Contemporary Accounting Innovations in Australia: Manufacturing versus Service Organisations

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Abstract

Researchers, focusing on the adoption of contemporary accounting innovations, postulate that different categories of organisations will place different emphasis on particular drivers when adopting the same accounting innovation, depending upon their perception of key performance indicators (Lee and Chan, 2003), the ownership of the innovation by influential individuals within the organisation (Brown, Booth and Giacobbe, 2001) and other enabling conditions (Cagwin and Bouwman, 2002). This suggests that particular organisational classifications may have a predisposition towards the adoption of particular innovations based on their perception of their business world.

This paper tests this proposition by comparing the adoption of specific accounting innovations between organisations within the manufacturing sector and organisations within the service sector. The study tests two hypotheses, first that different types of organisational classifications have a predisposition towards particular accounting innovations, and second, different drivers provide different motivators for the adoption of accounting technologies within different organisational classifications. In total 288 responses from organisations classified as either manufacturing or service were considered.

The results provide some support for the hypothesis that different organisational fields will rely on different elements of adoption for different accounting innovations. However, the second hypothesis, that different drivers provide different motivators for the adoption of accounting innovations, was not supported.

Key Words

Accounting Innovation
Value-based Management (VBM)
Total Quality Management (TQM)
Balanced Scorecard (BSC)
Activity-based Costing (ABC)
Activity-based Management (ABM)

Introduction

Increasing levels of global competition and technological change in recent years has elevated the attention of academics and practitioners to develop contemporary accounting innovations that are responsive to the needs of a dynamic environment. Rationale for improvement is also engendered in critical debate over the deficiencies of traditional management accounting techniques used to improve efficiency. Cognisant of these factors, there remains a lack of clarity concerning the adoption and use of accounting innovations within Australian organisations.

The Issue

The issue of the efficiency of business organisations has long been of central interest to both managers and management accounting researchers (Otley, 1999). The drive towards providing an integrative framework for management control has seen the development of models grounded in cybernetic processes upon which the content, context and process of business efficiencies are fundamental propositions (Otley and Berry, 1980; Flamholtz, Das and Tsui, 1985). This quest for improvement in efficiency has seen the development of a variety of techniques; each highlighting specific benefits designed to improve

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strategic related management accounting practices.

The impetus for such development has been the perceived inadequacies of traditional management accounting techniques. Issues such as, data manipulation, short-run opportunistic behaviour, lack of predictive powers, and the reporting of distorted information in an environment of increasing overhead costs have been extensively documented (Otley and Berry, 1980; Kaplan, 1984; Drury and Tayles, 1995; Merchant, 1997; Cooper and Kaplan, 1999).

Responding to these criticisms, contemporary accounting innovations incorporate a significant element of non-financial evaluation measures designed to align business strategy with internal and external concerns of the organisation (Moon and Fitzgerald, 1996; Ittner and Larcker, 1997; Chenhall and Langfield-Smith, 1998).

While these measures have improved the promotion of efficiency and effectiveness, little has been found in the literature that suggests different organisational classifications are predisposed to any specific accounting technique. This paper responds to the challenge issued by Mouritsen (1998), Ittner and Larcker (2001) and Zimmerman (2001) to further extend the boundary of discussion relating to management accounting issues that promote the growth of organisational knowledge. This study focuses on the specific issues of organisational efficiencies through the identification of accounting innovations, their adoption and their use that may have particular differences in the manufacturing and service sectors.

Background

A number of contemporary accounting innovations have been introduced into the accounting literature in recent years. These innovations have extended the descriptive objects, the causal variability factors, and the time periods of analysis, while, at the same time, influencing the organisational applications (Bjornenak and Olson, 1999). This was an attempt to reconcile the inherent deficiencies contained in traditional management accounting techniques. Five contemporary accounting innovations were identified from the literature (Kald and Nilsson, 2000) are as follows:

- Value-based Management (VBM)
- Total Quality Management (TQM)
- Balances Scorecard (BSC)
- Activity-based Costing (ABC)
- Activity-based Management (ABM)

The accounting innovations considered in this study have been described in great detail in the management accounting literature over the past few decades. However a brief description will serve to reinforce their importance as techniques designed to improve an organisation's values, strategies, process, and success.

