

**CONTINUOUS IMPROVEMENT CSF FRAMEWORK FOR ASSESSING CI  
MATURITY IN ISO AND NON-ISO CERTIFIED CONSTRUCTION  
CONTRACTING ORGANIZATIONS**

**HASHIMA BINTI HAMID**

A thesis submitted in  
fulfillment of the requirement for the award of the  
Doctor of Philosophy of Technology Management

Faculty of Technology Management and Business  
Universiti Tun Hussein Onn Malaysia

FEBRUARY 2015

## ABSTRACT

Continuous Improvement (CI) is being recognized as key enabler for productivity improvement within the construction industry especially since it was emphasized in the Egan Report in 1998. However, core business processes within the construction industry have not been able to take advantage of this philosophy. Research and development efforts in this area has been lacking in terms of its applications from a construction industry-specific perspective. Attempts to focus on CI through specific TQM and of recent ISO 9000:2000 efforts seem to have had little impact, especially complicated by the unique features of the temporary nature of construction project organizations. It has been identified that construction suffers from delays, cost overruns, rework, variations, claims, poor contract administration and lax supervision by the client's representative. Taking into account that construction projects are unique, temporary and embedded in sub-contracting culture, the task of achieving productivity improvement requires addressing the CI of specific processes. Hence, the first objective of this research is to determine the Critical Success Factors (CSFs) for Continuous Improvement (CI) as a focused independent management tool in the Planning and Scheduling (P&S) of construction projects. 38 Success Factors of CI for P&S of construction projects from literature review were listed and verified using three rounds of Delphi Method This constituted the CI Maturity Assessment Framework that was used to assess ISO and Non-ISO construction organizations. The finding shows that, ISO certified companies exhibit a comparatively correlation with CI maturity level, however not being significant enough than non-ISO companies. Hypotheses testing used to compare both groups, and it was found that 35 out of 38 of the CSFs did not show any significant difference in CI maturity level. Hence, it cannot be claimed that ISO certified organizations fully practice the principles of CI. Finally, a conceptual framework for implementing CI based on The Kaizen Blitz approach is proposed for construction projects to enable rapid performance improvements over short timescales that is suitable considering the various construction projects peculiarities.

## ABSTRAK

Penambahbaikan Berterusan (PB) dikenalpasti sebagai kunci utama peningkatan penambahbaikan dalam industri pembinaan semenjak penekanannya dalam Laporan Egan 1998. Walau bagaimanapun, proses utama industri pembinaan tidak mengambil inisiatif atas kebaikan falsafah ini, manakala usaha kajian dan pembangunan dalam bidang ini juga berkurangan. Fokus PB dalam Pengurusan Kualiti Menyeluruh serta ISO 9000:2000 juga memperlihatkan kesan yang sedikit akibat pengaruh komplikasi unik dan ciri-ciri sementara organisasi pembinaan; disamping pengaruh faktor-faktor lain yang menolong kepada pencapaian pengamalan konsep PB. Bidang pembinaan juga dikenalpasti menghadapi masalah dalam isu kelewatan, terlebih kos, kerja yang berulang, variasi, tuntutan, pengurusan kontrak yang lemah dan juga kelemahan penyeliaan dari wakil klien. Menyedari hakikat bahawa projek pembinaan adalah unik, bersifat sementara dan berselindung disebalik budaya sub kontraktor, kerja untuk mencapai penambahbaikan produktiviti yang meletakkan PB sebagai proses yang spesifik amat diperlukan. Objektif pertama kajian ini adalah untuk mengenalpasti Faktor Kejayaan Kritikal (FKK) bagi PB sebagai faktor tidak bersandar didalam fasa Perancangan dan Penjadualan (P&P) projek pembinaan. Sebanyak 38 FKK PB dikenalpasti melalui kajian literasi dan diverifikasikan melalui teknik Delphi tanpa penambahan sehingga ke akhir pusingan Satu Kerangka Penilaian (CI Maturity) digunakan untuk menilai tahap kematangan PB bagi syarikat yang mempunyai persijilan ISO dan bukan ISO. Hasil kajian mendapati syarikat persijilan ISO menunjukkan perbandingan korelasi yang kuat dengan tahap PB yang dilaksanakan, tetapi ianya tidak menunjukkan signifikan yang kuat. Oleh itu, ujian hipotesis dilakukan dan didapati 35 daripada 38 daripada FKK tidak menunjukkan perbezaan yang signifikan. Ini tidak dapat disimpulkan bahawa syarikat persijilan ISO mengamalkan segala prinsip PB didalam organisasi mereka. Akhir sekali, satu kerangka konseptual yang dipanggil Kaizen Blitz dibangunkan bagi melaksanakan penambahbaikan dalam tempoh yang singkat bersesuaian dengan pelbagai jenis keunikan di dalam projek industri pembinaan

## CONTENTS

<b>THESIS STATUS APPROVAL FORM</b>	<b>i</b>
<b>TITLE PAGE</b>	<b>ii</b>
<b>EXAMINER APPROVAL</b>	<b>iii</b>
<b>THESIS DECLARATION</b>	<b>iv</b>
<b>ACKNOWLEDGEMENT</b>	<b>v</b>
<b>ABSTRACT</b>	<b>vi</b>
<b>ABSTRAK</b>	<b>vii</b>
<b>CONTENTS</b>	<b>viii</b>
<b>LIST OF TABLES</b>	<b>xiv</b>
<b>LIST OF FIGURES</b>	<b>xvi</b>
<b>LIST OF ABBREVIATIONS</b>	<b>xvii</b>
<b>LIST OF APPENDICES</b>	<b>xix</b>
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Introduction	1
1.2 Background of research	2
1.2.1 Malaysian Construction Industry Scenario	
1.2.2 Issues and Challenges in Malaysian Construction Industry	4
1.3 Research Problem	8
1.4 Research Questions	11

1.5	Research Framework	12
1.6	Scope of Study	13
1.7	Research Methodology	14
1.8	Significance of Research	14
1.9	Definition of Terms	16
1.10	Outline of Thesis	18
1.11	Summary	19
<b>CHAPTER 2</b>	<b>CONTINUOUS IMPROVEMENT OVERVIEW</b>	
2.1	Introduction	20
2.2	Concept and Definition of Continuous Improvement (CI)	21
2.3	History of CI	24
2.4	Benefits and Challenges in the Implementation of CI	24
2.5	Contemporary Continuous Improvement Initiatives	26
2.6	CI Maturity Model and Construction Project Performance	38
2.6.1	CI Maturity Model and Continuous Improvement of Construction Project	39
2.7	Rationale for Implementing CI in Planning and Scheduling of Construction Projects	39
2.8	Summary	43
<b>CHAPTER 3</b>	<b>REVIEW ON CRITICAL SUCCESS FACTORS</b>	
3.1	Introduction	44
3.2	Definition of Success Factors (SFs)	45
3.3	Concept of Critical Success Factors (CSFs)	45
3.4	Overview of Project-based Critical	

	Success Factors or Success Factors (SFs) from Previous Research	50
3.5	Development of Critical Success Factors Related to CI in Planning and Scheduling of Construction Projects	55
3.5.1	Research Strategy for the Development of Critical Success Factors Related to CI in Planning and Scheduling	58
3.6	Explanations the Continuous Improvement Success Factors in Planning and Scheduling of construction Projects	60
3.6.1.	Development of Continuous Improvement Systems (CIS)	60
3.6.2.	Development of Performance Measures (PM)	61
3.6.3	Management Review	62
3.6.4	Analysis of processes to identify improvement actions	63
3.6.5	Implementation of improvement process	64
3.6.6	Variation management and activities	64
3.6.7	Variation Control Method	65
3.7	Summary	65

## **CHAPTER 4 RESEARCH METHODOLOGY**

4.1	Introduction	67
4.2	Research Methodology Overview	67
4.2.1	Philosophical Considerations	68
4.3	The Qualitative Research Component	73
4.3.1	Introduction of Methodology for Delphi Study	73
4.3.2	Why Delphi Study Methodology?	76
4.3.3	Procedure for Selecting Experts	80
4.3.3.1	Delphi Experts	81
4.3.4	Application of the Delphi Study Process	82
4.4	The Quantitative Research Component	83

	4.4.1	Sampling Design Process	83
	4.4.2	Selection of Research Respondents	84
	4.4.3	Sample Size	84
	4.4.4	Statistical Procedures	85
	4.4.5	Independent Sample t-test	85
	4.5	Summary	87
<b>CHAPTER</b>	<b>5</b>	<b>IDENTIFICATION OF CRITICAL SUCCESS FACTORS USING DELPHI TECHNIQUE</b>	
	5.1	Introduction	89
	5.2	Purpose of CSFs by Using Delphi Approach	89
	5.3	Structured Questions for Delphi Technique	90
	5.4	Data Analysis Procedures and Results of Delphi	96
	5.5	Summary	106
<b>CHAPTER</b>	<b>6</b>	<b>IDENTIFICATION OF CONTINUOUS IMPROVEMENT MATURITY LEVEL USING QUESTIONNAIRE SURVEY</b>	
	6.1	Introduction	107
	6.2	Questionnaire Survey Structure	107
	6.3	Pilot Study	109
	6.3.1	Reliability Test of Pilot Study	110
	6.3.2	Analysis Data of Pilot Study	111
	6.4	Questionnaire Survey Feedbacks Data Analysis	113
	6.5	Demographic Involved in Questionnaire Survey	122
	6.6	Ranking of Critical Success Factors	123
	6.7	CI Maturity Level of ISO and Non-ISO Certified Contracting Organizations	125
	6.8	Results of Independent Sample t test	145

6.9	Summary	151
<b>CHAPTER 7</b>	<b>DEVELOPMENT OF CONCEPTUAL CI MATURITY FRAMEWORK</b>	
7.1	Introduction	152
7.2	Rationale for Developing the Conceptual CI Maturity Framework	152
7.3	Proposed CI Maturity Framework Design	154
7.3.1	The Design of the Proposed CI Maturity Conceptual Framework	158
7.4	Summary	165
<b>CHAPTER 8</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	
8.1	Introduction	166
8.2	Summary of Main Findings	166
8.3	Contributions of Research	171
8.4	Limitations of Research	173
8.5	Research Assumptions	173
8.6	Recommendations for Further Research	174
8.7	Concluding Remarks of The Research	175
	<b>REFERENCES</b>	<b>176</b>
	<b>APPENDIX A: STATISTIK KESELURUHAN PROJEK PERUMAHAN BERMASALAH (LEWAT DAN SAKIT) SEHINGGA 30 JUN 2011</b>	<b>211</b>
	<b>APPENDIX B: COVER LETTER FOR DELPHI STUDY</b>	<b>212</b>
	<b>APPENDIX C: FIRST ROUND DELPHI STUDY</b>	<b>213</b>
	<b>APPENDIX D: SECOND ROUND DELPHI STUDY</b>	<b>219</b>



<b>APPENDIX E: THIRD ROUND DELPHI STUDY</b>	<b>239</b>
<b>APPENDIX F: QUESTIONNAIRE SURVEY</b>	<b>244</b>
<b>APPENDIX G: EXAMPLE EVIDENCE OF ACCEPTANCE AS PANEL EXPERT</b>	<b>254</b>
<b>APPENDIX H: RELIABILITY TEST FOR PILOT STUDY</b>	<b>255</b>
<b>APPENDIX I: EXAMPLE RESULT OF INDEPENDENT SAMPLE T TEST</b>	<b>258</b>

**VITA**

## LIST OF TABLES

1.1	Number of Establishments, and Employment by Size Group	4
1.2	Construction Personal Registered With CIDB	6
1.3	Research Questions and Objectives	11
2.1	Useful Tools/Techniques for Improvement	36
2.2	Examples of Continuous improvement projects	37
3.1	Problems with CSFs	47
3.2	List of Critical Success Factors on Finished Project in the United States of America	51
3.3	Summary of Critical Factors and Sub-factors for Different Project Objectives	51
3.4	Key Components of a Continuous Improvement Process	56
3.5	List of CSFs and Sub-factors for CI of Planning and Scheduling of Construction Projects	58
4.1	Contrasting features between paradigms	69
4.2	Research Methods Used for CSFs Identification	76
4.3	Comparison of Traditional Survey with Delphi Method	79
4.4	Combination Statistical Test and Information Used in Study	85
5.1	Panel of Expert for Delphi Method	90
5.2	Projects Involved by Panel Experts of Delphi Study	92
5.3	List of Critical Success Factors and Sub-factors for First Round Delphi Study	95
5.4	Cut-Off Scale	97
5.5	Results 1 <sup>st</sup> Round of Delphi Study	97
5.6	Interpretation of Mean Score for each Success Factors	100
5.7	Result of 2 <sup>nd</sup> Round Delphi Study	101

5.8	Result of 3 <sup>rd</sup> Round Delphi Study	104
6.1	Respondent's Demographic in Pilot Study	110
6.2	Cronbach's Alpha for Pilot Study	110
6.3	Analysis of Critical Success Factors from Pilot Study	111
6.4	Percentage, Grade and Description Level of Continuous Improvement Maturity	114
6.5	CI Ability and Changes of Constituent Behaviors	115
6.6	CI Maturity Level	118
6.7	ISO and Non-ISO Certified Companies Involved in the Survey	122
6.8	Mean Score Rank Value	123
6.9	Frequency of Point Score for each Critical Success Factors	125
6.10	Frequency of CI Maturity Level of ISO and Non-ISO Certified Contracting Organizations	128
6.11	Percentage, Grade and Description for Each CI Maturity Level of According to Critical Success Factors	131
6.12	Summary of Independent sample t test result	146
6.13	Summary of results from Independent sample t test between ISO Non-ISO Certified Contracting Organizations	148
7.1	Initial PDCA Approach of the Proposed CI Maturity Conceptual Framework	158

## LIST OF FIGURES

1.1	Research Framework	12
2.1	Evolution of QMS	21
2.2	Processes of Continuous Improvement	23
3.1	Juran's Triple Role Concept for On-Site Construction Activity Process	57
4.1	Breadth and Depth of Study	70
4.2	Research Design	72
4.3	Decision Tree for Determining that t Test Is The Correct Statistic	87
5.1	Years Experiences of Panel Experts	91
6.1	The Five Stages of Maturity in the CI Maturity Model	115
6.1.1	Respondents involved in the survey according to the grade of contractor	122
6.3	Frequency of CI Maturity Level of ISO Certified Contracting Construction Organization	130
6.4	Frequency of CI Maturity Level of Non-ISO Certified Contracting Construction Organization	130
7.1	PDCA Approach	154
7.2	Framework for Problem Solving	155
7.3	PDCA Process Improvement of Framework for Problem Solving	156
7.4	The Continuous Improvement Flow Chart (PDCA)	156
7.5	CI Maturity Framework for P&S of Construction Projects	164
8.1	CI Kaizen Blitz Implementation in Achieving High Performance P&S of Construction Projects	171

## LIST OF ABBREVIATIONS

AHP	-	Analytical Hierarchy Process
BS	-	Balance Scorecard
CENTRIM	-	Centre for Research in Innovation Management
CI	-	Continuous Improvement
CIDB	-	Construction Industry Development Board
CIMP	-	Construction Industry Master Plan
CINET	-	Continuous Improvement Network
CIRCA	-	Continuous Improvement Research for Competitive Advantage
CONQUAS	-	Construction Quality Assessment
CPM	-	Critical Path Method
CSFs	-	Critical Success Factors
DMAIC	-	Define, Measure, Analyze, Improve, and Control
DRIVE	-	Define, Review, Investigate, Verify and Execute
DRIVE	-	a framework for a structured approach to problem solving
EFQM	-	European Foundation Quality Management System
FKK	-	<i>Faktor Kejayaan Kritikal</i>
G6	-	Grade 6
G7	-	Grade 7
ISO	-	International Standard Organizations
JIT	-	Just In Time
KAIZEN	-	Japanese Philosophy for Continuous Improvement and pronouns as <i>Kai Zen</i> .
KCs	-	Key Characteristics
P&P	-	<i>Perancangan &amp; Penjadualan</i>
P&S	-	P&S
PDCA	-	Plan-Do-Check and Act

PDPC	-	Process Decision Programme Chart
PhD	-	Doctor of Philosophy
PM	-	Performance Measurement
QA	-	Quality Assurance
QC	-	Quality Control
QLASSIC	-	Quality Assessment in Construction
QM	-	Quality Management
QMS	-	Quality Management System
SFs	-	Success Factors
SPSS	-	Statistical Package for Social Science
TQM	-	Total Quality Management
UK	-	United Kingdom
UTHM	-	Universiti Tun Hussein Onn Malaysia

## LIST OF APPENDICES

A	<i>Statistik Keseluruhan Projek Perumahan Bermasalah (Lewat dan Sakit) Sehingga 30 Jun 2011</i>	211
B	Cover Letter for Delphi Study	212
C	First Round Delphi Study	213
D	Second Round Delphi Study	219
E	Third Round Delphi Study	239
F	Questionnaire Survey	244
G	Example Evidence of Acceptance as Panel Expert	237
H	Reliability Test for Pilot Study	255
I	Example Result of Independent Sample t test	258

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

The construction industry is often criticized for its poor level of productivity and performance, the Malaysian Government has also emphasized on the need to improve the level of productivity, which is notably highlighted within the Construction Industry Master Plan (CIMP) as one of the main five thrusts. These ongoing efforts by the Malaysian Government are however primarily focused on the aspect of using cross-industry continuous improvement (CI) methodology. However, due to the specific peculiarities within the construction industry, such as project-based, unique and temporary project organizations, as well as that of being fragmented with a sub-contracting culture, it is important to explore CI approaches that are more relevant and industry-specific. It is within this context that it is found to be of importance to identify the critical success factors of continuous improvement for particular key processes of the construction project. This chapter provides an outline of the area of research, specifically with respect to critical success factors (CSFs) of the continuous improvement aspect of construction planning and scheduling. It is without doubt that planning has always been a theme when it comes to improvements of productivity in all businesses, and the construction industry is no exception.

