which phase they occurred or were considered. In fact, some of these factors could cross over the phase boundaries. They may start in one phase and end in another. Like the process-model before it, the milestone-based model was only utilized as an aid to structure the evidence.

The second aspect requiring clarification concerns the linkage of the respondents' input to the respective methodology. During the first three interviews, the author recognized that the respondents appeared to have difficulties in delineating between the composition of a BPI methodology, a BPI initiative and a BPI project. For this reason, the interview process was immediately modified. This modification was discussed earlier in Section 4.4.4. The change enabled capturing what the respondent thought were key elements explicitly required by the methodology, implicitly required by that methodology, logically required or ancillary requirements. In Tables 4.4-1 through 4.4-6, four different fonts (bold-underlined, bold, bold-cursive, and normal) were used respectively to delineate these four different inputs. A legend regarding these fonts was provided as a footnote to each table.

4.5.2 Data Compression

The mechanics of the second synthesizing step dealt with condensing the data from the six sources per methodology into one set of data for each methodology. This data compression required eliminating duplicate entries, aggregating details regarding tools or techniques into higher-level elements and, where complexity or lack of clarity required, using

the reciprocal translation synthesis technique detailed by Noblit and Hare (1988). As predicted by Noblit and Hare, this reciprocal translation synthesis resulted in new metaphors for some of the elements. Results of the synthesis and data compression were assigned to phases of the milestone model according to where the key factor was first mentioned or where they were most often recognized by the interviewees. The latter is important so that the business community readers can better relate to these elements. Throughout step two, maintaining a holistic perspective was required in order to preserve proper orientation and assure completeness. A non-uniform granularity in terms of mixing tools, methods, constructs and composition elements was permitted at this stage of the synthesis process. The question of granularity was dealt with in the final synthesis step. These intermediate compressed results show comparable elements across all six methodologies according to the milestone phase structure. These results are shown in Table 4.5.2-1. In ordering the table entries, a BPI initiative's typical processing sequence was not assured but considered wherever this convention added clarity.

Table 4.5.2-1 Composite of Key Factors

| Milestone Phase | BPR | Lean management | Six Sigma | TCT | ToC | TQM |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Assessment: Id. Need, Assess potential, Calc. payback. Milestone = Decide on an initiative</p> | <ul style="list-style-type: none"> ● Create a <u>Vision Statement</u> ● <u>Define how the organization should operate</u> ● Resource planning to determine the project's viability ● Market analysis ● <u>SWOT analysis</u> ● <u>Cost – Benefit analysis</u> ● <u>Strategy analysis and alignment</u> ● Root Cause analysis of <u>Business problems</u> ● <u>Business Strategy linked to business processes</u> ● Project goals ● Communication plan | <ul style="list-style-type: none"> ● Management has to: <ul style="list-style-type: none"> ○ Determine the project's financial payback ○ Decide on its commitment to the project ● <u>Commit funding and human resources to it.</u> ● <u>Buy-in & commitment by management and the union</u> ● <u>Communication</u> | <ul style="list-style-type: none"> ● <u>Establishing the targeted financial improvements</u> ● <u>Research into Six Sigma and the results it can bring</u> ● <u>Funding the project</u> ● Contracting external consultants for Master Black Belts and possibly Black Belts ● <u>Committing to the initiative</u> | <ul style="list-style-type: none"> ● <u>Recognition of a need to improve</u> ● <u>Scope definition</u> ● <u>CEO commitment</u> ● <u>Macro-Assessment</u> ● <u>Vision of the entitlement</u> ● <u>performance level</u> | <ul style="list-style-type: none"> ● <u>Need analysis and problem definition</u> ● <u>Determination of the initiative's financial impact</u> ● Defining the strategic approach for the solution initiative charter and objectives ● <u>Resource and skill sets assessment</u> ● <u>Communicating the need and dilemma</u> ● <u>Communicating the solution</u> ● Calc. payback and financial impacts | <ul style="list-style-type: none"> ● <u>What is our vision for the future state?</u> ● <u>What would the project and resource plans look like?</u> ● <u>Analyse the business dilemma</u> ● <u>Evaluate the feasibility to realize</u> ● <u>Set intelligent goals, timetable and expectations</u> ● <u>Study feasible options</u> ● <u>Organizational commitment</u> ● <u>Communicate situation, TQM initiative and commitment</u> ● <u>Communicate the dilemma, goals, solution & commitment</u> |

Table 4.5.2-1 (continued)

| Milestone Phase | BPR | Lean management | Six Sigma | TCT | ToC | TQM |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Start-up: Define Strategic plan, Resource plan, and Project plan. Milestone = Kick-off</p> | <ul style="list-style-type: none"> ● <u>Financial objectives of the initiative</u> ● <u>Implementation strategy development</u> ● <u>Tactical planning for the project and resources</u> ● Project Charter, Scope and Statement of Work ● <u>Resource allocations</u> ● <u>Communicate the need, objectives and approach to the workforce</u> | <ul style="list-style-type: none"> ● <u>Hoshin kauri [Policy deployment]</u> ● <u>Sensei [using experts]</u> ● <u>Hancho identification and training</u> ● <u>Resource allocation – both internally and externally.</u> ● <u>Establishing project management reviews and control mechanisms.</u> ● <u>Communication to the workforce – especially the union</u> | <ul style="list-style-type: none"> ● <u>Communication to the organization</u> ● <u>Establishing the Executive Leadership</u> ● <u>Confirming the financial targets</u> ● <u>Resource allocation</u> ● <u>Setting the measurements to be tracked</u> ● <u>Project kick-off</u> | <ul style="list-style-type: none"> ● <u>CEO Workshop:</u> ● <u>Financial and time commitment</u> ● <u>Baseline and entitlement analysis</u> ● <u>Establishing the Cross-functional team infrastructure, BRTs, CFTs and BIT.</u> ● <u>Symptom & Barrier Identification</u> ● <u>Cockpit charts development</u> ● <u>Communicate initiative & expectations to workforce</u> | <ul style="list-style-type: none"> ● <u>Project charter and objectives</u> ● <u>Project plans and schedules</u> ● <u>Resource allocation</u> ● <u>Executive decision making (EDM) workshop</u> ● <u>Mgmt training</u> ● <u>Establish the steering committee</u> ● <u>Establish the process owner teams</u> ● <u>Thinking Processes</u> ● <u>Effect-Cause-Effect analysis</u> ● <u>Culture & paradigm analysis</u> ● <u>Resource management</u> ● <u>Initiative planning and scheduling</u> ● <u>Establishing initiative KPI's</u> ● <u>Communicate the initiative and kick-off</u> | <ul style="list-style-type: none"> ● <u>Resource allocation – including outside consultants</u> ● <u>Finalizing the project and resource plans</u> ● <u>Communicate project and resource allocation</u> ● <u>Initiative kick-off</u> |

Table 4.5.2-1 (continued)

| Milestone Phase | BPR | Lean management | Six Sigma | TCT | ToC | TQM |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><u>Deployment:</u> Communicate to the workforce the initiative & their involvement. Establish initiative infrastructure Milestone = Trained Infrastructure</p> | <ul style="list-style-type: none"> Establish Leader, Process Owner, Reengineering Team (Case Workers or Case Teams), Steering Committee & Reengineering Czar <u>Customer Focus linked to BPR</u> <u>IT strategy and business value analysis</u> <u>Detailed process evaluations & Benchmarking</u> <u>Process mapping</u> <u>Process selections – rollout planning</u> <u>Change management criteria and parameters</u> <u>Process redesign</u> <u>Organization redesign</u> <u>Resource plan and allocation</u> <u>Implementation plan and roadmaps</u> <u>KPIs linked to project and team objectives</u> Responsibility breakdown Review schedule <u>Communication plan</u> | <ul style="list-style-type: none"> <u>Work teams assignments and the project infrastructure</u> <u>Lean training</u> <u>Senpai/Kohai [senior/junior] concept</u> <u>Providing for Visual Management</u> <u>Prioritization of processes and kaizens</u> <u>Measurements & Dashboard charts</u> <u>Communication requirements</u> | <ul style="list-style-type: none"> <u>Setting up and assigning the Champion and Belts</u> <u>6σ Training the Executive Leader ship, Champions and Belts.</u> <u>Selecting and prioritizing the process to be improved</u> <u>Establishing the KPIs measurements, charting and controlling</u> <u>Populating the charts and SPC tools</u> | <ul style="list-style-type: none"> <u>Setting up & chartering BIT and CFT's</u> <u>TCT Training and workshops</u> <u>16 step change process</u> <u>Process mapping of the baseline and the entitled processes</u> <u>Root Cause Barrier Identification</u> <u>Barrier removal management</u> <u>TCT Hierarchical metrics & Cockpit charts</u> <u>Baseline performance evaluation</u> | <ul style="list-style-type: none"> <u>Resource allocation</u> <u>Team infrastructure, charter and objectives</u> <u>Identify the targeted process(es)</u> <u>TOC training</u> <u>Strategic & Tactic plans</u> <u>Create action plans including pilots and rollouts</u> <u>Strategic and operative KPIs and data logistics</u> <u>Communicating the implementation plan</u> | <ul style="list-style-type: none"> <u>Training</u> <u>Employ cross-functional management for job enrichment and improved quality management</u> <u>Establish quality teams</u> <u>Detailed project plan – Detailed action plan – who what and when</u> <u>Create a responsibility breakdown matrix</u> <u>Piloting and rollout planning</u> <u>Create a communication plan</u> <u>Create a KPI system covering both business and initiative</u> |

Table 4.5.2-1 (continued)

| Milestone Phase | BPR | Lean management | Six Sigma | TCT | ToC | TQM |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Implementation: Determine change logic, demands & impacts. Effect changes and eliminate former practices</p> <p>Milestone = Project end</p> | <ul style="list-style-type: none"> Understand and measure the existing processes. Identify areas of leverage. Design and build prototype of new processes. Cross-functional Team infrastructure: Steering committee and Process owners Project management Management reviews Steering committee Training Project plan execution Action plans Progress measurements and reviews Communication | <ul style="list-style-type: none"> PDCA cycle 5(6)S processes Value Stream Mapping Genchi Genbutsu 5W cause determination Muda, Muri, Mura Reduction of wastes Flow levelling Time and motion studies Cost reduction targets Process flow optimization Kaizen events Steering committee Measurements & Dashboard chart reviews Visual management | <ul style="list-style-type: none"> DMAIC (or DMADV for product and process development) 5-Whys Ishikawa diagrams FMEA SIPOC mapping Hypothesis testing Piloting Cause determination Teamwork Process variance analysis KPIs Charts and measurements Progress reviews Linkage of changes to metrics | <ul style="list-style-type: none"> The 5I's process Root-cause Barrier elimination action plan Implement process changes Contr of removal of substitute processes Drive financial improvements Cockpit charts with Baseline & Entitlement forecast Periodic progress reviews | <ul style="list-style-type: none"> Thinking Processes Strategic & Tactical plans ToC's 5-step process Drum-Buffer-Rope Implementing ToC's project management methods KPI tracking and reviews Execution of pilot and rollout plans Remedial action plans Root cause analysis Execution of communications plan Communicating and celebrating progress | <ul style="list-style-type: none"> Management workshops: Their new role as coaches On-going training and communication according to plan and needs Utilization of the Deming cycle Utilize FMEA and root cause analysis tools Ishikawa diagrams Quality circles Pareto charts Project management KPI driven Project reviews |

Table 4.5.2-1 (continued)

| | | | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Milestone Phase <u>Internalization:</u> Control improvements & conversion to new practices - assuring change permanency Objective = internalized methodology</p> | <p>BPR</p> <ul style="list-style-type: none"> Control the effectiveness of new process implementation <u>IT implementation planning</u> <u>KPIs and reviews</u> <u>Action plan</u> BPM or ERP software realization Celebrating success Cycles of repetition | <p>Lean management</p> <ul style="list-style-type: none"> <u>CIP: The 6th S</u> Stability of the KPIs <i>Revisiting/resetting the targets</i> <i>Resource reallocation</i> <i>Realizing the process improvements at the business level</i> Celebrating the successes | <p>Six Sigma</p> <ul style="list-style-type: none"> <u>SPC Charts and measurements</u> <i>Stable measurements</i> <u>Attainment of 3.4 PPMO</u> | <p>TCT</p> <ul style="list-style-type: none"> <u>Manage the business culture change for process optimization, financial improvements and increased business competitiveness</u> <u>CIP Continuation of Barrier management, measurements and reviews</u> <u>Process viewpoint instead of departmental orientation</u> Resetting of entitlement as the process is optimized – continuous improvement | <p>ToC</p> <ul style="list-style-type: none"> Monitor culture changes Monitor continuous improvement changes <i>New action plan development</i> | <p>TQM</p> <ul style="list-style-type: none"> <u>On-going training and communications</u> <u>On-going KPI reviews and action plan development</u> <i>Management workshops: Maintaining a continuous improvement culture</i> Internalization of the Deming cycle and the TQM philosophy Celebration of success |
| <p>Footnote:</p> | <p>Font =Type of requirement</p> | <p>(related to the methodology)</p> | <p><u>Explicit</u></p> | <p>Implicit</p> | <p>Logical</p> | <p>Ancillary</p> |

4.5.2.1 Aggregation and Reciprocal Translation Example

Before detailing the next step in the process, it appears appropriate to provide examples of the aggregation and reciprocal translation techniques used in the current process step. For the sake of clarity and simplicity, an application of these techniques was selected which involves intra-methodology synthesis rather than an inter-methodology one. This choice limits the application example to one methodology's "language" and "culture".

In Table 4.4-2, there are 17 entries in the implementation phase which were synthesized into 5 entries in Table 4.5.2-1. How this was done is presented here in five cases. In the first one, the "Single Minute Exchange of Die" (SMED) and "cycle and takt times" entries were aggregated into "time and motion studies". Although time and motion studies may be considered a direct metaphor for the cycle and takt time entry, it is not for the SMED one. This merger required translating the SMED based on its primary element of taking time and motion studies and using these studies as drivers for change. This data compression technique allowed the two entries, SMED and cycle & takt times, then to be replaced by one. Likewise, in the second case, the "reduction of wastes" entry in Table 4.5.2-1 was formed by aggregating three entries from Table 4.4-2 ("line-stop concept", "poka-yoke (error proofing)" and "total productive maintenance"). Translations of these three techniques were based on their single objective of reducing waste. Production lines are stopped to discontinue producing poor product quality. Error proofing is a means of avoiding producing poor quality. Total productive maintenance keeps the line in good order and therefore producing better quality products. The third aggregation deals with the combining of the "Heijunka box" and "line levelling" entries into "flow levelling". Although it can be argued that flow levelling is a direct metaphor of line levelling, the connection to a Heijunka box is not so straightforward. The purpose and use of this box had to be researched in order to translate the term and thereby allow its aggregation into flow levelling. The box is a manual scheduling tool in which Kanban cards are placed in slots according to the production time allocations. This tool makes

the type of jobs in the queue and the line loading transparent. The effect is that the production flow is levelled. The fourth aggregation also required translations. This reduction involved combining “JIT” (just in time) and “supermarket concept” into the single entry “cost reduction targets”. On the surface, JIT and supermarkets may have little in common. Both would appear to be just scheduling techniques. JIT involves delivery of parts precisely when there are required. The supermarket concept calls for a predetermined quantity of parts to be placed in racks close to where they are needed. The objective of both concepts is to reduce the inventory requirements while assuring adequate supply. Since reduction in inventory equates to reduction in bound capital and cost, therein lays the relationship on which the translation was based.

The final aggregation activity in this example involved combining eight entries from Table 4.4-2 into Table 4.5.2-1’s “process flow optimization” entry. Those eight entries were Kanban (pull systems), autonomation (smart automation), andon board/lights, first-in/first-out principle, Milk-run principle, one-piece flow, U-Layout, and Chaku-Chaku. Only the U-layout and one-piece flow had direct and recognizable connections to optimizing the process flow. The other six had to be analysed for their function, application and efficacy before they could be translated into the “process flow optimization” metaphor. Kanban, the principles of milk-runs and the first-in/first-out concept help optimize process flow by being scheduling and logistic techniques that are simple, reliable and effective. Andon board/lights improve the process flow by continuously monitoring the status of machines and production lines. Abnormalities are immediately indicated by the andon thereby enabling rapid resolutions. Autonomation is a portmanteau word coined by Toyota based on the word automation. When implemented, autonomation follows the Jidoka principle (Rosenthal, 2002). This principle involves detecting a defect where it is generated, stopping further production and eliminating the root cause of the defect before production continues. In this context, autonomation can be understood as optimizing both process flow and product quality. Chaku-Chaku was probably

the one which took the most time and effort to study and translate. Literally translated from Japanese, the term means load-load which reflects the operator's activities regarding the series of machines being serviced. Behind this literal translation of Chaku-Chaku is the concept of optimal machine layout and sequencing – therefore the connection to process flow optimization.

In this example, reciprocal translation was subordinated to aggregation. That is, the translations enabled the aggregation. Later, an example will be given where aggregation was not involved. The role of reciprocal translations will thereby become clearer.

4.5.2.2 Data Refinement

The third process step, depicted in Figure 4.5-1 above, required further compression of data in Table 4.5.2-1 into information pertaining specifically to methodology composition (Table 4.5.2.2-1). This step required two separate activities. The first was to eliminate non-methodology factors coming from two sources – scientific problem solving and project management. The author recognized that the BPI methodologies are implemented as a project-based initiative which itself is embedded in the scientific problem solving approach of 1) defining the problem, 2) analysing the situation, 3) developing alternatives, 4) committing to a solution, 5) implementing the solution, 6) controlling the results. This embedding means that all BPI initiatives will be characterized by both project management (statement of work, work breakdown structure, action plans, resource planning, goal and objective setting, project/progress review, workload prioritization and management) and scientific problem solving (business dilemma analysis, data gathering, information evaluation, alternative evaluation, and solution determination) elements. These elements were not considered germane to the methodologies themselves but rather to the initiatives which employ them. Since the research objectives concerned the commonalities within the methodologies and not the commonalities in the initiatives, elements pertaining to project management of an

initiative and scientific problem solving of the business dilemma were removed from consideration.

The second part of step three was to further aggregate the remaining details into higher-level components, eliminate similar entries within each methodology and synthesize evidence across the six methodologies. As in step two, this data compression also required using the synthesis techniques of Noblit and Hare (1988) for reciprocal translations. Unlike in the previous step where some of the metaphors related to a particular methodology were maintained, in this step, a conscious effort was made to utilize metaphors not related to any given methodology. The author feels that the final documentation should not contain jargon (terminology, nomenclature, registered trademarks and service marks) from any of the individual methodologies. Again, usage of such jargon could be viewed as bias or endorsing and promoting a given methodology.

Table 4.5.2.2-1 Synthesized Key Factors

| BPR | Lean management | Six Sigma | ICT | ToC | TQM |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> ● Creation of a value proposition ● Establish hierarchical CF change team infrastructure ● Process mapping ● Culture Change: use of internal expertise, empowerment, process mindset & CIP ● Management coaching re: new roles &responsibilities ● Root Cause elimination ● Policy deployment linking BPI goals to business strategy & objectives ● Visual Management (incl. Dashboard charting) ● Repetitive, multi-phase change management process ● Process mapping ● Root Cause elimination ● Process flow optimization ● KPIs driven process improvement ● Process flow optimization ● KPIs driven process improvement ● Culture Change: use of internal expertise, empowerment, process mindset & CIP | <ul style="list-style-type: none"> ● Policy deployment linking BPI goals to business strategy & objectives ● Establish hierarchical CF change team infrastructure ● BPI Methodology training ● Management coaching re: new roles &responsibilities ● Visual Management (incl. Dashboard charting) ● Repetitive, multi-phase change management process ● Process mapping ● Root Cause elimination ● Process flow optimization ● KPIs driven process improvement ● Culture Change: use of internal expertise, empowerment, process mindset & CIP | <ul style="list-style-type: none"> ● Policy deployment linking BPI goals to business strategy & objectives ● Culture Change: use of internal expertise, empowerment, process mindset & CIP ● Establish hierarchical CF change team infrastructure ● BPI Methodology training ● Repetitive, multi-phase change management process ● Process mapping ● Root Cause elimination ● Process flow optimization ● KPIs driven process improvement ● Visual Management (incl. Dashboard charting) ● Policy deployment linking BPI goals to business strategy & objectives ● Culture Change: use of internal expertise, empowerment, process mindset & CIP | <ul style="list-style-type: none"> ● Creation of a value proposition ● Management coaching re: new roles &responsibilities ● Establish hierarchical CF change team infrastructure ● BPI Methodology training ● Repetitive, multi-phase change management process ● Process mapping ● Root Cause elimination ● Process flow optimization ● KPIs driven process improvement ● Visual Management (incl. Dashboard charting) ● Policy deployment linking BPI goals to business strategy & objectives ● Culture Change: use of internal expertise, empowerment, process mindset & CIP | <ul style="list-style-type: none"> ● Management coaching re: new roles &responsibilities ● Process mapping ● Policy deployment linking BPI goals to business strategy & objectives ● Creation of a value proposition ● Establish hierarchical CF change team infrastructure ● BPI Methodology training ● Repetitive, multi-phase change management process ● Process flow optimization ● KPIs driven process improvement ● Root Cause elimination ● Culture Change: use of internal expertise, empowerment, process mindset & CIP | <ul style="list-style-type: none"> ● Creation of a value proposition ● Establish hierarchical CF change team infrastructure ● BPI Methodology training ● Process flow optimization ● Policy deployment linking BPI goals to business strategy & objectives ● Management coaching re: new roles &responsibilities ● Repetitive, multi-phase change management process ● Process flow optimization ● KPIs driven process improvement ● Root Cause elimination ● KPIs driven process improvement ● Culture Change: use of internal expertise, empowerment, process mindset & CIP |

4.5.2.3 Data Synthesizing: Process Example

Synthesizing information across the six methodologies in Table 4.5.2-1 into the Table 4.5.2.2-1 entries afforded a good example of how the reciprocal translation technique was used. Unlike the previous example, aggregation was not involved. In this example, five translations were required in order to determine the commonality of one key factor across the six methodologies. A first translation set started with BPR's entry, "create a vision statement", and TQM's entry, "what is our vision for the future state". The reciprocal translation resulted in a new metaphor called, "create a vision of the future state". This was subsequently translated against TCT's "vision of the entitled performance level" to create a new metaphor called, "create a vision of the entitled performance". After acquiring additional evidence pertaining to Lean Management and Six Sigma via focused research, a second translation set was made. This set started with translating, Lean Management's entry, "determine the project's financial payback" reciprocally against Six Sigma's entry, "establish the targeted financial improvements". These were translated into "establish project's financial improvements". This result was then reciprocally translated against ToC's entry, "calculate payback and financial impacts" to produce "establish project's financial impact". This result was further translated against that from the first translation set ("create a vision of the entitled performance"). This final reciprocal translation resulted in a metaphor called "creation of a value proposition". This end result is justified in that a value proposition for the BPI initiative must include its financial impact and payback as well as making a statement about the organization's future state.

4.5.3 Results: Common Key Factors

Results of the final synthesis in step three are listed in Table 4.5.2.2-1. Since the milestone phase reference no longer applied, it was eliminated from this table in favour of a holistic view of the BPI methodologies. From this table's entries, nine key constructs and components common to all six methodologies were extracted. These were:

1. Management coaching regarding new roles and responsibilities
2. Policy deployment linking BPI initiative goals to business strategy and objectives
3. BPI Methodology training
4. Hierarchical, cross-functional, change team infrastructure
5. Repetitive, multi-phase change management process
6. Elimination of root causes
7. Process flow optimization
8. KPIs driven process improvement
9. Business culture change.

In addition, three more were found to be common to a majority of the methodologies but not all. They were:

1. Creation of a value proposition
2. Process mapping
3. Visual Management (incl. Dashboard charting)

The first of these three was not in the original information for both Lean Management and Six Sigma methodologies. In a subsequent focused literature review, evidence was found in Koch's (2011) discussions of the five maxims of Lean Management as well as the Koch's descriptions regarding the voice of the customer and quality function deployment in Six Sigma. In addition, McCarty et al (2010) depicted elements of value proposition creation while discussing the foundations of the Six Sigma management system.

Process mapping did not surface as an element of the TQM methodology in either the SLR or initial interview data. Again, evidence was found through a focused literature review. Process mapping, as a component of TQM, was explicitly discussed in terms of the ISO-9000 standards and the EFQM excellence awards (Koch, 2011; Zink, 2004) and implicitly considered by Hummel and Malorny (2011) in their treatment of process analysis within TQM.

The third element, visual management, which was missing from the ToC and TQM methodology descriptions, was not only the subject of a focused literature review but also a focused, unstructured interview with practitioners. The literature review failed to find evidence regarding the explicit or implicit embedding of visual management as an integral component of either the ToC or TQM methodology. Websites of numerous consultancies were found that listed visual management and the toolboxes of these methodologies, but none discussed how, when or why visual management is used in the two respective methodologies. Visual management was simply listed along with tools and techniques from Six Sigma, Lean Management, etc. as part of the ToC or TQM methodology. Nevertheless, the extensive use of visual representations in the ToC methodology's "Thinking Processes" would appear to indicate that visual management is also employed in that methodology. It is logical to conclude that these visual representations (Current Reality Tree, Evaporating Cloud, Core Conflict Cloud, Future Reality Tree, Negative Branch Reservations, Positive Reinforcement Loop, Prerequisite Tree, Transition Tree and Strategy & Tactics Plan) are generated for use in managing the initiative in some way. This logical conclusion was supported by evidence from the follow-up, focused interviews. Both of the business practitioners independently provided examples of shop-floor visual management and visual control displays.

Follow-up interviews also gave evidence that visual management is an integral part of the TQM methodology. A TQM consulting practitioner (personal conversation, October, 2012) stated, for example, that "the workplace visuals and charts are vital to internalizing TQM philosophy with both the workforce and management". Additionally, one of TQM business practitioner explicitly stated how visual management was employed when describing how the TQM initiative was communicated. The respondent commented that, "other than face-to-face communications, the bulletin boards were populated with dashboard charts showing and explaining the KPIs" (personal conversation, August, 2012).

This new evidence was judged sufficient to include all three elements as common key factors. This inclusion resulted in a total of 12 key factors being judged common amongst the six methodologies. With these results, the second research question was answered, the second research objective was met and the first research/thesis aim achieved. A brief description of each of the 12 common key factors is given in Section 4.6 wherein the efficacy of each is also discussed.

4.5.4 Process Cycles of Learning

Before continuing on to discuss the efficacy of each common key factor in the next section, it is important to reflect on two aspects of the synthesis process – reciprocal translations and follow-up interviews. While the former was used to distil the data into information, the latter was employed to gather missing data and fill gaps in the evidence. The intricacies of these two techniques were enlightening findings.

As is evident in the examples given earlier, reciprocal translation was a time-consuming and thought-provoking process. As anyone who has used a thesaurus knows, a term's metaphors are grouped according to the different senses or contexts in which the term is utilized. Correspondingly, anyone using reciprocal translations of elements must not only be familiar with the meaning of the subjects being translated but also the senses and contexts in which the elements are found. This challenge was exacerbated in the research by having to deal with multiple languages (English, French, German and Japanese) as well as Asian and non-Asian cultural influences. Taking Chaku-Chaku as an example, the expression literally means load-load, but this Japanese term embodies more than the operator moving from one machine to another performing sequential loading operations. Connecting these operator activities to lean management's focus on eliminating waste and the cultural consideration of not overburdening the worker brings the concepts of machine layout, single piece flow and island-based manufacturing into Chaku-Chaku. This holistic view turns Chaku-Chaku into a process flow optimizing approach. This example shows why a pony-style reciprocal

translation would be totally inappropriate. Each reciprocal translation, made as part of this research, had to be investigated at the subject matter as well as the concept level. Gaining a comprehensive and holistic understanding was mandated.

