

Assessing the Implementation of Lean Six Sigma Programme in one of Malaysian Government Owned Companies

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ABC Berhad is a government-owned company in Malaysia. ABC Berhad initiated Lean Six Sigma Program (LSSP) as part of a new improvement's initiative. However, despite two years of training period, the program was unable to change ABC Berhad into a lean organization and embed lean thinking into the culture of the organization. The aim of this study was to determine if and how inadequate or improper implementation contributed to the lack of success of LSSP by analysing the implementation steps taken per the Kotter (1996) 8-step Change Management Model. This applied research has revealed that in general, all respondents agreed that elements of the Kotter 8-step Change Management Model were implemented, but that the effort and impact were quite minimal during the training period. The respondents felt that there was no alignment between performance and the reward system. Despite that, from the interview sessions, it was found that Lean Six Sigma was a good program for ABC Berhad to become a better, productive, and safe working environment organization. Several suggestions have been proposed for management to ensure the success of this program.

Field of Research: Management

Keywords: Lean Six Sigma, Organizational Change, Change Management

1. Introduction

'Lean Six Sigma' (or 'Lean Thinking') has been widely accepted as an adoptable tool for improving organizational performance. 'Lean Thinking' allows organization to do more with less, without jeopardizing quality, cost, or delivery, while still meeting customers' requirements (Liker, 2004). Lean Six Sigma is not just suitable for manufacturing companies, but may also be used for all type of industries. Womack & Jones (1996) agreed that Lean can be successful not only in manufacturing organization but also in any other organization. They developed the term called 'From Lean Production to Lean Enterprise'. Although lean will always be associated with reduction of costs, eliminating waste, and just-in-time (JIT) production, the adoption of the lean concept has been beneficial for knowledge-based activities such as services, design, engineering, and product development (Womack and Jones, 1996). Lean Six Sigma may be used in any type of industry. "Every business, regardless of size, suffers from three profit-eating problems that can be solved with Six Sigma methods and tools: delay, defects and variation." (Arthur, 2007).

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ABC Berhad is a Malaysian Government-owned Company that initiated a program on 'Lean Six Sigma Program (LSSP)' based on the emerging needs to develop ABC Berhad to be a market driven organization with sustainable business growth and targeting for a global market penetration. Despite two years of training programs consisting of briefings, workshop, training sessions, and pilot projects, the program was unable to reach its goal of transforming ABC Berhad into a lean organization and to embed lean thinking into the culture of the organization. LSSP seems to not have gotten enough support to sustain the initiatives and support the development of the program. Therefore, this research will analyse the implementation process of LSSP to determine if inadequate or improper implementation steps have a relationship to the unsuccessful implementation of Lean Six Sigma Program (LSSP).

In any organization, to promote improvement programs such as Lean Six Sigma requires a systematic approach in ensuring all staffs involved are able to understand the purpose of the improvement program. Change, in organisations as elsewhere, involves moving from a known state to a new state – one that is to some degree unknown. Change involves letting go of things as they are in order to take up new ways of doing things (Smith, 2005). Change management may be described as the application of appropriate planning, tools, and processes to effectively implement change and ensure its successful adoption (Reh, 2013). At the end, it will be accepted as a culture in the organization. Stanleigh (2008) claimed that most change initiatives fail because the management may not engage employees in the process towards change and do not allow sufficient time for change to set. It is important to implement change in a series of phases in order to engage employees and allow sufficient length of time for each phase to become institutionalized within the organization (Stanleigh, 2008)

This research specifically aims to analyse employee perception of change management steps during the implementation of a Lean Six Sigma Program (LSSP). It will also assess the significance of demographic variables to the change steps during the implementation of Lean Six Sigma Program (LSSP), and determine the benefit and weaknesses (if any) of LSSP to the staff and their department. The result from this research will also add the body of knowledge on the impact of change management process on employee engagement in a LSS program by assessing the implementation steps from the perspective of Kotter's 8-step Change Management Model.

