Advanced Cost Management Systems in Australia: A Study of Their Use and Usefulness

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Abstract

This is a study of the extent of use, and the usefulness, of eight advanced cost management systems in a wide range of Australian organisations. Data on the characteristics of these systems are also presented, as well as their association with extent of use and usefulness. In addition, the organisations are classified into groups according to the extent of their use of advanced cost management systems, and by their industry classification, and insights obtained from these classifications are presented.

Keywords

Advanced Cost Management Systems
ACMS
Use
Usefulness

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Introduction

The publication of Johnson and Kaplan's book 'Relevance Lost: The Rise and Fall of Management Accounting' in 1987 was a wake up call to the management accounting profession. Johnson and Kaplan claimed, for example, that virtually all management accounting practices used today had been developed by 1925 and at that point the pace of innovation seemed to stop (p. 12). They also claimed that management accounting systems are inadequate for today's environment and that in this time of technological change, global and domestic competition, and expanding information processing capabilities, management accounting systems are not providing useful, timely information for the process control, product costing, and performance evaluation activities of managers (p.1).

Since that time considerable effort has been devoted to developing, and publicising, modern cost and management accounting practices (Bromwich & Bhimani 1989; Chalos 1992; Hirst 1990; Howell, Brown, Soucy & Seed 1987; Kaplan 1994; Young & Selto 1991). Advanced Cost Management Systems (ACMSs) is the generic name for these systems, techniques and practices which support operational management, product-related decisions, and managerial performance evaluation. We consider in this paper eight ACMS areas, primarily based on the practices described in Chalos (1992).

Advanced Cost Management Systems

Considerable research has been carried out on the subject of ACMSs. However, much of the evidence is drawn from individual, successful implementations of specific advanced cost management systems, particularly activity based costing systems.

Although there have been many studies of the use of ACMSs (Adler, Everett & Waldron 2000; Armitage & Nicholson 1993; Booth & Giacobbe 1997; Bright, Davies, Downes & Sweeting 1992; Chenhall & Langfield-Smith 1998; Chung, Schoch & Teoh 1997; Cohen & Paquette 1991; Drury & Tayles 1994; Green & Amenkhienan 1992; Joye & Blayney 1990; Innes & Mitchell 1995; Innes, Mitchell & Sinclair 2000; Warwick, Reeve & Feltrin 1997) most focus on a single ACMS, usually activity based costing, and most are based on a manufacturing environment.

The main ACMS studies are outlined next.

Activity Based Costing (ABC) Systems

Activity based costing systems for product/service costing are cost systems in which costs are first assigned to activities in the production process and then either directly traced or allocated to products/services using the cost driver that most accurately captures how the cost of the activity varies (Cooper 1988a, 1988b, 1989; Chalos 1992; Kaplan 1994).

Activity Based Management (ABM) systems

Activity-based management is an outgrowth of activity-based costing. In activity-based management, the objective is to determine the key business activities that people spend their time on and use that information to identify opportunities to improve productivity, increase value generated by a given level of resources, or eliminate non-value adding activities. Emphasis is given to identifying and controlling the causes of costs associated with activities (cost drivers) rather than cost recording and subsequent cost analysis (Turney 1992; Cooper, Kaplan, Maisel, Morrissey & Oehm 1992).

Life Cycle Budgeting and Target Costing (LCBTC) systems

Life-cycle budgeting involves estimating the revenues and costs attributable to each product/service from its initial research and development to its final customer servicing and support in the marketplace. A target cost is the estimated long-run cost of a product/service that when sold enables the company to achieve the targeted profit. Target cost is often lower than the existing full product/service cost of making and selling the product/service (Czyzewski & Hull 1991, Chalos 1992, Artto 1994, Brausch 1994).

Product Life Cycle Costing (PLCC) systems

Life-cycle costing tracks and accumulates the actual costs attributable to each product/service from initial research and development to the time at which support to customers is withdrawn. The terms "cradle-to-grave costing" and "womb-to-tomb costing" convey the sense of capturing fully all costs associated with the product/service (Czyzewski & Hull 1991, Shields & Young 1991, Chalos 1992, Artto 1994).

Competitor Cost Analysis (CCA) systems

Competitor cost analysis involves the reassessment of the cost competitive position of the organisation's products/services by making comparisons with the costs incurred by competitors. Competitor cost analysis should result in the adoption of successful practices by reengineering existing processes (Chalos 1992).

Customer & Marketing Channel Analysis (CMCA) systems

Customer (or marketing channel) costing systems report costs that reflect the way that customers (or marketing channels) differentially use the resources of a company. The information provided by customer (or marketing channel) costing systems can be used to ensure that customers (or marketing channels) contributing sizeably to the profitability of an organisation receive a commensurate level of attention from the organisation (Petty & Goodman 1996).

