

# **TRENDS IN THE AUSTRALIAN QUANTITY SURVEYING PROFESSION: 1995 - 2003**

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## **ABSTRACT**

*This paper examines trends in the Australian Quantity Surveying profession since 1995. The paper is based on research conducted by a team from the University of Technology Sydney involving a series of five national surveys spanning 1995 to 2003. The surveys have examined trends in general practice and the utilization of information technology by the profession. The primary purpose of the surveys has been to assist firms in dealing with change and to adapt their operations to meet industry demands. Firms in all sectors of the construction industry will need to work smarter to gain competitive advantage and current industry procurement and technological trends clearly indicate that firms who are unable to re-engineer their work practices to evolve with these trends will find it increasingly difficult to survive in a meaningful and profitable form. The paper initially examines trends in the structure/size/nature of the profession and trends in general business practices and scope of services. This is followed by an in-depth examination of trends in the utilisation of information technology by Australian Quantity Surveying practices. The survey responses are then used to examine current problems and opportunities in the profession and what needs to be done in the short and longer term. The paper concludes with a range of recommendations and strategies that attempt to address these problems and ensure the relevance and importance of the profession well into the future. The paper will also provide the international quantity surveying community with a unique data source that should prove valuable for comparative purposes and general discussion about the global future and direction of the profession.*

Key Words: Quantity Surveying, Information Technology

## **1. INTRODUCTION**

The Quantity Surveying (QS) profession in Australia has experienced significant change over the past decade in terms of the scope and type of services provided both within and outside of the construction industry. These changes have occurred primarily in response to changing industry/client demands, Information Technology (IT) developments and increased levels of competition for services. Additionally, given the increasingly global nature of construction activity, increased international competition is of serious concern to all participants in an Australian construction industry dogged by extremely high levels of domestic competition and resultant low profit margin levels. The impact of changes in industry structure and procurement practices on the quantity surveying (QS) profession will continue to escalate. As information flows increasingly become electronic QS computing facilities, software and databases will need to develop in a compatible manner. Compatibility with and the utilization of CAD systems is just the beginning. It is inevitable that documentation and data will be increasingly automated to the point where measurement and other technical processes will require minimal human intervention.

This naturally leads to speculation about the imminent demise of the independent quantity surveying consultant but the reality is that, at this stage anyway, IT advancement provides the profession with enormous opportunity to actually strengthen its position in the industry. Quantity surveyors are well placed to become the major information handlers on construction projects as the majority of information flow evolves around quantities and cost. Realistically though, no profession or discipline can legitimately lay claim to being best suited to take control of information management. It is likely that current opportunities will be taken up by others if the profession adopts a "wait and see" approach.

This paper examines the trends and future directions in the services provided by the Quantity Surveying profession in Australia since 1995. It is based on research undertaken by a team from the Project Management Department at the University of Technology Sydney (UTS) comprising five nationwide surveys of the profession carried out from 1995 to 2001. The author would like to acknowledge the assistance of this team, namely Rick Best and Gerard DeValence, with the research for this paper.

## **2. THE AUSTRALIAN QUANTITY SURVEYING PROFESSION**

Quantity Surveyors in Australia provide financial management services for projects predominantly in the construction/property industry. Traditional services include the preparation of Bills of Quantities, Builders' Quantities, Cost Planning/Budgeting, Estimating and Contract Administration. The past decade has seen a marked rise in the diversification of services into non-traditional areas such as Feasibility Studies, Life Cost Analyses, Programming, Taxation Advice, Arbitration/Mediation, Expert Witness/Appraisal, Insurance Valuations, Risk Management, Quality Management, Value Management, Project/Construction Management and Facility Management. In the past five years, the profession has also made significant inroads in providing cost management services to other industries such as the Petro-Chemical, Manufacturing, Mining, Aeronautical, Shipping, Transport and Civil sectors. This diversification is a result of the profession adapting to meet changes in industry requirements.

The size of the profession is relatively small. Total membership of the Australian Institute of Quantity Surveyors (AIQS) is currently just over 3000 with only approximately 1200 corporate members (the rest made up of student/probationer members). However, there are generally no registration requirements for Quantity Surveyors (except in the state of Victoria) and no requirement to be a member of a professional association. Therefore, the AIQS membership does not reflect the total number of practitioners in the industry but, nevertheless, provides a good indication. The majority of firms in the industry are small having five employees or less and there are a large number of sole practitioners. This is an important aspect to remember when analyzing the survey results.

This is reflective of the extremely fragmented nature of the industry not only in Australia but globally. The industry in Australia is characterized by a large number of small organizations with over 100,000 small businesses operating in the industry. 98% of firms employ less than 20 people and 85% employ less than 4 people (Hutt 2000). Over 90% of construction work is subcontracted and project team consultants and contractors are typically assembled for individual projects in an ad-hoc "one-off" pattern with decisions on project team composition largely made on the basis of lowest price. Hence, project teams are assembled and disassembled on a project by project basis with little continuity of project team members over the long term. During the course of large projects, there are typically hundreds of firms (consultants, contractors, suppliers) involved during the various stages with a high level of "change-over" between the various trade contractors. Additionally, every project is a "one-off" prototype. Current initiatives to address these problems include alliance contracting, joint venturing and "single-source" delivery of services extending into the operational stages of projects.

Due to a lack of industry standards, each of these firms has their own organizational/management systems in place encompassing a wide range of technological capabilities and software usage. The wide range of software systems used and the incompatibility between many of these systems severely limit the scope for the industry to take advantage of the rapid technological advances surrounding it. Exacerbating this situation is the generally low profit margins in the industry which inhibit the ability of firms and the industry generally to make the necessary investment in IT systems, research and development. Other key problems include the complexities surrounding information flow on construction projects, the lack of information and process standards, the traditional "paper-based" mindset of the industry and legal and contractual issues relating to electronic documentation and records.

The manner in which developers, designers, consultants and contractors manage the entire building process will continue to change. These changes will result in not only substantial restructuring of how facilities are designed and supported but also a major reengineering of how these players do business. This presents the profession with an amalgam of opportunities and threats. This technological revolution will enable the profession to raise its level of service to a much higher and professional "value-adding" level as the technical aspects of the quantity surveyor's role increasingly become automated. The potential is there for quantity surveyors to be freed up from many of the time consuming technical aspects of their profession and focus on developing more sophisticated and professional services. Conversely, if firms fail to utilize and evolve with technological advances, particularly in terms of CAD and electronic transfer and receipt of information, they run the very real risk of being squeezed out of the virtual electronic project teams of the future. Accordingly, this paper will examine the results of research conducted on how the profession is evolving and meeting the challenges that these changes are providing.