Shareholder value and the techniques aimed at enhancing such value have attracted interest as an accounting innovation, under the guise of value-based management (VBM). While there still exists debate over a conceptual framework for VBM, and even more controversy over methods for creating shareholder value, seven value drivers have been suggested for this technique. These are; sales growth, operating profit margin, tax rate, weighted average cost of capital, and the competitive advantage period. Condon and Goldstein (1998, p10) proffer a working definition of VBM as ‘a management philosophy, which uses analytical tools and processes to focus an organisation on the single objective of creating shareholder value’. Through the alignment of strategic management, performance reporting, and incentive compensation, staff, at all levels, are encouraged to act like shareholders, making decisions that maximise value. Ultimately, these decisions can lead to real changes in stock market performance. Thus, more recent value drivers have promoted the orientation of the organisation to attributes that add shareholder value to the descriptive object. Value based metrics take these value drivers and summarise them into a single measure.

Total quality management (TQM) has become a pervasive catch cry in meeting customer demand for high quality products and services without contingent increases in prices. With the awareness that quality of final products and services is a strategic competitive variable, companies have recognised also that the concept of high quality must be applied to production processes to generate quality products and minimise costs (Chenhall, 1997). TQM has evolved as a management philosophy that emphasises the need to provide consumers with highly valued products, and to do so by improvements in efficiency through eliminating waste, reducing lead times at all stages of the production process, reducing costs, developing people, and developing continuously. These elements provide the causal link for improving organisational performance.

Kaplan and Norton's (1992, 1996a, 1996b, 2000) balanced scorecard (BSC) approach enables managers to view performance from four important perspectives. First, the financial perspective, which includes profitability measures such as cash flow, sales growth, and operating income by division, increased market share and return on equity. Second, the customer perspective that encompasses such measures as market share, response time, on time performance, product reliability, percent of sales from new products, percent of sales from established products and on-time delivery. Third, the innovation and learning perspective measures such things as new patents, number of new product launches, process time to market, and time taken to develop next generation products. Finally, the internal business perspective, which focuses on quality, time and efficient measures such as direct materials efficiency variances, effect yield, manufacturing lead-time, head count and inventory.

The BSC forces managers to focus on the handful of equally important (balanced) measures that are critical success factors to sustain and improve performance in the chosen competitive environment (Lipe and Salterio, 2000). Causality is therefore an important aspect of the BSC concept. The BSC also denotes a commanding top-down approach to its formulation. The measures on a BSC are used by executives to articulate the strategy of a business, to communicate the strategy of the business and help to align individual, organisational, and cross departmental objectives to achieve a common goal (Kaplan and Norton, 1996b). In this way the BSC is a means of communication, information, and learning that puts the business strategy at the centre. These strategic measures are translated into diagnostic measures at the operational level of the business. It is in the use of the innovation and learning perspective that the BSC extends the focus of internal descriptive objects over traditional management accounting techniques.

Activity-based costing (ABC) responds to the cost distortions inherent in traditional product-costing systems in a changing environment by linking resource expenses to the variety and complexity of products, not just the physical volumes produced (Cooper and Kaplan, 1999). ABC extends the concept of a cost object from products, to customers, suppliers, distribution channels, brands and market segments. To more accurately cost these descriptive objects, activity drivers are identified along an extended cost hierarchy: unit level activities, batch level activities, product-sustaining activities and facility sustaining activities. Activities are also grouped together into higher-level business processes. The identification of activities and processes produces cost drivers that are non-financial in perspective, extending the concept of causality to more factors that are translated at the operational levels of the organisation (Bjornenak and Olson, 1999).

