Self-Assessment Methodology: The Route to Business Excellence

A. M. AHMED, BRADFORD UNIVERSITY SCHOOL OF MANAGEMENT
J. B. YANG AND B. G. DALE, MANCHESTER SCHOOL OF MANAGEMENT

In recent years, there has been an increasing interest in the area of organizational self-assessment and an increasing number of companies have used the European Foundation for Quality Management (EFQM) business excellence model as the template for testing different business strategies as well as for measuring performance. There is little evidence of any methodology, however, that can help organizations link the areas for improvement identified from the assessment to their business' action plans at strategic, tactical, and operational levels. This article discusses these problems and puts forward a solution by describing the use of multiple criteria decision-making (MCDM) and the evidential reasoning approach (ER) in the self-assessment process. It is argued that the intelligent decision system (IDS) being developed can be used to improve how the self-assessment process is carried out and provide accurate and fast scoring for a company.

Key words: EFQM business excellence model, evidential reasoning approach, intelligent decision system, multiple criteria decision making, self-assessment

INTRODUCTION

In today's competitive global environment, companies of all types are facing many challenges. They are finding that their survival in a dynamic marketplace is increasingly in doubt. Industrialists, in particular, are striving to gain a competitive advantage through shortening the product development cycle and responding quickly and efficiently to customers' needs and wants (Ahmed and Abdalla 2000a; 2000b). Emphasis on the cost and functionality of a product, however, is not the only factor that enables companies to compete and cope in the global market. The development of internal quality and the ability to respond to customers' requirements in a timely manner are also critical (Clausing 1994). Most experts (for example, Dale 1999 and Feigenbaum 1999) agree that quality, in its widest sense, is the dominant factor in companies' national and global success. According to Feigenbaum (1999), an organization's initiatives toward quality development can be demonstrated in four ways:

1. By fundamental changes in the way people think, learn, decide, and accept the leading role in improving quality of every aspect of their daily activities
2. By using fact-based monitoring systems
3. By adopting a more structured approach rather than anecdotal
4. By developing their discipline toward quality-cost economics

Self-assessment has been accepted as a comprehensive, systematic, and regular review of an organization's activities, and results are referenced against a specific

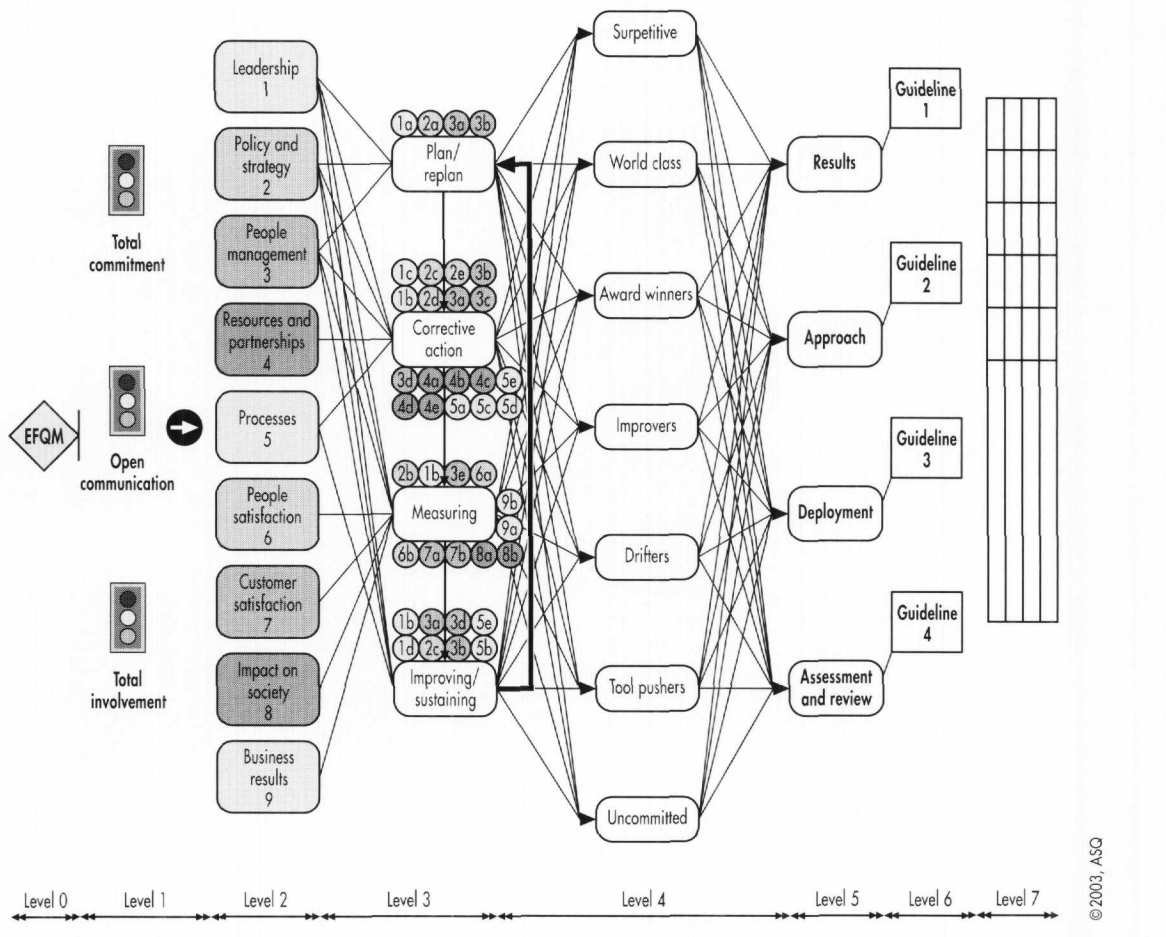
model. The European Foundation for Quality Management (EFQM) business excellence model addresses a number of the aforementioned challenges (Hakes 2000). The benefits an organization gains from carrying out a self-assessment are detailed by EFQM (1999) and include providing a powerful tool to measure performance, highlighting areas that require immediate action, and involving people at the strategic, tactical, and operational levels in developing a process improvement approach to quality.