### 3. QS SURVEY RESULTS & ANALYSIS

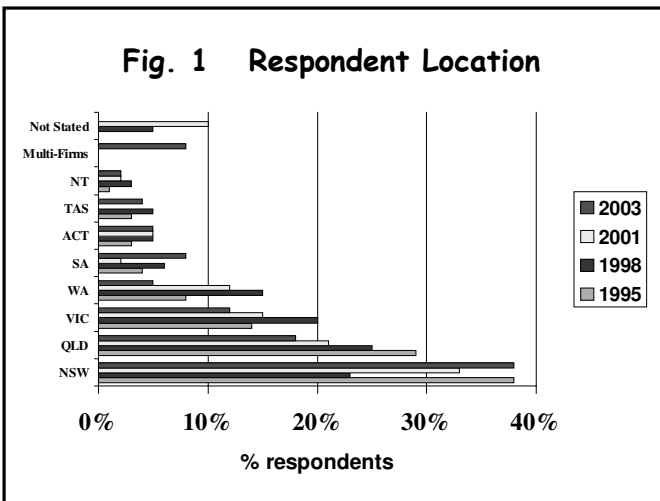
This section examines the general practices of Australian Quantity Surveying firms over the past 9 years. It is based on five nationwide surveys of the Australian QS profession carried out from 1995 to 2003 by a research team in the Project Management Department at the University of Technology Sydney in collaboration with the Australian Institute of Quantity Surveyors (AIQS). The 1999 survey was also carried out in collaboration with the Pacific Association of Quantity Surveyors (PAQS). These survey results enable evaluation of how the profession has reacted over the past nine years to the challenges and opportunities that industry change and technological development have presented.

#### 3.1 Survey Details

The surveys comprise a series of nationwide surveys of Quantity Surveying firms carried out in 1995, 1998, 1999, 2001 and 2003. 77 firms (out of 160), 65 firms (out of 126), 42 firms (out of 130) and 60 firms (out of 134) responded to the 1995, 1998 and 2001 surveys respectively representing response rates of 48%, 52%, 32% and 45%. The 1999 survey was posted to all AIQS members as part of a PAQS survey with 38 firms responding. The surveys comprised a number of questions concerning general practice details, information technology capability and use and future directions of the profession. The questions were largely the same for each survey but some questions were added to the 1999, 2001 and 2003 surveys.

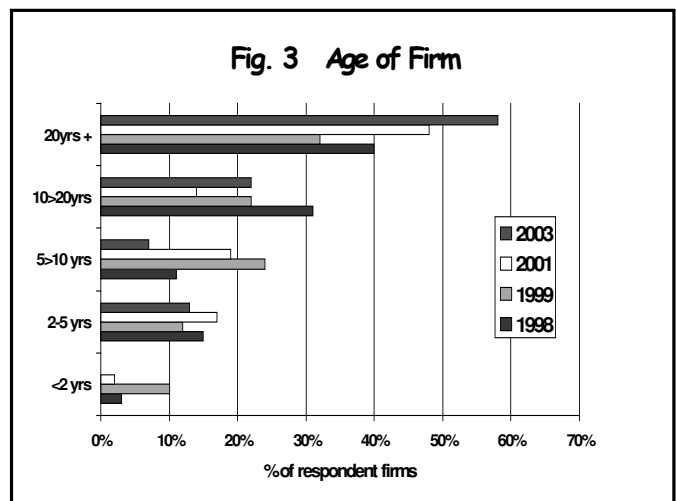
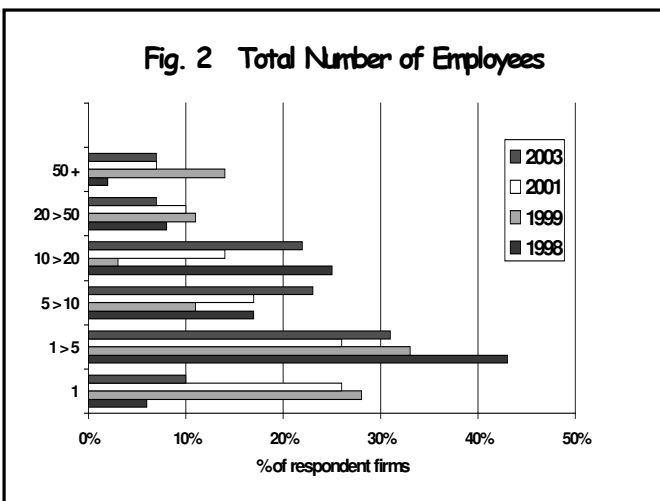
#### 3.2 Respondent Profile

Figure 1 shows the location of respondents (question was not asked in the 1999 survey).



This generally reflects the population sizes in the various states/territories of Australia with the vast majority of the population residing in the capital cities of each state/territory. Accordingly, respondents from the capital cities of Queensland, New South Wales and Victoria dominate the survey.

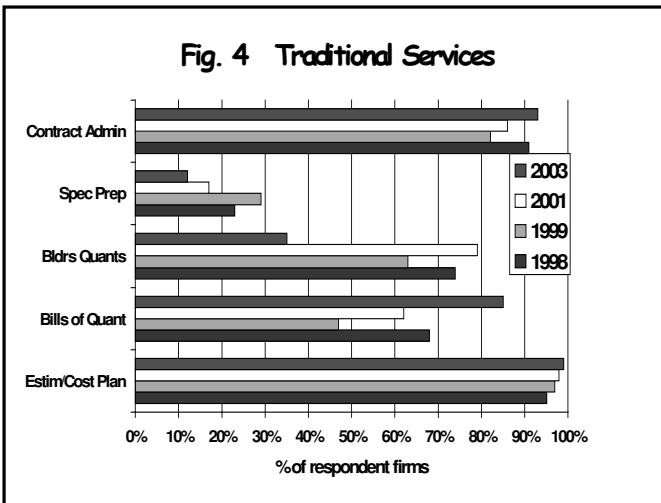
The respondents predominantly comprise small to medium sized organizations which is typical of the profession's (and industry's) structure. Approximately half had less than 5 employees and a large proportion of respondents were sole traders. These are significant factors when analyzing the survey results. Nevertheless, close to half have been in business for over 20 years which suggests that longevity is a feature of the profession