The second learning cycle involves the follow-up interviews proving to be much more challenging than the initial ones. This challenge was not because the former were unstructured and the latter semi-structured, but because the need to have a follow-up interview automatically indicated that something was missing or wrong. As in any interview, leading the interviewee to give some predetermined response is undesirable. In the initial interviews, care was taken to avoid such leading questions and interview styles that pre-programmed the responses. In this context, the follow-up interviews brought two additional challenges. The first dealt with the need for the follow-up interview. The respondents immediately and correctly assumed that the follow-up interview was predicated on a need for more information. Each explicitly asked what was missing, what was wrong or where the gap was. Answering such questions directly could have placed the respondent on the defensive – of themselves and/or their methodology. For this reason, the follow-up interviews were placed in the context of giving feedback about the initial interview and the research findings. Naturally, the issue of the information shortfall about a key element had to be introduced in some way during the conversation. The approach which worked best was to mention that a key element was found in another methodology and to ask the respondent to comment on what possible value that element could bring to the other methodology. This technique was adapted from Boddewyn's (2004, xvi) observation on interviewing that, "A good approach is to throw a dilemma rather than a straight question at them - for example: 'I have heard different answers ... I cannot understand the question someone else gave me ... What do you think they meant?'". The approach avoided explicitly stating that the element was missing from the respondent's methodology or implying that it should be part of that methodology. The question's focus was on the element's value. Responses to this query could be classified as

either conjecture-based or reference-based. A reference-based response gave explicit evidence that element was either part of that methodology (via a positive value reference) or not (via a negative value reference) since its value was referenced in terms of the respondent's methodology. A conjecture-based response implied that the element was missing from the interviewee's methodology especially if the conjectured value was negative. Receiving a conjecture-based response required further discussions about the element's potential value. When no reference-based response was forthcoming, it increased the probability that the assumption about the element being missing was true. However, when receiving only conjecture-based responses, there was no way to be absolutely sure that the element was included in or missing from the methodology. Even explicitly asking if the element was part of the interviewee's methodology would not generate unquestionable certainty since this query could lead the respondent to believe that the element should be part of the methodology and therefore respond accordingly.

4.6 Efficacy Analysis by Individual Factor

Evidence regarding efficacy (efficiency, effectiveness, value-added throughput or benefit) of methodology components were recorded as it was encountered during the SLR or interviewing processes. The activity of collecting such evidence during those processes was supplemental to the identification of common factors. During those phases, it would have been neither logical nor efficient to explore the efficacies of all elements, factors, components and constructs named in association with any of the six methodologies. Instead, a tactical approach was taken to identify the common factors first and then explore the efficacy drivers behind only those factors found to be common to all methodologies.

Insight into each of the 12 common factors and understanding their respective efficacy drivers was drawn from interviews, literature research and personal experience. In addition to interviews with BPI professionals, a series of three focused interviews with human resource experts and an industrial psychologist were made regarding the impact of the 12 common

factors. These interviews mandated follow-up literature research regarding the terminology, topics and concepts expressed by these non-BPI experts. Furthermore, a series of focused literature reviews pertaining to each of the 12 common key factors were performed as gap closure activities. The knowledge coming from the author's nearly 45 years of business experience and, in particular, 24 years of business process improvement practice and completion of 39 BPI initiatives also provided evidence for gap closure. Additionally, Conseil GmbH's "black literature" was consulted for evidence regarding efficacy drivers. This activity was not only a gap closure exercise but also one to assure validity, coverage and a degree of bias control.

Describing the fundamental deliverables for each key component and construct (the third research objective) required finding a technique to analyse and synthesize the data amassed on efficacy (the third research question). This analysis and synthesis task primarily involved aggregation of the data into suitable information. This aggregation required a number of reciprocal translations since the evidence had been gained from various sources, a variety of professional experts and multiple fields a study. However, the volume of these translations was minor in comparison to that required for synthesis of the common factors. Ultimately, a narrative summary of the efficacy data was selected as the appropriate means to analyse, synthesize and present the efficacy evidence. Completion of this narrative summary simultaneously answers the third research question and fulfils the third research objective. Thereby, the second research/thesis aim was also attained.

Each of the 12 key elements common amongst the methodologies will be dealt with sequentially in the context of a seamless process. The order in which their efficacies and value adding attributes are defined and described is:

1. Creation of a value proposition
2. Management coaching regarding new roles and responsibilities
3. Policy deployment linking BPI initiative goals to business strategy and objectives

4. BPI Methodology training
5. Hierarchical, cross-functional, change team infrastructure
6. Process mapping
7. Repetitive, multi-phase change management process
8. Elimination of root causes
9. Process flow optimization
10. KPIs driven process improvement
11. Visual Management (incl. Dashboard charting)
12. Business culture change.

This order roughly follows the sequence in which each becomes important during a BPI initiative. Placing them in the context of a seamless process and within a project framework common to initiatives permits an assessment of the content validity regarding the common factors as a whole. That is, considering the factors in this setting provided insight into how well these factors cover an entire initiative and highlighted any clear voids. A short description of each key factor is given as well as the results of research regarding its efficacy.

4.6.1 Creation of a Value Proposition

Creation of a value proposition is a factor which, across the six methodologies, varies in both the manner in which the value proposition is created and its composition according to the methodology's focal point and usage. There is a common thread however, which involves analysing the business dilemma, determining the realizable impact of the BPI initiative, setting the goals of that initiative and ultimately gaining top management's commitment for the initiative.

BPR uses a market, strength-weakness-opportunity-threat (SWOT), cost-benefit, and strategy analyses to create a case for action. The methodology calls for a justification as to why reengineering is required as well as defining how the organization should operate and

details of the results to be achieved. In the BPR methodology, this results in the creation of a vision statement.

In the TCT methodology, the recognition of the need to improve is gained via a macro-assessment. This activity is a high-level assessment of the potential improvements in the processes, balance sheet and profit and loss statement. A so-called “vision of entitlement” is created to show the future state of both processes and financials. The results of the macro-assessment are used to determine the project scope, parameters and objectives.

Failure to create a value proposition or one which meets the organization’s requirements results in understandable consequences. The BPI initiative will not be supported or funded and an alternative solution to the business dilemma will be sought. From a businessman’s perspective, these consequences can create a driving force for overstating the value proposition. While evaluating the business dilemma, both internal and external practitioners often become aware of management’s threshold for payback and investment. Consequently, they could structure the value proposition accordingly. This alignment does not necessarily mean that they invent false benefits. Since there is always a range in both potential payback and required investments, utilizing the most advantageous ends of these spectrums can greatly impact the value proposition. Therefore, the business’s management must make itself aware of the assumptions made in creating the value proposition.

4.6.2 Management Coaching

Management coaching regarding new roles and responsibilities is the recognition in all methodologies that the management function and focus will be modified as a result of the initiative. Although the different methodologies subscribe to different points of leverage, they are common in that they espouse the use of process owners in a matrix with functional management, the internalization of a continuous improvement process (CIP) and an empowered workforce. This empowerment takes advantage of the workers’ expertise and subject matter knowledge as well as the capability to make decision-making at the lowest

possible level. Also common amongst all methodologies is the extensive use of workshops and management training sessions to introduce the methodology's concepts, identify issues with their implementation and internalize their usage.

One of BPR's major focuses is to divert management's orientation away from automating old or obsolete processes to one of optimizing the process first and then automating. This methodology calls upon management to analyse the business strategy and then align the business processes and IT strategy to it. BPR also advocates using a business value analysis as the basis for both organizational redesign and business process reengineering. Management is expected to use this process redesign to eliminate out-of-date processes as well as eliminating non-value adding process steps. Ultimately, BPR heightens management's awareness that the business environment is dynamic and that their processes cannot be static. These processes must evolve and keep pace with market expectations and competitive requirements.

Lean Management coaches business management to focus on waste elimination and the use of "shop floor" expertise. The latter is emphasized in Lean Management's Sensei (using experts), Hancho (team leader) and Senpai/Kohai (Senior/Junior) concepts. All three of these concepts encourage management not only to use their workers' knowledge for problem identification and problem-solving but also for decision-making. They also focus management on taking a process view instead of a functional orientation. Additionally, Lean Management encourages managers to immediately implement line stoppage when product defects are detected (the Jidoka principle) and to utilize a "pull" system for production scheduling. These two concepts eliminate waste due to the production of defective products and that due to overproduction or inventory accumulation respectively.

Six Sigma's Executive Leadership training teaches management how to leverage the methodology's hierarchical infrastructure of Master Black Belts, Black Belts, Green Belts and Yellow Belts as a parallel organization to functional management. This "belt" infrastructure is

a hierarchical system in terms of both process and methodology ownership. Six Sigma also teaches management how to manage by statistics and variance analysis with the goal of attaining an error rate of less than 3.4 parts per million opportunities (PPMO). Six Sigma's aim appears to be management by statistics.

TCT explicitly states a number of ways in which management must change their mindset. A process viewpoint must be taken instead of the departmental one. The use of a cross-functional approach has to be taken. The business improvement team (BIT) made up of top management, being at the top of the hierarchy in the cross-functional team (CFT) infrastructure, has two primary responsibilities. This BIT empowers the lower-level CFT's as process owners to identify problems, develop solutions, and improve their respective processes. The BIT's second responsibility is to assure that the process improvements made by the CFT's are converted into business performance improvements. A major part of this conversion is the removal of substitute processes employed by management and employees to work around process barriers. TCT also explicitly deals with internalization of improvements and business culture change. These explicit changes in management's style, approach, roles and responsibilities are focal points of TCT's "CEO workshop". In this workshop, management is also taught how to manage using total process cycle time, first pass yield and on-time delivery as key process drivers. Management's utilization of these drivers is seen as one of TCT's major objectives.

ToC's Executive Decision Making Workshop focuses management on the use of ToC's "Thinking Processes" and culture paradigm analysis as well as the ToC methodology in general. The thinking processes coach management in identifying and handling cause-effect relationships, resolving conflicts, managing and implementing change and in dealing with unforeseen impacts. For management, one of ToC's primary objectives is viewed as a conversion to the management of process constraints.

TQM coaches management on how to employ cross-functional management for job enrichment and improved quality. In the TQM management workshop, the focus is on managing an empowered workforce and management's new role as coaches. TQM advocates a continuous improvement culture and that quality is everyone's business.

Without adequate coaching in their new roles and responsibilities, management cannot be expected to understand the methodology or support the initiative. It appears logical to assume that without this training, management would continue to think and act as they have in the past – that is, functionally instead of having a process or cross-functional mindset. Additionally, without the close interaction with management that coaching brings, the BPI practitioners would miss an opportunity to better understand the organization, its processes, and the potential for improvements.

4.6.3 Policy Deployment

Policy deployment linking BPI initiative goals to business strategy and objectives is a process that is not explicitly stated in all methodologies. This factor is an explicit part of both Lean Management and TQM. Additionally, policy deployment is an implicit part of both TCT and ToC in that its objectives, components and/or tools are referenced in these methodologies. In both Business Process Reengineering and Six Sigma, the reference to policy deployment is somewhat stronger. In their book on BPR/BPM, Jeston and Nelis (2008:15) state that, "It is executive management's responsibility to ensure there is a clear link between the process improvement projects undertaken by the business and the organization's strategy and objectives." All methodologies strive to anchor attainment of the strategic goals and objectives in the initiative's KPI's. This linkage has a bi-directional impact on the organization. It binds management into the BPI initiative and, at the same time, it ties those who are working on process improvement into the organization's strategic goals. This linkage assures that the initiative receives the attention and support required for successful completion and that the initiative's operative objectives are aligned with the business's strategic goals.

Some might liken this factor to Management by Objectives (MBO), but policy deployment appears to go beyond MBO. Unlike MBO, it does not link just the individual workers but rather the entire process and the functions to the business goals.

Policy deployment also appears to be more than just an enhancement of the normal strategic planning process. Like that process, it is cyclic and based on the fiscal year calendar. Policy deployment also utilizes the previous year's performance as a basis for going forward. It too reflects on the accomplishments and failures of the past year in order to give direction and objectives for the future. As is common in strategic planning, policy deployment calls for creating the plans annually, reviewing those strategic plans at least quarterly and reviewing the subordinated operative plans at least monthly. However, it differentiates itself from most strategic planning and MBO processes by explicitly detailing how and by whom the strategic goals will be broken down into operative ones and by detailing the structure and discipline required in the review technique.

Unlike in normal strategic planning where management is responsible for setting the operative goals and assuring their alignment to the business strategy, in policy deployment all levels of the organization are involved. They not only ascertain what the goals will be, but also detail the control mechanism, control frequency, KPI's and the required data logistics. Policy deployment increases everyone's understanding and ownership of the business, its strategy and its goals as well as embedding accountability into the lower levels of the organization. Consequently, these enhancements heighten the probability that those goals will be attained or even exceeded.

Policy deployment also differentiates itself from common MBO processes in terms of both structure and discipline. Unlike MBO and strategic planning which is carried out along the hierarchy of functional management, policy deployment is executed cross-functionally. It utilizes project management constructs such as task breakdown structures, milestone-based planning, detailed action plans (what will be done by whom and when), drumbeat progress

reviews and remedial action planning. In contrast, most MBO applications appear to focus on the objectives and to only have a cursory plan or statement about attainment. During implementation, process discipline also seems to be higher in policy deployment than in MBO. First of all, policy deployment starts at the bottom of the organization with its reviews and progress reporting. These reviews, like the goals they reference, are team-based. A protocol of the results attained is made and passed up the organizational ladder to be incorporated in reviews at those levels. Unlike MBO which is mainly focused on personal goal attainment and requires little documentation other than that in an annual personnel review, policy deployment creates a complete and permanent documentation audit trail.

Lean Management's Hoshin Kanri concept goes somewhat beyond the normal policy deployment one. This concept is predicated on top and middle management's empowerment of the workforce and thereby delegating responsibility and accountability to the lowest possible levels. The objective is to harness the knowledge and skills of all employees in optimizing the organization. Hoshin Kanri follows an exacting seven step process and utilizes a standardized set of reports known as "tables". Hoshin Kanri is seemingly the most structured use of policy deployment amongst the six methodologies.

From a practitioner's perspective, the failure to perform policy deployment or doing it poorly has significant negative consequences on the initiative. Without policy deployment, the entire workforce (including management) may not be fully engaged in the initiative. Having little ownership of the results would likely manifest itself in a lack of ownership for the changes. This lack of ownership would probably result in the workforce taking a "wait and see" stance. A poorly implemented policy deployment could be the result of poor linkage between the business objectives and the initiative or the objectives being viewed as unrealistic. While the former may foster confusion and possibly apathy, the latter could also cause the workforce to act antagonistically. Experience has shown that dissatisfaction with overly aggressive objectives can lead employees to passively or actively resist change. An

example of this opposition was seen in a BPI initiative where the factory manager had not accepted the business dilemma or the business objectives. He therefore viewed the policy deployment objectives set for his production teams as being excessive. In his passive resistance, he repeatedly delayed problem analysis as well as change implementation through filibustering or diversionary tactics and forcing the teams to discuss everything in minute details.

4.6.4 Methodology Training

BPI Methodology training is a standard component of all methodologies. Except for the subject matter being methodology specific and for some methodologies to call for a wider based training program than others, there is, amongst the methodologies, a high degree of commonality regarding this activity. All training activities utilize a combination of classroom and workshop environments. All methodologies execute their training top-down starting with the C-level (top) management. Everyone involved with the methodology or the initiative is trained. Additionally, all methodologies exploit this opportunity to communicate both the business dilemma and the BPI initiative as well as teach the respective methodology. The methodology training activities benefit both the recipient and the trainer. The recipient's knowledge is increased, anxiety reduced and feeling of self-determination enhanced. The trainer is afforded an opportunity to uncover hidden organizational drivers, sources of resistance to change and to gain an overall picture of the cultural landscape within the organization. Both parties benefit from acquiring a common understanding of what has to change and how this change will be carried out.

Although there seems to be an extremely low probability that the methodology training is not done during the initiative, there is the potential of it being done poorly. While the lack of training would promote ignorance, poor training could foster confusion, misinterpretation, frustration and even faulty implementation. Experience shows that this training is best performed by the practitioners directly involved in coaching and executing the

initiative. This requirement is not only because they hold a superior level of knowledge but also because it is in their self-interest to provide adequate training and understanding.

4.6.5 Cross Functional Team Infrastructure

Hierarchical, cross-functional, change team infrastructure is a universal construct across all methodologies. A separate infrastructure is mandated by the scope and nature of the change program. Typically, based on the author's experience and evidence gained from interviewing practitioners, the project scope is usually so large that a BPI initiative cannot be handled within the sphere of the existing organization. That organization must carry out the daily business. Additionally, the nature of the initiative being process improvement and optimization of the entire process takes the BPI initiatives beyond the control of individual function management. Functional managers control tasks or sub-processes but not the holistic process. Without that holistic process orientation, optimization of sub-processes would likely create sub-optimization of the total process. Therefore, the change teams have to be cross-functional in composition.

Having cross-functional change teams is a necessary but not sufficient condition for avoiding sub-optimization. The team must function in a manner quite similar to that for participatory action research. Each member of the team must have equal ranking with all of the other members. A change team dominated by one member will automatically be dominated by one function – that to which the member belongs or from which the member's performance indicators stem. Therein lays the risk of sub-optimizing the process in favour of a single function. It is also imperative that all team members not view their participation simply as contributors of functional expertise whose physical or mental presence is triggered by a request for that expertise. Each team member must be actively involved in attainment of the team goals. This level of involvement requires that they learn from the other members, view the processes from other functional viewpoints, are prepared to question or challenge those view points and continuously maintain a holistic process orientation. Lastly, as in

participatory action research, the team leadership coaches the team for goal attainment and does not direct or manage the team.

The hierarchical structure of the teams serves two purposes. The first involves breaking down responsibilities and enabling control. This hierarchical structure should not be misconstrued as a conduit to dictate, top-down, what has to change or how these changes will be implemented. In fact, in all methodologies, ownership of the processes and their optimization lies at the bottom of the infrastructure – not the top. In these methodologies, this lower level is empowered to identify and implement necessary changes. The hierarchical structure also affords an escalation path which takes the problem to the level of the organization where can be resolved. Logically, not all barriers to process improvement can be resolved on the shop-floor and not all should be resolved in the boardroom.

The second purpose for the hierarchical infrastructure is the separation of tasks. Across all six methodologies, there is a universal axiom that the lower echelon owns the processes and is empowered to optimize them. There is also a common tenet that the upper echelon promotes the initiative, provides resources and supports the activities of the lower echelon. TCT goes somewhat beyond this last statement. In this methodology, the business improvement team (BIT) is at the top of the infrastructure and is explicitly charged with the conversion of process improvements into business performance improvements. The TCT methodology explicitly recognizes that an organization could optimize its processes and yet this potential may not be fully reflected in the business performance. A simple example of this lack of linkage deals with resources no longer required by an optimized process. If these resources are not applied in a value adding manner somewhere else or removed from the organization, the business's cost structure will remain unchanged. For reasons such as this, TCT's BIT has the additional duty of assuring that all process improvements are linked to business performance improvements.

Failure to utilize cross-functional teams places the burden of change on the business functions and functional management. As stated before, this lack of proper team composition increases the risk of sub-optimization, overburdening resources and promotion of the status quo. The lack of a cross-functional approach can also generate friction between the functions. An extreme case of this tension-building was experienced while setting up cross-functional teams to improve the research and development process of a radio manufacturer. Prior to the BPI initiative, the business had a 10 year history of driving process improvements functionally. The antagonism between product development engineering and production engineering that had built up over the last 10 years became apparent when both sides failed to attend the initial cross-functional team meetings. The product development engineers felt that the production engineers were incapable of producing product to specifications. On the other side, the production engineers believed that the development engineers were not capable of designing a manufacture-ready product. Once in a cross-functional team environment, the two functions acquired an appreciation for one another as well as producing significant process improvements.

4.6.6 Process Mapping

“Process mapping is a powerful tool that allows the reviewer the opportunity to get a good understanding of the process, effectively find ways for the process to be more successful, and ensure that true value is being provided to customers”(Jacka & Keller, 2002:ix). This tool is applied in all methodologies although in different forms and in different levels of detail. The most common forms are “swim lane” (TCT and BPR), SIPOC (Six Sigma) and “Value Stream” (Lean Management). Apparently, each of these forms was developed to facilitate the implementation of the methodology in which they are embedded. There are several examples of tailoring the method to the methodology. Although, in most cases, there is no defined x-axis, TCT’s process maps explicitly require time to be used on the x-axis. TCT focuses on the process’s total cycle time and this type of process map allows both

practitioners and users to focus on the time requirements, rework loops and inefficient steps within the process. While all process mapping activities consider both external and internal customers, Six Sigma's supplier, input, process, output and customer (SIPOC) maps explicitly detail who the suppliers and customers are. Value Stream mapping highlights transfer and transport activities and accommodates takt time, cycle time and inventory information which are vital in the Lean Management methodology.

Although methodologies such as Lean Management, Six Sigma and TCT discuss process mapping using different levels of detail, none explicitly state how to determine the different levels of granularity. TCT consulting practitioners arbitrarily judge the granularity according to the number of activity "boxes" required to map the process. Zero level maps, the highest level ones, utilize less than 10 boxes. Level 1 maps use up to 30 boxes and level 2 maps are done with less than 60 boxes. Jacka and Keller (2002), who do not align their views on processing mapping with any BPI methodology, proffer a less arbitrary method of judging granularity and facilitating the drill down. Their delineation is based on the unit, task and activity levels. Process maps created to show the work done at the unit, division or site echelon is the least detailed while that at the activity level is the most comprehensive. All methodologies submit that the process mapping activity should start with simple overviews and then drill down in detail. Each also recognizes that the law of diminishing returns applies to this activity. That means, going beyond the level of detail necessary to understand the process and identify areas of potential improvement is non-value adding.

Jacka and Keller (2002) provide insight into the efficacy of process mapping which some practitioners may not have – particularly those who view process mapping as a documentation exercise. The authors (2002:278) state that, "the fundamentals of process mapping are simple, but its application is as complicated as the processes". They maintain that the purpose is not to make maps but rather to analysis the process. They warned that it is easy for practitioners to get wrapped up in the actual development of the maps or in the

minutiae – both being detrimental to the mapping exercise. Jacka and Keller (2002), like TCT pundits, claim that time should be on one axis of the process map. Unlike TCT, their technique calls for time to be on the y-axis and the map to take on a waterfall type characteristic. They state that, “process maps should represent a flow of tasks over time” (2002:268). However, they caution against making the process maps look like traditional flowcharts. Jacka and Keller (2002:269) submit that, “flowcharts generally are confusing to people who have not been trained in flowcharting techniques. A map may perfectly represent a process, but if it appears overwhelming, no one will use it. If symbols go up, down, and around and arrows and nodes go every which way, only the creator will use the map.” In this last quote and in general, Jacka and Keller imply that the greatest value lies in the product and its usefulness. Perhaps because these authors’ paradigm involves creation of the process maps by a third-party (who gathers information about the process, synthesizes this knowledge into a process map and then delivers the final product), the value derived during the synthesis is not explicitly discussed.

From a practitioner’s perspective, in the BPI initiatives it is imperative that the change teams perform the tasks assigned by Jacka and Keller (2002) to a third-party. Having the team collect process information and synthesize this evidence into a usable process map creates numerous benefits. Even if process maps already exist for other purposes such as ISO-9000 certification, they should not be used by the change teams. Efficiency should not overrule effectiveness and as Jacka and Keller (2002) pointed out, the purpose is not to generate maps but rather to generate an understanding of the process. Collecting the knowledge about the process assures that the baseline or existing process is being studied instead of the entitled or theoretical one. In Lean Management jargon, this objective is part of Genchi Genbutsu (go and see). This method of information gathering allows the researchers to see first-hand what the actual process involves.

Synthesis of the process mapping information in a cross-functional team environment brings four essential advantages. First, the sub-processes and activities of each function are critiqued by the other functions. This critique involves cross-examining why and how things are done as well as questioning if those activities are value adding to the overall process. This critiquing exercise generates the second advantage, namely the identification of non-value-added activities, substitute processes, hidden drivers and overall candidates for process improvement. This critiquing activity generates the third advantage – a mutual understanding of the process by all functions. The fourth, and perhaps most subtle advantage, is that the team members start to migrate away from a functional or silo mentality toward a process mindset. This transition is essential to the success of any BPI initiative. Understandably, short-circuiting the process mapping activity for the sake of efficiency could carry a very high price tag.

Theoretically, the lack of process mapping could be compensated for in some other way. However, the alternative method would likely be more time-consuming and possibly less effective. Experience shows that a graphic representation enhances understanding and expedites completion. Experience also shows that organizations that have not done mapping exercises such as in ISO-9000 tend not to have a universal understanding of their processes. This lack of understanding exists in spite of the fact that those organizations have handbooks on process specifications, product specifications, and job descriptions.

4.6.7 Repetitive Change Management Process

A repetitive, multi-phase change management process appears to form the backbone of each methodology. In each of the six methodologies, the author recognized that BPI initiatives contain a number of discrete change activities that must be managed on an individual basis. Therefore, the change management process is cyclic and has to be applied repetitively. Since each of these change activities involve aspects of both problem solving and project management, the change management process has multiple phases. The nature,

characteristics, attributes and even nomenclature of the activities being processed must be aligned with the strategic and philosophical focal points of the respective methodology. In some methodologies such as BPR and TQM, IP owners and practitioners label the individual changes simply as “projects”. In Lean Management and Six Sigma, they talk about “Kaizen events”. This activity is called “barrier removal” in TCT and “constraint breaking” in ToC. Regardless of the nomenclature used, these activities must be prioritized, limited in the number active at any given time and sequenced (consecutive or parallel). Most methodologies such as Lean Management prioritize activities based on their impact versus effort to change. Those with the highest payback ratio receive the highest priority. All methodologies discuss the benefits of limiting the number of active change activities. They emphasize that the workforce should not be overburdened and that the business processes have to continuously deliver to customer expectations. TCT explicitly states that the number of barrier removal activities or actions in process should not exceed five to six per CFT.

Five of the six methodologies explicitly state and name their respective cyclic process. These are “plan, do, study, act” or PDCA (Lean Management), “define, measure, analyse, improve, control” or DMAIC (Six Sigma), “inspiration, identification, information, implementation and institutionalization” or 5I’s process (TCT), “five focusing steps” (ToC) and “Deming Cycle” (TQM). In the BPR approach, authors such as Hammer and Champy (1993) as well as Jeston and Nelis (2008) focus on detailing the change management process as if it was a once-through process and then later state that execution of this process must be a recurring event. Hammer and Champy’s approach in 1993 was presented as a radical reengineering of the business. These authors also justified the need for this radical reengineering on the basis that businesses had viewed their processes as static entities over a number of years. They stated that, as technology and the business environment progress, the business processes need to be reviewed and updated to keep pace with market demands. Jeston and Nelis (2008) documented the basis for a repetitive process quite clearly in their

“7FE” project framework and discussions about implementation scenarios. Their framework cast a project (change management activity) into a framework consisting of project phases and three project essentials (Process leadership, Project and Change Management). They began by detailing how a project passes through the individual phases (foundation, findings & solutions, fulfilment, future) and later describe how incremental change projects can be done sequentially, in parallel or in a combination of the two. BPR/BPM practitioners interviewed as part of the research, appeared to favour the usage of Lean Management’s simpler PDCA approach over that of the “7FE” project framework.

PDCA (plan, do, study, act) and DMAIC (define, measure, analyse, improve, control) are documented relatives of the Deming Cycle (PDSA). According to Moen and Norman (2009), W. Edwards Deming originally championed the PDCA process which he referred to as the Shewhart Cycle. Liedtke (2012:1) stated that, “Deming re-named the 'Check' step in PDCA as the 'Study' step (PDSA) in order to encourage a more in-depth study versus a 'go and see' activity.” Moen and Norman’s (2009) work, as part of a series that documents the evolution of the scientific method into the PDCA and the PDSA cycles, also states that the PDCA cycle is called DMAIC in Six Sigma programs. Irrespective of the acronym given or the number of steps delineated, all of these processes roughly follow the scientific problem solving approach. They start with defining and analysing the situation. Then they study the alternatives and commit to the best solution as the basis for their action plan. All of them follow up on their plan by implementing the solution. At the end, the results are controlled and a decision made. If the results are sufficient, the next problem is tackled. If the results are not sufficient, the original problem is dealt with further. The efficacy of the process lies in that seemingly insurmountable challenges can be segmented and resolved efficiently.