Strategic Cost Management (SCM) systems

In this study strategic cost management is concerned with the firm's interrelationships with its suppliers and its customers with a view to reconfiguring these relationships to increase value and/or reduce costs.

Strategic cost management involves estimating the effect of the firm's decisions on the costs/profits of its suppliers and customers as well as on the firm's own costs/profits (Shank 1989; Chalos 1992; Shields & Young 1992; Shank & Govindarajan 1989,1993).

Multiple Performance Measures (MPM) systems

MPM systems emphasise the need to use more than one performance measure for process control and managerial control and employ non-financial (physical or time-related) measures in addition to financial measures. MPM systems are also known as the balanced scorecard approach (Hall 1990; Kaplan & Norton 1992, 1993, 1996; Curtis 1994, Kaplan 1994)

Despite the large academic and professional literature dealing with advanced cost management systems there are relatively few studies that investigate the extent of use of a broad range of ACMSs. Fewer still consider the characteristics of ACMSs, and their usefulness, in both the manufacturing and service environments. This paper presents the findings of our study, undertaken in the Australian context, which goes some way to filling the above mentioned gap in the ACMS literature. In addition, in this study the organisations are classified into groups according to the extent of their use of advanced cost management systems, and by their industry classification, and insights obtained from these classifications are presented.

Method

Survey Details

The nature of the research indicated the use of the survey method. Data from a wide range of organisational units, including manufacturing and service units of various sizes, were required to ensure external validity of the research findings. A mail survey was considered the most cost effective method given the wide geographic dispersion of the respondent firms (Marsh 1982).

The survey form was mailed to 600 Australian resident members of CPA Australia (CPAs) using mailing labels provided by CPA Australia. The Executive Director of CPA Australia provided a cover letter encouraging members to respond to the survey. The CPAs were selected at random by CPA Australia from members holding senior management or management accounting positions in industrial and commercial organisations with more than 100 employees. Units with less than 100 employees were considered less likely to employ advanced cost management systems.

The introductory section of the survey form explained the objectives of the survey and asked for responses to the questions based on the organisational unit the respondent was most familiar with. This could be a plant, branch, department or division of a large organisation, or the whole organisation in the case of a smaller organisation. This choice of unit of analysis was expected to maximise the accuracy of responses.

When responses slowed a reminder letter and a further copy of the survey form was sent to non-respondents. One hundred and sixty six completed survey forms were received. The response rate of 28% is comparable with those in similar Australasian studies (Booth & Giacobbe 1997 (33%); Adler, Everett & Waldron 2000 (19%)). Later a mini-survey form containing questions drawn from the main survey form was sent to all non-respondents, and the responses used for analysing non-response bias. Non-response bias was assessed by calculating whether there were any significant differences between the respondents to the main survey (the respondents) and those who responded to the mini-survey (the non-respondents). There were no significant differences so it is unlikely that non-response bias significantly influenced the findings of this study.

Measurement of Variables

The survey form contained questions regarding the eight ACMSs described

above, as well as industry classification and demographic data for the organisational units and the respondent.

The average respondent had been a CPA for 9 years and most (85%) worked in the accounting and finance area of their organisational unit. A majority of respondents (57%) reported to superiors who were not in the accounting and finance area indicating that the respondents were among the most senior accounting and finance personnel in their organisational units. Respondents with this profile are likely to be able to provide accurate responses to the questions in the survey form, and minimise the limitation of relying on a single respondent for each organisational unit.

Responding organisational units came from all divisions of the Australian Standard Industrial Classification (ASIC) (Australian Bureau of Statistics 1985) except Division A (Agriculture, Forestry, Fishing and Hunting). The divisions most represented were Manufacturing (38.9%), Finance, Property and Business Services (22.8%), and Wholesale and Retail Trade (11.4%). Organisational units varied in size from 100 to over 25000 employees. The average number of employees was 1492 (mean), 500 (mode) and 200 (median). The median age of the organisational units was 25 years. A large majority (83%) of units were parts of larger organisations.

Questions in the survey form requested data on the following system characteristics for each of the eight ACMSs described earlier: (1) How extensively is this system used? and if it was used then (2) How long has the system been in use? (3) How frequently are reports generated? (4) Which level of personnel uses the information? (5) How useful is the output of the system? (6) How integrated is this system with the management accounting system (MAS)? (7) How computerised is this system? (8) What is the information produced by this system used for?

A copy of the instrument appears as Appendix 1. This is the instrument for ABC only and the same questions were asked for the other seven ACMSs.

