

AUTOMATED QUANTITIES TECHNOLOGY – CHALLENGES FACING THE AUSTRALIAN QUANTITY SUR- VEYING PROFESSION

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ABSTRACT

This paper examines the challenges facing the Australian Quantity Surveying profession in the use of automated quantities technology. The paper is based on research by a team from the University of Technology Sydney involving a series of six national surveys of the profession spanning 1995 to 2005 and interviews conducted in 2005/06 by the author with a range of Quantity Surveying practices in Australia. The survey results since 1995 show that the uptake of automated quantities systems by firms has been surprisingly slow but that this has begun to change in the past two years. The paper will examine the current systems being used by firms and will highlight case examples of two firms who have developed their automated quantities systems over many years to the point where they are achieving significant competitive advantage and have achieved dramatic improvements in productivity, efficiency and providing value to their clients. These case examples will demonstrate the benefits that can be achieved from the effective utilisation of automated quantities technology and the strategies that have been used for effective implementation.

Keywords: automated quantities, quantity surveying, cost management

INTRODUCTION

Rapid advances in Computer-Aided Design (CAD) and Automated Quantities technologies are likely to lead to the demise of the technical measurer working with a scale rule and “rolls of drawings” in the not too distant future. Dramatic improvements in measurement productivity and efficiency can now be achieved through these electronic tools. 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. Firms in all sectors of the construction industry need to utilise Information Technology to work smarter and gain competitive advantage. The use of Automated Quantities provides arguably the greatest scope for this to be achieved by professional quantity surveying firms.

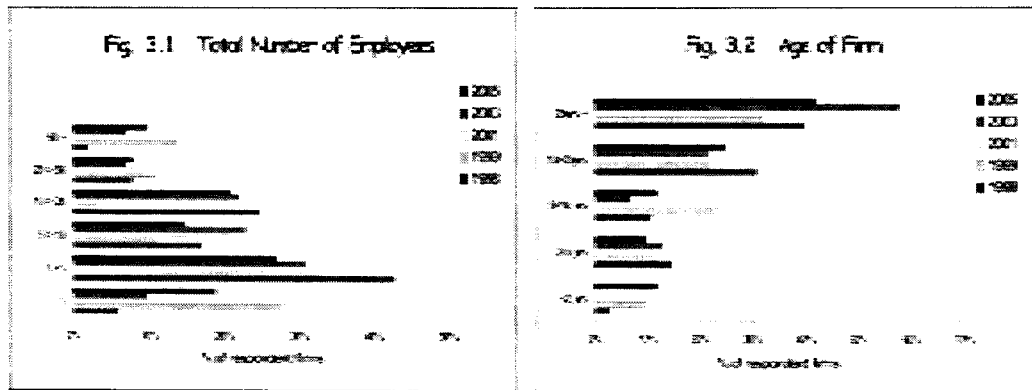
This paper examines the manner in which the Quantity Surveying profession in Australia has evolved with the use of automated quantities technology and the challenges that lie ahead.

THE AUSTRALIAN QUANTITY SURVEYING PROFESSION

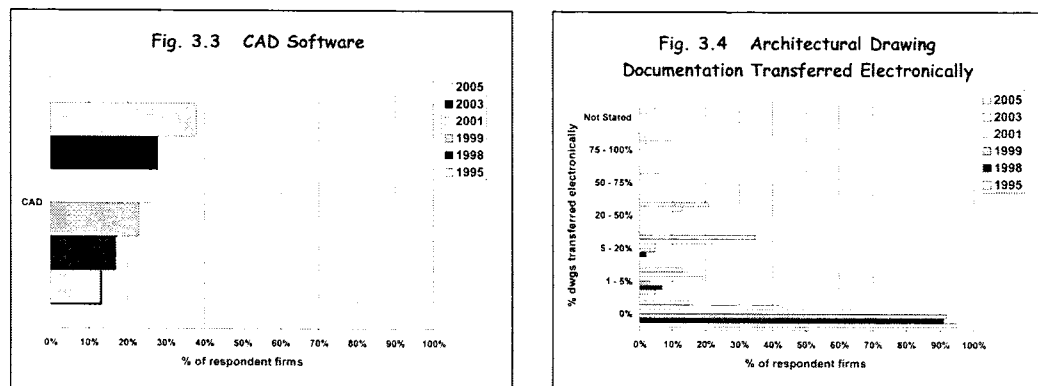
Quantity Surveyors in Australia provide financial management services for projects predominantly in the construction/property industry. Traditional services include the preparation of Bills of Quantities, Builders’ Quantities, Cost Planning/Budgeting, Estimating and Contract Administration. The past 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.

