PROJECT PAPER REPORT

LEAN SIX SIGMA TOOLS TO IMPROVE BUSINESS RESULT AT PHN INDUSTRY SND BHD

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LEAN SIX SIGMA TOOLS TO IMPROVE BUSINESS RESULT AT PHN INDUSTRY SDN BHD

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A research project submitted in partial fulfillment of the requirement
for the
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TABLE OF CONTENT

CONTENT		PAGE
ABSTARCT		i-ii
ACKNOWLEDGEMENT		iii
CHAPTER 1: INTRODUCTION		
1.0	Background Study	1
1.1	Statement of the Problem	1
1.2	Conceptual Definition	2
	1.2.1. Cost of Sales	2
	1.2.2. Lean – waste elimination	2
	1.2.3. Six Sigma	3
	1.2.4. Lean Six Sigma	3
1.3	Objective of the Study	3
1.4	Conceptual Framework	4
1.5	Research Questions	4-5
1.6	Scope of the Study	5
1.7	Significance of the Research	5
1.8	Research Methodology	5-6
1.9	Chapter Layout	6-7
CHAPTER 2: REVIEW OF LITERATURE		
2.0	Introduction	8
2.1	Lean Philosophy	8
	2.1.1. Waste identification	9

	2.1.2. Waste Elimination	10-11
	2.1.3. R's Concept of Lean	11
2.2	Six Sigma	12-13
2.3	Critical Success Factors	13
2.4	DMAIC Process	13-15
2.5	Lean Six Sigma	15
	2.5.1. What is the Lean Six Sigma	15-18
CHAPTER 3: METHODOLOGY		
3.0	Introduction	19
3.1	Research Design	19-20
3.2	Data collection	21-23
3.3	Research Instrument	24
3.4	Research Method	24
	3.4.1. Define Phase	24-26
	3.4.2. Measure Phase	26-27
	3.4.3. Analysis Phase	27-29
	3.4.4. Improve Phase	29-30
	3.4.5. Control Phase	30-31
3.5	Data Scale of Measurement	30
	3.5.1. Solution Metric	31
	3.5.2. Pareto Chart	31-32
	3.5.3. Histogram and Probability Plot (Regression)	32-34
	3.5.4. Failure Modes and Effects Analysis (FMEA)	35-37
	3.5.5. Vital Factor Priority Matrix	38-39
3.6	Pilot Study	39-40

	4.3.4. Process Capability	71-74
	4.3.5. Data Collection Plan	75-79
	4.3.6. FMEA – LOCAL PART & MATERIAL COIL	80-81
	4.3.7. Project Timing Plan	82
	4.3.8. Summary	83
	4.3.9. Leeson Learnt	83
	4.3.10. Barrier/Roadblock	83
	4.3.11. Action Plan to Remove Roadblock	84
4.4	Analysis Phase	84-85
	4.4.1. Determination of Vital Few -1st Level (Pareto)	86
	4.4.2. Root Cause Analysis – Fish Bone Diagram	87
	4.4.3. Determination of Vital Few	88
	4.4.4. Graphical and Statistical Analysis	89-98
	4.4.5. Vital Factors Priority Matrix	99
	4.4.6. Summary of Root Cause Why Why	100-101
	4.4.7. Action Plan for Improvement Phase	102-103
	4.4.8. Just Do Its Activities	104
	4.4.9. Project Timing Plan	105
	4.4.10. Summary	106
	4.4.11. Lesson Learnt	106
	4.4.12. Barrier/Roadblock	107
	4.4.13. Action Plan To Remove the Roadblock	107
4.5	Improve Phase	107-108
	4.5.1. Action Plan for Improvement	109-110

