

INVESTIGATING THE RELATIONSHIP BETWEEN THE BUSINESS PERFORMANCE MANAGEMENT
FRAMEWORK AND THE MALCOLM BALDRIGE NATIONAL QUALITY AWARD FRAMEWORK

Muhammad Muazzem Hossain, B.B.A., M.S.

Dissertation Prepared for the Degree of

DOCTOR OF PHILOSOPHY

UNIVERSITY OF NORTH TEXAS

August 2009

APPROVED:

Victor R. Prybutok, Major Professor
Mary C. Jones, Minor Professor and Chair of
the Department of Information
Technology and Decision Sciences
Nicolas Evangelopoulos, Committee Member
Audhesh K. Paswan, Committee Member
O. Finley Graves, Dean of the College of
Business
Michael Monticino, Dean of the Robert B.
Toulouse School of Graduate Studies

UMI Number: 3385793

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.

UMI[®]

Dissertation Publishing

UMI 3385793

Copyright 2009 by ProQuest LLC.

All rights reserved. This edition of the work is protected against unauthorized copying under Title 17, United States Code.

ProQuest[®]

ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

Hossain, Muhammad Muazzem. Investigating the relationship between the business performance management framework and the Malcolm Baldrige National Quality Award framework. Doctor of Philosophy (Management Science), August 2009, 149 pp., 24 tables, 15 figures, references, 60 titles.

The business performance management (BPM) framework helps an organization continuously adjust and successfully execute its strategies. BPM helps increase flexibility by providing managers with an early alert about changes and, as a result, allows faster response to such changes. The Malcolm Baldrige National Quality Award (MBNQA) framework provides a basis for self-assessment and a systems perspective for managing an organization's key processes for achieving business results. The MBNQA framework is a more comprehensive framework and encapsulates the underlying constructs in the BPM framework.

The objectives of this dissertation are fourfold: (1) to validate the underlying relationships presented in the 2008 MBNQA framework, (2) to explore the MBNQA framework at the dimension level, and develop and test constructs measured at that level in a causal model, (3) to validate and create a common general framework for the business performance model by integrating the practitioner literature with basic theory including existing MBNQA theory, and (4) to integrate the BPM framework and the MBNQA framework into a new framework (BPM-MBNQA framework) that can guide organizations in their journey toward achieving and sustaining competitive and strategic advantages.

The purpose of this study is to achieve these objectives by means of a combination of methodologies including literature reviews, expert opinions, interviews, presentation feedbacks, content analysis, and latent semantic analysis. An initial BPM framework was

developed based on the reviews of literature and expert opinions. There is a paucity of academic research on business performance management. Therefore, this study reviewed the practitioner literature on BPM and from the numerous organization-specific BPM models developed a generic, conceptual BPM framework. With the intent of obtaining valuable feedback, this initial BPM framework was presented to Baldrige Award recipients (BARs) and selected academicians from across the United States who participated in the Fall Summit 2007 held at Caterpillar Financial Headquarter in Nashville, TN on October 1 and 2, 2007. Incorporating the feedback from that group allowed refining and improving the proposed BPM framework.

This study developed a variant of the traditional latent semantic analysis (LSA) called causal latent semantic analysis (cLSA) that enables us to test causal models using textual data. This method was used to validate the 2008 MBNQA framework based on article abstracts on the Baldrige Award and program published in both practitioner and academic journals from 1987 to 2009. The cLSA was also used to validate the BPM framework using the full body text data from all articles published in the practitioner journal entitled the *Business Performance Management Magazine* since its inception in 2003. The results provide the first cLSA study of these frameworks. This is also the first study to examine all the causal relationships within the MBNQA and BPM frameworks.

Copyright 2009

by

Muhammad Muazzem Hossain

PREVIEW

ACKNOWLEDGMENTS

I would like to express my gratitude to my dissertation chair Dr. Victor Prybutok for his advice, compassion, guidance, patience, and supervision from the very beginning of this dissertation. Dr. Prybutok provided me unflinching encouragement, mentoring, and support in various ways. I am indebted to him more than he knows.