Activity-based management (ABM) utilises the information produced by the ABC system to improve organisational performance by minimising non-value added activities and redeploying resources to value-added activities. Cooper and Kaplan (1999) distinguish the former as operational ABM and the latter as strategic ABM. Operational ABM encompasses the actions that increase efficiency and lower costs. Whereas strategic ABM encompasses actions that shift activities away from

unprofitable descriptive objects to those more profitable. ABM also identifies process drivers that are root cause cost drivers that explain the quantity of resources required to perform an activity, incorporating and extending the concept of descriptive objects and causality of ABC. ABM utilises the concept of Porter's (1985) value chain to identify value-adding activities important to external descriptive objects that become the fundamental strategy of the organisation (Selto, 1995). Thus ABM incorporates performance measures for improving of process drivers that are both internally and externally oriented, that act as guides as the operational level of the organisation and provide a link to strategy at senior management levels.

Theoretical Construct

At the macro level the adoption if contemporary accounting innovations has been conceptualised as an 'expression of a definite organisational logic which, in turn, reflects a specific epistemological position' (Bessire, 2001, p1). Bessire concludes that the rationale for adoption has moved on from the structural-functionalist paradigm, which is supported by idealistic rationalism, and now embraces culturalism, as it is the only approach that simultaneously takes into account the subjective, objective, and projective dimensions of reality. These results appear supported at the micro level with a variety of researchers investigating specific accounting innovations.

In their examination of Activity Based Costing in a large sample of manufacturing plants, Ittner, Lanen, and Larcker (2002) found no significant association between ABC and return on assets. Instead, they found a positive association between ABC and higher levels of quality. This suggests that one of the conventional reasons for adopting an accounting innovation, greater profitability, is not substantiated. However, a similar study by Cagwin and Bouwman (2002) of a variety of organisations (excluding the banking industry, government, and non-profit organisations) concluded the opposite. Cagwin and Bouwman (2002) report a positive association between ABC and improved financial performance as measured by improvements in the return on investment.

Other authors investigating the causes of adoption have addressed factors that stimulate innovation. Lee and Chan (2003) empirically tested the relationship between the adoption of just-in-time (JIT) and total quality management (TQM) and the shareholders perception of the value of the adopting organisation. This sample consisted of 101 firms with significant manufacturing operations. The results suggest that adoption of these accounting innovations increased shareholders returns in the post-adoption period and that adoption was due to a desire to stimulation innovation, not the fear of appearing different. The study by Brown, Booth and Giacobbe (2001) of organisational influences impacting of the adoption of activity-based costing in Australian firms, considered both manufacturing and non-manufacturing organisations. Their results reject the more functional and environmental explanations for adoption, instead suggesting that a firm adopts an accounting innovation where there is a champion for the innovation and where the firm perceives a relevant advantage.

The studies identified are important because they have moved beyond the dichotomous decision of adopt or not adopt exhibited in the early research of Van Nguyen and Brooks (1997) and Bjornenak (1997). Like Anderson's (1995) application of the Kwon and Zmud (1987) model of adoption that identified specific categories and influential factors associated with adoption, the research cited above suggests that different classifications of organisations may adopt different factors that stimulate innovation.

This provides the motivation for two hypotheses tested in this study.

Hypothesis 1: *Manufacturing and service organisations have a predisposition towards the adoption of particular contemporary accounting innovation.*

Hypothesis 2: *Different drivers, within the key elements of adoption, provide different motivators for the adoption of particular contemporary accounting innovations within manufacturing and service organisations.*

Research Design and Overview

Sample and Response Rates
The study used organisations selected from the *Business Review Weekly's* 1999 list of Australian Top 1000 companies; these companies span all the industry codes covered by the Australian and New Zealand Standard Industry Classification. Using data from the above two broad organisational classifications were selected, manufacturing and service. With these *Standard Industry Classifications* (SIC) codes it is possible to obtain various sub-sets of classification, based on the primary line of business. For the purpose of this study SIC code D was used for manufacturing. The service industry classifications comprised the following SIC codes: E, transport, trade telecommunications, electric, gas, and sanitary services; H, finance, insurance and real estate; and I, service. For the purpose of this study these service industry classifications were aggregated into one classification.

