A FIELD STUDY EXAMINATION ON THE USE AND APPLICATION OF MODERN MANAGEMENT ACCOUNTING TECHNIQUES ADOPTED BY MANUFACTURING FIRMS IN GEBENG AND NEIGHBOURING INDUSTRIAL AREAS

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ABSTRACT

This study envisages to examining and investigating local management accounting practices adopted by large manufacturing firms in the quest to becoming competitive in today's business environment. Managers and top management alike rely on management accounting information in undertaking various multifaceted managerial and strategic functions. Managers often find that the larger the organizations become, the more sophisticated information they need and the more illusive it becomes. The aid of management accounting techniques and best practices enables them to draw some in depth insights needed to undertake strategies that will result to above average return required to sustain competitive edge. However, the question is: Do these companies employ management accountants to do the job? This paper further dwells on the intensity of both multinationals and high flyers domestic companies' contributions to modern management accounting evolution in addition to exploring the historical development of management accounting in the area.

INTRODUCTION

The field of management accounting has interesting elements of being a combination of two disciplines: management and accounting. Both are highly sensitive to changes transpiring in the business arena. Prior to the Industrial Revolution of the 20th Century, owner-managers had limited use of management accounting information. They did not need much elaborated reports, as there were less external parties involved or few complicated events took place. Their dependence on internally generated financial accounting information, for many decades, made management accounting stagnate as its functions were mainly overshadowed by financial accounting system.

Subsequently, the practice of management accounting has flourished in United States of America with the growth of large industries. Both industrial and commercial activities had escalated and dispersed over the rest of the world. As product lines expanded and operation became complex, forward-looking companies such as Du Pont, General Motors and General Electric recognise the need for management-oriented accounting reports that is distinct separated from financial reports (Johnson 1975); thus, management accounting practices became relatively sophisticated and provided the essential information needed to manage large-scale production of textiles, steel and other products (Chandler 1977).

These days the growths of international holding business and technological advancement have changed the world of management accounting. New management accounting techniques have emerged and proven to be successful tools by many firms in various industries in cost reduction, waste elimination, efficiency in operating processes, pricing, customer's satisfaction, and creating higher values to companies' outputs and bottom lines.

PROBLEM STATEMENT

Oftentimes, globalisation, global economy, e-commerce, robotic manufacturing, e-government, continuous manufacturing processes, balanced scorecard, target costing, kaizen, quality circles, environmental cost, social responsibility, activity based costing and many more management accounting best practices have always been the focus of many distinguished corporate entities, entrepreneurs, academicians, authors and production operation and management experts. The question is: Do these techniques exist locally? Do local companies use and apply these techniques? What is the rate of its application? Does the influx of large and multinational companies create new developments and changes in management accounting practices? Ideally, new developments need to be kept abreast by local's corporate entities to replicate results. The

need to know and understand how and what techniques these large companies adopt are necessary in order for them to survive in the highly competitive global market. Likewise in the tertiary level, there is still great dependence on foreign-authored management accounting textbooks in their teaching and learning processes. Thus, students do not really capture the local management accounting practices. With this scenario, students are not exposed to the real situation and practices that may lead them to MACT shocks.

OBJECTIVES OF THE STUDY

The utmost objective of this study is to explore the common management accounting (MA) techniques and practices used by manufacturing firms in Gebeng, Kuantan, a prime industrial area in the State of Pahang. Gebeng has been chosen primarily due to its technologically advanced industrial infrastructures through foreign direct investments from developed countries such as U.S.A., U.K., Japan, Netherlands, Germany, Singapore and others.

The study intends to document discriminating applications of management accounting techniques in various industries' manufacturing processes for the students, academicians and the general public at large to understand, learn and acquaint themselves with the latest methods, techniques and practices adopted by organisations. Thus, making prospective users and other academicians understand the local MA practices rather than reliance on foreign techniques manifested on textbooks. Some specific objectives of the projects are to:

i. determine the rate of adoption and applicability of modern management accounting practices adopted by manufacturing firms in the subject area;

ii. determine the most preferred MA technique/s used amongst technologically advanced manufacturing firms;

iii. determine the existence of management accountant's post amongst the corporate sector;

iv. to illustrate the evolutionary stages of management accounting practices in the area.

