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Are Accountants Ready for Their Roles as Information Systems Planners and Managers?

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Abstract

During the last few years various groups in Australia and other countries have called for an overhaul of accounting education. The discussions have centred on a number of viewpoints that have been contributed by accounting bodies, committee reports, individual practitioners and academics. The 1990 Australian Report of the Review of the Accounting Disciplines in Higher Education, (The Matthews Report) commented on the need to broaden the base of accounting education to include more topics on marketing, management, industrial relations and information systems because of the tendency for many accountants to move into management. We wish to extend this to include a range of issues we consider important to the information systems community as well as practising and academic accountants.

Accountants in executive and senior management positions in 1100 Australian organisations were surveyed and asked about their own information systems education, knowledge and practice. Opinions on the level and categories of information systems knowledge that accountants and executives need were sought.

Corporate accountants are often involved in proposing, planning, designing, implementing and managing information systems. They use many specific information systems areas of knowledge. Respondents identified a number of information systems areas in which they consider senior managers and executives in Australia have insufficient knowledge. These are business-focused management topics including: the ability to use IT in decision making, the strategic and competitive impacts of IT, the ability to access corporate data and contemporary uses of IT.

The results of the survey show that accountants in industry are involved in a much broader range of activities than they are traditionally exposed to in their formal studies. Accounting in industry is rapidly moving from its traditional financial and managerial accounting focus to a broad focus on organisations' information needs. A large majority of respondents consider that a wide range of information technology and systems topics should be included in initial accounting qualifications.

Based on these results, the paper recommends accounting education should be reviewed to give students greater exposure to information resource management and information systems planning and management topics. Other writers have called for formal studies to incorporate broadly-based analytical skills and communications abilities. We would support this and add a strong focus on organisational information systems. The changing nature of industry-based accounting, as shown by this study, would support a redefinition of accounting to embrace a broader concept of information management.

The findings presented in this paper should be of concern to information systems professionals, accountants, business managers and academics. Information systems educators must work with our accounting colleagues to ensure that current and future accountants in industry are adequately prepared in their initial and continuing professional studies for their increasing role in information systems planning, development and management.

Introduction

During the last few years various groups in Australia and other countries have called for an overhaul of accounting education. The discussions have centred on a number of viewpoints that have been contributed by accounting bodies, committee reports, individual practitioners and academics. We

wish to extend this debate to include a range of issues we consider important to the information systems community as well as practising and academic accountants.

The data and analyses presented in this paper are part of a larger project designed to explore and evaluate experiences and problems in the planning, management and use of information systems in Australian businesses.

The accounting profession in Australia is divided between two professional bodies: The Institute of Chartered Accountants in Australia (ICAA) and the Australian Society of Certified Practising Accountants (ASCPA). Thirty-seven percent of ICAA members are employed in government or industry. (ICAA 1995) Of the 77,721 members of the ASCPA, 50% are employed in industry and 17% in government. (ASCPA 1995)

Much has been written about the need to modify accounting programs to accommodate perceived changes to the nature of activities undertaken by accounting graduates. In the US, this debate has been primarily about whether the education of undergraduate accountants should be broadened to include more general and conceptual materials. This debate has included issues of whether accounting education should become a five-year program. In the US, Poe and Bushong (1991) report that "The number of accountants in managerial accounting far exceeds the number of accountants in all other disciplines, yet the needs of public accounting continue to dictate curriculum design." Moreover, "Many firms must hire nonaccountants in areas such as consulting and computer systems, in part because the structure of the accounting education curriculum discourages students from acquiring the nonaccounting specialized skills required in these areas". (Op. Cit. p66). They argue that we need to seek ways of providing the knowledge needed by all accountants, not just those in public practice.