### 3.3 Services Provided

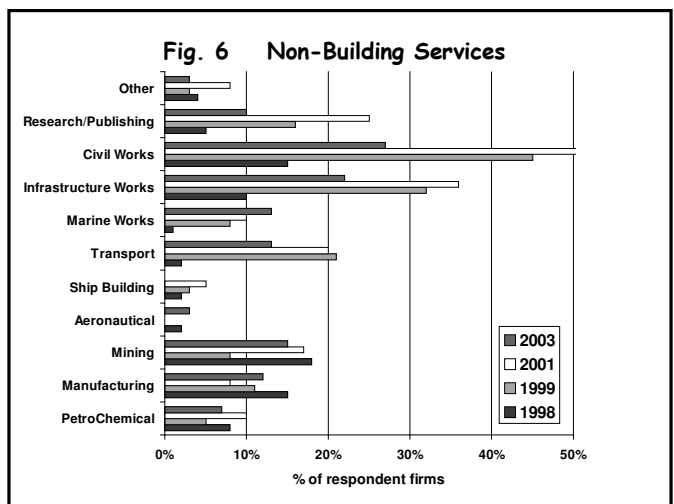
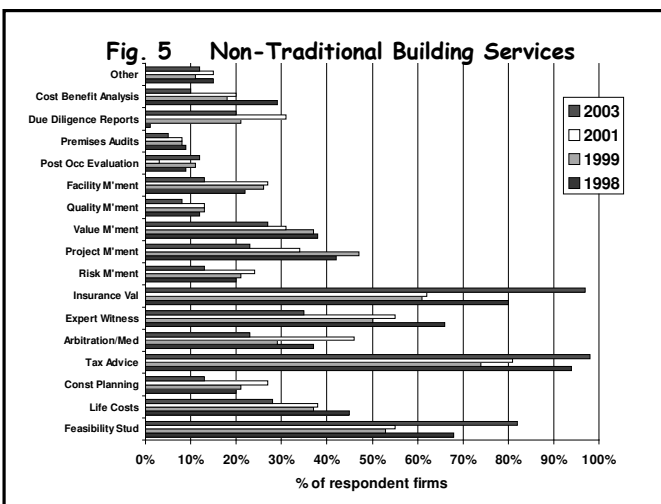
The past decade has seen Quantity Surveying firms expand and adapt their scope of services to meet changing industry demands. The use of the traditional "bread and butter" of the profession, Bills of Quantities, has declined markedly in the Australian construction industry over this time although the latest survey results indicate that there has been a resurgence in this area in certain market sectors. Despite this, the volume of work carried out by firms has increased over the corresponding period. Builders Quantities, whereby tendering contractors themselves (rather than the client) engage and pay Quantity Surveyors to prepare quantities are now far more common than the traditional Bill of Quantities provided and guaranteed by the client. Builders Quantities are usually prepared in a concise form with firms using their own concise standards; no standard concise method of measurement has yet been developed.

Another major change has been that Quantity Surveyors are now used much more in the "front-end" stages of projects where their expertise is of most value. Cost planning and budgeting is becoming the new "bread & butter" of the profession. One of the largest Quantity Surveying firms in Australia<sup>1</sup> provides a good example of these changes; in 1980 Bills of Quantities accounted for approximately 80% of their total workload whereas in 2003 this had declined to less than 10%. However, rather than leading to the firm's demise, the firm has adapted accordingly and now provides a greater volume and wider range of services.



This section of the survey targeted the scope of services provided by firms. Figure 4 shows the percentage of firms providing traditional services (question not asked in 1995). Estimating/Cost Planning and Contract Administration are the main services provided by firms. Even though the use of Bills of Quantities has declined most firms still provide this service albeit to a limited extent. More firms prepare Builders Quantities than Bills of Quantities.

Figures 5 and 6 show the extent of non-traditional and non-building services provided by firms (question not asked in 1995). They provide a good indication of the great diversification in the scope of services provided by the profession. This scope is now clearly very broad with taxation advice (comprising mainly building Tax Depreciation Schedules) and valuations for insurance purposes the most common service.



<sup>1</sup> The identity of this firm is not disclosed for reasons of confidentiality

The growth of the profession's role in the provision of feasibility studies indicates the increasing awareness of introducing quantity surveyors at the outset of a project where they can be of most value. The 2003 results show that over 80% of firms now provide this service. Project management, value management and life cost analyses are now an integral service provided. The involvement in Facility Management and post occupancy services generally has grown and provides perhaps one of the greatest areas for long term growth. However, the 2003 results show a decline in the number of firms providing Facility Management services which is surprising. The role of Quantity Surveyors in resolving disputes as Expert Witnesses in Arbitration/Litigation actions has escalated markedly. Australia is one of the most litigious countries in the world (measured in terms of legal cases per capita) and its construction industry is dominated by a high level of dispute. Most disputes evolve around money so the cost expertise of the quantity surveyor is commonly sought.

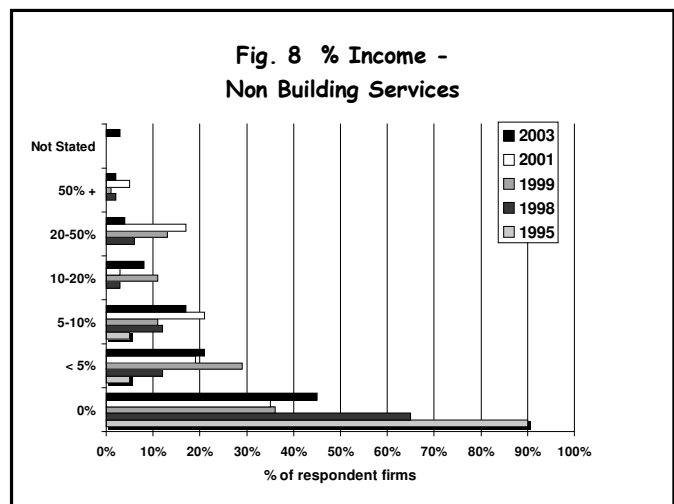
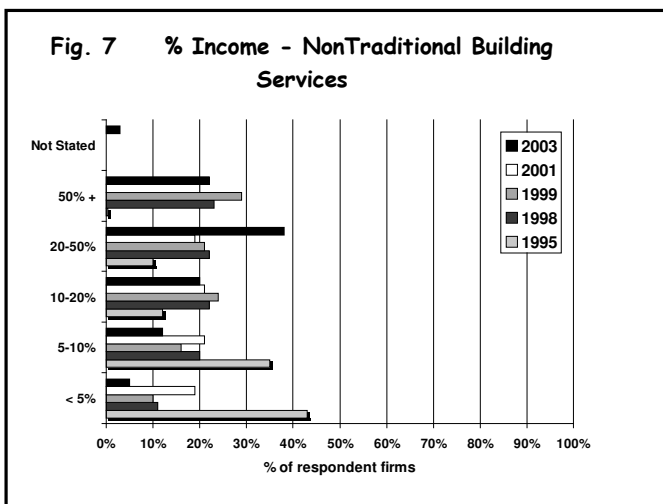
Figure 6 shows that Quantity Surveying firms are venturing into non-building areas demonstrating that the cost management skills of the Quantity Surveyor can be applied in other industries just as is the case with Project Management. The 1998–2001 results indicated that this trend was likely to continue but the 2003 results saw a decline. The civil, infrastructure, transport and mining sectors are the main sources of non-building work.

However, the provision of these services does not necessarily mean that they account for a large proportion of a firm's volume of work. Figures 7 and 8 indicate the percentage of income that these non-traditional/non-building services provide for firms. The results indicate a significant increase over the 9 year period.

These results provide evidence that Quantity Surveying firms have really taken on the challenge of diversification to better meet and serve industry demands. This indicates, in part at least, a proactive approach to change by many firms. They also demonstrate the very broad range of employment and business opportunities available for the modern day quantity surveyor.

In 1995, non-traditional services accounted for less than 10% of total income for over 80% of firms and no firm had a percentage higher than 50%. Non-building services were very limited; only 10% of firms carried out these services and, even then, they only accounted for less than 10% of total income. From 1998-2001 this picture changed significantly and the 2003 results have shown an even greater increase in non-traditional building services. By 2003 non-traditional services accounted for more than 10% of total income for over 80% of firms and over 20% of total income for nearly half of firms. For approximately 20-25% of firms these services actually account for over 50% of total income.