TCT’s 5I’s process (Inspiration, Identification, Information, Implementation and Internalization) also seems to mimic the scientific problem solving approach quite closely. The 5I’s process also appears to have the same efficacy objective as the Deming, PDCA and

DMAIC cycles. Inspiration and identification are involved in determining the need for change and defining the problem. Analysing and studying the alternatives are dealt with in the information phase. Implementation focuses on realizing the best alternative. Assuring that the targeted results were obtained and that the changes are embedded in the organization are the objectives of internalization.

ToC's five-step focusing process deviates significantly from the other change management methods. This process is tailored specifically to ToC's objectives of managing and alleviating constraints. It is a seemingly logical approach wherein the business process constraint is first identified and analysed for its maximum potential. The other steps in the business process are then aligned with the constraint's capabilities. The fourth step involves elevating the process's capabilities until another sub-process becomes the constraint. Once the initial constraint is broken, the final step calls for repeating ToC's five-step focusing process while concentrating on the new constraint. The impact of the five-step focusing process is that the throughput capacity of the overall process is increased and the process functions more efficiently.

From a practitioner's perspective, it is difficult to conceive a BPI initiative without a recursive, change management process. The lack of such process would seem to indicate that the initiative would have to be carried out in one "Big Bang". There would be no piloting, cycles of learning, or hypothesis testing. Incremental changes would be replaced with a single radical one. In such a non-recursive, change-management process, the potential for multiple high risks could exist. Not only could there be the risk of implementing the wrong solutions but also risks of overburdening the organization and its failing to perform to customer expectations.

4.6.8 Root Cause Elimination

Elimination of root causes is essential to effecting real process improvement. Root cause problems usually give rise to both symptoms and substitute processes. Symptoms are

the observable manifestations of a poorly performing process. Substitute processes are practices that get put in place to work around problems. The linkage between symptoms and root causes as well as the application of substitute processes, is best described by an example. Starting with the symptom of having excessive inventory on hand, a cause could be that products are purchased in lot sizes greater than is required. Drilling down even further for the root cause, one might find that the reason for large lot size quantities is that the purchasing department members have an incentive based on unit price reduction. This incentive drives the purchasers to place orders for large lot sizes thereby getting a volume discount. A substitute process associated with the symptom of having excessive inventory can be having a crowded warehouse and employing additional workers to compensate for the inefficiencies thus created.

Treating the symptoms or the substitute processes rarely yields true process improvement (Thomas, 1990). Continuing with the previous example, resolving the problem of having a crowded warehouse with excessive inventory might be to enlarge the warehouse capacity. This solution would lead to making a capital investment – a second substitute process. Although the problem of having a crowded warehouse would be eliminated, the lot size would not be reduced and the true root cause would not be eliminated. As this example points out, working on symptoms and substitute processes can, and often does, create more substitute processes.

Frequently, when the real root cause is known and treated, the solution is both simple and effective. Again using the example above, a decision has to be made on whether to eliminate large lot size orders or the incentive that drives the poor purchasing practice. So long as there is another way to eliminate the root cause for excessive inventory, eliminating an incentive driver is not beneficial to the business. One such alternative solution is a purchasing practice common in the automotive industry called “frame contracts”. These are purchase orders for large volumes of product to be delivered over a specified timeframe. As

the need for the product arises, delivery is requested (called off) against this contract. The impact is that the purchasers receive their unit price discount, the warehouse is not burdened with excessive inventory and the business does not have to fund a new or larger warehouse.

Within the six methodologies, there are numerous methods, tools and techniques used to trace problems back to their root cause and to detect symptoms or substitute processes. In terms of defined methods for finding root causes, Lean Management has its 5W (five whys) cause-determination method, Six Sigma and TQM use the Failure Mode and Effects Analysis (FMEA) method, ToC has its effect-cause-effect analysis and TCT has its root-cause barrier identification method. Nearly all of these methods are predicated on a cyclic process of questioning why something happens multiple times. This process starts by questioning the reason for the symptom in order to find its cause. This cause is then questioned and the process repeated until the root cause is determined. Some methodologies such as Lean Management and Six Sigma have set the number of repetitions at five – hence the 5W or 5-whys process.

All BPI methodologies employ some form of graphic representations of the results obtained in their root cause determination method. ToC, as part of its “thinking process” uses tree-shaped diagrams (Current Reality Tree, Future Reality Tree, etc.) to depict the linkage between root cause and symptoms. The Ishikawa diagram is likely the most popular tool amongst the methodologies for depicting that linkage. This tool is also called a fishbone diagram since it resembles the skeleton of a fish. Although the individual methodologies and their practitioners tailor the Ishikawa diagram for their own purpose, the effect is still the same. This graphic tool helps the user visualize the linkage between the symptoms and the root cause. This visualization enhances understanding and reduces the risk of working on the wrong issues.

TCT is one methodology which deals explicitly with the concept of substitute processes as well as symptoms. Its fishbone diagram is an adaptation of the Ishikawa diagram

that explicitly depicts substitute processes created by the symptom/cause. The top portion of the TCT fishbone is reserved for the substitute processes associated with the causes depicted in the lower half of the fishbone. This adaptation of the fishbone diagram not only personalizes the tool to the methodology but also enhances the utility of the graphic representation. The impact derived from the visualization remains the same as from other methodologies but the TCT user is additionally reminded that the substitute processes as well as the root causes have to be eliminated. Until both have been purged, the business will not derive the full entitled benefit (Thomas, 1990).

As pointed out in the examples cited earlier, failure to improve the process at the root-cause level prevents the organization from realizing its full processing potential. This lack of root-cause elimination translates into its output being less than entitlement, its cost being higher than entitlement and therefore, its competitiveness being less than entitlement.

4.6.9 Process Flow Optimization

Process flow optimization goes beyond production environments and involves more than product flow. Although this optimization is a common thread throughout all six methodologies, the focal point, subject, methods and optimization parameters are seemingly unique in each. BPR focuses on driving process flow optimization by redesigning the processes, restructuring the organization and laying the groundwork for process data mining, IT-based process management or even automation. Lean Management appears to take a quasi-scientific management approach (Taylorism) with a focus on waste elimination, line balancing and worker task loading through workplace analysis as well as time and motion studies. Six Sigma drives process flow optimization through process variation reduction and output quality improvement. The Six Sigma methodology associates attaining a failure rate level of 3.4 PPMO (six sigma variation) with having an optimized process. TCT uses the total process cycle time, first pass yield and on-time delivery between internal customers in the business process to drive improvements in process flow. ToC concentrates on the elimination

of process bottlenecks and minimization of buffering inventory as a means to affecting process flow optimization. All of the activities in the ToC five-step focusing process are focused on process bottlenecks – that is, constraints to optimization. Its drum-buffer-rope method of optimizing in-process inventories emphasizes improvements in process flow. TQM leverages quality and workforce involvement in quality circle activities to drive process flow optimization.

The emphasis on optimizing process flow is so strong in Lean Management that it warrants special consideration. A large portion of its methods, tools and techniques apply directly to the production environment and the process flow therein. Perhaps this alignment stems from the methodology's early adoption by the Japanese automotive industry and later by the automotive industry in general. Lean Management is so strongly linked with these roots that the methodology is often called the "Toyota Production System" or TPS and is well seasoned with Japanese terminology and culture. Since being made popular by Toyota and the works of Womack, Jones and Roos (1990), practitioners have spread the use of the methodology to other industries and to non-manufacturing environments.

Lean Management groups process flow optimization into three areas which it calls Muda, Mura and Muri. Muda is a Japanese word for waste or wastefulness. In optimizing process flow, this category would include the elimination of excessive movement and excessive handling. Typically, this improvement involves reduction in the overall process footprint. In manufacturing, the production lines would be shortened, the distance between workstations reduced and the use of a U-shaped layout design considered. In all environments, employment of the "first in – first out" and "one piece flow" techniques minimizes decision-making and handling requirements thereby reducing the process cycle time and increasing the throughput rate. These techniques, as well as other Lean Management methods, eliminate the wastes associated with excessive work-in-process inventory. Reducing

inventory frees up floor-space, reduces handling requirements and reduces both material and worker movement. The result is improved process flow.

The Japanese word Mura means unevenness, irregularity or non-uniformity. Under Mura, optimizing the scheduling and availability of components or supplies are two process flow considerations. Just-in-time delivery to where something is needed in the process and using the “supermarket concept” to assure that the right quantity of material is available at right place creates a more uniform throughput rate by improving material availability due to better scheduling. Furthermore, pull scheduling techniques such as Kanban minimize planning requirements and simplify information transfer by placing both factors on a visual control basis. These techniques optimize process flow by reducing the process cycle time and eliminating errors. Line levelling and flow levelling are two additional techniques that Lean Management uses to optimize the process flow from a Mura perspective.

Mura also drives process flow optimization through improved process quality and flexibility. Better quality not only results in less scrap and rework, but also in the reduction of the total processing cycle time and the improved on-time delivery between workstations as well as to the customer. In production, flexibility is gauged by the capacity to produce multiple products. This capacity is limited by the capability to do rapid changeovers in an effective and efficient manner. This limitation means that not only does the cycle time and cost per set up have to be reduced but setup errors, pilot testing and creation of unusable product have to be eliminated.

Lean Management’s SMED concept is a special approach under Mura. SMED could be misunderstood if taken literally or viewed as a process flow optimization for manufacturing only. As Shingo (1985) points out, SMED which stands for “single minute exchange of die” does not necessarily mean that all die (manufacturing tool for shaping or cutting materials) changeovers are expected be completed in 60 seconds. Also, the SMED concept is not limited solely to setups involving the change of dies. This concept should be

thought of as a technique for reducing set up times and permitting rapid changeovers in any operating environment. The improvements brought about by the SMED approach enable processing in small lot sizes to be economically feasible thereby enhancing the flexibility of both the process and the business. The approach is targeted at reducing downtime, changeover errors and unit cost. It decouples large orders from automatically mandating large production runs. It also moves businesses away from the “produce to stock” operating mode toward one of “produce to order”. As well as optimizing process flow, SMED reduces inventory and bound capital.

From a practitioner’s perspective, the SMED approach should not be limited to just a production environment. Any process which handles non-homogeneous entities and/or heterogeneous types of activities can be improved by reducing the time and effort required to switch between elements to be processed. The utility of applying the SMED concept to something other than production can probably be best demonstrated in the following two examples. The first is somewhat abstract and thought provoking. In the late 1960’s, computer memory was expensive and in limited supply. Therefore, computer manufacturers introduced the concept of virtual memory. The concept was to move blocks (pages) of information (program or data) in and out of the available memory as required. This process was called paging and was plagued by something called “thrashing”. Thrashing is analogous to SMED’s exchange of die requirement. It involves the removal of non-required pages and the setup of those that are required. Multitasking, large programs and mischievous IT “nerds” could easily reduce the system’s throughput rate. Scheduling similar programs, thereby reducing the number of exchanges and setups required, is analogous to producing in large lot sizes. This increased productivity to the detriment of flexibility and customer satisfaction. Increasing the amount of available memory, thereby also reducing the number of exchanges and setups required, is analogous to installing more production lines. This remedy increased output but required investments. These two stop-gap remedies remained in place as substitute processes

until the thrashing (set-up) speed could be increased to an acceptable level by increasing the computer's operating speed.

The second example is somewhat less abstract and deals with human resources working in a business process. Asked, as a consultant, to improve the purchasing and procurement processes of a trading company, the author found that the factor of human setup time was the root cause of poor productivity. Each of the 16 members of the purchasing department dealt with the acquisition requests, ordering, delivery and booking for all products in the business's product portfolio. The time and effort required for each individual to become acquainted with the product parameters (its specifications, the correct economic order quantity, the potential suppliers, the delivery logistics options and the price profile) to the point where an order could be placed were significant. Additionally, since the individual placing the order was not necessarily the same individual who handled the delivery and in-bound booking activities, there were significant setup time issues for those activities as well. Specialization of the workforce by assigning product groupings to individuals decreased both the changeover requirements and the setup times for the individuals. Further reductions in setup times were realized by standardizing forms, automating the archiving and record-keeping functions as well as by reducing the number of suppliers. This focus on reducing time and effort for setups resulted in a 77% increase in productivity – seven of the original sixteen staff members were reassigned.

Muri, in Japanese, is associated with unreasonableness, extreme difficulty, and excessiveness. In English, the term means “overburden”. In this category of process flow optimization, attention would be paid to such things as standardization of work and takt time (the cycle time allocated to completing the standardized work in the volume required to serve the customers). Standardization of work results in fewer or less complicated tools being required. As a result, activities such as changeovers are simplified and the necessary skill levels reduced. Standardization also improves quality and safety in the workplace. The

outcome of these improvements through standardization of work is a less burdened workforce.

It could be argued that Lean Management practitioners and business management are focusing on Muda to the detriment of the other two – particularly Mura. The author suggests that tendency could stem from going on a witch-hunt for waste (Muda) being an activity that is easier to understand, justify and execute than process analysis (Mura) and redesign (Muri). It could also be argued that Muda is strongly linked to quick financial returns while the other two categories require investments in both time and money. This unbalanced focus seems to also be exacerbated by the word “lean” in the methodology’s title. This term carries a connotation of removing waste (Muda). As a practitioner, the author feels that the methodology’s reputation is being tarnished by this unbalanced focus and its name is being too strongly associated with minimization of the workforce.

Realistically, process flows can never be completely optimized. Cost, investment, cash flow, human resources and technology factors are some of the key drivers forcing BPI practitioners to make compromises. Some of these factors create constraints while others are caught up in the “law of diminishing returns”. Optimizing process flow mandates value judgments considering the organization’s capabilities and capacities.

4.6.10 KPIs Driven Improvement

KPIs driven process improvement not only underscores the attainment of goals and objectives but also assures the internalization of process improvements. Universal to all methodologies is attainment of the initiative’s financial objectives. In each, the KPI’s are linked to project and team objectives. All methodologies also use some form of dashboard charts (TCT calls theirs cockpit charts) to display the business and initiative based parameters. Each also has drumbeat reviews of the KPI’s and creation of remedial action plans as necessary.

The type, number and interpretation of the KPI's vary amongst the methodologies. BPR and TQM appear to use the balanced scorecard method the most. This usage means that those methodologies process and track four distinct categories of measurements (Kaplan& Norton, 1996). These are business financials, customer-based variables, business process parameters and learning/growth measurements. The advantage of this approach is prevention of the myopic focus on any one set of parameters. On the other hand, Six Sigma concentrates on statistical process control of process variance. This methodology is heavily characterised by statistics, mathematics and error rate computations. TCT emphasizes a mixture of business and process measurements. In both areas, a blend of leading (predictive) and lagging (results-based) indicators is recommended by the methodology. TCT focuses on three process parameters – total process cycle time, first pass yield and on-time delivery. ToC also advocates the use of three KPI's – throughput, operating expense and inventory. These three form a simple process model based on financials. Process input is related to the financial inventory – the funds invested in the goods being produced. The process conversion is measured by the operating expense – the cost of converting input to output. Process output is termed throughput - the amount of sales realized for goods sold.

In all methodologies, the establishment of KPI's requires a data logistics system to gather data and convert this data into information. Establishing and troubleshooting these data logistics systems increases the practitioner's knowledge of the process, its foibles and areas of potential improvement. Therefore, process improvement is not just driven by the KPI's themselves but also by the establishment and tracking of those KPI's.

The absence of KPI's to drive process improvements would require some other means of managing the initiative and gauging its success. Conventional wisdom appears to mandate some way of orienting movement. Without this orientation, an engineer would argue that you have speed but not velocity. In this context, the expression “if you can't measure it, you can't manage it”, (credited to Peter Drucker, W.E. Deming and Walter Chrysler amongst others) is

more appropriate than the view of “What gets measured, gets done” (credited to Mason Haire, Peter Drucker and Percy Barnevik amongst others). In terms of a BPI initiative, improvement is a vector quantity in the same way that velocity is. Case studies of failed improvement initiatives show that it is inappropriate to adopt the what-gets-measured-gets-done paradigm (O’Shea & Madigan, 1997). Measurements have to be linked to actions such as change management activities. Overlooking this requirement, a BPI practitioner could fall victim to the “rain gauge fallacy” – measuring the precipitation doesn’t make it rain.

4.6.11 Visual Management

Visual Management (incl. Dashboard charting) is, from a practitioner’s perspective, a construct with an enormously wide spectrum of applications that has both evident and subtle benefits. Visual management replaces lengthy texts and written instructions with signs, symbols and other visuals. This replacement has an understandable benefit for illiterate individuals, people speaking different languages and environments where there is a presence of multiple language dialects or the existence of multiple cultures. The author would like to emphasize that visual management and its subset, visual control, should not be targeted at just an organization’s workforce. Anyone visiting a facility where visual management and visual control are employed benefit from these applications. Those visitors could include suppliers, salesman, customers, officials and the public at large. Visual management increases the effectiveness and efficiency of the communication process through increased clarity and quicker recognition of the message being communicated. The use of visual management and visual control as well as the creation of the visuals themselves appears to be limited only by human fantasy and skills.

Greif (1991) and Shimbun (1995) pointed out that when something is presented visually and clearly, it is not only easier to comprehend but also to remember. They indicated that visual management provides everyone with the same signals, the same prompts and from the same perspective. There is no interpretation of text or context necessary. The authors also

stated that visual management is not limited to the use of graphics. Numbers, letters, symbols, pictures and videos are also media which can be utilized to convey messages visually. A means not covered by any of these is such things as the simple stopping of a machine or turning on a light when a malfunction, lack of feedstock or poor quality is detected and attention is required. One of the earlier applications of visual management was process or layout mimic boards. They were popular in such places as refineries, chemical processing industries, railroad switching yards and electrical power plants. These businesses used the mimic boards to inform operators of abnormal situations, safety problems and the overall status of their processes. These mimic displays created awareness, localized problems and enabled quick resolution.

Greif (1991) indicated that visual management and visual control techniques facilitate the management of not only the process but also the entire organization. The author points out that visuals can be used to indicate the solution as well as the problem. They can provide information for decision-making, corrective actions, safety requirements and even assisting good housekeeping. They can reduce the time and effort required searching for information or meanings. Shimbun (1995) added that, in addition to providing feedback, visual control must also indicate the corrective action to be taken. Shimbun also pointed out that visual control should be made failsafe. This safeguard may require audio or secondary visuals in the event the first visuals are not seen or acted upon for some reason. Shimbun also stresses that visual control, like any system, needs to be maintained and updated. As processes change, its control system must also. From a practitioner's perspective, the one area of visual control which is most often neglected is charting of KPI's and the feedback regarding performance in general. Once the stellar performance starts to deteriorate, the motivation to update the charts and data boards appears to also decline.

It can be argued that Lean Management has the most extensive list of visual management tools and the best developed applications of visual control. Examples of those

tools and applications were extracted from the works of Bicheno & Holweg (2009), Grief (1991), Imai (1986 & 1997), Mascitelli (2007) and Shimbun (1995) to demonstrate the breadth and depth to which Lean Management has taken this concept. Value stream mapping is a standard Lean Management practice which has easy to recognize symbols for activities such as transportation. The picture of a truck requires no translation. Kanban is a simple reordering technique using cards. When replenishment of a material is required, the card is used to indicate this need and to identify what product is involved. Heijunka boxes visualize the work to be processed as well as the line loading or backlog situation. Shadow boards of hand tools, jigs, housekeeping supplies, etc. not only help maintain proper storage of these items but also promote rapid availability and recognition. Colour coding is not only applied to signs and floor markings but also to such items as clothing. Such coding of the worker's clothes can be used to indicate an individual's expertise, level of responsibility or special function. Patterns in floor markings may be used to indicate such things as machine traffic areas, pedestrian lanes and emergency exit routes. Visuals are often used to identify the location of safety equipment and emergency shutoff valves or switches. Also common in Lean Management is the use of skill and training boards to show proficiencies and expertise of team members. Andon lights are used to show the status of machines and processes. These lights are color-coded like traffic stoplights (red-yellow-green) for quick and universal recognition. Besides using andon lights, automatically stopping machines and production lines so as to indicate malfunctions or problems are also common in visual management. Displaying charts and graphics regarding KPI's, scheduling, loading, quality, absenteeism and safety in the workplace are also standard Lean Management practices.

From a practitioner's standpoint, there's a fine line between displaying visuals and using information or bulletin boards. By way of an example, one or two charts that are easy to read and understand while walking by the display are clearly the use of visuals. However, when an individual has to stand in front of the display reading and dwelling on its contents,

this display is very likely not a visual but rather an information board. In the workplace, there are both appropriate and inappropriate usages for each media. Misuse is not limited to utilization of the wrong media but also over-utilization of a given media. An example of this latter type of misuse was seen in a firm producing mechanical fasteners and involved the use of andon lights. There were 16 machines on the production floor. Each was equipped with an andon light. In addition, there was a duplicate for each light located in a cluster across from the foreman's and maintenance offices. While the use of the lights was appropriate at the machines, clustering the duplicates led to confusion as to which one was illuminated and required effort to ascertain where the problem was. The final solution was a simple mimic board inside the offices which depicted each machine and its andon light status.

As with process mapping, visual management could theoretically be excluded from a BPI methodology. However, the alternative communications media and practices utilized to compensate for the lack of visual management would, similar to the substitute processes for mapping, probably be less efficient and less effective. Experience has indicated that visual management and visual control require less time for the workers to comprehend the message and react appropriately than other communication channels. Additionally, this technique also appears to be more effective in terms of soliciting the correct responses.

4.6.12 Business Culture Change

Business culture change, aside from the clear objective of improving the business processes, appears to be the ultimate goal of all BPI methodologies. The importance of culture change was probably best expressed by Childress and Senn (1995:40) when they wrote, "We believe that more reengineering and process improvement efforts fail as a result of cultural issues than any other single reason." Each of the six methodologies strives to change the culture in three ways.

The first cultural change that the BPI methodologies endeavour to create is the internalization of their philosophy, methods, tools and views. The author feels that, since a

methodology's owners and practitioners believe strongly in their product, it is also a logical and valid assumption to assume they are also strongly convinced of its ability to provide a business with both competitiveness and sustainability. An example of this linkage is Finkenaur's (1995:8) statement about TCT that, "there is little you can do for your company that would help it in a broader way than cycle time reduction." A universal justification cited by the methodology's pundits for internalizing their methodology is that businesses operate in a constantly changing environment and therefore, businesses must constantly adapt.

Each of the methodologies holds similar views as to why constant change is necessary but somewhat different opinions as to what a business has to do to stay competitive. BPR's approach is that, since the business environment and marketplace is constantly undergoing change, management needs to keep their processes updated and actualized. In order to do this, according to the BPR methodology, they need to use current technology, especially that from IT, to remain competitive. Lean Management contends that waste, suboptimal processes and overburdening both people and processes are being generated on a continuous basis.

Therefore the organization needs to take countermeasures continuously. Six Sigma's view is that attainment of a 3.4 PPMO error rate and maintaining this level of process quality requires continuous effort. Not only new products and new technologies but also new competitive disadvantages drive this requirement. Thomas (1990), Finkenauer (1995) and TCT practitioners credit total cycle time and cycles of learning with being the key drivers of competitiveness. Jennings & Haughton (2000) and Thomas (1990) claim that it is not the big who eat the small but the fast who out run the slow. Goldratt (1990) argued that all businesses have processes and all processes have constraints. If there were no process constraints, businesses would have unlimited capabilities. Since a chain is only as strong as its weakest link, as businesses grow, the links in the process need to be strengthened. The last of the six BPI methodologies, TQM, takes the position that quality is too important to have its management relegated to a department or function. Under TQM, quality is viewed as being

everybody's business and like any business it has to be managed both strategically and operatively. TQM experts further argue that, in order for a business to remain competitive in the marketplace, its products need to remain competitive in the eyes of the customer.

The second cultural change objective is a logical consequence of the first. That objective is the internalization of some form of a continuous improvement process. This objective is explicitly detailed in each methodology. Attainment of this objective usually involves empowerment of the workforce and use of the business's internal expertise. A migration away from a functional or silo mindset toward one of process is also required. In all methodologies these requirements lead to the appointment of process owners and the use of cross-functional teams.

Implementing a culture of continuously improving the business processes mandates that the organization recognizes the need for such continuous change. Both the management and the workforce need to recognize that the business environment is not static. It is influenced by changes in technology, regulations, competitor offerings and customer expectations. Advances in technologies such as material science, engineering and IT not only solicit reactive change, but also enable proactive ones. In order to remain competitive, a business needs to keep pace with its competitors and its market's expectations. As competitors improve value propositions to the customers, a business needs to react by improving its own. On the other hand, a business can also leverage advances in technology to proactively gain a competitive advantage.

The last cultural adaptation targeted by BPI methodologies deals with a mindset or paradigm shift. This change involves replacing functional thinking, silo-mentality and a fire-fighting attitude with a process approach while retaining a holistic perspective. Justification for this change is based on the same arguments as that for the use of cross-functional teams and process improvement at the root-cause level. The three key goals are the avoidance of

sub-optimization, realizing sustainable process improvements and preventing the implementation of substitute processes.

Although, in the methodologies, the need for this cultural change is identified and the justification given, in practice, the shift is too often forsaken. Experience indicates that this symptom stems from both the BPI practitioner and the organization. The true root cause appears to lie with the organization. As the customer, the organization sets the expectations as to what the practitioner has to deliver. Organizations that are focused on quick wins, point solutions, minimal investment and cosmetic changes will likely not accept a value proposition mandating long-term cultural changes. Practitioners have the choice of either aligning their offerings to these customer expectations or walking away. Those who do not walk away apparently hope for the chance to change the organization's orientation or for a follow-on initiative. The practitioners do not appear to adequately consider the damage done to their reputation and that of their methodology by a failed initiative or even a successful one which delivers too little in terms of long-term sustainable results due to a lack of culture change.

From a BPI practitioner's perspective, a methodology whose initiatives fail to realize cultural changes is, in the long term, predestined to fall out of favour. Authors such as Jestin and Nelis (2008) provided evidence that supports this conjecture. They attribute the decline in BPR usage to a reputation the methodology acquired based on its usage. Initially, BPR was apparently misunderstood and misapplied. Its practitioners failed to assure cultural changes and its customers focused on reducing the workforce and applying IT solutions. As a result, the BPR methodology became synonymous with headcount reduction and cost savings. Recognizing this symptom and correcting its root-cause has allowed BPR's successor, BPM, to favour much better. Drawing upon an analogy far removed from business, this chain of events is very similar to that experienced by so-called "fad diets". Theoretically, all diets whose prescribed caloric intake is less than the individual's metabolic rate will result in weight loss. However, unless there is a cultural change in terms of eating habits, after the diet

has been completed, the weight will likely return. Experience shows that this type of yo-yo effect is also seen in businesses where there has not been a fundamental change in the organizational culture regarding process management.

4.6.13 Process Cycles of Learning

Reflecting on the research into the efficacy of the 12 common factors solicits comments regarding both the process and the evidence acquired. Conceptually, the process of acquiring evidence via interviews and focused literature reviews appeared to be simple and straightforward. The intent was to use this research evidence to supplement and temper information regarding efficacy attained through personal experience in 39 BPI initiatives. The research was also viewed as a means of challenging researcher paradigms and gauging researcher bias. However, the process cycle time requirement to realize these objectives was vastly underestimated. Conversely, the value derived was somewhat overestimated.

The interview respondents coming from outside the BPI community, human resource experts and industrial psychologist had to be introduced to both BPI methodologies and their initiatives before they could comment on efficacy issues. This requirement arose in spite of the fact that the human resource experts were chosen from businesses that had had BPI initiatives. The interviewees required substantial time to understand the 12 factors and the context in which these factors are applied. Even though each respondent was given a synopsis regarding BPI methodologies, initiatives and of the 12 common factors beforehand, each of these elements had to be discussed in detail during the interviews. Additionally, the author had to initiate discussions by referring to efficacy evidence gathered to date. Consequently, the scheduled three-hour interviews were insufficient. Fortunately, since all respondents became extremely interested in the research topic, each requested more time to discuss and understand the subject matter. In total, over 30 hours were spent on the efficacy interviews.