From these two classifications 150 companies were randomly selected, 40 from the manufacturing sector and 110 from the service sector. Addresses and contact details were sourced from *Who's Who in Business in Australia* and five questionnaires were distributed to the Chief Finance Officer, with the request to pass a copy of the questionnaire to appropriate staff that used these techniques as part of their function. It was assumed that they, or their immediate subordinate staff, would best understand and be able to respond to the issues raised in the questionnaire. A total of 750 questionnaires were distributed, 200 to firms in the manufacturing sector and 550 to firms in the service sector. From this, 288 useable responses were received, 62 from the manufacturing classification and 226 from the service sector, providing a response rate of 31.0% from the manufacturing sector and 41.09% from the service classification.

Research Instrument
The study used a modified version of the research instrument developed by Kald and Nilsson (2000). The questionnaire was developed to focus on the extent to which the five accounting innovations had been adopted and specific elements of adoption and their drivers within Australian organisations. Question 1 related to the adoption of the accounting innovations identified. The respondents were asked to rank on a scale of 1 to 3 the level of adoption, with 1 = not adopted, 2 = under consideration and 3 = currently in use by their organisation. Questions 2 to 5 addressed the four key elements that may influence the adoption of accounting innovations. These were identified as, (1) the importance of specific functions provided by the technique, (2) the operational use made of the technique, (3) the strategic benefits of the technique, and (4) the perceived limitations of the technique (Lothian, 1987; CIMA, 1993: Fitzgerald, Johnston, Brignall, Silvesto and Voss, 1994). Each question contained 7 drivers identified by Kald and Nilsson (2000) that may have an influence on elements of adoption. The 28 drivers are displayed in Table Four.

Reliability
To test the reliability of the four questions relating to the elements of adoption the Cronbach alpha was calculated. These results are stated in Table One.

The Cronbach alpha was used as it is considered the most prevalent metric in assessing reliability in management accounting research (Brownell, 1995). Nunnelly (1967) and Smith (2003) suggest that an alpha of 0.8 is normally deemed satisfactory; however an alpha of 0.7 is an acceptable level of reliability for measures in the preliminary or developmental stage. Given the relatively high alpha, all above .7480, the measure obtained was judged to be a good proxy for the underlying construct.

Table One: Cronbach Alpha for Each Element of Adoption

Element	Cronbach Alpha
Importance of the technique	.7496
Operational uses of the technique	.8063
Strategic benefits of the technique	.8081
Perceived limitations of the technique	.7480

Statistical Method

Using the Kologorov-Smirnov test for normality of distribution it was found that the service sector values were highly significant, along with the results for the manufacturing sector. This suggests that the distribution is significantly different from a normal distribution. Given that the normality assumption was violated all statistical testing employed non-parametric procedures. The Mann-Whitney U-test was used and the results are displayed in the various tables.

Results

Hypothesis 1 was addressed by question 1 where participants were asked to indicate the particular contemporary accounting innovations adopted by their organisation. The data listed in Table Two reports the percentage of the respondents indicating a response of 3, that is, the technique was currently in use. For the manufacturing classification $n = 62$ and for the service classification $n = 226$.

Table Two: Contemporary Accounting Innovations Adopted

Technique	Manuf $n = 62$ %	Service $n = 226$ %
Value-based Management	33.9	34.1
Total Quality Management	70.9	47.2
Balanced Scorecard	30.6	30.1
Activity Based Costing	58.1	47.8
Activity Based Management	45.2	42.9

Restating the data from Table Two in rank order it becomes apparent that three accounting innovations are considered of greater importance by both organisational classifications. However, the level of importance ascribed to the techniques is different within each organisational classification. This ranking is presented in Table Three.

Table Three: Adopted Contemporary Accounting Innovations in Rank Order

Manufacturing Technique	%	Rank	Service Technique	%	Rank
Total Quality Management	70.9	1	Activity Based Costing	47.8	1
Activity Based Costing	58.1	2	Total Quality Management	47.4	2
Activity Based Management	45.2	3	Activity Based Management	42.9	3
Value Based Management	33.9	4	Value Based Management	34.1	4
Balanced Scorecard	30.6	5	Balanced Scorecard	30.1	5

It can be seen that Total Quality Management ranks highest in the manufacturing sector while the highest ranked technique in the service sector is Activity Based Costing. Of the top three ranked techniques Activity Based Management was considered least important by both classifications.