After the introductory paragraph, the Literature Review is discussing the relationship between the Kotter's 8-step Change Management Model and its effect to the implementation of any change program in the organization. On Research Methodology, it will discuss on the establishment of a theoretical model to guide the study and the use of mixed method to support it. The findings of the study will report the respondents' demographic profiles, reliability test for Kotter's Eight-Step Model and the overall mean score for each step. On the Conclusion, it will discuss the outcome of the study and the recommendation.

2. Literature Review

In managing a change in the organization, Palmer et al. found Kotter's 8 steps of change management model to be possibly one of the best-known change managements model, now widely regarded as a classic in the field (Palomer et al., 2009). Norani (2011) studied and developed a framework for managing change in Lean Manufacturing Companies. She used Kotter's model as a benchmark to study the lean implementation on three Malaysian automotive components manufacturing firms (Norani, 2011). Bholra (2010) studied the

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impact of change management implementation in the merger process between two companies, choosing Kotter's Eight-step Change Management model to analyse the implementation steps been taken during the merger and the relation to the engagement level of the employee from both merging companies (Bhola, 2009). To guide the research study, table 1 shows Kotter's 8-step Change Management Model.

Table 1: Kotter 8-step Change Management Model

Step 1	Establishing a Sense of Urgency
Step 2	Creating the Guiding Coalition
Step 3	Developing A Vision And Strategy
Step 4	Communication the Change Vision
Step 5	Empowering Employees for Broad-Based Action
Step 6	Generating Short-Term Wins
Step 7	Consolidating Gains And Producing More Change
Step 8	Anchoring New Approaches In The Culture