The real value derived from these interviews was not the supplemental evidence regarding efficacy but rather the respondents' challenges to researcher paradigms and bias.

Very little detailed incremental information was forthcoming from the interviews. Mainly, evidence already obtained from the literature reviews and professional experience was confirmed or topics for additional focused literature reviews were offered. Those topics, such as neurological programming and the research of Mason Haire, required an excessive amount of time to research, understand and synthesize. For the most part, this supplemental research could be viewed as a deviation into the social sciences aspects of organizational management and research with very little direct connection to BPI methodologies and their composition. Although this research failed to provide significant evidence regarding efficacy drivers, these focused literature reviews did further the process of self-examining researcher paradigms and bias.

An important outcome of the interviews was a discussion regarding the notion of efficacy itself. The interviewees, particularly the industrial psychologist, routinely referred to the theoretical impact of the individual common factors. Their responses were filled with conditional sentences, hypothetical situations, and non-committal wording such as “perhaps”, “maybe”, “could” or “conceivably”. This orientation spawned discussions about the theoretical versus intended versus realizable levels of efficacy. The author found that the interviewees tended to view efficacy from either the theoretical and/or intended perspective. On the other hand, the researcher’s vantage point was basically the intended and/or realizable levels of efficacy.

Another part of the same discussion dealt with the nature of efficacy. Amongst the interviewees, a universal theme arose. That is, that efficacy could be characterized as a result and, as such, highly dependent on the circumstances and environment surrounding the usage of each common factor. The author envisions that, for example, in a simple metal bashing type business located in a developing country, the management and workforce could be overburdened by applying a comprehensive BPI methodology. As a result, the efficacies of its key factors could be impacted. Additionally, amongst the respondents, it was felt that

documenting the theoretical efficacy was not practical or within the scope of this thesis. They also felt that the realizable levels of efficacies were too dependent on application parameters. For that reason, Section 4.6 and its subsections were written from the orientation of describing the intended and realistic efficacies of each common factor. Furthermore, the frame of reference of the literature, the respondents and the researcher being triad-based, the author acknowledges that these intended and realistic efficacies may be regionally focused.

Based on the cycles of learning acquired while researching the efficacies of the common key factors, it was determined that the research technique was realistic but the implementation process could have been improved. That is, the use of focused interviews and literature reviews were valid but they should have been used differently. The author believes that the process would have been more efficient and effective if the efficacies for all 12 common factors were first completely documented from a practitioner's perspective based on experience and research findings prior to the focused interviews. Then, each respondent could have reviewed this draft documentation before being interviewed. They could then discuss and critique this documentation during the interview. The author believes that this new approach would have helped maintain a focus on the common factors and their efficacies during the interviews. It would also have helped limit the interviewee's requirements to understand the business process improvement subject matter. The interviewees could have critiqued the documented efficacies, discussed researcher paradigms and questioned researcher bias in a more efficient manner. This approach would have also helped avoid tangential and non-value adding literature reviews. In this scenario, the focused literature reviews would have been primarily gap closure activities or to enhance understanding regarding efficacy issues. Possible downsides to this procedural change include the potential for the respondents to take on the author's paradigms (or, at least, not adequately challenging them) and the likelihood that value-adding discussions such as those about the nature or notion of efficacy could have been missing.

4.7 Characterization of a Methodology's Composition

The fourth research objective and the related third research/thesis aim involve characterizing the apparent impact and importance of the common key factors within the context of a modelled BPI methodology. Attainment of this final research objective did not require the resolution of additional research questions beyond the three already answered. Additionally, only minor incremental research was needed to achieve the fourth research objective associated with this last thesis goal.

Characterization of the factors' efficacies in the context of a modelled methodology is similar to the description carried out in the previous section (4.6) except that this characterization evaluates the key factors as a system whereas the previous description dealt with them individually. As in that description, the apparent negative impacts that would likely be experienced as a result of a factor's deletion from or perfunctory/superficial application in the methodology are also included in the characterization. Finally, like the description, the characterization utilizes a narrative summary to synthesize and present the findings.

Since fulfilling the fourth research objective required no further research question to be answered and only incremental research to be done, the reader may question why this final objective was included. The author feels that such description of apparent impacts and characterization of a methodology's composition serves three basic purposes. First of all, the interdependencies between the 12 key factors have to be examined. Secondly, placed in the context of a BPI initiative, the interactions between those factors and environmental elements influencing the initiative have to be considered. Lastly, this characterization provides the opportunity to comment on the content validity of a theoretical methodology comprised only of the 12 common key factors. That is, the validity in terms of such a methodology covering the range of a BPI methodology's objectives.

The author stresses that only apparent impacts are described in this characterization. In order to determine the actual impacts, experimental research would be required. This

experimental research would necessitate multiple BPI initiatives implemented in comparable operating environments. As this requirement lies outside the scope of this thesis and since a cause-effect correlation was not required in order to meet the three purposes of this characterization, that description was based on apparent impacts only.

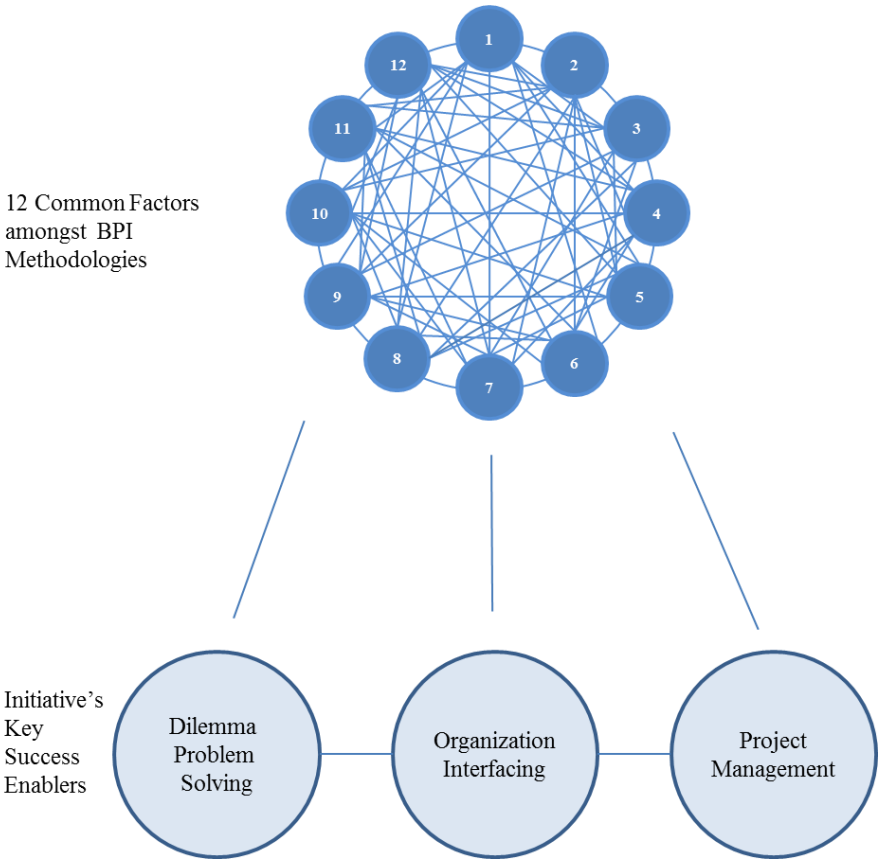
4.7.1 Use of a Model-based Methodology

In order to realise the three purposes just mentioned, characterization was made with the 12 common factors in the context of a theoretical Model-Based Methodology (MBM). This methodology is not associated with any stated philosophy as to what drive process improvements. The characterization required a subjective description based on experience as a BPI practitioner and the knowledge gained through this research. The characterization of the methodology is aligned with the composition of the six methodologies studied and their 12 common factors. Through the process of induction, it could be inferred that all methodologies would contain these 12 factors. Experience and the research indicate that this generalization is a plausible assumption on which to base the composition of the MBM.

When characterizing the composition of the MBM, interdependencies amongst the 12 factors have to be considered. Up until now, each of the 12 common key factors have been examined and treated independent of one another. Since the 12 factors are not totally discrete entities and they function collectively as a system within a methodology, their interdependencies are important. The author feels that it is beyond the scope of this characterization to reflect on all 66 possible interdependencies. Therefore, the key ones associated with each factor will be highlighted as the efficacy and application of that factor are considered. Finally, because the MBM would be applied in a BPI initiative, the interactions between the methodology components and the key success enablers for a BPI initiative are also reflected upon. Three key success enablers were considered – the organization in which the initiative takes place, the dilemma problem solving environment and the initiative's project management. The methodology's intra-dependencies

(interdependencies amongst the 12 factors) and its interdependencies with the key success enablers are depicted in Figure 4.7.1-1 below. Again, only the most salient co-dependencies will be commented upon when discussing of each of the 12 factors.

Figure 4.7.1-1 Overview of Relationships within a BPI Initiative



4.7.2 Creating a Value Proposition

The first factor to be considered in the MBM characterization is that of creating a value proposition. This factor initiates the entire BPI project. It is an essential element in gaining top management’s commitment for the initiative. As such, the value proposition has very strong ties to both the organization and the dilemma problem-solving enablers. By creating an appropriate value proposition, the organization’s management can envision how the organization should operate and what results could be achieved. Additionally, the value proposition is critical to the MBM in that it defines the business dilemma and thereby the

project scope parameters and objectives. These latter elements give the value proposition an indirect connection to the third enabler – project management. The value proposition also shares strong interdependencies with the policy deployment and KPI-driven process improvement factors. It provides both of these with the BPI initiative's goals that are broken down through the policy deployment process and controlled via the KPIs. Without a value proposition, regardless of how optimal the methodology is, it would likely not be considered for an application.

4.7.3 Management Coaching

Since the management function will, in some way, be impacted as a result of the initiative, the key common factor regarding management coaching about the new roles and responsibilities would be an essential part of the MBM. Understandably, the subject of that coaching would depend on the strategic or philosophical focal point of the methodology. That orientation is a subject matter consideration and not one dealing with the characterization of the methodology's components and constructs. Management coaching has a direct tie line to the organizational enabler since it deals directly with the organization's management.

Coaching permits the management to understand the methodology and how they can best support the initiative. Also, without the workshops and interfaces with the management that the coaching provides, the process owners and BPI practitioners may not gain adequate or appropriate insight into the business dilemma from the management's perspective.

The management training and coaching factor is closely linked with each of the other 11 factors. It uses the value proposition as an orientation. It provides the business strategy and objectives linkage necessary for policy deployment. The BPI methodology and its change management process provide the management coaching with its orientation toward the initiative. The management is coached on how to establish a change management team infrastructure and the impact of process mapping as well as root cause elimination and process flow optimization. The role management will play in driving process improvement

via KPIs would be essential to the MBM. The strongest interdependency with the other factors is felt to be with that regarding the business culture change. The management training and coaching factor significantly impacts the management's mindset, style, function and paradigms. Without management training and coaching as part of the MBM, these other 11 factors would suffer from lack of management's understanding, involvement and support of the BPI initiative.

4.7.4 Policy Deployment

Of the 11 other factors, policy deployment appears most closely linked to that of KPI driven process improvement. It establishes the KPIs, their goals and the data logistics behind each KPI. Without policy deployment in the MBM, the KPIs used by the practitioners and process owners might not be linked to the business strategy and objectives. Policy deployment is also linked directly to all three key success enablers. Its orientation is derived from the business dilemma, its impact is focused on the organization and it acts as one of the control mechanisms in project management.

4.7.5 Methodology Training

The BPI methodology training factor's inclusion in the MBM could be considered a mandatory characterization. This factor has a direct linkage to the organization enabler and indirect connections to the other two. Clearly, the organization needs to be trained in the methodology. Without training, the organization cannot be expected to understand the methodology, its methods and its tools. This training is especially important for the cross-functional teams and management as well as those directly involved in the initiative. This need forms a direct interdependency between the training factor and those of management coaching and the hierarchical, cross-functional change management team components. While the content of the training also provides respective linkages to the other nine common factors, the two dealing with elimination of root causes and process flow optimization enjoy an

exceptionally strong interdependency with the BPI methodology training factor. During the training, not only the recipients but also the trainer is benefited. Through the workshops and training sessions, the trainers and practitioners gain an understanding of the organizational drivers, symptoms and even root causes of poor performance. Additionally, since the training is done throughout the entire organization, these insights are obtained from multiple organizational levels as well as cross-functionally. The knowledge afforded the practitioners during the training increases the efficiency and effectiveness of removing the root causes of poor performance and optimizing the process flow.

4.7.6 Cross Functional Team Infrastructure

Within the MBM, there would have to be a provision for process ownership, drivers of process improvement and the avoidance of both functionalism and sub-optimization. Since, in the six methodologies studied, the hierarchical, cross-functional, change management team infrastructure is charged with these tasks, it appears appropriate to consider this element as also being critical to the MBM. As mentioned earlier, this factor has an important interdependency with the methodology training component. As leaders of change, the cross-functional teams would promote, utilize or manage the results and activities from all other 11 common factors. As administrators of the initiative, the cross-functional teams have a direct interdependency with the project management enabler. These teams are the project teams for the BPI initiative. As such they also have strong linkages with both the organization and dilemma problem-solving enablers.

4.7.7 Process Mapping

The inclusion of process mapping in the MBM provides the methodology with more than a documentation tool. As Jacka and Keller (2002) maintain, the purpose is not to make maps but rather to analysis the process. In the process mapping activities, as in the methodology training sessions, the teams and practitioners discover non-value-added

activities, substitute processes, hidden drivers and overall candidates for process improvement. Because of this, there is an exceptionally strong linkage between the process mapping, elimination of root causes and process flow optimization factors. Since the process mapping is done by the cross-functional teams, there is significant interdependency with that factor as well.

It was determined that one of the subtle results of the process mapping exercises is that this activity initiates the process of replacing functionalism and a silo mentality with a process mindset. In doing this, process mapping is a facilitator for the business culture change factor. Additionally, this relationship links process mapping into all three enablers. The strongest interdependency would be with the organizational enabler.

4.7.8 Repetitive Change Management Process

The MBM would require some form of change management process. Similar to the BPI methodology training, there would likely be a methodology-specific process linked into the methodology's subject matter and strategic orientation. A good example of this linkage is ToC's five-step focusing process and its process constraint subject matter. Because of the direct linkage between the change management process and the methodology training, these two factors enjoy a strong interdependency. Linkages and interdependencies with other common factors are assured since the change management process is the methodology's driver within the BPI initiative. As such, it utilizes all of the methodology's tools and methods.

A methodology's improvement process should be repetitive so that the changes are incremental rather than radical. This feature permits the organization to more easily assimilate the changes and also facilitates the business culture change. These aspects of the change management process justify strong linkage to both the business culture change factor and the organization enabler. Further linkage to the project management enabler is created when the

change management process has multiple phases. To be optimally effective, these phases should be synchronized with those found in both problem solving and project management.

4.7.9 Root Cause Elimination and Process Flow Optimization

Elimination of root causes and process flow optimization are two objectives for sustainable process improvement. As such, both of these factors should be included in the MBM and can be characterized together. Since they are process improvement drivers, they have a strong interdependency with the change management process factor. Because both lead directly to process and performance improvements, they are also directly linked to the KPIs driven process improvement element. Their strongest link with the enablers is probably with the dilemma problem-solving one. Both of these process improvement objectives should be tied directly to the business's dilemma. As pointed out in the efficacy study, failure to improve the process at the root cause level prevents the organization from realizing its entitled cost structure, productivity and level of competitiveness. Additionally, although compromises may be required for operative reasons, the inability to optimize the process flow will also prevent attainment of the entitled performance levels.

4.7.10 KPIs Driven Improvement

Every BPI initiative requires some form of control mechanism. The MBM would have to make provisions for this mechanism and its linkage into the other factors and enablers. The author feels that the KPIs driven process improvement mechanism allows for both focusing on process development and linking the process improvements to the business dilemma. By using quantitative information, this mechanism avoids subjective and possibly biased assessment of the initiative's progress. The mechanism's linkages with the other 11 common factors have already been characterized. With regards to the enablers, its strongest interdependencies are with the dilemma problem-solving and project management enablers. The dilemma not only establishes the targeted KPIs but also their levels of entitlement.

Project management uses the KPI driven control mechanism to gauge the initiative's progress and to ascertain the need for remedial action.

4.7.11 Visual Management

Although, theoretically, visual management could be excluded from the MBM, the substituted media and alternative practices would probably be less efficient and less effective. As stated in the efficacy analysis, visual management and visual control require less time than its alternatives to convey the message and to solicit the appropriate response. Consequently, not including visual management in the specification of a new methodology would hamper the methodology's efficiency. Therefore, the factor of visual management and visual control is included in the characterization of the MBM. Being a communications tool and facilitator of information exchange and mindset change, visual management has basically token interdependencies within the methodology. Its best linkage is with the business culture change element where visuals often serve as a constant reminder of the new culture. Regarding enablers, the factor's role as a communications and facilitator tool gives visual management a very strong interdependency with the organization enabler.

4.7.12 Business Culture Change

Business culture change would, in the Model Based Methodology, be characterized as having the same objectives as those found during the efficacy study. That means that the methodology must consider internalizing its methods and tools as well as a continuous improvement process in the organization. Additionally, the methodology must assure that the process mindset and holistic perspective elements are ingrained in the organization as well. The interdependencies between the business change culture factor and the other 11 common factors have already been noted in the previous sections. It appears trivial to note that this factor's strongest linkage is with the organization enabler. In this relationship, the culture of the organization is targeted and the organization must assimilate the new culture.

4.8 Summary

As depicted earlier in Figure 4.1-1 above, the overall research findings are a mixture of those which impact the research concept and research execution as well as the subject matter of this thesis. The findings from the initial survey and the literature reviews supported the formulation of the research strategy and tactics as well as confirmed the epistemological and ontological context parameters. These findings indicated that the research process had to be modified by including multiple interview sets. These findings also mandated inclusion of methods, tools and techniques to deal with the epistemological conditions being encountered in the research. These requirements were met through findings from the literature reviews. The most significant of these was the discovery of the reciprocal translation technique utilized to synthesize the methodology composition data. The literature reviews also provided findings required to resolve organizational issues and to manage researcher bias concerns.

Regarding the thesis's subject matter, the research findings met all four research objectives. First, six BPI methodologies were identified as being current and unique (Section 4.3). Second, from the methodologies' composition data, 12 key factors were identified as being common amongst all six methodologies (Section 4.5). Lastly, the value and efficacy of the 12 common key factors were described individually (third research objective: Section 4.6) and characterized in the context of a modelled BPI methodology (fourth research objective: Section 4.7).

CHAPTER 5: CONCLUSIONS

5.1 Introduction

The intent of this chapter is fourfold. The first is to give a brief synopsis regarding attainment of the four research objectives and answering the three research questions. The second aim is to reflect on this thesis's contributions to knowledge by resolving the research questions. The third intent is to highlight this thesis's contributions to practice and understanding (knowledge) in the business community. The fourth, and final, purpose deals with the potential for subsequent research. This chapter is structured to deal with each one of these four intents in the given order.

5.2 Identification of Unique and Current Methodologies

The first research objective was to identify the core and fundamental BPI methodologies out of an overall population which included numerous BPI approaches, methods, tools and techniques. The outcome was that six distinct BPI methodologies were identified: Lean Management, Business Process Reengineering, Total Quality Management, Six Sigma, Total Cycle Time and Theory of Constraints. As detailed in Chapter 3, Section 3.4.2, each of these six methodologies is based on a different philosophy as to what drives process improvement.

Attainment of the first research objective mandated resolution of the first research question's procedural portion: How to identify the current and unique methodologies from a heterogeneous population? The question first arose because, in that population, there was no clear delineation between the elements. In addition to this lack of breakdown or hierarchical structure, there was an undisciplined utilization of nomenclature and terminology. Furthermore, there were additional problems in determining which methodologies were current and which methodologies were stand-alone. The subset of actual methodologies contained a mixture of original, derivative, hybrid and outdated methodologies. Resolution of

the first research question therefore hinged on the definition and disciplined application of precise terminology as well as inclusion and exclusion criteria. Additionally, as detailed in Chapter 3, Section 3.4.2, a further analysis of the methodologies having similar BPI philosophies was performed so as to eliminate candidates that were duplicates, fads or non-comprehensive.

5.3 Identification of Common Key Factors

The second research objective dealt with establishing the salient key factors (constructs and/or components) common to the six business process improvement methodologies identified in attainment of the first research objective. As a result, the following 12 common key factors were identified:

1. Creation of a value proposition
2. Management coaching regarding new roles and responsibilities
3. Policy deployment linking BPI initiative goals to business strategy and objectives
4. BPI Methodology training
5. Hierarchical, cross-functional, change team infrastructure
6. Process mapping
7. Repetitive, multi-phase change management process
8. Elimination of root causes
9. Process flow optimization
10. KPIs driven process improvement
11. Visual Management (incl. Dashboard charting)
12. Business culture change.

Each of the six methodologies having its own terminology and jargon hindered attainment of this second objective and gave rise to the second research question's procedural portion: How to analyse and synthesize the composition evidence for commonality? The first stage of this process involved filtering and refining the data using inclusion and exclusion criteria. Subsequent to that, the key factors from the six different methodologies had to be made comparable with one another before commonality could be determined. This task was

accomplished by applying the reciprocal translation technique to paired elements of the evidence. These translations provided transparency of the common key factors amongst the six methodologies.

5.4 Efficacy of Individual Key Factors

Describing the fundamental deliverables for each key component and construct was the third research objective. The fundamental deliverables sought dealt with the underlying value adding attributes and efficacy drivers. Chapter 4, Section 4.6 is devoted to discussing these results. Evidence coming from the business process improvement consulting industry, having a sales orientation, hindered the identification of these attributes and drivers. Input coming from outside that industry was plagued by theoretical and subjective evidence. Determining a means by which this evidence could be analysed and synthesized was the basis of the third research question's procedural portion. Utilization of a narrative summary allowed identification of the fundamental deliverables for each of the common key factors described in Section 4.6 and its sub-sections.

5.5 Efficacy of Key Factors as a System

The fourth research objective involved characterizing the apparent impact and importance of the common key factors within the context of a modelled BPI methodology. This characterization is similar to the description carried out in Chapter 4, Section 4.6 except that it evaluates the key factors as a system whereas the description dealt with them individually. Attainment of this final research objective required only minor incremental research. Additionally, it did not require the resolution of any additional research questions. Like the description, the characterization utilized a narrative summary to synthesize and present the findings in Chapter 4, Section 4.7 and its sub-sections.

Although obtaining this objective did not require resolution of an additional research question, describing the value of each key factor in the context of a hypothetical methodology

being applied in a typical BPI initiative environment was not a trivial task. Consideration had to be made for the interdependencies amongst the 12 common factors. Additionally, attention had to be given regarding the linkage between those factors and key success enablers in the BPI initiative's environment.

5.6 Contribution to Knowledge

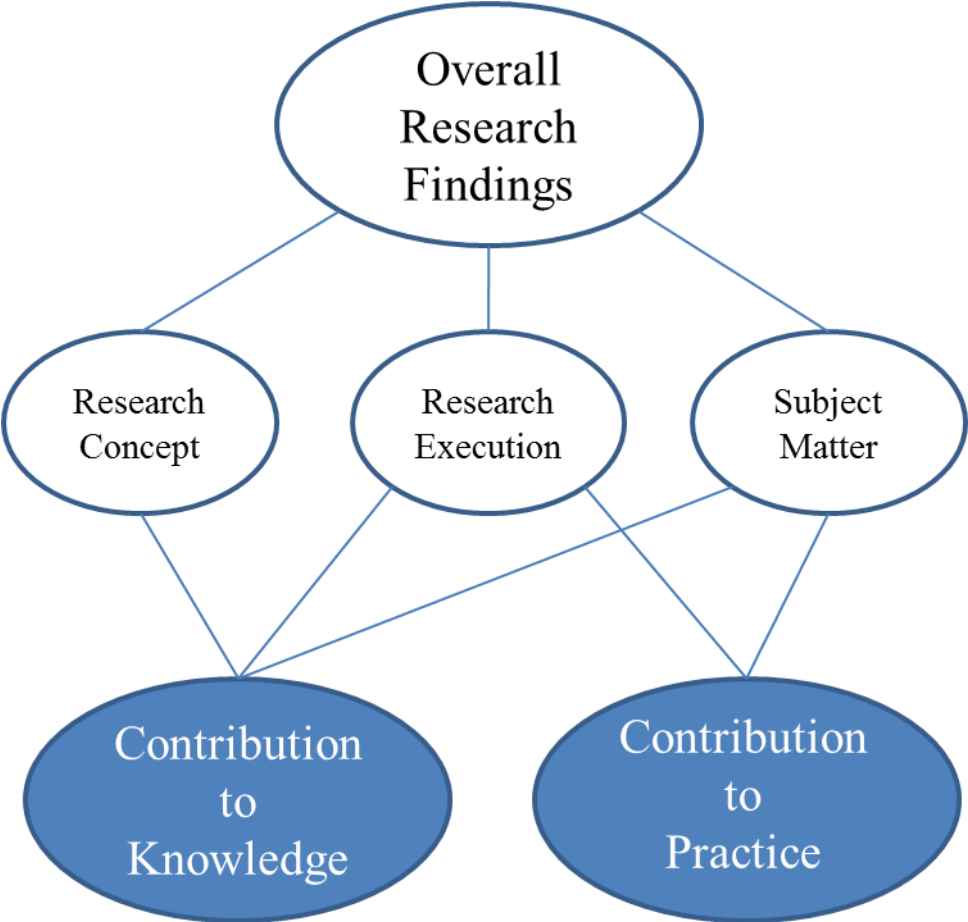
As detailed in Chapter 4, Section 4.1, the research and its findings have elements dealing with the research concept and research execution as well as the subject matter of BPI methodologies. Correspondingly, these three elements are linked further to the contributions made to knowledge and those made to practice. This relationship is depicted in Figure 5.6-1. The two types of contributions are, respectively, the focal points of this section (5.6) and Section 5.7. The areas of contribution are dealt with in the order listed in Figure 5.6-1.

As shown in Figure 5.6-1, there are five main areas wherein contributions to knowledge are made. The first four are primarily subject matter based and directly related to attainment of the four research objectives. The fifth is associated with contributions made to individual research sub-processes. The first three of the four sub-elements listed under point five are directly correlated to resolution of the three research questions. The fourth sub-element pertains to contributions made regarding the bracketing technique.

Each of the research objectives correlate to the evaluation and description of a subject matter topic not previously available in either the grey or published literature. Numerous authors such as Radnor (2010) and Koch (2010) have written about those topics (methodologies, components, elements and impacts) but not from the viewpoint or to the extent provided by this research. The evidence discovered during the research indicated that, in the currently available literature, authors have not identified the core and fundamental BPI methodologies out of the heterogeneous mixture of methodologies, methods, tools and techniques. The evidence also indicated that existing literature failed to document the common key factors amongst those BPI methodologies. Furthermore, the research has shown

that authors have overlooked the need to explicitly and categorically describe the individual efficacies of the common key factors germane to those BPI methodologies. Lastly, the evidence discovered during the research indicated that the current literature does not contain an explicit characterization of those factors' efficacies in terms of a system or modelled BPI methodology. This research and this thesis have contributed to knowledge by addressing those four shortcomings in the available literature.

