

THE ROLE OF TECHNICAL MARKETING IN EFFECTIVE UTILISATION OF QUALITY MANAGEMENT IN CONSULTING ENGINEERING FIRMS

Bill Addis and Muhammed Al-Ghamdi

The University of Reading, PO Box 219, Whiteknights, Reading, RG6 6AW, UK

The role of marketing in quality management, especially Total Quality Management in consulting engineering firms, is well established and growing. Too little attention, however, has been paid to the part played by technical marketing. The paper discusses how technical marketing can help consulting engineers develop a better understanding of their engineering skills and knowledge, and better convey the nature and benefits of their engineering services (their 'products') to technical and non-technical clients. The paper concludes that technical marketing can enhance quality management by helping to give clients better value for money and providing a clearer picture of the consultants' work process.

Keywords: Consulting engineers, professional services, technical marketing, total quality management, value.

INTRODUCTION

The adoption of quality management systems by consulting engineering firms has been a direct approach to tackling their main problem - staying in business. Lessons have been learnt from the success of Total Quality Management in manufacturing industries and the rewards to be gained, such as increasing productivity, decreasing product cost and improved delivery mechanisms, have accelerated its adoption by the consulting engineers. Minimising the costs associated with the delivery of consulting engineering services has come to be perceived as the primary solution of the challenges associated with fee competition. However, the question as to whether clients are only asking for cheap services has often been overlooked.

A recent survey by the *Association of Consulting Engineers* on clients' perception of consulting engineers revealed widespread dissatisfaction among clients concluding that:

(consulting engineers) need to match their high technical ability to an understanding of client needs, which at the present is low (Report 1994: 15)

Samson and Parker (1994) also identified this deficiency and perceived a gap between what engineering firms are providing and what clients want. They concluded that overcoming this gap and gaining a better understanding of clients' needs is a vital issue for consulting engineers to address when aiming to establish competitive advantage.

WHAT DO CLIENTS WANT?

Put simply, clients usually want value for their money. Several recent, major reports have emphasised this point (e.g. Atkins, 1994; Latham, 1994). In its report *Whither Civil Engineering?* The Institution of Civil Engineers highlighted the need to balance between short-term and long-term benefits of an infrastructure or building project and the need to secure value of money for clients (Report 1995b). In its report *The Future of the Profession* The Association of Consulting Engineers considered giving value to be the key for the future of consulting engineering firms, concluding:

The future lies with those firms of consulting engineers who recognise the changing base of clients and, through excellence of performance and innovation, add value to the client's programme of work (ACE, 1995: 3)

VALUE AND TQM

Ravald & Gronroos (1996) have defined value, as seen by clients, as the ratio of the perceived benefits to the perceived sacrifices. The perceived benefits comprise 'a combination of physical attributes, service attributes and technical support available in relation to the particular use of the product, as well as the purchase price and other indicators of perceived quality'. While perceived sacrifices include 'purchase price, acquisition costs, transportation, installation, order handling, repairs and maintenance, risk of failure or poor performance'. When the perceived benefits exceed perceived sacrifices along the life cycle of the product, then clients are assumed to be getting value for their money.

Total Quality Management has attracted the attention of many consulting engineering firms. However, its implementation has often been driven by the narrow belief that competitive edge is achieved only by firms that manage their resources most effectively and offer a timely response to the demands of the market.

Utilisation of TQM in consulting engineering firms

In the construction industry, considerable amounts of time, money and both human and material resources are wasted each year because of inefficient or non-existent quality management procedures. Rounds & Chi (1985) have explained how total quality management principles can help the construction industry to overcome such problems and achieve the same levels of success attained by manufacturing industries. Burati *et al.* (1991 and 1992) concluded that TQM can be applied in the construction industry, and those who implement it are going to meet quality requirements more than those who do not.