AUSTRALIAN QUANTITY SURVEYING PRACTICE SURVEY RESULTS

The author has been involved in extensive research of the quantity surveying profession since 1995. He has led a research team from the University of Technology Sydney in conducting six nationwide surveys of the profession from 1995 to 2005 in collaboration with the Australian Institute of Quantity Surveyors (AIQS). One aspect of these surveys was to evaluate how the profession has used and evolved with CAD and automated quantities over this time. These results form the foundation for this paper. The surveys were carried out approximately every two years in 1995, 1998, 1999, 2001, 2003 and 2005. The response rates generally ranged from 40% to 60% of firms with the actual responses for each year as follows: 1995 - 77 firms, 1998 - 65 firms, 1999 - 38 firms, 2001 - 42 firms, 2003 - 60 firms and 2005 - 52 firms. The respondent profiles are shown in Figures 3.1 and 3.2.



Figures 3.3 and 3.4 show that the level of firms with some form of CAD software and the proportion of architectural drawings received electronically. The purpose of these questions was to gauge the evolution of the profession with CAD technology. The statistics in relation to CAD software are alarming. In 1995 only 13% of respondents had CAD facilities. Over the ensuing 11 years this percentage has slowly increased to 38% which at least indicates that 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.

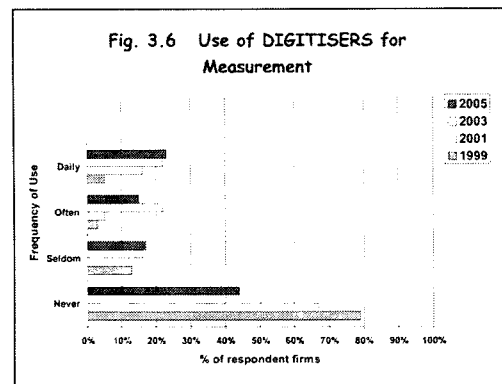
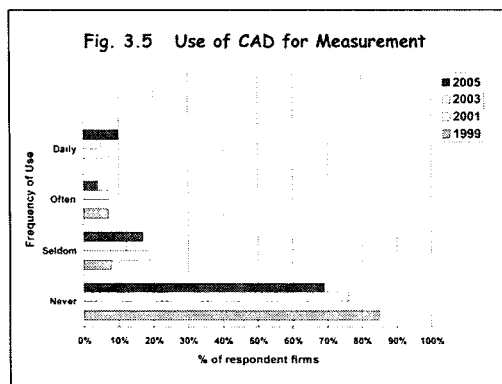


Improvements in the electronic transfer of drawings are occurring. The 1995-1999 surveys showed that less than 10% of firms transferred or received architectural drawings electronically but by 2005 this figure had risen to 85%. Improvements were also evident with engineers' and other consultants' drawings. Figure 3.4 shows that the percentage of firms that do not transfer or receive any architectural drawing documentation in an electronic form has reduced from over 90% in the 1995-1999 period to 15% by 2005. The 2005 results generally show a marked increase from previous years. Some firms are clearly developing their capabilities in this area - the latest results show that approximately 37% receive/transfer over 20% of their drawing documentation electronically compared to 0% in the 1995-99 period. Five of the respondent firms in the 2005 survey receive close to 100% of their architectural drawings in electronic form. These firms really stand out from the pack.

However, the level of electronic transfer of project documentation still remains very limited when looking at all firms collectively. Clearly there are mainstream technological capabilities that many firms are simply not keeping pace with. Whilst this may suffice for their operations at this point in time, this neglect of technological development may have serious consequences in the not too distant future.

The 1999 survey introduced a question relating to the use of electronic tools to aid the measurement process and these results provide a base foundation for this paper. The results in Figures 3.5 and 3.6 show that the majority of firms still cling to traditional paper-based measurement with the use of electronic measurement tools still quite uncommon.