Figure 5.6-1 Linkage of Research Findings to Contributions



1. Delineation of core methodologies
2. Identification of common key factors
3. Description of the factors' individual efficacies
4. Characterization of the factors' efficacies in a system
5. Applicable processes to:
 - a. Select core methodologies
 - b. Determine common factors
 - c. Establish factor efficacies
 - d. Enhance bracketing effectiveness

1. Methodology development
2. Contracting for BPI
3. Implementation practices
4. Initiative completion and internalization of change

The author believes that, by addressing the stated short-comings in the available literature, the research has contributed to knowledge by providing clarity and improved understanding of the subject matter dealing with BPI methodologies. Explicitly stated, these contributions can be summarized as:

1. A BPI methodology has to be evaluated in terms of being a comprehensive approach to improving a business's processes and culture. As such, its BPI philosophy has to be applicable to all business processes.
2. Documentation about methodologies routinely considers or discusses methods, tools, techniques, incomplete methodologies and hybrids of these elements as if they were stand-alone methodologies.
3. There are currently six core and fundamental methodologies that bring about sustainable results.
4. These six methodologies have given rise to approaches having similar focal points or philosophies as well as approaches constituting hybrids of those six methodologies.
5. There is a set of 12 common key factors amongst the six methodologies.
6. These 12 common key factors make up the basis of a BPI methodology.
7. Each of the 12 common key factors contributes a set of unique deliverables which impact the effectiveness and efficiency of a BPI methodology.
8. Within a methodology, the 12 common key factors interact and support one another as a system whose efficacy goes beyond that of the individual factors.
9. Within a BPI initiative, each of the 12 common key factors interact with an initiative's three key success enablers - dilemma problem-solving, organization interfacing, project management.
10. Partial or inappropriate application of the 12 common key factors negatively impacts a methodology's efficacy and thereby its ability to provide sustainable results.

As previously stated, these contributions are associated with the first four elements depicted in Figure 5.6-1. The fifth and final element concerns contribution to knowledge regarding application of four sub-processes.

The evidence amassed during the literature reviews and interviews introduced a number of processing issues. These issues ultimately gave rise to the procedural portions of a series of three research questions. Each of the research questions, addressing unique challenges, also provided multiple opportunities to contribute to both knowledge and practice.

Determining how to delineate the methodologies from the population containing not only methodologies but also BPI tools, techniques and methods was the first of the three research challenges. Like the two that followed it, resolving this research question was a problem-solving exercise. The contribution made to knowledge through its resolution is the understanding of how to apply business process improvement's tools and methods to solve research questions. This activity starts with viewing research as a process and goes well beyond the simple application of problem-solving techniques. As was demonstrated in Chapter 3 regarding findings in the literature review, BPI root cause analysis, identification of hidden drivers and process modelling techniques (such as SIPOC) can play an important role in addressing some research dilemmas.

When applying these techniques, the driving forces giving rise to the situation often become transparent. In the case of the first research question, these drivers were based on many works exhibiting a "sales driver" orientation and, overall, a lack of discipline in terminology usage. Resolution of that question demonstrated how gaining a firm understanding of the background and basis of a problem can simplify overcoming it. In summary, the contributions to knowledge posed by answering the first research question centred on the utility of having a process-mindset and applying process improvement techniques in a research environment.

The author is convinced that the greatest set of contributions to knowledge regarding processing was derived while answering the second research question. The dilemma here dealt with synthesizing the key factors for the commonality. The main barriers to synthesizing the data were its volume and quality. During the literature reviews, evidence pertaining to each of the six methodologies was obtained from multiple sources. Later, during the interviews, each of the five respondent types provided even more evidence for each of the six methodologies. Combined, this evidence was extremely voluminous and required data compression. At this point, the data quality became a real issue.

In the context of the synthesizing requirements surrounding the second research question, data quality pertains to 1) the evidence being germane to the composition of a methodology and 2) the ability to equate one piece of relevant evidence with another. As experienced while resolving the first research question, the sources of evidence provided a confusing, non-homogeneous mixture of data containing methods, tools and techniques as well as factors external to a BPI methodology. Additionally, the sources tended to use different terminology when discussing similar factors. Therefore, eliminating the heterogeneity in the data went well beyond excluding all evidence not related to the composition of a methodology.

The contributions to knowledge came as a result of trying to equate one piece of relevant evidence with another. Ultimately, a technique borrowed from meta-ethnography was used to accomplish this task. The technique is called reciprocal translation and gave rise to two different forms of contributions to knowledge. The first is that, a method, practice or skill from one area of research can be useful in a totally unrelated field of research. The extent of this contribution was made evident by the amount of scepticism received by the author regarding the possible usage of this technique. On multiple occasions phrases such as, “but your research has nothing to do with ethnography” was heard. Confronted with this scepticism and its associated application paradigm, the author is convinced that the effective

usage of the reciprocal translation tool made a significant contribution to knowledge and understanding as well as challenging paradigms.

The second form of contribution to knowledge came as a result of providing a set of practical examples. The information available in the literature such as that from Noblit and Hare (1988) treat the topic of reciprocal translations at the conceptual level. As such, the researcher is provided with the background of the rationale, boundary conditions for application and a conceptual overview of the activity. This thesis contributes examples of how reciprocal translations are performed and details of the implementation requirements. The reader is made aware of the technique's operative issues as well as the results.

In answering the third research question, a means of analysing the common factors for their efficacy and fundamental added values had to be found. The contributions to knowledge derived as a result of overcoming this barrier were similar to those stemming from resolving the first research question. A method for delineating relevant from non-germane evidence was demonstrated as well as ways of handling diverse terminology for similar topics. Additional contributions provided while answering the third research question pertain to managing subjective input, superficial evidence and abstract responses. These contributions to knowledge focused on understanding the driving forces behind these issues and the employment of effective remedial actions.

Lastly, a contribution was also made to the literature regarding process and techniques relating to the bracketing technique. Current literature tended to associate this tool with the interviewing process and ethnocentric or egocentric drivers of bias. This thesis demonstrates why the technique should be utilized throughout the entire research process - including the literature review. Bracketing is positioned in the thesis as a quality control technique to be applied whenever the researcher is confronted with evidence or is processing it. As a control instrument involved in value judgments about sources and evidence, the drivers of bias go beyond ethnocentric and egocentric considerations. The thesis points out that training, skills

and experiences also play a role in how or to what end these judgments are carried out. Davies (2007:157) supports this position with the statement that, “There are particular risks of researcher bias if you are embarking on a project in a field where you already feel ‘at home’.” High levels of knowledge about the research subject matter could create a preference for that evidence which is practical, proven, transparent, or within the comfort zone of the researcher. Davies failed to consider that insufficient subject matter knowledge could also be problematic. Assessments based on low levels of experience and expertise would likely allow poor, erroneous and biased information to pass a subjective filter. These introduced biases based on experience and expertise would be independent of ethnocentric and egocentric considerations.

In critiquing the bracketing tool’s design elements, the thesis also provides insight into how to overcome design flaws so as to enhance its applicability in areas such as DBA research. The tool’s design requirement for the researcher to document everything known or experienced pertaining to the subject matter poses a dilemma for certain researchers. Researchers, such as DBA candidates, typically investigate subjects pertaining to their business life or professional interest. For these researchers, it is impractical to meet the design requirement of fully documenting their knowledge. The thesis shows how to compensate for this inability by enhancing the data table used in the bracketing technique. Current literature advocates listing, using characteristic-based considerations, the possible sources of bias, countermeasures to suppress biases and countermeasure-induced bias considerations. In the thesis, these three lists have been expanded to include experience-based considerations.

5.7 Contribution to Practice

In contrast to the contributions made to knowledge by attaining the research objectives, answering the research questions and enhancing research tools, the contributions to practice were essentially driven by attainment of the thesis goals. As such, the contributions made to the business community are slanted more toward improved awareness, understanding

and transparency than toward contributing new knowledge, information or documentation. The analysis and synthesis of the research data affords the business community with better comprehension of, and clearer insight into, BPI methodologies. This contribution provides an improved understanding of their composition and their role in enhancing business performance.

The contributions to practice are best described in the context of those sub-processes that are impacted the most. These sub-processes are methodology development, contracting for BPI initiatives, methodology implementation and methodology internalization.

Contributions made to methodology development are targeted at the IP owners and practitioners within the BPI industry. The author feels that capturing and documenting the essence of the six BPI methodologies will help safeguard the core elements of BPI methodologies as those methodologies mature and new ones are created. Having an increased awareness of the essential components required in a methodology, the author believes that the BPI industry will more readily look for adaptations elsewhere. This does not mean that those essential elements could not undergo optimization but rather that the development of USP's will be focused in other areas that are less critical.

From a practitioner's perspective, protection of the key factors is not only required due to the evolutionary process but also because of "erosion" stemming from practitioners' taking shortcuts, utilizing the methodologies improperly or applying them to inappropriate circumstances. In such cases, the methodology could be inappropriately modified to fit the conditions or lose some of its key components. Experience shows that the root-cause drivers for this "erosion" come from the customer side of the BPI industry. The enhanced awareness and understanding of a methodology's vital components supports a reduction in the market forces driving change or exclusion of those essential elements.

Contracting is another sub-process impacted by this thesis. From the author's experience, contracts for BPI initiatives often involve limited or no external consulting

services. For this reason, the author has extended the term “seller” to include internal as well as external consultants who provide the “buyer” with the BPI methodology and their relevant expertise. Furthermore, the term “buyer” is not limited here to just those organizations undergoing the business process improvement. Intermediaries such as consulting firms not having BPI expertise are also considered to be buyers. Contributions made by this thesis to the contracting practice impact both the buyers and sellers.

Identifying and detailing the common factors as well as placing those factors in the context of a methodology improved the buyer’s insight into the methodologies’ composition, structure and function. This documentation facilitates a demystification of the BPI methodologies and their influences on business process efficiency and effectiveness. Consequently, this insight provides buyers with a better information base on which to make decisions regarding methodology selection and creation of BPI initiatives. This contribution to the buyer’s body of knowledge promotes the creation of a driving force for clearer and more transparent value propositions from the sellers as well as enhancing the buyer’s evaluation capabilities. Additionally, by exposing the potential for bias and misaligned expectations in the value proposition, this thesis enables their consideration and the taking of countermeasures. These contributions to awareness enable better alignment of expectations with realizable outcomes and more concrete dialogue in the contracting process.

This thesis’s contributions to the contracting sub-process also impacts the seller’s mindset and activities. These impacts will be driven by improved clarity regarding the methodology composition and better understanding of the methodology’s key factors. As mentioned previously, the focal point for creation of USP’s should shift away from amending the system of the 12 key factors and toward enhanced offerings. Again, the previously detailed changes in the buyer’s awareness facilitate that shift as well as moderate the seller’s sales orientation. The result would be a contract based on more realistic expectations, having clearer deliverables and structured to meet the temporal requirements set by the scope of the

contracted improvements. Accordingly, the seller would be challenged to modify his mindset and practices to meet the new contracting environment.

The mainstay of the contributions to the implementation sub-process is a direct result of changes in the contracting practices. Businesses and practitioners who acknowledge the importance of a methodology's key factors during contracting will be less likely to inappropriately apply these or the methodology. As a result, implementation would be a more straightforward activity with less rework and better results.

A contribution made to the implementation practice not resulting from contracting stems from improved knowledge of purpose. The thesis's descriptions of the efficacies of each key factor as well as the factors' importance as a system within a methodology provide the reader with an appreciation for the underlying rationale. As a result, those involved in the BPI initiative become better aware of the intent and utility of the individual factors as well as the system of factors. In turn, this means that there would be quicker acceptance of those elements and less resistance in the implementation sub-process. This contribution to the implementation practices enables an increased rate of successful BPI initiatives by preventing shortcuts and omissions when applying a methodology.

The contribution to the internalization sub-process involves justifying the need for internalization and thereby safeguarding the sub-process's existence. This contribution is linked to those in the contracting and implementation sub-processes. Without an appreciation for the underlying rationale regarding the methodology and its components, experience shows that a BPI initiative is often truncated when the consultants leave or the organization's management becomes defocused from the initiative. As a result, implemented changes are not internalized, a continuous improvement process is not put in place and the organization's culture is not updated. The thesis's contributions to the knowledge of purpose, as detailed in the previous paragraphs, counteract those shortcomings.

5.8 Subsequent Research Potential

Reflection on the potential for subsequent research is the fourth, and final, topic of this chapter. Serving as an upper bound for such research potential, the author does not feel that performing experiment-based research on BPI methodologies or BPI initiatives is realistic. In some ways, this would be analogous to buying a fleet of expensive Lamborghinis and parking each in a different country around the world so as to determine in which region they rust out the quickest. The analogy here is that such experiment-based research is too expensive and too time-consuming to be practical.

A more practical approach would likely involve studying individual factors in a methodology or phases in a BPI initiative in a rigorous and detailed fashion. In this vein, there are a number of foreseeable topics and areas for future research including the methods, tools and techniques utilized in the BPI industry.

The author feels that each of the 12 key factors could warrant a more in-depth evaluation in terms of their role in bring about sustainable process improvements. Some might even lend themselves to experiment-based research. Although some of these factors such as cross functional teams or KPIs have been investigated in other contexts, the author feels that additional analysis into their value added contributions to BPI methodologies could be justified. A related area of potential research involves the alignment, adaptation or interpretation of each of the key common factors to fit the methodology's unique philosophy as to what drives performance improvement.

Another issue for further investigation is the connection between a methodology's product lifecycle and the geographic location or cultural environment in which the BPI initiative is performed. During the research, the author was confronted with indications that this connection exists. Aspects of this issue will be discussed later in Chapter 6.

Another topic for possible further investigation deals with the relationship between industry and the successful implementation of a BPI methodology. It appears that some

industries or business cultures could provide a better environment for application of a given methodology. For example, some evidence seemed to indicate that Lean Management could be more suitable to manufacturing industries and that Six Sigma performs better in highly technical business cultures having large volumes of process transactions. Again, aspects of this issue are discussed later in Chapter 6.

A final consideration for follow-on research does not involve the thesis's subject matter but rather research methods and techniques. During the research, the author encountered indications that artificial barriers appear to exist between different fields of study. These barriers (paradigms) appear to inhibit the use of tools and techniques from one field in an unrelated area of research. The author feels that studies comparing such research methods or techniques in terms of their concepts and underlying processes could benefit the research community. Identification of commonalities and clarification of purpose or utility could serve to reduce the number, promote a more universal method or tool and broaden their applicability. These observations and comments are based on the criticism received regarding usage of a meta-ethnography technique to analyse BPI methodologies.

5.9 Closing Statements

In concluding, the author feels that, in spite of the financial and temporal considerations limiting the work to descriptive research, the thesis's findings are substantial and the contributions to knowledge and practice are significant. The author feels that consideration of these findings will promote extended and improved application of research techniques as well as provide an enhanced foundation for improved BPI initiatives and more sustainable results from those initiatives. Lastly, the author has a high level of confidence in the statements made, results obtained, and conclusions drawn in this thesis.

CHAPTER 6: DISCUSSIONS OF LIMITATIONS AND REFLECTIONS

6.1 Reflection on the Overall Research

Limitations placed on the research can be classified as either as boundaries imposed by the author or external constraints. The creation of boundaries was intended to prevent scope creep in the research project and to maintain a focus on the author's intent. That intent was to preserve and protect the composition and key components of BPI methodologies by identifying them and documenting their importance. The intent was neither to create a new methodology nor demonstrate personal expertise. Therefore, examining issues such as the key success factors for BPI initiatives or the design of an optimal methodology were placed outside the scope of this research. Because these issues were so interesting, fellow researchers, associates, advisors and respondents repeatedly tried to include them in the project scope. Although the author also finds them extremely interesting, researching such topics would have diluted the author's efforts and violated the thesis's intent.

The author also placed geographic and language limitations on the research. Justifications of these, in terms of the literature review, were given in Chapter 2, Sections 2.7.1.1.1 and 2.7.1.3. Imposition of these boundaries was based on the author's business experiences in countries such as The Philippines, Malaysia and Nepal as well as in the Triad and BRIC countries. Excluding subsistence-based organizations (which tend to focus on product and yield instead of process), the author found that businesses in these countries were very aware of the BPI themes. The author feels that this stems from global economics and global access to knowledge via the Internet and international schooling. The original boundaries (Triad countries and the English language) proved to be sufficient except in determining which methodologies are contemporary. Here, evidence from German and French literature proved necessary. The author did not foresee that works written in English would focus so heavily on methodologies in the early stages of the product lifecycle. This gave rise to the impression that maturing methodologies such as TQM and BPR were either in

their declining phases or no longer contemporary. This and other product lifecycle issues will be discussed later in sections 6.5 and 6.6.

External constraints placed on the research deal primarily with knowledge accessibility and with timing. As acknowledged in Chapter 2, Section 2.7.1.1.2, a body of knowledge with limited access exists. The author, being a BPI expert, is privy to only a portion of that black literature. His access is limited to the works created by himself, his associates, collaborating consulting organizations and his clients. Exposure to the full body of knowledge in the black literature would likely have accelerated the research and reduced its complexity. Associated with this limited access is the issue of limited disclosure capabilities. Nondisclosure agreements and confidentiality covenants prevent publication of this literature. This limited disclosure not only prevented the author from having exposure to the full body of knowledge in the black literature but also prevented him from referencing that portion of the literature that was accessible.

The timing limitation placed on the research stems from the continuous evolution and publication of knowledge. This limitation does not deal with the restrictions posed by academia or funding. Instead, it deals with the research presenting the evidence from a snapshot in time. The author's concern is not about the phenomenon of simultaneous discovery (often referred to as "multiple discovery") or the potential for his work being preempted by parallel research. His concern is about new publications and new knowledge being available on a continuous basis while the research has to be truncated at some point in time. This truncation is a time limitation that the author was forced to accept.

Reflection on the research process was carried out and documented incrementally as part of each major research sub-process. These process cycles of learning were detailed previously in the respective chapters and sections. The incremental reflections led to impromptu improvements in the interviewing schedule, interviewer techniques, and the design of follow-up interviews to promote objectivity during process execution. These

reviews also led to opinions such as that the number of interviews carried out on the methodology composition appeared to be excessive and that a change in the format of the efficacy interviews would have made that sub-process more effective and efficient. After having carried out these incremental reflections, it appears appropriate to reflect upon the overall research in terms of process, findings, issues and limitations. Some of the points under consideration were already alluded to when discussing the research challenges and opportunities in Chapter 2. In the context of findings, the six barriers to implementing successful BPI initiative listed by the expert panel during the initial survey are also reflected upon here.

6.2 Subjectivity and Bias

The topic of subjectivity and bias was a constant concern that surfaced in each phase or sub-process of the research and in the thesis writing. Because researcher subjectivity and bias was of such concern, a number of control and countermeasures were employed. An explicit attempt was made to acknowledge the issues, identify the possible sources, project the probable impacts and recognize potential secondary ramifications regarding researcher subjectivity and bias. As detailed earlier, reflexivity and bracketing were activated on both a temporal and milestone basis. Additionally, a number of “sanity checks” were made periodically by colleagues and friends in the BPI field. These reviews involved not only discussing the information, analysis and findings but also the indicated orientation, filter and paradigms. Furthermore, during the efficacy research, leverage was gained against researcher bias by having the non-BPI expert respondents critique and challenge the researcher’s findings. These external assessments proved valuable in controlling researcher bias and should be considered as a common practice for researchers.

Nearly all literature found pertaining to the topics appeared to focus primarily on the researcher’s subjectivity and the researcher’s bias. For example, in his paper on dealing with bias in qualitative research, Rajendran (2001:2) presented the topic clearly in the context of

the researcher. He stated that, “qualitative researchers are concerned with the effect their own subjectivity may have on the data they produce.” Later, he went on to add, “Particularly when the data must ‘go through’ the researcher’s mind before it is put on paper, the worry about subjectivity arises.” Rajendran (2001:3) further states that, “Even something as taken for granted as writing or talking has major consequences as decisions are made during the interaction of persons, method, and analysis.” Statements such as these highlight a real and significant concern which may even be more profound in applied research such as that for a DBA. However, focusing solely on the researcher is not taking a holistic view. The author feels that, without taking such a view, only a fraction of the bias issue is considered. The entire “iceberg” has to be contemplated not just that above the waterline.

The SIPOC process model was used to gain a holistic perspective regarding subjectivity and bias. In this model, authors, IP owners, practitioners and research respondents are the suppliers. Input is data gained from literature or interviews. The “P” in SIPOC represents both process and processor. The process involves data acquisition, comprehending the data, amalgamating the data into evidence and synthesizing the evidence into findings. The processor is primarily the researcher. However, it could be argued that anyone reviewing, critiquing and requesting changes to the research are also processors. Reflecting on Rajendran’s (2001) statements, all of these individuals are involved in thinking, discussing and documenting the output. The output is not just the research findings but also the final documentation. In the SIPOC model the customer would then be the readers, both academic and business.

Upon reviewing this SIPOC model, the author identified that subjectivity was present in multiple sub-processes. Since all media could be viewed as a channel for delivering a persuasive argument, a constant vigilance has to be maintained throughout the process for half-truths and incomplete pictures as well as views and feelings presented as facts. Aside from researcher bias, there are a number of other sources. From the author’s perspective,

suppliers' subjectivity was a major source of bias to be reconciled. A point of concern here was, once biases entered the system via the supplier sub-process, how can they be corrected, mitigated or purged. As mentioned earlier in the literature review chapter (Chapter 3), in some cases, "supplier" bias was recognizable and easily detected. In such cases, the biased evidence could be reconciled or was ignored. However, in many other instances there were only hints or suggestions that the supplier's subjectivity was resulting in bias. Here, such evidence had to be substantiated or disproved.

The second group of suppliers, the interview respondents, appeared to take ownership of the respective methodology and prone to presenting their views as facts. They also appeared to have a tendency to think and discuss in terms of incomplete pictures or context. The IP owners and consulting practitioners interviewed were openly passionate about their methodologies and took pride in the results it generated. At times, they, particularly the IP owners, appeared to border on being mono-maniacs with a sales mission. These self-styled experts repeatedly made negative comparisons to other methodologies. They also tended to use absolute terms when characterizing their own methodologies. That is, they would use phrases such as, "only this methodology can do that" or "no one else has this". Reflecting upon this, one might argue that they likely had more to gain by letting their subjectivity slip into bias than they had to lose. Along this line, where was the driving force for them to be objective and unbiased? In such situations, it is a researcher's task to detect and mitigate the supplier's bias.

Although detection of bias was somewhat easier, mitigating that bias was much more difficult and perhaps not absolute. With all probability, the detection filter for biased evidence was not perfect and the generation of remedial actions was not totally effective. This notwithstanding, the situation was made less critical in the interviewing research regarding methodology composition by interviewing multiple respondents per methodology and comparing their input against that from the literature. However, in the research interviews

regarding efficacy, IP owner and practitioner bias could not be easily managed. It was logical to assume that respondents showing bias in terms of methodology composition would produce even more and stronger biased statements about the efficacy of their methodology's components. For this reason, the author decided to constrain but not ignore the IP owner's and practitioner's input regarding efficacy. This safeguard meant that such input had to be substantiated by the literature or researcher experience and critiqued by respondents external to the field of business process improvement. This requirement resulted in having to interview both human resource experts and an industrial psychologist.

6.3 Issues Surrounding Sample Construction

Samples had to be constructed for interviews pertaining to both methodology composition and the efficacy of the common key factors found amongst the methodologies. In the former, key issues focused on sample size, respondent type, interview order and convergence of data. In the latter, respondent type and data convergence were the key factors. An overview of the issues and considerations dealing with sample design was outlined in Chapter 2, Section 2.4.4.2. Additionally, issues and considerations arising from the interview order were detailed in Chapter 4, Section 4.4.2 and discussed in the previous section (section 6.2). The following is a brief synopsis of the issues surrounding sample construction that were discussed in chapters two and four;

- Evidence regarding methodology composition required BPI expertise.
- In order to gain data convergence and a comprehensive overview of the composition issues, three types of BPI experts were required as respondents.
- Convergence of data from these three types of BPI experts was hampered by their unique BPI philosophies, ontological issues and viewpoints concerning their respective methodologies.
- The three types of BPI experts basically maintained a “selling” mode when presenting and talking about their methodologies.

- Those methodologies having multiple IP owners mandated that a set of selection criteria be applied.
- In order to gain a broader spectrum of experience from the practitioners, consultant and business practitioners with experience from different BPI initiatives were required.
- The interviewing order of IP owners and then practitioners appeared to give rise to researcher bias and was, therefore, inverted.
- The quota system and snowball technique for identifying and recruiting respondents was both effective and efficient.
- The BPI experts failed to give a comprehensive understanding of the efficacy considerations for the key factors found common amongst the methodologies.
- The gap in understanding efficacy considerations was closed by interviewing human resource management and industrial psychology experts.

These issues gave rise to a number of redesigns in both the interviewing and data analysis processes.

Reflecting on the number of BPI experts interviewed, a fixed quota of 30 respondents appears excessive. An alternative to this would have been to reduce the fixed quota for each practitioner type by 50%. In cases where this became inadequate for reasons such as poor or insufficient evidence, additional practitioners could be interviewed on an ad hoc basis. This recommendation is based on experience with the second practitioner interview rarely providing incremental evidence.

6.4 Data Collection Issues: Interviews

The difficulties arising from the quality of input from sources internal to the BPI field were exacerbated by their delivery characteristics. This complication was experienced much more in the interviews than with the literature - which was seemingly organized and well

structured. Although the IP owners and practitioners were provided with the interview schedule well in advance of the interviews, or maybe because of this, they exhibited difficulties in maintaining process flow. They routinely jumped back and forth in the list of questions seemingly at random. A clear majority used fragmented sentences and unclear syntax. While the extensive use of jargon and acronyms were common to all interviews, in four of the 30 this usage was excessive. The impression was given that these respondents were attempting to exhibit superiority, confuse the interviewer or possibly test the researcher's BPI knowledge. Each of these poor quality responses had to be routinely questioned for clarity and completeness. Additionally, many of these same respondents exhibited signs of having their own agenda. Although their entering into a "sales mode" was often detected, their tangential deviations into such fields as client initiatives and organizational management philosophies were the most difficult to control. Besides personal biographic data, IP owners and consulting practitioners repeatedly offered quantitative evidence about successful BPI initiatives where their methodologies had been used. Reflection on those initiatives and the results achieved could have been useful had the respondents been willing to discuss them in terms of efficacy or root-cause drivers of the effects. Reflecting on these interviews and the problems encountered, it is questioned if the use of an unstructured interview would have been more effective and efficient. The author feels that simply providing the respondents with the topics to be discussed and the objectives of the interview might not have significantly degraded the quality of the evidence nor prolonged the cycle time. However, this change would have required those objectives to be carefully stated so as to avoid influencing the interviewee's responses. Additionally, the researcher would have had to cautiously manage attainment of those objectives.

Irrespective of the respondent type (IP-Owner or practitioner), one negative characteristic in the interviews remained seemingly constant. This problem was the difficulty experienced by the respondents in delineating between methodology and initiative, between

methodology and project management, and between methodology and the process of solving the business's dilemma. Since the methodology is embedded in the initiative and integrated with both project management and problem solving activities, the respondents seemed to view all of this as one entity and exhibited difficulties in contemplating the individual components. Apparently, an appropriate analogy might be, "once the soup is cooked, is hard to discern what vegetable contributed which flavour". When asked to characterize their responses regarding composition as being 1) explicitly or implicitly stated in the methodology, 2) a logical consequence of the methodology or 3) an ancillary requirement external to the methodology, each of the 30 respondents exhibited difficulties in doing this. They required significant time to contemplate each response they had given. The majority ultimately changed some of their responses. In at least one case (personal conversation, July, 2012), the respondent replied, "I'm not sure - what do you think?" Unfortunately, modifying the research process or the tools and techniques employed within the interviewing process probably would not have eliminated this confusion and inability to delineate.

6.5 Literature Reviews Issues

The next two points of reflection deal with the literature reviews to find evidence on the BPI subject matters. The original plan called for three discrete literature reviews. One was to be for the gap analysis. The second was to determine the methodology compositions and the third, to explore the drivers of efficacy. In reality, performing literature reviews was an on-going activity with overlap amongst their objectives. In addition to those for the three original purposes, there were literature reviews required for gap closure of missing information, literature reviews to substantiate evidence acquired from the interviews and literature reviews to understand unfamiliar subject matter presented by the respondents or authors. Lastly, there was literature reviews required to understand, support or problem-solve issues regarding the research process itself. These ancillary reviews required significant

amounts of unplanned effort and time. In research projects there should be time allocations for contingency considerations such as these.