This article is based on research conducted as part of an Engineering Physical Sciences Research Council (EPSRC) funded project (Yang 2001; Yang, Dale, and Siow 2001) that examines measuring and assessing business performance through self-assessment and decision modelling. The research addresses the problems associated with the current methods of assessing organizational performance against the EFQM business excellence model. It also allows the application of the decision support system (DSS) to the self-assessment process, which enables an independent assessor to improve the scoring accuracy of an organization's self-assessment document against the model's criteria, thus providing a more accurate scoring decision.

The current approaches (for example, matrix chart, workshop, pro forma, questionnaire, and award simulation) for conducting a self-assessment deliver different benefits and have associated problems (Ritchie and Dale 2000a; 2000b). This variation in delivering benefits can cause confusion regarding which approach is the most appropriate for a particular situation.

These approaches to self-assessment cannot be considered as a generic methodology. The EFQM published booklet, *Assessing for Excellence: A Practical*

Figure 1 The proposed methodology for the self-assessment process.



Guide for Self-Assessment (1999), emphasizes a number of problems associated with each of these approaches. The matrix-chart approach does not facilitate comparisons against European Quality Award (EQA) applicants, lists of strengths and areas for improvement are not produced, and there is no direct cross-reference between the steps in the matrix and the subcriteria of the EFQM business excellence model. A workshop can be a high-risk approach in terms of excellent preparation and facilitation, and is considered less robust and rigorous as a process (EFQM 1999). Furthermore, there is scope for unrealistic scoring, and evidence of the deployment of an organization's processes can be difficult to assess. A pro forma approach does not always tell the full story. It only represents a summary of the assessment and therefore might dilute the self-assessment process. The questionnaire approach indicates only what people think and not the reasons that underlie their thinking. An award simulation approach is ambitious, and potentially risks a lack of involvement by the management team and greater delegation to others, as well as potential for creative writing, covering up the real issues (EFQM 1999).

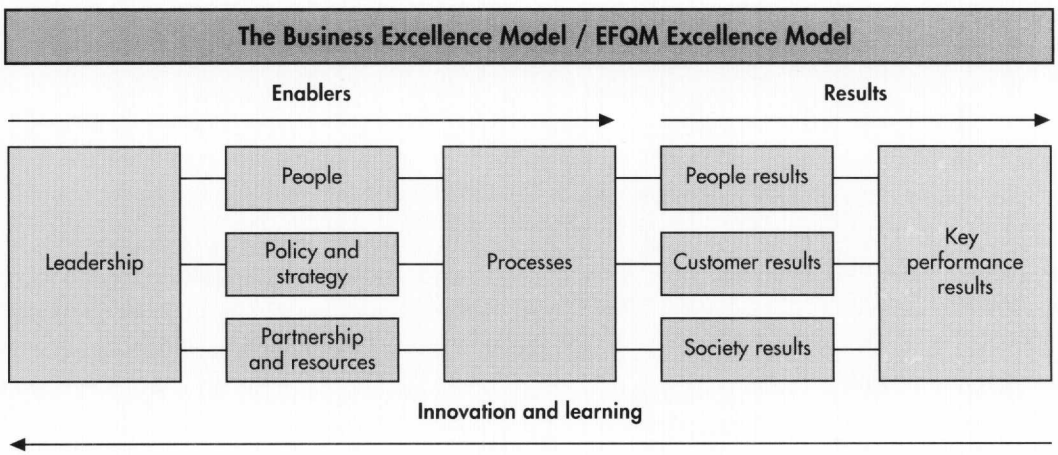
THE PROPOSED METHODOLOGY

The proposed methodology shown in Figure 1 and based on the evidential reasoning approach (Yang and Singh 1994; Yang and Sen 1994; Yang 2001) provides an eight-level structured framework for self-assessment. Level zero represents the initial decision relating to the appropriateness of applying for the EFQM award. Level one illustrates the ingredients required for the assessment process. Level two indicates the understanding stage with reference to the EFQM criteria. Level three identifies which of the subcriteria requires a focus on planning, action, measuring, or improving. Level four concentrates on classifying organizations into seven categories and specifying the characteristics associated with each category. Level five focuses on the results, approach, deployment, assessment, and review (RADAR) logic, and level six provides a comprehensive guideline for assessing each element of the EFQM criteria. Level seven is designed to weigh the final scores of the self-assessment process.

Level Zero

Achieving an excellence award is on the agenda of the management teams of most companies. Deciding whether to apply for a particular award (for example, regional, national, or international) depends on an internal and external evaluation of the company's capabilities. Simon (1977), in decision-making modeling terms, describes this process as consisting of four major phases: intelligence, design, choice, and implementation (see Figure 2).

Figure 2 Decision-making modeling phases (Simon 1977).



The *intelligence* phase involves examining the reality of the situation and identifying the problem. The company has to examine the requirements of the award and match them with information and data available in-house.

In the *design* phase, a simplified representation of reality is constructed. The model of representation is then validated through a number of case studies, and criteria are set for evaluating possible alternative solutions. The *choice* phase involves selecting a solution, such as to apply for an EQA award. Once this proposed solution is determined to be feasible, the *implementation* phase is considered.