RESEARCH DESIGN

Research contents are based on variables and issues identified as relevant in the application of management accounting concepts and techniques (MACT). They are manufacturing operation and activities, kind of infrastructure available, kinds of products being produced, availability of raw materials, manufacturing process layout, production throughput and cycle time, modernisation of resources, corporate policies and company's size.

Research approaches also consider other moderating issues that may neutralize the intensity of the impact of the main variables such as aspiration and goals of the company, innovations, and human capital. Further, intervening variables such as globalisation and regionalisation initiatives are given recognition. These are challenges confronting the country as the Southeast Asian region opens its doors to AFTA (ASEAN Free Trade Agreement) and WTO (World Trade Organization), which have impact on the MACT. This study also considers three relevant areas that are seen to be the fundamentals of this study. They are: the Anglo-American management accounting practices, the Sino-Japanese management accounting practices and management accounting research findings by a couple of researches from various parts of the world which were adopted from secondary sources.

METHODOLOGY

Pilot Study

Initially, a pilot study was undertaken to gauge the general outlook of the target respondents. A predetermined set of questionnaire was personally distributed to 12 selected, responsive and large manufacturing companies in Gebeng, Pelabuhan and Mentakab, Pahang. After having gained some insights on the topic, a personal interview with key personnel (production and accounting) ensued. The results of

these interviews were descriptively analysed that form part as the basis for framing up the contents of the final set of survey questionnaires.

Sampling Design

The companies involved in this project comprise of both multinationals and domestic enterprises in Gebeng Industrial Areas encompassing neighboring areas of Pekan, Pelabuhan, Mentakab, Pahang. It further covers the area of Paka and Teluk Kalong, Kemaman, Terengganu in the view to increase the number of respondents. All in there were 76 companies that had been selected through ocular survey, yellow pages and also from the register of police force surveillance team of the subject areas. The questionnaires were sent to the key personnel (Accountant) by post together with the corresponding stamped and addressed envelope (CSAE). Added scope of research activities were carried out through survey questionnaire, field examination and personal interview to understand fully their current practices. Secondary sources were also utilized to further augment the results of the study.

The Survey Questionnaires

The survey questionnaires were designed to elicit information from the samples, which consist of ninety-one variables in six main sections, i.e. Sections A to F. Section A covers the demographical information of the respondents. In Section B, production process, cycle time, and type of production operation were featured. Section C deals with the accumulation of product cost, manufacturing overhead application systems, cost structure, environmental costs and its accounting treatment, quality measures and social responsiveness. Section D emphasizes more on cost management systems and practices. Section E deals on transfer pricing, control and performance measures. Section F is an ancillary section designed to extract information about management accountant's job position, educational background, and professional membership.

The Field Examination and Personal Interview (FEPI)

FEPI was conducted subsequent to the respondent's survey questionnaire result that had been analysed. This constituted ocular examination of the production layout, manufacturing process, and other infrastructure. Personal interview with accounting and non-accounting personnel took place to explore further relevant issues, which were previously quoted in the survey questionnaires' findings. Simultaneously pictorial documentation of the various infrastructure and state-of-the-art technologies available locally was also conducted to further substantiate the findings. In cases, where researcher is barred to view the process, illustrative discussions were taken as an alternative.

Data Analysis

All data obtained in various phases of data collection were analyzed using the Statistical Package for Social Science (SPSS) 11.0 available at the university. The inter-items reliability analysis scale (alpha) shows coefficients of thirty-one variables of 0.8361. Simple descriptive statistical analysis and frequency tabulation were mostly used all throughout the study to obtain the required objectives.

LIMITATION OF THE STUDY

The scope of this study is vastly concentrated in the areas of Gebeng, Pelabuhan, Pekan and Mentakab of the State of Pahang Darul Makmur, and Paka and Telok Kalong of the State of Terengganu. Thus, the research results are not a representative of the total management accounting practices of the country.