Whilst discussions by the author in 2006 with many quantity surveying firms suggests that a number of firms have been taking steps to implement automatic quantities technology into their business practices since the 2005 survey, it appears that many of these firms are trialling products but are having difficulty in successfully implementing them. It appears that some of the greatest inhibitors are the necessary cultural changes with staff and the re-engineering of work practices to optimise the use of this technology. It is evident that these processes take time and the immediate “fix” is simply not possible. Additionally, the technology is advancing rapidly and it can be difficult for firms to identify the system that will best suit their purposes long term.



The majority of respondent firms remain averse to using CAD automated quantities – in 1999 85% were not using CAD for this purpose and by 2005 this had only improved slightly to approximately 69%. In other words this indicates that approximately 30% of the profession still do not use CAD at all for measurement. Given the low proportion of firms with CAD facilities in the first place, these results are probably not surprising. The use of digitisers, although already deemed redundant by many in the industry, has increased but the majority of firms do not use even this basic measurement tool. Nevertheless some firms have seen the potential with the 2005 results showing that approximately 14% of respondents use CAD often or daily for measurement. These firms and others like them who did not respond to the survey, stand out as pioneers in this area.

CASE STUDIES OF QS FIRMS

These survey results have shown that the use of automated quantities systems by quantity surveying firms is limited and, in many cases, non-existent. This presents huge challenges for the profession. However, there are a growing number of firms who have successfully embraced this technology and the profession has much to learn from their experiences. The following two sections examine the case example history of two quantity surveying firms who have successfully implemented Automated Quantities technology into their business practices. The lessons learned by these firms, the approaches/strategies taken and the benefits obtained will prove of great assistance to firms interested in going down this path as well as the profession generally. The examples comprise a medium sized firm, Mitchell Brandtman, and a large firm, Turner Townsend Rawlinsons.¹

CASE STUDY 1 – MITCHELL BRANDTMAN, BRISBANE, QUEENSLAND

Mitchell Brandtman is a medium sized Quantity Surveying firm that was established in 1970. The main office is in Brisbane, Queensland with branches in Cairns, Sydney and Perth. This case example will be based on the Brisbane office which comprises approximately 35 staff with 27 quantity surveyors. The firm is well known for its innovative approaches particularly with respect to the use of IT. The information in this section has been provided by the firm's Managing Director, Mr. David Mitchell.

The firm began its journey in IT development in 1981 with the objective of making their business practices more efficient and productive. This involved a range of initiatives including the electronic development of systems and databases and the gradual re-engineering of their works practices to suit.

Mitchell Brandtman first began utilising CAD systems in 1998. This began with the exploration and analysis of CAD systems generally and what they had to offer the firm. This initial research and development was conducted by Mr. Mitchell and two staff members. A major first step was to develop their IT systems so that they could receive drawings and be able to plot them electronically and therefore manipulate the drawings in an electronic mode to suit the firm's purposes. This enabled the receipt and transfer of documents/drawings much more quickly. Being able to work from drawings that were able to be plotted was a big step forward.

In terms of electronic measurement, the firm began experimenting with standard "off-the-shelf" CAD systems such as AutoCAD. Their capabilities and constraints were explored and identified and the firm began to use these capabilities where possible for measurement. In 1999 it was decided that if the firm was to effectively move into the IT world the whole office needed to understand CAD technology, systems and software. All staff members undertook CAD training programs that were organised through outsourcing. In-house CAD training was not seen to be economical or effective for the firm.

During that period the firm embarked on an ambitious strategy to turn all information into electronic mode – the virtual office. This applied to both historical and current project data and information. It was recognised that if cultural change was to be achieved with staff it had to be backed up with the necessary technology and IT systems. In effect, re-engineering their systems to suit their mode of operation. All records in the office dating back 30 years were converted into electronic form and were made available for access by all staff. Emphasis is placed on re-using information from previous projects rather than starting from scratch and this database provides the foundation for this. Additionally, staff can search the database for information/knowledge gained from previous projects. For example, if an issue with a particular contract clause arises, staff can search the database for information on previous projects relating to that clause.