The potential to enhance productivity and performance is critical to any organization's success. Hence, organizations are attempting to implement various methodologies and techniques, both from a short-term and long-term basis, to ensure



their success. Amongst many such methodologies and techniques, such as six sigma, balanced scorecard approach etc., CI is one such methodology or technique. CI is considered a fundamental element for organization success, as it consists of eliminating defects, reducing waste, managing production time and improving productivity and performance.

## **1.2 Background of research**

The construction industry of any country is the backbone of its infrastructure and economy. It is one of the largest industries and is regarded as one of the main contributors towards a country's economy (Ngai et al., 2002); and contributes to about 10-11% of the gross national product (GNP) in industrialized countries (Navon, 2005; Meiling, 2010). Construction industry is an important sector in the economy, not just because it directly provides input-driven growth to the GDP, but more importantly, helps other sectors contribute to GDP (CIDB Malaysia, 2007). The construction industry enables the growth of other industries through its role as a fundamental building block of the nation's socio economic development. Educational institutions, government offices, some tourist attractions, transportation infrastructure (airports, seaports, roads), housing, commercial property – all the essential elements of a healthy, functioning economy, need to be built and maintained by the construction industry. Besides, enabling socio-economic development, construction activities generate tremendous spillover opportunities. It contributes to the growth of other industries in its role as a large user of manufactured goods (building materials, iron, steel, etc.) of specialized tooling and heavy machinery and the financial services sector.

The construction industry is unique, fragmented in nature and involves extraordinary diversity of professions, specialists and suppliers. The image related to construction industry has traditionally been one that is noted to place poor emphasis on productivity improvements; either through technology, people or process enhancement. It is pointed out by Wan Mahmood et. al, (2006) and Aktas et al, (2012), that many

criticisms have been faced by the construction industry with respect to issues related to workmanship performance, construction processes, complexity due to the many sub-organizations involved, the poor handling of materials on site, issues related to quality systems implementation, safety etc.

## **12.1 Malaysian Construction Industry Scenario**

Within the Malaysia context, the construction industry contributes significantly to the economic growth of the country. The types of construction projects, consists of a wide spectrum ranging from residential, commercial to infrastructure. The construction industry has contributed approximately 3.3% of the country's gross domestic product (GDP) value in 2012, with a forecasted 11.2% growth in the subsequent year (Department of Statistics Malaysia, 2012a). The labour force serving the construction industry also accounts for approximately 9.2% of the country's total labour force in 2011 (Department of Statistics Malaysia, 2012b). Given this, under the Tenth Malaysia Plan (2011-2015), the Ministry of Works plans to inject an estimated RM 138 billion (approximately US\$46 billion) to enhance the long term growth of the construction sector (CIDB Malaysia, 2010). It is estimated that there will be 52 high impact projects worth RM67.2 billion (Euro 16.8 billion) that will be implemented via privatization or public-private partnership agreements. Some of the projects to be considered in the pipeline are toll highways, coal fired power plants, rail projects, airports expansion, public housing, development of the Malaysian Rubber Board land (3,300 acres), setting up of hospitals and university campuses, development of a 'Media City', development of integrated transport terminal and privatization of a sea port. (RHB Invest, 2010). One such example under this plan is the Mass Rapid Transit (MRT) system, which costs over RM40 billion with an estimated demand for up to 130 000 construction workers of various trades.

The construction companies in Malaysia consists of mainly contractors of varying grades based on contract sum range of licenses, specialist contractors,

architectural and engineering consultant companies, and other related consultancies. The size of the companies in terms of personnel does vary to a great extent. Based on the Report on Survey of Construction Companies (Malaysian Statistics Department, 2009), a total of 34.6% [206,080 employees] of the total employees fall under the employment size group of 100-499. This is followed by the group employment for 1,000 and above accounting for 26.8% [182,302 employees]. However, most establishments i.e. as many as 78.6% [4,355 establishments] have employees of below 100 persons but only contributed 22.4% [RM 13.9 billion] of overall gross output compared to 1,188 establishments in the group size of more than 100 persons who contributed 77.1 % [RM 46.8 billion] gross output and 77.6% (461,980 employees) of total employment as shown in Table 1.1.

Table 1.1: Number of Establishments, and Employment by Size Group 2007  
(Source: Report on Survey of Construction Companies: Department of Statistics  
Malaysia, 2009)

Employment size Group	Establishments	Total Employment
<100	4355	133,159
100-499	976	206,080
500-999	140	96,457
≥1000	72	159,443
Total	5543	595,139

### 1.2.2 Issues and Challenges in Malaysian Construction Industry

Despite its growth and healthy contribution to the GDP, the Malaysian Construction Industry is under constant pressure to improve its performance, productivity and intention to increase efficiency in construction projects (Erikshammar et al., 2010). According to the Construction Industry Development Board (CIDB) of Malaysia, the

general perception regarding the Malaysian construction industry as a whole is that it is underachieving, with many issues such as poor communication and adversarial attitude contributing to inefficient and ineffective construction practices, payment defaults, construction delays, cost overruns, and disputes (CIDB, 2009).

CIDB in Malaysia has been set up since 1994. It is a statutory body under Minister of Works, Malaysia. Established in July 1994 to coordinate all activities in the construction industry and increase its competitiveness. Specifically:

- To coordinate the needs and wants of the construction industry;
- Planning the direction of the construction industry;
- Addressing the pertinent issues and problems faced by the construction industry;
- Making recommendations in the formulation of policies for the construction industry.

One of the specific functions of CIDB is to promote and stimulate the development, improvement and expansion of the construction industry, and in so doing often the approach has been to address issues from three fundamental perspectives, i.e. people, technology and process.

#### **a) People Perspective**

Currently, the Malaysian construction sector is still hugely dependent on the services of unskilled foreign, which further complicates the attempts to improve the image of the industry, as it resorts to the use of cheaper foreign labour whilst it is widely acknowledged that ‘cheaper does not mean better’. Due to the availability of employment opportunities, foreign workers have been transferring an estimated RM5.0 – RM6.0 billion out of the country on an annual basis. From a people perspective, an inconsistent foreign workforce has critically, undermined efforts at a national level to develop a permanent and highly productive local workforce (CIDB, 2009). It has been reported that this phenomenon is affected by local citizens who are not interested in involving themselves in the construction sector due to an unattractive payment structure and service terms that do not guarantee job security. On an annual basis, CIDB has been training an average of 20,000 local construction workers and youths as an effort to

reduce the need on foreign workers. However, its efforts have been impeded by the availability of more job opportunities in other sectors. In construction sector, there are about 312,573 foreign workers. This number makes up 41.2% out of the total number of work force in construction. In 2008, the cumulative number of construction personal registered with CIDB rose by 13.0% to 934,590 under various categories. Out of this total, 709,724 personal [75.9%] were local construction personnel, whereas the rest were foreign construction personnel as shown in Table 1.2.

Table 1.2: Construction Personal Registered With CIDB (Source: CIDB Malaysia, 2009)

Category	2004	2005	2006	2007	2008
Construction Worker	249,389	298,647	356,385	419,951	487,956
Semi-skilled Worker	29,878	34,165	38,161	42,293	43,989
Skilled Worker	94,274	101,242	111,087	123,460	129,234
Construction Site Supervisor	54,806	58,374	628,68	73,017	77,234
Construction Manager	37,705	40,067	43,593	48,503	51,755
Administration Personnel	51,271	65,776	89,587	119,616	144,422
Total	517,323	598,271	701,681	826,840	934,590

There is considerable skills training being provided in an ongoing process by CIDB, however this does not seem to have impacted much in terms of increased productivity.

#### b) **Technology Perspective**

The current level of technology application is viewed from the extent of mechanization of the production process. Various efforts are being undertaken to spur the construction industry towards higher productivity through the use of more efficient technology. One such attempt is the incentivization programme for the use of industrialized building systems (IBS). It has been identified that there is a rather slow uptake of IBS within the industry, main reasons being attributed to that of increased costs and lack of an integrated value chain (Abd. Shukor A.S. et. al. 2011)

### c) **Process Perspective**

Amongst the three perspectives of people, technology and process: the aspect of 'process' has often been tackled in the least vigorous manner in most industries. This seems to be the case of the construction industry as well. There are some attempts by CIDB to address this problem. However, most of the initiatives are based on ensuring quality of the finished product, for example in the use of QLASSIC. Hence, the aspect of process is often placed within the scope of general management theory and practice. However, it is contended in this research as being a fundamental flaw, as clarified below; requiring a rather different and more industry-specific approach to deal with the issue of improving productivity by working on enhancing key production processes.

The construction industry in Malaysia is rather complex. Kamar (2011), remarks that the project complexity has increased due to extant of scope, requiring fragmented parties around the world to communicate with one another for efficient project execution. The complexity of projects is reflected by the large number of specialists who contribute to the decision-making process. In this regard, the fragmented construction industry retards the development of industry-wide information and knowledge sharing because most of the time, planners, architects and designers interact only minimally among themselves and none benefit from the experience of others (Bahtiar, 2011).

Furthermore, it is noted by Gao and Pheng, (2013) that the diffusion of construction activities amongst so many parties and enterprises in so many diverse segments, each of which pursuing diverse specific and tangible goals, reduces the ability to focus on improvements. Additionally, recent literature indicates that construction projects continue to be often completed with extended schedules, large cost overruns and quality concerns. As highlighted in the Sunday Times (2007), construction industry has numerous weaknesses in the delivery system resulting in excessive cost overrun and quality deficiencies in the final output.

Thus, the current situation necessitates a comprehensive framework to ensure that a strong foundation will be laid and that construction players will be well positioned to compete globally. Following the recommendations of the CIMP and related literature (CIMP,2005; Abdul Razak et al, 2010), the critical success factors are viewed as the

elements that are imperative to the success of the achievement of the strategic thrusts and strategies of the CIMP, however serious efforts towards such initiatives from the process perspective seems to be lacking. It is noted by Al-Moumani (2000), that in order to successfully execute construction projects and keep them within estimated cost and prescribed schedules and thus avoid facing the traditional problems identified with the poor image of the industry a methodology with sound engineering judgment is required that can lead to a proper planning and scheduling process. It is recommended that factors for ongoing improvement in the successful completion of projects be investigated thoroughly, particularly those that affect the project success, and structured attempts be undertaken to overcome the problems.

### **1.3 Research Problem**

It has been identified that construction suffers from delays, cost overruns, rework, variations, claims, poor contract administration and lax supervision by the client's representative (Chini and Valdev, 2003). A reliable construction industry in terms of high productivity and performance can provide the basis for sustaining strong economic growth. However, large-scale engineering and construction projects have traditionally dominated the subject of project management and implementation. According to Pinto (1986), the project management process is complex, usually requiring extensive and collective attention to a broad aspect of human, budgetary and technical variables. Projects possess a specialized set of critical success factors, which if addressed and attention given, will improve the likelihood of successful implementation. On the other hand, if these factors were not taken seriously, it might lead to failure in managing the project, hence this will cause to the problem of delays and effect many problems like cost overrun, disputes, arbitration, litigation, and total abandonment (Sambasivan and Soon, 2007).

Nowadays, the construction industry in Malaysia is facing critical problems, especially in terms of delay in the completion of projects (see Appendix A). Even

though the projects have already been completed, there still exists problems of safety, quality and esthetic values (Othman, 2006). This is evident from increasing building defects and issues on quality of product and service occurring in Malaysia. For instance, the case of the MRR2 (Middle Ring Road 2), whereby it was forced to be shut down because of cracks found on its piers. Another example would be the cracking and settlement of various newly constructed schools and computer laboratories which was a big national issue (Othman, 2006). One of the main reasons for this problem was identified as the failure in the monitoring and controlling process. Additionally, numerous government reports have criticized the industry's poor performance, especially in terms of productivity, quality and quality systems (Ali Azlan, and Rahmat,Ismail, 2010).

There have been many attempts to improve quality performance in the construction industry. However the attempts have often been focused on the outcomes, rather than the process. Although the construction industry has applied various techniques and tools for achieving quality improvement, there has been very little attention focused on developing sustainable approaches such as “Continuous improvement (CI). However, taking into account recent developments within industry regarding the emphasis on CI, it is evident that this concept is being incorporated within many organization-wide initiatives, such as ISO. By embodying continuous improvement worldwide, ISO has opened the door for all types of firms all over the world to begin their journey to excellence performance. However, as stated by Stankard, (2002) “ ISO .. **alone** is insufficient to achieve durable competitive advantage and high performance.. it's scope is too narrow.”

CIMP 2006-2015 has stressed out the various issues facing the Malaysian Construction Industry and identified CI as one of the important mechanisms in order to achieve successful implementation of the seven thrust of the CIMP. Attempts to focus on CI through specific TQM and the recent ISO 9000:2000 series efforts seem to have had little impact; especially complicated by the unique features or peculiarities of the



temporary nature of construction project organizations and some additional peculiarities of construction projects that has always been debated amongst researchers as being the major constraints in efforts to sustain the CI practice as undertaken in other major industries (Koskela, 2005).

In this respect, all these peculiarities influence the current implementation and practice of CI concept - as is currently being attempted, which is based on the similar approach as that within other major industries. The most current is the use of business excellence approach (EFQM, 2003) as a 'generic process' application approach. The traditional methodology or technique in the use of the CI concept as a wholly dynamic process for construction contracting organizations is clearly a problem. Working from a traditional CI perspective involves the complete assumption of being CI being amendable to cross-cultural adoption of its principles through a generic methodology. This is a problem for construction contracting organizations as they are bound by contracts and generally work to satisfy requirements spelt out within the specific contract. They are generally not motivated to initiate improvements beyond requirements. A notable feature of this problem is within the Planning and Scheduling (P&S) phase of the project. Extant literature search on the application of the CI methodology with respect to the P&S phase in the construction industry has not resulted in any success.

This scenario, gives the impression that there is no continuous improvement concept or lesson learnt within the industry within the P&S phase of the project, which is clearly a critical phase in the successful delivery of construction projects. Additionally, attempts to identify previous research on key factors for the successful undertaking of the P&S process of construction projects has also not resulted in any success. Hence, this research focuses on identifying an approach to tackle the above issues related improving productivity within construction projects, which is to focus on CI of particular key processes of the construction project delivery process. Hence, requiring the identification of the Critical Success Factors (CSFs) of Continuous Improvement for construction projects in Malaysia, particularly that of the P&S process and hence develop a mechanism to enable construction project practitioners to undertake and sustain the practice of CI.

## 1.4 Research Questions and Objectives

It is clear that the Malaysian Construction Industry is currently facing certain critical challenges in having to improve its image, one of it is very low level of productivity, with associated delay and quality issues, rework and cost overrun. Hence, this research seeks to answer the following research questions on CI for the customized construction project planning and scheduling process in the Malaysian Construction Industry context as shown in Table 1.3 below.

Table 1.3: Research Questions and Objectives

Research Questions	Objectives
<p>RQ1: What are the factors related to continuous improvement of the planning and scheduling (P&amp;S) of construction projects in Malaysia?</p>	Determine the CSFs of CI for Planning and Scheduling of construction projects
<p>RQ2: How are these P&amp;S success factors correlated to the level of CI within the ISO and non-ISO certified construction contracting organizations?</p>	Study the level of CI implementation in ISO and non-ISO certified construction contracting organizations according to Planning and Scheduling Critical Success Factors (CSFs).
<p>RQ3: Does the P&amp;S Success Factor of CI Maturity level amongst ISO and non-ISO certified construction contracting organizations differ from each other?</p>	Compare difference of CI Maturity Level between both ISO and non-ISO certified construction contracting organizations in Malaysia based on Planning and Scheduling CSFs.
	Develop and structure a Framework for effective CI implementation focused in achieving high performance 'Planning and Scheduling' of construction projects.

## 1.5 Research Framework

A conceptual framework is the system that consists of concepts, assumptions, expectations, beliefs, and theories that supports and informs about the research and it also is a key part of the research design (Miles & Huberman, 1994; Robson, 2002).