The interest in TQM has extended to the consulting engineering profession and several research studies have been conducted on the use of TQM by consulting engineering firms. Most of these have focused upon the introduction of TQM to the profession. Oakland and Alderadge (1994) concluded that the concept of TQM is not always fully understood and in some cases confused with BS 5750, and listed some of the weaknesses encountered when TQM is implemented in an engineering firm. Both Culp *et al.* (1993) and Predall (1994) found that TQM could be used successfully by consulting engineering firms. However, neither these studies, nor several others (e.g. Rounds & Chi (1985), Burtai *et al.* (1991 and 1992) addressed the question of how TQM helps the process of adding value for client's money.

Does TQM give value-for-money?

TQM is a management strategy that creates an organisation culture through training, motivation and the encouragement of participation in order to satisfy clients' needs and provide continuous improvements. It focuses on the work process and relationships at different work stages among different participants where there are always suppliers, processors and customers. The ability of TQM to enhance the work performance is due largely to the efforts directed towards minimising the process's time and costs by doing a job right the first time (see, e.g., Culp *et al.* 1993, and Burati *et al.* 1991).

There is no doubt that minimising the time and reducing the costs associated with the delivered engineering service is going to add value for clients' money. However, how significant is this improvement when the life cycle of the construction product is considered. In their study of the life cycle costs of a office buildings, Khanduri *et al.* (1993) indicate that initial cost, including engineering design work, is 42% of the life cycle costs. If the cost of engineering design is assumed to be 5% of the initial costs (Eldin 1991), then its cost will be around 2.1%. Any savings in costs at the engineering design stage, by the use of TQM (or any other means) can, then, bring very little increase in value-for-money for the client when evaluated over the project's life cycle.

THE RELATIONSHIP BETWEEN QUALITY AND MARKETING

The actual nature of the relationship between marketing and quality is, as yet, a relatively underdeveloped topic. Furthermore, many of those who have looked at the subject have tended to consider the role of TQM in enhancing marketing activity (e.g. Witcher 1990, Oakland & Aldridge 1994, Wellemin 1990, Rounds & Chi 1985).

Much less attention has been given to the role that marketing plays in enhancing quality in general and TQM in particular. A key ingredient of quality, which can be defined as satisfying clients' needs, is the marketing activity by which means the service provider can come to understand clients and establish their needs (Morgan, 1991). Richardson (1996) has elaborated the role of marketing in establishing the true requirements for the product or service, and the process by which these requirements are defined and communicated to the client. For John S. Oakland, head of the European Centre for TQM at Bradford Management Centre, 'quality starts with marketing' (Richardson, 1996). Marketing thus needs to be at the leading edge of TQM implementation.

The importance of marketing in the successful implementation and utilisation of TQM by consulting engineers has generally been overlooked and would appear not yet to be well-understood by the engineering profession or those engaged in introducing TQM into consulting engineering firms. Although Morgan and Morgan (1991) concluded that marketing is a legitimate management function in consulting engineering firms, they commented that there were no signs indicating that they were yet market-oriented.

Table 1: Changes in work load (last ten years)

	Compared to		
	1-2	4-5	10
	(years ago)		
Up	64%	60%	38%
No change	29%	18%	19%
Down	7%	22%	43%

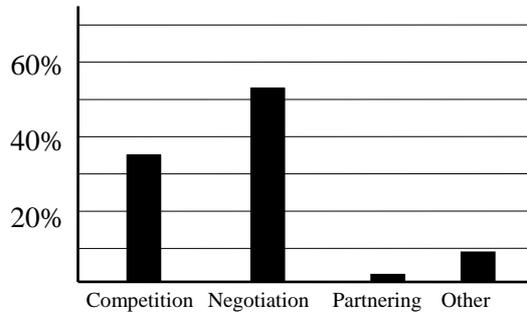


Figure 1: What is the most common way by which your firm wins its work?

