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THE QUANTITY SURVEYOR'S ROLE IN INNOVATION GENERATION, ADOPTION AND DIFFUSION IN THE AUSTRALIAN CONSTRUCTION INDUSTRY

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In 2004 the Building Research Innovation Technology and Environment (BRITE) Project conducted a survey on technological and organisational innovations in the Australian construction industry. This research uses the survey information to test the perception that there is a dichotomy between the self perceptions of quantity surveyors and the way that other stakeholders in the industry view the profession. A comparison is made of the survey responses given by quantity surveyors with those of the construction industry generally as well as with an identified group of high innovators in the industry. Quantity surveyors tend to innovate in the fields of data collection, management and monitoring processes which are perhaps not as visible to other members of the team as design innovations. Our research revealed that they widely believed innovation to have a positive effect on productivity but preferred informal measures of the value of such innovations. This is a somewhat surprising result as their core business is the collecting and measuring of information. To encourage improved innovation performance, quantity surveyors favoured increased training, more open attitudes and the removal of lowest cost tendering for quick profit. They specifically did not seek increased recognition or incentives as a way of improving performance. Generally they believed that it is design consultants who drive innovation in construction projects. Quantity surveyors perceived themselves to be supporters of innovation rather than blockers and saw themselves as contributors to a team but not usually as leaders of that team. Other industry groupings, however, did see the profession as potential blockers of innovation. Quantity surveying professionals need to be aware of the risk that other team members may see them more as "management's auditors" rather than as genuine team contributors.

Keywords: construction, culture, innovation, quantity surveying.

INTRODUCTION

The BRITE Project was established by the Australian Cooperative Research Centre for Construction Innovation to promote the incidence and quality of innovation in the Australian building and construction industry. The project seeks to redress industry scepticism about the benefits of innovation through demonstration and benchmarking activities. Case studies of successful innovations are reported on and this information is widely disseminated in the industry and the broader community. The case studies are intended to demonstrate best practice and contribute to the enhancement of

industry capabilities. In addition, in alternate years, surveys are conducted on the nature, incidence and variety of technological and organizational innovations. The survey data measures the innovation activity in the industry over time, in order to benchmark performance and facilitate appropriate public policy development. The BRITE Innovation Survey Report 2004 is available at <http://www.brite.crcci.info/publications/index.htm>. This paper will present comparative survey results for three groups: quantity surveyors, the whole industry and the group of respondents who were identified as high innovators. Such comparisons are useful in order to identify the unique perspective of quantity surveyors within the construction industry, as well as the ways in which it may be possible to improve innovation performance.

As noted by Page et al. (2004: 1) a focus on quantity surveying moves the centre of innovation research away from production and manufacture towards the knowledge-intensive delivery of professional services. Innovation within quantity surveying firms relies on the management of knowledge acquisition and the capturing of project-based learning for future use. It is not surprising, therefore that the quantity surveying firms surveyed for the BRITE Project regarded themselves as innovators rather than blockers of innovation. The innovations they reported responsibility for, however, tended to have less visibility for other project participants than for the quantity surveyors themselves. This may go some way towards explaining the difference in perception between quantity surveying firms' views of themselves and other industry participants' views of quantity surveyors. The indications are that the quantity surveying profession needs to be more proactive in promoting the technological and organisational innovations that are currently being developed.

SURVEY INFORMATION

The BRITE survey sample was drawn from 3,500 businesses in the construction sector in the states of New South Wales, Queensland and Victoria. One third of this population was sampled. 383 completed surveys were received for an acceptable overall response rate of 29%. Of these surveys 30 were from quantity surveyors for a satisfactory response rate of 28%. Information was collected on the respondent's perceptions of the determinants of innovation in the industry. Innovation was specifically defined to include both technological and organisational improvements. Incremental as well as radical or breakthrough changes were both regarded as innovations. Innovations were further classified as "new to the organisation", "new to the industry" and "new to the world". Respondents were classified as high, medium or low innovators according to an index compiled from the degree of novelty and profitability of their innovations, along with the number of advanced managerial practices adopted and the level of investment in research and development. Perceptions of the principle drivers and blockers to innovation were also the subject of questions in the survey.

"VISIBILITY" OF THE WORK OF QUANTITY SURVEYORS

One of the difficulties encountered when setting up a survey reporting on the frequency of innovation in construction, is that not all participants in the industry are equally aware of the role played by the other participants. Some areas of activity are innately more "visible" than others and therefore better understood. Design, for example, is a high profile activity in most construction projects. Design innovations are often the most conspicuous aspects of a project. They are frequently apparent to

all participants in the process. A recent study has reported on the tendency of architects, in particular, to innovate beyond the scope of the original client requirements and operate from their own agenda (Ivory 2005). Such innovations will certainly be noticed but their contribution to the success of the project will not always be a positive one. On the other hand, process innovations of the kind that quantity surveyors are likely to introduce may go unnoticed by other participants not directly affected.