Level One

Conti (1993) states that "the self-assessment process is never-ending and is the starting point for a regular strategic or operative planning process within the company to ensure continuous quality improvement." To keep the momentum going, there are a number of factors that need to be embedded throughout the organization before the self-assessment begins. These factors were discussed as individual issues by a number of researchers and experts (for example, Dale 1994; Wilkinson 1994; Oakland 1993; Brelin et al. 1995). The proposed methodology in its context considers these factors as traffic lights that indicate where the self-assessment process can be applied successfully (see Figure 1). These factors include management commitment, open communication, and employee involvement. After management commitment, the order of representation is not important, since most of the factors can run concurrently. Commitment is the way to convince the work force that management is not only serious about the self-assessment process, they are also prepared to get involved with its application. Management commitment must be continuously demonstrated and tested until it becomes an integral part of the business (Ritchie and Dale 2000a; 2000b).

Practical application

Following several roundtable meetings and discussions with senior management, everyone agreed that open communication and feedback between departments was extremely important to the success of a self-assessment, and was considered the second priority after management commitment. They also emphasized that good communication requires the use of a standardized language within the organization during the self-assessment process. On these basics it was considered useful to construct glossaries for keywords, phrases, code numbers, and specifications. In addition, procedures, instructions, corporate policies, and objectives should be clearly documented and frequently referred to, so they remain the standard despite changes in materials, product configurations, formulations, and test requirements. When the quality of communication is low, error patterns occur, which require immediate action in order to improve the communication structure. To enhance this improvement process for conducting the self-assessment, employees should be encouraged to pass information, provide comments and queries, and expect to receive prompt answers, because an incomplete communication structure and feedback system is a breeding ground for error patterns that lead to lower scores.

Dale (1994) points out that it is well known that a company's greatest assets are its people and their total involvement and participation in quality improvement within the self-assessment approaches. The third most important factor was some form of recognition scheme, which must be in place to appraise employees' efforts and provide further encouragement.

If any of these three lights (that is, total commitment, open communication, and total involvement) is red (that is, not fully in place), then one should identify the reasons behind this situation before starting the self-assessment process. If all the three lights are green, the assessment process can proceed with confidence.

There are a number of critical decisions at level 1. These include the following:

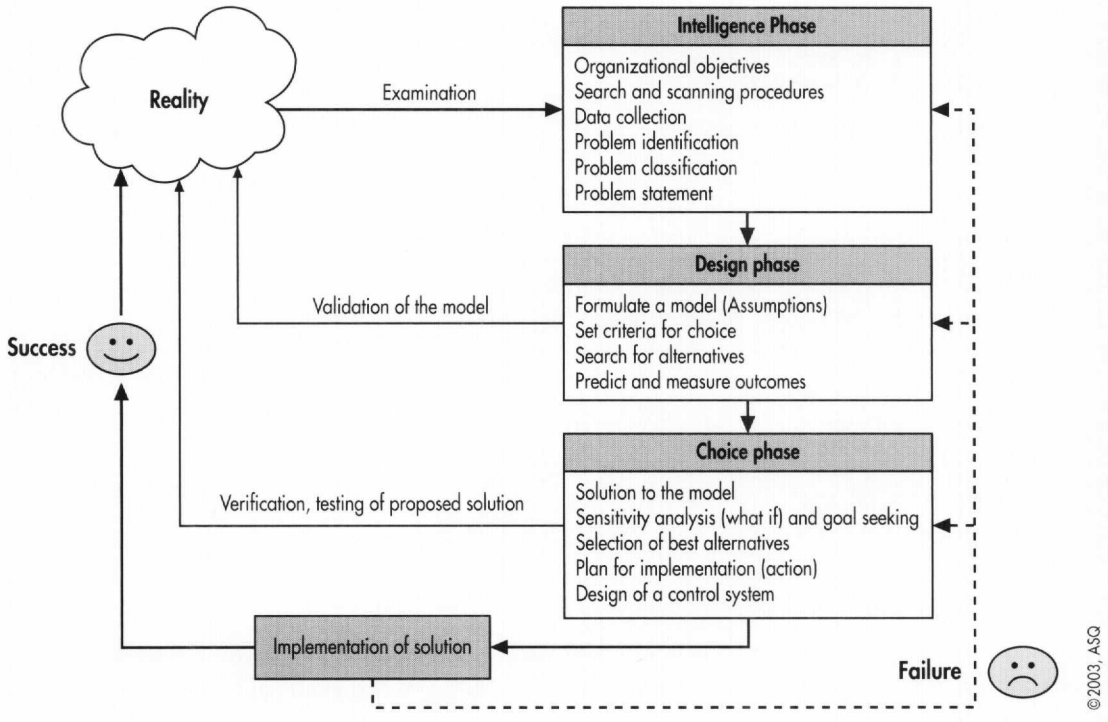
- **Decision 1: Is it appropriate for the company not to involve third-party assessor(s)?** Conti (1993), Ritter (1993), and Zink, Hauer, and Schmidt (1992) indicate that clear decisions about not involving a third-party assessor or team must be made before independent business units can assess themselves and derive their own areas for improvement.