Figure 1.1 illustrates the way in which a framework assists in conceptualizing the relationship between a range of activities of this study to achieve the research objectives based on the concepts reviewed and methodology used.

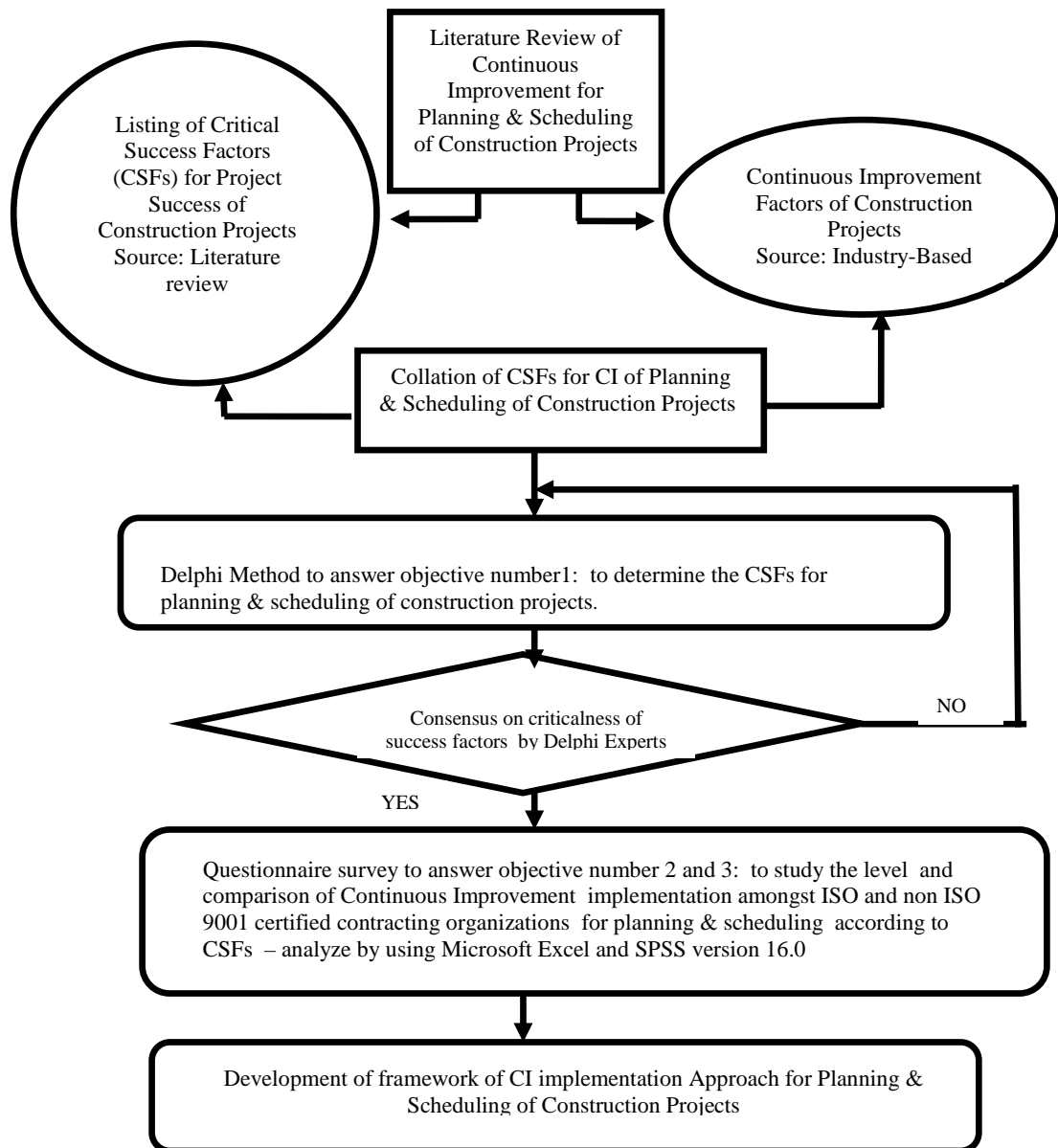


Figure 1.1: Research Framework

## 1.6 Scope of Study

This research is focused on contractors throughout peninsular Malaysia. However, the population of study is scoped to G6 and G7 contractors.(construction organizations). This is due to the fact that the majority of construction contracting companies that are ISO accredited in Malaysia belong to the G6 and G7 CIDB category. Additionally, as the ISO accredited companies are deemed to have a continuous improvement practice based on the ISO 9001:2000 series, hence this was used as a logical population from which the sample of respondents was finally chosen (purposeful sampling).

The G6 and G7 contractors are assumed as belonging to the category of Large Contractors (taken as the research population). Hence, based on there being eighteen (18) G6 and two hundred (200) G7 ISO registered contractors at the time of the data collection process, the approach was to have a total sample size of 200 ISO and 200 non-ISO construction contracting organizations as the target sample. Hence, this research is primarily focused on higher grade (G7 and G6) construction contracting organizations who act as main contractors in construction projects.

The main thrust of this study is to investigate the implementation of Continuous Improvement according to the CSFs of CI for both ISO and non-ISO certified contracting construction organizations in Malaysia. Additionally, it is anticipated that such large organizations would have in place a more systematic system and organization structure in order to provide the opportunity for exploring the issues of CI, and larger organizations such as G6 and G7 would be more appropriate to be the focus of study.

Finally, the construction phase that is focused on and explored in this research is the Planning and Scheduling (P&S) phase. The P&S process is of paramount importance for the success of construction projects and it impacts on all activities from concept to project completion.

## 1.7 Research Methodology

Basically this study involved a combination of quantitative and qualitative methods. It is noted by Creswell (2006) that in attempting to achieve quality data, the use of multiple expert views, theories, methods, and empirical materials, the researcher can hope to overcome the weakness or intrinsic biases and the problems that come from single method, single-observer and single-theory studies.

In this study, three rounds of Delphi were undertaken to achieve the first objective, which is to determine the SFs for CI of P&S. Based on the Delphi Study findings, a structured questionnaire with five point scoring system was designed to determine the CSF of CI implementation amongst construction contracting organizations. In order to achieve objective two and three,; a set of questionnaires were distributed to both G6 and G7 grade of contractors organizations consisting of ISO and non-ISO certified companies. The data collected was also used to compare mean between the groups (ISO and non-ISO) by using independent sample t-test. The data was analyzed with the aid of SPSS package version 16.0 and Microsoft Excel 2003. Finally, a framework for CI for planning and scheduling for construction projects was developed based on the CSFs determined from the first objective.

## 1.8 Significance of Research

It is without doubt that the concept of Continuous Improvement (CI) implementation in P&S of construction projects is very important. It ensures that the organizational structure of the company complements and supports the people, process, technology, roles and responsibilities and that they can work in conformity with the concept of CI more efficiently. In a certain sense it helps to embed elements of the *culture of excellence* within the organization.

Kang (2004), stated that Continuous Improvement obviously is a 'process' by itself in an organization This being the case, the importance of having a clear

understanding of the critical aspects of CI for P&S and how to achieve higher maturity is of primary importance to any organization that wishes to be competitive and successful. As noted by Kang (2004), this concept of CI, if correctly implemented, can help construction contracting companies improve their process cycle times, reduce resource consumption, increase reliability of the process and improve the quality of the project. According to Rummler and Brache (1995), process accounts for about 80% of all problems, while people account for the remaining 20%.; hence by focusing on the CI process in a customized process orientation, the organization should be able to reduce most of its problems in attempting to have effective P&S practice.

The determination of the Critical Success Factors (CSFs) of CI for P&S of construction projects through Delphi Study for achieving the first objective is significant for all construction organizations as it provides a clear indication of the few key factors that organizations should focus on in order to be successful. By identifying the CSFs, it could allow organizations to focus on their efforts on building their capabilities to meet the necessary requirements in P&S. Although the focus of the research has been the larger construction contracting organizations, the analysis acquired from this objective provides the awareness of what are the CSFs of CI for P&S of construction projects as a whole.

The attempt to accomplish objective two and three provides the empirical verification of the level of CI maturity for ISO and non-ISO certified construction organizations in terms of planning and scheduling in the Malaysian Construction Industry context. This will provide the realization of having to focus on CI in a more specific sense rather than to rely on ISO guidelines as a satisfactory means leading to satisfactory CI practice. Through consistent efforts of using the CI framework, it can provide the individual organizations an approach on how to focus on implementing improvement according to CSFs for CI for construction projects. For example from the quick use of the CI maturity level measurement instrument (current research instrument), even sub-contractors would know which level of CI for P&S that they are at currently and can aim to continuously improve their practices of P&S in their construction projects. This concept of CI as proposed in this research, is that of Kaizen-Blitz, that is to focus on improvements to be undertaken in short periods of time, that is

logically the practical form of CI that can have significant results on construction projects and contribute to the body of knowledge (Chapter 7).

## **1.9 Definition of Terms**

### **a) Continuous Improvement (CI)**

Boer et al., (2000) define CI as “..the planned, organized, and systematic process of ongoing, incremental and company-wide change of existing culture aimed at improving company performances.” CI in this research will be defined as ‘an effort to continuously seek and make change(s) for the better through processes which can be characterized as either incremental or radical transformation and maintain the results.

### **b) Planning and Scheduling**

Planning is the way to organize and sequence the tasks needed to accomplish a goal. Whilst, Scheduling is the development of time requirements for each operation, and the relating of each to calendar time (Weber 2005).

In this case, Planning and Scheduling is defined as the way to organize and sequence all the tasks needed to accomplish a goal by scheduling all the time requirements for each operations and relating each to calendar time.

### **c) ISO 9001:2000 certified**

ISO 9001:2000 certified refers to a company or organization that has been independently audited and certified to be in conformance with ISO 9001 may publicly state that it is "ISO 9001 certified" or "ISO 9001 registered" (SIRIM, 2009)

d) Construction Industry

The construction industry is defined in various ways, depending on an individual's point of view. Construction is generally described as the activities of the creation of physical infrastructures, superstructures and related facilities (Wells, 1985). According to Nam and Tatum (1988), construction is referred to as all types of activities associated with the erection and repair of immobile structures and facilities. Industry on the contrary is a group of related economic activities classified according to the type of goods or services supplied (Abdullah, 2008).

e) Critical Success Factors

According to the definition by Leidecker and Bruno (1984), CSFs as “those characteristics, conditions, or variables that when properly sustained, maintained, or managed can have a significant impact on the success of a firm competing in a particular industry.”

Hence, in this study, CSFs is defined as those few things or variables that must go well to ensure success of processes and/or services in organizations to achieve it's aim.

f) Main/Large contractor

Business Dictionary defines Main contractors is an alternative term for prime contractors; they have a contract with the owner of a project or job, and have the full responsibility for its completion. A prime contractor undertakes to perform a complete contract, and may employ (and manage) one or more subcontractors to carry out specific parts of the contract.



The main or large contractor in this study is a contractor who is responsible to oversee all aspects of the project from planning, cost control to project managing.

g) High performance

In this study, high performance means as a notion of extra-ordinary outcomes of work being achieved through extra-ordinary contributions by people that continually aligns organization's strategy, goal objectives and internal operations with the demands of its external environment and relies upon a high degree of commitment, creativity, knowledge and skill.

h) Key Characteristic

A feature of a material, process, or parts (including assemblies) whose variation within the specified tolerance has a significant influence on process of life cycle of project management.

## **1.10 Outline of Thesis**

This thesis is organized into eight chapters. A brief explanation of each chapter is given below.

Chapter One serves as an introduction to the research study. This chapter provides a brief note about the issues of construction industry in Malaysia related to the scope of the research. Subsequently, it looks into issues regarding to success factors implement of continuous improvement (CI) in order to overcome the construction industry problems that cause and effect by improper managing construction project planning. The background research, research questions, significance of the research, and scope of research are also included in this chapter.

Chapter Two explores the literature review pertaining to continuous improvement implementation. It also presents an earlier research work on CI; CI in construction industry; and key areas of concern within the scope of the research. In addition, this chapter also describes several models in terms of CI which serves as a foundation of the research.

Chapter Three examines some of the CSFs for implementing CI that has been undertaken by past researchers which is adapted for this research and confirmed through a Delphi Study. The Delphi questionnaire designed primarily based on the output of relevant literature review.

Chapter Four discusses the overall research methodology: the sampling process; data collection; the research design; Delphi method; questionnaires survey; and the statistical tools used in this research work.

Chapter Five presents the identification of critical success factors using Delphi Technique. It describes the purposed of CSFs; structured questions and the findings of Delphi study.

Chapter Six presents the identification of continuous improvement maturity level using questionnaires survey. It provides the questionnaire survey structure, reliability test and analysis of pilot study. This chapter also presents the results of the questionnaire survey analysis including demographic characteristics of the respondents and their companies, and also presents a discussion on the results of survey findings.

Chapter Seven presents the development of the proposed Critical Success Factors of CI framework including the rationale for developing the framework; flow of the processes and the framework design itself

Chapter Eight presents the conclusion of this research. The suggestions for future research in the area of Continuous Improvement for Planning and Scheduling of Construction Projects are also highlighted.

## **1.11 Summary**

This introductory chapter has outlined the background of the research topic, the problem statement, research questions, objective, and the significance of the research. A basic explanation of the methodology is provided and finally an outline of the thesis is presented.

## **CHAPTER 2**

### **CONTINUOUS IMPROVEMENT OVERVIEW**

#### **2.1 Introduction**

Continuous Improvement (CI) has become common in many companies in developed countries. The word indicates a process of incremental improvement of the standard way of work (Chen et al, 2000). It is a compound word involving two concepts: KAI (change) and ZEN (for the better) (Palmer, 2001). The concept of CI has received much attention with respect to being key to Japan's competitive success. A considerable number of studies, which have focused on Japanese management techniques have illustrated the importance of KAIZEN. Furthermore, studies of KAIZEN activities in different countries suggest that the concept of KAIZEN has become routinely accepted throughout the world (Aoki, 2008). Over the past decade, CI has been studied from many perspectives. Hence, this chapter is to highlight the various perspectives from the literature, and to document the significant findings from earlier research that will serve as the foundation for the current investigation. This chapter presents an overview of continuous improvement and covers all the important aspects of CI in order to provide a deeper understanding of the concept.

According to Mat Naim, (2005), CI is the latest evolution in quality management; starting from inspection, then to quality control, quality assurance, quality management and finally continuous improvement. This is similar to Figure 2.1, which illustrates the level of sophistication of quality systems.

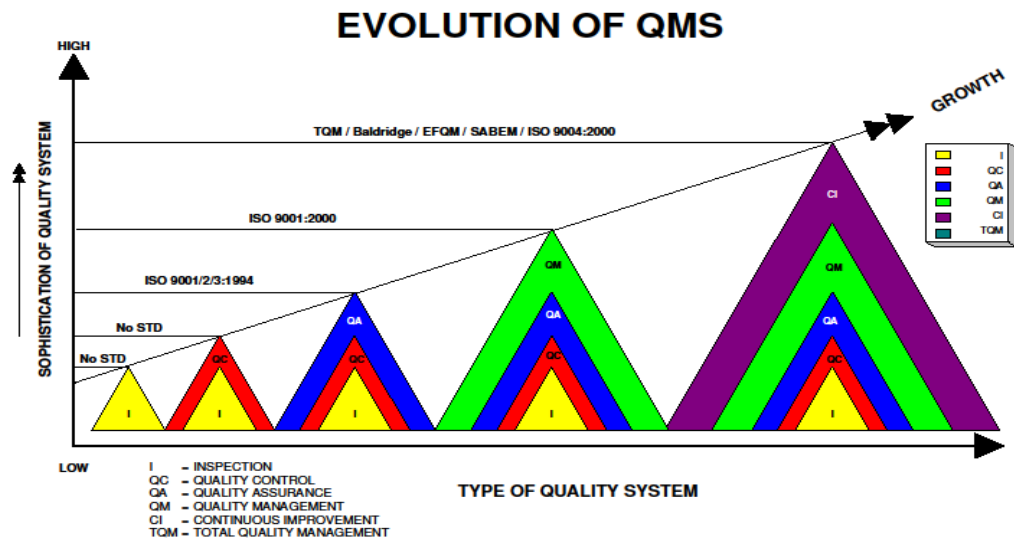


Figure 2.1: Evolution of QMS

(<http://saqi.co.za.temp.wadns.net/DNN/Portals/0/Publications/EVOLUTION%20OF%20QA%20QMS.pdf>)

The illustration is in line with Deming's (1986) approach in terms of how the evolution should be developed, founded on three basic precepts: 'Customer Orientation', the notion that 'quality is determined by the system' and "Continuous Improvement".

It has been established that the benefits of CI are available to organizations of all sizes, across all sectors— see for example case study evidence reported by Oakland (2003), De Jager et al. (2004), Fraser (1995), Taylor and Hirst (2001) and Gallagher et al. (1997). Hamzah et al., (2004), note that in order to meet the challenges posed by the competitive environment, construction organizations must infuse quality and performance improvement initiatives in all aspects of their operations to improve their competitiveness.