In the BRITE survey, the high innovator group nominated engineers and large repeat clients first as “drivers of innovation” in construction followed by architects and main contractors. The overall industry response was slightly different with large repeat clients rated first, followed by architects and engineers. Quantity surveyors generally saw the professions as the main drivers of innovation. Architects and building designers were the most frequently nominated group apart from the quantity surveyor’s own sub-sector. These were followed by engineers and project managers. Certainly quantity surveyors rated themselves much higher as innovators than did the other two groups. This finding may relate to the lack of “visibility” of quantity surveying innovations. Data collection and the management and monitoring of processes are activities which can be carried out effectively without impinging greatly on the activities of others. As such they can tend to “slip under the radar” and may not get recognition from other members of the team. Nevertheless, they may result in significant savings and efficiency improvements. Under-reporting of this kind of innovation by team members not directly involved may partly explain the gap between the answers given by quantity surveyors and those from the rest of industry and the high innovator group as shown in Table 1 below.

Table 1- BRITE Survey Innovation Drivers

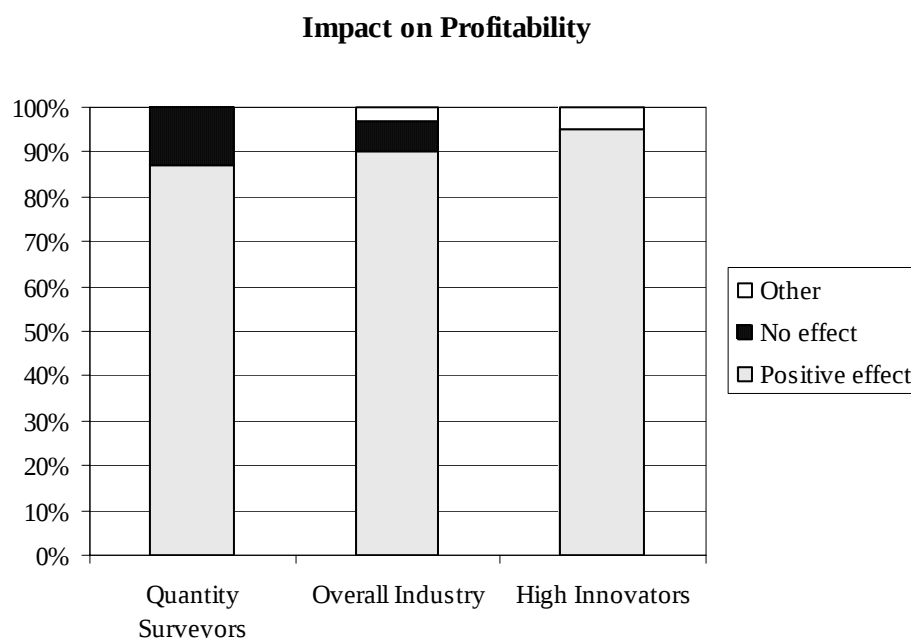
Industry Stakeholder	Quantity Surveyors	Overall Industry	High Innovators
Quantity surveyors	77%	19%	16%
Architects	77%	55%	59%
Building designers	63%	44%	49%
Engineers	60%	51%	63%
Project managers	60%	38%	45%
Large/repeat clients	57%	59%	63%
Developers	57%	38%	39%
Manufacturers	50%	46%	46%
Main contractors	50%	43%	57%
Organisations that set industry standards	47%	26%	26%
One-off clients	37%	27%	28%
Trade contractors	27%	27%	24%
Funders	23%	15%	23%
Government regulators	20%	12%	20%
Other suppliers	17%	26%	21%
Letting agents	13%	7%	4%
Insurers	3%	5%	2%
Other	0%	1%	1%

The visibility issue needs to be addressed if the image of quantity surveyors held by other construction professions is to be improved. One of the ways of doing so is to examine the formal measures of innovation in the literature and see what is normally included and what is commonly excluded.

