# PROCESS REENGINEERING OF A FAN AND BLOWER PRODUCTION

**By**

**KUMARES WARA RAO S/O SUBRAMANIAM**

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

**June 2004**

*Thank You Lord Jesus*

In remembrance
My loving father,
Subramaniam s/o Applasamy

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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**Chairman: Professor Madya Ir. Md. Yusof Ismail, Ph.D.**

**Faculty: Engineering**

The most common approach to business problem solving and making improvement is by starting at the core of the business: the sequence of different elements of the business i.e. the process. The fan and blower industry is best described as job shop environment that requires different levels and process techniques. The amalgamation of all these processes and quality control system is the final desired outcome of this project. The system was designed using guidelines of the Process Quality Model (PQM). The PQM is suitable for the purpose of designing a system that will identify and document any non-conformance. The design encompasses the four major departments that are involved in production. The most important department, which is Production, consists of several sections doing their own processes. This department received through attention in order to create the optimum solution.

The first step was to get the necessary comments from the employees in charge of the departments. After this, the present system is analysed to determine the current manufacturing process and its quality control measures. When this is achieved, the right definition of quality is created to be the motto for the creation of the new system. Then appropriate solutions are thought of and reworked many times to ensure they are accepted. To do this, accurate information is sent to the workers through training and education.

When the new measures are in place, right measurement to determine the effectiveness of the system is needed to justify its existence. The shop floor consists of eight different sections that gives different rates of non-conformances. The improvements were conducted during a period of eleven months from September 2001 to August 2002. In this period of time, the sections recorded an increase of non-conformances from 15 times (at September 2001) to 57 times (at August 2002) which is an increase of 280.00%. While the labour hours lost to correct or remedy them decreased from 97.5 hours to 38.5 hours (decrease of 60.51%) in the same period. For the same period, the losses decreased 95.77%. These figures show that the implemented improvement detects more quality issues but decreases the cost losses and time spent to solve them. However, there is always improvement to be done in any system. Thus recommendations to improve the system is noted too.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

**PENGOLAHAN SEMULA PROSES DALAM PEMBUATAN KIPAS DAN PENYEMBUR**

Oleh

**KUMARES WARA RAO S.**

**Jun 2004**

**Pengerusi: Professor Madya Ir. Md. Yusof Ismail, Ph.D.**

**Fakulti: Kejuruteraan**

Pendekatan biasa untuk mengatasi masalah perniagaaan adalah dengan membuat perubahan kepada bahagian asas perniagaan: rangkaian setiap komponen perniagaan yang berlainan iaitu proses pembuatan. Industri kipas dan penyembur boleh digambarkan sebagai pembuatan secara '*job shop'* yang mempunyai pelbagai peringkat dan teknik pembuatan. Perpaduan suatu kaedah proses dan kawalan kualiti yang berkesan merupakan hasil akhir dan tujuan projek ini. Sistem baru itu telah direka menggunakan petua-petua dari Model Proses Kualiti (PQM). Model ini didapati sesuai untuk mereka sistem baru ini kerana model ini boleh mengenal dan merakam sebarang kecacatan dalam pembuatan. Rekaan sistem mengambilkira empat jabatan utama yang terlibat dalam pembuatan produk itu. Jabatan yang paling penting iaitu jabatan Pembuatan mempunyai beberapa bahagian yang menjalankan prosesnya sendiri. Jabatan ini mendapat perhatian lebih mendalam untuk mendapat penyelesaian-penyelesaian yang optimum.

Langkah pertama ialah mendapat komen-komen daripada pegawai-pegawai yang mengurus jabatan masing-masing. Sistem yang sedia ada dikaji untuk mengetahui proses pembuatan dan kawalan kualitinya. Selepas langkah-langkah ini tercapai, definasi kualiti yang berpatutan perlu diwarkahkan sebagai kata hikmah untuk mereka sistem baru itu. Langkah-langkah penaiktarafan yang berpatutan difikir dan diolah untuk memastikan penerimaannya. Untuk mencapai objektif ini, latihan dan pendidikan yang sesuai perlu diberi kepada pekerja-pekerja yang terlibat.

Apabila langkah-langkah baru ini telah dilaksanakan, cara-cara untuk menyukat keberkesanan sistem baru perlu dilakukan. Tempat kerja yang diselidiki terdiri daripada lapan bahagian yang memberi kadar kecacatan yang berbeza. Penaiktarafan sistem ini dilakukan dalam jangkamasa 11 bulan iaitu dari September 2001 hingga Ogos 2002. Untuk jangkamasa ini, jumlah kecacatan yang direkod bertambah dari 15 kali (pada September 2001) ke 57 kali (Ogos 2002), pertambahan sebanyak 280.00%. Pembaziran masa untuk memulihkan kecacatan-kecacatan ini merekodkan penurunan dari 97.5 jam kepada 38.5 jam (penurunan sebanyak 60.51%) dan pembaziran kos berkurang sebanyak 95.77%. Angka-angka ini membuktikan kebolehan langkah-langkah penaiktarafan untuk mengesan isu-isu kualiti dan menyelesaikannya dalam jangkamasa tersingkat lalu memberikan penjimatan kos. Namun, pelbagai lagi langkah boleh diambil untuk memajukan lagi sistem telah dimanfaatkan untuk kemajuan di masa hadapan.

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I certify that an Examination Committee met on 23 June 2004 to conduct the final examination of KUMARES WARA RAO S/O SUBRAMANIAM on his Master of Science thesis entitled "A STUDY OF PROCESS REENGINEERING IN THE SHOP FLOOR OF A FAN AND BLOWER PRODUCTION " in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

**Ir. Mohd Sapuan Salit, Ph.D.**
Faculty of Engineering
Universiti Putra Malaysia
(Chairman)

**Ir. Md. Yusof Ismail, Ph.D.**
Faculty of Engineering
Universiti Putra Malaysia
(Member)

**Megat Mohamad Hamdan Megat Ahmad, Ph.D.**
Faculty of Engineering
Universiti Putra Malaysia
(Member)

**Napsiah Ismail, Ph.D.**
Faculty of Engineering
Universiti Putra Malaysia
(Member)

_____

**Gulam Rusul Rahmat Ali, Ph.D.**
Professor/Deputy Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

This thesis submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee are as follows:

**Ir. Md. Yusof Ismail, Ph.D.**
Associate Professor
Faculty of Engineering
Universiti Putra Malaysia
(Chairman)

**Megat Mohamad Hamdan Megat Ahmad, Ph.D.**
Associate Professor
Faculty of Engineering
Universiti Putra Malaysia
(Member)

**Napsiah Ismail, Ph.D.**
Associate Professor
Faculty of Engineering
Universiti Putra Malaysia
(Member)

_____

**AINI IDERIS, Ph.D.**
Professor/Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

## DECLARATION

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

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**KUMARES WARA RAO s/o SUBRAMANIAM**

Date:

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