RESULTS AND DISCUSSIONS

A total of 76 large companies were identified as samples and survey questionnaires were sent out. However, only 40 completed questionnaires were finally received. All of them were fit to be analysed. Reliability analysis were made and showed a coefficient of Alpha of 0.8361, which denoted a good reliability level.

Company Attributes

The demographic profile of the 40 respondents suggests that vast coverage of differing industries are involved in the study of which 62.5% are domestic companies operating in diverse industries from automobile manufacturers to timber milling. Multinational enterprises (37.5%) are basically operating in industries ranging from chemicals, rubber latex threads to wood based and chips and medium and high-density fibre product. In terms of business experience, 37.5% of the respondents have been in business for five to ten years, 32.5% ten to fifteen years, and 20% sixteen to twenty-four years, one company with less than five years, and another company with thirty-five years business experience.

The target companies are considered reasonable in size with production assets investments ranging from RM1 million to RM2.9 billion. 80% of respondents produce two or more products, which are sold either locally or world over. In terms of workforce, respondents employ 100 to 7,000 persons of which 82.5% employ less than 500, and 17.5% with 501 to 7,000 employees. Table 1 shows the details of survey respondents.

Table 1: Summary of Demographical Attributes of Respondents

Number of Respondents	**Multinationals (15) Local Companies (25)**
Kinds of Business:	Berhad (3) Senderian Berhad (37)
Industry Covered:	Manufacturing (21) Automobile (3) Oil & Gas SS (2) Petrochemical (14)
Size of Investment:	RM 1 million to RM 2.9 billion
Years in business:	< 5 (3), 5 to 10 (15), 10 to 15 (13), 16 to 24 (8), 35 (1)
Number of Employees:	< 100 (16), 101 to 500 (17), 501 to 1000 (3), 1000 to 4000 (3), 7000 (1)

Production Layout

Survey findings show that 77.5% of the companies adopt traditional production layout and 22.5 % utilizes the cell arrangement whereby the production processes are wholly completed in one plant area. Petrochemical and chemical industries (50%) are the leading users of cell production set-up. This further indicates that these companies have lesser non-value added activities, either moving or waiting, brought about by dispersed plant layout. In depth analysis of the findings indicates that 78% of respondents using cell layout simultaneously adopt 6 various types of modern MACT as shown in Table 2.

Table 2: Cross Tabulation of Production Layout and Use of MACT

No.	Use of MACT	Kind of Production Layout/Number of Companies				
		Traditional*	Percent	Cell*	Percent	Total %
1	Target Costing	6	15	1	2.5	17.5
2	Kaizen Costing	1	2.5	3	7.5	10
3	Continuous Improvement	9	22.5	6	15	37.5
4	Benchmarking	20	50	6	15	65
5	Variance analysis	23	57.5	9	22.5	80
6	Break-Even Analysis	18	55	5	12.5	67.5
7	Budgeting	31	77.5	9	22.5	100
8	Standard Costing	31	77.5	6	15	92.5
9	Re-engineering	3	7.5	0	0	7.5
10	Balanced Scorecard	2	5	5	12.5	17.5
11	Value Engineering	1	2.5	1	2.5	5
12	Product Life cycle Costing	2	5	1	2.5	7.5
13	Total Quality Management	31	77.5	7	17.5	95
14	Just-In-Time Production	19	47.5	5	12.5	60
15	Just-In-Time Purchasing	26	65	5	12.5	77.5
16	Activity-Based Costing	5	12.5	2	5	17.5
17	Backflush Costing	6	15	1	2.5	17.5
18	Flexible Manufacturing	26	65	3	7.5	72.5
19	Material Requirement Planning	27	67.5	6	15	82.5

Production Process and Operation

The study discovers that semi-automated production process is predominantly used at 55 %, followed by computer-controlled operations (35%), automated (7.5%) and manual (2.5%). Industry wise, the petrochemical and chemical industries have highest adoption rate (93%) in computer controlled machine operations (CNC). The manufacturing sectors, where 90% of the samples in the industry adopt semi-automated process, still possess the most outdated production process – manual. Automobile industry is fully reliant from semi-automation process in enhancing employment rate along with transfer to technology in the State of Pahang. It further discovers that the majority of Multinational companies (MNC) operates on semi-automation (69%), CNC (33%), automated (8%) in contrast with local companies where 35% of companies are involved in CNC operations, 52% semi-automated, 8% automated and 4% manually. This denotes that there is no significant difference in the type of production process between MNC and local companies except that the former is high-tech. Table 3 shows the tabulation analysis of production process by country of origin.