FORMAL MEASURES OF INNOVATION

Formal measures of innovation require definitions and classifications of innovation types and extent. The general literature on innovation in construction distinguishes between several different kinds of technological and organisational innovations (Winch 1998; Slaughter 2000; Gann and Salter 2000; Blayse 2004; Bossink 2004; Brandon 2004). Rates of innovation generation and innovation adoption are difficult to compare precisely because definitions are diverse and because it is not easy to distinguish an individual innovation event in an ongoing development process. Awareness of this problem may explain the stated quantity surveyor preference for informal measures of innovation performance. Technological innovations are more readily understood and recognised by the casual observer than process or organisational innovations. The BRITE Survey did not seek to identify an ‘absolute frequency’ of innovation, precisely because it is problematic to define a single unit of innovation in an innovation process. Instead the survey asked firms to identify whether or not they had introduced an innovation in the past three years that was “new to the organisation,” “new to the country” or “new to the world.” The degree of novelty of an innovation is seen as a better indication of the significance of the event than a self assessment of the number of innovations introduced. For this reason also, the questionnaire asked about the impact on profitability of the most successful innovation. Quantity Surveyors were more likely to report that their most successful innovation had a neutral effect on profitability than the industry generally and the high innovators group. Nevertheless the large majority regarded innovation as generally profitable.

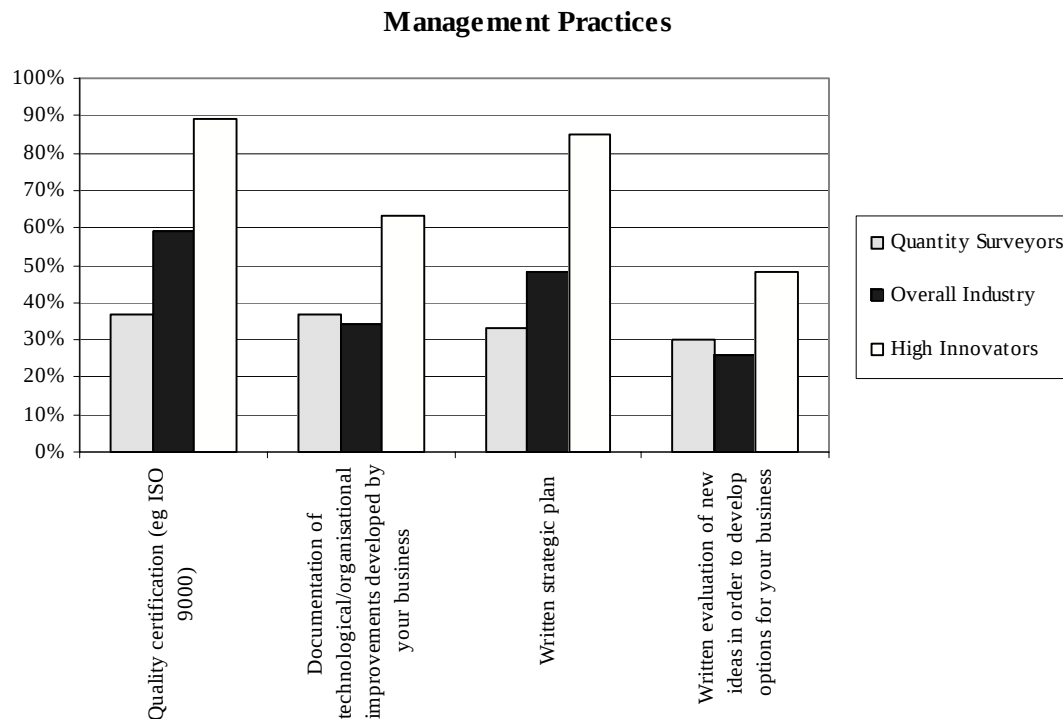
Figure 1 – Impact on profitability of the most successful innovation introduced in the last three years



The fact that 13% of quantity surveyors could regard as their most successful innovation one which had no effect on profitability indicates that they may be measuring success in terms of process improvement and long-term goals. Such improvements are likely to be under-reported in an ad hoc evaluation of innovation.

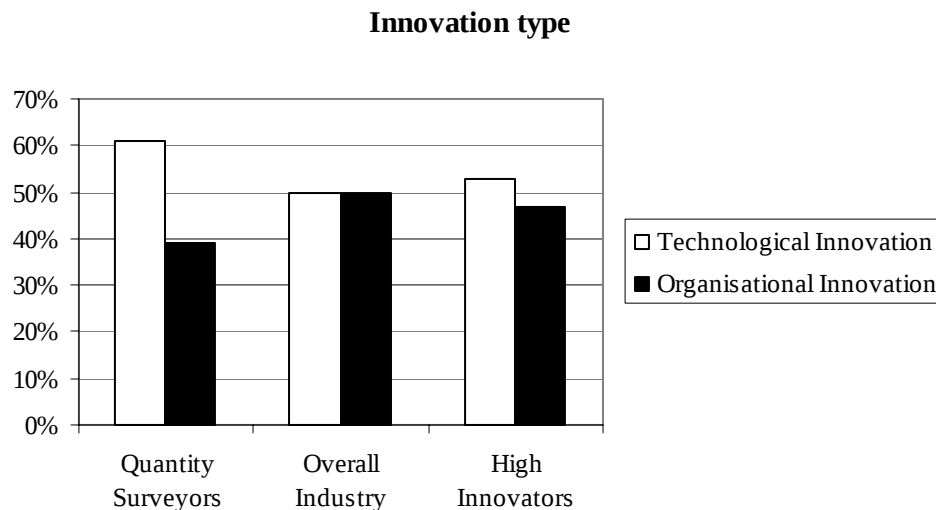
Generally, however, quantity surveyors simply do not measure their own performance. Despite being experts in measurement they seem to have a tendency to avoid self-assessment in any formal way.