I gratefully acknowledge Dr. Mary Jones, Dr. Nicolas Evangelopoulos, and Dr. Audhesh Paswan for their insightful guidance, unconditional support and unlimited encouragement.

Many thanks to my fellow friends in the Ph.D. program who were there for me whenever I needed them. Thanks to all my friends who helped me in many ways in completing my Ph.D. program.

Lastly, to my parents, brothers, sisters, and my wife Mahfuja Islam, words cannot express my gratitude for their unconditional love and support. Without their “you-can-do-it” encouragement, it would not have been possible for me to accomplish what I have today.

TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS.....	iii
LIST OF TABLES.....	v
LIST OF FIGURES.....	vii
Chapters	
1. INTRODUCTION.....	1
2. LITERATURE REVIEW.....	8
The MBNQA Framework.....	8
The BPM Framework.....	19
Latent Semantic Analysis (LSA).....	27
The BPM-MBNQA Conceptual Framework.....	31
Research Models and Propositions.....	35
3. RESEARCH METHODOLOGY.....	83
Corpus 1: MBNQA Input-Output (XY) Statements.....	84
Corpus 2: IJBPM Abstracts.....	87
Corpus 3: BPM Input-Output (XY) Statements.....	87
4. ANALYSES and RESULTS.....	89
cLSA of Corpus 1.....	89
LSA of Corpus 2.....	100
cLSA of Corpus 3.....	106
5. DISCUSSION, IMPLICATIONS, and FUTURE DIRECTION.....	119
Discussion.....	119
Implications.....	123
Future Direction.....	124
APPENDICES.....	126
REFERENCES.....	145

LIST OF TABLES

	Page
Table 1: Brief description of MBNQA categories.....	12
Table 2: Brief description of MBNQA dimension level constructs	13
Table 3: Major BPM consulting firms and their activities.....	22
Table 4: Brief description of the BPM framework constructs	26
Table 5: Correspondence of the BPM constructs to the MBNQA constructs	34
Table 6: Tabular view of results-related propositions for MBNQA category level framework....	52
Table 7: Tabular view of system’s propositions for MBNQA category level framework	62
Table 8: Tabular view of the MBNQA dimension level propositions.....	76
Table 9: List of journals with MBNQA-related abstracts	86
Table 10: Summary of two factors of the causal MBNQA framework	91
Table 11: Inter-factor frequency measures	92
Table 12: Inter-factor percentage measures	92
Table 13: Summary of seven factors of the causal MBNQA framework	94
Table 14: Inter-factor frequency measures for seven-factor MBNQA framework	97
Table 15: Inter-factor percentage measures for seven-factor MBNQA framework	98
Table 16: Summary of two semantic factors of BPM framework	101
Table 17: Summary of ten semantic factors of BPM framework	103
Table 18: Summary of two factors of the causal BPM framework.....	108
Table 19: Inter-factor frequency measures	109
Table 20: Inter-factor percentage measures	109

Table 21: Summary of ten factors of the causal BPM framework.....	111
Table 22: Inter-factor frequency measures	114
Table 23: Inter-factor percentage measures	115
Table 24: Significant percentage supports	117

PREVIEW

LIST OF FIGURES

	Page
Figure 1: The 2008 MBNQA performance excellence framework.....	15
Figure 2: MBNQA core values and concepts, criteria, and outcomes (NIST, 2008, p. 49)	17
Figure 3: The proposed BPM framework.....	25
Figure 4: Schematic of term-by-document matrix X	28
Figure 5: The BPM-MBNQA conceptual framework.....	33
Figure 6: The 2008 MBNQA framework at the category level	36
Figure 7: The 2008 MBNQA framework at the dimension level.....	62
Figure 8: The proposed BPM framework (repeated).....	77
Figure 9: Causal semantic net for two-factor MBNQA framework	92
Figure 10: Causal semantic net for seven-factor MBNQA framework	99
Figure 11: Causal semantic net for two-factor BPM framework.....	109
Figure 12: Causal semantic net for ten-factor BPM framework.....	118
Figure 13: Empirical evidence of the MBNQA framework	120
Figure 14: The operational paths of BPM.....	122
Figure 15: The strategic paths of BPM.....	123