- **Decision 2: Does the company have an internal expert to act as an assessor?** Sayle (1988) points out that in the case of using an internal third party, managers can assess other departments in the same company.
- **Decision 3: Is it more beneficial to employ an external assessor(s)?** The use of an external third-party independent assessor or team, which is the norm in most cases, is helpful to gain additional ideas for the continuous improvement process.
- **Decision 4: Does the company consistently have enough information to facilitate the self-assessment process?** The detailed information, which is needed to complete the self-assessment successfully in terms of resources, time, and qualification of the managers involved, must be identified and available within the company.
- **Decision 5: Does the company have qualitative and quantitative data to support the assessment procedures?** The types of data in the form of customer and employee surveys should include complaints, illness rates, absenteeism, error rates, profit trends, quality costs, and work safety data.
- **Decision 6: Does the company have the right teams to be involved in the process?** Selecting the assessment teams to include people from all relevant management levels and corporate functions can be an obstacle in starting the self-assessment process (Ritter 1993).
- **Decision 7: Do these teams, selected in the assessment process, require further training?** The types and frequency of training to be provided to the teams involved in the assessment process is one of the key factors for a successful implementation (Conti 1993).

Level Two

Level two mainly focuses on developing a good understanding of the nine criteria, 32 subcriteria, and their areas to address included in the EFQM business excellence model (see Figure 3). The model is structured in

Figure 3 Excellence model (EFQM 1999).



a series of levels, the highest being the nine criteria shown in Figure 3. Below these nine criteria are 32 subcriteria against which organizations can assess their activities. These are described in the EFQM (1999) documentation. For example and as indicated in Appendix B within the "partnerships and resources" criteria, an organization should consider such things as:

- How external partnerships are managed
- How finances are managed
- How buildings, equipment, and materials are managed
- How technology is managed
- How information and knowledge are managed

Level Three

The authors concentrated their contribution toward level three on classifying the 32 subcriteria of the EFQM business excellence model into four classes: planning, corrective action, measuring, and improving/sustaining. The purpose of this classification is to focus efforts while an organization is carrying out the self-assessment process. There are a number of overlapping subcriteria between these four classes, as demonstrated in Figure 1 and discussed in more detail later in this article.

Criteria 1a, 2a, 3a, and 3b are mainly directed toward the planning activity class. Criterion 1a focuses on how leaders plan their mission statements, vision, and values. Criterion 2a emphasizes how to plan the structure and contents of policy and strategy based on the present and future needs and expectations of stakeholders. Criterion 3a points out how people resources are planned, and 3b concentrates on how to plan for enhancing people's knowledge and competencies through various techniques (see Figure 1).

Criteria such as 1b, 1c, 2c, 2d, 2e, 3c, 3d, 4a, 4b, 4c, 4d, 4e, 5a, 5c, 5d, and 5e are mainly corrective-action activities, while criteria 3a and 3b overlap between planning and corrective-action activities. In a similar approach, criteria 1b, 2b, 3e, 6a, 6b, 7a, 7b, 8a, 8b, 9a, and 9b are measurement activities. Criterion 1b demonstrates another example of overlapping criterion between the corrective-action and measurement activities.

Criteria 1b, 1d, 2c, 3a, 3b, 3d, 5b, and 5e are related to the improvement activities needed to sustain performance. Criteria 3a and 3b overlap between planning and improvement, 2c and 3a overlap between corrective-action and improvement activities, and 1b overlaps between the measurement and improvement activities (see Figure 1).

Level Four

Level four focuses on specifying the seven organizational characteristics: the uncommitted, drifter, tool pusher, improver, award-winner, world-class, and surpetitive type. Drawing on the work of Dale, Lascelles, and Boaden (1994); Dale and Lascelles (1997); and Dale and Smith (1997), the first six organizational characteristics were defined as follows.

- *Uncommitted.* This is an organization that has not yet started a formal quality improvement process. Communication is lacking up and down the organization, management and employees are driven by fear, contact with customers is minimal, an overwhelming emphasis on return of sales and net assets is employed, and investment in people, technology, and infrastructure is lacking.
- *Drifter.* This is an organization that has been engaged in quality improvement for up to three years. Communication is limited, management fails to distinguish between BS 5750/ISO 9000 standard and total quality management (TQM), teamwork is superficial, and there is little investment in technology.
- *Tool pusher.* This is an organization that has more quality improvement experience than a drifter, usually between three and five years. Communication is showing an improvement, the management style is reactionary, there is a growing emphasis on customer orientation, the focus of employees is directed toward meeting output targets rather than return on assets, and the emphasis is on solving current rather than future problems.
- *Improver.* This is an organization that has been engaged in a process of quality improvement for five to eight years. Trust between all levels of the

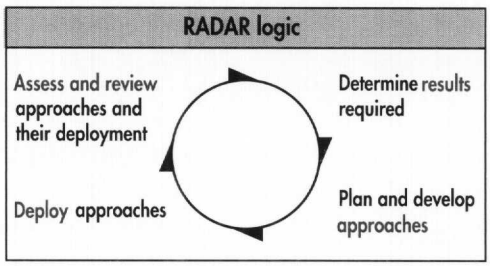
organizational hierarchy exist, a leadership culture is starting to emerge, there is more emphasis on customer orientation, and a long-term education and training program is in place at all levels of the organization.

- *Award winner.* This is an organization that has actually won an internationally recognized quality award. Communication is more structured, there are cross-functional management processes, there is more contact and orientation with customers, employees are sharing decisions, and a number of successful changes are made.
- *World class.* This is an organization that is characterized by the total integration of quality improvement and business strategy. Communication is integrated horizontally and vertically, management becomes more visionary, customers are satisfied, employees are motivated and involved, and there are structured and focused investment programs in place.