Table Four reports the responses to questions 2 to 5 relating to the drivers of the elements of adoption of the accounting innovations adopted by the two classifications of organisations.

Table Four: Importance of Elements of Adoption by Classification

Elements of adoption	Drivers	Manuf *n = 66* %	Service *n = 226* %	Sig.
Importance	Profitability	95.2	85.4	.042**
	Cost effectiveness	88.7	80.5	.127
	Cost quality	72.5	61.5	.098
	Production efficiency	80.6	53.5	.000*
	Customer satisfaction	67.7	74.3	.346
	Employee satisfaction	48.4	43.8	.335
	Product development	58.2	42.0	.050**
Organisational and Strategic Use	Decision support for senior management	83.4	72.1	.055
	Decision support for operating levels	82.3	64.2	.006*
	Evaluation of customer and product profitability	77.4	68.6	.147
	For responsibility accounting	74.2	61.1	.056
	Supports efforts to improve quality	64.5	58.0	.348
	Identify business strategic needs	82.3	67.3	.019**
	Facilitate business strategic implication	74.2	63.3	.077
Organisational and Strategic Benefits	Contributes to a better understanding of how the business works	80.6	89.8	.054
	Shows whether the business is following its business strategy	79.0	87.2	.055
	Facilitates the implementation of change	71.0	61.5	.155
	Facilitates co-operation across functional boundaries	62.9	50.1	.125
	Provides support for the organisations planning and monitoring functions	82.3	68.6	.032**
	Are used at all levels of the organisation	61.3	47.3	.133
	Facilitates integrated control within the organisation.	61.3	48.7	.052
Limitations	Overly focused on the past	58.4	42.9	.166
	Overly focused on the short term	51.6	39.8	.146
	Overly focused on financial performance	41.9	46.9	.085
	Information not available in time	58.1	46.5	.127
	Often provides erroneous information	56.5	51.8	.409
	Easy to manipulate	33.9	49.6	.029**
	Too aggregated	46.7	50.4	.583

** = Significant at 5% level
* = Significant at 1% level

These questions asked the participants to rate the particular drivers of each of the four elements of adoption irrespective of the accounting innovations, the purpose being to obtain an overall measure of how particular drivers influence the adoption of a universal accounting innovation. For each of the elements of adoption responses were asked to identify the importance of each driver on a scale of 1 to 3. For the questions relating to the element 'importance of the technique' were rate 1 = no importance, 2 = reasonably important and 3 = extremely important. Again, the question relating to the element concerning 'operational and strategic use' required the participants to rate their answers as 1 = no importance, 2 = reasonable importance and 3 = extremely

important. This format was repeated for the drivers relating to the element 'operational and strategic benefits' where participants rated the drivers as 1 = no benefit, 2 = some benefit and 3 = extremely beneficial. The same method was used for the element 'perceived limitations' with participants answering 1 = completely disagree, 2 = partly agree and 3 completely agree, to the drivers of this element.

The results to test Hypothesis 2 are displayed in Tables Five. Table Five summarises the drivers of the elements of adoption, contained in those tables that displayed a difference between the organisational classifications.

Table Five: Elements of Adoption Exhibiting a Significant Difference Between Organisational Classifications

Elements of adoption	Drivers	Manuf *n = 62* %	Service *n = 226* %	Sig.
Importance	Profitability	95.2	85.4	.042**
	Production efficiency	80.6	53.5	.000*
	Product development	58.2	42.0	.050**
Operational and Strategic Use	Decision support for operating levels	82.3	64.2	006*
	Identify business strategic needs	82.3	67.3	.019*
Operational and Strategic Benefits	Provides support for the organisations planning and monitoring functions	82.3	68.6	.032**
Limitations	Easy to manipulate	33.9	49.6	.029**
** = Significant at 5% level * = Significant at 1% level				

With respect to the element of adoption 'importance of the technique' it is not surprising to see a significant difference between drivers that relate to production between manufacturing and service classifications. What is surprising is the difference between the classifications relating to profitability and product development. The results presented suggest that the service classification places less importance on the drivers ‘profitability’ and ‘product development’ than the manufacturing classification when considering the adoption of an accounting innovation.