Figure 2 – Adoption of Management Business Practices



The BRITE Survey results show a considerably lower use of management practices which deal with formal evaluation of performance by quantity surveyors compared with that recorded by the high innovator group (Figure 2). On the other hand quantity surveyors reported a higher percentage of technological innovation compared with organisational innovation than either of the other studied groups (Figure 3). This should be seen in the context of the general tendency for quantity surveyors to be slow adopters of new technologies.

Figure 3 – Technological versus Organisational Innovations



Some of the reason for this difference may be that there are some definition problems between the two classifications. It is possible that quantity surveyors may regard the introduction of some new information technology systems as technological innovations while construction companies are more likely to see the same systems as process or organisational change.

STRATEGIES TO ENCOURAGE INNOVATION

Quantity surveyors who responded to the BRITE Survey favoured increased training and information programs, best practice demonstrations and the hiring of skilled people as ways of encouraging innovation. They also saw a need for more open constructive attitudes and for the removal of lowest cost tendering for quick profit. These last two issues were given only moderate importance by the overall industry response and the high innovator group. The specific problem of dubious practice in competitive tendering is, however, well recorded elsewhere (Williamson et al. 2004). High innovators may not have rated this as significant because they have already largely moved away from the competitive tendering environment.

In order to reap the benefits of innovation, organisations in construction need to have in place “supportive organisational mechanisms of a financial, technological, constructional, organisational and behavioural nature” (Egbu 1999: 1). Awareness of this multi-dimensional nature of innovation is unevenly spread through the different areas of the industry and different organisations are at different points along the process. This explains some of variation in favoured strategies to encourage innovation across sectors.

Most quantity surveying firms are small businesses. The BRITE Survey indicates that lack of money and time are the main inhibitors of innovation for them. However they need to trial and adopt mature new technologies if they are to keep up with sector wide innovation. CAD interface and collaborative project management are innovations which offer significant promise to quantity surveyors in terms of productivity improvement (Lowry 2004).

Attitudes to Recognition

50% of the high innovator group saw increasing recognition, rewards and incentives as the main way to encourage innovation. However, only 11% of the overall industry agreed with this proposition. No quantity surveyors agreed. This is hard to explain other than that it may relate to the previously mentioned failure to measure performance. The profession generally needs to build its self esteem, to understand its strengths and to value what it has to offer. There is a need for more collaboration between quantity surveyors and other construction professionals. Quantity surveyors need to develop their own formal measures of innovation. When this is done the question of recognition and reward will very likely receive an impetus from the identified successful innovators.

Team Players

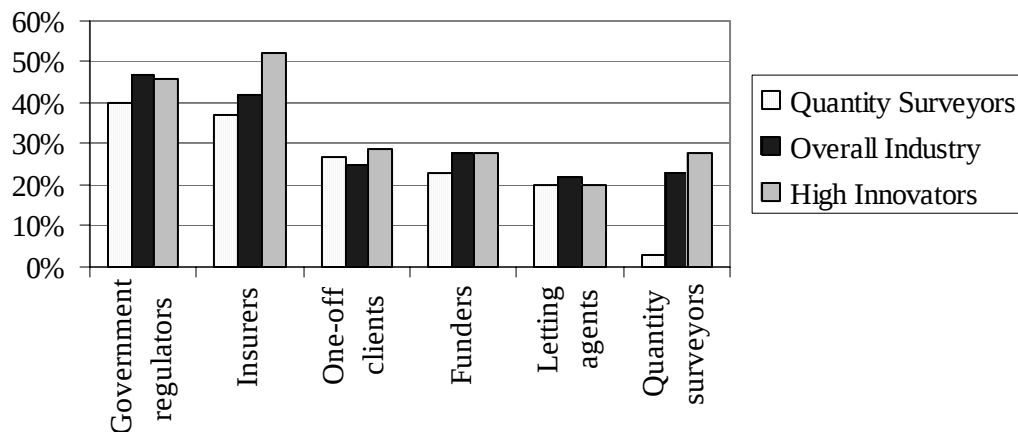
Many authors have reported on the change in the role of the Quantity Surveying profession in the construction industry in recent years (Page et al. 1999; Page et al. 2001; Boon 2001; Ellis and Wood 2001; Fellows et al. 2003; Potts 2004; Davis and Baccarini 2004). A decrease in the use of traditional Bills of Quantities has led to the quantity surveying profession developing new roles for themselves. In addition the role of the quantity surveyor is being altered by the establishment of multi-disciplinary teams to manage projects collaboratively using information technology (Garner and Mann 2003).