The contribution made at this level is the introduction of the seventh category, "surpetitive," (see Ahmed 2002; Ahmed and Abdalla 2002; Ahmed and Abdalla 1999) and the identified characteristics are highlighted as follows:

- Their recognition of the role innovation plays in their movement forward
- Their emphasis on selecting the unique type of measures to monitor performance
- They have an explicit way in keeping a wide gap to their competitors
- They exploit reward and incentive schemes as a necessary tool to motivate and develop individuals
- Their unique approach to transfer people's knowledge and expertise
- Their emphasis on leadership as a key success factor
- Their emphasis on considering benchmarking as a way of life
- Their emphasis on using their own techniques of utilizing and allocating resources
- Their critical emphasis on stimulating national and overseas investment

Figure 4 RADAR logic (EFQM 1999).



Level Five

The RADAR scoring matrix as depicted in Figure 4, is the evaluation method used to score data in self-assessment against the EFQM excellence model. When an organization is using the RADAR scoring matrix, weights are given to each of the nine criteria of the business excellence model to calculate the number of points awarded.

Level Six

Level six focuses on developing comprehensive sets of guidelines that can be used to help organizations conduct a self-assessment in a more objective way. During the investigation of the collaborators and the documents prepared for the EFQM award submission and through detailed discussions with senior management of these organizations, it became apparent that there are concerns regarding the accuracy of scoring for two reasons. First, the scoring accuracy relies on the opinions and experience of the assessor(s) involved in the self-assessment process. It is argued that multiple criteria decision-making (MCDM) theory considers these opinions as subjective decisions, which carry possibilities of inaccuracy. Second, there are not enough generic guidelines to assist organizations in providing the appropriate evidence to support the EFQM scoring method. The development of such guidelines is important in linking the identified areas for improvement to the action plans of the company.

The contribution of this EPSRC research project at this level is to generate these guidelines as well as decisions decomposing the EFQM model into

Table 1 Guidelines allocated percentages.

Organizational characteristics	Uncommitted	Drifter	Tool pusher	Improver	Award winner	World class	Surpetitive
Guidelines allocated %	0	15	30	50	65	85	100

sub-subcriteria. This decomposition will assist an organization in targeting higher scores for the areas, which are related to its key business activities, and at the same time placing less emphasis on those areas that are not as important to the organization.

Guideline selection

There were two problems facing the authors in deciding which elements to include in the generic guidelines list and what weight should be assigned to each element. EFQM (1999) provided some information about a number of these elements. Others were extracted from various sources, mainly interviews with senior managers and consultants (see Table 1).

Based on this information, the weighting technique was chosen. This technique is discussed in detail later in this article. An illustrative example of the award-winner guidelines for the customer results criteria and leadership sub-subcriteria approach, deployment, assessment, and review is provided in the following sections. An example of surpetitive guidelines is included in Appendix A.

Award winners customer perception measures results

1. Information overview: Provides 65 percent of the holistic picture of the business
2. Trends: Positive and provides 65 percent of the measures required for the relevant approaches and deployment and covers 65 percent of the stakeholders' data
3. Targets: 65 percent of the targets being set and compares with own targets and other external organizations
4. Comparisons: Compares with 65 percent of other industry averages or "best in class"
5. Causes: Cause-and-effect analysis is used in 65 percent of business areas.
6. Scope: Measures 65 percent of the balanced set of factors for now and for the future, and addresses 65 percent of the relevant areas and activities

Award winner leadership sub-subcriteria approach

This covers what an organization plans to do and the reasons for it. In an excellent organization, the approach is well structured, having a clear focus on all existing and potential stakeholder needs; sustainable over the long term; adaptable to changes; and measurable. The approach is integrated with other approaches where appropriate and supporting policy and strategy.

1. Condition/state: The approach to the development of company mission statements, values, and vision covers 65 percent of business areas.
2. Stakeholders' needs: There is a focus by leaders to define and reflect 65 percent of the needs of stakeholders in the company's mission statements, values, and vision.
3. Policy and strategy: The company's mission statements, values, and vision are 65 percent explicitly cited.
4. Integration: The company's mission statements, values, and vision have been integrated 65 percent in relation to other policy or procedures approaches.
5. Innovativeness: The company's mission statements, values, and vision reflect the importance of innovation approaches in 65 percent of the related areas.
6. Sustainability: The company's mission, values, and vision relate to 65 percent of the specific factual information. The basis upon which the mission, vision, and statements were developed is partially clear and as such can be considered as sustainable over four to five years.

7. Flexibility: The company's mission statements, values, and vision reflect and recognize 65 percent of the changes that take place within the company, its major markets, or competition.
8. Measurability: The mission statements, values, and vision provide 65 percent of the current position of the company. More objectivity and measurement elements are included within documentation.

Award winner leadership sub-subcriteria deployment

This covers what an organization does to deploy the approach. In an excellent organization the approach will be implemented to its full potential capability to achieve the planned benefits to meet all stakeholder needs and continuously be measured EFQM (1999).

1. Condition/state: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is carried out in 65 percent of the business areas.
2. Capability: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is implemented to 65 percent of its full potential/capability.
3. Achieved benefits: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is achieving 65 percent of the planned benefits.
4. Systematicality: The deployment of leaders' approach is carried out 65 percent as a systematic process.
5. Implementation perception: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is 65 percent systematic.
6. Stakeholders' acceptability: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is understood and acceptable by 65 percent of stakeholders.
7. Measurability: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is measured in 65 percent of the potential areas across the organization.

Award winner leadership sub-subcriteria assessment and review

This covers what an organization does to assess and review both the approach and the deployment of the approach. In an excellent organization the approach and deployment of it will be subject to regular measurement, learning activities and opportunities will be undertaken, and the output from both will be used to identify, prioritize, plan, and implement improvement.