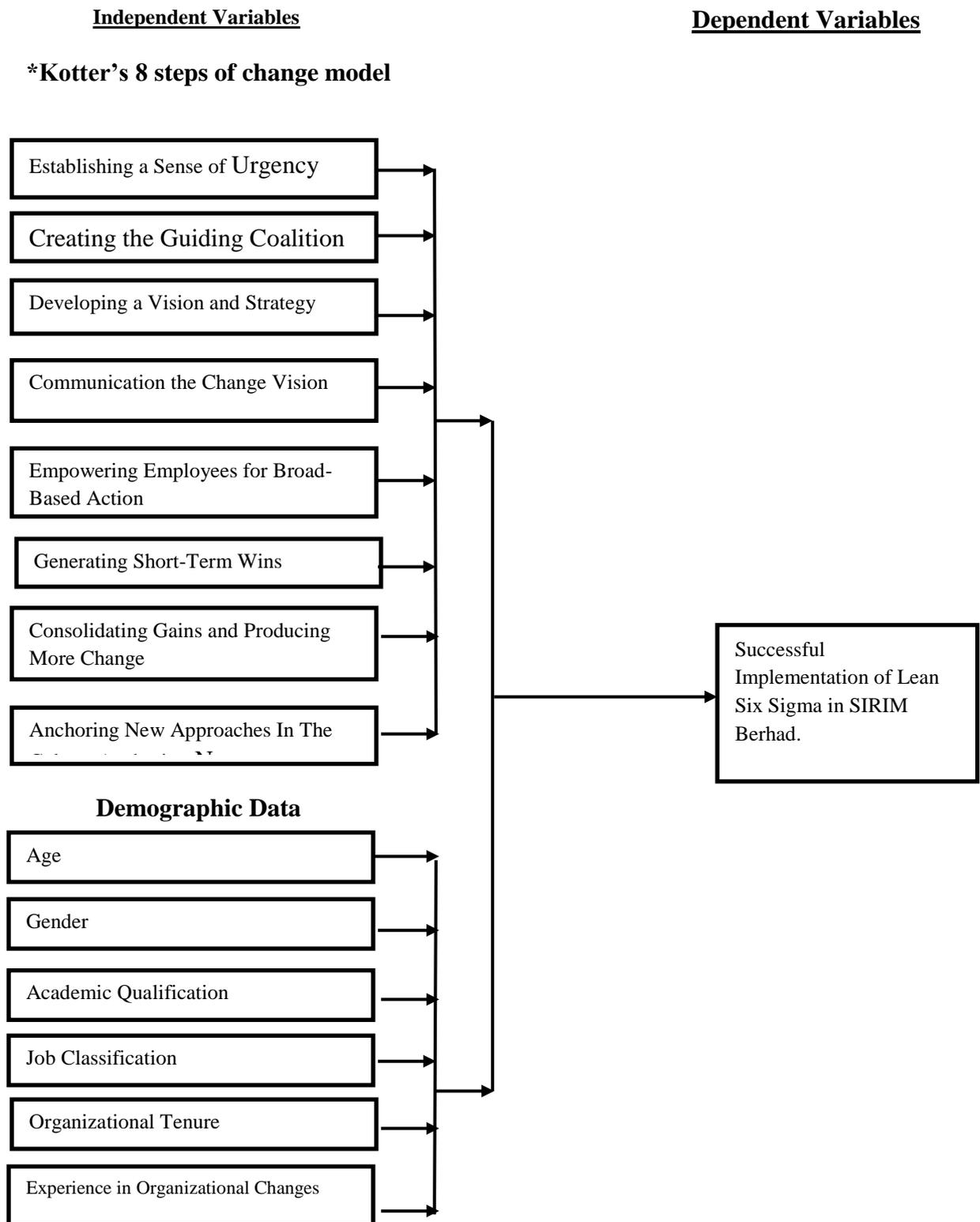
3. Research Methodology

The above discussion and literatures have shown the importance of change steps to the successful implementation of Lean Six Sigma Program. The theoretical model has been established as shown in figure 1. Employee perception of the 8 steps of change management model is the independent variables to the successful implementation of LSSP in ABC Berhad. In addition, the research also assessed the significance of demographic variables to the implementation of LSSP.

Based on the theoretical model, the following research questions have been formulated to guide the study and answer research objective one and two. The research questions have been used to clarify the research objectives and make it easier to better understand the purpose of the study as described in research objectives one and two.

1. Has the program established enough of a 'Sense of Urgency' to the staff during the implementation period?
2. Has the program created a group of people (change agents) with enough force to lead and organize the change effort and able to encourage the group to work together as a team during the implementation period?
3. Has the staff been familiarized with the 'Vision and Strategy' and understand the end results of Lean Six Sigma program?
4. Are the staff well versed in the benefits of Lean Six Sigma?
5. Has the program obtained enough support from the management and become well accepted by the staff?
6. Are the staffs clear about the short term target and long term target of the program and feel that Lean Six Sigma will have a lot of benefits for them?

Figure 1: Theoretical Framework



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The research used a mixed method where a quantitative method was used to measure employees' perception on organizational change process using a set of self-administered questionnaires (surveys) and a structured interview, one of effective qualitative data collection methods. The research was limited only to the staff from seven departments in ABC Berhad that participated in the Lean Six Sigma Program (LSSP). A population of 46 employees participated in the survey and 7 out of 46 employees were selected for structured interview.

The questionnaires comprised of two sections which the first section comprised of six questions measuring the demographic information of the respondents, including age, gender, academic qualification, job classification, years of service and to determine if the respondents were exposed to any organizational change prior to LSSP. The second section of the questionnaire consisted of 33 question comprising all elements in Kotter (1996) 8-step Change Management Model. 5-point Likert scale was used which ranged from 1 (strongly disagree) to 5 (strongly agree). The research questionnaire was piloted on three individuals within the organization to ensure that no statements remained ambiguous or were an invalid measure of the variable. The data collection process began with a phone call to the person in charge of LSSP in every department, explaining the intended purpose of the study, what the data were to be used for and setting up an appointment date of delivering the questionnaires form. The person in charge then distributed the questionnaires forms to every staff involved within their department. The respondents were given two weeks to return the complete questionnaire forms to the person in charge.

For structured interviews, phone calls were made to 7 selected participants to explain the intended purpose of the interview and to set up the interview date. The questions were then emailed or posted using internal postal systems to the interviewees prior to the interview sessions. The questions for the structured interview were created to determine the benefits of Lean Six Sigma to the staff and their department.

4. Results and Discussions

Descriptive data of respondents in terms of demographic variable such age of respondents, gender, academic qualifications, job classification, year of service and exposure to changes of any program are as Table 2 below.