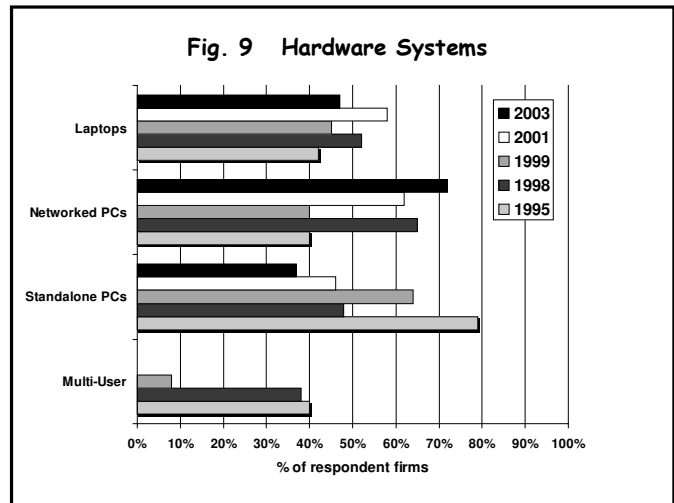
Income from non-building services also showed substantial rises although this tapered back a bit with the 2003 results. In 1995 90% of firms did not generate any income from non-building services but by 2001/03 this figure had reduced to approximately 40%.



### 3.4 Computing Systems

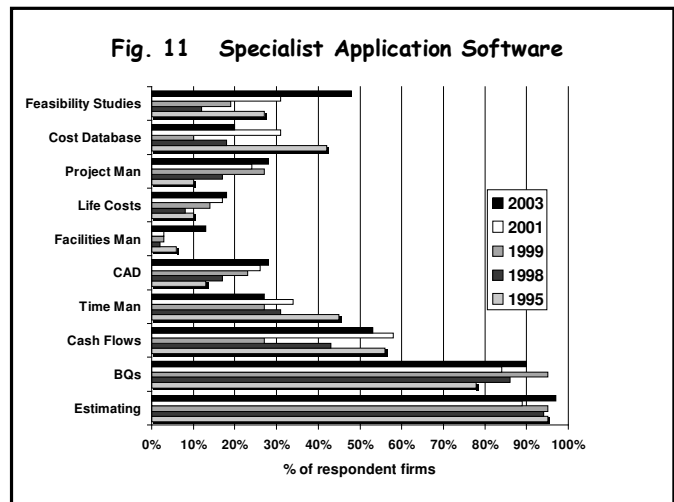
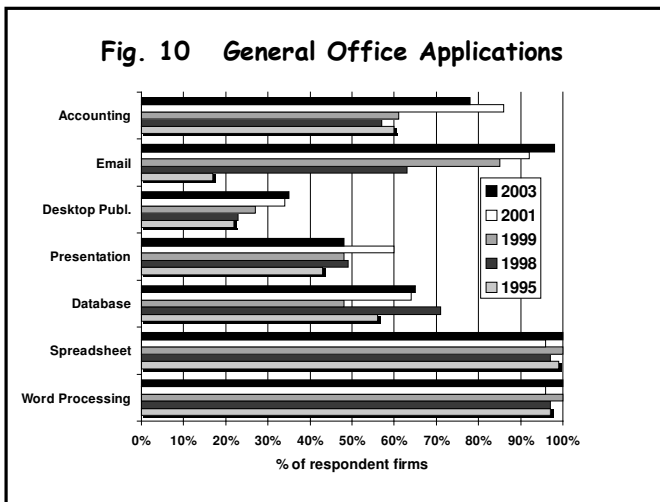
#### Operating Systems

In order to ascertain current processing technology capacity, respondents were asked to indicate their hardware platforms with the results shown in Figure 9. This provides the basis for the analysis of the IT survey results. The use of multi-user systems comprising a mainframe and dumb terminals has declined from around 40% of firms in 1995 to zero in 2003. The move to networked computers has been substantial and is to be expected. Over 70% of the 2003 respondents use networked systems which, given that the survey sample comprised over 40% of firms with 5 or less employees, indicates most firms use networking where practical. The use of laptop computers has remained relatively static being used by only approximately half of QS firms.



#### General Software Systems

The surveys revealed that the majority of firms use mainstream general office application software as indicated in Figure 10. The major change has occurred in the use of electronic mail (email). In the 1995 survey only 17% of firms used email but by 2003 this figure had increased to 98%. This provides a good example of how quickly email has been embraced as a major communication tool in business.



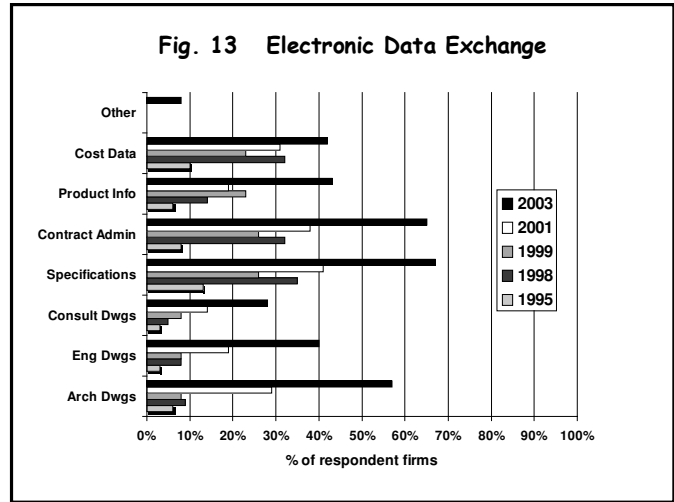
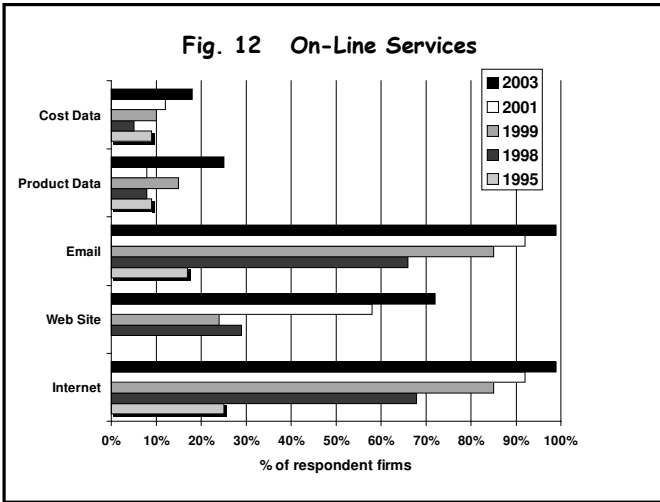
#### Specialist Software Systems

Figure 11 indicates that although the majority of firms use specialist application industry software for estimating, cost planning and Bills of Quantities (BQ) preparation the same may not be said for other specialist areas such as facilities management. However, many firms have developed programs for these specialist areas in-house (largely based on spreadsheets) and many project management style programs provide "all-encompassing" capabilities. In-house software is now used by over half of firms. Of note is the marked increase in specialist feasibility software. The most alarming statistic however continues to be in relation to CAD software. In 1995 only 13% of respondents had CAD facilities. Over the ensuing 9 years this percentage has slowly increased to 28% which indicates that at least some firms are venturing into the CAD area. Nevertheless, this proportion is still low particularly if the profession is intent on remaining a key player in the project procurement cycle. Whilst some respondents cite cost as the main reason for the non-use of CAD, it is clear that the majority of Quantity Surveyors are resisting active involvement in the CAD area.