Table 3: Tabulation Analysis of Production Process By Country of Origin

Production Process	Local Companies		Multinationals		Total (Percent)
	Frequency	Percent	Frequency	Percent	
Automated	2	8	1	8	7.5
Semi-automated	13	52	9	69	55
Computer Controlled Operation	9	36	5	33	35
Manual	1	4	0	0	2.5
Total	25	100	15	100	100
Percent	63%		37%		

The study further highlights that in terms of manufacturing start-up, i.e. time taken to get the machines ready for production after shutdown, automated and CNC operations have longer start-up hours (48 hours), semi-automated (12 hours) and manual (instantaneous). This indicates that the more technologically advanced a manufacturing operation becomes, the longer hours it takes to start-up its production and vice-versa.

Non-Value Added Production Activities (NVAA)

The findings reveal that NVAA exist during production process. Respondents have adopted storing (85%), waiting (70%), moving (80%) and inspection (90%). Comparatively, manufacturing industries have higher incidence of NVAA amongst the industries as depicted in Table 4.

Table 4: Production Activities By Industries

Activities Undertaken	Types of Industries				Total	
	Oil & Gas SS	Petrochemical	Manufacturing	Automobile	Frequency	Percent
Processing	2	14	21	3	40	100
Storing	2	10	19	3	34	85
Waiting	2	7	16	3	28	70
Moving	2	11	16	3	32	80
Inspection	2	12	19	3	36	90

Strategic Management Accounting Techniques (SMAT)

Various SMAT have been queried in terms of usage. Result shows that adoption rates are: target costing (17.5%), kaizen (10%), benchmarking (65%), value chain analysis (70%), re-engineering (7.5%), product life cycle costing (7.5%) and balanced scorecard (17.5%).

Target costing (TC)

TC adoption rate is low at 17.5% as compared to Japan 80%. Locally, manufacturing sector usage is at 28.6% and automobile (33.3%) and 0% in both oil & gas and petrochemical/chemical industries. This finding is unanimous to the study conducted by Monden and Hamada (1991) and Norlaila Abdullah (2003) where target costing is applicable only in assembly line industries, printing and publication, and electronics, which is the prime gap factor.

Kaizen (Continuous Improvement)

The survey reveals that there are 4 respondents (10%) adopting kaizen principles that extend to cost down practices, value engineering, and research activities' improvements. Based on face-to-face interview, kaizen practices ultimately having positive effect to the organisation's profitability and line cycle time (LCT).

Benchmarking

There are 26 respondents (65%) that embrace benchmarking technique. Adoption rate by industry shows that automotive (100%), manufacturing (52%), chemical and petrochemical (52%) and oil & gas support industries (50%).

Value Chain Analysis (VCA)

On a question of identifying business activities that adds value to company's wealth, the study shows that 80% of respondents responded, "Yes." 70% of VCA activities are devoted to major functions in production and distribution activities. In petrochemical and chemical industries, VCA leads respondents to outsourcing plants' maintenance services. In an interview with one of the respondents, relies from almost 600 contractors to perform maintenance activities during shut down operations every 3 years. Thus, outsourcing an activity results to more value rich operations where expertise and infrastructure are not available.

Re-engineering (RE)

RE rate of adoption amongst the respondents is at 7.5%. During the field examination, it was discovered that oil & gas support services, chemical, petrochemical, oleo chemical and oil palm refineries do not need any re-engineering because the existing infrastructures and production operations had already been re-engineered at inception stage. On the other hand, most of the companies in the manufacturing sector do not have plans to do re-engineering. In automobile industry, RE is beneficial as it affords shortened cycle time in the assembly operation.