When reviewing the element 'operational and strategic uses of the technique', it appears that the service sector places less importance on the driver 'identify business strategic needs' when adopting an accounting innovation than the manufacturing classification. The other driver considered of lesser importance to the service classification is, 'decision to support for senior management'.

For the element 'operational and strategic benefits of the technique', the only significance difference was with the driver 'provides support for the organisations planning and monitoring functions', and for the element of adoption 'limitations of accounting innovations the only driver with significant difference was, 'easy to manipulate'.

Discussion

When ranked in order of importance by the two organisational classifications, Total Quality Management ranks most important in the manufacturing classification with 70.9% of the respondents indicating it was currently in use. Activity Based Costing ranked second with 58.1% of respondents indicating it was currently in use. This ranking was reversed in the service classification with Activity Based Costing

being implemented by 47.8% of organisations and Total Quality Management by 47.4%. Both classifications reported Activity Based Management as third with 45.2% of manufacturing adopting, compared with 42.9% for service.

The above provides some support for Hypothesis 1 that different organisational classifications have a predisposition toward the adoption of particular accounting innovations.

The results presented in Table Five suggest that there is little evidence to support Hypothesis 2 that different drivers provide different motivators for the adoption of accounting innovations within different organisational classifications

The results suggest that, of the 28 drivers examined only 3 were significantly different at the 1% level and 1 of these is explained away as being manufacturing specific. Therefore, 25 of the drivers, or 89.3%, are considered as considerably important to both organisational classifications when adopting an accounting innovation.

Summary and Conclusions

The challenge of this paper was to further extend the boundary of discussion relating to management accounting issues that promote the growth of organisational knowledge. The contribution of this study was the identification of a specific ordering of accounting innovations within specific organisational classifications. These results provide some support Hypothesis 1, that different types of organisational classifications have a predisposition toward particular contemporary accounting innovations. However, the results do not support Hypothesis 2 that different drivers provide different motivators for the adoption of accounting innovations within different organisational classifications, with the possible exception of those drivers relating specifically to production.

These results beg the question, if the adoption of particular accounting innovations is not motivated by the drivers of the elements of adoption, what does motivate one organisational classification to adopt one particular accounting innovations over another? While the answer to this question is outside the scope of this study possible explanations may be provided by Brown, Booth, and Giacobbe (2001), whose study into the adoption of ABC by Australian firms suggests that the adoption of accounting innovations are influenced by two key factors. These are, a perceived relative advantage over the organisation's previous management accounting model and a champion of the innovative technique within the organisation.

Limitations and Future Research

Several limitations can be identified with this study. First, the survey method used resulted in a lack of researcher interaction with the respondent. This presents the possibility that the respondents could misinterpret the questions asked. Second, in this study, the financial controller was asked to distribute the questionnaire to his/her subordinates who were most familiar with the accounting innovation. Therefore, the views captured may not accurately reflect the organisation's view as they may be coloured by the framework of the individual. Third, while the response rate was acceptable – 31.0% for the manufacturing sector and 41.09% for the service sector – it is possible that the sample may not fully reflect the broad cross-section of the two industries. This may limit the generalisability of the findings.

Future directions of accounting innovation adoption could focus on a single innovation and use a larger sample that is more representative of a cross-section of specific Australian or international organisational groups. Also, where this study focused on innovation adoption, future studies could focus on implementation of accounting innovations between different organisational groups. Finally, future studies focusing on the association between financial and non-financial drivers, the influence of the innovation champion, and the perceived value of stakeholders to the

innovation, could provide a fertile research ground.

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