Lovell (1992) believes there is scope for considerable improvement in the education of UK accountants. He quotes Patten and Williams: "The fundamental flaw of accounting education is that while it has tended to remain static, the profession has been changing. The accounting profession is entering a new era, with new functions to be performed within organisations and within society, and with new expectations of those who enter." (in Lovell 1992)

Sundem, Williams and Chirrona, all of whom were, at the time of writing, members of the US Accounting Education Change Commission, believe that the traditional approach has been to train students to be professional accountants. They are concerned that accounting students have access to fewer courses in non-accounting business areas. They believe "Accounting should be presented as an information development and communication process. As the industrial society gives way to the information society, accounting information will have to compete with more and more sources of information." Accountants must recognize the expanded sources of information and be able to define the new role of accountants as information systems specialists." (1990 p51)

In Australia, the Report of the Review of the Accounting Disciplines in Higher Education, (The Matthews Report) commented on the need to broaden the base of accounting education to include more topics on marketing, management, industrial relations and information systems because of the tendency for many accountants to move into management. The Matthews Report recommended a double degree in accounting and commerce or business and that universities should offer a four-year undergraduate program that includes studies in the design and use of information systems. In the absence of funding for a four-year program, a three year program should provide for students to do double majors in accounting and a related business area. These, as well as many other reports and articles have called for changes to accounting education.

The Project

This paper is part of a project designed to document and evaluate experiences and problems of Australian companies in their planning and development of information systems. The project was undertaken as a large mail survey of Australian businesses. A total of 1100 organisations in three samples of Australian companies were surveyed: those with 20 to 99 employees, those with 100 - 499 employees and those with 500 or more employees. These groups include Australian owned and managed companies as well as part or completely foreign owned or controlled.

A mail survey was the only suitable method for the large sample to be researched. The Australian Society of Certified Practising Accountants (ASCPA) provided stratified samples of its membership database. Questionnaire booklets, personally addressed introduction letters and reply-paid envelopes were mailed to ASCPA members who held executive positions in the companies surveyed. About three weeks later a follow-up letter was posted to non-responders. This was followed by a brief reminder where necessary.

The opportunity was taken to include in the questionnaire a range of questions designed to explore the role accountants in senior management and executive positions in Australian companies play in information systems strategic planning and development.

The demographics of Australian business are quite different to that of countries which have been the subject of much research; for example, Lederer and Mendelow (1988) surveyed companies with up to 125,000 employees and Earl (1993) surveyed companies having average annual revenues of £4.5 billion. Even the largest Australian companies are small by comparison to these. The Australian Bureau of Statistics (1993) (ABS) reports on the Australian business sector in eight employment size groupings, the largest being those businesses employing more than 1000 people. In 1993 there were 26,060 organisations with 20 - 99 employees, 4218 with 100 - 499 employees and 1090 with more than 500 employees (op cit). The ABS (1993) includes statistics for a defined business unit titled "Management Units". Our survey used a term "organisation" which was defined in the questionnaire and is a close surrogate for the ABS Management Unit

Objectives

The survey was designed to provide answers to the following questions:

- In which areas of information systems strategic planning, development and management are professional accountants in senior management and executive positions in Australian companies involved?
- What level of information systems strategic planning, development and management knowledge is required of non-information systems senior managers and executives in Australian companies?
- What formal information systems education have accountants in senior management and executive positions received?
- Do executives and senior managers in Australian companies have adequate information systems knowledge for the tasks they undertake?
- In what areas should the formal education of accountants be changed to ensure that future industry-based accountants are able to discharge properly their management responsibilities in respect to the information systems needs of their organisations?

Results

The response rate for the survey for the three samples was from 33 to 36%. It is necessary that any sample surveyed be as representative as possible of the population. Table 1 lists the organisations surveyed classified according to ABS (1993) industry classifications. The respondent samples fit well with the population, except for over-representation of manufacturing and under representation of community services. This is almost certainly explained by manufacturing industries employing a higher percentage of accountants than do community services organisations. Tables 1 and 2 refer to the overall survey and have been included in earlier published papers from this work: for example (Falconer and Hodgett, 1996).