Analysis and Discussion

The data regarding the characteristics of the eight ACMS have been summarised in Table One. Also, for each of the ACMSs, Spearman rank correlation coefficients were computed to indicate the degree of association between the characteristics and the extent of their use and their usefulness. An interpretation of this data follows. Note that in our interpretations of the rank correlation coefficients no formal consideration is given to multicollinearity between the characteristics (for instance there are large positive correlations between integration with the management accounting system (MAS) and computerisation for all ACMSs).

Extent of Use of Advanced Cost Management Systems

Inspection of Panel A shows that approximately half the respondents use Activity Based Costing (ABC) (48%) and Multiple Performance Measures (MPM) (Balanced Scorecard) (45%). Use of the other six ACMSs is less extensive. It varies from about a third of respondents for Activity Based Management (ABM) (33%) and Competitor Cost Analysis (CCA) (35%), through about a quarter for Strategic Cost Management (SCM) (26%) and Customer and Market Channel Analysis (CMCA) (26%) systems, to less than a quarter for Life Cycle Budgeting and Target Costing (LCBTC) (21%) and Product Life Cycle Costing (PLCC) (16%) systems. For all ACMSs more respondents are making limited or moderate use than those making major or very extensive use.

Inspection of Panel A also shows that for all ACMSs the largest correlations are between extent of use and usefulness. We think this indicates that usefulness drives use: the more useful a system is considered to be, the more extensively it is used. However, we cannot rule out the possibility that the relationship is reciprocal with ACMSs that are used more extensively being considered more useful..

Table One: Advanced Cost Management Systems Characteristics*

Panel A	**ABC**	*MPM*	*CCA*	*ABM*	*SCM*	*CMCA*	*LCBTC*	*PLCC*
Extent Of Use								
Sample size	164	165	166	165	165	166	166	166
Used %	48	45	35	33	26	26	21	16
Not used (0) %	52	55	65	67	74	74	79	84
Limited use (1) %	17	9	18	12	10	5	7	5
Moderate use (2) %	17	15	12	11	8	14	6	3
Major use (3) %	11	15	4	7	7	6	5	5
Very extensive use (4) %	4	7	2	2	2	1	2	2
Usefulness (r_s)	.50**	.69**	.45**	.62**	.53**	.58**	.72**	.74**
Integration with MAS (r_s)	.40**	.35**	.37**	.42**	.36*	.24	.47**	.58**
Computerisation (r_s)	.28*	.48**	.44**	.57**	.42**	.25	.65**	.65**
Frequency of reports (r_s)	.40**	.19	.26	.39**	.29	.44**	.24	.50*
Length of Use (r_s)	.20	.17	.35*	.22	.31*	.02	.33	.50*
Used for (purposes) (r_s)	.03	.08	.11	.18	.32*	.11	.39*	.69**
Used by (personnel) (r_s)	.09	-.14	-.08	-.11	-.22	-.02	.05	.46*
Panel B	*ABC*	*MPM*	*CCA*	*ABM*	*SCM*	*CMCA*	*LCBTC*	*PLCC*
Usefulness								
Sample size	79	70	53	51	40	40	34	24
Not useful (1) %	0	0	0	0	0	0	0	0
Minimally useful (2) %	7	3	21	10	10	10	15	13
Moderately useful (3) %	41	37	34	49	35	30	38	29
Highly useful (4) %	44	50	40	37	45	50	35	50
Critically useful (5) %	8	10	6	4	10	10	12	8
Mean value (1-5)	3.5	3.7	3.3	3.4	3.6	3.6	3.4	3.5
Extent of Use (r_s)	.50**	.69**	.45**	.62**	.53**	.58**	.72**	.74**
Integration with MAS (r_s)	.14	.21	.14	.14	.24	.37*	.34*	.31
Computerisation (r_s)	.16	.48**	.39**	.43**	.52**	.39*	.62**	.50*
Frequency of reports (r_s)	.35**	.36**	.27	.29*	.35*	.27	.26	.53*
Length of Use (r_s)	.22	.14	.23	.01	.19	.18	.26	.41*
Used for (purposes) (r_s)	.04	.19	.01	.01	.17	.04	.28	.55**
Used by (personnel) (r_s)	.21	-.11	-.20	.10	-.31*	.01	.26	.25
Panel C	*ABC*	*MPM*	*CCA*	*ABM*	*SCM*	*CMCA*	*LCBTC*	*PLCC*
Length Of Use								
Sample size	79	75	52	52	42	42	34	25
Less than 1 year (1) %	9	11	17	14	10	12	15	4
1-2 years (2) %	22	24	23	25	17	36	18	20
2-3 years (3) %	23	15	14	23	19	14	15	8
3-5 years (4) %	17	17	12	12	14	12	15	28
More than 5 years (5) %	30	33	35	27	41	26	38	40
Mean value (1-5)	3.4	3.4	3.2	3.1	3.6	3.1	3.4	3.8

*The characteristics are shown in terms of Frequency Percentages (%) and Spearman Rank Correlation Coefficients (R_s);(** significant at .01, * significant at .05 [two-tailed])

Table One: Advanced Cost Management Systems Characteristics* (cont.)