	4.5.2.	Solution Matrix	111-112
	4.5.3.	Cost Benefit Analysis	113
	4.5.4.	Solution Risk Analysis –FMEA	114-116
	4.5.5.	Solution Implementation Plan – Pilot Project	117-118
	4.5.6.	Training and Communication	119-120
	4.5.7.	Project Timing Plan	120
	4.5.8.	Summary	121
	4.5.9.	Lesson Learnt	121
	4.5.10.	Barrier/Roadblock	121
	4.5.11.	Action Plan to Remove Roadblock	121-122
4.6	Control Phase		122-123
	4.6.1.	Project Charter (Revised 1)	124-125
	4.6.2.	Action Plan for Improvement	126-127
	4.6.3.	Solution Selection Matrix	128-129
	4.6.4.	Analysis Before and After Improvement	130-148
	4.6.5.	Replication Plan	149-150
	4.6.6.	Control Plan	151
	4.6.7.	Cost Saving Summary (Pilot Implementation)	152
	4.6.8.	Dashboard of Project Achievement	153
	4.6.9.	Projected Cost Saving From Replication Activities	154
	4.6.10.	Pilot Project Timing Plan	155
	4.6.11.	Summary	156
	4.6.12.	Lesson Learnt	156-157
	4.6.13.	Barrier/Roadblocks	157
	4.6.14.	Action Plan To Remove the Roadblock	157

4.6.14. Action Plan To Remove the Roadblock 157

CHAPTER 5: SUMMARY, RECCOMENDATION AND CONCLUSION

5.1 Introduction 157

5.2 Summary 157-163

5.3 Recommendations 163-164

5.4 Conclusion 164-167

REFERENCES 168-169

LIST OF TABLES

	PAGE
Table 1– DMAIC Tool Box	14
Table 2 – Synergies In-between Lean and Six Sigma	17
Table 3 – Basic Research Design	20
Table 4- Data collected in Project Paper case study	23
Table 5 – Solution Metric Example	31
Table 6 - Sample FMEA	35
Table 7 – Severity Rating Criteria	36
Table 8– Detection Evaluation Criteria	37
Table 9- Occurrence Evaluation Criteria	37
Table 10- Sample Vital Factor Priority Matrix	38
Table 11 - Percentage skill of R Value in Vital Factor Priority Matrix	39
Table 12- Project Title	43
Table 13 – Project Selection Matrix	44
Table 14 – Cost Benefit Analysis	46
Table 15 – Project Charter	48
Table 16 – Drill Down Tree	50
Table 17 – SIPOC Diagram (Labour Cost)	53
Table 18 – SIPOC Diagram (Local Part)	54
Table 19 – VOC Analysis	55
Table 20 – KANO Model	56
Table 21 – Project Timing Plan	57
Table 22 – Mapping Process Flow - Local Part and Material Steel Coil	65

Table 23 – Mapping Process Flow - High Cost of Labor 66

Table 24 – Data Collection Plan (Man) 75

Table 25 – Data Collection Plan (Machine) 76

Table 26 – Data Collection Plan (Material) 78

Table 27– Data Collection Plan (Method) 79

Table 28 – FMEA local Part and Material Coil 80

Table 29 – FMEA local Part and Material Coil 81

Table 30 – Project Timing Plan 82

Table 31 – Vital Factors Priority Matrix 99

Table 32 - Summary of Root Cause Why Why 100

Table 33 -Action Plan for Improvement Phase 102

Table 34 - Just Do It Activities 104

Table 35 - Project Timing Plan 105

Table 36 - Action Plan for Improvement 109

Table 37 – Solution Metric 111

Table 38 - Cost Benefit Analysis 112

Table 39- Solution Risk Analysis 114

Table 40- Solution Risk Analysis 117

Table 41- Solution Risk Analysis 119

Table 42- Project Timing Plan 120

Table 43- Project Charter (Revised 1) 124-125

Table 44 - Action Plan for Improvement 126-127

Table 45- Action Plan for Improvement 127-128

Table 47 - Analysis Before and After Improvement (Leather Glove) 130

Table 48- Analysis Trend Usage Before and After Improvement 133

(Leather Glove)

Table 49- Analysis Trend Usage Before and After Improvement 135

(Canvas Apron)

Table 50 - Analysis Before and After Improvement (Direct Labours, 137

Salaries & Wages)