Table 1. Organisations Surveyed by Industry Type

Industry	Large Org'ns*		Medium Org'ns**		Small Org'ns***	
	Sample (%)	Pop'n† (%)	Sample (%)	Pop'n† (%)	Sample (%)	Pop'n† (%)
Manufacturing	44.6	27.0	45.2	28.7	36.6	20.8
Finance, property and business services	16.4	12.8	15.1	15.1	11.1	15.8
Mining	6.0	2.3	5.6	1.9	2.6	0.0
Transport and storage	6.0	4.7	6.3	4.5	6.5	4.2
Electricity, gas and water	4.5	3.1	0.0	0.7	0.0	0.0
Wholesale trade	4.5	6.7	9.5	7.9	15.0	9.2
Retail trade	4.5	5.7	7.2	7.3	11.1	12.5
Agriculture, forestry or fishing	3.0	0.7	1.6	2.3	3.9	2.5
Construction	3.0	4.3	6.3	3.9	7.8	6.3
Communication	3.0	0.3	0.8	0.0	0.7	0.0
Recreation, personal and other services	3.0	7.1	1.6	10.6	4.6	15.9
Community services	1.5	25.6	0.8	17.1	0.1	12.8

*n = 66 **n = 126 ***n = 153

† Source: Australian Bureau of Statistics, Profiles of Australian Business 1992.

Table 2 show that all respondents held senior management or executive positions.

Table 2. Descriptions of Positions* Currently Held by Respondents

Description	Large Org'ns (%)	Medium Org'ns (%)	Small Org'ns (%)
Finance controller (Director)	34	42	25
Accounting manager	15	13	12
Divisional manager	9	4	5
Information systems manager	9	2	0
Management accountant	8	5	11
CEO	5	10	14
Director	3	6	9
Other managerial positions	17	18	24

*n = 345

Respondents were also asked whether there was a specific person responsible for information systems activities within their organisations. Eighty-seven percent of large companies, 85% of medium and 61% of small companies indicated that they have one person responsible for information systems activities. This is in line with expectations: one would expect less specialisation of executive positions in small companies compared with large organisations. Of the companies with an executive or senior manager responsible for information systems management, the following was reported.

Table 3. Title of Position Responsible for Organisations' Information Systems

Position Title	Large* Org'ns (%)	Medium** Org'ns (%)	Small*** Org'ns (%)
Information systems manager	78	53	19
Data processing manager	9	5	12
Company accountant	0	5	14
Company secretary	0	2	11
Financial controller	9	22	32
Unspecified	4	13	12

*n = 66 **n = 126 ***n = 153

Table 3 shows that managers in traditional accounting positions are frequently responsible for information systems activities in all but the largest companies. Large companies nearly always separate the management of the information systems functions from other executive functions by establishing a specific position to manage information systems.

Two hundred and eighty-five respondents across all three groups provided information about the areas of knowledge related to information systems planning, development, management and use that they regularly use as senior managers or executives. Respondents were asked to indicate using a Likert scale their level of involvement in each stage of a six-stage model of information systems planning and development. Table 4 shows the replies aggregated across all three company-size groups.

Table 4. Percentage of Involvement in Information Systems Planning and Development Stages by Professional Accountants Employed as Senior Management or Executives, Aggregated for All Organisations

Information Systems Activities	Always	Often	Sometimes	Seldom	Never
	%	%	%	%	%
Proposing projects	19	25	35	17	4
Planning projects	18	20	33	21	8
Designing projects	11	12	26	29	22
Implementing projects	13	21	35	17	14
Plan control and security	12	18	23	27	20
Ongoing operation and maintenance	14	17	22	26	21

There was one minor difference between the organisation groups. Executives in large companies reported a lower frequency of extensive involvement with each stage. Almost all respondents indicated they have an involvement with proposing and planning information systems projects and the great majority indicated involvement in subsequent stages. Professional accountants appear to play an important part in the planning and development of information systems in companies of all sizes. The top twelve knowledge areas are reported in order in Table 5.