The second issue regarding literature reviews pertains to the assumptions made about the body of knowledge. As previously stated, the author originally assumed that literature review of English works would be sufficient. This premise was justified on the belief that the methodologies would either be created in that language or translated into it for reasons of application. The latter was intended to cover methodologies such as Lean Management which were formalized in Japan and then transferred throughout the Triad and the rest of the world. Although the language assumption was essentially correct and proved to suffice in terms of the basic research, during the research it became evident that considerations should also have been made for product lifecycle and maturity factors. These factors ultimately brought the language issue back into consideration.

The research indicated that a methodology's product lifecycle plays a role in determining which methodologies are current. The connection is probably best demonstrated by the use of two examples. The first deals with total quality management. In the initial survey and at the beginning of the SLR, doubt was raised as to whether or not TQM was a current methodology. Initially, this methodology appeared to be more of a management philosophy than a process improvement methodology. This doubt and impression was based on views expressed by the expert panel and findings in the English language literature. That literature seemed to position TQM as being non-current or, at best, in the declining phase of its product lifecycle. Upon interviewing TQM practitioners in Germany and France as well as discussing TQM with Japanese and Spanish managers, a quite different picture was created. These non-Anglo-Saxon interviews clearly indicated that TQM was not yet in the declining phase of its product lifecycle in those regions. Ultimately, a decision was made to do a focused, non-English literature search on TQM. Works such as that of Koch (2011) provided evidence that TQM should be judged as a current methodology.

The second example deals with the TCT and ToC methodologies. Unlike TQM, both of these methodologies stem from single-source IP owners. These are Philip R. Thomas and Eli Goldratt respectively. Both Thomas and Goldratt were zealous promoters of their methodologies. Since Thomas's retirement 12 years ago, available information in English would indicate that the TCT methodology was at, or near, the end of its product lifecycle. The last major publication in English on TCT was Thomas's book in 1994. Additionally, the consulting practice owning the TCT brand went into bankruptcy in 2012. These circumstances appeared to correlate the methodology's lifecycle with that of its IP owner. This connection would have indicated a particular concern for the future of ToC since Goldratt, the methodology's creator and IP owner, died in mid-2011. Reflecting on the experiences with TQM, a similar set of interviews, discussions and non-English literature searches were made on TCT. Again, works such as Koch (2011) showed that TCT was still a consideration. The final lesson learned was that product maturity had to be strongly considered with respect to each methodology under study.

6.6 Maturity Considerations

The cycle of learning from these two examples appear to present two possible considerations. First, in their "fatherland" and "mother-tongue", maturing methodologies may appear to receive less attention but that decline may not correlate to the actual product lifecycle phase of the methodology on a global basis. Second, a methodology could, in different parts of the world, be in different stages of its life cycle.

Jeston and Nelis (2008) highlighted a different aspect of maturity that also deserves consideration. Unlike the previous account, their issues with maturity did not deal with geography, language or product lifecycle considerations. Also, their concerns did not involve the maturity of the methodology but rather the maturity of the organizations utilizing the methodology. Although Jeston and Nelis (2008) placed this issue in the context of BPR/BPM, their principle could be applied to the application of any methodology. The point made by

these authors is that some businesses have processes which are further developed than those of other businesses. This situation could stem from conditions such as those businesses being in different economies, cultures or industries. From a practitioner's perspective, the issue raised by Jeston and Nelis (2008) is one of the many that have to be considered when deploying a BPI initiative. From a researcher's perspective, there could be a link between business process maturity and the appearance of a methodology being current or noncurrent. For example, if the businesses in a particular region or industry had process maturities not appropriate for applying a given methodology, then the methodology would be under-utilized. This under-utilization within a region or industry could be interpreted as if the methodology was not current. If, in reality, this linkage exists then perhaps maturity of businesses within a region or industry should have been a consideration in assessing whether or not a methodology is current. Reflecting upon this change, as stated before, only TQM and TCT had the appearance of being underutilized. Fortuitously, for reasons other than the business process maturity issue, both of these methodologies were judged to be current and therefore included in the research. Nevertheless, other researchers should take these cycles of learning concerning product and business maturities under consideration when working in a similar field.

6.7 Expert Panel's Barrier List

The expert panel used in the initial survey discussed how this research might improve the effectiveness or efficiency of applying any methodology. As part of that discussion, they listed six barriers to implementing a BPI initiative successfully. It appears appropriate to reflect on each barrier (underlined) and the impact this research may have on it.

There is a lack of understanding for the time required to make process improvements.

The panel indicated that there were three causes behind this symptom. The first was that management had a high sense of urgency for change and therefore drove for quick solutions. The second was that the consulting practitioner was too focused on obtaining a contract. The

third was that a lack of appreciation for the time requirements could exist. None of these three were directly addressed by the research since they are initiative and implementation based. However, it could be argued that, when reading the details of the 12 factors and their efficacies, an organization's management would get an appreciation for the effort and possibly the time required to bring about their targeted changes. It could also be argued that those managers, after having reviewed the factors, respective efficacies and the characterization of the MBM (Model Based Methodology) would realize the advantages of performing a holistic BPI initiative instead of just a point solution as well as the need to create sustainable improvement through culture change.

The magnitude of the changes required is either misunderstood or underestimated. The panel felt that the need and effort required by the organization to internalize process changes is not fully appreciated. Again, the research did not directly address this barrier because it too was a barrier to successful implementation. Nevertheless, the business reader should gain a sense of importance for internalization of process changes and the resolve required. This premise should be especially true regarding the factor pertaining to the new roles and responsibility of management and the factor dealing with changing the business culture. Business managers, when considering these factors, would be able to estimate the need and effort associated with each.

Process improvements are made by overcoming the symptoms rather than eliminating the root cause. This implementation problem is one of the barriers mentioned by the panel that was directly addressed in the research. The elimination of root causes is one of the 12 common factors to all six methodologies. The description of this factor, its associated efficacy drivers and its impact in context to a methodology (MBM example) enlighten the reader as to why the root causes need to be eliminated as well as the impact of failing to do so.

The panel's fourth barrier dealt with the lack of understanding as to how process improvements are made. They clarified that this barrier dealt less with the change process

itself but more with the linkage of process constraints and therefore the scope of the required change process. That is, point or spot solutions are used where holistic process optimization is required. The linkage of process constraints and the associated scope of the change initiative are not explicitly covered by this research. The author feels that the research has no direct impact on this barrier. However, a business reader should acquire a better appreciation and understanding as to how methodologies are applied, the need for a holistic treatment of process improvement and the importance of key components.

The drivers against change are not fully understood. The panel delineated this barrier from people's normal resistance to change. They associated these drivers with the organization's KPIs, incentive systems and business culture rather than personal anxiety or fear. This barrier was, in part, dealt with in the thesis during the discussions regarding the policy deployment and the KPI driven implementation factors. However, the focus in both treatments was on the drivers "for" change. Except for examples and specific comments regarding hidden drivers and resistance to change, the drivers "against" change were not explicitly mentioned.

The last barrier to successful BPI initiatives mentioned by the panel was concerned with the inability to compare BPI methodologies with one another. Viewed superficially, eliminating this barrier could possibly be misconstrued as the ultimate aim of this thesis. However, this interpretation is not the case. The panel was concerned with successful implementation. One enabler for a BPI initiative's success relies on management's ability to evaluate the appropriateness of a given methodology for their organization and its processes. Instead of researching the applicability and key success factors of implementing the methodologies, the research was focused on analysing and exploring the composition of those methodologies. , However, this research provides managers with a better information base on which to make decisions regarding methodology selection and creation of BPI initiatives. Hopefully, the research has also lent some transparency to the key elements of BPI

methodologies and possibly even removed some mystique arising from terminology or USPs touted by the consulting practitioners. However, the task of giving management the ability to determine which methodology best fits their organization is still an open issue.

6.8 Personal Reflections

Research is essentially a project-based endeavour. It has such project elements as a concept, objectives, scope of work, plan of execution, environmental factors and even a critical path. As with any project, it will very likely not follow the original plans or schedule. Being the project manager, the researcher needs to keep all of these factors in consideration throughout the project lifecycle. Those project managers having extensive subject matter expertise run the risk of overlooking or taking some of these elements for granted by being overly focused on the results, results attainment or simply their areas of expertise. The author recognized this pitfall late in the research project.

Being a BPI professional and highly motivated by the subject matter of the research, the author was initially too results oriented. This root cause surfaced as a symptom while writing the thesis. Documentation of the research findings and contributions in the draft versions were focused strictly on subject matter. Although they had taken extensive research time and effort to acquire and synthesize, findings impacting the research concept and execution were not adequately documented in those draft versions. Likewise, the contributions made to research knowledge, practice and the literature were also underplayed. Presenting a balanced and complete picture of the findings and conclusions represented a significant mindset shift by the author.

The final point of reflection centres on the impact this research has made on the author as a BPI professional and the head of a BPI consulting firm. The author has acquired a better comprehension of, and clearer insight into, BPI methodologies as a whole. This includes an improved understanding of their compositions and their role in enhancing business performance. Having an increased awareness of the essential components required in a

methodology will help the author safeguard the core elements of the BPI methodologies as those methodologies are practiced. From the author's perspective, this protection focuses on inhibiting practitioners from taking shortcuts, utilizing the methodologies improperly or applying them to inappropriate circumstances.

Demystification of the BPI methodologies and their jargon as well as the influences on business process efficiency and effectiveness by their key factors provides the author with a better information base on which to make decisions regarding methodology selection and creation of BPI initiatives. This contribution to the author's body of knowledge allows him to create a clearer and more transparent value proposition for his prospective clients. In doing so, the author can better deal with the potential for bias and misaligned expectations in the value proposition. The author believes that better alignment of expectations will place the focus on realizable outcomes and provide for more concrete dialogue in the contracting process.

Being better aware of the efficacies of each key factor as well as the factors' importance as a system within a methodology provides the author with an improved appreciation for the underlying rationale. As a result, the author can provide his client's organization with an improved knowledge of purpose. This means that those involved in the BPI initiative become better aware of the intent and utility of the individual factors as well as the system of factors. The author feels that this enhanced understanding by his client will enable quicker acceptance of those elements and less resistance during the implementation phase of his client's BPI initiative. He also believes that, ultimately, these contribution to the implementation practices will result in an increased rate of successful BPI initiatives.

The author also feels that providing his client's organization with an enhanced knowledge of purpose will underwrite internalization of the BPI methodology and promote the necessary culture change. When executing a BPI initiative, one of the author's worst fears is that those two activities will be truncated upon his departure or when the organization's management becomes focused on other issues. Failure to internalize or make a sustainable

culture change is a barrier to his client's realizing the entitled level of performance and, ultimately, results in a tarnished reputation for the author's consulting services.

CHAPTER 7: REFLECTIONS ON LEARNING

The purpose of this chapter is to reflect upon certain aspects of the author's learning curve not already discussed in previous sections of this thesis, such as 4.4.4, 4.5.4 and 4.6.13. These sections dealt primarily with cycles of learning pertaining to the research process and discussions about potential improvements to that process. This chapter draws its value from reflection given to insights gained while interfacing with fellow researchers and those who have read, reviewed and critiqued the research findings. Presenting and discussing the research topic, the research approach and the key findings provided the author with an appreciation for his audience's frames of reference, orientation, expectations and, perhaps, paradigms. The current chapter, in part, augments the considerations presented in chapters 5 and 6 that discussed the benefits to BPI practitioners and the impact the research may have on their future work. As discussed in Section 6.8, being one of those practitioners, the author also enjoys those benefits, value and impacts.

7.1 Scope and Boundary Issues

The need to consider his audience's possible orientation and expectations for the research results became apparent during the early phases of the DBA programme. Although discussions of the research with BPI professionals during the initial survey indicated that the author's and audience's expectations were in alignment, symptoms of misalignment arose during discussions with DBA colleagues and other researchers. These individuals routinely referred to BPI implementation and initiatives. They also conflated the author's search for common key factors amongst the methodologies with key success factors required for effectively completing an initiative. These individuals often suggested that researching BPI implementation is more value adding and interesting. For this reason, as detailed in Section 1.5, it was imperative to clarify the difference between descriptive research into what makes up a BPI methodology and explanatory research into what makes the implementation of that methodology successful. It was stressed that the research focuses on identifying and

describing the common key factors within the methodologies and characterizing their importance to the effectiveness and efficiency of a methodology during a BPI initiative. It was further emphasized that no attempt was made to explain the application parameters that might enable or possibly assure successful implementation.

Declaration, delineation and explanation of the research scope and its boundaries in the first two chapters appeared sufficient to align the reader's orientation and expectations with the research's scope and focus. The adequacy of these descriptions was placed in question upon interviewing non-BPI specialist respondents and, later, when discussing the research results with those who reviewed or critiqued the author's findings. This consideration surfaced in connection with the efficacy of the 12 common key factors. The issue is driven by the different frames of reference used to discuss efficacy.

As detailed in Section 4.6.13, the human resource specialists and, particularly, the industrial psychologist exhibited a different frame of reference from that of the author. During their respective interviews, these individuals referred to the theoretical efficacies of the common key factors: that is, what the value of those factors could be or perhaps what their effects may be. In contrast to this, the author's frame of reference was the practical efficacies: that is, the intended or realizable impacts.

As discussed in Section 4.6 .13, resolving the frame of reference disparity came, in part, from the given respondents' feeling that documenting the theoretical efficacies was not practical or within the scope of this thesis. Furthermore, the human resource experts and industrial psychologist concluded that the realizable efficacy could be characterized as a result and, as such, highly dependent on the circumstances and environment surrounding a BPI initiative. As a result, the efficacies of its key factors would be dependent on a complex array of context-specific factors, with multiple interactive effects. For that reason, Section 4.6 and its subsections were written from the orientation of describing the *intended* efficacies of each common factor. Conceptually, these intended impacts are those realizable from initiatives

carried out under ideal conditions. Although the determination of those conditions is beyond the scope of this thesis, the author feels that research into determining them would be more practical than attempting to discover the realizable efficacies from practical BPI initiatives. Having reflected on this in Section 5.8, both areas are fertile ground for substantial amounts of follow-on research.

The author acknowledges that limiting the description to the intended efficacies focuses attention on those practical impacts that are projected, anticipated and designed into a BPI methodology. The author further acknowledges that broadening the scope of the research to include the in-depth treatment of implementation would have had a direct effect on the outcomes of the author's research. This effect would have been especially evident in the descriptions pertaining to efficacy. However, the in-depth study of implementation would have involved consideration of influencing factors stemming from areas such as the industry, the business, market conditions, social settings, cultural norms, geographic locations, financial limitations and behaviour of individuals involved in the implementation. The author feels that broadening the scope of the research to include all of these contextual factors would not only be impractical but also detract from the primary research objective of understanding BPI methodology composition. As justified in Section 1.4.3, experimental research involving implementation results would be extremely expensive and time consuming – especially when multiple replications would be required to prove claims regarding impacts, best practices and correlating the observed efficacies to the 12 common key factors.

Understanding and appreciation for the need to limit the scope of the research may be promoted by drawing an analogy far removed from business process improvements. The analogy involves likening a BPI methodology to a road vehicle and efficacy to the vehicle's performance. Scientist and engineers may design a new vehicle and its components based on theory and design rules. Although those design rules stem from practical experience and empirical information, the new vehicle design is still theoretical in terms of its potential

performance. This theoretical performance may be modified by redesigns mandated during vehicle construction or constraints imposed by factors such as a lubricant's inability to totally eliminate friction. The end result is a vehicle no longer having a theoretical performance but rather one that is measurable. By placing the vehicle on a dynamometer test stand and subjecting the vehicle to standardized conditions on a test track the manufacturer can develop claims regarding the estimated or intended vehicle performance. However, as a disclaimer usually states, "The actual performance may vary". As most drivers are aware, the realized level of performance depends on a seemingly endless list of parameters that include driving habits, road conditions, tyre design, tyre inflation, road topography and vehicle loading. As a result, it would be impractical for the manufacturer to research all possible situations and to develop claims regarding the respective levels of realizable performance.

7.2 Data Sourcing and Referencing Issues

The reflections here regarding data sourcing and referencing issues go beyond the data collection, data quality and data synthesis issues that were discussed in sub-sections of 2.2 and Section 6.4. Therein, the issues arising from hidden "sales mode" drivers, excessive use of jargon, inconsistency in terminology and unsubstantiated conjectures were detailed. Additionally, the present reflections relate only somewhat tangentially with the incomplete and fragmented data requiring gap closure activities as detailed in chapters 3 and 4. The current reflections pertain more specifically to the research's additional requirements for focused literature reviews, focused interviews, non-BPI expert interviews and the "black" literature.

The symptom triggering these reflections was the seemingly sharp reduction in attributing data and identifying influential contributors as the topic progressed from methodology identification to key factor determination and ultimately to efficacy characterization. As detailed in sections 3.3 and 3.4 (including their respective sub-sections), an abundance of literature was found pertaining to identification of BPI methodologies, the

authors of which included IP owners, consulting practitioners and researchers such as Radnor (2010) and Koch (2011). The volume, quality and value of the data were also discussed in the given sections. As a result, the most influential contributors were identified and their data was either referenced or quoted accordingly. The issues of data generation, attributing data and identifying the most influential contributors changed somewhat during the key factor determination phase and, even more dramatically, in the efficacy characterization phase.

As discussed in chapters 3 and 4, data pertaining to the key factors within the BPI methodologies were obtained from both literature reviews and interviews. Section 3.4.3.2 detailed, per methodology, the literature review findings and identified the most influential contributors. Those findings were presented in a number of tables within Section 3.4.3.2. As stated in Section 3.6, the information in these tables provided the structure and input for the final synthesis activities. However, prior to that synthesis, a set of “methodologies composition” interviews was required in order to fill the voids in the data. This gap closure data, along with that from the literature, was presented in tables 4.4–1 through 4.4–6 for each methodology respectively. In each table, the data was attributed to the respective respondent. Based on data volume, the reader might view the practitioners as the most influential contributors. However, based on the author’s BPI experience, the IP owners’ contributions is considered by him to be of higher quality. As discussed in Section 4.4.4 and later in Chapter 6, the IP-owners focused somewhat better on the elements of the methodology and less on improvement initiatives and business dilemmas. In doing so, their responses tended to be more concise, more descriptive and less conjecture-based than those of the practitioners. Quality issues such as these are discussed later in this section.

The real focal point of this reflection centres on generating and attributing efficacy data. As stated in Section 4.6, insight into the respective efficacy drivers from each of the 12 common factors was drawn from interviews, literature research and the author’s personal experience. It is important to note that the literature research included the available “black”

literature. This type of literature and the author's personal expertise were used in evaluating claims found in the published literature and those voiced by the interview respondents. In addition, "black" literature and personal expertise also triggered new topics and areas of investigation regarding efficacies of the 12 common key factors. Personal expertise and the "black" literature were not used as unsubstantiated sources for the efficacy characterizations. Since both of these resources are not equally associated with all six BPI methodologies, a potential for bias existed. Therefore, efficacy characterizations were based on data from the published literature and from the interview respondents.

Generation of these data was hampered by the underlying drivers for proffering such information, which was frequently promotional in essence. As mentioned throughout the thesis, the author detected sales and marketing drivers in both the literature and interviews. These drivers appeared to be most prevalent in discussions regarding areas of impact, value and efficacy. The author was often confronted with phrases such as, "only our methodology's process mapping is truly effective" or "no other system of KPIs can bring about real process improvement". Because of hidden drivers such as these, the author avoided single sourcing and the inclusion of unsubstantiated claims in the efficacy characterizations. The result of this convention was that data generated from published literature and interviews were pooled and then synthesized in order to generate the efficacy characterizations. This synthesis involved, as stated earlier, drawing on the black literature and the author's personal expertise as tools for evaluating the evidence and structuring the characterizations. This evaluation and critiquing of evidence resulted in follow-up interviews, focused literature reviews and interviews with non-BPI experts such as human resource managers and industrial psychologist.

Opportunities for attributing data to a given source or identifying the most influential contributor were significantly reduced by the existence of hidden drivers coupled with the necessary process of pooling and synthesizing the generated data. These opportunities were

further reduced by the quality of the data generated. Although IP-owners, in their interviews and literature, tended to give a somewhat better treatment of their methodology's intended efficacies, those impacts and values were often not attributed or specifically aligned to the respective 12 key factors.

The author's comment that the treatment by IP-owners was better is both a generalization and a comparison to the poor results derived from practitioners. The IP owners interviewed were authors and principals in consulting firms offering BPI services. As such, it was anticipated that they could have an advantage over the practitioners. Likewise, the consulting practitioners were BPI experts who had practical experiences with BPI initiatives in diverse industries such as automotive supplier and electronics. Therefore, it could be argued that their understanding of the efficacy drivers could be better than that of the business practitioners. Although the business practitioners were top-level managers from an assortment of business that included hospitals, automotive, contract logistics and metal-working, their exposure to BPI methodologies was limited to one or two of them. As a result, their experience and evaluation derived from a "customer" perspective rather than any broader view of the designed/intended efficacies. Their "war stories" and anecdotal evidence regarding their respective initiatives were interesting but lay outside the scope of the research and were not germane to the research objectives. In all cases, the generated efficacy data could be characterized as fragmented and piecemeal. A great deal of time and BPI expertise was required in order to substantiate and synthesize the data into concrete information regarding efficacy characterizations.

A novel means of increasing the opportunity for attributing data was posed by a fellow researcher. She suggested attributing data to the initial source and then to identify those contributors who substantiated the data. This had the potential of significantly increasing the number of quotes and references. The author declined to use this opportunity for three reasons. First, the order in which the evidence was sourced was author-dependent. The

suggested process would have introduced an ordinal scaling without meaning. Second, the process could inadvertently position the initial source as being the more influential contributor as opposed to those who substantiated the data. This ranking would also be without meaning. Third, in connection with the previously mentioned scaling and ranking, the attribution could be misconstrued as an endorsement or promotion of an individual or the related methodology. This could have placed the author's objectivity in question and possibly diluted the credibility of the research results.

Although the attribution of efficacy data was relatively less than that for the methodologies and the key factors, appropriate ones were made. In fact, in the sections describing efficacies of the individual key factors and their system as a whole, there were 38 such references and quotes. The majority of these helped clarify the intended efficacies, presented caveats or highlighted differing views. The most noteworthy of these was that to Jacka and Keller (2002) whose process mapping approach and its derived value ran counter to the evidence obtained from other sources. None of the 38 identified a contributor as being the most influential or single source. Also, all 38 attributions were to literature sources. This is, in part, because literature sources provide recoverable data (which personal communications do not) and because interviews (especially of non-BPI experts) often substantiated evidence found in the literature or triggered additional literature research.

7.3 BPI Philosophy Driven Filtering

Amongst those who have discussed or critiqued the research, some have questioned how future researchers and practitioners with different philosophies as to what drives business process improvement might interpret the value of the research results. Their concerns centred primarily on the impact of the 12 common key factors. In order to structure and thereby simplify reflection on this query, the author classified those future researchers and practitioners into two categories. Category A contains those individuals whose BPI philosophy is aligned with that from one or more of the six methodologies under

consideration. Category B is comprised of those individuals whose BPI philosophy is not aligned with any of the BPI philosophy represented by any of the six methodologies.

Classifying individuals according to their BPI philosophy's relationship to those of the six methodologies facilitates discussion of the philosophy driven filters and promotes a clearer view of the underlying issues. The utility derived from this categorization construct will become more evident during the ensuing discussions.

Within both categories, A and B, there are three types of individuals – those inclined to accept the factors and their efficacies, those requiring modification or enhancements and those predisposed to rejecting either the factors and/or the intended efficacies. All three orientations could stem from understanding or comprehension issues as well as from philosophy alignment ones. In both category A and category B, concerns about those who accept the factors and respective impacts only arise when there are understanding or comprehension issues. These issues could lead to partial application, misuse and/or faulty expectations. The desire to modify/enhance could also be driven by incomplete comprehension or not fully understanding the function or impact of a key factor. This situation could also lead to flawed implementation or faulty expectations.

The need to modify or enhance a factor could also be driven by the individual's BPI philosophy. Examples of this were previously discussed in Section 4.6.6. There, it was noted why and how developers of the six methodologies have modified such key factors as process mapping and root-cause analysis tools to align it with their philosophy. Also, researchers or practitioners identifying with one of the six methodologies (category A members) may or may not accept the neutral terminology into which author purposely synthesized the data for both key factors and efficacy. The result being that they may want the research results rewritten in their own "language" or they view it somewhat differently because of the unfamiliar terminology.

A major issue arises when the researcher's or practitioner's philosophy as to what drives business process improvement is outside those of the six methodologies (therefore, category B types). This may result in the individual rejecting the research results or cherry picking from those results. The author draws an example from his experiences with a garment manufacturer in China. Although the business owners and management wanted process improvements on the order of magnitude touted in the promotional literature, their BPI philosophy ran counter to all six of the given methodologies. As such, they were category B members. They held to a "carrot and stick" philosophy as a driver for process improvement. Under this philosophy workers were rewarded for higher productivity and penalized/discharged when their productivity fell below a stated threshold. Because of this philosophy, the notion of a culture change, methodology training and creation of a value proposition were essentially eliminated from the BPI initiative. Additionally, the use of cross functional teams was unthinkable for the management team – department management dictated corrective actions and oversaw the implementation. Furthermore, continuous improvement was also driven functionally and not process-wise. Activities such as process mapping, the change management process, root cause determination, process flow optimization were all duties of the functional management. Other adaptations of the 12 common key factors involved policy deployment, visual management and KPI driven improvement factors being restricted/aligned to the "carrot and stick" approach. In summary, the management's "carrot and stick" philosophy resulted in a mixture of rejection, realignment, reassignment and cherry picking of the 12 key factors.

Adaptation of the visual management factor was a striking example of the influence stemming from management's BPI philosophy. Management's alignment of this key factor was not restricted to just the KPIs and displayed results. Colours utilized in the visuals were selected to reinforce management's BPI philosophy. Red and yellow/gold were associated with positive results and departments/individuals who excelled. In China, red and yellow have

a connotation of blooming and ripening respectively. Black and white were used when displaying unacceptable results, poor performance or something negative. White being the colour for withering or mourning and black for dormant or death.

In summation, the author acknowledges that individuals (both category A and B members) could be biased toward accepting, amending or rejecting the research results based on their BPI philosophy and the strength of their convictions. Since researchers are trained in dealing with bias, the author feels that this group could be less prone to bias than would be practitioners – especially consultants providing BPI services and therefore striving to create unique selling points. The author has presented the research results using methodology-neutral terminology and a balanced accounting of all six methodologies in an attempt to optimize acceptance. However, the author acknowledges that the readers' ultimate interpretation of and relationship to the findings may vary depending on their BPI philosophy, paradigms and internal drivers.

7.4 Understanding the Model-Based Methodology Construct

The author feels the first step in understanding the model-based methodology construct is to appreciate the need for this construct. A BPI methodology can be likened to a large, complex software program that is comprised of several discrete modules. As with the key factors found to be common amongst BPI methodologies, each of the program's modules can be reviewed independently. That is, the function and overall value to the program of each module can be discussed individually. This type of review for each common key factor was done in sub-sections of 4.6 respectively. In addition to reviewing the individual modules, software developers and authors such as Ebenau & Strauss (1994) and Freedman & Weinberg (1990) stress the importance of inspecting the overall software program and the interfacing of the individual modules. Their objective is to ascertain the developmental flaws directly - unlike ensuing testing which might only indicate the symptoms. In order to characterize the system comprised of the 12 common key factors, the author chose a technique similar to the

computer science's "walk-through" review (Freedman & Weinberg, 1990) instead of its "Fagan inspection" method (Fagan, 1976). The latter being a quality control procedure somewhat similar to the DBA's supervisory/viva voce processes in that a team of qualified experts evaluate the work product. In contrast to the Fagan procedure, a "walk-through" is a review technique wherein the developer leads interested parties through the work product. The author felt that this was an appropriate technique for characterizing the system of key factors discussed in sub-sections of 4.7. In order to facilitate these discussions, a construct was created that would embody this system of 12 individual factors.