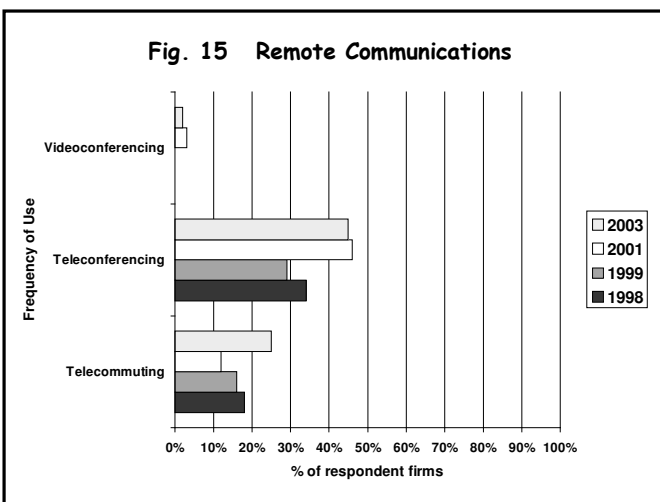
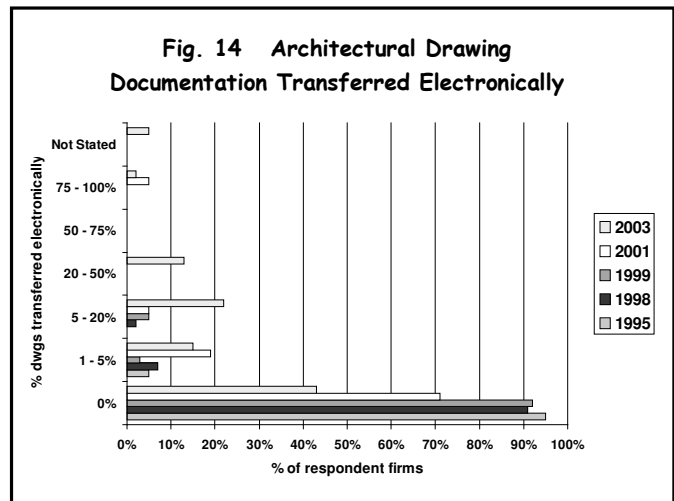
## Electronic Communication

In terms of electronic communication, access to on-line services has improved as shown in Figure 12. As previously mentioned, in 1995 only 13% of firms had e-mail/internet facilities but by 2003 this figure has increased to 98%. In 1995 none of the respondent firms had web sites but by 2003 72% of firms had one. This figure is likely to have increased further by now. However, the use of on-line cost and product data services remains at a low level.

Figure 13 shows that the level of external electronic data exchange, other than by telephone or fax, has improved in the 2003 survey. The 1995-1999 surveys showed that less than 10% of firms transferred or received architectural drawings electronically but by 2003 this figure had risen dramatically in the past two years to 58%. Marked improvements were also evident with engineers' and other consultants' drawings.



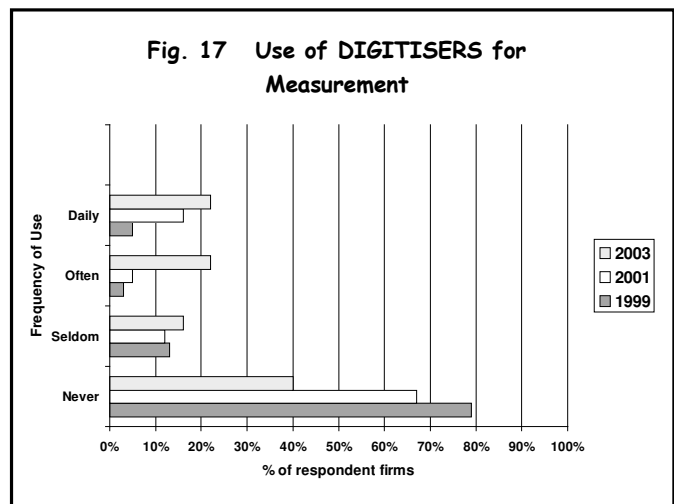
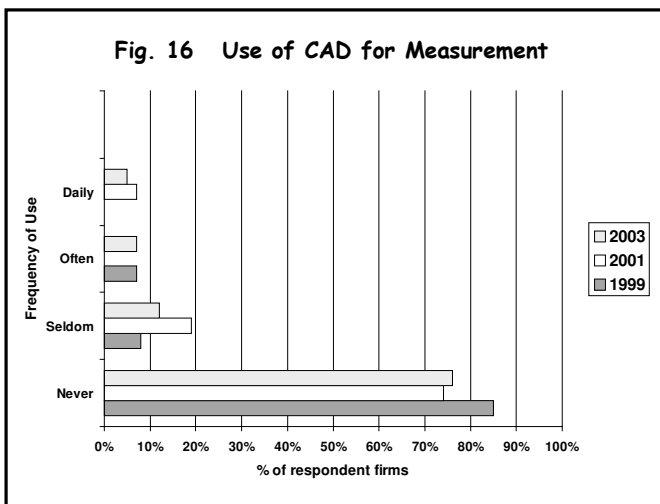
However this level of transfer remains very limited. Figure 14 shows that, despite some improvements since 1995, over 40% of firms still do not transfer or receive any drawing documentation in an electronic form. However, some firms are clearly developing their capabilities in this area - the latest results show that approximately 17% receive/transfer over 20% of their drawing documentation electronically. These firms really stand out from the pack and clearly show that it is possible.



In terms of remote communications, the percentage of firms utilizing telecommuting by having at least one employee working has increased to about 25%. This is demonstrative of the benefits of telecommuting (at least in part) both for employers and employees. Teleconferencing facilities are now used by approximately 45% of firms. Only one firm (in the 2003 survey) had videoconferencing facilities.

## Measurement Tools

The 1999 survey introduced a question relating to the use of electronic tools to aid the measurement process. The results in Figures 16 and 17 show that the majority of firms still cling to traditional paper-based measurement with the use of electronic measurement tools quite rare. The majority of respondent firms remain averse to using CAD automated quantities – in 1999 85% were not using CAD for this purpose and by 2003 this had only improved slightly to approximately 75%. In other words this indicates that three-quarters of the profession still do not use CAD at all for measurement. Nevertheless some firms have seen the potential with the 2003 results showing that approximately 10% of respondents use CAD often or daily for measurement. However, it is not known whether this applies to all staff within these firms or just “selected” staff. These firms and others like them who did not respond to the survey, stand out as pioneers in this area. Given the low proportion of firms with CAD facilities in the first place, these results are probably not surprising. The major reasons cited for not using CAD are the cost involved in investing in the necessary hardware/software and training of staff, the incompatibility of different CAD systems and problems with the automated capabilities of these systems. Many firms stated that there was no need or requirement for them to measure with CAD. There are still many problems associated with using CAD for measurement and the time when CAD systems can automatically produce a detailed Bill of Quantities for projects generally (rather than being set up for specific projects) is still probably a long way off. But the reality is that most CAD systems have the capabilities to, at the very least, automatically generate basic quantities in terms of areas, volumes and numbers of items.