Quantity surveyors can have a complex intermediary role in the relationship between the client and the designer in construction projects. As Ivory (2004) notes there is often not one point of contact between a designer and a client. Often subgroups within the various organisations involved act as advocates for elements of the project. Other team members may see quantity surveyors as the advocates for cost restraint at the expense of quality. Quantity surveyors have an entirely different perception of themselves.

Quantity surveyors showed a general trend to be less willing to label other stakeholders as blockers of innovation than was exhibited by the other two groups (Figure 4). Statistically, they believed that “government regulators”, “insurers” and “one-off clients” were the most frequent blockers of innovation. Overall industry respondents also believed that “government regulators” were the most significant blockers of innovation, followed by “insurers”, “funders” and ‘organisations that set industry standards’. High innovators believed that “insurers” were the most common blockers of innovation, followed by “government regulators”. The less judgemental attitude of quantity surveyors may stem from the knowledge that other groups are sometimes quick to rate them as blockers without sufficient knowledge of their roles and functions. There may be a distinctive cultural tendency in the profession to avoid “extreme” or “charged” comments about other groups. The idea of a professional culture to which most members of a particular group adhere, may have some relevance in seeking to understand the variation between the survey answers given by quantity surveyors and those given by the rest of the industry. There do appear to be certain common attitudes to work, reward, recognition and performance evaluation that are held largely in common by professional groups such as quantity surveyors.

Figure 4 – Perceptions of Innovation Blockers

Innovation Blockers



In a study based in Hong Kong, Fan et al (2001a; 2001b) found that different “professional socialisation” resulting from differing training and education requirements could result in significantly different ethical perceptions among professionals. Furthermore the researchers noted that few studies of professional ethics take a cross professional stance. A comparison between quantity surveyors and accountants revealed that quantity surveyors had more consistent ethical socialisation and therefore more consistent surveyed attitudes than the accountant group. This was true despite considerable similarities in the nature of the work performed. Formal professional ethics training was found to be lacking for both groups. However differences in both pre-work and post-work professional training induced significant differences in practitioners’ attitudes. Similarly the BRITE Project survey found attitudinal differences between quantity surveyors and other groups which were statistically significant. Whether or not these differences derive from a distinct professional culture could well be a topic for future research.

RISKS FOR THE QUANTITY SURVEYING PROFESSION

In a complex and dynamic industry environment the role played by the various professions is likely to fluctuate and change. New technologies may make some traditional roles obsolete and others may be greatly altered in scope and responsibilities. Computer programs which aim to deliver automatic quantities and pricing from 3D computer drawings are in the process of development in several places. While the application problems are by no means small, it is possible that in future programs will be available that will take over those parts of a quantity surveyor’s work that are repetitive and routine. The profession will need to concentrate on their value-adding and organisational skills if it is to continue to prosper. Due and proper recognition of the role of quantity surveyors from other elements in the construction industry is needed, if the benefits of their expertise are not to be lost.

CONCLUSION

The BRITE Survey response highlights significant differences between many quantity surveying firms and the construction industry as a whole. These differences are

largely based around the lack of formal assessment of innovation processes. Quantity surveyors expertise is in measurement yet they largely avoid measuring their own performance levels. The development of formal systems for measuring innovation success can have two likely effects. Firstly, the formal evaluation process may make the innovations developed by quantity surveyors more visible to the other members of the team. This lack of visibility in the innovation process may partly explain negative attitudes to the profession found in some other industry participants. Secondly, the existence of formal systems of evaluation could provide the evidence for a drive for better distribution of rewards and incentives. In this way the quantity surveying profession can become more integrated into the currently developing collaborative construction industry structure. Without the development of formal innovation evaluation, quantity surveyors run the risk of being left outside the new industry structures and being regarded suspiciously by other players. There is a need for the profession to assert and promote its strengths and abilities to the industry as a whole.

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