The second step in comprehending the MBM construct is to understand the design of that construct. Creation of the theoretical "model-based methodology" construct to facilitate the characterization of the 12 common key factors as a system was described in Section 4.7.1. This construct is not associated with any stated philosophy as to what drives process improvements and is not proffered as a competitor to or enhancement of existing BPI methodologies. It was designated solely as a platform on which the 12 common key components could be discussed as a system. As such, it has certain parallels to the functional prototyping or modelling performed by product developers. Those models go beyond simple mock-ups. They allow experts to evaluate the form, fit, and function of components within the model as a system as well as to appraise the comprehensiveness of that product. These objectives are directly correlated with the three basic purposes for the MBM as defined in Section 4.7. The first of these being to characterize the interdependencies amongst the 12 key factors. The second was to characterize this system (MBM) of key factors in the context of a BPI initiative. Describing these intra-dependencies required characterizing the environmental elements influencing such initiatives – the organization in which the initiative takes place, the problem solving environment and the initiative's project management. The third purpose for the MBM construct was to provide the author an opportunity to comment on the content validity of a theoretical system comprising only the 12 common key factors. That is, the

validity in terms of such a methodology covering the range of a BPI methodology's objectives.

The third step in understanding the model based methodology construct is to recognise the limitations placed on utilisation of this construct. As stated in Section 4.7.1, characterization of the MBM, the interdependencies amongst the 12 common key factors and the intra-dependencies between those factors and an initiative's environmental elements was a subjective description based on the research findings and the author's experiences as a BPI practitioner. The author stresses that only apparent/intended impacts were described in that characterization. In order to determine the actual impacts, the author feels that experimental research would be required. This experimental research would necessitate multiple BPI initiatives implemented in comparable operating environments. As this requirement lies outside the scope of this thesis and since a cause-effect correlation was not required in order to meet the three purposes of this characterization, the given description was based on the findings of the author's non-experimental research.

7.5 Linkage between Research Outcomes and BPI Implementation Practice

The objective of the following reflection is twofold. The first is to clarify how the research results might relate to possible "best practice" in BPI initiatives. The second is to expound upon how BPI practitioners might benefit from the contributions to knowledge and practice made by the research. While realizing these objectives, the author cautions the reader to consider that the driving force for such initiatives is drawn from a wide continuum. This range can vary from urgent "stop the bleeding" turn-around requirements to assuring long-term viability of the organization. An initiative's objectives could significantly impact how the methodology is utilized and how its key components are applied. As an example, an urgent turn-around may limit the available time and resources for the initiative. As a result of the range in driving forces, determination of best practices and equating benefits amongst BPI initiatives become extremely complicated. For the purpose of simplification, the author's

reflections relate to the ends of the driving force spectrum – urgent turn-around and long-term sustainability.

The reader is further cautioned not to misconstrue the research outcomes (12 common key factors and their efficacies) as best practices. Best practices are derived by analysing activities (physical or mental) and determining which activities lead to the greatest benefit. Additionally, given the adjective's superlative degree (best), three or more activities would be required. Although the author's descriptive research concerned six methodologies, it involved analysing their compositions and determining which key factors were common amongst those methodologies. Therefore, it would be a misunderstanding to interpret the research outcomes as best practices for BPI activities.

The research outcomes appear to be related to “good practices” in two design activities – methodology development and initiative planning. Since each of the six methodologies contain the 12 key factors, consideration of those factors when developing a new methodology appears prudent. The “good practice” would be to study each factor and then to contemplate its inclusion in the new methodology. This consideration may lead to enhancements and adaptations which align those factors with the new methodology's philosophy and orientation. Although the author's experience cautions against it, it could also lead to exclusion of one or more factors. Attention paid to the 12 common key factors does not prohibit the methodology developers from including additional constructs or factors. Lastly, whether considering, enhancing, adapting and deleting the 12 key factors or adding new ones, “good practice” would require evaluating the intended impacts at both system and individual levels.

The “good practice” associated with project design activities in a BPI initiative's planning phase has direct parallels to that regarding new methodology development. That is, each factor would be studied and its utilization in the initiative contemplated. This too could lead to enhancements and adaptations which align a factor's implementation with the

initiative's driving force, BPI philosophy and requirements. This "good practice" could also lead to exclusion of one or more of the 12 key factors. Although it appears realistic to consider all 12 factors for long-term sustainability initiatives, it could be necessary to scale down or eliminate certain factors for urgent turnaround initiatives. These turnaround situations will be reflected upon later. Lastly, the "good practice" pertaining to project design activities would require evaluating the targeted impacts at both system and individual levels against the initiative's objectives.

In the author's experience, as the driving force for initiatives progress toward the urgent turnaround end of the spectrum, factors whose efficacies directly support the "stop the bleeding" objective tend to be prioritized. Likewise, factors having significant time and effort requirements are de-emphasized, restructured or even eliminated. The author's involvement in a leveraged, management buyout of a flatware manufacturer provides a concrete example of the previous statements. The available resources for the improvement initiative were limited to the author, as outside consultant, and the management team, as the business owners. In addition, the bridge loan for this buyout dictated a six-month turnaround. Of the key factors, value proposition creation and KPI-driven improvement were driven strictly by the business situation. Efficacy considerations for worker buy-in, implementing a process mindset and culture change were over shadowed by the turnaround's urgency. This urgency also curtailed concern for the key factors regarding business culture change, policy deployment, process mapping and visual management. Most of these four factors were virtually eliminated from the initiative. Restricting the requirement for a cross-functional team factor to encompass only the management team had a negative impact on the factors pertaining to methodology training and management coaching. Given that management's new roles and responsibilities involved driving the change requirements, coaching focused basically on change management. Likewise, training was limited to expediting the key factors pertaining to root cause elimination and process flow optimization – both of which were analysed and driven by the

management team. Lastly, the repetitive change process factor was replaced by a rapid, non-cyclic approach. The outcome of this urgent turnaround initiative was that the bridge loans were met and long-term financing was assured. Additionally, 30 months later, the management team initiated a long-term sustainability BPI initiative with appropriate considerations for the 12 key factors.

Appropriately executed, the “good practices” for the two designated design activities (methodology and initiative) could culminate in the creation of “best practices” within each field of activity. However, in order to determine these best practices, analysing sets of at least three comparable methodologies or respectively, sets of at least three comparable initiatives would be required. Although the former might be realizable, the author feels that the latter is unrealistic. Given the multitude of driving forces for change and business situations in which BPI initiatives are executed, identification of comparable initiatives is highly problematic.

In contrast to ascertaining which activities in a BPI initiative could be deemed “best practices”, identifying practice improvements linked to the 12 key factors and characterization of their specific efficacies appeared more realistic. These improved processes were described in Section 5.7. They are methodology development, contracting for BPI initiatives, methodology implementation and methodology internalization. The current reflection is upon with how BPI practitioners might benefit from these improvements rather than restating those improvements in practices detailed in Section 5.7.

Before continuing with this reflection, the reader is reminded of the convention detailed in Section 2.2.2.3 regarding the term “practitioner”. This term involves both BPI consultants (consulting practitioners) and business people who actively apply/applied a methodology (business practitioners). The purpose of reviewing this convention is to remind the reader of the two types – both of which may not benefit equally in the improved practices. Using the contracting process as an example, as the business practitioner’s (buyer) knowledge

regarding methodology composition and potential impacts/value of its components is improved, the consulting practitioner's (seller) tasks could become more difficult.

As stated in Section 5.7, the research's contributions to business practices stem primarily from improved awareness, understanding and transparency regarding the BPI methodology, its composition and value of its key components. The analysis and synthesis of the research data affords both the consulting and business practitioners with better comprehension of, and clearer insight into BPI methodologies. The author feels that capturing and documenting the essence of the six BPI methodologies increases a practitioner's awareness of methodology composition, its essential components and the roles those components play in enhancing business performance. Because of their increased awareness, in the future, practitioners can better safeguard the core elements of BPI methodologies as new ones are created and existing ones are further developed or utilized in BPI initiatives. Safeguarding does not mean that those practitioners would not enhance or optimize these essential elements over the methodology's lifecycle. Safeguarding would involve considering the core elements' efficacies both individually and as a system whenever modification to or implementation of the practitioner's methodology is contemplated. This maintains their methodology's quality and effectiveness. Additionally, the enhanced awareness and understanding of a methodology's vital components in the overall market for business process improvements also supports the practitioners' endeavour to maintain their methodologies quality and effectiveness. This support stems from a better informed market being able to make better cost-benefit decisions as well as enabling buyers of BPI consulting services to better evaluate a methodology's value proposition. In turn, this should result in reduced pressure on the practitioners to adulterate their value proposition in favour of quick fixes and short-term financial gains for their clients. In turn, better informed buyers and practitioners having increased product (methodology, composition and efficacies) awareness are capable of

setting more realistic objectives for an initiative and to configure that initiative for both improved effectiveness and efficiency.

Reflection on the previous statements and the descriptions in Section 5.7 as to how the research findings are linked to improved practices, indicates that the issue is not how the practitioners benefit from adopting the improved practices. Instead, as discussed in section 5.7, the four mentioned practices are improved because of the practitioners adopting the research findings. It is the practitioners who shape, adapt and execute those four functions. If the practitioners do not adopt the knowledge in the research outcomes, the linkage to improving the practices will be broken. Therefore, the issue should perhaps centre on the driving forces for practitioners to adopt these findings – thereby increasing their knowledge and ultimately enabling the practices to be improved.

Motivations for adoption of the research findings may vary according to the type of practitioner and the practice under consideration. In developing new methodologies, it is in the interest of the consulting practitioner and IP owners to produce a high-quality product which efficiently and effectively addresses client dilemmas. When enhancing and adapting existing methodologies, both types of practitioners profit by maintaining their methodology's core efficacies while creating USP's or amending the methodology. During the contracting activities, business practitioners engaged in contracting (with external or internal providers) for process improvements benefit from having a better information base on which to make decisions as well as a clearer vision of what they are buying. It is in their interest to enhance their evaluation capabilities regarding the product (methodology) they are buying, the project (BPI initiative) they are undertaking and the results they are targeting. The consulting practitioners (internal or external) as contractors are motivated to maintain their body of knowledge comparable to that of the buyers and to provide a transparent value proposition to their client. Additionally, for reasons of reference and referral, it is in the consulting practitioner's interest to engage in feasible projects with realizable targets. The driving forces

for practitioners to adopt the research outcomes stemming from the contracting process carry over into the implementation process – feasible projects and realizable targets. Additionally, it is in the interest of all practitioners to apply the methodology appropriately, avoid rework and minimize effort while optimizing results. In concluding, these practitioners are also motivated to having the implemented changes internalized and the organization’s culture updated. It is not in the interest of the practitioners to have the BPI initiative truncated, management support lost or a continuous improvement process not realized. For consulting practitioners, the lack of internalization could diminish the reference-ability of the client and the BPI initiative - thus impacting future sales.

7.6 Application of Qualitative Research Techniques to the DBA Context

The reflections being made here pertain to contributions made to the application of research methods and techniques to a study in which the researcher has extensive subject matter expertise. This is typical of much DBA research, in which the researcher is also a practitioner, often with substantial experience and expertise in the field, raising multiple issues of interpretation and bias. This was true of this research and an important constituent of the author’s cycles of learning, as his depth of experience required him to pay particular attention to these issues. As discussed in Section 4.1 and depicted in Figure 4.1-1, the overall research findings comprised more than the substantive findings concerning BPI methodologies and their compositions. They also contained insights relating to the application of qualitative research techniques, as well as the overall research process.

Another cycle of learning concerned the extensive literature research required to discover, qualify, justify and utilize appropriate research concepts and execution practices. In this endeavour, the author’s subject matter expertise was of little value. The selection and utilization of appropriate research methods, tools and techniques mandated that the author acquire and apply new skills previously unrelated to his subject matter expertise. The process of obtaining this knowledge and associated skills was not only complicated by new concepts,

terminology and paradigms but also by terminology that had meanings that differed from the author's professional experiences. During this learning experience, the author was afforded an opportunity to reflect on literature concerning research methods, tools and techniques from a perspective quite removed from that of the originators. During this reflection, the author felt that the documentation was mostly theoretical and contained few business-oriented, illuminating examples. The author acknowledges that, in part, this impression could have stemmed from a prior lack of expertise in research concepts and execution practices or lack of experience with the terminology and techniques. However, the author persevered and eventually achieved a degree of mastery in their application to his research, succeeding in enhancing the analysis and reducing researcher bias. Through reflection on the research process, it was concluded that the insights gained regarding the research process were in themselves a valuable contribution, as detailed in Section 5.6.

In Chapter 3 it was shown how BPI root cause analysis, identification of hidden drivers and process modelling techniques (such as SIPOC) can play an important role in addressing some research dilemmas. These illustrative examples demonstrated that by applying these techniques, the driving forces giving rise to the situation often become transparent. Methods for delineating relevant from non-germane evidence and handling diverse terminology for similar topics was also shown as well as ways of managing subjective input, superficial evidence and abstract responses. This knowledge and the specific examples contributed to the thematic analysis performed as part of the research and are a contribution to the overall narrative analysis, - knowledge of which the thematic analysis is a part. Key to enhancing this research practice is treating research as a process, maintaining a process improvement mindset and applying BPI techniques to the data analysis and synthesis sub-processes. Details of this contribution were discussed in Section 5.6.

As described in Section 5.6, the research's application of the reciprocal translation technique as part of the synthesis sub-process went beyond solely contributing knowledge of

how reciprocal translations are performed and clarifying examples with details of the implementation requirements. Although the application provides the reader with an awareness of the technique's operative issues as well as the results, it also demonstrates the utility of applying a method, practice or skill from one area of research to a totally unrelated field of investigation. As described in Section 5.6, the extent of this contribution was made evident by the amount of scepticism received by the author regarding the usage of this "meta-ethnography technique" outside the field of ethnography.

Reflecting on BPI initiatives, the author was often confronted with responses similar to the scepticism regarding the usage of reciprocal translations in the research. In such initiatives, the author received such comments as:

- "This is a hospital - it is not a manufacturing process" when implementing TOC.
- "You cannot compare us to Toyota – we are not in the automotive industry" during lean management implementations.
- "Six Sigma is something for General Electric but not us – we are a service-based company."

The author believes that such scepticism and lack of buy-in may arise from personal biases, different paradigms, lack of vision or the desire for a basis on which to resist change.

Regardless of the actual root cause, a researcher, like a BPI practitioner, must be prepared to address such mindsets. The author feels that the research, in highlighting this issue, has contributed to that preparation by identifying the problem and challenging the mindset.

As discussed in sub-sections of 2.2.3, extensive application was made of bracketing, as well as the reciprocal translation technique. Bracketing is a valuable technique in the interpretation of phenomenological research data but the author proposes that its use and value in this research were beyond its generally accepted range of application and thus constituted a contribution to knowledge.

In addition to providing an illustrative example and discussing the operative parameters, the basis on which the bracketing tool is predicated was also extended. As discussed in Section 5.6, the author challenged the literature's association of this tool only with the interviewing process. Justification was given for utilizing this tool throughout the entire research process - including the literature review. Bracketing, in essence a quality control technique, should be applied whenever the researcher is confronted with evidence or is processing it. The author also explained why drivers of bias beyond ethnocentric and egocentric ones should be considered and why a researcher's training, skills and experiences also play a role as drivers of bias. In section 5.6 it was also detailed as to how a researcher's lack of subject matter knowledge could also bring about poor value judgments regarding data sources and evidence.

The author acknowledges that recognition of the bracketing tool's broader potential for application and optimization was a result of having extensive BPI expertise and an unbalanced experience profile across the six methodologies. Recognizing that this expertise and the non-uniform experience profile could be as influential in creating bias as the author's ethnocentric and egocentric background, the author questioned the limitations placed on the bracketing tool's considerations and usage. The author feels that by critiquing and enhancing the bracketing tool design, the tool's applicability and effectiveness have been improved. By expanding and enriching its use in research contexts in which the researcher has substantial expertise, the tool becomes more appropriate for use in research investigating subjects pertaining to the author's expertise, business life or professional interest, as is typical of many DBA contexts.

REFERENCES

- Akao, Y. (1994). Development History of Quality Function Deployment. In S. Mizuno & Y. Akao (Eds.), *QFD, the customer-driven approach to quality planning and development* (pp. 339-351). Tokyo: Asian Productivity Organization.
- Argyris, C. (2000). *Flawed Advice and the Management Trap: How managers can know when they're getting good advice and when they're not*. Oxford: Oxford Press.
- Ayad, A. (2010). Critical thinking and business process improvement. *Journal of Management Development*, 29 (6), 556-564.
- Ahern, K. (1999). Ten Tips for Reflexive Bracketing. *Qualitative Health Research*, 9, 3, 407-411.
- Bahn, D., Paper, D. (1998). BPR vs. BPI: Contrasting Two Constructs. *AMCIS 1998 Proceeding*, Paper 37.
- Baines, T. S., Adesola, S. (2000). Methodology for business process improvement - a practical guide. *Advances in Manufacturing Technology - Conference*, 14, 3-8.
- Bendell, T. (2005). Structuring business process improvement methodologies. *Total Quality Management & Business Excellence*, 16(8), 969-978.
- Bendell, T. (2006). A review and comparison of six sigma and the lean organisations. *The TQM magazine*, 18(3), 255-277.
- Bicheno, J. & Holweg, M. (2009). *The Lean Toolbox*. UK: PICSIE Books.
- Bicheno, J. & Catherwood, P. (2005). *Six Sigma and the Quality Toolbox for Service and Manufacturing*. UK: PICSIE Books.
- Bogdan, R and Biklen, S (1992). *Qualitative Research for Education: An introduction to theory and methods*. Boston: Allyn & Bacon.

- Boddewyn, J. (2004). Observations from a Lifetime of Interviewing, xvi. In R. Marschan-Piekkari & C. Welch (Eds). 2004. *Handbook of Qualitative Research Methods for International Business*. Cheltenham, UK: Edward Elgar.
- Brink, P. & Wood, M. (1998). *Advanced design in nursing research*. Thousand Oaks, CA: SAGE Publications.
- Burns, N. & Grove, S. (2003). *Understanding Nursing Research*. Philadelphia: W.B. Saunders.
- Buzacott, J. (1996). Commonalities in Reengineered Business Processes: Models and Issues. *Management Science*, 42(5), 768-782.
- Brue, Greg (2002). *Six Sigma for Managers*. New York: McGraw-Hill.
- Buckley, J., Buckley, M., & Chiang, H. (1976). *Research Methodology and Business Decisions*. New York: National Association of Accountants.
- Carr, W and Kemmis, S (1986). *Becoming Critical: Education knowledge and action research*. London: Falmer Press.
- Childe, S., Greswell, T., Rogers, T., Wood, C., Maull, R. & Smart, P. (2001). *Development, testing and validation of a methodology for process-based change. Proceedings of the Fourth SMESME International Conference, 205-213.*
- Childress, J. & Senn, L. (1995). *In the Eye of the Storm: Reengineering Corporate Culture*. Long Beach: The Leadership Press.
- Chrzanowska, J. (2011). *Bracketing – setting aside your biases* [On-line]. Available: <http://www.qualitativemind.com/WP-content/uploads/2011/04/QM-Bracketing-with-example.docx>
- Clough, P. & Nutbrown, C. (2010). *A student's guide to methodology*. London: Sage.
- Creswell, J. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*. London: Sage. Buckley

- Crotty, M. (1998). *The Foundations of Social Research: Meaning and Perspective in the Research Process*. London: Sage.
- Davies, M (2007). *Doing a Successful Research Project: Using qualitative or quantitative methods*. New York: Palgrave Macmillian.
- Dawson, C (2009). *Introduction to research methods: A practical guide for anyone undertaking a research project*. Oxford: How to Books.
- Deming, W. E. (1986/2000). *Out of the Crisis*. Boston: MIT Center for Advanced Engineering Study.
- Dixon-Woods, M., Agarwal, S., Jones, D., Young, B. & Sutton, A. (2005). Synthesising qualitative and quantitative evidence: a review of possible methods. *Journal of Health Services Research & Policy*, 10(1), 45-53.
- Ebenau, R.G. & Strauss, S. H. (1994). *Software inspection process, system design and implementation series*. New York: McGraw Hill.
- Ehie, I. & Sheu, C. (2005). Integrating six sigma and theory of constraints for continuous improvement: a case study. *Journal of Manufacturing Technology Management*, 16(5), 542-543.
- Fagan, M.E. (1976). Design and Code inspections to reduce errors in program development. *IBM Systems Journal*, 15(3), 182–211.
- Finkenauer, B. (1995). Process Management and Cycle Time Reduction. *Conference Proceedings: Council for Continuous Improvement*.
- Freedman, D.P. & Weinberg, G.M. (1990). *Handbook of walkthroughs, inspections, and technical review: evaluating programs, projects, and products (3rd ed.)*. New York: Dorest House Publishing.
- Geertz, C. (1973). Religion as a Cultural System. *The Interpretation of Cultures*. New York: Basic Books. 87-125.

- George, M. L. (2002). *Lean Six Sigma: Combining Six Sigma Quality with Lean Speed*. New York: McGraw-Hill.
- Goldratt, E. M. (1985). *Das Ziel: Höchstleistung in der Fertigung*. Hamburg: McGraw-Hill Book Company.
- Goldratt, E. M. (1990). *The Haystack Syndrome: Sifting information out of the data ocean*. Croton-on-Hudson: North River Press.
- Goldratt, E. M. (1990). *Theory of Constraints*. Croton-on-Hudson: North River Press.
- Greif, M. (1991). *The Visual Factory: Building Participation Through Shared Information*. Cambridge, MA: Productivity Press.
- Griesberger, P., Leist, S. & Zellner, G. (2011). Analysis of Techniques for Business Process Improvement. *ECIS 2011 Proceedings*, Paper 20.
- Grünberg, T. (2003). A review of improvement methods in manufacturing operations. *Work Study*, 52(2), 89-93.
- Guba, E. (1990). *The Paradigm Dialog*. Newbury Park Ca.: Sage.
- Hammer, M. (2001). *The agenda: what every business must do to dominate the decade*. New York: Crown Business.
- Hammer, M. & Champy, J. (1993). *Reengineering the Corporation: A Manifesto for Business Revolution*. New York: HarperCollins Publishers.
- Holloway, I. & Wheeler, S. (2002). *Qualitative Research in Nursing*. Oxford: Blackwell Publishers.
- Howald, A. (2006). *Introduction to Theory of Constraints, Lean & Six Sigma*. Thomas Group. In-house conference.
- Hummel, T. & Malorny, C. (2011). *Total Quality Management*. Munchen: Carl Hanser Verlag.
- Imai, M. (1986). *Kaizen: The key to Japan's Competitive Success*. New York: McGraw-Hill.

- Imai, M. (1997). *Gemba Kaizen: a common sense, low-cost approach to management*. New York: McGraw-Hill.
- Jacowski, Tony (2010). Six Sigma vs. Total Quality Management. *EzineArticles.com*.
- Jacka, J. & Keller, P. (2002). *Business Process Mapping*. New York: John Wiley & Sons.
- Jennings, J. & Haughton, L. (2000). *It's not the BIG that eat the SMALL ... it's the FAST that eat the SLOW*. New York: HarperCollins Publishers.
- Jeston, J. & Nelis, J. (2008). *Business Process Management: Practical Guidelines to Successful Implementations*. Oxford: Elsevier.
- Juran, J. M. (2004). *Architect of Quality: The Autobiography of Dr. Joseph M. Juran*. New York: McGraw-Hill.
- Kaplan, R. S. & Norton, D. P. (1993). *Measuring Corporate Performance*. Boston: Harvard Business School Video.
- Kaplan, R. S. & Norton, D. P. (1996). *The Balanced Scorecard*. Boston: Harvard Business School Press.
- Kaplan, R. S. & Norton, D. P. (2001). *The Strategy Focused Organization*. Boston: Harvard Business School Press.
- Koch, S. (2011). *Einführung in das Management von Geschäftsprozessen*. Heidelberg: Springer Verlag.
- Kotter, J. P. (2008). *A sense of urgency*. Boston: Harvard Business Press.
- König, E. & Volmer, G. (2008). *Handbuch Systemische Organisationsberatung*. Weinheim Germany: Beltz Verlag.
- Krafcik, J. F. (1988). Triumph of the lean production system. *Sloan Management Review*, 30 (1), 41–52.
- Kumar, R (2005). *Research Methodology: A step-by-step guide for beginners*. London: Sage.
- Liedtke, C. (2012). The Application of Policy Deployment in Indian Companies. *Proceedings from the Asian Network for Quality Congress, Hong Kong*.

- Martin, K. R. (1992). *A History of TGI: Thomas Group Inc.*. Dallas: Heritage Worldwide.
- McCarty, T., Daniels, L., Bremer, M., & Gupta, P. (2010). *The Six Sigma Black Belt Handbook*. New Delhi: Tata McGraw-Hill.
- Mascitelli, R. (2007). *The Lean Product Development Guidebook*. Northridge, CA: Technology Perspectives.
- Moen, R. & Norman, C. (2009). The History of the PDCA Cycle. *Proceedings from the Seventh Asian Network for Quality Congress, Tokyo.*
- Moldvay, C. (2011). Management Consulting. *IBIS World*. Los Angeles: PRWEB.
- Noblit, G. W. & Hare, R. D. (1988). *Meta-Ethnography: Synthesizing Qualitative Studies*. Newbury Park: Sage Publications.
- Noorderhaven, N.G. (2000). Hermeneutic Methodology and International Business Research. Department of Business Studies - Uppsala University. Uppsala, Sweden.
- O'Shea, J. & Madigan, C. (1997). *Dangerous Company: The Consulting Powerhouses and the Businesses They Save and Ruin*. New York: Random House.
- Ohmae, K. (1991). *The Borderless World: Power and Strategy in the Interlinked Economy*. London: HaperCollins Publishers.
- Page, S. (2010). *The Power of Business Process Improvement: 10 Simple Steps to Increase Effectiveness, Efficiency and Adaptability*. New York: American Management Association.
- Parahoo, K. (2006). *Nursing Research: Principles, Process and Issues (2nd ed.)*. London: Palgrave Macmillan.
- Poór J., Milovecz, A. & Király, A. (2012). Survey of the European Management Consultancy 2011/2012. Research Center on Management and Human Resource Management - University of Pécs. Pécs, Hungary: FEACO.

- Povey, B. (1998). The development of a best practice business process improvement methodology. *Benchmarking: An International Journal*, 5(1), 27-44.
- Radnor, Zoe (2010). *Review of Business Process Improvement Methodologies in Public Services*. London: AIM Research.
- Rajendran, N. (2001, October). Dealing with biases in qualitative research: a balancing act for researchers. Paper presented at the Qualitative Research Convention 2001: Navigating Challenges, University of Malaya, Kuala Lumpur.
- Ramdass, K. & Pretorius, L. (2008). Comparative assessment of process improvement methodologies. *Engineering Management Conference, 28-30 June 2008*, 1-5.
- Rosenthal, M. (2002). The Essence of Jidoka, *SME Lean Directions Newsletter*.
- Sokovic, M., Pavletic, D. & Pipan, K. (2010). Quality Improvement Methodologies – PDCA Cycle, RADAR Matrix, DMAIC and DFSS. Journal of Achievements in Materials and Manufacturing Engineering, 43/1, 476-483.
- Shewhart, W. (1986). *Statistical Method from the Viewpoint of Quality Control*. New York: Dover Press.
- Shimbun, N. K. (1995). *Visual Control Systems*. Cambridge, MA: Productivity Press
- Shingo, S. (1985). *A Revolution in Manufacturing: The SMED System*. Stamford, CT: Productivity Press.
- Streubert, H.J. & Carpenter, D.R. (1999) *Qualitative Research in Nursing: Advancing the Humanistic Imperative*. Philadelphia: Lippincott.
- Thawesaengskulthai, N. & Tannock J. D. T. (2008). A decision aid for selecting improvement methodologies. *International Journal of Production Research*, 46(23), 6721-6737.
- Thomas, P. R. (1990). *Competitiveness through Total Cycle Time*. New York: McGraw Hill.