## 2.2 Concept and Definition of Continuous Improvement (CI)

During the last decade, there has been a growing interest in the concept of continuous improvement (CI), and major industrial enterprises in a general sense have adopted CI to

improve their competitiveness. Most of the enterprises tend to believe that when things are going well, further improvements are possible. Hence, CI has been incorporated within a range of approaches and methodologies for business and operations improvement. Some of these approaches include Total Quality Management, Quality Management (QM) Systems, Benchmarking, Zero Defects, Kaizen, Lean Thinking, Statistical Process Control (SPC), ISO-9000, Business Process Reengineering (BPR), Business Excellence Models, Theory of Constraints (TOC) and etc. Whichever umbrella improvement initiative is preferred, it is important that the concept be understood and applied to a firm's operations to meet the requirement and expectation from the customer's perspective. Handy, (1994) notes that the CI concept was further developed as a new field in Operations and Innovation Management in relation to the Japanese practice of *Kaizen*.

Boer et al. (2000) provide insights into some key aspects and terminology used in the current implementation of the CI concept, namely: a) suggestion, recognition or reward, training systems; b) methods, tools and techniques; c) individual and team-based contributions; d) CI as a normal day-to-day activity; e) Company-wide involvement and commitment; f) Strategy-driven and strategy-forming; g) Empowerment; h) Facilitating individual and organizational learning;; i) Multiple projects (taking place simultaneously); j) and applied in all sorts of organizations.

There are various descriptions and understandings regarding the concept of continuous improvement. For example, Walsh et al., (2002), stated that, the concept of CI is a critical success factor of any organization and should be used as a foundation stone upon which every successful QM initiative should be based upon. It is clear from literature that experts may describe and propose slightly different approaches to continuous improvement (CI). For example, according to Juergensen, (2000), CI is a philosophy that Deming described simply as consisting of "Improvement initiatives that increase successes and reduce failures". Whereas, Hochberg (1996), describes CI as a philosophy and a set of principles by which to operate an organization based upon leadership by everyone, data-based decision making, systems/process thinking, and employee involvement to continuously improve an organization's ability to achieve current and future customer needs.

Bhuiyan & Baghel (2005) define CI as a culture of sustained improvement aiming to eliminate waste in all systems and processes in an organization. CI occurs through a series of improvements: some cases are incremental and others are radical changes. Another definition of CI is pointed out by Bessant et al., (1994), stating that CI is “a company-wide process of focused and continuous incremental innovation.” Yet others view CI as either an offshoot of existing quality initiatives like total quality management (TQM) or as a completely new approach of enhancing creativity and achieving competitive excellence in today’s market (Oakland, 1999; Caffyn, 1999; Gallagher et al., 1997).

The American Society for Quality (ASQ 2007) defines CI as an ‘ongoing effort to improve products, services, or processes. These efforts can seek incremental improvement over time or breakthrough improvement all at once.’ According to the European Standard EN ISO 9004: 2000 Guidelines for Performance Improvement (in BSI 2004, p.53), an organization should have a continual process of improvement and there are two fundamental ways to achieve this: breakthrough projects and small-step ongoing improvement activities.

Taking these views and definitions into account, CI in this research is defined as ‘an effort to continuously seek and make change(s) for the better, through processes which can be characterized as either incremental or radical transformations geared at maintaining results.’ Figure 2.2 illustrates the effect on business performance by applying this form of comprehensive CI concept.

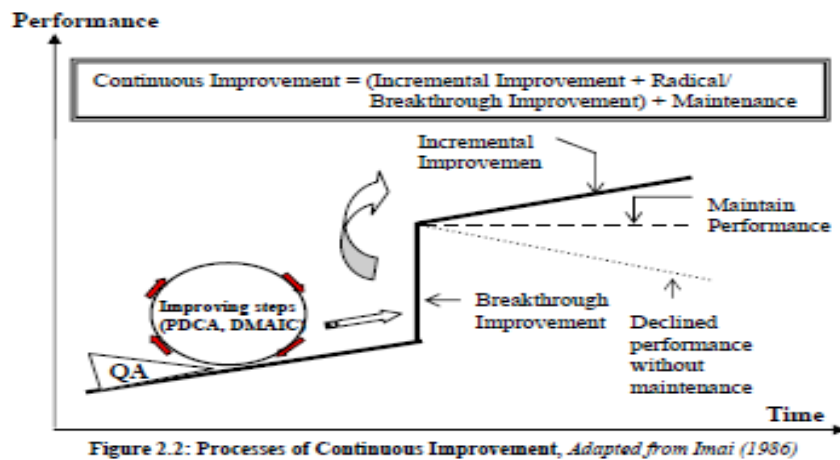


Figure 2.2: Processes of Continuous Improvement (Adapted from Imai,1986)

### **2.3 History of CI**

According to Schroeder and Robinson, (1991), the roots of modern improvement programs can be traced back to initiatives undertaken in several companies in the 1800s which brought positive changes in the organization. Additionally, the author stated that during the late 1800s and early 1900s, much attention was given to developing scientific methods based on time-trials in order to help managers analyze and solve production problems. One such initiative involved the US government, who set up the “Training Within Industry” service during the Second World War to enhance the industrial output on a national scale. This included job method training, a program designed to educate supervisors on the importance and techniques of CI methods. This program was later introduced in Japan by management experts like Deming, Juran, and Gilbreth (Robinson, 1990).

Eventually, according to Imai (1986), the Japanese developed their own ideas, mainly focused on quality control, which was used initially in the manufacturing process, and which later evolved into a much broader term, growing into a management tool for ongoing improvement involving everyone in the organization.

### **2.4 Benefits and Challenges in the Implementation of CI**

Competition and continuously increasing standards of customer satisfaction have proven to be endless driver of organizational performance improvements. Reid (2006) notes that the CI approach constantly seeks to identify and implement ongoing enhancements in a firm’s products, services and processes. The benefits of the implementation CI is identified by Cole (2001) as follows:

- a) It mobilizes large numbers of employees which improves employee commitment and increases the sources of ideas;
- b) A number of small wins can occur simultaneously leading to a magnification of results;



## REFERENCES

- Ab Wahid, R. Corner, J. (2009) "Critical success factors and problems in ISO 9000 maintenance", *International Journal of Quality & Reliability Management*, Vol. 26 Iss: 9, pp.881 – 893
- Abd. Shukor A.S., Mohammad, M. F., Mahbub, R. and Ismail, F. (2011) Supply Chain Integration in Industrialised Building System in Malaysian Construction Industry. *The Built and Environment Review* 4(1):108-121
- Abdelhamid, T. S. (2003). Six-sigma in lean construction systems: Opportunities and challenges. Proc., *11th Annual Conf. of the International Group for Lean Construction (IGLC-11)*, Blacksburg, Va.
- Abdul Hakim , M., (2006) "Quality Management System", *International Conference on Construction Industry*, Universitas Bung Hatta, Padang, Sumatra, Indonesia.
- Abdul Razak, I., Matthew H. Roy, Zafar Ahmed, Ghaffar Imtiaz, (2010) An investigation of the status of the Malaysian construction industry, *Benchmarking: An International Journal*, Vol. 17 Iss: 2, pp.294 – 308
- Abdullah , F. (2008). Construction Industry and Economic Development: *The Malaysian Scene*. University Technology Malaysia.
- Abdullah, F., (2004). Construction Industry and Economic Development: *The Malaysian Scene*. University Technology Malaysia.
- Ahadzie, D.K., Proverbs D. G., & Olomolaiye, P.O. (2008). Critical success criteria for mass house building projects in developing countries. *International Journal of Project Management*, 26(6), pp. 675-687. in press.
- Ahmed, S. M. (2002) "Measurement of Construction Processes for Continuous Improvement," *Final Report Submitted to the Building Construction Industry Advisory Council*, Department of Education (DoE), State of Florida. Attention. Gartner Research. ID Number: G00149625.
- Ahn, H. (2001). Applying the balanced scorecard concept: an experience report, *Long Range Planning* 34(4): 441 461. [http://dx.doi.org/10.1016/S0024-6301\(01\)00057](http://dx.doi.org/10.1016/S0024-6301(01)00057)

- Aktas, E., Çiçek, I. & Kiyakc, M. (2011). The effect of organizational culture on organisational efficiency: the moderating role of organisational environment and CEO values. *Procedia - Social and Behavioral Sciences*, Vol. 24, 1560–1573
- Ali, Azlan S. and Rahmat, Ismail. (2010). The performance measurement of construction projects managed by ISO-certified contractors in Malaysia. *Journal of Retail & Leisure Property*, 9, 25–35
- Al-Moumani, H.A. (2000), “Construction delay: a quantitative analysis”, *International Journal of Project Management* , Vol. 18, pp. 51-9.
- Al-Najjar, Z.J., Saco, Z.M., and Al-Azzawi, A.A. (2004). The impacts of production theories on construction planning efficiency. *Emirates Journal for Engineering Research*, 9 (1), 9-20.
- Alzahrani, J.I. and Emsley, M.W. (2013). The Impact of Contractors Attributes on Construction Project Success: A Post Construction Evaluation. *International Journal of Project Management*, 31, 313-322.
- Amaratunga, D., and Baldry,D. (2002) "Moving from performance measurement to performance management", *Facilities*, Vol. 20 Iss: 5/6, pp.217 - 223
- Amberg, M., F. Fischl and M. Wiener, (2005). Background of critical success factor research, Working Paper. Friedrich-Alexander-Universitat Erlangen-Nurnberg, Working Paper No 2/2005. Nurnberg, Germany.
- American Society for Quality (2007), Basic concepts of Continuous Improvement, Retrieved: January, 2007, <http://www.asq.org/learn-about-quality/continuous-improvement/overview/overview.html>
- Andersen, E.S., and Jessen, S.A.(2003). “Project maturity in organisations”, *International Journal of Project Management*, Vol 21, p 457-461
- Andersen, H.; Lawrie, G.; Shulver, M. (2000). The balanced scorecard vs. the EFQM business excellence model: Which is the better strategic management tool? 2GC Active Management White paper.
- Anderson, D,R., Sweeney,D,J.,Williams,T,A & Martin,K. (2008), 11th ed., Quantitative Methods for Business, 11th ed.,Thomson South-Western, Mason.
- Aoki, K. (2008). Transferring Japanese kaizen activities to overseas plants in China. *International Journal of Operations & Production Management*, 28, 518–539.
- Arslan G. and Kivrak S. (2008).Critical Factors to Company Success in The Construction Industry. World Academy of Science, Engineering and Technology. 45, pp. 43-46.

- Atthirawong, W. and McCarthy, B. (2001). Critical Factors in International Location Decisions: A Delphi Study. Paper presented at the Twelfth Annual Conference of the Production and Operations Management Society, Orlando, USA.
- Azani, H. and Khorramshahgol, R. (1990). "Analytic Delphi Method (ADM): A Strategic Decision Making Model applied to location planning". Engineering Costs and Production Economics. Vol.20. pp.23-28.
- Babicz, G. (2002). Assessing the Baldrige Award Quality, 41(11) 36-39.
- Bahtiar, SFI, (2012) Modeling the knowledge management processes for planning and scheduling of construction projects based on state-of-the-art technology. Master Thesis, Universiti Tun Hussein Onn Malaysia.
- Baldwin, A., McCaffer, R., Osman, I.I (2001) Project Performance in a Contracting Organisation: Analysis, Evaluation and Development. Paper presented at the CIB World Building Congress, Wellington, New Zealand
- Ballard, G. (1994). "The Last Planner". Spring Conference of the Northern California Construction Institute, Monterey, CA, April 22-24.
- Banik, G. C. (1999). Construction productivity improvement. ASC Proceedings of the 35th Annual Conference. San Luis Obispo, CA, 165-178
- Bar, E. (2004). ISO-9000 and Baldrige-based Approach to Quality. Retrieved via <http://www.docstoc.com/docs/76788111/ISO-9000-and-Baldrige-based-Approaches-to-Quality>. on July 2009.
- Barad, M.; Dror, S. (2008). Strategy maps as improvement paths of enterprises, International Journal of Production Research 46(23): 6627-6647.  
<http://dx.doi.org/10.1080/00207540802230405>
- Barnes, F. (2000). Good business sense is the key to confronting ISO 9000. The Review of Business, 21(1/2), 11-15.
- Bassioni, H.A, Price, A.D.F., Hassan, T. M. (2004). Performance measurement in construction, Journal of Management in Engineering 20(2): 42-50.  
[http://dx.doi.org/10.1061/\(ASCE\)0742-597X\(2004\)20: 2\(42\)](http://dx.doi.org/10.1061/(ASCE)0742-597X(2004)20: 2(42))
- Bassioni, H.A., Price, A.D.F., Hassan, T.M. (2005), "Building a conceptual framework for measuring business performance in construction: an empirical evaluation", Construction Management and Economics, Vol. 23 No.5, pp.495-507.

- Bauer, J., Tanner, S.J. and Neely, A. (2004), "Benchmarking performance measurement: a consortium benchmarking study", in Neely, A., Kennerly, M. and Waters, A. (Eds), *Performance Measurement and Management: Public and Private*, Centre for Business Performance, Cranfield University, Cranfield, pp. 1021-8.
- Bauer, J.E., Duffy, G. and Westcott, R.L. (2002). *The Quality Improvement Handbook*, 2nd ed. Milwaukee, ASQ Quality Press
- Beatham, S.; Anumba, C.; Thorpe, T.; Hedges, I. (2004). KPIs: a critical appraisal of their use in construction, *Benchmarking: an International Journal* 11(1): 93-117. <http://dx.doi.org/10.1108/14635770410520320>
- Beatham, S.; Anumba, C.; Thorpe, T.; Hedges, I. (2005). An integrated business improvement system (IBIS) for construction, *Measuring Business Excellence* 9(2): 42-55. <http://dx.doi.org/10.1108/13683040510602876>
- Beatham, S.M., Anumba, C.J., Thorpe, A. and Murray, M.A.P. (2002), "Utilising the EFQM excellence model to drive business improvement", in Gancalves, A., Roy, M.A.P. and Steiger-Garcao, A. (Eds), *Advances in Concurrent Engineering*, 9th ISPE International Conference on Concurrent Engineering, Cranfield University, UK, A.A. Balkema Publishers, Rotterdam, pp. 413-22.
- Belassi, W., and Tukel, O.I. (1996), "A new framework for determining critical succes/failure factors in Projects", *International Journal of Project Management*, vol.14 (3), pp.141-51.
- Bendell, T. (2005), "Structuring business process improvement methodologies." *Total Quality Management*, Vol.16, No.8-9, pp.969-978.
- Berglund, M. and Karlton, J. (2005). "Human, technological and organizational aspects influencing the production scheduling process", *International Journal of Production Economics*, Vol. 110, No, 1-2, pp. 160-174.
- Berglund, M. and Karlton, J. (2005). Human, technological and organizational aspects influencing the production scheduling process. *Proceedings of the 18<sup>th</sup> International Conference on Production Research*, University of Salerno, Salerno.
- Bessant, J and Caffyn, S. (1994), *Rediscovering Continuous Improvement*, Technovation, Vol. 14, No. 1, pp.17-29.
- Benson, P., Hill, A. and Hoffmann, T., *Manufacturing Systems of the future-A Delphi study*, *Production Inventory Management*, Vol.23, No.3. pp.87-105.

