

Information Technology, Decision Support and Management Accounting Roles

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Abstract

Commentators have observed that unless management accountants adapt to developments in IT they risk being reduced to a subordinate role. This paper reports on the results of a longitudinal survey: specifically two surveys of management accountant members of CPA Australia and ICMA spanning an eight year period. These surveys (CPAs in 1997 and ICMAs in 2005) were aimed at assessing the change in their roles as a result of IT developments. The paper investigates the possibility that accounting functions within organisations are becoming restricted to the areas of financial reporting and transactions processing, rather than decision support and problem solving. The findings of both studies show that management accountants perceive they spend on average only a third of their time on the latter types of management accounting activities. The paper also identifies the specific IT skills necessary for decision support systems and discusses how such skills should be incorporated in accounting education programs.

Keywords

**Management Accounting Practice
Decision Support
Survey of Management Accountants
Changing Role of Management
Accountants
Management Accounting Education
Financial Reporting
Problem Solving**

Introduction

Developments in information technology (IT) over the past 20 years have resulted in considerable changes in the nature of business and, with these changes, the work of managers and business professionals. Developments in IT have dramatically increased the variety and volume of easily accessible information, from both internal and external sources, and at all organisational levels (Armitage *et al.*, 1994; Booth, 1995). Most professionals must now be sufficiently competent with IT to be able to access and analyse a wide variety of data in order to make or recommend business decisions.

Changing roles also require that people in business possess cross-disciplinary attitudes and be able to work in teams. Indeed, some commentators argue that modern business organisations should place importance on the ability to be flexible in roles. Process improvement requires creatively developing and implementing ideas in organisations which entreat staff to “think beyond the frame” and “find better ways” in order to survive and succeed in competitive markets and industries.

The picture of the ideal worker ... is one who has the imagination to develop new markets, create new ideas and new products, and not simply fit into traditional or existing patterns.
(Porter 1997, p. 85.)

This is reflected in commentary on the work of accountants who provide support for managers in operations, marketing, human resources and other functions. For example, Siegel *et al.* (2003) suggest that the work of accountants supporting management as “business partners”:

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“.. requires a variety of skills, encompasses several disciplines, and impacts on the organisation in various ways. ... They still hold fiduciary responsibilities (but) they definitely do more than accounting. They are involved in strategic planning, process improvement, team building and a host of other activities (p. 39).”

In the competitive environment of business, all staff employed in a firm should add value beyond their salary. If management accountants are to add value to the organisations for whom they work, they must be able to advise and support managers on a number of dimensions and generally remain strategically relevant in their role. Harrison (1993, p.29) argued that management accountants should be active in “decision support”:

Management accountants can be value-added business partners ... (if they) step outside the traditional role of compilers (accurate and controlled transaction processors) and take on the roles of interpreter, adviser, and partner.

Management accountants who limit their role within organisations to traditional “bean-counting” will generally fail to add sufficient value to the firm. This paper is based on the premise that accountants who cannot add value in their support for managers risk being reduced to a subordinate role. Adding value requires that management accountants utilise a broad range of skills and appreciate that the management of a business strategy and business functions such as operations, marketing and customer service interacts closely with the work of the management accountant.

For some time, the wider impact of IT on the accounting profession has been of concern to professional accounting bodies. For example, the Institute of Chartered Accountants in Australia (ICAA, 1998) reported that accountants need expanded skills in IT as well as strategic and general business skills if they are to remain relevant to business. The ICAA warned that if accountants fail to expand their skills, they will be replaced by lawyers, IT professionals and the “growing army of

MBAs”. While accounting traditionally entailed the processing of historical data, the report asserts that accountants’ roles will change to ‘be focused on adding value, having far greater input to ... business decisions’ (1998, p.1). However the report provided little evidence that this was actually happening.

Given the multi-disciplinary nature of managerial roles in modern business organisations, it is possible that decision support has increasingly been taken over by professionals in non-accounting disciplines. This paper reports on two surveys of management accountants in Australia in 1997 and 2005 aimed at examining to what extent management accounting roles within Australian organisations have changed, and to what extent they are restricted to the areas of financial reporting and transactions processing. The research is aimed at identifying those areas of management accounting where IT is having its greatest impact. The paper also identifies the specific IT skills necessary for decision support and discusses how such skills should be incorporated into accounting education programs.