It was, however, encouraging to see a marked increase in the use of digitizers for measurement in the 2003 results. The use of digitizers for measurement has traditionally been very low in the profession. In 1999, 79% of firms never used digitizers, 13% seldom used them, 3% used them often and only 5% used them daily. These figures only improved marginally in 2001 but 2003 saw major increases to the point where nearly half of firms use digitizers often or on a daily basis. However, as with CAD measurement, it is not known whether these firms make digitizers available to all staff.

Nevertheless, the results indicate that the profession is generally not utilizing and evolving with systems that can automatically produce quantities. There is tremendous scope here for quantity surveying practices to improve productivity and cost efficiency by utilizing such systems.

### 3.5 Future Expectations

The next section of the survey asked firms to give their opinions on a series of propositions relating to the possible future impact of general industry changes and Information Technology advances. The propositions and results are shown in Table 1. The predominant response for each year is highlighted in bold.

**Table 1: Future Expectations**

Questions	Strongly Agree					Agree					No Opinion					Disagree					Strongly Disagree									
	1995	1998	1999	2001	2003	1995	1998	1999	2001	2003	1995	1998	1999	2001	2003	1995	1998	1999	2001	2003	1995	1998	1999	2001	2003					
<b>GENERAL PRACTICE</b>																														
1	The role of the QS as an independent consultant will expand in the future					n/a	58%	58%	52%	54%	n/a	8%	8%	12%	8%	n/a	11%	15%	10%	8%	n/a	3%	3%	0%	0%					
2	Future QSs will mainly be employed as part of a professional team in multi-disciplinary practices providing integrated "in-house" services					1%	2%	3%	3%	3%	19%	17%	34%	26%	10%	21%	8%	16%	19%	12%	51%	62%	47%	45%	57%	8%	11%	0%	7%	18%
3	The QS will be a key player in the construction industry in 10 years time					n/a	49%	63%	61%	57%	n/a	8%	8%	12%	3%	n/a	5%	16%	3%	7%	n/a	4%	0%	3%	0%					
<b>INFORMATION TECHNOLOGY</b>																														
4	The impact of IT on the construction industry will be minimal in the next 5 years					0%	3%	0%	0%	3%	20%	5%	3%	7%	18%	18%	3%	3%	10%	5%	49%	49%	60%	47%	55%	13%	40%	34%	36%	19%
5	The impact of IT on the construction industry will be minimal in the next 10 years					1%	2%	0%	0%	5%	5%	2%	0%	3%	7%	18%	5%	0%	0%	8%	52%	29%	53%	50%	53%	24%	62%	47%	47%	27%
6	Further advances in computing and IT generally will see the end of the technical QS measurer					4%	8%	3%	7%	3%	47%	18%	29%	24%	20%	4%	11%	13%	10%	3%	35%	51%	50%	40%	60%	10%	12%	5%	19%	14%
7	IT advances will lead to fewer but more highly skilled QSs					n/a	14%	6%	7%	10%	n/a	32%	52%	35%	37%	n/a	14%	11%	17%	13%	n/a	37%	28%	31%	33%	n/a	3%	3%	10%	7%
8	CAD networking facilities and knowledge will be essential for the QS in 5 years time					n/a	20%	18%	24%	20%	n/a	46%	39%	45%	50%	n/a	12%	27%	17%	15%	n/a	18%	16%	14%	15%	n/a	4%	0%	0%	0%
9	The QS profession should be actively involved in utilising, developing and promoting the use of CAD automated quantities					n/a	25%	21%	21%	22%	n/a	42%	55%	43%	48%	n/a	9%	16%	17%	13%	n/a	18%	8%	19%	13%	n/a	6%	0%	0%	4%
10	Only larger practices have the resources to take advantage of IT					6%	9%	13%	7%	7%	19%	20%	24%	24%	33%	15%	11%	16%	12%	7%	42%	42%	42%	43%	45%	18%	18%	5%	14%	8%
11	Greater use of IT will enable the QS profession to provide better service to clients					32%	31%	32%	31%	15%	43%	45%	50%	56%	67%	16%	15%	10%	10%	8%	9%	6%	8%	3%	10%	0%	3%	0%	0%	0%
12	The QS is well placed to take advantage of the changes in the construction industry which will flow from the increased use of IT					25%	23%	29%	36%	18%	42%	54%	42%	38%	55%	24%	17%	16%	14%	20%	8%	3%	13%	12%	5%	1%	3%	0%	0%	2%

\* predominate response for each year marked in bold

The predominant response categories were largely the same for each year and indicate that attitudes towards future directions in the industry, quantity surveying work practices and IT and their effect on the profession have remained relatively unchanged.

### **General Practice**

#### **1. The role of the QS as an independent consultant will expand in the future.**

Approximately 80% of respondents in each survey agreed or strongly agreed with the above proposition. This reflects an optimism in the profession that hasn't changed despite the many changes in the industry and the profession.

#### **2. Future QSs will mainly be employed as part of a professional team in multi-disciplinary practices providing integrated "in-house" services.**

This question concentrated on the future viability of the independent QS practice in light of changes in industry procurement practices which have seen many clients move to 'design and construct' style single source procurement solutions. In 1995/98 60-70% disagreed with this whilst in 1999/2001 only about 50% disagreed. In 2003 75% disagreed which suggests that most practitioners do not believe that single source packaging of projects will have a detrimental impact on QS firms.

#### **3. The QS will be a key player in the construction industry in 10 years time.**

Once again the respondents generally responded very optimistically to this question with approximately 80% agreeing with this in the first four surveys. In 2003 90% agreed which perhaps reflects that, despite all of the rapid changes over the past decade, the skills and expertise of the QS are still in great demand.

### **Information Technology**

#### **4. The impact of IT on the construction industry will be minimal in the next 5 years**

The interesting result here was the decline in the 2003 survey of respondents who strongly disagreed with this proposition. In 1995 13% strongly disagreed but in 1998, 1999 and 2001 approximately 40% strongly disagreed. However, in 2003 only 19% strongly disagreed which may suggest that many practitioners feel that the effect of IT developments in the short term will not be as great as might be expected.

#### **5. The impact of IT on the construction industry will be minimal in the next 10 years**

A similar pattern of responses was found with this question. In 1995 only 24% strongly disagreed with this but 1998-2001 saw approximately 50-60% strongly disagree. By 2003 this figure went back down to 27%.