Table 2: Changes in the ratio of fees earned to project value (last 10 years)

	Compared to		
	1-2	4-5	10
	(years ago)		
Higher	14%	17%	7%
No change	44%	27%	17%
Lower	41%	56%	76%

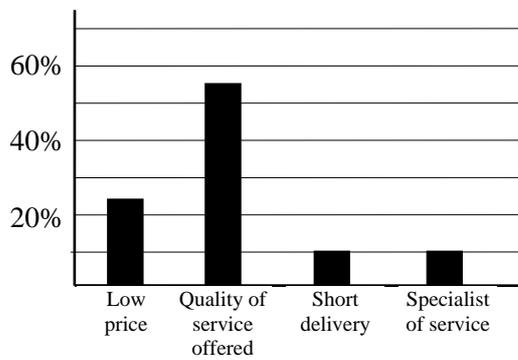


Figure 2: What is the best way in which your firm can beat competition?

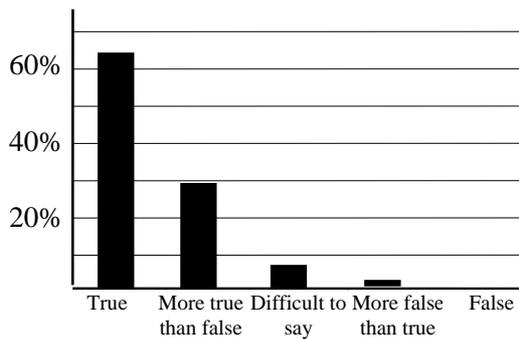


Figure 3: My firm believes that the key to attracting customers is improving quality

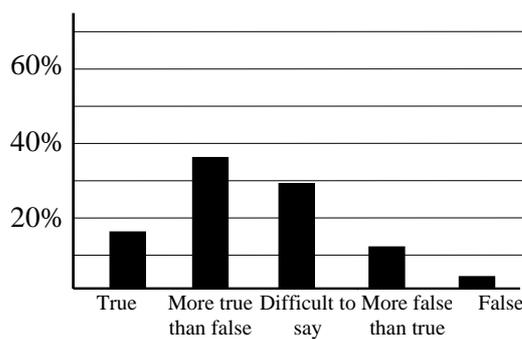


Figure 4: Employees of my firm view the business through customers' eyes

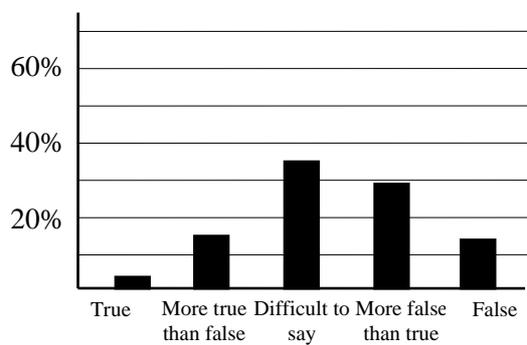


Figure 5: My firm feels that innovation and change come from the customer

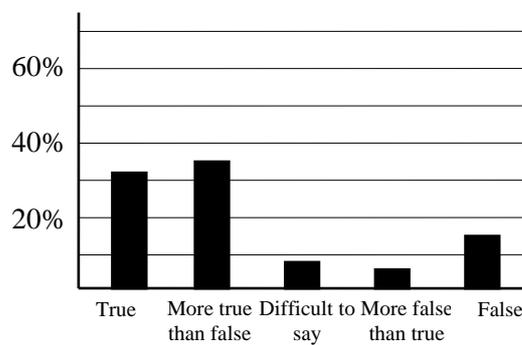


Figure 6: The function of marketing is to sell services the firm produce

SURVEY OF ENGINEERS' MARKETING ACTIVITY

The authors of this paper have recently conducted a survey of marketing in consulting engineering firms (Survey 1998). Nearly 200 questionnaires were returned, representing a 47% response. One preliminary general conclusion is that there has been little change since the survey of Morgan & Morgan in 1991.