Panel D	ABC	MPM	CCA	ABM	SCM	CMCA	LCBTC	PLCC
Used By (Personnel)								
Sample size	79	74	53	52	42	42	34	25
Operators (1) %	3	1	0	4	0	0	0	0
Supervisors (2) %	13	14	2	4	2	0	3	0
Middle managers (3) %	41	38	8	44	26	26	41	28
Senior managers (4) %	43	46	81	48	67	71	53	68
CEOs (5) %	1	1	9	0	5	2	3	4
Mean value (1-5)	3.3	3.3	4.0	3.4	3.7	3.8	3.6	3.8
Panel E	**ABC**	**MPM**	**CCA**	**ABM**	**SCM**	**CMCA**	**LCBTC**	**PLCC**
Used For (Purposes)								
Sample size	79	75	52	50	42	41	34	25
A/C decisions (1) %	3	1	15	6	5	5	3	0
Mainly A/C decs (2) %	1	1	14	6	26	20	15	16
A/C dec & PE/Ctrl (3) %	18	33	23	30	41	27	27	24
Mainly PE/Ctrl (4) %	57	43	29	38	21	39	41	48
Perf Evaln/Control (5) %	22	21	19	20	7	10	15	12
Mean value (1-5)	3.9	3.8	3.2	3.6	3.0	3.3	3.0	3.6
Panel F	**ABC**	**MPM**	**CCA**	**ABM**	**SCM**	**CMCA**	**LCBTC**	**PLCC**
Frequency Of Reports								
Sample size	79	73	49	51	39	39	33	23
Annually (1) %	8	1	45	14	15	18	15	4
Quarterly (2) %	10	10	27	12	41	23	9	9
Monthly (3) %	70	63	22	59	33	44	67	61
Weekly (4) %	10	19	4	14	8	15	3	17
Daily (5) %	3	7	2	2	3	0	6	9
Mean value (1-5)	2.9	3.2	1.9	2.8	2.4	2.6	2.8	3.2
Panel G	**ABC**	**MPM**	**CCA**	**ABM**	**SCM**	**CMCA**	**LCBTC**	**PLCC**
Integrated With MAS								
Sample size	79	75	53	52	42	42	34	25
Separate (1) %	19	27	74	29	41	31	26	28
Data tfr manual (2) %	28	25	9	19	33	19	24	24
Data tfr electronic (3) %	11	13	6	10	2	21	6	4
Partial integration (4) %	19	28	8	23	24	17	21	28
Full integration (5) %	23	7	4	19	0	12	24	16
Mean value (1-5)	3.0	2.6	1.6	2.9	2.1	2.6	2.9	2.8
Panel H	**ABC**	**MPM**	**CCA**	**ABM**	**SCM**	**CMCA**	**LCBTC**	**PLCC**
Computerised								
Sample size	79	75	51	52	42	41	34	25
Manual (1) %	4	4	35	6	9	10	6	4
Mainly manual (2) %	13	25	31	21	48	20	9	16
Manual&computer (3) %	23	34	24	23	12	24	29	16
Mainly computer (4) %	34	25	4	17	24	32	29	36
Computerised (5) %	27	11	6	33	7	15	27	28
Mean value (1-5)	3.7	3.1	2.1	3.5	2.7	3.2	3.6	3.7

For all ACMSs, except CMCA, the next largest correlations with extent of use are those with integration with the management accounting system (MAS), and with computerisation. We think this indicates that, in addition to usefulness, reasons for greater extent of use of these ACMSs are that they are readily available in the organisations because they are integrated with the MAS, and because they are computerised. Alternatively, they are used to a great extent, perhaps because of their usefulness, and are therefore early candidates for computerisation and integration with the MAS.

Inspection of other panels shows that for all ACMSs, excepting CCA and SCM, the level of integration with the MAS is about evenly split between those that are not integrated with the MAS and those that are. Most CCA and SCM systems are not integrated with the MAS (Panel G). Consistent with this finding, most CCA and SCM systems are not computerised, whereas for the other ACMSs, a clear majority involved some level of computerisation (Panel H). Also, consistent with the above findings, for the majority of CCA and SCM systems the frequency of reports is lower (annual or quarterly) than for the other ACMSs, where the majority have a higher reporting frequency (monthly, weekly or daily)(Panel F).