- Bhuiyan, N. and Baghel, A. (2005). An overview of continuous improvement: from the past to the present. *Management Decision*. Vol. 43 No. 5, pp. 761-771
- Bicheno, J. (2001). *Kaizen and Kaikaku*. D. Taylor, D. Brunt (Eds.), *Manufacturing Operations and Supply Chain Management: The LEAN approach*, Thomson Learning, London (2001), pp. 175–184.
- Billows, D. (2007). *Project Change Orders: Happy Customers & Effective Change Control*. The Hampton Goups, Inc. Colorado. Retrieved via [www.4pm.com/articles/pmtalk3457.pdf](http://www.4pm.com/articles/pmtalk3457.pdf)
- Blaikie, N. (2007) *Approaches to Social Enquiry 2nd Edition*. UK and USA: Polity Press.
- Blewitt, D. J., "TQM Must Focus on Results, Not Techniques," *Washington Business J.*, p. 11 (14–20 Dec 1992)
- Bodek, N. (2002), "Quick and easy kaizen", *IIE Solutions*, Vol. 34 No.7, pp.43-6.
- Boeing, Com. (2002). Retrieved [http://www.boeing-suppliers.com/supplierAQS\\_CI\\_Detailed\\_Evaluation\\_Tool.pdf](http://www.boeing-suppliers.com/supplierAQS_CI_Detailed_Evaluation_Tool.pdf) On 14 April 2008.
- Boer, H., Berger, A., Chapman, R. and Gertsen, F. (2000) *CI Changes: from Suggestion Box to Organisational Learning: Continuous Improvement in Europe and Australia*. Aldershot, UK: Ashgate Publishing Ltd.
- Bourne, M.; Neely, A.; Mills, J.; Platts, K. (2003). Implementing performance measurement systems: a literature review, *International Journal of Business Performance Management* 5(1): 1-24.  
<http://dx.doi.org/10.1504/IJBPM.2003.002097>
- Boyer, K.K., and Verma, R. (2009). *Operations and Supply Chain Management for the 21st Century*. South-Western Cengage Learning, USA.
- Boynton, A. C, and Zmund, R. W. (1984). 'An assessment of critical success factors.' *Sloan Mgmt. Review*, 25(4), 17-27
- Braam, G.; Nijssen, E.(2004). Performance effects of using the balanced scorecard: a note on the Dutch experience, *Long Range Planning* 37(4): 335-349.  
<http://dx.doi.org/10.1016/j.lrp.2004.04.007>

- Brewer G. J., Gajendran T., & Chen S. E. (2005), Construction project supply chains and their use of ICT, Scherer R. J., Katranuschkov P., Schapke S. E. (eds) , CIBW78 Information Communication Technology in Construction, (p 513-520), Technische Universität Dresden, Germany (ISBN 3-86005-478-3)
- Brian, A., Jan, B., and Per-Erik J., (2003). Construction Process Improvement. Blackwell Publishing Company, Oxford.
- Brown, A.W., Hinks, J. and Sneddon, J. (2001), "The facilities management role in new building procurement", *Facilities*, Vol. 9 Nos 3/4, p. 119.
- Brunet, A. and New, S. (2003), "Kaizen in Japan: an empirical study", *International Journal of Operations & Production Management*, Vol. 23 No. 11, pp. 1426-46.
- Buchanan, S. & Gibb, F. (1998). The information audit: An integrated approach. *International Journal of Information Management*, 18(1): 29-47.
- Buggie, F. D. (2000). "Beyond six sigma." *J. Manage. Eng.*, 16\_4\_, 28–31.
- Caffyn, S. (1999), "Development of a continuous improvement self-assessment tool", *International Journal of Operations and Production Management*, Vol. 19 No.11, pp.1138-53.
- Camilleri, E., 2011. *Project Success: Critical Factors and Behaviours*. First ed. Gower Publishing Limited. Farnham, UK
- Carson, P.P., Lanier, P., Carson, K.D. & Guidry, B.N. (2000), "Clearing a path through the management fashion jungle-some preliminary trailblazing", *Academy of Management Journal*, Vol.43, No.6, pp.1143-58.
- Cavana, R.Y., Delahaye, B.L., and Sekaran, U. (2001). *Applied Business Research: Qualitative and Quantitative Methods*. Queensland: John Wiley & Sons Australia, Ltd.
- Cha, H. S., and O'Connor, J. T. \_2005\_. "Optimizing Implementation of value management processes for capital projects." *J. Constr. Eng. Manage.*, 131\_2\_, 239–251.
- Chan, A. (2004). Key performance indicators for measuring construction success, *Benchmarking: an International Journal* 11(2): 203-221.  
<http://dx.doi.org/10.1108/14635770410532624>

- Chan, F.T.S., Lau, H.C.W., Ip, R.W.L., Chan, H.K. and Kong, S. (2005), "Implementation of total productive maintenance: a case study", *International Journal of Production Economics*, Vol. 95 No. 1, pp. 71-94.
- Chan, P. C. A.; Ho, C. K. D.; Tam, C. M. (2001). Design and build project success factors: multivariate analysis, *Journal of Construction Engineering and Management* March/April:93-100.
- Chan, T.K. and Hiap, P.T. (2012) A balanced scorecard approach to measuring industry performance. *Journal of Construction in Developing Countries*, 17, 23-41.
- Chassin, M.(1997). Assessing strategies for quality improvement. *Health Affairs*, May/June, pp. 151-61.
- Checkland P, Scholes J. (1990). *Soft systems methodology in action*. Wiley: Chichester.
- Chen J.C, Dugger J., and Hammer. B., (2000). "A Kaizen based approach for cellular manufacturing design: A case study", *The J. Technol. Stud.*, 27(2):19-27.
- Chini, A. and Valdez, H. (2003). ISO 9000 and the US Construction Industry. *ASCE Journal of Engineering Management*, Vol 19, No. 2, April 2003, pp 69-77.
- Choma, A. A. & Bhat, S. (2010), Success vs failure: what is the difference between the best and worst projects?, in 'Proceedings PMI Global Congress 2010 - Washington DC'.
- Chua, D,K,H. Kog, Y,C, Loh, P,K (1999) Critical success factors for different project objectives *Journal of construction engineering and management* 125 (3) 142-150
- Clarke, A. (1999). A practical use of key success factors to improve the effectiveness of project management, *International Journal of Project Management*, 17(3), 139-145.
- Clifford, S. (2005). So many standards to follow, so little payoff. Inc.com Web service
- Clinton, R.J., Williamson, S. and Bethke, A. (1994), "Implementing total quality management: the role of human resource management", *SAM Advanced Management Journal*, Vol. 59 No. 2, pp. 10-16.
- Cobbold, I.; Lawrie, G. (2002). The development of the balanced scorecard as a strategic management tool. *Performance Measurement Association White paper*. University of Cambridge
- Cole, R. (2001). From continuous improvement to continuous innovation. *Quality Management Journal*, 8, 7-20

- Collyer, S.; Warren, C.; Hemsley, B. & Stevens, C. (2010), 'Aim, fire, aim - Project planning styles in dynamic environments', *Project Management Journal*, vol. 41, no. 4, 108-121
- Connelly, L.M (2009). *Mixed Methods Studies*. MEDSURG Nursing. Vol. 18, No. 1
- Construction Industry Development Board (2007) *Annual Report 2006*, Kuala Lumpur.
- Construction Industry Development Board (2008) *Annual Report 2007*, Kuala Lumpur.
- Construction Industry Development Board (2009) *Annual Report 2008*, Kuala Lumpur.
- Construction Industry Development Board (2010) *Annual Report 2009*, Kuala Lumpur.
- Construction Industry Development Board (2011) *Annual Report 2010*, Kuala Lumpur.
- Construction Industry Development Board (CIDB) (2008), *Malaysian Construction Outlook 2008*, Presentation by Business Development Division, Construction Industry Development Board (CIDB), August 2008
- Construction Industry Development Board (unpublished advance copy) *Annual Report 2011*, Kuala Lumpur
- Conti, T., Kondo, Y., & Watson, G.H. (2003), *Quality into the 21st century: perspectives on quality and competitiveness for sustained performance*, ASQ Quality Press, WI.
- Cooke-Davies, T. (2002). "Project management maturity models – does it make sense to adopt one?", *Project Manager Today*, p 1-4
- Cooke-Davies, T.J. and Arzymanow, A. (2002), "The maturity of project management in different industries: an investigation into variations between project management models, presented at the 5th Int. Conf. Int.Res. Netw. Org. Proj., East Horsley, U.K.,
- Cooke-Davies, T. and Arzymanow, A. (2003) "The maturity of project management in different industries: An investigation into variations between project management models", *International Journal of Project Management*, Vol 21, p 471-478
- Cortinas, B.D. (1991). *On-Site Construction Productivity Improvement Through Total Quality Management*. Master Thesis. The University of Texas, Austin. Retrieved at: [http://www.researchgate.net/publication/235031739\\_On-Site\\_Construction\\_Productivity\\_Improvement\\_Through\\_Total\\_Quality\\_Management](http://www.researchgate.net/publication/235031739_On-Site_Construction_Productivity_Improvement_Through_Total_Quality_Management)



- Costa, D, Formoso, CT, Kagioglou, M., Alarcón, LF, and M. ASCE, CHC. (2006). Benchmarking Initiatives in the Construction Industry: Lessons Learned and Improvement Opportunities. *Journal of Management In Engineering*. pp. 158-167
- Crawford, J.K. (2006) "The Project Management Maturity Model", *Information Systems Management On Line Journal*, [www.ism-journal.com](http://www.ism-journal.com), Fall 2006
- Crawford, L, & Pollack, J. (2004) Hard and soft projects: a framework for analysis. *International Journal of Project Management*, 22, 645-653.
- Crawford, L., Pollack, J. and England, D. (2006), "Uncovering the trends in project management: journal emphases over the last 10 years", *International Journal of Project Management*, Vol. 24 No. 2, p. 175
- Crosby, P. B. (1979). *Quality is free*. New York: McGraw-Hill.
- Crotty, M. (1998) *The foundations of social research: meaning and perspective in the research process*. London: Sage.
- David, R.J. & Strang, D. (2006), "When fashion is fleeting: transitory collective beliefs and the dynamics of TQM consulting." *Academy of Management Journal*, Vol.49, No.2, pp.215-233.
- Davenport, T.H. & Prusak, L. (2003), *What's the big idea?: creating and capitalizing on the best management thinking*, Harvard Business School Press, Boston, MA.
- Dedhia, N.S (2008); "Quality, Culture and Social Responsibility", 13th Asia Pacific Quality Organization International Conference, Oct 18 – 20, 2008, Shanghai, China
- De Jager, B., Minnie, C., de Jager, J., Welgemoed, M., Bessant, J., Francis, D. (2004). Enabling continuous improvement: a case study of implementation. *Journal of Manufacturing Technology Management*, Vol. 15(4), pp.315-24.
- Delgado- Hernandez, D.J., & Aspinwall, E. (2005). Improvement tools in the UK construction industry. *Construction Management and Economics*, 23(9), 965–977.
- Deming, W. E. (1986). *Out of the crisis*. Cambridge, MA: MIT Center for Advanced Engineering Study.
- Denis Leonard, (2010), "Quality management practices in the US homebuilding industry", *The TQM Journal*, Vol. 22 (1) pp. 101 – 110

- Department of Statistics (2012a) National Accounts 2011, Malaysia, 2012.
- Department of Statistics (2012b) Economic census 2011 – Construction, Malaysia, June 2012. Available at: [www.statistics.gov.my](http://www.statistics.gov.my) (Accessed on 10 September, 2013).
- de Waal, A.A. (2003). Behavioral factors important for the successful implementation and use of performance management systems. *Management Decisions*, 41 (8) : 688-697.
- de Waal, A.; Counet, H. (2006). Lessons learned from the balanced scorecard. Performance measurement and management: Public and private. Cranfield: Cranfield School of Management
- de Waal, A. 2003. Behavioural factors important for the successful implementation and use of performance management systems, *Management Decision* 41(8): 688-697. <http://dx.doi.org/10.1108/00251740310496206>
- de Waal, A. 2008. The secret of high performance organizations. *Management Online Review* [online], [cited 10 October 2011]. Available from Internet: <http://www.hpocenter.nl/uploads/MORE%20-%20The%20Secret%20of%20HPOs%20-%20April2008.pdf>.
- Doloi, H. (2009). Analysis of pre-qualification criteria in contractor selection and their impacts on project success. *Construction Management and Economics*, 27, 1245-1263
- Dooley, K. (2000). The paradigms of quality: evolution and revolution in the history of the discipline. *Advances in the management of organisational quality*, 5, 1-28.
- Duffy, J. (2001). "Maturity models – Blueprints for e-evolution", *Strategy and Leadership*, Vol 29( 6), p19-26.
- Dror, S.(2008). The balanced scorecard versus quality award models as strategic frameworks, *Total Quality Management & Business Excellence* 19(6): 583-593. <http://dx.doi.org/10.1080/14783360802024366>
- Dvir, D. & Lechler, T. (2004), 'Plans are nothing, changing plans is everything: the impact of changes on project success', *Research Policy*, vol. 33, no. 1, 1-15.
- Dvir, D.; Raz, T. & Shenhar, A. (2003), 'An empirical analysis of the relationship between project planning and project success', *International Journal of Project Management*, 21(2), 89-95.
- Easterby-Smith, M. Thorpe, R. and Lowe, A. (2003) *Management Research: An Introduction 2<sup>nd</sup> Edition*. London: Sage Publications.

- EFQM (2003). European Foundation Quality Management Excellence Model 2003. Available at <http://www.efqm.org>
- EFQM (2007), The EFQM Excellence Model, The European Foundation for Quality Management, available at: [www.efqm.org](http://www.efqm.org) (accessed July 2007).
- Egan, J., (1998). "Rethinking Construction" report of the Construction Tasks Force to The Deputy Prime Minister on the scope for improving the quality and efficiency of UK construction, DETR available at <http://www.construction.detr.gov.uk/cis/rethink/index.htm> (accessed on 16 July 2008).
- Ellis, D., Barker, S., Potter, S. & Pridgeon, C.(1993). Information audits, communication audits and information mapping: A review and survey. *International Journal of Information Management*, 13(2): 134-151.
- Erikshammar, J., Björnfort, A. and Gardelli, V. (2010). "The Ambiguity of Value". Proceedings for the 18th Annual Conference of the International Group for Lean Construction, Haifa, Israel.
- Esteves, J. (2004). Definition and Analysis of Critical Success Factors for ERP Implementation Projects. Doctoral thesis at the Universitat Politècnica de Catalunya, Barcelona.]
- Evans, J. R., & Lindsay, W. M. (2008). *Managing for Quality and Performance Excellence*. Mason, OH: Thomson Higher Education
- Faniran, O.O., Oluwoye, J.O. and Lenard, D.J. (1998), "Interactions between construction planning and influence factors", *Journal of Construction Engineering and Management*, Vol. 124( 4), pp. 245-56
- Farooqui, R.U., and Ahmed, S.M. (2009). "A stepping stone to total quality management for construction companies", In 7th Latin American and Caribbean Conference for Engineering and Technology, San Cristobal, Venezuela
- Farris, J.A., Van Aken, E.M., Doolen, T.L. and Worley, J. (2009), Critical Success Factors for Human Resource Outcomes in Kaizen Events: An Empirical Study, *International Journal of Production Economics*, Vol. 117 No. 1, pp. 42-65.
- Farris, J.A., Van Aken, E.M., Doolen, T.L., and Worley, J.M. (2006), Learning from Kaizen Events: A Research Methodology for Determining the Characteristics of More – and Less – Successful Events, *Proceedings of the 2006 American Society for Engineering Management Conference*, Huntsville, AL, October 25-28, 2006, CD-ROM.

- Fellows, R. and Liu, A. (1997). *Research Methods for Construction*. Blackwell Science.
- Fellows, R. and Liu, A. (2008). *Research Methods for Construction*. 3<sup>rd</sup> ed. Wiley-Blackwell: Utopia Press.
- Ferguson, C. R. & Dickinson, R. (1982). Critical success factors for directors in the eighties. *Business Horizons* (May-June 1982), 14-20.
- FFC (Federal Facilities Council)(2004). *Key Performance indicators for Federal Facilities Portfolios*. Washington DC. The National Academies Press.
- Fortune, J., White, D., (2006). Framing of project critical success factors by a systems model. *International Journal of Project Management*, Vol. 24(1), pp. 53-65.  
<http://dx.doi.org/10.1016/j.ijproman.2005.07.004>
- Formento, H.R, Chiodi, F.J., Cusolito, F.J., Altube, L.A., and Gatti, S.P. (2013). Key Factors for Continuous improvement Process. *Independent journal of management & production* Vol. 4( 2). <http://www.ijmp.jor.br>
- Fraenkel, J., Wallen, N., & Sawin, E.I. (1999). *Visual Statistics*. Needham Heights, MA Allyn and Bacon
- Fraser, D. (1995). Generating a culture focused on continuous improvement. *Health Manpower Management*, Vol. 21 No. 4, pp. 5-10.
- French, S. (2009a). Critiquing the language of strategic management, *Journal of Management Development* 28(1): 6-17.  
<http://dx.doi.org/10.1108/02621710910923836>
- French, S. (2009b). Re-thinking the foundations of the strategic business process, *Journal of Management Development* 28(1): 51-76.  
<http://dx.doi.org/10.1108/02621710910923863>
- Fryer, K.J., Antony, J., and Douglas, A. (2007). Critical success factors of continuous improvement in the public sector. *The TQM Magazine*. Emerald Group Publishing Limited. Vol. 19 No. 5, pp. 497-517.
- Gallagher, M., Austin, S., Caffyn, S. (1997), *Continuous Improvement in Action – The Journey of Eight Companies*, Kogan Page Ltd, London
- Gambo, Muhammad Mustapha (2011) *A study of current design & build procurement approach practice based on the client's specific expectations in the Malaysian construction industry*. Masters thesis, Universiti Tun Hussein Onn Malaysia
- Gao, S. and Pheng, LS (2013). Understanding the application of Kaizen methods in construction firms in China. *Journal of Technology Management in China* Vol. 8(1), pp. 18-33