The results of the survey show that consulting engineers are working more for less reward: over the last ten years, their work-load has increased and the ratio of fees earned to project value has decreased (Tables 1 & 2). They also indicate that negotiation is the main means (52%) by which consulting engineers win their jobs (Figure 1), and providing quality services is the favoured way (56%) to beat competition (Figure 2). Quality is also given emphasis as an effective means for retaining clients: 63% of the consulting engineering firms feel that the key to attracting and holding customers is to keep improving service quality (Figure 3). However, it seems that few engineering firms are fully implementing this idea: only 17% of engineering firms say it is true that their employees view the business through the eyes of the customers (Figure 4). Furthermore, less than 20% feel that innovation and change come directly from the customer (Figure 5). Similarly, the results show that marketing is not yet being taken very seriously: only 25% of firms have marketing departments and 5% have market research units. Furthermore, over 32% of firms felt that the function of marketing is to sell the services that the firm produces (Figure 6).

These results show that both awareness of the need to understand the true needs of clients, and proper utilisation of marketing are low in engineering firms. Marketing seems to be used by the profession mainly as a selling technique in order to help engineering firms get their names on tender lists for projects (Addis & Al-Ghamdi, 1998)

TECHNICAL MARKETING: THE MARKETING OF CONSULTING ENGINEERS' PRODUCT

The potential of marketing as a management activity has not yet been realised in most consulting engineering firms. One reason for this is that the nature of the product - the consulting engineering service - and of the client has not yet been fully developed. The authors have argued elsewhere (Addis & Al-Ghamdi 1998) that a full understanding and use of the idea of technical marketing can help firms to make their marketing effort more effective and capable of improving a firm's competitiveness.

What is the consulting engineers' product?

Research into the marketing of engineering services has generally focused on how consulting engineers sell their product rather than the nature of the product itself. It is commonly perceived that plans and specifications are the commodity being sold, e.g. (Burati *et al.* 1992), but this is to fail to understand the nature of the skill needed to produce the drawings. Happold (1986) suggests that the drawings and specifications are the packaging of the product, but not the product itself. Stanley (1982) and Chan (1992) argue that consulting engineers are selling their engineering skill, knowledge, judgment and experience - the nature of which is analysed in depth in Addis (1990) - and that this is what clients are actually paying for. Unfortunately, placing value on such a product or commodity is not easy, least of all for the non-technical people who

often make choices between the different levels of service that competing engineers may be offering for different prices.

The nature of the consulting engineers' product is complex. In summary, it comprises the engineering knowledge, skills and experience of a firm's members of staff, and the firm's ability to solve existing and new technical challenges to the satisfaction of its clients. This resides largely in the technical ability of the staff and the technological hardware or software they need to execute the work; but most of all, perhaps, it requires knowing what to do and how to do it.

What is technical marketing?

Technical marketing can be summarised as the effort directed for the development and conveyance of the engineer's true product and to distinguish it carefully from the means by which this product is delivered - drawings, specifications, etc. (Addis & Al-Ghamdi, 1998). While it is not a new concept it is still often overlooked by the profession. To use it effectively, consulting engineers need to start developing the following skills:

- identifying the different engineering skills of staff;
- identifying the engineering skills required to carry out different types of project and for different clients;
- identifying wherein a firm's engineering skill and expertise resides – its staff, track record, collective experience inherited from past projects, working practices, procedures, manuals, etc. bespoke software and computer systems, project archives, well-established links with specialist contractors.