Inspection of Panel A shows that for ABC, ABM, and CMCA there are also large correlations between extent of use and frequency of reports. Except for PLCC (where there is a large correlation between extent of use and purpose of use indicating PLCC systems are used more extensively when they are used for performance evaluation and control purposes) there are no large correlations between extent of use and: length of use, purpose of use, or personnel used by.

Inspection of other panels shows that all ACMSs had similar length of use patterns with about half having been in use for less than 3 years and about half for more than 3 years. This indicates that while all of these ACMSs are well established in some organisational units they are still being introduced in others (Panel C). The ACMSs are used almost entirely by middle management level personnel and above. Only with ABC and MPM were supervisors involved in any substantial way (Panel D). All ACMSs are used to some extent for both alternative choice decisions and performance evaluation and control. However with all systems the emphasis is on performance evaluation and control, except for SCM where the emphasis is on alternative choice decisions (Panel E).

Usefulness of Advanced Cost Management Systems

Inspection of Panel B shows that the mean usefulness scores are fairly similar for all eight ACMSs, varying from 3.3 to 3.7 out of 5, which places them all in the moderately useful range. MPM has the highest score (3.7), followed by SCM and CMCA (3.6), then ABC and PLCC (3.5), then ABM and LCBTC (3.4), then CCA (3.3). No respondent scored any of the ACMSs being used by their organisational unit as not useful.

As mentioned in the section on extent of use above, there are large correlations between extent of use and usefulness for all ACMSs. We think this indicates that usefulness drives extent of use, but cannot rule out the possibility that the relationship is reciprocal with ACMSs that are used more extensively being considered to be more useful.

There are also moderate to large correlations between usefulness and computerisation for all ACMSs, except ABC. This indicates that computerised ACMSs, which are likely to be more timely, powerful, and flexible, are considered to be more useful than manual systems. Interestingly, there are no large correlations between usefulness and integration with the management accounting system (MAS). This indicates that integration with the MAS of itself does not increase the usefulness of an ACMS, whereas, as noted in the section on extent of use above, integration with the MAS does increase the extent of use of an ACMS.

There are moderate correlations between usefulness and frequency of reports for all ACMSs except CCA, CMCA and LCBTC. Except for PLCC (where there is a large correlation between usefulness and purpose of use indicating PLCC systems are considered more useful when they are used for performance evaluation and control purposes) there are no large correlations between usefulness and: length of use, purpose of use, or personnel used by.

Extent of Use of ACMS: A Further Analysis

In the analysis of extent of use of the eight ACMSs above each ACMS was considered separately. In this section we go further and establish patterns in the use of the eight ACMSs by organisational units.

The organisational units (cases) were formed into two groups (clusters) based on the extent of use of each ACMS using K-means cluster analysis (Quick Cluster in SPSS for Windows V10). This procedure identifies any relatively homogeneous groups (clusters) of cases based on selected characteristics, using an algorithm that can handle large numbers of cases. The algorithm requires the researcher to specify the number of clusters. Analyses for 2, 3, and 4 clusters were carried out. The 2 cluster solution (resulting in 45 cases in group A and 115 cases in group B) gave the best combination of parsimony and interpretability. The method which updates cluster centres iteratively was chosen for classifying cases. Analysis of variance F statistics were computed which showed that the extent of use of each of the eight ACMSs contributed significantly to the separation of the groups. While these statistics are opportunistic (the clustering procedure tries to form groups that do differ), the relative size of the statistics provides information about each variable's contribution to the separation of the groups. ABM and MPM contributed most to the separation of the groups, PLCC contributed least, and the other ACMSs approximately equally.

Box plots were then prepared for each of the eight variables regarding the extent of

ACMS use within each of the two groups (using Explore in SPSS for Windows V10). These appear as Figure One. Box plots are summary plots based on the median, quartiles, and extreme values. The box represents the interquartile range which contains 50% of values. The thick line across the box indicates the median value. The whiskers are lines that extend from the box to the highest and lowest values, excluding outliers.

Inspection of the box plots in Figure One shows the extent of use of the eight ACMSs by members of the two groups. The first group (with 45 cases, or approximately one quarter of the sample) makes use of all eight ACMSs to varying but substantial extents. Trimmed means (5%) for extent of use values (which range from zero to 4) for this group were 2.0 for ABC, 2.7 for MPM, 1.1 for CCA, 1.7 for ABM, 1.3 for SCM, 1.1 for CMCA and LCBTC, and 0.6 for PLCC. On the basis of this 'extent of use' data, this group was labelled the progressive group. The second group (with 115 cases, or approximately three quarters of the sample) makes very little use of any of the eight ACMSs, beyond limited use of ABC and MPM. Trimmed means (5%) for extent of use values were less than 0.5 for all eight ACMSs. On the basis of this 'extent of use' data, this group was labelled the conservative group.