Background and Research Questions

The accountant’s task can be considered as consisting broadly of two key elements - “scorekeeping” and “decision support” (King, *et al.*, 1990). Scorekeeping is concerned with transactions processing resulting in financial reports and monthly management accounts used to monitor budgets. Decision support is concerned with management decision making, for example by analysis and modelling of past and future activities and decisions. These definitions are adopted throughout this paper and were used in the survey instruments.

Two decades ago, Johnson and Kaplan (1987) observed that scorekeeping seems to dominate the management information provided by accountants. As accountants generally provide only one set of information, ‘management accounting practices therefore follow, and become subservient to, financial accounting practices’ (p.198). Almost a decade later, Kaplan (1995, p.13) argued that,

in order to remain relevant, management accountants should ‘move away from being scorekeepers of the past to become the designers of the organisation’s critical management information systems’.

While agreeing that management accountants should adopt more of a decision support role, other writers have specifically addressed the impact of IT in expanding the information readily available to managers. Burns *et al.* (1999) sought to gain insights into the changes taking place in management accounting practice. They noted that management accounting has ‘a supporting role in providing managers with some (although not all) of the information they need ... rather than being a system concerned with controlling managers.’ (p.28). However, Burns *et al.* argue that unless the management accountant seeks to be more actively involved in supporting managers (p.28):

“.. there is a real possibility that many of the functions of the management accountant will be taken over by managers and other personnel who, with the aid of IT, can produce and use much of the information previously produced by management accountants.”

A qualitative study of 16 UK firms by King *et al.* (1990) concluded that there is evidence that IT developments have been used to make significant improvements in the routine scorekeeping and reporting activities. However, they found only limited evidence that management accountants have used IT to provide more focused information or to enhance their decision support services to management. Importantly they found that where accountants are acting as historians (scorekeepers), there is a tendency for non-accounting managers to develop independent information systems.

The above concerns raise issues for accounting education and the professional development of management accountants. Burns *et al.* (1999, p.28) suggest that “education must address the importance of IT and reflect the changing roles of the management accountant”. Booth (1995, p.9) recommended ‘the retraining of management

accountants to have broader management and IT skills’. Cooper (1996, p.41) used perhaps more dramatic language, suggesting that management accountants who do not develop an appropriate skill set ‘risk finding themselves at a career dead-end’.

Accountants, as all professionals, use more than just a body of knowledge in their work. The decision support role of accountants for example, draws on problem-solving skills amongst others. The Accounting Education Change Commission (1990, p.311) included the ‘ability to identify and solve unstructured problems in unfamiliar settings and to apply problem-solving skills’ in the set of intellectual skills necessary for accounting graduates. A taskforce of the ICAA (1994) identified the skills required by the accounting professional to function effectively in an IT environment in the 21st century. However, the report did not make clear whether problem solving and decision support require specific IT skills, different to those necessary for scorekeeping.

The objective of our 1997 and 2005 studies was to determine whether management accounting roles within Australian organisations have changed as a consequence of the impact of IT and whether they have become restricted to the areas of financial reporting and transactions processing. In particular, using the definitions of King *et al.* (1991, pp. 46-50), the objective was to determine if developments in IT are being used by management accountants to enhance the decision and problem solving support provided to other managers and whether management accountants perceive their role will change in the future. In both studies the following research questions were asked in relation to the impact of IT in Australian organisations.

To determine the extent to which Australian management accountants are involved in decision support and problem solving, the proportion of management accountants’ time devoted to scorekeeping and decision support (as per the definitions of King *et al.* 1990) can be measured. The first research question therefore is:

1. *What proportion of management accountant's time is being devoted to scorekeeping? What proportion of their time is being used for decision support to managers?*

Given concerns about the IT skills management accountants need to add value through decision support activities, the second question specifically considers the impact of IT on decision support activities:

- 2a. *Has the introduction of IT enabled management accountants to provide more focused information and/or improved the level of decision support provided to management?*
- 2b. *Do they perceive their role will change in the future as a result of IT systems?*

Given the implications for management accounting education and professional development:

3. *What types of IT skills do management accountants believe they need in order to provide valuable decision support?*

Given the concerns expressed by Johnson and Kaplan (1987); Kaplan (1995) and Burns et al (1999):

4. *Has there been a significant change in the perceptions of the respondents over the intervening period between the two surveys?*

Survey Participants and Procedure

In 1997 a questionnaire was sent to a stratified random sample of 200 management accountants drawn from the membership database of the Australian Society of CPAs. The Society randomly selected the sample and arranged the mailout in order to preserve confidentiality.