CHAPTER 1

INTRODUCTION

The Malcolm Baldrige National Quality Award (MBNQA) framework provides a basis for self-assessment and a systems perspective for managing an organization's key processes for achieving business results. The business performance management (BPM) framework helps an organization continuously adjust and successfully execute its strategies. BPM helps increase flexibility by providing managers with a sense of uncertain changes earlier and allows faster response to such changes. It thus helps organizations address market opportunities. The simultaneous use of the Malcolm Baldrige National Quality Award (MBNQA) framework and the business performance management (BPM) framework by an organization has the potential to help organizations pursue excellence while simultaneously increasing their agility and competitive advantage. Therefore, to facilitate the ability to use both frameworks simultaneously for organizational advantage I examine the existing literature and from it glean the common relationships among the frameworks and use these findings to posit an integrated framework.

The Malcolm Baldrige National Quality Award criteria provide a comprehensive framework for self-assessment and embody a systematic approach to organizational quality (Bemowski & Stratton, 1995; Evans 1997; Pannirselvam & Ferguson, 2001). The criteria are grouped into seven categories that show the underlying relationships among and between organizational performance and various quality management constructs (Pannirselvam & Ferguson, 2001). These relationships are portrayed in the Malcolm Baldrige National Quality Award (MBNQA) framework. The MBNQA criteria define practices in seven categories - (1)

leadership, (2) strategic planning, (3) customer and market focus, (4) measurement, analysis, and knowledge management, (5) workforce focus, (6) process management, and (7) results. These seven categories are composed of a set of 18 performance-oriented criteria items. Each of these categories embodies two or more criteria items. For instance, the leadership category is composed of two criteria items: senior leadership, and governance and social responsibilities. The Baldrige criteria also shed light on asking questions that organizations can use to establish vital linkages in their structure, operations, strategy, and results. For example, a key question item regarding the customer and market knowledge criteria item is how organizations identify customers, customer groups, and market segments. These question items provide practitioners and academicians with invaluable insights for developing self testing instruments. However, because of the use of the same term “items” to indicate criteria items and question items there is the potential for the confusion in academic literature of these question items with the criteria items. Therefore, I intend to make a distinction at the onset between the criteria items and the question items by labeling the criteria items as the dimensions of the categories. Thus, the Baldrige framework is a framework of seven interrelated constructs (categories) with each construct having two or more dimensions with each dimension measured with multiple question items.

The MBNQA framework was first created in 1987 for the purpose of improving organizational competitiveness (Garvin, 1991; Gradig & Harris, 1994) and has evolved continuously since its inception (National Institute of Standards and Technology [NIST], 1993; Bemowski, 1996; NIST, 1997; NIST, 2000; NIST, 2007; NIST, 2008). The 2007 criteria bring significant changes from the 2006 criteria in almost all categories and dimensions, and these

changes include adding seven terms to the Glossary of Key Terms (NIST, 2007, p. 8-9). These changes are reflected in the framework in terms of new and modified underlying relationships. For example, the 2007 criteria assume that strategic planning has a stronger focus than in previous frameworks on innovation, strategic advantages, and resource needs to achieve strategic objectives. However, NIST (2008) posits:

In 2007, the Baldrige Criteria were significantly revised to encourage organizations to consider carefully their strategic advantages, core competencies, and opportunities for innovation and how these considerations drive key decisions on work systems (such as outsourcing, partnerships, and workforce decisions). In recognition of the challenges for organizations to address these opportunities, the decision was made to make no substantive revisions to the Criteria for 2008. (NIST, 2008, p. 27)

The most significant changes in the 2008 booklet include the addition of the term “Strategic Advantages” to the Glossary of Key Terms, and two new diagrams – one of which illustrates the role of core values and concepts in underpinning the criteria, and the other shows maturity levels in organizational learning (NIST, 2008). Therefore, the 2007 framework and the 2008 framework can be used interchangeably. The relationships in the proposed conceptually enhanced 2007/2008 framework are currently not validated in the academic literature. Validating the 2007/2008 framework will support the framework’s current form as well as provide managers with meaningful information that they can use in deciding where they should focus their efforts in achieving performance excellence. Therefore, the first objective of this study is to validate the underlying relationships presented in the 2007/2008 framework.