Further analysis was undertaken to see whether the progressive and conservative groups differed in respects other than their extent of use of ACMSs. Organisational units were allocated into two broad categories of 'manufacturing' (which comprised organisational units involved in mining (7.8%); manufacturing (38.9%); electricity, gas and water utilities (1.2%); and construction (1.2%)) or 'services' (which comprised organisational units involved in wholesale and retail (11.4%); transport and storage (3.6%); communications (4.2%); finance, property and business services (22.8%); public administration and defence (0.6%); community services (3.6%); and recreation, personal and other services (3.6%)). Non-classifiable economic units made up the remaining 2.4% and were excluded from

the analysis. We found that a majority (63%) of the organisational units in the progressive group regarding ACMS use were in the 'manufacturing' category while a majority (54%) in the conservative group regarding ACMS use were in the 'services' category. However, these differences were not statistically significant at conventional levels. The differences between the progressive and conservative groups with regard to organisational unit size, age and whether part of a larger organisation were also not statistically significant.

To explore the industry issue directly box plots were prepared for each of the eight variables regarding the extent of ACMS use within each of the two broad industry categories. These appear as Figure Two.

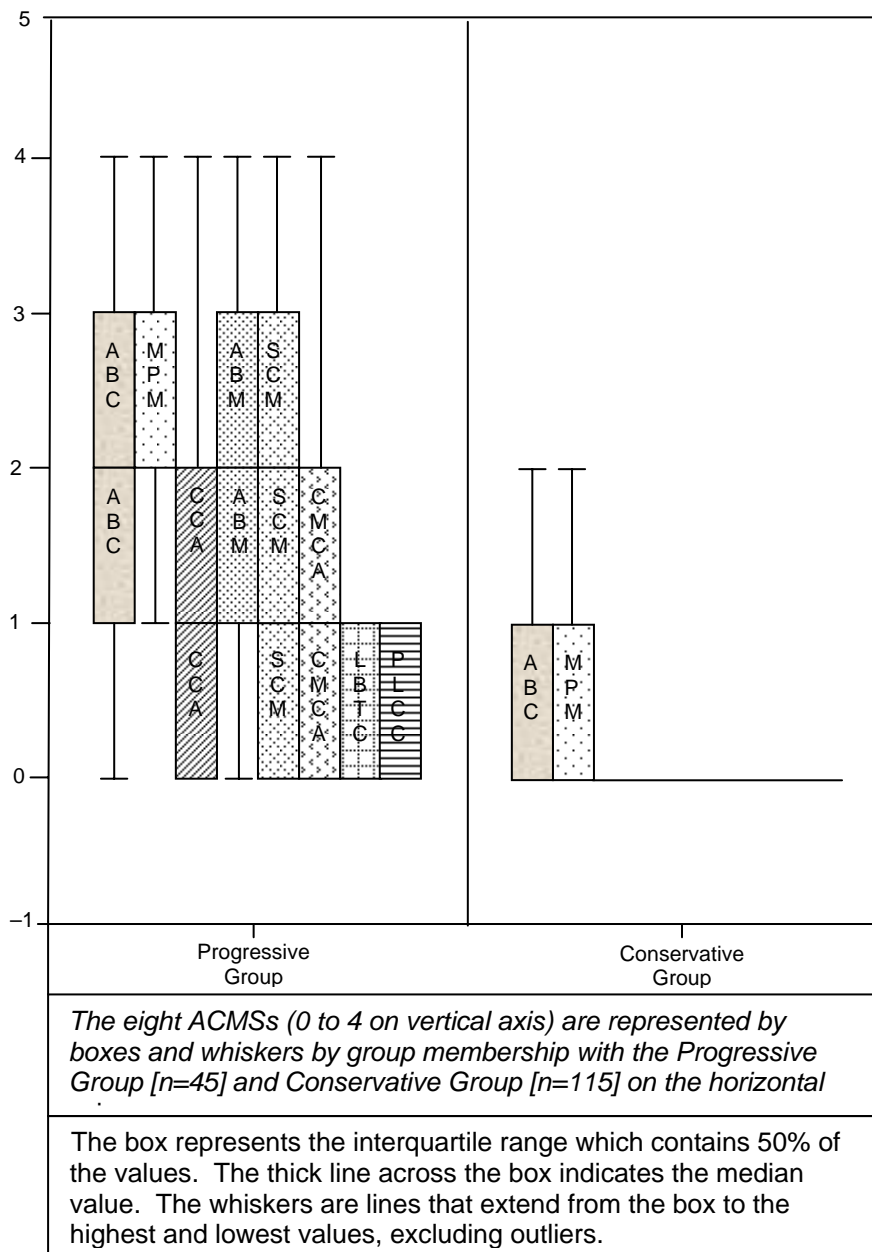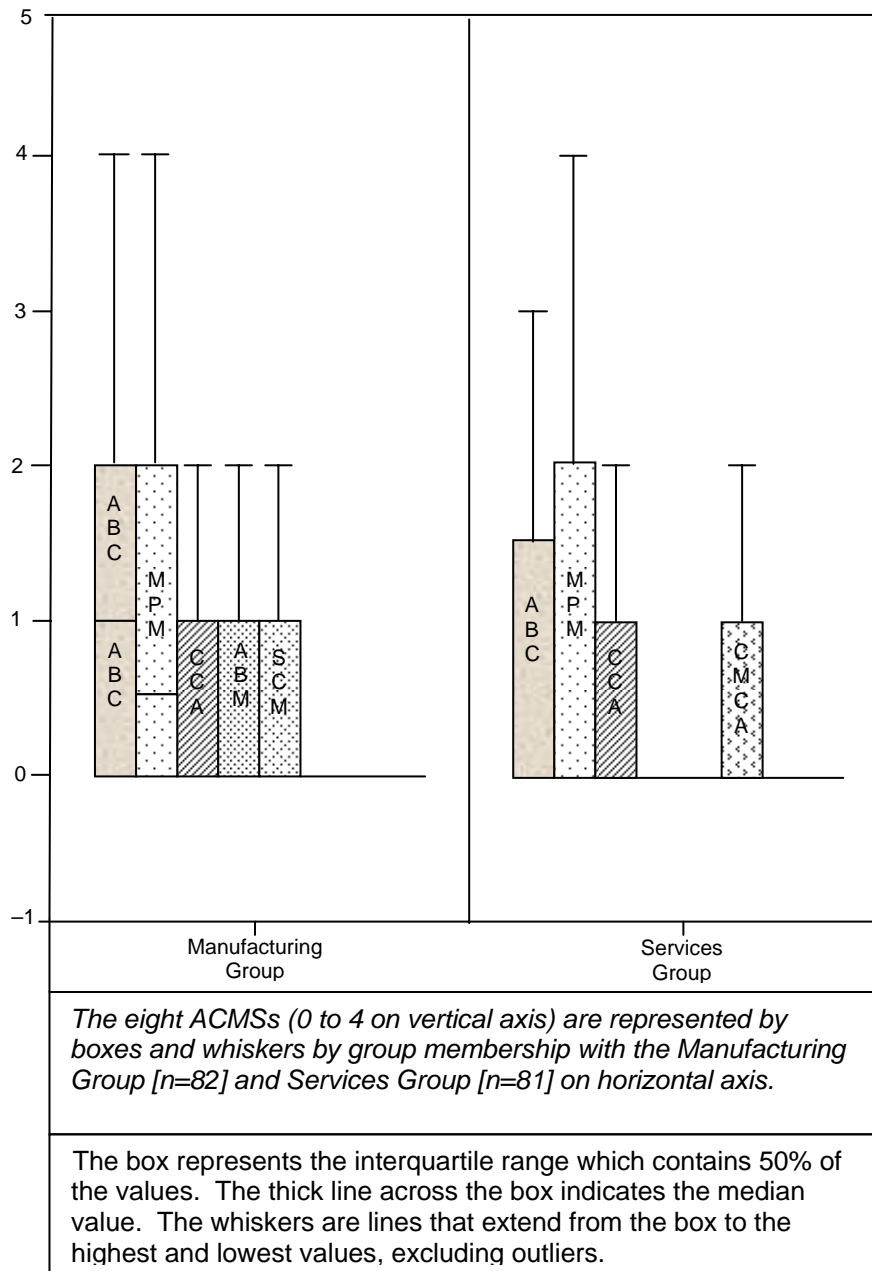**Figure One: Box Plots for Extent of Use: Progressive vs. Conservative**

The eight ACMSs (0 to 4 on vertical axis) are represented by boxes and whiskers by group membership with the Progressive Group [n=45] and Conservative Group [n=115] on the horizontal .

The box represents the interquartile range which contains 50% of the values. The thick line across the box indicates the median value. The whiskers are lines that extend from the box to the highest and lowest values, excluding outliers.

Figure Two: Box Plots for Extent of Use Manufacturing vs Service

The eight ACMSs (0 to 4 on vertical axis) are represented by boxes and whiskers by group membership with the Manufacturing Group [n=82] and Services Group [n=81] on horizontal axis.

The box represents the interquartile range which contains 50% of the values. The thick line across the box indicates the median value. The whiskers are lines that extend from the box to the highest and lowest values, excluding outliers.