Table 51 - Analysis Before and After Improvement (Direct labours, 139

salaries & wages) After Enforce Overtime Control

Table 52 - Analysis Before and After Improvement Electricity 141

Consumption after Install Motion Detector

Table 53 - Analysis Before and After Improvement after Install 143

Remote Monitor

Table 54- Analysis Before and After Install Remote Control 145

Monitoring at Heavy Machinery

Table 55 - Analysis Before and After Used ERP system for Local 146

Part Purchase

Table 56 - Analysis Before and After Control Ordering for Local 147

Part Purchase

Table 57 – Replication Plan 149-150

Table 58 – Control Plan 151

Table 59 – Cost Saving Summary (Pilot Implementation) 152

Table 60 – Projected Cost Saving From Replication Activities 154

Table 61- Pilot Project Timing Plan) 155

Table 62 - Six Sigma Tool Box Applied in the Project 169

LIST FIGURES

	PAGE
Figure 1 – Conceptual Framework	4
Figure 2- Customer Viewpoint	17
Figure 3 – Pareto Graph	32
Figure 4 – Probability Plot Graph	33
Figure 5 – Histogram Interpretation	34
Figure 5 – Pareto Chart PHN Operational Cost	53
Figure 6 – Fish bone analysis	62
Figure 7 – Fish bone analysis	63
Figure 8– Probability Plot of Local Part Cost (Minitab Software Simulation)	67
Figure 9– Probability Plot of Material Steel Coil (Minitab Software Simulation)	68
Figure 10– Probability Plot of Labour Cost Contract (Minitab Software Simulation	69
Figure 11– Probability Plot of Labour Cost Permanent (Minitab Software Simulation)	70
Figure 12– Process Capability of Local Part Cost (Minitab Software Simulation)	71
Figure 13 – Process Capability of Local Material Steel Cost (Minitab Software Simulation)	72
Figure 14 – Process Capability Labour Cost Contract (Minitab Software Simulation)	73
Figure 15– Process Capability Labour Cost Permanent (Minitab	74

Software Simulation)

Figure 16- Determination of Vital Few -1st Level (Pareto) 86

Figure 17- Root Cause Analysis – Fish Bone Diagram 87

Figure 18- Analysis Factor X1 – Consumable vs Cost of Sales 89
(Cos)

Figure 19 – Pareto Chart of Consumable 89

Figure 20 – Graft Trend Cost of Sales & Revenue Vs Consumables 90

Figure 21 - Analysis Factor X1 – Consumable vs Cost of Revenue 90
(REV)

Figure 22 - Analysis Factor X2 – Direct Labour, Salaries and 91
Wages Vs Cost of Sales.

Figure 23 – Graft Trend Cost of Sales & Revenue Vs Labours, 92
Salary & Wages

Figure 24 – Graph Trend Workers Overtime 92

Figure 25 - Analysis Factor X2 – Direct Labour, Salaries and 93
Wages Vs Revenue (REV)

Figure 26 - Analysis Factor X3 – Local Parts Vs Cost of Sales 94
(CoS)

Figure 27– Pareto Local Parts Customer Vs Cost of Sales (CoS) 94

Figure 28 - Bar Graph Trend Cos & REV vs Local Part 95

Figure 29 - Analysis Factor X3 – Local Parts Vs Revenue (REV) 95

Figure 30 - Analysis Factor X4 – Utilities vs Cost of Sales (CoS) 96

Figure 31 – Bar Graph Trend CoS & REV vs Utilities 97

Figure 32- Analysis Factor X4 – Utilities Vs Revenue (REV) 97

Figure 33– Cost Benefit Analysis 113

Figure 34 – Graph Consumption Leather Glove Vs Kelvar Glove 132

Figure 35– Dashboard of Project Achievement 153

CHAPTER 1: INTRODUCTION

1.0 Background Study

This project paper is a case study conducted at PHN Industry Sdn Bhd, a company jointly owned by DRB-HICOM Berhad and PROTON Holdings Sdn Bhd. It produces automotive components for major Original Equipment Manufacturers (OEMs), namely, PROTON, PERODUA and HONDA. The company specializes in the metal stamping, components assembly, roll forming and dies manufacturing. However, cost efficiency is a recurring issue; the management has consistently been searching for solutions to reduce increasing cost of metal components and to eliminate wastes in production processes. Also, business profits have been challenged by increasing competition in an increasing saturated automotive market.