- Garvin, D.A. (1988), *Managing Quality: The strategic and Competitive Edge*, Collier
- Ghosh, B.C., Liang, T.W., Meng, T.T., & Chan, B. (2001). The key success factors, distinctive capabilities and strategic thrust of top SMEs in Singapore. *Journal Business Research*, 51, pp.209-221.
- Gibson, J.W. & Tesone, D.V. (2001), "Management fads: Emergence, evolution, and implications for managers." *Academy of Management Executive*, Vol.15(4), pp.122-133
- Gibson, J.W., Tesone, D. V. & Blackwell, C.W. (2003), "Management fads: Here yesterday, gone today?" *Advanced Management Journal*, Vol. 68(4), pp.12-17.
- Gieskes, J. and Ten Broeke, A. (2000). Infrastructure under construction: continuous improvement and learning in projects. *Integrated Manufacturing Systems*, Vol. 11(3), pp. 188-98.
- Globerson, S. and Zwikael, O. (2002), "Impact of the project manager on project management planning processes", *Project Management Journal*, Vol. 33(3), pp. 58-64.
- Glover, W., J. (2010). *Critical Success Factors for Sustaining Kaizen Event Outcomes*. Phd Dissertation. Retrieved via <http://scholar.lib.vt.edu/theses/available/etd-04162010-104939/>
- Goh, M. (2000). Quality circles: journey of an Asian public enterprise. *International Journal of Quality and Reliability Management*, Vol. 17 No. 7, pp. 784-99.
- Goldsmith, N. (1991). Linking IT planning to business strategy. *Long Range Planning*, 24(6): 67-77.
- Gomez, C.P & Hashima H .(2009). The Continual Improvement Clause 8.5.1 of ISO 9001 and The Philosophy of Kaizen . Proceeding of 2<sup>nd</sup> Construction Industry Research Achievement International Conference (CIRAIC 2009). The Legend Hotel Putra Place, Kuala Lumpur, Malaysia. (3-5 NOV 2009).
- Gopalakrishnan, J. (2006), "Manage the Kaizen way", *Intercom*, Vol. 53 No. 6, pp. 21-4.
- Gordon, D.K.(2002). Where does quality begin? *Quality Progress*, 35(3), 103-104.
- Grady, M.W. (1991), "Performance measurement: implementing strategy", *Management Accounting*, June, pp. 49-53.
- Grant, KP., Pennypacker, JS. (2006). "Project Management Maturity: An Assessment of Project Management Capabilities Among and Between Selected Industries", *IEEE Transactions on Engineering Management*, Vol 53( 1), p 59-68

- Greatbatch, D. & Clark, T. (2005), *Management speak: why we listen to what management gurus tell us*, Routledge, Oxon.
- Greene, F., Loughridge, F.B. & Wilson, T.D. (1996). The management information needs of academic heads of department in universities: a critical success factors approach. Sheffield: University of Sheffield, Department of Information Studies. (British Library Research and Development Department Report 6252) [Available at: <http://www.shef.ac.uk/~is/publications/hodsins/index.html> Site accessed 1st November 2008].
- Gudienė, N., Ramelytė, L., & Banaitis, A. (2013). An Evaluation of Critical Success Factors for Construction Projects using Expert Judgment. Paper presented at 1st International Virtual Scientific Conference. Retrieved from <http://www.scieconf.com>
- Hakes, C. (1995). *The corporate self assessment handbook for measuring business excellence*. New York: Chapman & Hall.
- Halachmi, A. (2005). Performance measurement is only one way of managing performance, *International Journal of Productivity and Performance Management* 54(7): 502-516. <http://dx.doi.org/10.1108/17410400510622197>
- Hamzah et al. (2010). A Study on the Acceptance of IBS in Construction Industry in Kelantan: Application of Logistic Regression Analysis. *Proceedings of the Regional Conference on Statistical Sciences 2010 (RCSS'10)*: 297-306.
- Hanafizade, P., Ghafari Rayni, S.A., (2007). "Critical Success Factor in Enterprise Strategic Planning for Information Systems ", *Iran Economic Bulletin*, Vol. 7(26).
- Handy, C.B. (1994) *The Empty Raincoat: Making Sense of the Future*, Hutchinson, London.
- Hanna A S, Camlic R, Peterson, P A and Lee, M (2004) Cumulative Effect of Project Changes for Electrical and Mechanical Construction. *Journal of Construction Engineering and Management*, 130(6), 762-71.
- Hassan, D & Kanji, G.K. (2007) - *Measuring Quality Performance in Health Care*. Kingsham Press. U.K.
- Hayes, J. (2007). *The Theory and Practice of Change Management*, 2nd Ed, Palgrave.
- Hayes, R., Pisano, G., Upton, D., & Wheelwright, S. (2005), *Operations, Strategy, and Technology: Pursuing the competitive edge*, John Wiley & Sons, N.J.

- Hendricks K.B., & Singhal V.R. (1997), "Does Implementing an Effective TQM Program Actually Improve Operating Performance? Empirical Evidence from Firms that Have won Quality Awards", *Management Science*, Vol. 43, No.9, pp.1258-1274.
- Heon Han, S., Jin Chae, M., Im, K.S. And Dong Ryu, R. Six Sigma-Based Approach to Improve Performance in Construction Operations. *Journal of Management in Engineering*. pp.21-31.
- Hillman, G. P. (1994) 'Making Self-assessment Success', *Total Quality Management*, Vol. 6(3), pp. 29-31.
- Hochberg, L. (1996). Introduction to Continuous Improvement. Training Handout. Eau Claire, WI: Chippewa Valley Technical College.
- Hodgetts, R.M, Luthans, F. & Lee, S.M. (1994), "New paradigm Organisations: From Total Quality to Learning to World-Class", *Organisational Dynamics*, New York, Vol.22, Iss.3, pp.5-19.
- Holmes, E., Brown, R. J., Mansell, W., Fearon, R. P, Hunter, E., Frascuilho, F., & Oakley, D. A. (2005). Are there two qualitatively distinct forms of dissociation? Are view and some clinical implications. *Clinical Psychology Review*, 25, 1-23.
- Hoque, Z. and James, W. (2000). Linking balanced scorecard measures to size and market factors: impact on organizational performance. *Journal of Management Accounting Research*, 12: 1-17.
- Howell, M.T. (2010). *Critical Success Factors Simplified Implementing the Powerful Drivers of Dramatic Business Improvement*. Productivity Press.
- Hughes, S.W., Tippett, D.D. and Thomas, W.K. (2004), "Measuring project success in the construction industry", *Engineering Management Journal*, Vol. 16 No. 3, pp. 31-7.
- Ibbs, C.W. and Kwak, Y.H. (2000), "Assessing project management maturity", *Project Management Journal*, Vol. 31 No. 1, pp. 32-43.
- Ibbs, C. W., Wong, C. K., and Kwak, Y. H. (2001). "Project change management system." *J. Manage. Eng.*, 17(3), pp 159–165.
- Imai, M. (1986), *Kaizen: The key to Japan's Competitive Success*, McGraw-Hill, NY.
- Imai, M. (1986). *Kaizen-the Key to Japan's Competitive Success*. New York: McGraw-Hill. <http://www.iqa.org/information/d2-7.shtml/>

- Imai, M. (1997). *Gemba Kaizen: A Commonsense, Low-Cost Approach to Management*. McGraw Hill Professional Publishing
- ISO 9000:2000 (2000). *MS ISO 9000:2000 Quality management systems- Fundamentals and vocabulary*. Shah Alam: Sirim.
- ISO 9001:2000 (2000). *MS ISO 9001:2000 Quality management systems – Requirements*. Shah Alam: Sirim.
- ISO 9001:2008 (2008). *ISO 9001:2008 Quality management systems – Requirements*. International Organization for Standardization.
- ISO 9004:2000 *Quality Management System- Guideline for Performance Improvement*
- ISO 9004:2009 *Quality Management System- Managing for the sustained success of an organization: A quality management approach*
- Iyer, K.C., Jha, K.N. (2006) "Critical factors affecting schedule performance: evidence from Indian construction projects", *ASCE Journal of Construction Engineering and Management*, Vol.132 No.8 pp871-81
- Jaafari, A. (2001). *Management of risks, uncertainties and opportunities on projects: time for a fundamental shift*. *International Journal of Project Management*, 19(2), 89-101.
- Jagdeep, S. and Harwinder, S. (2012). *Continuous improvement approach: state-of-art review and future implications*. *International Journal of Lean Six Sigma* Vol. 3 No. 2.pp. 88-111
- Jamil, C.Z.M. and Mohamed, R. (2013). *The Effect of Management Control System on Performance Measurement System at Small Medium Hotel in Malaysia* *International Journal of Trade, Economics and Finance*, Vol. 4, No. 4, pp 202-208
- Jari, A.J., Pankaj and Bhangale, P.(2013). *To study critical factors necessary for a successful construction project*. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)* ISSN: 2278-3075, Volume-2(5), pp. 331-335
- Jha, K. N., & Iyer, K. C. (2006). *Critical factors affecting quality performance in construction projects*. *Total Quality Management*, 17(9), 1155-1170.
- Jha, S., Noori, H. and Michela, J. (1996). *The dynamics of continuous improvement. aligning organizational attributes and activities for quality and productivity*. *International Journal of Quality Science*, Vol. 1 No. 1, pp. 19-47



- Johannsen, C. (1995). Application of the ISO 9000 standards of quality management in professional services: an information sector case. *Total Quality Management*, 6(3), 231-242.
- Johnson, J., Karen, D., Boucher, K.C. and Robinson, J. (2001), "Collaborating on project success", *Software Magazine*, February/March.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112–133.
- Jolson, M. and Rossow, G. (1971). The Delphi Process in Marketing Decision Making. *Journal of Marketing Research*.8, November, pp 443-448.
- Jørgensen, F. (2003) A Journey Through Self- Assessment, Learning, and Continuous Improvement. Doctoral dissertation, Aalborg University, Aalborg.
- Jørgensen, F., Boer, H. and Timenes Laugen, B. (2006) CI Implementation: An Empirical Test of the CI Maturity Model. *Creativity and Innovation Management*, 15, 328–37.
- Juergensen, T. (2000), *Continuous Improvement: Mindsets, Capability, Process, Tools and Results*, The Juergensen Consulting Group, Inc., Indianapolis, IN.
- Jugdev, K and Müller, R (2005) A retrospective look at our evolving understanding of project success, *Project Management Journal*, 36(4), 19-31.
- Junnonen, J. (1998). Strategy formation in construction firms, *Engineering, Construction and Architectural Management* 5(2): 107-114.  
<http://dx.doi.org/10.1108/eb021065>
- Juran, J. M. (1995). *A History of Managing for Quality*. ASQC quality Press, Milwaukee, Wisconsin.
- Kagioglou, M.; Cooper, R.; Aouad, G. (2001). Performance management in construction: a conceptual framework, *Construction Management and Economics* 19(1): 85-95. <http://dx.doi.org/10.1080/01446190010003425>
- Kamar, K.A.M., 2011. *An Investigation into the Critical Success Factors of Industrialised Building System (IBS) Contractors: The Malaysian Case*, PhD Thesis, University of Salford, UK.
- Kaplan, R.S. and Norton, D.P. (1992), "The balanced scorecard – measures that drive performance", *Harvard Business Review*, January-February, pp. 71-9.
- Kaplan, R.S. and Norton, D.P. (1993), "Putting the balanced scorecard to work", *Harvard Business Review*, September-October, pp. 134-47.

- Kaplan, R. S. (1990) *Measures for Manufacturing Excellence*, Boston: Harvard Business School Press.
- Kaplan, R.S. and Norton, D.P. (1996), "Using the balanced scorecard as a strategic management system", *Harvard Business Review*, January-February, pp. 75-85.
- Karia ,N., and Abu Hassan Asaari, M.H. (2003). TQM Practices: Continuous Improvement and Problem Prevention, In Khalid S. Soliman, *E-Business and Organizations in the 21<sup>st</sup>. Century*, International Business Information Management Association, Cairo, pp498-502
- Kassim, M.A., and Loong, L.J. (2002). A Study On Variations In Sewerage Construction Projects. *Jurnal Teknologi*, 37(B). pp 13–26
- Kayworth, T., & Leidner, D. (2000) *The Global Virtual Manager: A Prescription for Success*. *European Management Journal*, 18(2), 183-194
- Kaziliūnas, A. (2008). Problems of auditing using quality management systems for sustainable development of organizations. *Technological and Economic Development of Economy: Baltic Journal on Sustainability*, 14(1): 64–75.
- Kaziliūnas, A. (2010). The Implementation of Quality Management Systems in Service Organizations. *Public Policy and Administration*. 2010, No. 34, p. 71-82
- Keane, P., Sertysilisik, B., and Ross, A. (2010). "Variations and Change Orders on Construction Projects." *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction*, 2(2), 89-96.
- Kerzner, H. (2006), *Project Management: A Systems Approach to Planning, Scheduling and Controlling*, 9th ed., Wiley, New York, NY
- Ketelhohn,W.,1998 "What is a key success factor?" *European Management Journal*, Vol. 16, No.3, and pp: 335-40.
- Khang, D. B., & Moe, T. L. (2008). International Development Projects: A Life-Cycle-Based Framework. *Project Management Journal*, Vol. 39, No. 1, © the Project Management Institute, Published online in Wiley InterScience ([www.interscience.wiley.com](http://www.interscience.wiley.com)) , 72–84.
- Kim, D-Y., Kumar, V. and Kumar, U. (2011) 'A performance realization framework for implementing ISO 9000', *International Journal of Quality and Reliability Management*, Vol. 22, No. 4, pp.383–404.

- King S. F. and Burgess T.F. (2006) Beyond Critical Success Factors: A Dynamic Model of Enterprise System Innovation, *International Journal of Information Management*, 26: 59-69.
- Kissoon, S, V. (2009). The conceptual model of continuous improvement Teamworking in retail banking operations: A mixed-method strategy. PhD Theses. RMIT University.
- Klassen, R. and Whybark, D. (1994). "Barriers to Management of International Operations". *Journal of Operations Management*. Vol.11,pp. 385-396.
- Kong, S.M., & Zakariah, Z.A. (2009, June 20–21). ISO 9000 in Malaysian construction industry. Proceedings of MICRA 2006. Jointly organised by Kulliyah of Architecture and Environmental Design, International Islamic University Malaysia and Management in Construction Researchers Association. pp250–260.
- Koskela, L. (1992). Process Improvement and Automation in Construction: Opposing or Complementing Approaches? The 9th International Symposium on Automation and Robotics in Construction, 3 - 5 June 1992, Tokyo. Proceedings. Pp. 105-112
- Koskela, L. (2011). Fifty Years of Irrelevance: the Wild Goose Chase of Management Science. *Lean Construction Journal IGLC Special Issue 2011*, pp 1-11.
- Kotari, A. (2012). Does Quality Management Need for Today. *International Journal on Arts, Management and Humanities* 1(1): 87- 92
- Kroslid, D. (2002). "Six sigma and lean manufacturing—A merger for world-class performance, but is it really talking place?" *Asian J. Quality*, 2(1), 87–104.
- Kuen CW, Zailani S, Fernando, Y. (2009). Critical factors influencing the project success amongst manufacturing companies in Malaysia. *Afr. J. Bus. Manage.*, 3(1): 16-27
- Kulatunga, U., Amaratunga, D. and Haigh, R. (2007). Performance Measurement in the Construction Research and Development. *International Journal of Productivity and Performance Management*, 56(8), pp. 673-688.
- Kulatunga, U., Amaratunga, D., Haigh, R. (2011). Structured approach to measure performance in construction research and development: Performance measurement system development. *International Journal of Productivity and Performance Management*, Vol. 60(3), pp.289 - 310
- Kwak, Y.H. and Ibbs, C.W. (2002). "Project Management Process Maturity (PM)<sup>2</sup> Model", *Journal of Management in Engineering*, p 150-155

- Lam, E., Chan, A., Chan, D., (2008). Determinants of construction projects - successful design. [ *Construction Engineering and Management* 134 ( 5 ) , 812-818
- Landin, A. (2000). ISO 9001 within the Swedish Construction Sector. *Construction Management and Economics*, 18, pp. 509-518.
- Laraia, A.C., Moody, P.E., and Hall, R.W. (1999), *The Kaizen Blitz: Accelerating Breakthroughs in Productivity and Performance*, New York: The Association for Manufacturing Excellence.
- Larsen, M. and Myers, M.D. (1999). When success turns into failure: a package-driven business process re-engineering project in the financial services industry. *Journal of Strategic Information Systems*, Vol. 8, No. 4, December 1999, pp. 395-417.
- Leidecker, J.K. & Bruno, A.V. (1984). Identifying and using critical success factors. *Long Range Planning*, 17 (1), 23-32.
- Lenferink, D.J.H.H.( 2009). The discontinuous innovation process at established SMEs : an exploration of the discontinuous innovation process as experienced by established SMEs. Retrieved at <http://essay.utwente.nl/60124/>.
- Leung, M.Y., Ng, S.T. and Cheung, S.O. (2004), “Measuring construction project participant satisfaction”, *Construction Management and Economics*, Vol. 22 No. 3, p. 319.
- Li, H (1996) Towards Quantitatively Measuring the Performance of Construction IT Systems. *Building Research and Information*, 24(1), 379-82
- Lim C.S., and Mohamed M.Z. (1999). Criteria of project success. *International Journal of Project Management*. 17(4), pp.243–8.
- Lindberg, P. and Berger, A. (1997).Continuous improvement – design, organization and Management. *International Journal of Technology Management*, Vol. 14 No. 1, pp. 86-101.
- Linderman, K., Schroeder, R., Zaheer, S. and Choo, A. (2003), “Six sigma: a goal – theoretic perspective”, *Journal of Operations Management*, Vol. 21 No. 2, pp. 193-203
- Loughridge, B. (1996). Investigating the management information needs of heads of academic departments in universities in the United Kingdom: A critical success factors approach. In Vakkari, P. et al., (Eds.) *Information Seeking in Context* (pp. 147-162). London: Taylor Graham.