Balanced Scorecard (BS)

Research findings reveal that 17.5% of the respondents are using BS as strategic performance measure. Most of these are chemical and petrochemical (35.7 %) and automotive (66.7%). Proponents of BS are companies that have been in business for 5 to 15 years (85.71%) and 25 years (14.28%). Further, multinationals have higher rate of BS adoption (20%) as compared to locals (16%). Note that companies back-up by foreign graduate's accountant (42.8%) have higher incidence of BS as opposed to both professional (28.6%) and local (28.6%). Also, companies with higher manufacturing assets investments have higher rate of adoption.

Modern Cost Accounting Techniques

Activity-Based Costing (ABC)

The rate of ABC usage is at 17.5%. Industry wise, ABC is predominantly used in oil & gas support services (50%), chemical and petrochemical (37.5%, manufacturing (5%) and Automobile (0%). Local companies have higher rate of adoption (71%) in contrast to multinationals (29%). Companies producing multiple product lines (5 to 8) have dominance in ABC applications. It is deduced further that ABC is common in companies of mix products with the CNC manufacturing infrastructure. In an interview with one of the key personnel of a prominent respondent, it is noted that ABC system is inline with the parent company's procedure.

Backflush Costing (BC), Just –in-Time Production (JITPr) and Purchasing (JITP)

The rate of adoption of BC is at 17.5%. Since this system is related to JIT, it is necessary to synergy the findings. JITPr adoption rate is 60%. Industry users are mostly from oil & gas support services (100%), petrochemical and chemical (71.4%), manufacturing (47.62%) and automobile (66.7%). For JITP, the rate of adoption is 77.5%. Findings show that respondents apply JITP without regard on the availability of local raw materials. Out of 24 JITPr companies and 31 JITP, only 7 (17.5%) adopt backflush costing and the remainder (17) implements JIT with the use of traditional costing system.

Product Life Cycle Costing (PLCC)

The survey reveals 7.5% of the respondents implements PLCC mainly from manufacturing sector. Previous research by Berliner & Brimson (1988) indicates PLCC is suitably used in products with short life span i.e. computer and electronics. However, this study discovers that PLCC can also be applied in chemical and automobile industries.

Traditional Cost Accounting Techniques

Standard Costing (SC)

SC application rate is 92.5%. Users of SC are from oil & gas support services (100%), chemical and petrochemical (92.9%), manufacturing (86.7%) and automobile (100%). Companies have high preferences to SC regardless of size of capitalization, product lines and kind of production set-up and age. Companies ageing 5 years to 35 years patronize SC flexibility.

Other Product Costing Methods and Computerized Costing System

Preference to other costing methods such as process costing (45 %), job order costing (5%), activity-based costing (17.5%), full cost based on actual cost incurred (5%), weighted average cost (5%), marginal cost (12.5%), and own costing system (2.5%) exist amongst respondents. In terms of industry usage, Table 5 shows the summary of the various product-costing methods by industry. Also, 62.5% of respondents use computerized costing system. Usage by industry shows 93% are chemical and petrochemical companies, manufacturing (43%), oil & gas support services (100%) and nil for automobile industry.

Table 5 : Summary of Product Costing Methods By Industry

Costing Methods	Types of Industry			
	Oil & Gas	Chemical	Manufacturing	Automobile
Process Costing	45%	36%	57%	67%
ABC	17.5%	36%	5%	0
Job Order Costing	5%	0	5%	0
Full Costing	5%	14%	0	0
Own Costing	2.5%	7%	0	0
Marginal Costing	12.5%	7%	14%	33%
Weighted Average	5%	0	5%	0
Standard Costing	7.5%	0	14%	0
	100%	100%	100%	100%

Environmental Wastes (EW) and its Costs

Out of the 40 respondents, 82.5% generate EW during production process. 100% of companies in automobile industry have waste emission, petrochemical (85%), manufacturing (79%) and oil & gas support services (50%). The kind of EW varies from industry to industry, however, toxic waste are common in all industries. Toxic waste emission rate by industry indicate that chemical and petrochemical rank the highest (53%), manufacturing (20%), automobile (20%) and oil and gas support services (7%). Table 6 indicates the summary of annual environmental cost outlay, waste disposal system, environmental cost accounting treatment environmental waste management as a key performance indicator.

