

SUSTAINABLE ASSESSMENT IN MANUFACTURING COMPANY

MOHD FUAD BIN YASAK

A project report submitted in partial fulfilment of the requirement for the award of
the degree of Master of Engineering (Industrial Engineering)

Faculty of Mechanical Engineering

Universiti Teknologi Malaysia

JULY 2015

Dedicated to

My father, Yasak bin Younos, whose sacrifice

My mother, Noriah binti Ahmad, whose patience

and Nor Atiqah Zolpakar

Lead to achieve my postgraduate studies

ACKNOWLEDGMENT

At first thank to ALLAH, the most gracious and the most merciful for providing me the opportunity to me pursue my dream of postgraduate study and ability to accomplish this research.

I would like to express my deepest gratitude towards my supervisor, Prof. Dr. Noordin Mohd. Yusof. Without his kind guidance, encouragement and valuable advice during the project and writing, this thesis would not be come to the light. His attention and technical expertise were key elements to my master project. I am gratified in gaining from his depth knowledge in the area of sustainability, which will have a significant impact on my future career in industrial field.

My gratitude and appreciation goes to UTM that provide me platform and opportunity for me to continue my study. I am very grateful to my all friends and colleagues office for their concern, encouragement and moral support during the challenging tenure of this project.

Finally, and most importantly, special thanks to my family special my parents and my sibling for their unconditional love, sacrifice, encouragement and support that enables me to achieve this degree. Not to forget Nor Atiqah Zolpakar.

ABSTRACT

Knowledge of sustainability concepts and the application of sustainability assessment in Malaysian industries are rather limited. A practical approach towards understanding sustainability concepts and its advantages is by conducting sustainability assessment. Sustainability assessment should consider the three pillars of sustainability via the environment, economic and social. The objectives of the study were to perform sustainability assessment on a popular power tool by determining its sustainability score and to propose improvement to increase the sustainability score. Sustainability assessment was performed using the Math Lab fuzzy logic toolbox. The sub element for environment were solid waste and global warming, whereas for economic, the sub element were cost, quality, technology and process. Finally for social sub element it was the social performance. Outcomes of this study demonstrate the integration between fuzzy logic and sustainability assessment yield the sustainability score for a popular power tool. Methods for improving the sustainability score of the chosen product were also proposed. Finally, some recommendations for future studies were proposed.

ABSTRAK

Pengetahuan tentang konsep kelestarian dan aplikasi penilaian kelestarian di kalangan pengusaha industri di Malaysia adalah terhad. Pendedahan yang praktikal untuk menjelaskan tentang konsep dan kelebihan kelestarian adalah dengan menjalankan penilaian kelestarian. Penilaian kelestarian hendaklah mengambil kira tiga tiang utama kelestarian, iaitu alam sekitar, ekonomi dan juga sosial.. Tujuan kerja kursus adalah untuk menjalankan penilaian kelestarian ke atas alatan kuasa tinggi yang popular untuk mengetahui tahap kelestarian alatan tersebut di samping untuk mencadangkan penambah baikkkan ke atas alatan untuk meningkatkan tahap kelestarian alatan tersebut. Kajian kelestarian dijalankan ddengan menggunakan perisian Math Lab aplikasi logik rawak. Alam sekitar mempunyai dua pecahan utama iaitu lebih pepejal dan pemanasan global, manakala untuk unsur ekonomi, mempunyai empat pecahan utama, iaitu kos, kualiti, teknologi dan proses. Akhir sekali adalah sosial, di mana hanya keupayaan sosial sahaja sebagai pecahan utama. Kajian kelestarian yang di gabungkan dengan logik rawak telah berjaya mengukur tahap kelestarian alatan berkuasa tinggi tersebut. Kemudian mencadangkan beberapa kaedah untuk meningkatkan tahap kelestarian untuk alatan yang telah di kaji. Akhir kata, beberapa cadangan untuk kajian masa hadapan telah diberikan.