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Table 2: Respondents' Demographic Profiles

Demographic variables	Items	Frequency (n)	Yes	No
			Percentage (%)	Percentage (%)
Age	32 and below	6	33.3	66.7
	33- 48 years old	32	65.6	34.4
	49 and above	8	50.0	50.0
Gender	Male	23	52.2	47.8
	Female	23	65.2	34.8
Academic qualifications	SPM/ Certificate	13	38.5	61.5
	Diploma	4	50.0	50.0
	Degree	18	61.1	38.9
	Master/ PHD	11	81.8	18.2
Job classification	Admin Staff	5	60.0	40.0
	Technicians	9	22.2	77.8
	Executive/ Group leader	26	61.5	38.5
	Head/ Manager and above	6	100.0	0.0
Organizational tenure	3-10 years	14	50.0	50.0
	11-20 years	23	60.9	39.1
	More than 21 years	9	66.7	33.3
	Total	46	58.7	41.3

Cronbach's Alpha analysis was used to test the reliability of questions measuring 8 steps of Kotter (1996) change management model and the results as in table 3.

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Table 3: Reliability test scores for Kotter's Eight-Step Change Management Model

Step	Elements	No. of questions (items)	Cronbach's Alpha
1	Establishing a Sense of Urgency	4	0.610
2	Creating the Guiding Coalition	4	0.848
3	Developing A Vision And Strategy	4	0.624
4	Communication the Change Vision	4	0.785
5	Empowering Employees for Broad-based Action	4	0.749
6	Generating Short-Term Wins	4	0.635
7	Consolidating Gains And Producing Core Change	4	0.648
8	Anchoring New Approaches In The Culture	5	0.564

By using SPSS, the average mean score and standard deviation for each step have been calculated and the result as in table 4. Mean scores over 3.5 indicate that generally all respondents agrees that elements of Kotter (1996) Change Management model were implemented and used during implementation of LSSP.

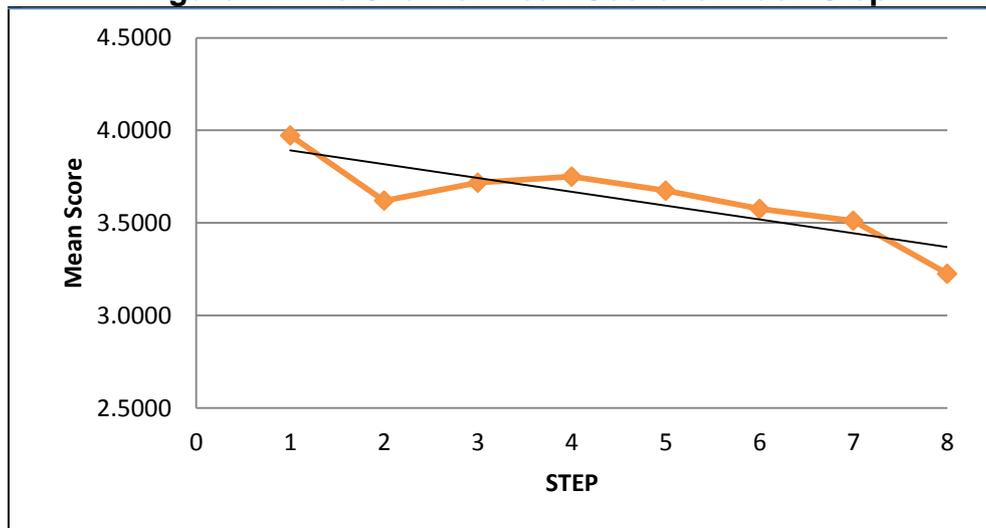
Step one has the highest mean score (3.9728) followed by the step four (3.7500) and step three (3.7174); thus, we can say that during the implementation program, the change agent able to establish a sense of urgency to all participants, communicate the change vision, and developed the vision and strategy to encourage buy-in from the participants involved in the program.