Table 6 : Summary of Environmental Cost and Waste Issues By Industry

Type of Environmental Waste:	Toxic (45%), Non-Toxic (55%)
Annual Costs Incurred: (RM 000)	< RM200 (2.5%) < RM 1,300 (42.5%) < RM2000 (30%) <RM 3000 (7.5%)
Disposal Program Adopted:	Own treatment (21%); Sent overseas (6%); Gov't Disposal (58%)
	Recycled locally (3%); Store in a shelter (3%) Neutralize (9%)
Absorption of Environmental Cost to product:	As raw material cost (15%); Factory Overhead (70%); Administrative
	Cost (15%)

Profit Planning Techniques (PPT)

Respondent's usage of various PPT is depicted in Table 7. It shows that 68% of respondents prefer to use Cost Volume Profit Analysis (CVPA). The incidence of usage increases from 50% to 100% in companies with product lines of 2 to 10. For budgeting and budgetary control, it indicates that 100% of respondents implement the techniques as an effective tool in planning and evaluation. With regards to the use of material resource planning (MRP), the survey reveals that 82.5% of the respondents implement MRP. Results of interviews with multinationals' executives note that higher percentage of firms' usage of MRP is due to integrated approach in purchasing system of the whole organisation (local and parent) in addition to current underlying stringent control on inventories.

Economic Order Quantity (EOQ) usage: 50% of respondents adopt EOQ in purchasing activities. Respondents with product mix of 2 to 10 have EOQ rate of adoption of 53% while single product line companies' usage is 38%. Net Present Value (NPV) analysis' usage is at 43% of which 59% are locals and 41% are multinational companies. Respondents also use other methods in planning for capital acquisition where 17.5% use payback period and 27.5% accounting rate of returns.

Table 7: Frequency analysis of Profit Planning Techniques By Company Origin

Profit Planning Techniques	Local		Multinationals		Total (Percent)
	Frequency	Percent	Frequency	Percent	
Cost-Volume Profit Analysis	22	88	6	40	67.5
Budgets	25	100	15	100	100
Material Requirement Planning	21	84	12	80	82.5
Economic Order Quantity	12	48	8	53	50
Net Present Value Analysis	10	40	7	47	43

Performance Evaluation Techniques

Financial Measures (83%)

Local companies (68%) prefer to evaluate business unit's performance by financial measures and multinational's rate is at 32%. Financial measures includes ARR or accounting profit rate (82.5%), return on Investment (ROI) at 60%, residual Income (RI) 10%, and Economic Value Added (EVA) 10%. Survey reveals that ROI (56%) is most preferred by companies with business age ranging from 5 years to 35 years and 4% of companies with age less than 5 years. It is noted further that companies use these methods simultaneously with non-financial measures.

Non-financial Measures

Respondents do utilize non-financial measures (52.5%) in evaluating companies' performances at least one measure. The most preferred method is customer's satisfaction (52.5%), power and energy consumption (7.5%), market growth (2.5%), production volume (2.5%)and innovation (10%). Further analysis reveals that respondents with business age less than 5 years do not adopt any non-financial measures in evaluating company's performance.

Transfer Pricing (TP)

The survey reveals that 47.5% of respondents use TP system. This indicates the decentralized management system is still at minimum amongst respondents. In terms of industry usage, TP is highly applicable to automobile industry (67%), chemical and petrochemical (64%), oil and gas (50%) and manufacturing (27%). Table 8 shows the frequency usage distribution of the various TP methods.

Table 8 : Frequency Usage Distribution of Transfer Pricing Method By Industry

Industry	Transfer Pricing Methods/ Frequencies					Total	
	MP	NP	MPD	MPT	VC+	Frequency	Percent
Oil & Gas SS	1					1	50
Petrochemicals	2	2	3	2	1	10	64
Manufacturing	2	2	2			6	27
Automobile	1		1			2	67
Total	6	4	6	2	1	19	47.5
Percent (100%)	32	21	32	10.5	4.5		

Quality & Quality Control Measures

Total Quality Management (TQM)

Ninety-five percent (95%) of respondents use TQM in ascertaining that only quality products are dispatched to customers. Almost all the 4 industries covered in the survey have 100% TQM application rate except manufacturing industries (95%) where 2 of the respondents prefer to use otherwise. Local companies have 100% TQM affinity whilst multinational 87%. In adhering to TQM principles, 70% of respondents prepare Quality Cost Report (QCR). Manufacturing industries have 43% compliance on QCR whilst the rests have 100% adherence to preparation of QCR.