In order to gain only the perceptions of those who see their career as a professional accountant and who potentially have the role of providing decision support within an organisation, the sample was restricted to (1)

CPA qualified accountants, (2) employed in industry, commerce or government, and (3) who had indicated that their primary job function was management accounting. As a consequence, those working in public accounting practices were excluded.

The questionnaire developed for the study was pre-tested on a number of colleagues and their feedback was used to amend those questions that seemed confusing or ambiguous. Background information was obtained on the respondents' profiles (e.g. size of company, years of experience), and information on how IT has impacted and will impact on their jobs (e.g. proportion of time spent on various tasks, new skills considered necessary).

In 2005, the same questionnaire was sent to a random sample of 200 management accountants drawn from the membership database of the Institute of Certified Management Accountants (ICMA). The Institute randomly selected the sample and arranged the mail out in order to preserve confidentiality.

In 1997, ninety responses were received, of which 88 were useable, representing a response rate of 44%. In 2005, again responses were received, of which 86 were useable, representing a response rate of 43%. In both 1997 and 2005, the majority of these responses were from industry and/or commerce.

Characteristics of Respondents

The profile of the respondents is shown in Table One. All sizes of companies were represented and reasonably evenly distributed across the range.

The qualifications and years of accounting experience of the respondents are given in Tables Two and Three. The vast majority of respondents are degree qualified with more than 5 years experience, but with the ICMA members having a significantly higher level of academic qualifications.

Table One: Size of Company

Number of employees	1997 Study (n=88)	2005 Study (n=86)
1 - 50	19% (n=17)	17%(n=15)
51 - 100	21% (n=18)	12%(n=10)
101 - 500	14% (n=12)	14%(n=12)
501 - 1,000	16% (n=14)	17%(n=15)
1,001 - 10,000	23% (n=21)	16%(n=14)
10,000+	7% (n=6)	24%(n=20)

Table Two: Academic Qualifications

	1997 Study (n=88)	2005 Study (n=86)
Professional Qualifications	11% (n=10)	8%(n=7)
Diploma	14% (n=12)	7%(n=6)
Bachelors		
Degree	67% (n=59)	33%(n=28)
Higher Degree	8% (n=7)	50%(n=43)
Other	-	4%(n=4)

Table Three: Years of Accounting Experience

	1997 Study (n=88)	2005 Study (n=86)
0 - 5	13% (n=12)	6%(n=5)
6 - 10	33% (n=29)	10%(n=9)
11 - 20	39% (n=34)	30%(n=26)
21+	15% (n=13)	54%(n=46)

From the above tables, it is clear that the survey respondents represent a full spread over all sizes of companies, academic qualifications and years of experience.

Therefore the findings given below should be seen as unbiased and reliable.

Results

Time Allocation

A key finding of the 2005 study was that in spite of the proliferation of IT developments over the last eight years, the perceived average amount of time respondents spend on decision support activities changed from only 25.6% to 38.4%. A separate question determined that in terms of staff hours under the control of the management accountant, the average percentage of time spent on processing routine transactions and generating standard reports was perceived as 53.0% in 1997, and only dropped to 41.0% in 2005. Time spent on non-standard analyses using data from within the company's databases, dropped from 34.5% in 1997 to 27.5% in 2005. Time spent managing and enhancing the computerised systems increased from 12.5% in 1997 to 19.3% in 2005. The results are summarised in Table Four.

This time allocation seems to be widespread across company size and level of seniority. There was a lack of any significant statistical relationship between time spent on scorekeeping activities and number of employees in the company ($F = 2.094$ in 1997 and $F = 1.658$ in 2005) or with the number of directly supervised accounting staff ($F = 1.059$ in 1997 and $F = 2.136$ in 2005).

Impact of IT on Decision Support

The percentage of respondents who agreed that IT has enabled them to provide more focused or specifically tailored information for decision support hardly changed from 1997 to 2005 (92% to 90%). The percentage of respondents who indicated that the introduction of IT had made a significant or radical improvement in the decision support they were able to provide to management actually dropped from 83% to 74%. The finding that the respondents perceived on average that they spend approximately one third of their time (25.6% in 1997 and 38.4% in 2005) on decision support activities seems in marked contrast to their perceptions of the potential for IT to improve these activities.

In 1997, only 31.8% of respondents perceived that their future roles would change significantly or radically as a result of IT, compared to 42.1% in 2005. A majority in 1997 (67.2%) believed that their roles would either not change or change only marginally.