The MBNQA framework enjoys widespread acceptance at local, national, and international levels (Kochan, 1992; Ettorre, 1996; Pannirselvam, Siferd, & Ruch, 1998). Various studies have used, extended and tested this framework in several industries, such as health

care (Prybutok & Spink, 1999; Meyer & Collier, 2001), government organizations (Pannirselvam et al., 1998; Pannirselvam & Ferguson, 2001), and higher education (Winn & Cameron, 1998). However, these studies tested the framework at the category level. There is a paucity of evidence testing the MBNQA framework at the dimension level. A dimension level analysis will provide academicians and managers with better insight regarding how each item in a category is related to specific items in other categories (Pannirselvam & Ferguson, 2001). That is, dimension level analysis is necessary to better understand how various quality management aspects affect each other and impact business performance (Evans, 1997). Therefore, the second objective of this study is to explore the MBNQA framework at the dimension level, and develop and test constructs measured at that level in a causal model.

The BPM framework embodies a closed-loop. Cokins (2007) posits that business performance management existed decades ago and that organizations were doing performance management long before it was labeled such in 1990s by information technology research firms and software vendors. There is little or no research in academia on business performance management. Several practitioner BPM frameworks exist but these are industry specific and vary from industry to industry (Eckerson, 2004; Cokins, 2007). However, all such frameworks have common constructs – develop strategy; define, measure and manage performance against strategic goal; continuously adjust and refine strategy; and optimize the strategic execution. Therefore, the third objective of this work is to validate and create a common general framework for the business performance management by integrating the practitioner literature with basic theory including existing MBNQA theory.

The 2008 criteria place significant importance on competitive advantages, strategic advantages, core competencies, and innovation. The Baldrige criteria ask thought-provoking, critical questions that emphasize an organizational infrastructure that is essential to maintain and improve competitive advantage and bring about innovation. One impediment to achieving improved organization effectiveness and competitiveness is the huge gap between strategy and execution (Eckerson, 2004). Eckerson (2004) suggests that business performance management (BPM) bridges the gap between strategy and execution. Eckerson also posits that BPM helps organizations exploit market opportunities as they arise, and make organizations more effective, and more competitive. Therefore, the final objective of this study is to integrate the business performance management framework and the MBNQA framework into a new framework (BPM-MBNQA framework) that can guide organizations in their journey toward achieving and sustaining competitive and strategic advantages.

In summary, the objectives are as follows:

1. Validate the underlying relationships presented in the 2008 MBNQA framework at the category level
2. Explore the MBNQA framework at the dimension level, and develop and test constructs measured at that level in a causal model
3. Validate and create a common general framework for the business performance management by integrating the practitioner literature with basic theory including existing MBNQA theory
4. Integrate the BPM framework and the MBNQA framework into a new framework (BPM-MBNQA Framework) that can guide organizations in their journey toward achieving and sustaining competitive and strategic advantages

The purpose of this study is to achieve these objectives by means of a combination of methodologies including literature reviews, expert opinions, interviews, presentation

feedbacks, content analysis, and latent semantic analysis. An initial BPM framework was developed based on the reviews of literature and expert opinions. There is a paucity of evidence of academic research in business performance management. Therefore, this study reviewed the practitioner literature on BPM and developed a generic, conceptual BPM framework. With the intent of obtaining valuable feedback, this initial BPM framework was presented to Baldrige Award recipients (BARs) and selected academicians from across the United States who participated in the Fall Summit 2007 held at Caterpillar Financial Headquarter in Nashville, TN on October 1 and 2, 2007. Incorporating the feedback, a refined, improved BPM framework has been proposed.