1.1 Statement of the Problem

The problem in this study involves measuring business performances vis-a-vis cost of sale and revenue for the past three fiscal years. In this regard, the percentage cost of sale versus revenue was recorded in between 85% to 87%, and four major contributors have been identified and included in the improvement program such as consumable usage, labor, utilities usage and local part supply. The issue about the improvement programs is to bring down 2% cost of sale and bring up the profit.

1.2 Conceptual Definition

1.2.1. Cost of Sales

"The cost of sales for a manufacturer is the cost of finished goods in its beginning inventory plus the cost of goods manufactured minus the cost of finished goods in ending inventory", (http://www.accountingcoach.com)

Cost of sales define in the analysis of project paper are includes imported parts, local parts, steel coil, labor cost, dies making consumable, repair and maintenance, sub-contract, consumables and others

1.2.2. Lean – waste elimination

John Bicheno (2000) identified some traditional waste captured in manufacturing system such as;

(a) Untapped Human Potential – Not empowering people to push the envelope with change to improve a process or product.
Empowerment requires clear communication, commitment, support, and a culture of trust and mutual respect.

(b) Inappropriate Systems – Using the incorrect system for the process, making the process more time consuming or cumbersome than it needs to be.

(c) Energy and Water – Eliminate the wasteful usage of energy and water.

(d) Materials – Get rid of wasteful usage of materials from the design to manufacturing.

(e) Service and Office – Do away with wastes created in the offices and services provided to customers.

1.2.3. Six Sigma

To eliminate the defects and follow structure process, in order for organization achieves the goals of business excellence, "Lean will focus on Plan - Do - Check – Action (PDCA) philosophy, whereby Six Sigma follow the Define – Measure – Analysis – Improve – Control (DMAIC) philosophy. It is interesting to note that both philosophies are similar, but each step of the DMAIC process utilizes the PDCA cycle", (Nash et al.,2006).

1.2.4. Lean Six Sigma

Lean Six Sigma is hybrid approach of Lean which eliminate waste and Six Sigma to reduce variation. "The focus is to use the knowledge of the workers with the proper tools to design, improve, and control the key processes of the product manufactured", (Schutta, 2006). "In order to achieve the goal, management should provide the business process consisting planning and strategic thinking". (Schutta, 2006)

