



**UNIVERSITI PUTRA MALAYSIA**

**DEVELOPMENT OF PRELIMINARY SIX SIGMA FRAMEWORK  
FOR MALAYSIAN MANUFACTURING COMPANY**

**ASLINA BINTI SIMAN**

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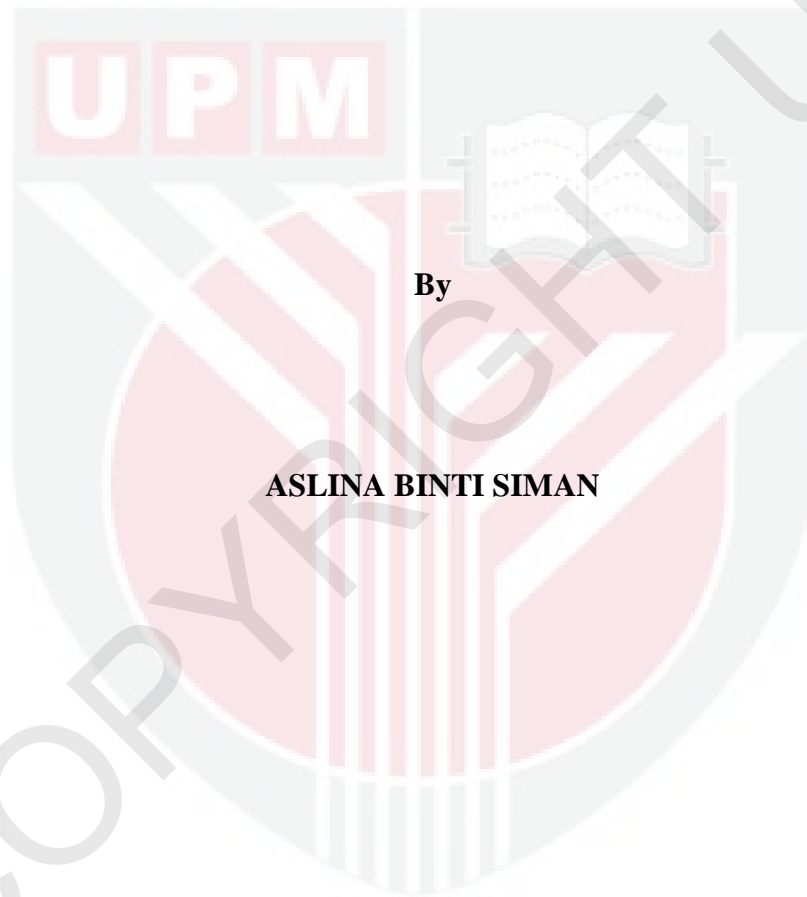


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**DEVELOPMENT OF PRELIMINARY SIX SIGMA FRAMEWORK FOR  
MALAYSIAN MANUFACTURING COMPANY**



**By**

**ASLINA BINTI SIMAN**

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in  
Fulfilment of the Requirements for the Degree of Master of Science**

**February 2012**

In dedication to:

My beloved husband, for his continuous support, encouragement and affectionate caring; and my lovely daughter and son, Nur Aifa Eryna and Muhammad Fi Firdaus who always cheer my life.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

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**February 2012**

**Chairman : Ir. Hj. Mohd Rasid bin Osman**

**Faculty : Engineering**

In today's industrial climate, manufacturing companies need to find and use any approach that will help them work smarter and achieve higher performance level to compete effectively in the global market. Although the overall average efficiency and quality levels have risen, companies are now hitting a "glass ceiling"; with their existing improvement efforts having little impact on often deep rooted quality issues. Appropriately applying the Six Sigma approach and toolset is, as a growing number in manufacturing companies already found, it is a good way for working smarter. The standard Six Sigma deployment protocol, are acceptable for large organizations, but way beyond Small and Medium Enterprise (SME) organizations. Without having a basic framework as a guideline and help from expert such as consultants, companies

that are interested in implementing Six Sigma are having difficulties in identifying and understanding the implementation process needed. This study aims to examine success factors and to develop a framework on how to implement Six Sigma. A questionnaire was used as one of the research tools and it was developed based on established literature. A total of 239 questionnaires were distributed. The response rate is 22.18 percent. The survey results from this study show that 28.3 percent of the manufacturing companies have already implemented Six Sigma for an average period of 5.3 years. Some impeding barriers highlighted in Six Sigma implementation are high entry cost, no dedicated resources and no clear mandate from top management. Case studies in some selected manufacturing companies were carried out whereby comparisons were conducted between the existing framework and actual practices. Actual practices vary depending on the practitioner knowledge and guidelines from the top management. Out of five case study companies, company D shows to have the biggest impact and benefits from Six Sigma implementation whereby they have achieved an average saving of RM 5 Million per year and having a good system and an organization wide real time communication. Based on literature review, survey result and case studies, Six Sigma implementation framework was developed accordingly. It consists of a step by step procedure from initial implementation until the successful Six Sigma project implementation stage, together with some tips, information and examples that need to be emphasized or aware off. This research seeks to conclude that a strategic Six Sigma framework for Malaysia manufacturing company as a guide so that Six Sigma can be effectively implemented, subsequently utilized and deliver business benefits to Malaysia manufacturing companies.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putera Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