In line with the above-mentioned research objectives, the study seeks to address the following research questions:

1. Are the proposed relationships between the categories in the MBNQA 2008 framework supported?
2. How are the dimensions related within each category and between categories in the MBNQA 2008 framework?
3. Is the proposed BPM framework supported by the extant literature?
4. Does BPM framework contribute to enhanced competitiveness and innovation?
5. How is the proposed BPM framework related to the 2008 MBNQA framework?

This study uses causal latent semantic analysis (cLSA) to validate the proposed BPM framework and the 2008 MBNQA framework. The causal LSA (cLSA) is a modification and thus a derivative of the traditional latent semantic analysis. In addition to uncovering the latent factors, the cLSA establishes causal relationships among these factors based on the input and output statements contained in the factors (see Appendix B for detail). To validate the BPM

framework, I performed cLSA on a BPM corpus developed based on the full body text data from all articles published in the practitioner BPM journal entitled the *Business Performance Management Magazine* since its inception in 2003. In addition, the traditional latent semantic analysis (LSA) was used to uncover the latent semantics of the BPM framework from the article abstracts published in the *International Journal of Business Performance Management*. To validate the MBNQA framework, I performed cLSA on an MBNQA corpus obtained from the article abstracts on the Baldrige Award and program published in practitioner and academic journals from 1987 to 2009.

The remaining of the study is organized as follows. Chapter 2 provides a review of the literature on the MBNQA, BPM and latent semantic analysis. Chapter 2 also delineates the research models and generates propositions for testing the research objectives. Chapter 3 articulates the research methods, construct measurement, sample design, scale development, and data collection so as to answer the research questions presented in Chapter 1. Chapter 4 provides the data analysis and results. Finally, Chapter 5 discusses the limitations, contributions and implications of the study.

CHAPTER 2

LITERATURE REVIEW

This chapter provides a review of the literature on the Malcolm Baldrige National Quality Award (MBNQA) framework, the business performance management (BPM) framework and latent semantic analysis (LSA). There are five sections in this chapter. The first section presents a review of the literature on the MBNQA framework. The second section provides a review of the practitioner literature on BPM. A conceptual BPM framework is proposed based on the review of the practitioner literature. The third section discusses latent semantic analysis. Section four discusses how the BPM and the MBNQA framework can be integrated; and it presents the integrated BPM-MBNQA conceptual framework. Finally, research propositions are detailed in section five.

The MBNQA Framework

The Malcolm Baldrige National Quality Award (MBNQA) is considered the highest honor for business excellence in America (TYBEA, 2001). The United States Department of Commerce established the Baldrige Award and the Baldrige National Quality Program in 1987 to jumpstart a small, slowly growing quality movement (TYBEA, 2001). The Baldrige Award and program plays a critical role in strengthening competitiveness (Bell & Keys, 1998) with the intent of achieving three specific goals – to promote quality awareness, to recognize quality achievement of U.S. companies, and to publicize successful strategies (Bemowski & Stratton, 1995; TYBEA, 2001; NIST, 2007). The National Institute of Standards and Technology (NIST) of the US Commerce Department designs and manages the Baldrige Award and program. Congress selected NIST to administer the Baldrige Award because of “its long-standing role in helping

U.S. companies compete, its world-renowned expertise in quality control and assurance, and its reputation as an impartial third party” (TYBEA, 2001, p. 5).

The first Baldrige Awards were presented in 1988 to three companies. The United States president presents the awards to the recipients. From 1988 to 1998, the awards were given to each of three sectors – manufacturing, service, and small business. With the October 1998 passage of legislation, NIST established Baldrige Awards for education organizations and healthcare providers; and the first applications for awards were accepted in 1999 (TYBEA, 2001). NIST was authorized to expand the Baldrige Award program to non-profit organizations by the October 2004 legislation signed into law by President Bush. The first applications for awards in the non-profit organizations sector were accepted in 2007 (NIST, 2007).