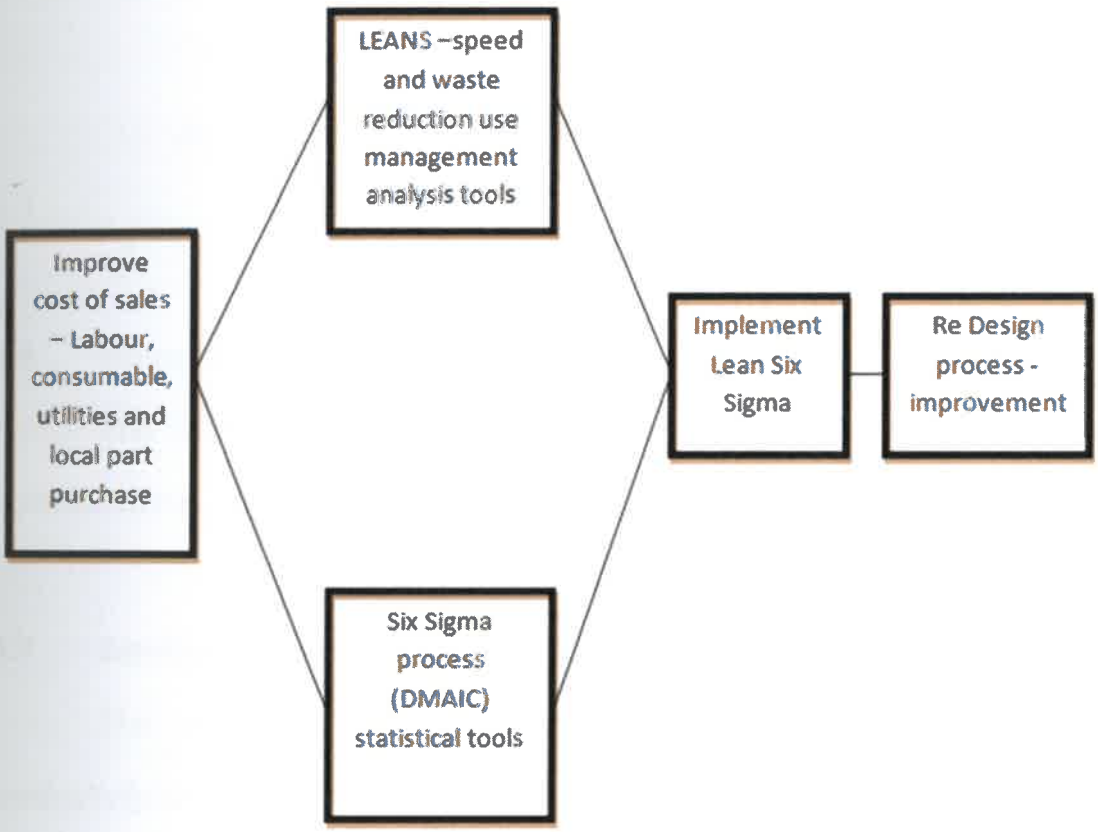
1.3 Objective of the Study

The objective of the project paper is to implement Total Quality Management through Lean Six Sigma Tools application in PHN Industry Sdn Bhd to enhance business results by increase the profits and make the business more competitive among the competitors.

1.4 Conceptual Framework

Figure 1 illustrate a conceptual framework of this research with the purpose to find out the cost of sales improvement by eliminate the waste through implementing Lean Six Sigma Process DMAIC and statistical tools.

Figure 1 – Conceptual Framework



1.5 Research Questions

(a) Primary Question

i. How to improve business performance using TQM Lean Six Sigma application?

(b) Secondary Questions

i. What is business performance?

ii. What the factors influencing business performance?

iii. How to reduce the variable costs?

iv. What are the Lean Six Sigma tools to be used to improve business performances?

v. How to define the opportunity for improvement?

vi. How to get data to measure of solution matrix to determine the critical factors?

vii. How to get data to analyze cost benefit for determine the impact of the project?

1.6 Scope of the Study

The scope of study limited to the business performance in the automotive industry at PHN Industry Sdn Bhd.

1.7 Significance of the Research:

The results will allow future researchers to further improve on the productivity and quality of the PHN Industry Sdn Bhd operations which were not included in this study.

1.8 Research Methodology

(a) Theory: Lean Six Sigma and TQM (including Project Charter)

(b) Methods:

i. Root Cause Analysis (RCA)

ii. Action Plan for improvement

iii. Cost Benefit Analysis

iv. FMEA

v. Solution implement Plan

vi. Determination of Vital Few X's – Potential Factors

vii. Graphical & Statistical Analysis – Regression

1.9 Chapter Layout

Chapter 1: Introduction

This chapter covers a general background on the research topic, problem statements, research questions and objectives. Other subjects covered include conceptual framework, significance and limitation of the study.

Chapter 2: Review of Literature.

This chapter discovered the methodology review of both Lean and Six Sigma. How the both methodologies complement each other when hybrid to Lean Six Sigma? The main characteristic when both methodologies hybrid become Lean Six Sigma is Lean's speed and waste reduction, also integrates tools for Six Sigma statistical decision making.