The cultural change was achieved relatively easily with the firm's staff members. This is seen by many firms as the biggest inhibitor to major change – the conservatism and inability to adapt by staff members. Mr. Mitchell attributes this to the firm's history of innovation, the employment of staff that had the necessary attributes and the young age of staff in the office. When the electronic changes began in 1999, all of the staff, except two principals, were under the age of 35 with the majority in their 20s. This factor, combined with the firm's targeting of bright students/graduates, proved extremely valuable during this transitory period.

The firm began to first develop meaningful electronic quantities using a relatively cheap program called CadLite. They then progressed to the 2000 version of AutoCAD which had better measurement tools than earlier versions. From there they used the BTOS (Buildsoft Take Off System) that had been developed within the Buildsoft estimating program. Up to this point, the firm relied on creating electronic quantities in a log file and then copying this data into their Buildsoft estimating system or a spreadsheet application. The next step was to explore systems that would enable quantities to be exported automatically into their estimating systems.

In 2003/04 the firm adopted the CostX program developed by Exactal (Exactal 2006). This program enabled them to work in a combined CAD/estimating environment. Mr. Mitchell found that this system best suited their firm's purposes and the firm is now entrenched in its use. He described some of the main benefits as follows: easy to use, short training period for new users, has the "look" of any Microsoft program (adding to familiarity), can work totally within the CAD drawing and produce quantities and estimates, automatic links between drawings and cost planning databases, when drawings are changed the revisions are automatically accounted for in the quantities and estimate (thus eliminating the previously time consuming task of remeasuring and pricing work

when changes are made), and the immediacy of these results where clients can quickly be informed of the cost consequences of proposed changes.

Research has shown that Australians now have second longest average working hours of countries comprising the OECD and current trends indicate that they will soon top this list.² The Australian Council of Trade Unions (ACTU) found the following:

“ACTU research into workplace issues has found that long hours and the increasing intensification of work is the overwhelming primary concern of workers. For much of the last century Australia led the world in fair working time. But in 1980 Australia started to buck the international trend and hours began to grow. Currently, Australia has the second longest working hours in the OECD. On current trends we will soon have the longest. It is a sad irony that Australia now has one of the worst records in the world. It is time to once again civilise working time” (ACTU 2005, p.1).

Professionals in the Australian construction industry are a prime example of this trend with long hours in the realm of 50-60 hours per week or even more considered quite normal. Added to this problem is the intense pressure that these professionals work under particularly in terms of meeting deadlines. For Quantity Surveyors, the time consuming task of physical measurement (and re-measurement as drawings change) adds to these pressures. Fee competition amongst firms still remains an issue for the profession and has seen profit margins squeezed for many firms thus exacerbating the problem.

Mitchell Brandtman recognised this problem many years ago. The company places tremendous importance on staff enjoying work and having time for an “outside life”. A real aim was to use the productivity and efficiency gains through IT to enable staff to enjoy a more balanced life. Whilst deadlines still need to be met, the focus is on a 37 ½ working hour week for all staff. Emphasis is placed on productivity, efficiency and a balanced working life.

Productivity improvements are just not restricted to CAD applications. The firm continually looks at ways of making their work practices faster and more efficient. An example is the use of the Adobe Acrobat Professional program where it is possible to convert a PDF “image” of a table of figures automatically into a “live” table in a spreadsheet application. This proves useful when, for example, they receive a “hard copy” schedule of finishes and fittings – it can quickly be converted into a live spreadsheet table.

The firm also does a lot of work with informing/educating staff about the high level use of spreadsheet applications. Examples include the use of pivot tables within a spreadsheet application to quickly re-arrange tables/figures to suit. This information and knowledge sharing amongst staff members has now become an integral part of their business practice.

Mitchell Brandtman’s services are predominantly estimating and cost planning. Whilst they have not done any detailed research into specific time saving benefits, Mr. Mitchell estimates that they can now prepare a cost plan in one-tenth of the time it would normally take using traditional methods. The major benefit is that they can spend far more time concentrating on the pricing and the development of cost data bases rather than spending most of their time on measurement. Mr. Mitchell explains that in a traditional QS office, a lot of the time pressures and stress come from the time consuming nature of physical measurement and the frustration of having to make changes to those measurements as drawings are revised and deadlines get squeezed tighter and tighter. The use of CostX has had a major effect on reducing these time pressures. The program’s ability to automatically change quantities and the cost plan if drawings are revised has been particularly beneficial.