Research & Development (R &D)

Findings on R & D initiatives show that local companies (16%) have R & D unit and multinationals 40%. An interview with one of the multinationals executives indicates that R & D functions are globally undertaken by parent company.

International Standard Organization (ISO) Certification

The survey reveals that 65% of respondents hold an ISO certification, of which 42 % are multinationals and 58% local companies. This is a high correlation between QCR and ISO amongst respondents as shown in Table 9.

Table 9 : Cross Sectional Analysis of QCR and ISO Certification

Industry	Frequency	
	Prepares QCR	Possess ISO Certification
Oil & Gas Support Services	2	1
Petrochemical/Chemicals	14	12
Manufacturing	9	10
Automobile	3	3
Total	28	26
Percent	70	65

Management Accountant's Post (MAP)

MAP does not exist amongst the respondents. Survey indicates that management accountants' roles in the corporate arena are basically assumed by a number of accounting related post as shown in Table 10. In terms of professional affiliations, 30% of respondents are members of Malaysian Institute of Accountants, a regulatory body of the accountancy profession in Malaysia.

Table 10 : Cross Sectional Analysis of Management Accountants' Roles By Company Origin

Gender	Male (70%); Female (30%)
Management Accountant's Role Assumed by	Senior Manager (12.5%); Accounts Manager (22.5%)
	Finance/Administrative Manager (32.5%); Financial
	Accountants (22.5%); Cost Accounting Manager (5%)
	Assistant Finance Manager (5%)
Years of Service	< 3 (22.5%); < 6 (42.5%); <9 (5%); <12 (27.5%)
	< 15 (2.5%)

Activity-Based Costing (ABC) at BASF PETRONAS Chemicals in Gebeng, Kuantan, Pahang

This company's ABC is based on the worldwide financial guidelines of BASF (Germany), its parent company. The company's manufacturing overhead costs (MOHDC) is accurately ascertained and allocated to the products by way of identifying various activity cost pools and drivers. There are 2 major MOHDC in the operation: variable manufacturing overhead cost and fixed manufacturing overheads.

Fixed Manufacturing Overhead Costs (FMOC)

FMOC is accumulated through the 2 major cost centres: the infrastructure (manufacturing complex) and the running cost centre. Since the company owns 3 manufacturing complexes, each are treated as cost centre. All costs directly incurred in each complex are considered as fixed manufacturing overhead costs. Examples of fixed overhead in each complex are: plant depreciation, labor, maintenance, spare parts, staff maintenance salaries, and support services costs. These costs are absorbed into the product based on the activity or time consumed in the production process, taking place in a given manufacturing complex.

Variable Manufacturing Overhead Costs (VMOC)

VMOC are accumulated through each running cost centres, which include utility, demineralised water, natural gas, cooling water, nitrogen, steam, waste water and instrument air. Each of these costs is considered as pools of costs. Each pool of costs are calculated and charged to the products based on the total activity or cost driver undertaken. The activity cost drivers can be hours used, kilowatt usage or metric ton of chemicals.

The Evolution of Management Accounting Practices in Malaysia (EMAP)

The local EMAP have gone through a variety of differing sequences in consonance with the changing business environment of the industry. Some industries do not have to pass each evolutionary stage. Interestingly, some industries directly leap to stages 4 and 5 with the aid of state-of-the-art infrastructure affronts and functional competencies. The EMAP can be framed up into 5 distinct stages as follows:

Stage 1 – Dribbling costing-practices, which transpired prior and early post independence era where bookkeeping were predominantly in use and performed by less qualified accounting personnel and served as the basis for costing products and services.