Now NIST designs and manages the Baldrige Award and program for manufacturing, service, small business, education, healthcare, and non-profit organizations. Three frameworks are provided by NIST to administer awards in these categories. The first framework embodies criteria for business and non-profit organizations and is used for manufacturing, small business, service and non-profit categories. The second and third frameworks provide criteria for education organizations and healthcare providers, respectively. NIST provides three frameworks to capture the peculiarity that exists across industries. However, the bottom-line purposes and underpinnings of all frameworks are the same. Minor differences in frameworks exist in the name of the dimensions of the frameworks and are needed to reflect the esoteric characteristics of each industry. For instance, the term customer is better suited to businesses and non-profit organizations. The term patient is more appropriate in the healthcare industry. The differences in frameworks are reflected as follows: (1) the category Customer and Market

Focus in the business and non-profit criteria is replaced with Focus on Patients, Other Customers, and Market in healthcare criteria, and with Student, Stakeholder, and Market Focus in education criteria, and (2) the dimensions in the Results category have been named in the frameworks to reflect the distinctive outcomes of each industry.

The underlying causal relationships and the design structure of the frameworks remain unchanged across industries. Therefore, the terms “Malcolm Baldrige National Quality Award framework,” “MBNQA performance excellence framework,” “MBNQA model,” “Baldrige framework,” and “Baldrige model” are used to embody the causal relationships and the skeleton of all frameworks. Because the relationships and the skeleton of the frameworks are the same, the business and non-profit framework is used hereon as a representation of the Baldrige model, the MBNQA model or the MBNQA framework. In line with one of the objectives of this research, the 2008 Baldrige criteria are referred to the theoretical MBNQA framework.

The bottom-line philosophy of the Baldrige framework is to provide a systems perspective for managing organizations and their key activities and processes to obtain results. The MBNQA framework defines seven criteria categories that are designed to endow organizations with an integrated approach to performance excellence. These criteria categories are (1) leadership, (2) strategic planning, (3) customer and market focus, (4) measurement, analysis, and knowledge management, (5) workforce focus, (6) process management, and (7) results. The Baldrige scoring system encompasses these seven criteria categories and divides them into two evaluation dimensions: (1) process and (2) results. “Process” refers to the methods that organizations use to address the requirements in Categories 1 – 6, while “Results” refers to organizations’ outputs and outcomes in achieving the requirements in Category 7

(NIST, 2008). The two evaluation dimensions are central to the Baldrige Award applicant evaluation and feedback. A critical factor in evaluation and feedback is the importance of an organization's reported process and results to its key business factors. NIST suggests that organizations identify the areas of their greatest importance and report them in their organizational profile. NIST posits that organizational profile is the most important starting point for self-assessment and for writing an application. In addition, organizational profile helps organizations identify potential gaps in key information and focus on key performance requirements and results. It sets the context such as operating environment, key working relationships, and strategic challenges and advantages for the way an organization operates. Therefore, organizational profile serves as an overarching guide for an organization's performance management system. However, organizational profile is not considered a criteria category and does not contribute toward the scoring system. This study investigates the underlying relationships among the seven criteria categories and thus considers the discussion of organizational profile for further research. A brief description of the criteria categories is given in Table 1. Table 2 provides a brief description of the MBNQA constructs at the dimension level.

Table 1: Brief description of MBNQA categories

Constructs	Description
1. Leadership	Examines how organization's senior leaders guide and sustain their organization, how organizations view their governance system, and how organizations fulfill their ethical, legal, and community responsibilities (NIST, 2008).
2. Strategic planning	Examines how organizations determine their short and long term goals, and how organizations make plans to enhance relationships with customers, suppliers, and partners (NIST, 2008; Prybutok, Zhang, & Ryan, 2008).
3. Customer and market focus	Describes how organizations determine product and service expectations, identify customer groups and market segments, and measure customer satisfaction levels to ensure the continuing relevance of product and service and to develop new business opportunities (NIST, 2008; Prybutok et al., 2008).
4. Knowledge management	Examines organization's selection, gathering, analysis, management, and improvement of data, information, knowledge, and information technology. Also examines how organizations use review to improve their performance (NIST, 2008).
5. Workforce focus	Examines organization's ability to engage, manage, develop, and assess its workforce in alignment with its overall mission, strategy, and action plans (NIST, 2008).
6. Process management	Examines how organizations determine their core competencies and work systems, and how they design, manage and improve their key processes to implement those work systems (NIST, 2008).
7. Results	Examines organization's performance and improvement in all key areas including product and service outcomes, customer-focused outcomes, financial and market outcomes, workforce-focused outcomes, process effectiveness outcomes, and leadership outcomes (NIST, 2008).