Table 5. The Top Twelve Information Systems Knowledge Areas Used by Senior Managers and Executives

Knowledge Areas	Respondents Who Regularly Need Knowledge in These Areas (%)
Spreadsheets	85
Word processing	72
Local area networks	62
Computerised accounting systems	60
Office automation	51
Electronic data interchange	49
Presentation graphics	45
Project management	44
Information systems management	39
Executive information systems	39
Strategic planning & policy for IS	33
Information systems security & integrity	32

There were few differences between the three organisation groups, so Table 5 includes data for large companies only. The main differences between companies of different sizes are that knowledge of local area networks, electronic data interchange and strategic planning for information systems were used twice as often in large companies as compared with medium and small companies. In addition to the responses reported in Table 5, 20-30% of respondents in large companies reported that they regularly need knowledge in the areas of computer operations, hardware, mainframe systems, and systems analysis and design. CASE methodologies, object-oriented design, expert systems, programming, desktop publishing and social issues were considered to be irrelevant in the daily working of the senior managers and executives who responded.

The qualified accountants to whom this survey was addressed were asked their opinion as to whether senior managers and executives in their organisations have an adequate knowledge of information systems and technology. Sixty-six percent of respondents in large organisations, 63% in medium and 68% in small organisations consider that their senior managers do not have adequate knowledge of information systems and technology. Table 6 shows the areas of information technology in which the knowledge of executives and senior managers should be greater.

Table 6. Areas of Information Technology in Which the Knowledge of Executives and Senior Managers Should be Higher.

Areas of Knowledge	Percentages of Respondents		
	Large Org'ns (%)	Medium Org'ns (%)	Small Org'ns (%)
Ability to use IT in decision making	91	84	87
Strategic impact of IS	83	47	48
Competitive impact of IS	83	51	46
Ability to access corporate data	66	60	61
Contemporary uses of IT	51	45	49
IS management	46	31	39
Contemporary IS technology	37	27	25
Computer security and control	34	28	29
Project management	29	28	27
Computer networking	23	29	22
Accounting for IS ops	20	16	24
Database issues	20	28	22
Systems development methodologies	17	19	13
Comp accounting systems	17	29	42
Computer systems audit	14	9	12
Systems analysis and design	6	27	12
Social issues of computing	6	12	9

The top five responses reported in Table 6 are business-focused issues. This is in contrast to the technical nature of the main knowledge areas used, reported in Table 5. Senior accountants in industry appear to recognise the potential that information technology has to transform business and at the same time recognise that executive knowledge within the company is insufficient to take full advantage of opportunities that information technology presents. Knowledge of strategic management of information systems was not widely used, but is the second most needed area of improvement of executives' skills and abilities. This is consistent with other findings from this study. In another paper we reported that only 58% of large companies, 29% of medium companies and 19% of small companies undertake information systems strategic planning. (Falconer and Hodgett, 1996)

Table 7 shows the information systems-related topics studied by respondents in their initial accounting degree for respondents who became members of the ASCPA up to ten years ago.

Data were collected for those respondents who joined the ASCPA between 10 and 20 years ago and more than 20 years ago. There were very few information systems topics studied by the respondent accountants who joined more than 20 years ago. Fifteen to twenty percent studied some programming or computerised accounting systems. The incidence of study of all topics listed in Table 7 doubled for the more recent members compared with the group who joined between 10-20 years ago. The only exceptions to this were programming which increased from 64% to 92% and networking .

Table 7. Information Systems Related Topics Studied in Initial Accountancy Qualification by Respondents Who Joined the ASCPA Up to Ten Years Ago

Information Systems Topics	Respondents (%)
Programming, introductory	92
Computerized accounting systems	69
IS management	62
Audit around computer	61
Spreadsheets	46
Databases	46
Hardware knowledge	46
Programming, advanced	39
System analysis & design	39
Computer security	39
Audit through computer	39
Computer operations	31
Computer networking	31
Word processing	23
Mainframe systems	23
Project management	15
Social issues of computing	15