#### **6. Further advances in computing and IT generally will see the end of the technical QS measurer**

The responses to this question add further credence to the supposition that many in the profession do not see the impact of IT as being as great as first envisaged. In 1995 45% disagreed and in 1998-2001 approximately 60% disagreed. In 2003 this had increased to 74%. This clearly suggests that the majority of the profession believe that the problems (both current and future) with CAD generated quantities are so great that physical measurement will always be necessary at least in part.

#### **7. IT advances will lead to fewer but more highly skilled QSs**

Opinion was relatively divided on this matter in each of the surveys. The utilization of appropriate IT developments will increasingly enable quantity surveyors to provide more sophisticated professional services as many of the traditional QS tasks become automated. However, questions 1 and 3 showed that most respondents were very optimistic about the future demand for quantity surveyors. These factors may be the underlying reasons for the division of opinion.

## **8. CAD networking facilities and knowledge will be essential for the QS in 5 years time**

Despite the survey findings of a low level of usage of CAD software, approximately 60-70% of respondents in each of the surveys agreed that CAD networking facilities and knowledge will be essential in 5 years time. It is clear however that nowhere near 60-70% of respondents are doing something about it. As shown earlier, the 2003 survey showed that only 28% of respondents had CAD software. Additionally, only 10% used CAD often or daily for measurement.

## **9. The QS profession should be actively involved in utilising, developing and promoting the use of CAD automated quantities**

Approximately 65-75% of respondents in each of the surveys agreed that the profession should be actively involved in CAD development. However, with only 10% of firms in the 2003 survey using CAD regularly for measurement, it is clear that few firms are actually doing something. Nonetheless the author is aware of some firms who are very actively involved in this area and perhaps will provide the catalyst for other firms to follow suit.

## **10. Only larger practices have the resources to take advantage of IT**

This proposition sought to determine whether smaller firms were at a disadvantage in terms of IT development. However, approximately 50-60% of respondents disagreed with this with approximately 10-15% unsure.

## **11. Greater use of IT will enable the QS profession to provide better service to clients**

Approximately 75-85% of respondents in each of the surveys agreed with this. Nevertheless, the survey results show that many firms are not embracing many IT capabilities that might enable them to provide better services.

## **12. The QS is well placed to take advantage of the changes in the construction industry which will flow from the increased use of IT**

Once again fairly consistent responses were received to this question in each of the surveys with approximately 65-75% agreeing. Given the low level of CAD usage indicated by the respondents, this view may be considered to be overly optimistic. The QS does have tremendous opportunities to be at the center of electronic information flow and management on projects but the survey results suggest that much more needs to be done if the profession is to embrace these opportunities. Whilst some firms are very progressive and active in this area, the profession is largely taking a reactive rather than proactive approach

# **4 FUTURE DIRECTIONS**

The last section of the survey asked firms to indicate what they thought the major threats to the profession would be over the next five years and what directions their firm was planning to take to be in a position of strength over the same time frame. The following is a summary of the main comments from the 2003 survey.

## **4.1 Major Threats**

### **Fee Competition**

Fee cutting and bidding amongst firms is seen as the major threat facing the profession by the majority of respondents. Changes to Australian trade practices legislation in the mid 1980s resulted in professional associations being unable to compel firms to adhere to published fee scales. This was classified as anti-competitive under the new legislation and enabled firms to undercut each other to procure work. This was followed by a major recession in the economy from approximately 1990 to 1994 where firms became desperate for work and were prepared to reduce their fees to often unsustainable levels. This was not peculiar to the quantity surveying profession and had a big impact on all consultancy practices in the industry. The hangover from this period remains as clients became used to paying lower fees. The design professions were particularly affected and this is reflected in the decline in the quality of documentation that respondents have identified in each of the surveys conducted. This has prompted firms to diversify and specialize to gain competitive advantage. From the IT perspective, many firms state that squeezed margins have prevented them from investing in IT research and development.

### **Professional Indemnity Insurance**

Australia has one of the highest rates of litigation per capita in the world and in an industry such as construction it is not surprising that the level of legal action is rising rapidly. Combined with world events in recent years the whole insurance market in Australia is in upheaval. This has led to significant rises in Professional Indemnity Insurance premiums throughout the industry and quantity surveyors have not been spared. Despite being a relatively low risk compared to other professions in the industry, insurance premiums have increased anywhere from 100% to 800% for QS firms in the last few years. The quality and comprehensiveness of this insurance has at the same time declined. The number of insurers in this market has reduced from about ten to three or four.

### **CAD**

The development of CAD and automatically generated quantities is seen by many firms as a major threat particularly in terms of the technical role of the quantity surveyor. However, the more enlightened firms believe that the greatest threat actually lies in not embracing CAD and CAD measurement and evolving with and being integrally involved in its development. The survey results clearly indicate that the vast majority of firms are clinging to traditional paper based measurement although the latest results do offer a glimmer of hope. It should also be remembered that not all firms responded to the surveys and the author is aware of a number of firms that are now utilizing this technology in a large way.

### **Conservatism/Inability to Change**

Whilst the construction industry is generally conservative by nature, the survey results indicate that the quantity surveying profession is perhaps more conservative than most in terms of IT utilization. Many firms felt that the inability to change and re-engineer processes to take full advantage of technological advances was dragging the profession down. Some felt that directors of many firms lacked motivation to embark down this path due to a focus on short-term profits. Some respondents felt that this was particularly the case with some directors who were nearing retirement and were not prepared to take the plunge into IT development that would have longer term benefits. Some respondents felt that too many firms focused on the traditional technical role of the quantity surveyor and were not prepared or capable of raising their services to a higher and more professional value-adding level.

### **Other Professions**

Firms clearly recognize the fact that project cost management is not the exclusive domain of the quantity surveying profession and that there are a number of other professionals carrying out this service and many others with the potential to do so. Project management and large accountancy firms were seen as the main threats. In fact, one respondent felt that the prospect of a large quantity surveying firm joining forces with a large international accountancy firm was not far away. The packaging of services under a "one-stop shop" approach and more "in-house" service provision by larger firms was also identified by many respondents. Perhaps the greatest threat in this respect lies with professionals more amenable to utilizing IT capabilities.

### **Poor Marketing**

Being a relatively obscure profession in Australia, effective marketing is perhaps even more important than is the case with other professions. However, many firms felt that the profession as a whole was poorly marketed and that the piece-meal approaches adopted by individual firms were of no real benefit to the profession as a whole. A clear message coming though from the comments was that smaller firms felt that they needed more support from the Australian Institute of Quantity Surveying in marketing their services.

### **Quality of Graduates**

Some respondents were dissatisfied with the quality of graduates from university courses particularly in terms of core skills in measurement and construction knowledge. Additionally, some firms have found that graduates are not interested in the technical measurement role. In the words of one director of a major QS firm, "they all want to be project managers". Some respondents felt that core competencies and skills in the profession were declining generally. The extent of core quantity surveying curriculum in some university courses has declined in recent years as the pressures of major federal government changes to higher education impact on the manner in which some courses are delivered. Many courses also provide more generic and broad content to reflect the changing nature of the profession, particularly with respect to the rapid increase in the last decade in the type and scope of services provided. Another factor impinging on this area is the inability of many firms to provide "on-the-job" training to the levels experienced in years gone by. This has been largely brought about by the intense fee competition amongst firms and the concomitant squeeze on profit levels.