Table 4: Summary of Overall Mean Score for Each Steps

Step	Kotter's Eight-Step Change Management Model	No of questions (items)	Mean Score	Standard Deviation
1	Establishing a Sense of Urgency	4	3.9728	0.4662
2	Creating the Guiding Coalition	4	3.6196	0.7007
3	Developing A Vision And Strategy	4	3.7174	0.4790
4	Communication the Change Vision	4	3.7500	0.5553
5	Empowering Employees for Broad-based Action	4	3.6739	0.5722
6	Generating Short-Term Wins	4	3.5761	0.4798
7	Consolidating Gains And Producing Core Change	4	3.5109	0.4742
8	Anchoring New Approaches In The Culture	5	3.2261	0.4394

The mean scores started to decreased from step 5 to step 8 where these steps are actually known as the implementation stages where the participant starts to utilize on the knowledge that they have learned. Step 8 showed the lowest mean score of 3.2261 compared to the other steps. This demonstrates the inability of change agent to promote 'anchoring new approaches in the culture' of the organization. Figure 6 shows the relationships of all steps and the mean scores.

Figure 2: Line Chart of Mean Score for Each Step



A t-Test analysis was conducted to know the perception of staff toward the implementation steps between step one to four and step five to eight. All eight steps have been divided into two groups. Group A represent the step 1 to 4 and group B represent the declining steps which are from step 5 to 8. From the analysis, the p value (Sig. 2 tailed) is 0.000. Therefore, it has been statistically demonstrated that there is a significant different between these two groups. The implementation steps may be some of the possible causes why LSSP was unable to sustain in ABC Berhad.

Further analyses were then conducted to each 33 question. Two highest mean scores from 33 questions were on item 1 and 4 of step 1. More than 95% of the respondents agreed with a statement that ABC Berhad needs to change to stay ahead or to be competitive in the market, and also agreed with the initiatives to implement LSS in the organization. This means that all respondents were aware that they need to keep on improving to stay competitive and effectively react with current market demands. The two lowest mean scores were found on items 30 and 29 step 8. These 2 questions related to reward systems. Nearly 80% of the respondents felt no alignment between performance and reward systems in LSSP and that they were not rewarded on their achievement. In addition, the third lowest mean score was item 23 of step 6, as almost 60% of the respondents felt that no celebrations have been conducted to celebrate their achievement, with a mean score of 3.22. These may be among the reasons why LSSP was unable to be sustained in ABC Berhad.

Again, t-Test analysis was conducted to determine if there are differences in the response between two groups in each demographic variables toward all 8 steps of Change Management Model (variable of interest). Due to the small number or population, all demographic variables have been divided into two groups. From the analysis, all p values (Sig. 2 tailed) were more than 0.05. Therefore, it has been revealed that there is no statistically difference between the demographic variables and all 8 steps that have been applied.

On the interview session, all of the interviewees agreed that Lean Six Sigma is a good change program for ABC Berhad. They really feel that the LSS Program is able to increase their motivation to work, profit, customer satisfaction, productivity and service quality. At the

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same time, they are able to reduce and eliminate the source of waste and shorten the process lead time.

5. Conclusion

Research has shown that in general, all respondents agreed that elements of Kotter (1996) Change Management model were implemented and used during implementation of LSSP in ABC Berhad, but the effort and impact were minimal. These are supported by the mean score data from the survey analysis on each step. Initially, the change agent was able to get buy-in from the participants to get involved in Lean Six Sigma Program, but mean scores started to decrease during the implementation stages. Without a solid coalition and guiding teams, the targeted outcome is hard to achieve. The mean score dropped significantly at step 8, which may be the possible root cause of the inability of ABC Berhad to implement Lean Six Sigma program in the organization. Questions related to reward system and recognition had the lowest mean scores. Generally, a good rewards system will give a great opportunity to help foster the team bonding in guiding coalition especially between the leaders and the staffs. It is important that the company's management team continue support of the change effort in progress, including all staff involved, as well as new leaders who are brought in the organization. The proper application of a reward and recognition program can help build a high-performance team, while fostering cross-organizational cooperation. ABC Berhad should consider a mix of team and individual rewards, and balance awards to encourage both cooperative and competitive behavior.

Despite that, all interviewees agreed that Lean Six Sigma was a good program to develop ABC Berhad into a more productive and safe working environment and organization. The findings of the study also provide valuable insights into the field of change management and employee engagement in Lean Six Sigma.

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