- Loiy, B.I.(2012). An evaluation of the implementation of Total Quality Management (TQM) within the construction sector in the United Kingdom and Jordan. Doctoral thesis, University of Huddersfield.
- Love, P.E.D. and Irani, Z (2001) Evaluation of IT Costs in Construction. *Automation in Construction*, 10, 649-58.
- Love, P.E.D., Li, H., Irani, Z. & Holt, G. (2000) Re-thinking TQM: toward a framework for facilitating learning and change in construction organization, *The TQM Magazine*, 12(2). pp. 107-17. *Management Review*, 14 (6), pp. 496 - 515.
- MacCarthy, B.L., Wilson, J.R. and Crawford, S. (2001). Human performance in industrial scheduling: a framework for understanding. *Human Factors and Ergonomics in Manufacturing*, Vol. 11 No. 4, pp. 299-320.
- MacKenzie, N. and Knipe, S. (2006) Research dilemmas: Paradigms, methods and methodology. *Issues in Educational Research*, Vol. 16, No. 2, pp. 193-205. Available to download from:<http://www.iier.org.au/iier16/mackenzie.html> accessed on 2/03/09
- Malik, S.A and YeZhuang, T, (2006). ‘Execution of Continuous Improvement Practices in Spanish and Pakistani and Pakistani Industry: A comparative Analysis’. *IEEE International Conference on Management of Innovation and Technology*, Vol. 2, pp.761-765, Singapore.
- Malik S A, Li-bin L, YeZhuang T and Xiao-Lin S (2007), ‘‘Continuous Improvement Practices in Asian Developing Countries: A Comparative Analysis Between Chinese and Pakistani Manufacturing Industry’’, 14th International Conference on Management Science and Engineering, pp. 692-697, Harbin, PR China
- Malina, M.A. and Selto, F.M. (2004), Choice and Change of Measures in Performance Measurement Models, working paper, Naval Postgraduate School, Monterey, CA and University of Colorado, Boulder, CO, June.13
- Marash, S.A., Berman, P. & Flynn, M. (2004), *Fusion management: harnessing the power of Six Sigma, Lean, ISO 9001:2000, Malcolm Baldrige, TQM and other quality breakthroughs of the past century*. ASQ Publishing Company, Fairfax, VA.
- Martin, S. 2002. ‘‘Sustainability, Systems Thinking and Professional Practice’’. *Planet*,4: 20-21
- Martof. L. (2006). *Management Review: A process, not an event*. Quality Corner. Retrieved via [http://www.modernsteel.com/Uploads/Issues/October\\_2006/30758\\_quality.pdf](http://www.modernsteel.com/Uploads/Issues/October_2006/30758_quality.pdf) at 20th June 2011.

- Mat Naim bin Abdullah @ Asmoni. (2005). "A Case Study on Quality Management System In Construction Project." Universiti Teknologi Malaysia: Degree of Master.
- Mayo, M.C., & Brown, G.S., (1999). A Competitive Business Model. *Ivey Business Journal* (March/April): 19-23
- Megat Kamil Azmi. (2002). Reforming Malaysian Construction Technology Towards Higher Dynamism. *Asian Forum 2002 For the Field of Architecture and Building Construction*. Feb 26,27 and 2008 2002. Tokyo, Japan
- McCabe, S. (2001). *Benchmarking in Construction*. Blackwell Science Ltd. London.
- MacCarthy, B.L., Wilson, J.R. and Crawford, S. (2001). Human performance in industrial scheduling: a framework for understanding. *Human Factors and Ergonomics in Manufacturing*, Vol. 11 No. 4, pp. 299-320
- McCabe, S. (1998). *Quality improvement techniques in construction*. Addison Wesley Longman Limited.
- Md Ariffin, K Kasim, R., David, M., and Shamsudin, Z. (2013). Stakeholders' expectation of audit assessment on public buildings. In: *Proceedings the 2nd International Conference on Global Optimization and Its Applications 2013 (ICoGOIA2013)*, 28-29 August 2013, Melaka, Malaysia . (Unpublished)
- Medori D (1998). The development and implementation of an integrated performance measurement framework. *Performance Measurement -Theory and Practice: International Conference*. University of Cambridge, Cambridge, pp. 639-646
- Megat Kamil Azmi. (2002). Reforming Malaysian Construction Technology Towards Higher Dynamism. *Asian Forum 2002 For the Field of Architecture and Building Construction*. Feb 26,27 and 2008 2002. Tokyo, Japan
- Melnyk, S.A., Calantone, R.J., Montabon, F.L., and Smith, R.T. (1998). Short-term action in pursuit of long-term improvements: Introducing Kaizen events *Production and Inventory Management Journal*, 39 (4) (1998), pp. 69-76.
- Miguel, P. A.; Dias, J. C. S. (2009). A proposed framework for combining ISO 9001 quality system and quality function deployment. *TQM Journal*. 21(6): 589-606.
- Miller, D. & Hartwick, J. (2002), "Spotting Management Fads." *Harvard Business Review*, Vol.80, Iss.10, pp.26-27
- Mobey A, and Parker D (2002). Risk evaluation and its importance to project implementation. *Int. J. Productivity and Performance Manage.*, 51(4):202 – 208.

- Mohd Yunus, N. (2007). Variation Control Affecting Construction Works for Lembaga Kemajuan Tanah Persekutuan (FELDA). Master Theses UTM. Unpublished.
- Moselhi, O, Assem, I and El-Rayes, K (2005) Change Orders Impact on Labor Productivity. *Journal of Construction Engineering and Management*, 131(3), 354-59
- Muhwezi, L., Chamuriho, L.M., & Lema, N.M. (2012). An Investigation into Materials Wastes on Building Construction Projects in Kampala-Uganda. *Scholarly Journal of Engineering Research*, 1(1), pp. 11-18.
- Mullens, M., & Kelly, M. (2002). Introducing revolutionary change in the modular housing construction process using a Kaizen Blitz (CD-ROM). *Industrial Engineering Research 2002 Conference Proceedings*, Orlando, FL.
- Murray, P. & Chapman R. (2003), "From continuous improvement to organisational learning: developmental theory", *The Learning Organisation*, Volume 10, Number 5, pp.272-282
- Nam, C.H. and Tatum, C.B. (1988). "Major characteristics of constructed products and resulting limitations of construction technology." *Construction Management and Economics*. 6, 133-148
- Naoum, S, G., (2007). *Dissertation Research & Writing For Construction Students: 2<sup>nd</sup> Edition*. Elsevier Ltd.
- Navon,R. (2005). "Development and on site evaluation of an automated material management and control model". *Journal of construction engineering and management*, Vol. 131(12) ,pp. 1328.
- Nawawi, A.H.(2008) Consensual Experts' Opinion in Forecasting. *Asian Social Science*, Vol 4, No 9, pp. 64-72
- Neely, A. (2000). Three modes of measurement: theory and practice, *International Journal of Business Performance Management* 1(1): 47-64.  
<http://dx.doi.org/10.1504/IJBPM.1998.004544>
- Neely, A. (2002). *Business performance measurement: theory and practice*. Cambridge: Cambridge University Press.
- Neely, A., and Bourne, M. (2000). Why Measurement Initiatives Fail. *Measuring Business Excellence*. 4(4). pp.3-7.
- Neese, M. (2007), "A foundation for continuous improvement", *Circuits Assembly*, Vol. 18 No. 7, pp. 50-1.
- Ngai, S, Drew, D, Lo, H P and Skitmore, M (2002). A Theoretical Framework for

- Determining the Minimum Number of Bidders in Construction Bidding Competitions. *Construction Management and Economics*, 20(6), 473-482
- Nguyen, L. D., Stephen O. Ogunlana, Do Thi Xuan Lan, (2004), "A study on project success factors in large construction projects in Vietnam", *Engineering, Construction and Architectural Management*, Vol. 11 No. 6, pp. 404-413
- Nilsson-Witell, L., Antoni, M., and Dahlgaard, J.J., (2005). Continuous improvement in product development: Improvement Programs and Quality Principles. *International Journal of Quality & reliability management*. 22(8), pp 753-768. Emerald Group Publishing limited.
- Niven, P. (2002), *Balanced Scorecard Step by Step: Maximizing Performance and Maximizing Results*, John Wiley & Sons, New York, NY.
- Niven, P. (2006). *Balanced scorecard step-by-step: maximizing performance and maintaining results*. New York: Wiley.
- Oakland, J. (1999), *Total Organizational Excellence – Achieving World-Class Performance*, Butterworth-Heinemann, Oxford.
- Oakland, J. S., (1993), *Total Quality Management: The route to improving performance* Butterworth-Heinemann, Oxford.
- Oakland, J., & Marosszeky, M. (2006). *Total quality in the construction supply chain*. Oxford: Butterworth-Heinemann.
- Okoli, C. & Pawlowski, S. D. (2004). The Delphi method as a research tool: an example, design considerations and applications. *Information & Management*, 42 , 15-29.
- Olson, R. (2009). Understanding the barriers to continuous improvement. Retrieved via <http://www.systemsquality.com> on Mei 2009.
- Orwig, R.A. & Brennan, L.L. (2000) An integrated view of project and quality management for project-based organisations, *International Journal of Quality Reliability Management*, 15:4/5, pp. 351-63
- Oztas, A., Guzelsoy, S.S. and Tekinkus, M. (2007). Development of Quality Matrix to Measure the Effectiveness of Quality Management Systems in Turkish Construction Industry. *Building and Environment*. 42, 1219-1228
- Paez, O., Salem, S., Solomon, J., & Genaidy, A. (2005). Moving from lean manufacturing to lean construction: Toward a common socio technological framework. *Human Factors and Ergonomics in Manufacturing*, 15(2), 233-245. doi:10.1002/hfm.20023



- Pakseresht,A., & Asgari,G., (2012) “Determining the Critical Success Factors in Construction Projects: AHP Approach”, *Interdisciplinary Journal of Contemporary Research In Business*, Vol.4, No.8, pp.1-11.
- Palmer V S (2001), “Inventory Management Kaizen”, *Proceedings of 2nd International Workshop on Engineering Management for Applied Technology*, pp. 55-56, Austin, USA.
- Pellow, A. & Wilson, T.D. (1993). The Management Information Requirements of Heads of University Departments: a Critical Success Factors Approach. *Journal of Information Science*, 19, 425-437.
- Peters, J. and Howard, K. (2001). Looking for good research in management – a publisher’s case study. *Management Decision*, Vol. 39 No. 7, pp. 594-8.
- Pinto, J.K. and Slevin, D.P. (1989), “Critical success factors in R&D projects”, *Research Technology Management*, January-February, pp. 31-5.
- Pinto JK. (1986). Project Implementation: A determination of its critical success factors, moderators, and their relative importance across the project life cycle (Doctorate dissertation, University of Pittsburgh).
- Pinto, J. K. & Prescott, J. E. (1990), 'Planning and tactical factors in the project implementation process', *Journal of Management Studies*, vol. 27, no. 3, 305-327
- PMI Standards Committee (2004), *A Guide to the Project Management Body of Knowledge*, Project Management, Newtown Square, PA.
- Pollalis, Y.A. & Frieze, I.H. (1993). A new look at critical success factors. *Information Strategy*, Fall, 24-34.
- Porter, M.E. (1985). *Competitive advantage*. New York: Free Press.
- Potocki ,A.K and Brocota, R.C.(1995). A system of management for organizational improvement. *Johns Hopkins APL Technical Digest*, 16(4). pp.402-412
- Prajogo, D.J. (2000). Inside Continuous Improvement: A literature review. *Jurnal Teknik Industri* Vol. 2, No. 2, Desember 2000: 65 – 71
- Prince, E., (2007). *Effective Process Planning and Scheduling: The benefits of integrated planning and scheduling developed in the olefins industry extend into many Project Management*, Newtown Square, PA.

- Pun, K.F., Chin, K.S. & Lau, H. (1999). A self-assessed quality management system based on integration of MBNQA/ISO-9000/ISO-14000. *The International Journal of Quality & Reliability Management*, 16(6), 606-629.
- Pun, K.F., Chin, K.S. & Lau, H. (1999). A self-assessed quality management system based on integration of MBNQA/ISO-9000/ISO-14000. *The International Journal of Quality & Reliability Management*, 16(6), 606-629.
- Quansah, K.B. (2005). Continuous Assessment Handbook. Retrieved via [http://www.ineesite.org/toolkit/INEEcms/uploads/1046/Continuous\\_Assessment.PDF](http://www.ineesite.org/toolkit/INEEcms/uploads/1046/Continuous_Assessment.PDF) on 24 Jun 2009.
- Quazi, H. A., Hong, C. W., & Meng, C. T. (2002). Impact of ISO 9000 certification on quality management practices: A comparative study. *Total Quality Management*, 13(1), 53-67.
- Ray, P. and Sahu, S. (1990). "Productivity Management in India: A Delphi Study". *International Journal of Operations and Production Management*. Vol. 10 (5). pp. 25-51.
- Rampersad, H. (2001). *Total Quality Management: an Executive Guide to Continuous Improvement*. New York: Springer.
- Readman, J. and Bessant, J. (2007) What Challenges Lie Ahead for Improvement Programmes in the UK? Lessons from the CINet Continuous Improvement Survey 2003. *International Journal of Technology Management*, 37, 290–305.
- Remenyi, Dan, Williams, Brian, Money, Arthur and Swartz, Ethné (1998), *Doing Research in Business and Management. An Introduction to Process and Method*, London: Sage.
- Robinson, A. (1990), *Modern Approaches to Manufacturing Improvement*, Productivity Press, Portland, OR.
- Robinson, H.S., Anumba, C.J., Carrillo, P.M. and Al-Ghassani, A.M. (2005), "Business performance measurement practices in construction engineering organizations", *Measuring Business Excellence*, Vol. 9 No. 1, pp. 13-22.
- Robinson, H.S., Carrillo, P.M., Anumba, C.J. and Al-Ghassani, A.M. (2005), "Review and implementation of performance management models in construction engineering organisations", *Construction Innovation*, Vol. 5 No. 4, pp. 203-17.
- Rocco, T.S, Bliss, L.A, Gallagher, S & Perez-Prado, A (2003) *Information Technology, Learning, and Performance Journal*, Vol. 21, No. 1, Spring 2003

- Rockart, J. F. (1982). "The changing role of the information systems executive: A critical success factors perspective." *Sloan Mgmt. Review*, 24(1), 3-13.
- Rummler, G. A., & Brache, A. P. (1995). *Improving performance: How to manage the white space on the organization chart* (2nd ed.). San Francisco: Jossey-Bass Publishers
- Reid, R.A. (2006). Productivity and quality improvement: an implementation framework. *Int. J. Productivity and Quality Management*, Vol. 1, Nos. 1/2, 2006
- Rigby, D. & Bilodeau, B. (2005a), *Management Tools 2005: Global survey results*, Bain & Company, Retrieved: September, 2005, [http://www.bain.com/bainweb/PDFs/cms/Marketing/2005\\_tools\\_strategy\\_brief.pdf](http://www.bain.com/bainweb/PDFs/cms/Marketing/2005_tools_strategy_brief.pdf)[164]
- Rigby, D. & Bilodeau, B. (2005b), "The Bain 2005 management tool survey," *Strategy & Leadership*, 33 (4): 4-12.
- Rummler, G. A., & Brache, A. P. (1995). *Improving performance: How to manage the white space on the organization chart* (2nd ed.). San Francisco: Jossey-Bass Publishers.
- Rusjan, B. (2005). Usefulness of the EFQM excellence model: theoretical explanation of some conceptual and methodological issues, *Total Quality Management & Business Excellence* 16(3): 363-380. <http://dx.doi.org/10.1080/14783360500053972>
- Russell, J. P. (2007). Know and follow ISO 19011's auditing principles. *Quality Progress*, 40(2), 29-34.
- Russell, R.S. and Taylor, B.W. (2003), *Operations Management*, 4th ed., Pearson Education, Upper Saddle River, NJ.
- Saaty, T.L. (1990): How to make a decision: The Analytic Hierarchy Process. *European Journal of Operational Research* 48: 9-26
- Said, I., Ayub, A., Abd Razaki, A., and Tee, K.K. (2009). Factors Affecting Construction Organization Quality Management System In The Malaysian Construction Industry. In: *International Conference Of Construction Industry 2009*, 30 Julai-1 Ogos 2009, Padang Indonesia
- Salem, O., Solomon, J., Genaidy, A., and Luegring, A. (2005). Site implementation and assessment of lean construction techniques. *Lean Construction Journal*. 2(2). pp.1-21