Technical marketing and clients' value-for-money

The engineering knowledge, skills, and experience can add value of clients' money in a multitude of ways during construction and throughout the life of the resulting product. Often they are defined in terms of the performance achieved by the fruits of engineering design (Simpson & Horrobin, 1970). Bennie (1977) and Addis (1994), for instance, have listed among the many features of a building or engineering structure that can be enhanced by the engineering design and contribute to its efficiency:- the working or living environment, attractive appearance, ease of construction and maintenance, and running costs. The role of engineers in selecting structural systems and elements, and materials for both internal and external walls is vital to ensuring that a building can be built, will be safe and durable, and will facilitate the environmental, aesthetic and functional wishes of both client and architect. Kelly (1993) reports that a considerable proportion of the running cost of buildings are directly influenced by engineering design – energy, maintenance and cleaning comprise, respectively, 35%, 12% and 10% of the total operation cost.

Technical marketing plays a threefold role in enhancing the value of clients' money.

First, it directs the efforts toward improving the engineering product. Technical marketing enhances the awareness of consulting engineers that every product has a life cycle, even engineering services themselves - Kaye (1986) has reported the history of the finite-element stress analysis as a good example of such a product life cycle. By focusing on the products' development, engineers do not have to compete in terms of price only. They are also competing in terms of providing better services that help in improving the performance of clients' product. Such competition leads to better value for clients' money.

Secondly, technical marketing focuses attention towards the true identity of the 'client'. Consulting engineers have been severely affected by the prominent role architects play in the construction industry. This leads many engineers to believe that their client is the architect and their job is simply to provide a load-bearing structure which satisfies the appropriate design codes of practice (Addis 1994). Technical marketing directs the attention of consulting engineers towards the changing needs of the owners of buildings and other construction projects, and develop their own consulting engineering product on these needs.

Finally, technical marketing emphasises the importance of properly conveying the nature of the engineering product. Its complex nature makes it difficult for potential clients (e.g. developers, contractors, architects) to distinguish accurately between different engineering alternatives, especially when they are non-expert clients (infrequently engaged in commissioning buildings). This means that clients cannot easily recognise effective design solutions that will achieve the highest value for their money. Only engineers can help clients to distinguish between different engineering products. Technical marketing can help consulting engineers develop the necessary skills that help clients understand which alternatives will best suit their needs.

In each of these ways, technical marketing can contribute directly to achieving and delivering quality for the clients - i.e. satisfying clients' needs.

CONCLUSIONS

Previous studies have tended to present TQM as an effective technique capable of satisfying clients' needs and improving the competitiveness of consulting engineers. However, insufficient attention has been given to defining precisely what clients want from engineers and identifying how effective TQM is in fulfilling their needs. While clients are demanding more value for their money, this is not likely to be achieved merely by improving the efficiency of the engineering work process since it represents such a small part of the life cycle costs of a construction product.

The authors' survey has revealed that consulting engineers' adoption of 'quality' as a management tool has not improved their perception of the importance of understanding clients' needs as a basis for delivering a satisfactory service. Marketing is still largely perceived as selling engineering services and not linked to TQM and the delivery of quality.

Technical marketing has been described and its role in directing the attention of consulting engineers towards their engineering knowledge and skills. Consulting engineers need to develop the skills necessary for conveying the benefits of their engineering knowledge to both technical and non-technical clients. By doing so, technical marketing can help engineers at every stage of the work process in understanding the wider picture of their contribution and how it is benefiting the client, or the owner. On the one hand this improves the effectiveness of quality management, and on the other, it is contributing to the goal of quality management which is satisfying clients' needs.

REFERENCES

- Addis, W. (1990) *Structural Engineering – the Nature of Theory and Design*, Ellis Horwood, Chichester.
- Addis, W. (1994) *The Art of the Structural Engineer*, Artemis, London.