Table 2: Brief description of MBNQA dimension level constructs

Constructs	Description
1.1 Senior leadership	The roles and responsibilities of senior leaders in setting and communicating the organization's vision, values and practices to create a sustainable organization (NIST, 2008).
1.2 Governance and social responsibilities	A responsible, informed, and accountable advisory body to protect shareholders' interests, and to fulfill social responsibilities in legal, ethical, and good citizenship manner (NIST, 2008).
2.1 Strategy development	The formulation of strategy and strategic objectives by weighing strategic challenges and advantages (i.e., strengths, weaknesses, opportunities, and threats) (NIST, 2008).
2.2 Strategy deployment	The conversion of strategic objectives into action plan while optimizing the utilization of available resources (NIST, 2008).
3.1 Customer and market knowledge	The process to understand the needs and expectations of current and future customers and markets (i.e., the process to understand the voice of the customer and market) (NIST, 2008).
3.2 Customer relationships and satisfaction	The process to establish customer relationships, and to ascertain customer satisfaction and dissatisfaction in order to retain the current customers, and acquire new customers and new markets (NIST, 2008).
4.1 Performance analysis, review and improvement	Effective selection and use of financial and non-financial data and information to analyze, review, and improve organizational performance with a view toward achieving strategic objectives and to prepare for unexpected organizational or external changes (NIST, 2008).
4.2 Data and knowledge management	The development and management of knowledge assets (e.g., all sorts of data, information, software and hardware) to improve organization efficiency and effectiveness (NIST, 2008).
5.1 Workforce engagement	The mechanism that engages, develops, and assesses an organization's workforce to foster high employee performance and to enable and encourage employees to contribute to the achievement of strategic objectives and organizational sustainability (NIST, 2008).

Continued

Table 2: Continued

Constructs	Description
5.2 Workforce environment	An effective and supportive workforce environment that encompasses standards for workforce safety, health care services, career counseling and development, recreational and cultural activities, benefits packages, formal and informal recognition, nonwork-related education, etc. (NIST, 2008).
6.1 Work systems design	Identification of core competencies, work systems, and key work processes that are critical for creation of customer value, preparation for potential emergencies, and achievement of organizational success and sustainability. Key work processes include processes for innovation, research and development, technology acquisition, supply chain management, outsourcing, mergers and acquisition, global expansion, project management, sales and marketing, etc. (NIST, 2008).
6.2 Work process management and improvement	The implementation, management and improvement of key work processes that are critical for creation of customer value, and achievement of organizational success and sustainability (NIST, 2008).
7.1 Product and service outcomes	Measures of products and service performance such as internal quality measurements, field performance of products, defect levels, service errors, response time, etc. (NIST, 2008).
7.2 Customer-focused outcomes	Measures of customer-related performance such as customer satisfaction and dissatisfaction; retention, gains, and losses of customers; customer complaints, complaint management, effective complaint resolution, and warranty claims; customer-perceived value based on quality and price; customer assessment of access and ease of use; awards, ratings and recognition from customers and independent rating agencies (NIST, 2008).
7.3 Financial and market outcomes	Measures of financial and market performance such as revenues, profits or losses, budgets, cash position, net assets, debt leverage, earnings per share, financial operations efficiency, financial returns, business growth, donations and grants received, percentage of revenues derived from new products, programs or services, etc. (NIST, 2008).
7.4 Workforce-focused outcomes	Measures of workforce-related performance such as increased workforce retention, leader development, workforce training, workforce safety, employee absenteeism, employee turnover, employee satisfaction, employee complaints, etc. (NIST, 2008).

Continued