- Salkind, N.J. (2008). *Statistics for People who (think they) Hate Statistics: 3<sup>rd</sup> Editions*. SAGE Publications. California, United Kingdom.
- Salleh, R. (2009). *Critical Success Factors of Project Management for Brunei Construction Projects : Improving Project Performance*. Queensland: Queensland University of Technology
- Sambasivan, M. & Soon, Y.W. (2007), Causes and Effects of Delays in Malaysian Construction Industry, *International Journal of Project management*, Vol. 25, Issue 5, pp 517-526
- Samuelsson, P. (2003) Improvement Processes in Construction Companies IN: Atkin, B. Borgbrant, J. and Josephson, P. (eds.) *Construction Process Improvement*, Oxford: Blackwell Science Ltd, pp. 225-238.
- Sandt, J., Schaeffer, U., and Weber, J (2001). Balanced performance measurement systems and manager satisfaction -empirical evidence from a German study WHU - Otto Beisheim Graduate School of Management
- Santos, A. Powell, J. and Formoso, C. (2000) Setting Stretch Targets for Driving Continuous Improvement in Construction: Analysis of Brazilian and UK practices. *Work Study*, 49(2), pp.50-58.
- Sanvido, V., Grobler, F., Parfitt, K., Guvenis, M. and Goyle, M. (1992). Critical Success Factors For Construction Projects. *ASCE Journal of Construction Engineering and Management*, USA. 118(1). pp 94-111
- Saqib, M., Farooqui, R.U., & Lodi, S.H., (2008). Assessment of critical success factors for construction projects in Pakistan. Retrieved May 27, 2011, <http://www.neduet.edu.pk/ICCIDC-I/Conference%20Proceedings/Papers/041.pdf>
- Sarhan, S and Fox, A (2013). Performance measurement in the UK construction industry and its role in supporting the application of lean construction concepts. *Australasian Journal of Construction Economics and Building*, 13 (1) pp.23-35
- Savolainen, T. (1998). Cycles of continuous improvement, realizing competitive advantages through quality. *International Journal of Operations & Production Management*, Vol. 19.No. 11, pp. 1203-22.
- Sayer, P. (2000). *Realism and social science*. London: Sage Publications.
- Schroeder D.M. and Robinson A.G. (1991). America's most successful export to Japan: continuous improvement programs. *Sloan Manage. Rev.* 32: 67-81.

- Sekaran, U. (2003). *Research methods for business* (4th ed.). Hoboken, NJ: John Wiley & Sons.
- Senge, P. (1992). *The Fifth Discipline*. New York: Doubleday Currency
- Shortell, S. M., J. L. O'Brien, J. M. Carman, R. W. Foster, E. F. Hughes, H. Boerstler, and E. J. O'Connor. (1995). Assessing the impact of continuous quality improvement/total quality management: Concept versus implementation. *Health Services Research* 30 (2): 377–401
- Shu-Hui J and, Ping H.S. (2006). Construction Project Buffer Management in Scheduling Planning and Control .Proceedings of the 23rd ISARC, Tokyo, Japan. pp 858-863
- Sinclair, D.; Zairi, M. (1995a). Effective process management through performance measurement. Part I. *Business Process Re-engineering and Management Journal* 1(1): 75-88. <http://dx.doi.org/10.1108/14637159510798239>
- Sinclair, D.; Zairi, M. (1995b). Effective process management through performance measurement. Part II benchmarking total quality-based performance measurement for best practice, *Business Process Reengineering and Management Journal* 1(2): 58-72. <http://dx.doi.org/10.1108/14637159510798284>
- Sinclair, D.; Zairi, M. (1995c). Effective process management through performance measurement. Part III--an integrated model of total quality-based performance measurement, *Business Process Re-engineering & Management Journal* 1(3): 50-65. <http://dx.doi.org/10.1108/14637159510103220>
- SIRIM (2009). *Standards and Quality News*. Vol 16 (2). Strengthening The National Measurement System.
- Slatter, P., (2007). *A New Strategy For Continuous Improvement: 10 Steps To Lower Costs and Operational Excellence*. Industrial Press. Inc. New York.
- Sloan, T. and Boer, H. (2007) Special Issue: Continuous Improvement – Status and Challenges – *Introduction*. *International Journal of Technology Management*, 37, 215–20.
- Smith, A. J. & Walker, C. T. (1994). BOT: Critical Factors for Success. A paper
- Soderquist, K., Chanaron, J. and Motwani, J. (1997), “Managing innovation in French small and medium sized enterprises: an empirical study”, *Benchmarking for Quality Management and Technology*, Vol. 4 No. 4, pp. 259-72

- Sokovic, M, Pavletic, D, Kern Pipan, K. (2010) Quality Improvement Methodologies – PDCA Cycle, RADAR Matrix, DMAIC and DFSS, *Journal of Achievements in Materials and Manufacturing Engineering* 43(1).pp 476-483.
- Somers T.M and Nelson, K (2001). The impact of critical success factors across the stages of enterprise resource planning implementations. *Proceedings of the 34th Hawaii International Conference on Systems Sciences (HICSS-3)*, January 3–6 Maui, Hawaii (CD-ROM).
- Sommerville, J. & Robertson, H.W. (2000) A scorecard approach to benchmarking for total quality construction, *international Journal of Quality & Reliability Management*, 15: 4(5), pp. 453-66.
- Stankard, M.F. (2002). *Management systems and organizational performance: The quest for excellence beyond ISO9000*. Westport, CT: Quorum Books.
- Starkey, K. and Mckinley, A. (1993). *Strategy and Human Resources*, Blackwell, Oxford.
- Staw, B.M. & Epstein, L. (2000), “What bandwagons bring: effects of popular management techniques on corporate performance, reputation and CEP pay,” *Administrative Science Quarterly*, Vol.45, pp.523-556.
- Sturdy, A. (2004), “The adoption of management ideas and practices: theoretical perspectives and possibilities”, *Management Learning*, Vol.34 (2): 155-179
- Sunday, O. A (2010) Impact of variation orders on public construction projects. In: Egbu, C. (Ed) *Procs 26th Annual ARCOM Conference*, 6-8 September 2010
- Sun, H, Ho, K., and Ni, W B (2008). The empirical relationship among Organisational Learning, Continuous Improvement and Performance Improvement from OL to LfO. *International Journal of Learning and Changes*, Vol.3, No.1, pp.110-124
- Sun, H., Li, S., Ho, K., Gertsen, F., Hansen, P. & Frick, J. (2004), “The trajectory of implementing ISO9000 standards versus total quality management in Western Europe”, *International Journal of Quality & Reliability Management*, Vol.21, No.2, pp.131-153.
- Sun, M., Vidalakis, C. and Oza, T. (2009) A change management maturity model for construction projects. In: Dainty, A. (Ed) *Procs 25th Annual ARCOM Conference*, 7-9 September 2009, Nottingham, UK, Association of Researchers in Construction Management, 803-12.
- Syed Salehi, H., (2010). Strategic Planning Lecture, Electronic Branch, Islamic Azad University, Tehran, Iran

- Tan, D.J-Z. and Ghazali, F.E.M. (2011). Critical Success Factors for Malaysian Contractors in International Construction Projects using Analytical Hierarchy Process. EPPM, 20-21 Sep 2011.Singapore, pp. 127 -138
- Tari, J.J., & Sabater, V. (2004), “Quality tools and techniques: Are they necessary for quality management?”, *International journal of production economics*, Vol.92,Iss.3,pp.267-280.
- Tasmin, R. (2008). Knowledge Management Practices and Innovation Activities among Large manufacturers in Peninsular Malaysia. Unpublished Doctor of Philosophy Theses, University of Multimedia, Malaysia.
- Taylor, P. and Hirst, J. (2001).Facilitating effective change and continuous improvement: the mortgage express way. *Journal of Change Management* Vol. 2 No. 1, pp. 243-255
- Teian, K. (1992), *Guiding Continuous Improvement Through Employees Suggestions*, Productivity Press, Portland, US.
- Temponi, C. (2005). Continuous improvement framework: implications for academia. *Quality Assurance in Education*, Vol. 13 No. 1, pp. 17-36.
- Tennant, S and Langford, D (2008) The construction project balanced scorecard. In: Dainty, A (Ed)*Procs 24th Annual ARCOM Conference*, 1-3 September 2008, Cardiff, UK, Association of Researchers in Construction Management, 361-370.
- Teo, R.A., (2009). *Continuous Improvement to the Construction Industry: Enhancing Quality Through Learning*. VDM Verlag.
- Terziovski, M. (2001). “The effect of Continuous Improvement and Innovation Management Practices on Small to Medium Performance’. *Proceedings of 5h International Conference on Quality and Innovation Management*, pp.1-22, Euro-Australia Co-Operation Centre for Global Management.
- Terziovski, M.; Power, D. (2007). Increasing ISO 9000 certification benefits: a continuous improvement approach. *International Journal of Quality and Reliability Management*. ,24(2): 141–163.
- Thawesaengskulthai, Natcha (2007) *Selecting quality management and improvement initiatives: case studies of industries in Thailand*. PhD thesis, University of Nottingham.
- Thiry, M. and Deguire, M. (2007). “Recent developments in project-based organisations”, *International Journal of Project Management*, Vol 25, p 649-658

- Tiong, R.L.K, Khim-Teck Yeo, and S. C. McCarthy (1992). Critical Success Factors in Winning BOT Contracts. *ASCE - Journal of Geotechnical & Geo-Environmental Engineering*, Vol.118 No.6, pp.217-229.
- Toor, S. and Ogunlana, S. (2009). "Construction professionals' perception of critical success factors for large-scale construction projects." *Construction Innovation: Information, Process, Management*, 9(2), 149-167
- Toor, S., Ogunlana, S., (2010). Triangle apart from the interests of key performance indicators (KPI) of large-scale development projects in the public sector stakeholders views. *International Project Management* 28,228-236 .
- Trischler, William E. (1996). *Understanding and Applying Value Added Assessment*. Milwaukee, WI: ASQ Quality Press.
- Turner, J.R. (1999), *The Handbook of Project-based Management: Improving the Processes for Achieving Strategic Objectives*, McGraw-Hill, London
- van Zolingen, S. J., and C. A. Klaassen. (2003). Selection process in a Delphi study about key qualifications in senior secondary vocational education. *Technological Forecasting and Social Change* 70:317-340.
- Veisefh, M., Røstad, C.C., and Bjørn A., (2003), *Productivity and Logistic in The Construction Industry-what can the construction industry lean from stationery industry*. A paper presented at NORDNET 2003.
- Voss, C.A. (2005), "Paradigms of manufacturing strategy re-visited", *International Journal of Operations & Production Management*, Vol.25(12), pp.1223-1227
- Vrijhoef, R and Koskela, L. (2005). *Proceedings of the 13<sup>th</sup> Annual Conference of the International Group for Lean Construction*, Sydney, Australia
- Vukomanovic, M.; Radujkovic, M.; Burcar Dunovic, I. (2008). Performance management models in construction companies, *Gradevinar* 60(9): 771-778
- Walsh, A., Hughes, H., and Maddox, D.P., (2002). Total Quality Management Continuous Improvement is the Philosophy or reality?. *Journal of European Industrial Training*, Vol. 26(6), pp 299-307.
- Wan Mahmood, W. Y., Mohammed, A. H., Misnan, M. S., Mohd. Yusof, Z. & Bakri, A. (2006). Development of Quality Culture in the Construction Industry. ICCI-2006. (Unpublished paper) Universiti Teknologi Malaysia, Malaysia. p 1-11. Retrived at <http://eprints.utm.my/657/>



- Wang, X., & Huang, J. (2006). Success key stakeholders of the project performance and project between : Chinese Engineer views. *International Project Management* 24,253-260
- Ward, C.S., Curtis, B. and Chapman, C.B. (1991), "Objectives and performance in construction projects", *Construction Management and Economics*, Vol. 9 No. 4, pp. 343-54.
- Warszawski, A. (1990). *Industrialization and Robotics in Building: A Managerial Approach*. Harper & Row, New York.
- Wateridge J.(1999). The role of configuration management in the development and management of Information Systems/Technology (IS/IT) projects. *Int J Project Manage* 17(4):237–41.
- Watson, P. and Seng, L.T. (2001), "Implementing the European Foundation for Quality Management Model in construction", *Construction Information Quarterly*, Construction paper 130.
- Weber, S. C. (2005). *Scheduling Construction Projects: Principles and Practices*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Webster, S. (2001). A case study of scheduling practice at a machine tool manufacturer in MacCarthy, B.L. and Wilson, J.R. (Eds), *Human Performance in Planning and Scheduling*, Taylor & Francis, London, pp. 67-81
- Wegelius-Lehtonen, T. (2000). Performance measurement in construction logistics. *Int.J. Production Economics*.69 pp.107-116
- Wells, J. (1985). The role of construction in economic growth and development. *Habitat International*. Vol. 9. pp.55-70, 198
- Wheatley, M. (2007). "Maturity Matters", *PM Network*, p 48-53
- Wilcox, M. and Morton, R. (2006), "Optimizing efficiency with Kaizen blitz", *Process Cooling & Equipment*, November/December, pp. 21-5.
- Willar, D., Coffey, V., and Trigunarsyah, B. (2010). "An examination of factors influencing effective and continuous improvement of Indonesian contractors' quality management system", *In 8th International Conference on Construction and Real Estate Management*, Queensland University of Technology, Brisbane, Australia.
- Willar, Debby (2012) *Improving quality management system implementation in Indonesian construction companies*. PhD thesis, Queensland University of Technology

- Williams MC.(1999). Rich pictures on the path towards systemic being. *Syst Res Behav Sci* 16:369–73.
- Wilson, T.D. (1992). The nature of strategic information and its implications for information management. A paper presented at the FID conference in Madrid in July 1992.
- Wilson, T.D. (1994a). Information needs and uses: fifty years of progress? In Vickery, B. (Ed.) *Fifty years of information progress*. London: Aslib.
- Wilson, T.D. (1994b) Tools for the analysis of business information needs. *Aslib Proceedings*, 46 (1), 19-23
- Woepfel, M.(2009).Obstacles to implement Lean. Retrieved via <http://pinnacle-strategies.com/blog/2009/07/why-is-it-so-hard-to-get-buy-in-to-continuous-improvement/> on 16 Februari 2010.
- World Bank (1996), *World Bank Survey of International Construction Projects*, World Bank,London
- Yahya, S. (2003). The Role Of Iso 9001: 2000 Consultants. *IIUM Journal of Economics and Management* 11, no. 2 (2003): 143-65.
- Yan, B. and Makinde, O.D. (2011).Impact of continuous improvement on new product development within SMEs in the Western Cape, South Africa. *African Journal of Business Management* Vol. 5(6), pp. 2220-2229, 18 March, 2011.Available online at <http://www.academicjournals.org/AJBM>
- Yang, C. (2009). Development of an integrated model of a business excellence system, *Total Quality Management & Business Excellence* 20(9): 931-944. <http://dx.doi.org/10.1080/14783360903181610>
- Yeo, K.T.(2002). Critical failure factors in information system projects. *Int J Project Manage.* 20(3):241–6.
- Yeung, J.F.Y., Chan, A.P.C., Chan, D.W.M., and Li, L.K. (2007). Development of a Partnering Performance Index (PPI) for construction projects in Hong Kong: a Delphi study. *Construction Management and Economics*, 25(12), 1219-1237
- Yin, R.K (2006) Mixed Methods Research: Are the Methods Genuinely Integrated or Merely Parallel? *Research in the Schools*. Vol. 13, No. 1, pp.41-47

- Yong, Y. and Mustaffa, N. (2013). "Critical success factors for Malaysian construction projects: an empirical assessment." *Construction Management and Economics*, 31(9), 959-978.
- Zikmund, W.G., (2000), ' Exploring Marketing Research', 7 th (eds), Dryden Press, Fort Worth .
- Zuckerman, A. (2000) 'Gaining added value from the year 2000 ISO 9000 revisions', *World Trade*, Vol. 13, No. 2, pp.60–62
- Zwikael, O. and Globerson, S. (2006), "From critical success factors to critical success processes", *International Journal of Production Research*, Vol. 44 No. 17, pp. 3433-49
- Zwikael, O., Shimizu, K. and Globerson, S. (2005), "Cultural differences in project management processes: a field study", *International Journal of Project Management*, Vol. 23 No. 6, pp. 454-62.
- Zwikael, O. and Sadeh, A. (2007), "Planning effort as an effective risk management tool", *Journal of Operations Management*, Vol. 25 No. 4, pp. 755-67