It is of note that this percentage reduced significantly to 45.4% in 2005 ($F = 6.43$). However, there was no significant statistical relationship ($F = 0.377$ in 1997 and $F = 0.645$ in 2005) between this perception and the respondent's years of accounting experience.

Table Four: Perceived Time Spent On Various Tasks

Perceived time spent on:	1997 survey		2005 survey		t
	Mean	Std dev	Mean	Std dev	
Decision support	25.6%	17.8%	38.4%	22.3%	-3.915
Staff processing of routine trx	53.0%	21.6%	41.0%	25.8%	1.164
Non-standard analyses	34.5%	15.3%	27.5%	13.2%	3.705
Managing & enhancing computerised systems	12.5%	18.4%	19.3%	17.7%	-2.568

IT Skills

Respondents were asked to indicate the IT skills they considered necessary in order to provide valuable decision support to management. Respondents selected these skills from a list of seven skills drawn from a

paper titled *Information Technology in the Accounting Curriculum* published by the International Federation of Accountants (IFAC) Education Committee (2003). The results are summarised in Table Five.

Table Five: IT Skills Considered Necessary

Skills sufficient to use:	1997 Study (n=88)	2005 Study (n=86)
Spreadsheets	83% (n=73)	87% (n=75)
Executive Information Systems	68% (n=60)	68% (n=58)
Security & control of sensitive data	51% (n=45)	63% (n=54)
Database design: open systems, tools	40% (n=35)	45% (n=39)
Networking software	39% (n=34)	30% (n=24)
Electronic Data Interchange	27% (n=24)	50% (n=43)
Emerging technologies	13% (n=11)	21% (n=18)

The most commonly identified IT skill that respondents perceived necessary was spreadsheets (83% in 1997 and 87% in 2005). There was a lack of any significant statistical relationship between spreadsheets skill and company size and respondents' years of accounting experience ($F = 1.73$ and 3.206 in 1997 and $F = 2.06$ and 1.85 in 2005

respectively). This is perhaps expected given that spreadsheets is possibly the most common computing tool used in decision support in the last decade.

Discussion

Changing Roles

It is surprising that contrary to our expectation and despite the proliferation of IT developments since the 1990s, the percentage of their time respondents perceived they spent on decision support activities only changed from 25.6% in 1997 to 38.4% in 2005 (t -value of -3.915). Regardless of the strict definitions of the terms “scorekeeping” and “decision support”, an average of approximately one third indicates that respondents perceive their role to be dominated by scorekeeping and other requirements. This is concerning given that the 1997 respondents had indicated that their primary job function was in management accounting, and in the case of the 2005 study had chosen to join the ICMA – a specialist postgraduate management accounting body. This is not to suggest that management accounting should not involve any scorekeeping, but that decision support should have a greater time allocation for management accountants, especially if those Management Accountants are to add value.

The proliferation of IT and the consequent productivity improvements in the scorekeeping area could allow management accountants to spend more time on decision support. It could be speculated that productivity improvements in recent years in the scorekeeping area have been used to reduce management accounting staff or to cope with growth. This may leave the management accountant still “snowed under” with routine scorekeeping, such that they feel under too much pressure to proactively seek to enlarge their decision support role.

The results are consistent with the earlier claim of Johnson and Kaplan (1987, p. 22-30) reported above, that management accounting had become subservient to the demands of financial accounting. It could be argued from the results that the prediction of Cooper (1996, p. 35-41) that the need for management accountants will fall is not outside the realms of possibility if they continue to spend such a high percentage of

their time on scorekeeping activities. Regardless of whether he is being overly pessimistic or not, it is certainly true that the information available to managers today is much broader, and no longer limited to financial transaction-based data. If management accountants find themselves spending most of their time supplying only transaction-based (scorekeeping) data, then managers may well look elsewhere for the additional information they need.

It is also possible that as a result of a shrinking “middle management” level in most organisations, management accountants (who typically have found themselves in this level), are being either moved up or down the management tree. Those who are moved down will probably find themselves doing more of the “scorekeeping” activities, and those who move up may well not have had the time to respond to the survey. Those who remain in the middle level may have their roles dictated by top managers, and these managers may see the management accountant’s role limited to that of a traditional/scorekeeping accountant. The sort of analysis which is called “decision support” in this paper is often carried out by all levels of management with easy to use data mining software.