- Addis, W. and Al-Ghamdi, M. (1998) 'The International Competitiveness of Consulting Engineers: The role to be played by Technical Marketing', Proceedings of the 1st Conference in International Construction Marketing.
- Atkins, W. S. (1994) Construction Industry Strategic Study.
- Bennie, F. G. (1977) The Philosophy of Value in Building Design & Use, Quality and Total Cost in Buildings and Services Design, The Construction Press.
- Burati, J.L., Matthews, M.F. and Kalidindi, S.N. (1991) "Quality Management in Construction Industry", Journal of Construction Engineering and Management, Vol. 117, No. 2, June, pp. 341-359.
- Chan, Peng S. (1992) "How to Market Your Professional Services: A Strategic Approach", Management Decision, Vol. 30, No. 7, 46-53.
- Culp, Gordon, Smith, Anne and Abbott, Jim (1993) "Implementing TQM in Consulting Engineering Firm", Journal of Management in Engineering, Vol. 9, No. 4, October, pp. 340-356.
- Eldin, Neil N. (1991) 'Management of Engineering/Design Phase', Journal of Construction Engineering And Management, Vol. 117, No. 1, March, pp.163 - 175.
- Happold, Edmund (1986) "Presidential Address: Can you hear me at the back?", The Structural Engineer, Vol. 64A, No. 12, Dec., 367-378.
- Kaye, Harvet (1986) Inside the Technical Consulting Business: Launching and Building Your Independent Practice, John Wiley & Sons.
- Kelly, John (1993) Value Management in Design and Construction: The economic Management of Projects, London: E&FN Spon.
- Khanduri, A.C., Bedard, C. and Alkass, S. (1993) ' Life Cycle Costing of Office Buildings at the Preliminary Design Stage', Joint Conference Edinburgh Dev. in Civil & Construction Engineering Computing, pp. 1-8.
- Latham, Michael (1994) Constructing The Team, HMSO.
- Morgan, Neil A. (1991) Professional Services Marketing, Butterworth Heinemann Ltd.
- Morgan, Robert E. and Morgan, Neil A. (1991) "An Appraisal of The Marketing Development in Engineering Consultancy Firms", Construction Management and Economics, Vol. 9, pp. 355-368.
- Oakland, J. S. and Aldridge, A. J. (1994) "Quality Management in Civil and Structural Engineering Consulting", International Journal of Quality & Reliability Management, Vol. , No. , pp. 32-48.
- Predpall, Daniel F. (1994) "Developing Quality-Improvement Processes in Consulting Engineering Firms", Journal of Management in Engineering, Vol. 10, No. 3, May/June, pp. 28-34.
- Ravald, Annika and Gronroos, Christian (1996) 'The Value Concept and Relationship Marketing', European Journal of Marketing, Vol. 30, No. 2, pp. 19-30.
- Report (1994) Client perception Study, Association of Consulting Engineers, London.
- Report (1995a) The Future of the Profession, Association of Consulting Engineers, London.
- Report (1995b) Whither Civil Engineering?, Institution of Civil Engineers, London.
- Richardson, Brian (1996) Marketing for Architects and Engineers: A new approach, Spon.
- Rounds, M. and Chi, Nai-Yuan (1985) "Total Quality Management for Construction", Journal of Construction Engineering and Management, Vol. 111, No. 2, June, 117-128

- Samson, Danny and Parker, Rod (1994) "Service Quality: The Gap in the Australian Consulting Engineering Industry", *International Journal of Quality & Reliability Management*, Vol. 11, No. 7, pp. 60-76.
- Simpson, John W. And Horrobin, Peter J. (1970) *The Weathering And Performance of Building Materials*, Medical And Technical Publishing Co. Ltd., Chiltern House, Oxford Road, Aylesbury, Bucks.
- Stanley, Maxwell C. (1982) *The Consulting Engineer*, 2nd ed.
- Survey (1998) Survey of marketing activity by UK consulting engineers. Conducted by Al-Ghamdi, M. & Addis, W., Department of Construction Management & Engineering, University of Reading, UK. Results not yet published.
- Wellemin, John H. (1990) *Customer Satisfaction Through Total Quality*, Chartwell-Bratt.
- Withcher, B. (1990) *Marketing and Total Quality Management*, The Durham University, Business School.