There has been an obvious increase the inclusion of computing and information systems topics in undergraduate accounting qualifications in the last 20 years. These topics correspond to those knowledge areas accountants report that they regularly used in their positions as senior manager or executives. All topics are information technology focused, rather than business focused. There appears to be no inclusion of the business-focused information systems knowledge areas reported as necessary for senior managers. These areas include: ability to use information technology in decision making, strategic impact of information systems, competitive impact of information systems, ability to access corporate data and contemporary uses of information technology. It would seem that accounting courses have increased the accounting content of accounting courses to the point where about half the graduate have some exposure to information systems topics, but the topics chosen for accounting courses are information technology focused rather than business focused. This is an issue which should be addressed by accounting bodies and course designers.

Table 8 lists the areas of information systems knowledge that respondents believe should be included in an initial accounting qualification. Only those topics referred to by more than 50% of respondents are included. The results have been reported only for large companies as the only variation between different sizes of organisations was a slight change of order of these topics.

Table 8. Areas of Information Systems Knowledge that Should be Included in an Initial Accounting Qualification.

Information Systems Topics	Respondents (%)
Spreadsheets	92
Decision support systems	90
Computerised accounting systems	83
Word processing	70
Strategic planning & policy for IS	72
Information systems security & integrity	68
Executive Information systems	60
Information systems management	58
Programming, introductory	57
Computer system audit	57
Systems analysis & design	53
Project management	53
Office Automation	53
Database design	51
Local area networks	51
Electronic data interchange	51

Summary

Corporate accountants are often involved in proposing, planning, designing, implementing and managing information systems. They use many specific information systems areas of knowledge. The top six areas of information systems knowledge considered important for this group are all business and industry focused. There is a strong recognition of the role that information systems can play in improving the way business is done.

About half the members who joined their professional society within the last ten years have had some exposure in their undergraduate degrees to traditional introductory computing topics such as programming, word processing and spreadsheeting. Business or industry focused information systems topics, such as planning and management were not included in the formal study of any of the respondents.

A large majority of respondents consider that a wide range of information technology and systems topics should be included in initial accounting qualifications.

Accounting Education in Australia

The professional accounting societies in Australia have a strong influence over the topics that are included in a tertiary qualification which is intended to enable students to gain membership of a professional accounting body. The Australian Government will only fund three-year undergraduate business degrees, notwithstanding the recommendations of a Government-funded enquiry into accounting education in Australia. Prospective students in Australia expect that such membership will normally be gained in a three-year undergraduate accounting or business degree. Authors cited in this paper have written of the difficulty of meeting professional accounting body requirements and building sound analytical and problem-solving skills into a three or four year undergraduate award.

Implications

This study shows that many accountants in industry in Australia are involved in activities much broader than they are traditionally exposed to in their formal studies. So widespread is the planning and management of information systems by accountants in industry that it is not unreasonable to suggest that accounting in industry is rapidly moving from its traditional financial and managerial accounting focus to a broad focus on organisations' information needs. Accountants are involved in planning for and managing their organisations' information and information systems. They recognise that information is the most difficult organisational resource to manage.

We suggest that accounting education should be reviewed to give students exposure to information resource management and information systems planning and management topics. This supports the views of Sundem et al. (ibid) Given the difficulty of introducing even more material into an already crowded undergraduate degree, this should be approached by reviewing the structure of formal studies required for membership of professional accounting bodies. We would support other writers' calls for formal studies incorporating broadly-based analytical skills and communications abilities. To this we would add a strong focus on organisational information systems. We believe a graduate of such a program would be then well placed to complete a post-graduate professionally-oriented qualification for entrance to a professional accounting society. Alternatively, or as well, the changing nature of industry-based accounting would support a redefinition of accounting to embrace a broader concept of information management. This is a matter that we recommend professional accounting bodies consider.

We believe the findings presented in this paper should be of concern to information systems professionals, accountants, business managers and academics. Information systems educators must work with our accounting colleagues to ensure that current and future accountants in industry are adequately prepared in their initial and continuing professional studies for their increasing role in information systems planning, development and management.

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