**PEMBANGUNAN RANGKA KERJA AWAL ‘SIX SIGMA’ UNTUK SYARIKAT-SYARIKAT PEMBUATAN DI MALAYSIA**

Oleh

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**February 2012**

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Pada keadaan industri sekarang yang sangat mencabar, syarikat-syarikat pembuatan perlu mencari dan menggunakan cara yang dapat menolong mereka untuk bekerja lebih bijak dan mencapai prestasi yang lebih tinggi untuk bersaing dengan lebih efektif dalam pasaran global. Walaupun secara keseluruhannya aras kecekapan dan kualiti telah meningkat, banyak syarikat telah menemui jalan buntu terhadap masalah kualiti yang sudah berakar umbi kerana usaha penambahbaikan yang telah dijalankan tidak memberi kesan yang berkesan. Semakin banyak syarikat pembuatan mengakuinya bahawa cara yang baik untuk bekerja lebih pintar adalah dengan menerapkan pendekatan ‘Enam Sigma’ dan teknik yang bersesuaian. Garis panduan perlaksanaan Enam Sigma sesuai untuk organisasi yang besar tetapi ia adalah mustahil bagi syarikat-syarikat kecil dan sederhana. Tanpa garis panduan rangka kerja dan bantuan daripada pakar-pakar

perunding, syarikat-syarikat yang berminat untuk melaksanakan Enam Sigma menghadapi masalah dalam menentukan dan memahami proses yang diperlukan untuk melaksanakannya. Penyelidikan yang dijalankan ini adalah bertujuan untuk mengenalpasti faktor-faktor kejayaan dan untuk menghasilkan sebuah rangka kerja mengenai cara menerapkan Enam Sigma di dalam syarikat-syarikat pembuatan tersebut. Satu senarai soalan digunakan sebagai kaedah kajian dan ia dihasilkan berdasarkan kajian ilmiah yang sedia ada. Sebanyak 239 set soalan telah diedarkan. Kadar maklumbalas adalah sebanyak 22.18 peratus. Keputusan kaji selidik dari kajian ini menunjukkan bahawa 28.3% daripada syarikat-syarikat pembuatan tersebut telah melaksanakan Enam Sigma dengan purata 5.3 tahun. Beberapa halangan yang dihadapi dalam pelaksanaan Enam Sigma adalah kos yang tinggi di awal pelaksanaannya, tiada sumber khas yang diperuntukkan dan tiada mandat yang jelas dari pihak pengurusan atasan. Kajian kes untuk syarikat pembuatan yang terpilih dimana perbandingan dilakukan antara rangka kerja yang ada dan amalan sebenar. Amalan sebenar adalah berbeza dan ini bergantung kepada pengetahuan pengamal dan garis panduan dari pihak pengurusan atasan. Daripada lima syarikat kajian kes, syarikat D menunjukkan kesan impak dan kebaikan yang paling besar dari kesan pelaksanaan Enam Sigma dimana mereka memperolehi purata penjimatan sebanyak lima juta setahun serta mempunyai sistem yang baik dan mempunyai system komunikasi organisasi yang cepat dan menyeluruh. Rangka kerja seterusnya dihasilkan berdasarkan kajian literatur, soal selidik dan kajian kes. Ia mengandungi prosedur yang mempunyai langkah-langkah dari pelaksanaan awal hingga memperolehi kejayaan sepenuhnya hasil dari pelaksanaan Enam Sigma bersama beberapa petua, maklumat dan contoh-contoh yang perlu ditekankan dan diberi perhatian. Kajian ini dapat merumuskan satu rangka pelaksanaan



Enam Sigma yang strategik untuk syarikat-syarikat pembuatan di Malaysia sebagai panduan agar Enam Sigma boleh dilaksanakan dengan efektif, dan seterusnya dilaksanakan secara berkesan dan menghasilkan keuntungan perniagaan yang signifikan kepada syarikat-syarikat pembuatan di Malaysia.



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I certify that an Examination Committee has met on \_\_\_\_\_ to conduct the final examination of Aslina binti Siman on her thesis entitled “Development of Preliminary Six Sigma Framework for Malaysia Manufacturing Company” in accordance with the Universities and University College Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1993. The Committee recommends that the student be awarded the Master of Science.

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## DECLARATION

I declare that the thesis is my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or other institutions.

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**ASLINA BINTI SIMAN**

**Date : 16 February, 2012**

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