Rather than adopt a “closed shop” attitude to the firm’s IT developments and innovative approaches, the firm is very open in discussing and raising awareness of their IT practices to the wider QS community. Mr. Mitchell and his staff conduct a range of industry seminars and other forums for the profession and the industry generally.

Another valuable contribution is made through their involvement in the education of quantity surveying students at university level. Mr. Mitchell and staff members have been involved in Quantity Surveying IT and CAD education at the Queensland University of Technology (QUT) for the past five years. Most of this time is donated to the university free of charge. The courses are extremely popular with the students and enables the QS course to be at the leading edge of QS related industry technology.

David Mitchell sees this as a key contribution to the future of the profession as it is these young quantity surveyors who will have an important role in picking up and evolving with this technology. The firm itself gets a lot of direct benefits from the classes. As everyone in their office has obtained expertise in the use of the technology and CAD applications, training from scratch is only required for new staff. Being able to conduct classes with a whole group of students with little or no training in the area enables the firm to trial things with the students, see how they react and adapt to these different approaches. Mr. Mitchell has found that he learns a lot from educating students with no background knowledge – it provides an element of randomness that can't be found in their office. Many developments in their IT systems have come from what they have learnt from these students.

Mitchell Brandtman have a young average age of staff in the office and the firm is widely recognised for its innovative and “staff-friendly” practices. This has resulted in tremendous interest from student/graduate quantity surveyors and has enabled the firm to employ some of the brightest young Quantity Surveyors on the market. Underpinning any professional services business is the quality of staff and this ability to attract bright young staff is seen as a major competitive advantage for the firm. This is particularly important in Australia as there is currently a chronic shortage of good quantity surveyors in the market. The firm places great emphasis on staff training and see this as very important for the long term development of the organisation.

Anecdotal evidence suggests that the capacity for QS firms in Australia to provide on the job training has been greatly diminished over the past decade due to squeezes on profit margins and other industry pressures. The productivity benefits obtained by their IT systems have enabled Mitchell Brandtman to devote the necessary time for staff development and training. Staff are encouraged to ask questions, help each other, share ideas and essentially work together closely as a team.

Whilst these IT developments are the hallmark of the organisation, Mr. Mitchell contends that all of this is useless, and in many cases very dangerous, if staff do not have sufficient expertise in the core competencies of the QS profession. Areas such as developing construction knowledge, site experience, documentation understanding, measurement knowledge and other key competencies are seen as extremely important.

Case Study 2 – Turner Townsend Rawlinsons

Turner & Townsend Rawlinsons are one of the largest Quantity Surveying firms in Australia. In 2005 Turner & Townsend, an international construction and management consultancy firm, merged with Rawlinsons, one of the oldest QS firms in Australia. Rawlinsons are also well known for publishing the Australian Construction Cost Handbook . The firm employs more than 120 people across eight Australian offices (Sydney, Brisbane, Melbourne, Canberra, Cairns, the Gold Coast, Adelaide and Perth). The information in this section has been provided by the firm's Managing Director, Mr. Harry Carrick.

Turner & Townsend Rawlinsons (TTR) is widely recognised as an industry leader in IT and CAD development and innovative and progressive business practices. In terms of electronic measurement, the firm has been instrumental in the development of the CostX system (Exactal 2006). Mr. Carrick has been a driving force in this development since the 1990s. The catalyst for Mr. Carrick's endeavours was his frustration at the QS profession's generally apathetic attitudes to the utilisation of CAD capabilities for electronic measurement. He saw this as an opportunity to explore not only for his firm but also for the profession generally and the wider industry.

After examining and trialling a range of applications, Mr. Carrick set about developing a system that suited his firm's business practices and engaged CAD programmers and other IT experts to assist with this process. This eventually led to the development of the CostX program and a separate company called Exactal was formed to continue this development. TTR does not have a financial interest in this company but continues to work with them in ongoing development work.

The firm now utilises CostX for the preparation of cost plans, estimates and Bills of Quantities. When utilising CostX all measurement work is performed electronically. A scale rule is now redundant. This even applies to Bill of Quantities production where difficulties have existed in the past in terms of the detail required. Mr. Carrick cites the example of the Hydraulics Trade. Hydraulics can traditionally take up to 20% of total BQ production time yet using CostX the complete trade can be measured electronically in a fraction of the time using traditional measurement approaches.