From Table Four it is apparent that there has been no significant change in the perceptions of the respondents over the intervening period between the two surveys regarding time allocation. The only significant change is in the respondent’s perception that their roles would either not change or change only marginally and could not foresee any significant or radical change in the future (67.2% in 1997 and 45.1% in 2005; $F = 6.43$).

This raises the problem of interpreting the result. Either the academics of ten years ago were wrong in their dire warning of the demise of the profession, or that management accountants are ignoring these warnings at their own peril. The two studies reported on in this paper do not address this question. Further research involving interviews/questionnaires with the managers who use the information provided by management accountants, in order to

determine their perception of the usefulness of that information, and whether those managers are going elsewhere rather than to the management accountant for the information they need for decision making, could well provide an answer to this question.

IT Skills and Management Accounting Education

The Education Committee of the International Federation of Accountants (IFAC) has recently considered IT in the accounting curriculum. The International Education Standard on the Content of Professional Accounting Education Programs (IFAC, 2003, p.44) identifies 'Information Technology knowledge and competences' as one of three knowledge and skills areas that a professional accounting education should contain. Arguably, IT knowledge and skills should be included in formal tertiary education programs, not just seen as part of the practical work environment.

Interestingly, a study by Tan, Fowler and Hawkes (2004, p61) found that both practitioners and academics rated problem solving and quantitative skills at the top of their list of skills considered important for graduate entry management accountants.

Table Five reveals that spreadsheeting is perceived to be the IT skill most commonly seen as necessary for decision support (83.0% in 1997 and 87% in 2005 selecting this skill). This has implications for management accounting education because spreadsheeting is an IT skill which requires the application of generic problem-solving skills. Given that the Accounting Education Change Committee (AECC) (1990) identifies problem-solving skills as an important element of accounting programs, it follows that spreadsheet design principles, as an extension of problem-solving skills, should be included in university accounting programs. An examination of Australian university handbooks has found that most accounting programs include a course on basic computing which may include a spreadsheeting exercise, but not a course specifically designed to teach spreadsheet design principles. Spreadsheet design principles should be taught at an undergraduate level, rather than leaving these skills to be developed after graduates are in

the workforce. Consequently, there are very few textbooks specifically catering to covering spreadsheeting skills in management accounting models (the exception being Beaman, et al, 2006).

Many spreadsheets in business today are used as aids to decision support. Successful spreadsheet models depend heavily on the model builder's problem-solving skills and adherence to spreadsheet design principles. It is therefore the responsibility of management accounting educators to develop teaching programs to provide graduates with these skills. The challenge for management accounting educators is to produce graduates who can not only understand the mechanics of spreadsheeting software, but who are able to build financial models which are flexible and error free so as to be useful to other managers for decision support.

Conclusions

Although numbers in 1997 and 2005 were limited to a sample of 200, the response rate was high and because of the spread in the characteristics of the survey respondents, the results of the two surveys are regarded as valid.

The study was restricted to the perceptions of management accountants regarding the proportion of time they currently devote to scorekeeping vs. decision support activities. In order to determine whether the proportion of time devoted to decision support by accountants represents sufficient support to management, further research should involve interviews/questionnaires with managers who use information provided by accountants, to determine managers' perception of the usefulness of accounting information. If the results of the present survey are true of the majority of management accountants in Australia (ie spending on average only a third i.e of their time providing decision support information to managers), then further research may well confirm the findings of King *et al.* (1990) that many managers are going elsewhere, rather than to the management accountant, for the information they need for decision making. This is supported by Burns *et al.* (1999, p. 59) who state that 'traditional accounting measures are

being supplemented by other performance indicators ... provided by the operating control systems and only later input into the accounting system'.

Further research could also involve qualitative interviews with management accountants to further explore their changing roles. It is possible that the definitions of "scorekeeping" and "decision support" adopted for this paper from King *et al* (1990) do not sufficiently allow for new and emerging roles performed by management accountants, for example their role in managing and enhancing computerised systems.

The implications of the findings in this paper both for practising management accountants and for management accounting educators are clearly significant. If management accountants continue to spend too much time on "scorekeeping" activities rather than providing the decision support services that managers need, then the prediction of Cooper (1996) that they 'risk finding themselves at a career dead-end' may come true. The authors are of the opinion that an allocation of one third of their time to decision support is too little and that to improve decision support to managers and thus maintain their role, management accountants must not only allocate more time to decision support, but must also update their financial modelling and other IT skills.

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