Stage 2 – Cost ascertainment & analysis stage is culminated by the use of systematic costing methods, which were part and parcel of financial accounting system. Simple budgeted costs information, financial ratios including trend analysis were uses with necessity.

Stage 3 - Planning & control stage took place in the mid 1980s where the fusion of full range budgeting, breakeven analysis, standard costing, variance analysis and other statistical methods sufficed the needs of promising entrepreneurs.

Stage 4 – Integration stage resulting from the private sector dominating the industry coupled with the privatization moves of the Public Sector led to the use of more sophisticated techniques such as linear programming for profit maximization, discounted cash flows for capital expenditures, inventory models and other Program Evaluation Review Techniques (PERT) for profitability analysis, risk and sensitivity analysis with the aid of high tech electronic accounting gadgets.

Stage 5 - Sustainability stage is characterized by shifting local management accounting practices to competitiveness through creation of value by optimizing resource utilization, waste minimization, innovation, environmental care and social responsibility to sustain long term survival.

CONCLUSION

The main findings of this study can be summarized as: first, the use and application of MACT exists amongst large manufacturing companies although disparity exists. There is sporadic use of old fashioned-proven MACT that makes integration of various techniques minimal. Second, most companies (42.5%) prefer to invest in high-tech processes rather than using sophisticated MACT. Third, the most preferred modern MACT are: 1st - TQM, 2nd - MRP, 3rd - JIT-purchasing, 4th - Benchmarking and 6th - JIT – production. However, the least preferred are: reengineering (7.5%), and PLCC (7.5%). Fourth, the most preferred traditional management accounting techniques are: Budgeting (100%), SC (92.5%), variance analysis (80%), CVP analysis (60%), ROI (60%) and process costing (45%). And, the least preferred as Job order costing (5%) and weighted average costing (5%). Fifth, respondents' production process capabilities by industry are as follows:

1	Chemical & Petrochemical	Computer Controlled Machines	93%
2	Oil & Gas Support Services	Automated Production Process	100
3	Manufacturing Industry	Semi-automated Production Process	90%
4	Automobile Industry	Semi-automated Production Process	100%

Sixth, there is higher incidence of non-value added activities during the production process exists i.e. inspection (90%), storage (85%) and moving (80%). Seventh, sixty-five percent (65%) of respondents possess ISO certification which means majority of companies comply with company's operating standards. Eight, R & D activities of respondents are at 25%. Ninth, seventy percent (70%) of respondents prepare QCR in the quest to satisfy consumers' requirements. Tenth, forty seventy and a half percent (47.5%) of companies adopt domestic TP of which the most favored method of setting TP is market price (32%) and market price less discount (32%). Eleventh, seventy two and a half percent (72.5%) of respondents give support to community projects and the most preferred project is educational (23%), health, religious (17%) each, environmental (12%) and orphanage (5%). Twelfth, sixty two and a half percent (62.5%) of respondents use computerized costing system. Last but not least, thirteenth, management accountant's position does not exists amongst respondents; however, management accounting roles are assumed and discharged by finance & administrative manager (32.5%), accounts manager (22.5%), financial accountants (22.5%), senior manager (12.5%), cost accounting manager (5%) and finance manager (5%).

RECOMMENDATIONS

1. Private and government sectors must continuously spearhead the economy to increase diversification, merger, and acquisition undertakings leading to demand creation for sophisticated MACT to open avenues to skillful and capable management accountants, thus, free from stagnation.

2. The public and private sectors must create posts for management accounting graduates in order to enhance the utilization of available resources and core competencies, thus, add creation of values to organisation's wealth.

3. The number of management accountants and accountants occupying top management position, let us say, CEO, needs to be raised in order to recognize the capabilities and skills an accountant in business can do.

4. The Creation of local Management Accounting Review that publishes and highlights best management accounting practices needs to be disseminated freely to all learning organizations.

5. Management Accounting Awareness Program (MAAP) amongst higher echelon of management needs to be created through regular and continuous publication of well proven MACT and strategies with emphasis on both conceptual and operational learning.

6. Further research proposal can be focused in examining Public Sector MACT in addition to replicating and learning the so-called best practices of prominent manufacturing companies in detail.

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