The firm now has over 60 staff members who are proficient users of the CostX program. In the early stages, the use of CostX was restricted to cost plans and estimates but as staff began to experience the significant time savings with this tool they began to demand that they also use it for BQ production. Once gaining expertise in its use, staff were very reluctant to turn back to traditional approaches. This led to further developments with the program that enabled full electronic BQ measurement. Worker satisfaction in the office soared and the firm began to attract interest from quantity surveyors seeking employment, particularly young student/graduate quantity surveyors. As a result, the firm have been able to form a team of some of the brightest and innovative quantity surveyors in the country.

Mr. Carrick sees this as the greatest benefit of all. He states that it doesn't matter how good your systems are, the crucial component is good quality staff. In fact, he has found that it is easier to secure good quality clients than it is to secure good quality staff. CostX and other business practices have given them a competitive edge over many rivals for the limited number of good quantity surveyors available in the market. This has had a huge impact on the success of their business.

The next major benefit is with the response times for their clients and other project consultants. The firm's most valuable services lie in the early feasibility and cost planning stages of a project. In these early stages, the firm regularly has meetings with the client and project team where the cost plan is projected on to two screens, one for the drawings and the other for the cost plan/budget. They find this an extremely popular and effective approach with their clients. This is particularly the case with design change proposals. The ability of the program to quickly calculate the effect of design changes/revisions has changed the landscape in which the firm deals with their clients and raises their services to a much higher professional level. The potential impact of changes can be immediately visualised on the screens in front of the whole team. An added advantage is that the client and project designers are forced into taking ownership of the cost plan/budget and responsibility for design stages.

In the past, using traditional approaches, it would be very time consuming to measure and cost design change proposals and changes to the project budget were often viewed as the "QS's fault". In this forum, it becomes very clear what the change is, who is responsible for the change and what the end impact on the budget will be. This dynamic real-time analysis is extremely powerful and provides enormous assistance for designers and clients in ensuring their projects are within budget. The program enables far more effective communication with the client in the design development as they can clearly see the design changes and the cost effect simultaneously. This is really "designing to a cost" and really places the QS in the proactive driver's seat rather than often being a "reactive passenger" in the back seat.

Clients continue to be impressed. Mr. Carrick cites a recent example where a project client saw the firm's cost plan presentation and was so impressed that he commissioned them to use the presentation technique on another of his projects. This involved using the CostX program to highlight areas of the building (accommodation, circulation, rental areas and the like) rather than working from traditional schedules. The ability to examine the functionality of the room layouts and costs in a visual form (and the effect of changes) was very beneficial.

Response times for clients have been slashed. Mr. Carrick cites examples of staff returning to the office at say 4pm from a project meeting where design changes have been proposed. In the past it may have taken a number of days before the QS could respond due to the need to remeasure quantities and re-price the works. Now it is not uncommon for that staff member to send through their report on the changes within an hour by 5pm before they leave for the day.

As with Mitchell Brandtman, this has reduced the need for staff to work long hours to meet deadlines. This is another major bonus in terms of worker satisfaction. These are real examples of implementing smart systems to not only improve the bottom line of the business but also to create a satisfying workplace environment and allowing staff to have appropriate time for an "outside life".

The ability to automatically re-calculate the effect of drawing changes on measurements has proved of enormous benefit in BQ production. This is the typical problem that QS firms face using traditional approaches – amendments during the BQ preparation period. This leads to excessive working hours as work is required to be remeasured as deadlines need to be met and increases the frustration and stress levels of staff. These remeasurements also typically place tremendous strains on the firm's profit levels for the BQ production, sometimes to the point where firms actually lose money. Using CostX, this problem is greatly reduced.

Turner Townsend Rawlinsons have eight offices around the country. Their IT infrastructure and the use of programs like CostX have enabled them to work in a virtual seamless office throughout Australia. Staff from different offices can be working on the same project as location becomes irrelevant. This enables the firm to easily shift work around offices as workloads change from one city to the next.