### **Lack of Interest from School Leavers**

Perhaps the greatest problem facing the profession in Australia is the declining level of interest shown by school leavers in the profession. Of those that are interested many are not interested in the very technical aspects of the profession such as measurement preferring to be involved in some of the more "glamorous" services that firms now provide. This is despite the fact that measurement skills underpin most if not all services provided by quantity surveyors. A traditional path for quantity surveyors in Australia has been to undertake a university course part-time whilst employed as a cadet at a quantity surveying firm. However, the number of students studying part-time in this capacity has reduced significantly in the past decade. An example of the problem can be demonstrated by a major firm in Australia who in the past would employ 10-12 cadets at any one point in time. Towards the end of last year this had reduced to just one cadet with the firm experiencing particular problems in attracting first year cadets from school. Other firms have experienced similar problems. The marketing problems outlined earlier are clearly a factor here and the AIQS will introduce a concerted marketing campaign aimed at school leavers in 2004.

## **5 IT STRATEGIES FOR QUANTITY SURVEYING FIRMS**

The following strategies flow from the findings of the research underpinning this paper. These strategies are not intended to be exhaustive and do not provide detailed examples of how these strategies might be achieved. Rather they are aimed at providing "food for thought" for Quantity Surveying practitioners to assist in determining approaches that best suit their particular firm and circumstances.

### **5.1 Maintain and Develop Professional Expertise in Core Competencies**

First and foremost firms need to ensure that their quantity surveyors have sufficient professional expertise in the core competencies and skills of the profession and continue to develop this expertise. Adequate "on-the-job" training should be in place for inexperienced employees and to also complement tertiary education. Too much focus on the use of IT may lead to the deterioration of fundamental professional skills that will increasingly become necessary as technological advances continue to automate technical activities thus requiring practitioners to operate at a more highly skilled and professional level. The danger of inexperienced or incompetent staff utilising sophisticated but "user friendly" software is obvious. Nevertheless, practitioners need to be far more adaptable and willing to change their standard work practices than in the past.

### **5.2 Learn, Utilise and Evolve with CAD**

There is no question, in the author's mind, that Quantity Surveying firms, and indeed all construction professionals, need to utilise and gain expertise in CAD sooner rather than later. CAD systems will be at the centre of future information management system and virtual projects and, consequently, professionals will need CAD capabilities and expertise just to be a player. Whilst 2D CAD currently predominates in the industry, the industry is moving towards 3D object oriented CAD and firms looking to the future will need to embrace this CAD format. 3D CAD also offers far more possible uses for the Quantity Surveyor. The most obvious benefit for Quantity Surveyors lies in the use of automated quantities with enormous productivity gains already possible. The preparation of quantities in the traditional paper-based mode is tedious and time-consuming and typically accounts for approximately 80% of the total time spent in preparing tenders, budgetary estimates and cost plans. Rather than being a threat, automated quantities actually have the potential to provide tremendous opportunities for the profession. Removing much of the technical drudgery, albeit the traditional "bread and butter", of the profession will provide practitioners with more time to focus on developing sophisticated cost management systems and a wider range of value-added services. This will provide the potential for firms to be able to provide a wider range of value-added services on a larger number of projects. The important thing is not who or what prepares the quantities (as long as they are accurate) but more what is done with the quantities. Many practitioners are skeptical, with good reason, about the automated quantities capabilities of CAD systems. There are still many problems with utilizing commercial "off the shelf" CAD software to generate quantities. However, these problems are being overcome and most programs, at the very least, are capable of generating basic lineal, area and volume measurements with most now able to produce quite detailed item quantities. Hence, it is possible now for practitioners to extract a large proportion of a project's quantities from automatically generated quantities in spreadsheet formats which can be linked directly to most estimating/measurement programs.

### **5.3 Invest in Necessary Technology**

Many firms cite cost and the time required to learn CAD and other software/technology as the main inhibitors to investment in the IT area. However, the greatest cost for employers usually lies in their actual workforce. The average annual salary of a qualified Quantity Surveyor in Australia is approximately \$70,000 per annum which equates to approximately \$90,000 when salary loadings are taken into account. CAD software and the necessary hardware can be purchased for \$6000-\$10,000 for one licence with this figure decreasing for additional licences. Whilst time and money must be spent learning how to use these systems, the technology costs are actually relatively low when compared to salary costs. When one considers the potential productivity improvements the cost of investment in CAD may not only be negligible but may not be a cost at all in the long term due to the enhanced profitability of the firm's operations. Looking at the broader picture, CAD capabilities and expertise will more than likely result in increased business opportunities.

### **5.4 Diversification/Specialization of Services**

The survey results outlined earlier indicate that Quantity Surveying firms are diversifying their scope of services to better meet industry/client demands and to secure their long term future. This diversification is seen by many as critical to the future of the profession as a whole. The survey results show that the proportion of income obtained from non-traditional and non-building work has risen markedly in the past 9 years. Facility Management and Ecological Sustainable Development (ESD) represent two huge new growth areas for the profession in terms of new services. The financial management skills of the Quantity Surveyor can be applied in many different areas both within and outside the property industry and many firms are beginning to realize the opportunities that this creates.

### **5.5 Multi-Skilled Team**

Such diversification and specialisation will require firms to have employees (or consultants) with a very broad range of skills, expertise and professional training. Diversification represents considerable risk for firms without the necessary skill and expertise to carry out the new services. Accordingly, many Quantity Surveying firms are now employing construction professionals from a variety of "non-QS" backgrounds to augment their services. A multi-skilled and qualified workforce will also provide firms with greater opportunities to expand their scope of services.

### **5.6 Continuing Professional Development**

Continuing Professional Development (CPD) is a requirement for members of most professional associations and the construction industry is no exception. Rather than relying solely on their employers, practitioners need to also take responsibility for their own professional development. IT is a classic area for CPD due to the regularity and speed of change and such personal development can significantly enhance an individual's value to a firm.

## **6. CONCLUSION**

Continuing industry change and technological developments will present the profession with many challenges, threats and opportunities. Whatever direction the profession takes, the financial management expertise of the Quantity Surveyor will remain in demand. The uncertainty really lies in what capacity and for whom the Quantity Surveyor will be working and whether the individual independent Quantity Surveying firm will continue to exist in its current form. It is clear that computing and information management expertise will be a necessary component in the tool kit of the future Quantity Surveyor. Diversification and specialization appears set to continue and expand as quantity surveyors continue to explore new markets and niches for competitive advantage.

Despite speculation about the future of the profession, the survey responses consistently demonstrated optimism for the future by quantity surveying firms. At this point in time quantity surveyors are in strong demand and the Australian government has identified a shortage of quantity surveying professionals throughout the country. Many firms are struggling to employ quality cadets, graduates and experienced personnel to enable them to meet their demands. Whilst this may simply be a result of the sustained boom in the industry over the past five years, it is clear that the need for effective financial management of projects will always be necessary. It is to be hoped that quantity surveyors will continue to be a key player in this area.

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