

A COMPARATIVE STUDY OF ACTIVITY-
BASED COSTING (ABC) AND TIME-DRIVEN
ACTIVITY-BASED COSTING (TDABC) ON
COST ACCOUNTING

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I hereby declare that the work in this thesis is based on my original work except for 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 Universiti Malaysia Pahang or any other institutions.

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ABSTRAK

Di dalam setiap persaingan perniagaan yang besar, adalah penting bagi syarikat untuk memasukkan anggaran kos yang tepat untuk menentukan harga terbaik bagi produk untuk mendapatkan keuntungan. Menjelang 1980-an, *Traditional Cost Accounting* (TCA) tidak lagi mencerminkan realiti ekonomi semasa disebabkan oleh maklumat yang menyimpang tentang keuntungan pesanan, produk dan pelanggan mereka. Di samping itu, *Activity-based Costing* (ABC) adalah kaedah kos yang asalnya dibangunkan untuk mengatasi kekurangan kaedah TCA dalam era kerumitan dan kepelbagaian produk yang semakin pesat berkembang. Walau bagaimanapun, ia tidak diterima secara umumnya kerana ia mengabaikan potensi keupayaan yang tidak digunakan di mana potensi itu akan memberi manfaat kepada ramalan prestasi sesebuah syarikat. Tambahan pula, journal semasa yang diterbitkan tidak menyatakan dengan jelas mengenai kadar kos kapasiti, kapasiti praktikal dan persamaan masa. Objektif kerja ini adalah untuk membandingkan kelebihan ABC dan *Time-driven Activity-based Costing* (TDABC) yang didorong oleh masa dengan menganalisis ciri-ciri ke arah kelestarian kos. Kerja ini bermula dengan mengumpul data di industri elektronik dan elektrik yang terletak di Pahang. Produk yang dipilih adalah induktor magnet. ABC memberi tumpuan kepada kos yang wujud dalam produk berasaskan aktiviti untuk menghasilkan, mengedarkan atau menyokong produk yang berkenaan. TDABC menggunakan persamaan masa dan kadar kos kapasiti untuk mengukur kapasiti yang tidak digunakan. Melalui kaedah ABC, kerja ini berjaya mengumpulkan masa yang digunakan oleh operator untuk menyelesaikan tugas yang diberikan. Masa terbesar yang digunakan oleh operator adalah pada aktiviti *epoxy application* iaitu 43.89% dan masa terkecil ialah 0.63% pada aktiviti *oven curing*. Kapasiti kos tertinggi ialah aktiviti *epoxy application* dengan kos MYR 1,665,729.98 dan jumlah bahan yang digunakan dipilih sebagai pemandu kos. Jika kuantiti permintaan produk meningkat sebanyak 10%, jumlah kos pengeluaran diramalkan adalah MYR 4,260,115.20 manakala kos produk seunit diramalkan sebanyak MYR 0.81. Melalui kaedah TDABC, kerja ini mendapat maklumat mengenai kapasiti pengendali praktikal iaitu 123,600 minit. Selain itu, kadar kos kapasiti aktiviti *winding* adalah MYR 2.53 dan persamaan masa adalah 0.12 χ_1 dengan χ_1 sebagai pembolehubah jumlah bahan mentah sebanyak 8,697.6 kilogram. Semua aktiviti dianalisis dan dikategorikan dalam 3 kategori iaitu optimistik, pertengahan dan pesimistik. Terdapat 7 sub-aktiviti di bawah kategori optimistik, 6 sub-aktiviti di bawah pertengahan dan 4 sub-aktiviti di bawah pesimistik. Kerja penyelidikan yang telah dijalankan di industri dengan mengimplimentasikan kaedah ABC dan TDABC seterusnya membuat perbandingan antara kedua kaedah ini dan menyimpulkan bahawa TDABC adalah kaedah yang mempunyai penentuan harga pemandu yang objektif, meyingkatkan proses yang memakan masa, membolehkan pemandu kos yang banyak dan dapat meramalkan dan merancang menggunakan analisis penggunaan kapasiti. Justeru, pihak industri akan mendapat kebaikan daripada implementasi kaedah TDABC dalam proses membuat keputusan.

ABSTRACT

In any business competition, it is important for the company to incorporate an accurate cost estimation to decide the best price for products to gain profits. By the 1980s, Traditional Cost Accounting (TCA) is no longer reflecting the current economic reality due to distorted information about the profitability of the company's orders, products, and customers. In addition, Activity-based Costing (ABC) is a costing method originally developed to overcome the shortcoming of TCA method in the era of rapidly increasing product complexity and diversification. However, it is not universally accepted because it ignores the potential for unused capacity which will be beneficial for forecasting. Nevertheless, the current published work does not clearly state of capacity cost rate, practical capacity and time equation. The aim of this work is to compare the advantages of ABC and Time-driven Activity-based Costing (TDABC) by analyzing the features towards costing sustainment. The work begins by collecting data at electrical and electronic industry located at Pahang and the product selected is a magnetic inductor. ABC focuses on the costs inherent in the activity-based products to produce, distribute or support the products concerned. TDABC uses time equation and capacity cost rate to measure the unused capacity with respect to the time and cost. Through ABC method, this work successfully gathered the time allocated by operator to complete the task given. The largest time allocated by operator is at epoxy application activity which is 43.89% and the smallest is 0.63% at oven curing. The highest amount of cost of capacity is epoxy application activity with cost of MYR 1,665,729.98 and the amount of material used is selected as the cost driver. As the demand quantity of the product is increase by 10%, the total cost of production is predicted to be MYR 4,260,115.20 while the unit product cost is forecast at MYR 0.81. Through TDABC method, this work gains information on practical capacity of operator which is 123,600 minutes. Moreover, the capacity cost rate for winding activity is MYR 2.53 and the time equation is $0.12\chi_1$ with χ_1 as variable of amount of raw material of 8,697.6 kilograms. All sub-activities are analyzed and categorized in 3 categories which are optimistic, most likely and pessimistic. There are 7 sub-activities under optimistic category, 6 sub-activities under most likely and 4 sub-activities under pessimistic. In conclusion, by implementing and comparing of ABC and TDABC at the company, this work proves TDABC is a method with objective cost driver determination, removes time consuming process, have multiple cost drivers and able to forecast and planning using analysis of capacity utilization. Thus, TDABC can improve the company costing structure by using the advantages of TDABC in order to gain detailed decision-making process.

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LIST OF SYMBOLS

| | |
|-----------|--|
| Tt | Time needed to perform an activity |
| β_i | Estimated time to perform the incremental activity |
| β_0 | Standard time to perform the basic activity |
| \$ | Dollar currency sign |
| χ_i | Quantity of the incremental activity |

LIST OF ABBREVIATIONS

| | |
|-------|------------------------------------|
| ABC | Activity-based Costing |
| BOM | Bill of Material |
| LOH | Labor and Overhead |
| MHU | Material Handling Unit |
| MTS | Mahalanobis-Taguchi System |
| TCA | Traditional Cost Accounting |
| TDABC | Time-driven Activity-based Costing |
| US | United State |
| VBC | Volume-based Costing |
| VMI | Visual Mechanical Inspection |

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