Another development that the firm is working on is a CostWeb real time cost library model. This involves the pricing of current projects in trade format and converting them into an elemental form thus facilitating even more sophisticated cost planning utilising real time current market cost data. This is another giant step forward. The next development in Version 2.2 of CostX is the seamless links with the Autodesk® Revit® program. The Revit® program is one of the most widely used programs around the world for building information modelling and will enable CostX to be utilised in a 3D object oriented design environment.

CONCLUSION

Cost management in the Australian construction industry is not the exclusive preserve of the quantity surveying profession. Many project managers, engineers, contractors and other professionals also provide cost management services within the industry and those with business practices that embrace automated quantities technology will prove to have significant advantages over quantity surveying firms without these capabilities. In some respects, the rapid improvements and developments within programs like CostX are perhaps too far ahead for many in the profession/industry who have yet to venture down the electronic measurement and estimating path. For these firms, fundamental shifts in their business practices are required and this all takes time to develop. However, the competitive advantages already being realised by firms such as Mitchell Brandtman and Turner Townsend Rawlinsons are likely to provide more of a catalyst for change in the profession than anything else. The longer firms delay their entry into the automated quantities world the further other firms with these capabilities will progress and add to their competitive advantage. The strategies taken by these firms to embrace these technological tools and adapt their business practices accordingly provide considerable inspiration and assistance for not only other quantity surveyor firms but for the profession generally in Australia. The challenge to embrace this technology is now on in earnest in Australia and it remains to be seen how the profession as a whole adapts.

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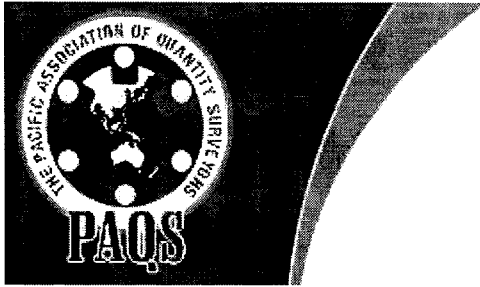
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The 11th PAQS Congress is to be held in Auckland New Zealand from 10 - 12 June 2007 at the Skycity Grand Hotel. Program and accommodation details can be found at <http://www.paqs2007nz.com> There will be PAQS Committee and Board meetings on 9 and 10 June prior to the opening of the Congress on the 11th. The PAQS Golf tournament will be held on Friday 8 June 07.

The 10th PAQS Congress was held in Singapore from 21-24 May 2006 at the Marina Mandarin Hotel and the Proceedings of the Congress are available for purchase from the SISV - see the contact details for the SISV on the Membership page. An excellent social and technical program ensured that the 170 delegates had a memorable event. About half the total number of delegates were from some 12 countries making this a truly international Congress. The PAQS Board meeting was held prior to the Congress and further progress was made in the PAQS research, international promotion and accreditation activities. PAQS interim accreditation was granted to the University of Technology Sydney.

The 9th PAQS Congress was held from 26-29 June in Dalian, China at the Shangri - la Hotel. This was the largest PAQS Congress ever held with over 450 delegates attending. The Congress hosts, the China Engineering Cost Association, excelled in providing an interesting program with speakers from around the world. The Proceedings (papers) from the Dalian PAQS Congress are available for purchase directly from the CECA. The Dalian coastal scenery and attractions proved to be even more beautiful and interesting than we had been shown in the previous Congress briefings by CECA.

The PAQS Annual Board meeting was held just prior to the Congress in Dalian and some significant decisions were made for the future growth of the PAQS, including the formation of a Research Committee and approval of the Education Committee's recommendation on accreditation of universities in the PAQS region.

The 8th PAQS Congress was successfully held in Cape Town South Africa in conjunction with the ICEC World Congress from 17 - 21 April 2004. Papers from the Congress are available for purchase from the ASAQS. All delegates and their partners enjoyed a thoroughly professional and entertaining program, plus the excellent hospitality of the South Africans. We congratulate them on a great Congress.

The 7th PAQS Congress which was held in Tokyo on 1-3 November 2003, was a great success. The warm hospitality of the BSIJ members was much appreciated by the 200 approx delegates. The PAQS Annual Board meeting was well attended and resulted in some significant decisions which are dealt with in other pages of this website. Proceedings from the 7th PAQS Congress are available in English from the BSIJ.

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