1. Condition/state: The assessment and review of leaders' approach in terms of developing the company's mission statements, values, and vision is conducted in 65 percent of the business.
2. Learning opportunities: The assessment and review of leaders' approach in terms of developing the company's mission statements, values, and vision is providing 65 percent of learning opportunities.
3. Comparisons: The assessment and review of leaders' approach in terms of developing the company's mission statements, values, and vision is benchmarked with 65 percent of the others, for example, competitors, industry averages, or best in class.
4. Improvement: The assessment and review of leaders' approach in terms of developing the company's mission statements, values, and vision is improving in 65 percent of the areas based on the output from learning and performance measures.

Level Seven

The weights awarded in relation to the guidelines provided in level 6 are calculated in two ways (A and B) as described in the following sections.

Calculation A

This is applied by using the arithmetic average of 100 percent divided by the number of guidelines. For example, in assessing an approach of a company to leaders developing mission statements, values, and vision as discussed in level 6, there are eight guidelines. These include condition/state, stakeholders' needs, policy and strategy, integration, innovativeness, sustainability, flexibility, and measurability. Each is

Table 2 Award-winner guideline weighting using technique A.

Guideline	1	2	3	4	5	6	7	8	100%
Weight	0	12.5	0	0	12.5	12.5	12.5	12.5	***62.5***

Table 3 Award-winner guideline weighting using technique B.

Guideline	1	2	3	4	5	6	7	8
Category	Award winner	Tool pusher	Uncommitted	Award winner	World class	Surpetitive	Award winner	Award winner

Table 4 Weighting calculation B.

Category	Weighting subtotal	Weighting total
Uncommitted	1*12.5	***12.5%***
Drifter	0	***0***
Tool pusher	1*12.5	***12.5%***
Improver	0	***0***
Award winner	4*12.5	***50%***
World class	1*12.5	***12.5%***
Surpetitive	1*12.5	***12.5%***

assigned 12.5 percent of the arithmetic average. If the company presents convincing reasons in terms of evidences, which they have achieved in relation to one of these guideline requirements, a 12.5 percent weight is then awarded accordingly. But if there are no evidences available, then a weight of 0 percent is assigned. Table 2 shows an example of the award-winner category using the calculation A weighting technique.

As demonstrated in this example, 0 weight is given because no evidences are presented, but it is possible that this particular guideline is not relevant to this company situation. Subsequently the total weight will be lower than what this company deserves. This is why calculation A is considered inappropriate to give a fair weight for the individual guidelines, which will have an impact on the accuracy of the final score. To overcome this, the irrelevant guidelines to the company situation can be removed and the arithmetic average is increased accordingly.

This technique also tends to deal only with individual categories (for example, award winner) without considering that companies can be in different categories in their approach of the leaders developing mission statements, values, and vision guidelines. Unfortunately, calculation A cannot provide a solution for this problem.

Calculation B

This technique provides a robust solution to problems associated with technique A. Evidences presented by the company are investigated carefully and classified into seven categories. The number of guidelines divides the arithmetic average of 100 percent equally. Table 3 illustrates an example of the award-winner category using calculation B weighting technique.

Table 4 illustrates the follow-up weighting calculation B for all categories.

CONCLUSIONS

The research findings show the mixed levels of understanding and experience of both business excellence and self-assessment within the collaborating organizations. These organizations are doing self-assessment in different ways and for different reasons. Self-assessment as a process is holistic in nature, and as such will affect the entire structure of the organization. Managers need a structured and regular methodology to follow for self-assessment and cannot just choose to do it on a whim to fill a void or keep directors satisfied. This is a short-term solution and will create a plethora of problems.

Other organizations were obliged to adopt this management technique to gain a competitive edge (be it through identifying areas for improvement and acting upon them, raising public awareness about the company, or preparing for a quality award submission). Some were using self-assessment as a means of coordinating and selling quality initiatives or merely to "keep up with the rest of the crowd." Some had a greater incentive than others to carry out the self-assessment, in the sense that it was believed that their resources were adequate while others were over-extended, and some staff members had their performance in this area linked to financial bonuses.

The general opinion on self-assessment is that it provides a useful tool for measuring organizational performance and identifying areas for improvement. In doing so it facilitates benchmarking internally and externally, provides a common language between those companies employing self-assessment, and prepares an organization for future competition. The self-assessment process, if deployed properly, requires managers and staff alike to assimilate a high level of knowledge, which to a certain extent has to be manipulated to suit the operational environment. The self-assessment process should not necessarily be seen as a technical one, but should not be treated as something simple either. In this respect it deserves as much attention as any other process within the organization's operations. Management must have the imagination, foresight, and capacity to use self-assessment to its full potential, otherwise its use will be restricted. The proposed methodology supported by intelligent decision systems (IDS) will ensure that organizations achieve the full benefits of the self-assessment process in keeping up with the dynamic changes occurring in the marketplace and respond quickly, effectively, and professionally.

REFERENCES

Ahmed, A. M., and H. S. Abdalla. 1999. The role of innovation process in crafting the vision of the future. *International Journal of Computers and Industrial Engineering* 37, no. 1-2: 421-424.

– – –. 2000a. Surpetitive strategy as a portfolio for the next millennium. *International Journal of Human Factors and Ergonomics in Manufacturing* 10, no. 2: 1-22.

– – –. 2000b. Beyond competition: A framework for the next 21st century. *International Journal of Production Research* 38, no. 15: 3677-3709.

– – –. 2002. An intelligent system for performance measurement selection. In *Proceedings of Institution of Mechanical Engineers Part B*, 216: 591-606.

Ahmed, A. M. 2002. Virtual integrated performance measurement. *International Journal of Quality and Reliability* 19, no. 4: 414-441.