Inspection of the box plots in Figure Two shows the extent of use of the eight ACMSs by members of the two industry categories. Manufacturing type units (with 82 cases, or approximately half of the sample) make use of ABC, MPM, CCA, ABM and SCM to varying but substantial extents. Trimmed mean (5%) extent of use values (which range from zero to 4) for this category were 1.1 for ABC and MPM, 0.4 for CCA, 0.6 for ABM, 0.4 for SCM and CMCA, 0.3 for LCBTC, and 0.2 for PLCC. Service type units (with 81 cases, or approximately half of the sample) make use of ABC, MPM, CCA, and CMCA to varying but substantial extents. Trimmed mean (5%) extent of use values for this category were 0.7 for ABC, 0.9 for MPM, 0.6 for CCA, 0.3 for ABM, 0.3 for SCM, 0.5 for CMCA, 0.3 for LCBTC, and 0.2 for PLCC. These data indicate that ABC, MPM and ABM are used more in manufacturing than service

industries, CCA and CMCA are used more in service industries than manufacturing industries, and SCM, LCBTC and PLCC are not used widely in either category.

Summary of Findings

This study shows that organisational units tend to either be progressive in their approach to the use of these eight advanced cost management systems (ACMSs) and use most or all of them, or be conservative and make limited or no use of any of them. The differences between the progressive and conservative groups with respect to industry classification, organisational unit size, organisational unit age, and whether the unit was part of a larger organisation were not statistically significant.

Activity based costing (ABC) and Multiple performance measures (Balanced scorecard) (MPM) are the most extensively used ACMSs, being used heavily in the progressive units and to a limited extent even in the conservative units. Competitor cost analysis (CCA) and Activity based management (ABM) are the next most extensively used ACMSs, followed by Strategic cost management (SCM), Customer and marketing channel analysis (CMCA), Life cycle budgeting and target costing (LCBTC) and Product life cycle costing (PLCC). These ACMSs are used by the progressive units but almost not at all by the conservative units.
ABC, MPM and ABM are used more in manufacturing type industries than service type industries, CCA and CMCA are used more in service industries than manufacturing industries, and SCM, LCBTC and PLCC are not used widely in either category.

Extent of use of all ACMSs is strongly correlated with, and we think driven by, their usefulness, the degree to which they are integrated with the management accounting system (MAS), and the degree to which they are computerised. Usefulness of the ACMSs is strongly correlated with, and we think driven by, the degree to which they are computerised and, to a lesser degree, by the frequency of reports produced by the system.

Although we took steps to minimize the problems this study is subject to the usual limitations associated with research conducted using a mail survey. In addition, the sample was chosen based on the CPA member database thus excluding organizational units not employing a CPA. The study did not gather organizational unit performance data so does not investigate any association between the performance of organizational units and the use and usefulness of ACMS. An investigation of the relative performance of the progressive and conservative groups would be a fruitful area for further research, as would the study of the relationship between organizational contextual variables, such as competitive strategy, diversity of unit activities, and level of innovation and the use and usefulness of ACMS.

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APPENDIX 1. Instrument for Characteristics of Advanced Cost Management Systems

Activity based costing (ABC) systems for product/service costing

Activity based costing systems for product/service costing are cost systems in which costs are first assigned to activities in the production process and then either directly traced or allocated to products/services using the cost driver that most accurately captures how the cost of the activity varies.

*For each of the following questions please tick the box that **best** describes your situation as it relates to the above type of advanced cost management system.*

1 How extensively is this system used in your organisational unit?

No Usage	Limited Usage	Moderate Usage	Major Usage	Very Extensive Usage

If you answered 'No usage' please proceed to the next section.

2 How long has the system been in use in your organisational unit?

Less than 1 year	1-2 years	2-3 years	3-5 years	More than 5 years

3 How frequently are reports generated for your organisational unit by this system?

Annually	Quarterly	Monthly	Weekly	Daily

4 Which level of personnel uses the information generated by this system?

Operators	Foremen/ Supervisors	Plant/Department Managers	Senior Management	CEO

5 In your judgment how useful is the output of the system to the users specified above?

Not useful	Minimally Useful	Moderately Useful	Highly Useful	Critically Useful

6 How integrated is this system with the management accounting system (MAS)?

Completely separate	Data transferred manually to/from MAS	Data transferred electronically to/from MAS	Partially integrated with MAS	Fully integrated with MAS

7 How computerised is this system?

Manual	Mainly manual	Equally manual and computerised	Mainly computerised	Computerised

8 What is the information produced by this system used for?

Alternative choice decisions	Mainly for alternative choice decisions	Equally for alternative choice decisions and for performance evaluation and control	Mainly for performance evaluation and control	Performance evaluation and control