- Thomas, P. R. (1991). *Getting Competitive: Middle Managers and the Cycle Time Ethic*. New York: McGraw Hill.
- Thomas, P. R. & Gallace, L. J. (1992). *Quality alone is not enough*. New York: AMA Membership Publications Division.
- Thomas, P. R. (1992). *Time Warrior: Using the Total Cycle Time System to Boost Personal Competitiveness*. New York: McGraw Hill.
- Thomas, P. R. (1994). *Survival at Nodulex: The Time-based Route to Competitive Quality*. Dallas: Heritage Publishing.
- Thomas, J. & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, 2008, 8-45.
- Tranfield, D., Denyer, D. & Smart, P. (2003). Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*, 14(3), 207-222.
- University of Liverpool (2013). <http://university-liverpool-online.com/programmes/doctorates/dba/dba-vs-phd> (accessed 10 June, 2013)
- Wikipedia Encyclopaedia. BRIC (2010). <http://en.wikipedia.org/wiki/BRIC> (accessed 24 October 2010).
- Wolf, J. F. (1992). Neely Gardner and Deming's Total Quality Management: Parallels and Connections. *Public Administration Quarterly*, 16(2), 209-221.
- Womack, J. P., Jones, D. T. and Roos, D. (1990). *The Machine That Changed the World*. New York: Rawson Associates.
- Womack, J. P. & Jones, D. T. (2003). *Lean Thinking*. New York: Free Press.
- Zelić, B. & Stahl, B. C. (2005). The Influence of Realist Ontology on Technological Projects: The Case of Irish Electronic Voting. *Professional Knowledge Management*, 3782/2005, 657-667.
- Zink, K. (2004). *TQM als integratives Managementkonzept*. Munchen: Carl Hanser Verlag.

APPENDICES

Appendix 1: Interview Research

App 1.1 Generic Interview Schedule for IP Owners

The objective of these questions is to understand the methodology and its application to Business Process Improvement (BPI) initiatives.

1. How did you get involved in the field of BPI methodologies?
2. What was the driver behind the development of your BPI methodology?
3. What are its unique selling points?
4. What impact does utilizing a pilot implementation have? If one is used, how should a rollout plan be developed?
5. How is the methodology deployed? By whom?
6. How is the methodology implemented? How is this driven?
7. How is implementation controlled? By whom?
8. What should the frequency of this control mechanism be?
9. At what stage in the initiative project does the methodology start to take effect? How does this become apparent?
10. What types of performance indicators are required for the methodology to be effective?
11. How is internalization of the methodology driven? By whom?
12. How is internalization controlled? What performance indicators are required?
13. What are the key components of the methodology
 - a. Prior to the start-up phase?
 - b. In the start-up phase?
 - c. In the deployment phase?
 - d. In the implementation phase?
 - e. In the internalization phase?
14. Are there any aspects which make the methodology effective or efficient that we did not yet discuss?

App 1.2 Generic Interview Schedule for Consulting Practitioners

The objective of these questions is to understand the methodology and its application to business process improvement (BPI) initiatives.

1. When did you start using this BPI methodology in your clients' process improvement initiatives?
2. Do you utilize other BPI methodologies or their methods/tools in these initiatives? If so, which ones and how are they integrated?
3. Are you involved in these initiatives from the beginning?
4. Are other outside change agents / consultants normally involved in these initiatives?
5. If so, how are they utilized and what are their expertises?
6. How is the need for an initiative usually identified? By whom?
7. Who normally selects the methodology? How?
8. How is the methodology communicated? By whom? To whom?
9. How is the methodology deployed? By whom?
10. How is the methodology Implemented? By whom?
11. Is a pilot implementation normally utilized? If so, how?
12. Is a rollout plan followed? If so, how is it developed?
13. How is implementation of the methodology driven?
14. How is implementation controlled? By whom?
15. What is the frequency of this control mechanism?
16. At what stage in the initiative project does the methodology start to take effect?
17. How is internalization of the methodology driven?
18. How is internalization controlled? By whom?
19. What types of performance indicators are usually required in an initiative?
20. What types of performance indicators are required for the methodology?
21. What do you feel are the key components of the methodology
 - a. Prior to the start-up phase?
 - b. In the start-up phase?
 - c. In the deployment phase?
 - d. In the implementation phase?
 - e. In the internalization phase?
22. Are there any aspects which you feel make the methodology effective or efficient that we did not yet discuss?

App 1.3 Generic Interview Schedule for Business Practitioners

The objective of these questions is to understand the methodology and its application to business process improvement (BPI) initiatives.

1. Was use of this BPI methodology your company's first process improvement initiative?
2. Was this your first involvement with the BPI methodology?
3. Were you involved in the initiative from the beginning?
4. Were outside change agents / consultants involved in the initiative?
5. If so, were they experts on the methodology?
6. How was the need for an initiative identified? By whom?
7. How was the methodology selected? By whom?
8. How was the methodology communicated? By whom? To whom?
9. How was the methodology deployed? By whom?
10. How was the methodology Implemented? By whom?
11. Was a pilot implementation utilized? If so, how?
12. Was a rollout plan followed? If so, how was it developed?
13. How was implementation of the methodology driven?
14. How was implementation controlled? By whom?
15. What was the frequency of this control mechanism?
16. At what stage in the initiative project did the methodology start to take effect?
17. How was internalization of the methodology driven?
18. How was internalization controlled? By whom?
19. What types of performance indicators were required for the initiative?
20. What types of performance indicators were required for the methodology?
21. What do you feel are the key components of the methodology
 - a. Prior to the start-up phase?
 - b. In the start-up phase?
 - c. In the deployment phase?
 - d. In the implementation phase?
 - e. In the internalization phase?
22. Are there any aspects which you feel make the methodology effective or efficient that we did not yet discuss?

App 1.4 Example of Interview Notes: TBM Practitioner

Code: TBM-CP-2-USN

Interviewee; Program Manager-

1. *When did you start using the Time-Based Management methodology in your clients' process improvement initiatives?*

I started using TBM in 1983. Even before 1983, I had used some of the tools and methods such as fish-boning in companies where I had line responsibility. I used it on about 39 BPI projects. I retired in 2005, but TBM is still my recommended BPI methodology.

2. *Do you utilize other BPI methodologies or their methods/tools in these initiatives? If so, which ones and how are they integrated?*

Like I said, I am now retired, but before that, I did not use anything except TBM, I may have leveraged tools from other methodologies – especially if the client had prior familiarity with them. In these cases, it helped the client buy in quicker. We simply made it a part of the TBM methodology for that client. In some cases, the tools proved to be an enhancement and they were adopted. All this is a minority – maybe 3 of the 39 contracts.

3. *Are you involved in the initiatives from the beginning?*

Not always, but most often. Maybe 95%. It depends on who makes the sale and who has the contacts. Other factors are the workload and the required expertise. Usually, if I make the sale, then I have the best contact, the best relationship, and client's trust. In this case, it makes sense for me to continue on the project. We do not have Partners who sell and junior consultants who work the program like McKinsey.

4. *Are other outside change agents / consultants normally involved in these initiatives?*

In only one case. There the client had an IT consultant in-house and we were required to work with them. The most common thing was that the clients had internal consultants and they worked with us. I can remember 7 such programs, 3 of which we actually had them in our offices and they learnt TBM and applied it with us.

5. *If so, how are they utilized and what is their expertise?*

The non-BPI guys just did their own thing. We rarely interfaced or had joint activities except at the barrier removal level. As to the internal consultants, they were not TBM experts. Sometimes they did their own thing, but most of the time, they looked over our shoulders. Since these guys had their own agenda, they often spied on us and tried to take credit for our improvements. This led us to insisting on those internal consultants being part of our team and accountable to us and not a client's department manager. This

kept everyone honest and eliminated the friction. In the 3 cases where this happened, we trained them and then gave them OJT. It was sometimes difficult for these guys since everyone knew that they would be returning to the client after the program finished. This created political problems that had to be escalated.

6. *How is the need for an initiative usually identified? By whom?*

Almost always the board or top management identifies the need and contacts us. We get in because of our references and testimonials. We do not market ourselves or do cold calling. I only know of a couple of cases out of our 200 or so projects where someone under the C-level actually was involved in getting a program started. And in these cases, that person may have championed the BPI initiative, but he had to bring it up to top management and convince them of the merits. I would say that the CEO, COO Chairman and then CFO are the rank order of those who drive for the project. After all, it is usually poor profitability or backsliding in competitiveness that causes these guys to take action.

7. *Who normally selects the methodology? How?*

As I said before, testimonials and references play a key role. Consultants live on the level of confidence the client has in them. If they cannot generate sufficient confidence and credibility, then the client will go elsewhere. Results and having former clients behind you is crucial. The best advertisement is for a client to brag about his BPI project and to get a potential one interested enough to ask who the consultants were.

Who? Since our projects are between 18 months and 3 years, there is a pretty big price tag. Approval has to be made at the CEO and/or board level. Those beneath that level get involved in narrowing the list down and running beauty contests to see which consultants they favour and recommend, but the decision is above their signature authority.

8. *How is the Time-Based Management methodology communicated? By whom? To whom?*

Word of mouth mainly with support from internal memos and bulletins. If the client has a regular internal newsletter, we have a write-up put in there with regular updates and progress reports. The project and our involvement are discussed in department meetings and all-hands type meetings. Additionally, our training and teams involve a lot of resources who, in turn spread the word to those not directly involved. Everyone knows when Sam goes off to training and they ask him when he gets back. Also, they see us and our meetings and the program cockpit charts which are hung on the bulletin boards. This causes people to talk. We just have to assure that the truth is being told and that management is available to answer the employee's questions. We're focused on the initiative and the results. It is up to management to communicate their initiative.

9. *How is the methodology deployed? By whom?*

Deployment involves a macro assessment, a CEO workshop, and setting up the teams. A macro-assessment takes a snapshot of our client's business and its processes. This takes a week or so depending on the number of sites involved. A 1 or 2 sight business where the sites are close to one another takes about a week. Prior to that, the client submits its financials and other documentation which is reviewed before we go in. Once on-site, we interview key management and union leaders. We include the union or worker's councils because they provide us with another side of the picture in terms of processes and operations.

In the MA report, we provide management with a list of barriers to entitlement and the process and functions that need improvement. We try to stay from naming departments since this just leads to a shit-fight even before we get the final contract. You have to remember that the department and functional managers are in the meeting when we present the MA report. This report justifies our contract and fees as well as the duration of the project. Cultural changes take years. The client normally goes into the meeting thinking that they can get a quick fix and we'll be out in a couple of months. We have to change that mind-set.

Often this mind-set has changed enough after the MA report and we can negotiate the contract then. Sometimes we have to wait until after the CEO workshop. At this workshop, the CEO and his direct reports are trained in the methodology and they are asked to look at the process and barrier to entitlement, which we detailed in the report. This is when they start to buy into the methodology, our barrier list and our costs.

In TBM, there is a hierarchy of teams – each with its own charter and purpose. At the top of the pyramid is the business improvement team, the BIT. It is usually comprised of top management - but not the entire C-level. Usually, the CEO, CFO COO and CSO are sufficient since they control the major business processes involved in order fulfilment and R&D. The BIT is charged with oversight of the next lower level teams – the CFT or cross-functional teams. The BIT is also responsible for transforming the BPI optimization into business results improvements. These can be cost reduction, higher sales and less bound capital. In other words, they are in charge of competitiveness in the market place and business viability - sustainability. They also act as the top rung in the escalation chain since not all barriers can be removed by the teams below the BIT. The CFT is empowered to own and improve the processes. They are usually department managers and lead staff. They are charged with identifying barriers to the entitled process, prioritizing these and overseeing their removal. They can remove the barriers themselves or delegate this to the BRTs – the barrier removal teams which are adhoc teams chartered for individual barrier

removals under the oversight of the respective CFT. Each CFT tackles no more than 8 barriers at a time – some of which may be worked on by a BRT. This forces the teams to prioritize the removals, does not overly burden the workforce and allows the teams to link changes in the KPIs to work that they have done.

The BIT and CFTs have KPIs which control their progress. Each team sets up a cockpit or dashboard chart which contains their respective KPIs.

10. *How is the Time-Based Management methodology Implemented? By whom?*

Implementation is via the hierarchy of teams. The common thread is the barrier list which gets started in the macro assessment, reviewed and enhanced in the CEO workshop, finalized in the BIT and then prioritized by the CFTs. This, along with the barrier removal activities and the KPI driving improvements is the heart of implementation.

The KPIs are what drives improvements in both the BIT and CFT areas of responsibility. These metrics are linked hierarchically and the cockpit charts show the team's progress from baseline to entitlement. Each team ratifies the baseline performance and the estimated entitled performance level for each of its KPIs. Barriers are those issues, problems, etc., which prevent the process or business from performing at the entitled level of performance. The cockpit charts track improvements made by the CFTs and the BIT. Often these KPIs show a stall or backsliding. The respective team then has to analyse the situation and take correct action.

11. *Is a pilot implementation normally utilized? If so, how?*

Pilots are the devils work. It slows progress, gives the teams an out for their performance, and really is a non-value adding step. It is a substitute process for thinking though the barrier, finding the root-cause and taking decisive action. It lets the teams off the hook - Oh well, the pilot didn't work, we'll just have to try something else - anyone got a suggestion? Pilots are not necessary. Those that suggest them either do not know enough about the process, its barriers or do not have the balls to proceed. Those who want pilots lazy and foolish.

Rollouts are a horse of a different colour. When the client has multiple sites – especially ones far apart, it is often necessary to convert one site after another. This is not piloting. It is just good resource management. Of course, there is sometimes cycles of learning as you rollout and in these cases, the subsequent sites get an improved change which has to be brought back into the preceding sites.

12. *Is a rollout plan followed? If so, how is it developed?*

Rollout for multiple sites yes! Pilots, no! We do not do pilots!

The rollout is designed by the CFTs and approved by the BIT. The home site or the biggest one is normally the first, and then the next closest geographically or in terms of importance are selected.

As I said, cycles of learning are captured and the changes improved accordingly.

13. *How is implementation of the Time-Based Management methodology driven?*

I think that I covered this earlier. The KPIs in the cockpit chart are the drivers for both the BIT and CFTs. The BRTs do not need them as the life span for these teams is usually 3-4 weeks only.

14. *How is implementation controlled? By whom?*

The teams review their own cockpit chart at least monthly. Some KPIs can and should be captured more frequently. Ideally, these would be reviewed in the weekly CFT meetings or special BIT meetings. At the very least, these KPIs are rolled up or averaged for the month's cockpit chart.

The CFT cockpit charts are reviewed by them and action plans made accordingly. They present their cockpit chart to the BIT along with the respective action plan. The BIT is there for escalation of barriers that cannot be removed by the CFTs. The BIT cockpit chart is leveraged to discover hidden barriers, unrevoked substitute processes and erroneous activities. Both the CFT and BIT are charged with stall and backslide correction.

15. *What is the frequency of this control mechanism?*

As I said, at least monthly. Weekly would be preferred especially at the beginning of the project. One has to remember however that there is a lag time between making a process change and its impact showing up in the cockpit charts.

16. *At what stage in the initiative project does the Time-Based Management methodology start to take effect?*

TBM kick in quite early. Even though the KPIs may not capture the improvements, the working relationships between functions start as early as the end of the CEO workshop. There the culture – especially silo or functionalism gets highlighted and things start to improve immediately. The methodology calls for a close examination of the cultural barriers as well as the process and subject matter ones. Since the top management is usually the driver of company culture, one does not have to wait until the process owners start making their changes to see improvements in the organization and its results.

It is important to install the KPIs ASAP for many reasons. First of all, so that the true baseline performance is captured – our incentives depend on this. Secondly, so that a false entitlement is not set. Delays in implementing KPIs have a tendency to understate

the entitled performance. Again, our incentives depend on this being set correctly.

Thirdly, making these quick wins transparent is important for motivation in the initiative and buy in for the methodology. Lastly, some of the actions taken early on in the project may lead to sub-optimization. This needs to be made visible and corrected ASAP.

17. *How is internalization of the methodology driven?*

Internalization means two things: continued usage of the methodology and assuring that the changes made are lived. The former drives the latter. If you continue to have barrier removal and business improvement activities by teams that are driven and controlled by their cockpit chart results, then the changes will be lived. They have to be or else there will be little or no improvements in the KPIs.

The enemies of internalization is setting low levels of entitlement, complacency with the results generated, and running off to the next improvement fad which is shinier or more fashionable. It's a lot like losing weight. If you believe that you have accomplished all that can be done or your goal is too low, the yoyo effect will result or you will go on to another fad diet. The poor eating culture will not have been changed.

18. *How is internalization controlled? By whom?*

As I said, the teams continue to do their work and each monitor the overall progress as well as that being accomplished by their team.

19. *What types of performance indicators are usually required in an initiative?*

This depends on the reasons for the BPI initiative. Increased competitiveness, cost reduction and improved profitability are the most common reasons for BPI projects. Competitiveness means looking at sales, market share and growth. Cost reduction means lowering the total costs not just product costs or inventories. Profitability may be looking at margins at the product, project, site or business levels. It should be noted that cycle time, on-time delivery and first pass yield – the TBM metrics – are directly linked into each of these initiative metrics.

20. *What types of performance indicators are required for the Time-Based Management methodology?*

This depends on the teams. The CFTs, being process owners have to watch the process indicators – cycle time, on-time delivery and first pass yield. They are charged with reducing the time it takes to run through the process, the timeliness of the process outputs and the quality of these. When I speak of outputs, I mean internally from one step or sub-process to another not just to the end customer. Of course, cost – process-based is another important CFT consideration. Do not confuse function or departmental cost with process cost. A department can have a lot of non-value adding waste in it that leads to

unwanted costs. This is one area that the BIT must watch. If the total functional costs greatly exceed the total process costs then they need to take action.

The BIT looks at the rolled up process indicators as well as the financial ones – especially costs, sales, customer satisfaction and profit. The BIT has both process and finance drivers.

21. *What do you feel are the key components of the Time-Based Management methodology Prior to the start-up phase?*

- Macro-Assessment (*explicitly required*)
- CEO workshop (*explicitly required*)
- Vision of Entitlement (*explicitly required*)

In the start-up phase?

- Root Cause Barrier Identification (*explicitly required*)
- Baseline and entitlement analysis (*explicitly required*)
- Cross-functional team infrastructure, BRTs, CFTs and BIT. (*explicitly required*)

In the deployment phase?

- Team training (*explicitly required*)
- Process mapping of the baseline and the entitled process (*explicitly required*)
- Barrier ranking and prioritization (*explicitly required*)
- Baseline performance of KPIs (*explicitly required*)

In the implementation phase?

- Cockpit charts with hierarchical metrics (*explicitly required*)
- Barrier Removal (*explicitly required*)
- Weekly team meetings (*implicitly required*)
- Cockpit chart reviews (*explicitly required*)

In the internalization phase?

- Team infrastructure (*explicitly required*)
- Cockpit chart reviews and corrective actions (*explicitly required*)
- Barrier removal (*explicitly required*)
- On-going Barrier identification (*implicitly required*)
- Revisiting entitlement (*implicitly required*)

22. *Are there any aspects that you feel make the Time-Based Management methodology effective or efficient that we did not yet discuss?*

Yes, holding a 30K foot view. The methodology demands that the functions cooperate and work together. It also demands that they take a holistic view of their

processes. This needs to be so far up that their individual functions are no longer visible. This allows a process orientation to replace functionalism. If this is not accomplished, sub-optimization and silo mentality will be the order of the day. The end result is that entitlement will not be reached and the client will not get the true benefits it could – especially competitiveness.

[When I review the literature, I find that the various authors emphasize different components. It would help if you could categorize your responses to question 13 into something like 1) explicitly required in the methodology, 2) implicitly required, 3) logically required or 4) ancillary requirement such as from project management.][Note: Responses recorded (in italics) with responses for Q13]

Appendix 2: Glossary of Key Terms

Autonomation: Smart automation wherein the system detects defects and stops itself.

Autonomation is designed to avoid waste and to focus on root cause elimination. It follows the Jidoka concept.

Baseline: The current level of performance of any key performance indicator (KPI).

Black Literature: This term refers to undisclosed reports, presentations and writings which, for the most part, are properties of consulting firms or practitioners. They include confidential studies of, or comparisons with, competitor products (methodologies, tools, etc.), classified benchmarking results and new product development research.

Chaku-Chaku: Literally translated from Japanese, it means “Load-Load” which is the action a production line worker performs. The concept considers the optimal layout and placement of machines or workstations so as to minimize product transport and worker movement. Often, a “U” layout is employed.

C-Level management: This term applies to the top level of management in an organization. It stands for the “Chief” level (e.g. CEO, Chief Executive Officer).

Component: Method, tool or technique utilized by a BPI methodology to establish or support its efficiency or effectiveness. Examples are process mapping, Methodology training and KPI tracking.

Concurrent validity: Validity in terms of reproducibility of results.

Construct: Concept or structure created by a BPI methodology to establish or support its efficiency or effectiveness. Examples are value propositions, culture change and continuous improvement orientation.

Content validity: Validity in terms of covering the full range of objectives.

Culture: , “A historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and their attitudes toward life” (Geertz 1973:89).

Efficacy: This term is used to mean the capability and capacity to bring about change or improvement. It considers both efficiency and effectiveness.

Entitlement: The “should-be” level of performance of any key performance indicator (KPI).

Face validity: Validity in terms of linking the questions to an objective.

Five “I” Process: A component of Total Cycle Time[®]. Philip Thomas (1991) describes this process as a roadmap to entitlement comprised of inspiration, identification, information, implementation and institutionalization.

Five “S” Process: A component of Lean Management. Seiri (Sort) deals with removing unnecessary tools, items, etc. from the workplace. Seiton (Set in Order) structures the workplace to provide efficiency and effectiveness. Seiso (Shine) insures that the workplace is, and stays, clean. Seiketsu (Standardize) deals with optimizing and standardizing the work process. Shitsuke (Sustain) strives to change the workplace culture into one of continuous improvement and maintaining high standards.

Five-Whys or 5-Whys Process: A process of root cause determination based on asking “why” five times. It starts by asking why the symptom occurs. The response is then questioned and the process repeated multiple times.

Gap Analysis: The gap analysis dealt with the status of existing works and the assessed the extent to which the research objectives had already been met by publicly available information.

Genchi Genbutsu (Lean Management): Appropriate decision making process based on personal involvement. It influences the decision maker to “go and see”.

Hancho: The Japanese term for team leader who, in TPS and Lean Management methodologies, is the process owner and change management team leader.

Heijunka: A Japanese term for line levelling and smoother production. It is often used as an adjective with “box” or “board” to refer to a visual management tool that helps schedule line loading and provides visual management,

Hoshin Kanri: Literally translated from Japanese, it means “compass needle planning”. In Lean Management, it is policy deployment which is linked to the long-term objective referred to as “True North”.

Ishikawa diagram: A visual management tool developed by H. Ishikawa to graphically represent the relationship between an effect and its cause(s). It is often employed in conjunction with a root cause determination process such as the Five-Whys.

ISO-9000: A subset of the International Standards Organization’s guidelines that deals with processes and process management.

Jidoka principle: This concept is a Japanese notion wherein a machine is endowed with limited human intelligence. This intelligence is focused on detecting poor quality and ceasing production until the root cause has been eliminated.

Kanban: This term is a Japanese word for “card”. It is often used in Lean Management as a visual control system to manage production or inventory.

Kaizen: The Japanese term for improved change. It has been used as a synonym for Lean Management.

Key factors: The most important constructs and components essential to a BPI methodology in terms of its effectiveness and efficiency (See “Construct” and “Component”).

Lean or Lean Management: An approach associated with the Toyota Production System which focuses on process improvement by eliminating the seven forms of wastes (see “wastes”).

Link Charts: Graphical representation of the linkage between the process improvement activities and the organization’s financial indicators (esp. Turnover or Profit).

Meta-ethnography: This method of meta-synthesis offers three alternative techniques for synthesizing studies, refutational synthesis, reciprocal translations, and lines of argument synthesis.

Methodology (BPI): A process or approach proffered by business experts to realize business process improvements. A BPI methodology is based on a fundamental philosophy as to what drives performance improvements. As a system of methods that support that philosophy, it is composed of a set of concepts, constructs, tools and techniques which

form a framework that is consequently and holistically applicable to all business processes. Such application is a strategic initiative to align the operative culture with the organization's goals and objectives in order to realize significant and long-lasting performance improvements. So as to avoid confusion with other approaches, techniques and tools, in this SLR the use of the term "methodology" is restricted to this sense.

Milk run: A concept modelled after the former logistics method for providing households with milk and picking up the empty containers for the factory. On the out-bound side, it facilitates both producer and customers. On the in-bound, it serves both supplier and producer.

Muda: Lean Management principle of reducing *non-value-adding work*. See "Wastes" in this glossary.

Mura: Lean Management principle of *unevenness* in the process flow – a by-product of JIT.

Muri: Lean Management principle of reducing *overburden* - unnecessary work and tasks (especially those imposed by management).

Paradigm: A mental pattern, model or viewpoint often based on precedents, experiences or cultural orientations.

Poka-yoke: The Japanese term for "error proofing". It refers to the process design to prevent human error.

Pull Training: Training only those that are, or will be, involved and actively participate in the initiative. This approach is in contrast to blanket training of the entire organization.

Push Communication: Blanket communication to the entire organization. This approach is in contrast to communicating on a need-to-know basis.

Quality function deployment or QFD: This concept is a "method to transform user demands into design quality, to deploy the functions forming quality, and to deploy methods for achieving the design quality into subsystems and component parts, and ultimately to specific elements of the manufacturing process" (Akao, 1994: 339).

Reciprocal Translations: A Meta-ethnography technique for synthesising differing studies which deal with the same phenomenon (Tranfield, Denyer and Smart, 2003). Applied

to BPI methodologies, each with seemingly different approaches, definitions and/or terminologies, this technique would allow the identified constructs and components to be translated between, even amongst, methodologies. This translating technique will highlight both commonalities and differences while overcoming the barriers of definition and terminology usage.

Research methodology: “the ontological and epistemological assumptions on which research is based” (Noorderhaven 2000:3).

Research method: A strategy for collecting and analysing data - the “theoretical definition and operationalization of variables, collection of data, generation and testing of hypotheses, etc.” (Noorderhaven 2000:5).

Senpai/Kohai: A Japanese term for “senior/Junior” that refers to a mentoring of the less knowledgeable by the more experienced. An age difference is not always the deciding factor for the relationship.

Sensei: Literally translated from Japanese, it means “the person born before”. It is used in Lean Management to mean teacher and is associated with the use of experts.

SIPOC: A graphic based model that consists of: Supplier, Input, Process, Output and Customer. This model is used to analyse sub-processes as well as the total business process. This means that the supplier and customer do not have to be external to the organization.

Six Sigma or 6σ : A statistical quality control methodology whereby an error free rate of 99.99966% is targeted.

Time-based Process Mapping: Process mapping whereby the X-axis represents time. Therefore, there are no feed-back loops, only feed-forward ones.

Triad: As used by Ohmae in 1991 to mean North America, Western Europe and Japan.

U-layout: This approach is a process flow optimization tool that reduces product transport and worker movement. It requires the workplace flow to be in the form of a “U”.

Wastes (Lean Management): The original seven classifications of wastes (*muda*) were Transport, Inventory, Motion, Waiting, Overproduction, Over Processing and Defects. These classifications were represented by the acronym TIM WOOD. The list has been subsequently enhanced by an 8th element - waste of skills/expertise (Bicheno & Holweg, 2009). This modification gave rise to the acronym TIM WOODE. Both acronyms, TIM WOOD and TIM WOODE, are commonly used in business improvement initiatives utilizing the lean management methodology.