Brelin, H. K., K. S. Davenport, L. P. Jennings, and P. E. Murphy. 1995. *Focused quality: Managing for results*. United Kingdom: Kogan Page Ltd.

Clausing, D. 1994. *Total quality development: A step-by-step guide to world-class concurrent engineering*. New York: ASME Press.

Conti, T. 1993. *Building total quality: A guide for management*. London: Chapman & Hall.

Dale, B. G., ed. 1994. Japanese total quality control. In *Managing Quality*, 2nd edition. Englewood Cliffs, N. J.: Prentice Hall.

Dale, B. G., and D. M. Lascelles. 1997. Total quality management adoption: Revisiting the levels. *The TQM Magazine* 9, no. 6: 418-428.

Dale, B. G., and M. Smith. 1997. Spectrum of quality management implementation grid: Development and use. *Managing Services Quality* 7, no. 6: 307-311.

Dale, B. G., D. M. Lascelles, and R. J. Boaden. 1994. Levels of total quality management adoption. In *Managing Quality*, 2nd edition. London: Prentice Hall International.

Dale, B. G. 1999. *Managing Quality*, 3rd edition. Oxford, England: Blackwell.

de Bono, E. 1993. *Surpetition: Going beyond competition*. Glasgow, United Kingdom: Harper Collins Publishers.

EFQM. 1999. *Assessing for excellence: A practical guide for self-assessment*. Brussels, Belgium: Brussels Representative Office.

Feigenbaum, A. V. 1999. The new quality for the twenty-first century. *The TQM Magazine* 11, no. 6: 376-383.

Hakes, C. 2000. *The business excellence handbook*, 5th edition. London: European Quality Publication.

Oakland, J. S. 1993. *Total quality management: The route to improving performance*. United Kingdom: Butterworth Heinemann.

Ritchie, L., and B. G. Dale. 2000a. Self-assessment using the business excellence model: A study of practice and process. *International Journal of Production Economics*, no. 66: 241-254.

– – –. 2000b. An analysis of self-assessment practices using the business excellence model. In *Proceedings of Institution of Mechanical Engineers Part B (IMechE)*, no. 214: 593-602.

Ritter, D. 1993. A tool for improvement using the Baldrige criteria. *National Productivity Review* 12, no. 2: 167-82.

Sayle, A. J. 1988. *Management audit: The assessment of quality systems.* London: McGraw-Hill.

Simon, H. 1977. *The new science of management decisions,* revised edition. Englewood Cliffs, N. J.: Prentice-Hall.

Siow, C. H. R., J. B. Yang, and B. G. Dale. 2001. A new modelling framework for organizational self-assessment: Development and application. *Quality Management Journal* 8, no.4: 34-47.

Wilkinson, A. 1994. Managing human resources for quality. In *Managing Quality,* 2nd edition. edited by B. G. Dale. United Kingdom: Prentice Hall International.

Yang, J. B., and M. G. Singh. 1994. An evidential reasoning approach for multiple attribute decision making with uncertainty. *IEEE Transactions on Systems, Man, and Cybernetics* 24, no. 1: 1-18.

Yang, J. B., and P. Sen. 1994. A general multilevel evaluation process for hyprid MADM with uncertainty. *IEEE Transactions on Systems, Man, and Cybernetics* 24, no. 10: 1458-1473.

Yang, J. B. 2001. Rule and utility based evidential reasoning approach for multiple attribute decision analysis under certainty. *European Journal of Operational Research* 131, no. 1: 31-61.

Yang, J. B., B. G. Dale, and C. H. R. Siow. 2001. Self-assessment of excellence: An application of the evidential reasoning approach. *International Journal of Production Research* 39, no. 16: 3789-3812.

Zink, K. J., R. Hauer, and A. Schmidt. 1992. Quality assessment: Instrument zur analysis von qualitatskonzepten auf der basis von EN 29000, Malcolm Baldrige Award und European Quality Award, part 2. *Qualitat und ZUVERLASSIGKEIT* 37, no. 11: 657-57.

BIOGRAPHIES

A. M. Ahmed is Abu Dhabi Company for Onshore Oil Operations (ADCO) lecturer in total quality management (TQM) based at the European Center for TQM, Bradford University in the United Kingdom. He has a bachelor's degree in industrial engineering, a master's degree in manufacturing management, and a doctorate in a surpetitive framework for world-class manufacturing organizations. He has worked as senior mechanical engineer, line manager superintendent in the automotive industry, and 12 years as managing director for SMEs. He has acted as a consultant for a number of world-class organizations. He can be reached at a.m.ahmed1@bradford.ac.uk.

J. B. Yang is senior lecturer of decision and system sciences in the Manchester School of Management of UMIST. Over the last two decades, Yang has been conducting research in the areas of multiple criteria decision analysis using both quantitative and qualitative information with uncertainties, hybrid decision methodologies combining operational research methods with artificial techniques, multiple objective optimization in engineering and management, intelligent decision support systems, and dynamic system modelling, simulation, and control of engineering and management systems. Yang has published three books and more than 120 papers in national and international journals and conferences.

B. G. Dale is head of the Manchester School of Management of UMIST and United Utilities professor of quality management. After serving an engineering craft apprenticeship, Dale held positions in process and production planning, management services, and industrial engineering. He has written 10 books on total quality management and more than 350 papers on the subject. He is coeditor of the *International Journal of Quality and Reliability Management* and editor of Faculty of Economics, Erasmus University, Rotterdam.