Chapter 3: Methodology

This chapter will further discuss on the methodology to conduct the research for the Lean Six Sigma Project Paper. The five phases of Lean Six Sigma Methodology present in this project are Define, Measure, Analyse, Improve and Control. (DMAIC)

In this chapter, the details of methodology used to conduct research are discussed, which cover the research method or design, data collection and data analysis techniques.

Chapter 4: Finding and Analysis

Implement Lean and Six Sigma hybrid methodology DMAIC phases and respective statistics analysis tools and metric solution tools to identify and define the project decision making,

Chapter 5: Summary, Recommendation and Conclusion

This chapter provides a summary of the research based on the findings and outcome of the analysis using the methodology discussed earlier. Conclusion will be drawn based on the analysis of the findings. Any possible implications and recommendations of the findings are also discussed in this chapter.

CHAPTER 2: REVIEW OF LITERATURE

2.0 Introduction

The project paper has discovered the methodology review of both Lean and Six Sigma. How the both methodologies complement each other when hybrid to Lean Six Sigma? The main characteristic when both methodologies hybrid become Lean Six Sigma is Lean's speed and waste reduction, also integrates tools for Six Sigma statistical decision making.

2.1 Lean Philosophy

According Womack and Jones (1996), lean thinking is invented from Toyota Production System (TPS). The approach adapted to manufacturing after World War 2 by Taiichi Ohno. Due to shortage capital and material, Eiji Toyoda (Toyota Owner) has instructed and forced the employees to eliminate all waste in production system. Waste was defined as "anything other than the minimum amount of equipment, materials, parts, space and time which are absolutely essential to add value to the product" (Russell and Taylor, 2000, p. 737). TPS became dominant production model at the time and adapted by most of European motor companies and US motor companies.

According Holweg (2007), Lean manufacturing is the continuity from the TPS. The fundamental of lean thinking is focused on individual product by identifying value added and non-value added activities; and eliminate all respective waste at entire function of the system. "The concept is based on kaizen, continuous improvement, and elimination of waste" (McCarty et al., 2005, p. 152).

2.1.1. Waste identification

John Bicheno (2000) identified some traditional waste captured in manufacturing system such as;

(f) Untapped Human Potential – Not empowering people to push the envelope with change to improve a process or product. Empowerment requires clear communication, commitment, support, and a culture of trust and mutual respect.

(g) Inappropriate Systems – Using the incorrect system for the process, making the process more time consuming or cumbersome than it needs to be.

(h) Energy and Water – Eliminate the wasteful usage of energy and water.

(i) Materials – Get rid of wasteful usage of materials from the design to manufacturing.

(j) Service and Office – Do away with wastes created in the offices and services provided to customers.

"Type of waste creates no value to the process, but can be immediately eliminated from the process", (Womack & Jones, 1996).

The waste can easily eliminate, if the root cause successfully identify through observe the activities relate in process and understanding all the respective elements interact with others. "Understanding the entire process, (Womack & Jones, 1996). Once understanding can achieve the desire level, "the team can challenge the actions that do not collectively create value for the customer", (Womack & Jones, 1996).

2.1.2. Waste Elimination

According to Nash (2006), there are four steps to eliminate waste such as;

(a) Identify the opportunity - The process required employee involvement to implement the changes. As mentioned by previous researcher, "buy-in and continued involvement of the employees is an invaluable asset to the project team and the company as a whole" (Nash, Poling, and Ward, 2006). In order to achieve the organization goal, the Lean's awareness and training should be spread out in organization as a culture. No matter the employees from which section or department, they should be able to see the opportunity for lean implementation

(b) Design the solution for the waste – The solutions designed for current and future prediction; and documented in system. The solutions can realize through implementations of Value Stream Mapping and 5S. "Value stream mapping documents all actions required to make or implement a specific product or process" (Womack & Jones, 1996, 38). The actions are placed into one of the three categories (Womack & Jones, 1996, 38).

- Value add tasks as perceived by the customer
- Non-value add tasks that are required to the process and cannot be eliminated
- Non-value adds tasks that do not create value and can be eliminated immediately).

"5S deployment eliminates clutter and promotes order", (Nash et al., 2006).