APPENDICES

APPENDIX A: GUIDELINES

Surpetitive Customer Perception Measures Results

1. Information overview: Provides 100 percent of the holistic picture of the business
2. Trends: Positive and provides 100 percent of the measures required for the relevant approaches and deployment, and covers 100 percent of the stakeholders' data
3. Targets: Shows 100 percent of the targets being set and compares with own targets and other external organizations
4. Comparisons: Compares with 100 percent of other industry averages or "best in class"
5. Causes: Cause-and-effect analysis is used in 100 percent of business areas
6. Scope: Measures 100 percent of the balanced set of factors for now and for the future, and addresses 100 percent of the relevant areas and activities

Surpetitive Approach

1. Condition/state: The approach to the development of company's mission, values, and vision contains 100 percent of business areas.
2. Stakeholders' needs: There is a focus by leaders to define and reflect 100 percent of the needs of existing and potential stakeholders in the company's mission statements, values, and vision.
3. Policy and strategy: The company's mission statements, values, and vision are 100 percent explicitly cited.
4. Integration: The company's mission statements, values, and vision have been integrated 100 percent in relation to other policy or procedures' approaches.
5. Innovativeness: The company's mission statements, values, and vision reflect 100 percent commitment to innovation in all relevant areas.
6. Sustainability: The company's mission, values, and vision relate to 65 percent of the specific factual information. The basis upon which the mission, vision, and statements were developed is partially clear and as such can be considered as sustainable over a period of eight years or more.
7. Flexibility: The company mission statements, values, and vision reflect and recognize 100 percent of the changes that take place within the company, its major markets, or competition.
8. Measurability: The mission statements, values, and vision provide 100 percent of the current position of the company. More objectivity and measurement elements are included within documentation.

Surpetitive Deployment

1. Condition/state: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is carried out in 100 percent of the business areas.
2. Capability: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is implemented to 100 percent of its full potential/capability.
3. Achieved benefits: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is achieving 100 percent of the planned benefits.
4. Systematically: The deployment of leaders' approach in developing the company's mission statements, values, and vision is a 100 percent systematic.
5. Implementation perception: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is 100 percent systematic.
6. Stakeholders' acceptability: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is understood and acceptable by 100 percent of stakeholders.
7. Measurability: The deployment of leaders' approach in terms of developing the company's mission statements, values, and vision is measured in 100 percent of the potential areas across the organization.

Surpetitive Assessment and Review

1. Condition/state: The assessment and review of leaders' approach in terms of developing the company's mission statements, values, and vision is conducted in 100 percent of the business.
2. Learning opportunities: The assessment and review of leaders' approach in terms of developing the company's mission statements, values, and vision is providing 100 percent of learning opportunities.

3. Comparison: The assessment and review of leaders' approach in terms of developing the company's mission statements, values, and vision is benchmarked with 100 percent of the others, for example, competitors, industry averages, or best in class.
4. Improvement: The assessment and review of leaders' approach in terms of developing the company's mission statements, values, and vision is improving in 100 percent of the areas based on the output from learning and performance measures.

What is Surpetitive?

Edward de Bono has pointed out that competition is no longer the sole key element for success, as it was once thought. He described it as part of the baseline for survival. However, success requires going beyond competition to surpetition, where the term "surpetitive" comes originally from. Com/petition is a Latin word. It means seeking together or choosing to run in the same race. It is spelled as (com) petition to illustrate that all competitors are running in the same race (the marketplace). But (sur) petition, on the other hand, means seeking above, or instead of choosing to run in the same race, companies have to choose their own race. The slash in the new term sur/petition is there to indicate the notion of seeking above, just as 2/3 indicates two over three.

The major difference between competition and surpetition is in terms of purpose. Competition benefits consumers in two ways: keeping prices down and quality up. It is also important in utilizing resources and encourages enterprise. Surpetition is concerned with how organizations move upward from the baseline of competition. In other words, it is *value driven* (de Bono 1993).

APPENDIX B: EFQM EXCELLENCE MODEL CRITERIA AND SUBCRITERIA

Criteria 1: Leadership

a. Leaders develop the mission, vision, and values and are role models of a culture of excellence.
b. Leaders are personally involved in ensuring the organization's management system is developed, implemented, and continuously improved.
c. Leaders are involved with customers, partners, and representatives of society.
d. Leaders motivate, support, and recognize the organization's people.

Criteria 2: Policy and strategy

a. Policy and strategy are based on the present and future needs and expectations of stakeholders.
b. Policy and strategy are based on information from performance measurement, research, learning, and creativity-related activities.
c. Policy and strategy are developed, reviewed, and updated.
d. Policy and strategy are developed through a framework of key processes.
e. Policy and strategy are communicated and implemented.

Criteria 3: People

a. People resources are planned, managed, and improved.
b. People's knowledge and competencies are identified, developed, and sustained.

c. People are involved and empowered.

d. People and the organization have a dialogue.

e. People are rewarded, recognized, and cared for.

Criteria 4: Partnerships and resources

a. External partnerships are managed.

b. Finances are managed.

c. Buildings, equipment, and materials are managed.

d. Technology is managed.

e. Information and knowledge are managed.

Criteria 5: Processes

a. Processes are systematically designed and managed.

b. Processes are improved, as needed, using innovation in order to fully satisfy and generate increasing value for customers and other stakeholders.

c. Products and services are designed and developed based on customer needs and expectations.

d. Products and services are produced, delivered, and serviced.

e. Customer relationships are managed and enhanced.

Criteria 6: Customer results

a. Perception measures

b. Performance indicators

Criteria 7: People results

a. Perception measures

b. Performance indicators

Criteria 8: Society results

a. Perception measures

b. Performance indicators

Criteria 9: Key performance results

a. Perception measures

b. Performance indicators