

Evaluation of sustainable development using business excellence models in a used motor oil industry

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Received: 17 Jul. 2014, Revised: 20Sep.2014, Accepted: 30 Sep. 2014

ABSTRACT

Business and commerce are a chance to create wealth and economic development in companies and industries. Leader of companies must be containing a sense of relief and hope as one of the factors of production and wealth to enhance trust, cooperation between the organization and the community. In order to achieve at the Business Excellence (BE) is emphasized to the need for the simultaneous measurement of organizational performance on the Critical Success Factors (CSFs), environmental, social issues and challenges. Objective of current study was to evaluate of sustainable development in used motor oil industry using BE models. Therefore, a framework was discussed as distinct from other common practices to measure performance of an industry. The models allow multi-dimensional focuses on different indicators of the organization's internal, external and CSFs. The check list method was used to collect data in site of industry in the present study. Then, obtained results were surveyed by models such as the Malcolm Baldrige National Quality Award (MBNQA), European Federation for Quality Management (EFQM) and Kanji's Business Excellence Model (KBEM). Results of current analyze indicated that despite the fact that these models and approaches are different, but they are same in term of shared concepts. Finally, we can be able to say that the simultaneous implementation of these models and approaches can be a suitable process in the study of sustainable development of organizations. According to the obtained results of models, the case study industry was in sustainable development conditions.

Key words: Sustainable development, Business Excellence Models, Used motor oil industry

INTRODUCTION

Globalization and international competition lead to the introduction of National Quality Awards and their use by a growing number of companies. Looking back on a journey beginning after the World War II in Japan, one can realize that (product) quality is depended on much more than inspection using tools of quality assurance. A management philosophy goes to have to embrace all activities, requirements and expectations of the customers, community and the objectives of the organization. Therefore, this process needs to satisfy in the most efficient and cost effective way of maximizing the potential of all employees in a continuing drive for improvement [1, 2]. Overall success of a company is measured by measuring its economic performance, customer satisfaction and employee, stock prices and the level of responsibility. The balance of the obtained successes and the optimal time of achievements are performed by promoting the development of innovative practices. Successful managers must be aware of the fact that the staffs requirements are constantly

changing. The pace of change is remarkable for innovative employees. Nonetheless, employees increasingly are looking for denote identity and affiliations of their business. Excellent companies are determined for any job a duty until the job incumbent feels the influence and overcome work, undeniable role in achieving the goals of the organization. Nowadays, all organizations are tested with regard to the development, growth and sustainability in competitive performance evaluation systems. Also, they need the order in which the efficiency and effectiveness of programs, processes and human resources [3, 4]. The first condition to improve, and ultimately to achieve OE, is to develop and implement a system of performance measurement criteria that go beyond the presentation of financial figures and incorporate other non-financial success factors. Performance measurement traditionally focuses on the reasons that explain the success or failure from a historical perspective, which is clearly not enough to understand organizational excellence. If we define OE as a means of measuring

customer's, employer's and shareholder's satisfaction simultaneously within an organization in order to obtain a comprehensive evaluation of the organizational performance, it becomes clear that knowing what drives the satisfaction of the key organizational stakeholders is the path that leads to success of a business in the future [5,6].

The use of these models as tools for organizational self-assessment has been increasing in recent years. The concept of excellence was introduced by Peters and Waterman in relation to management and organizational performance when they published their best seller book "In Search of Excellence - Lessons from America's Best-Run Companies" 25 years ago. The use of the EFQM as a framework for organizational self-assessment has spread to many companies in Europe since its introduction in 1992 making it the most popular tool for self-assessment in Europe [6]. The model itself represents a business system comprised of inputs (i.e. shareholder expectations; leadership vision; people, resources and information), processes (i.e. people management, strategy formulation, process management) and outputs (i.e. financial results; customer satisfaction; products and service performance). In the real world, a business needs to be able to adapt to changes in its external environment in order to remain competitive. No organization can survive in splendid isolation. The BE incorporates external influences such as customer, competitor, legislative and societal requirements and encourages organizations to adapt themselves to their environment. A key emphasis in the model is the requirement for a company's responses to be conducted in a systematic manner to optimize performance [7]. The primary reasons for failures (or success) of an industry or company are leadership, management commitment and involvement, established requirement and strategic view. The success of an organization is always reflected on its leader. Therefore, leadership is a critical factor considering the OE as many studies were conducted on this factor. Leadership is considered as the determinant factor for leading organizations towards its goals [8, 9].

Results of studies about higher education institutions in Northern Ireland showed that EFQM in different ways for different purposes are used in an organization may even logic of using this model changed. Senior executives from 40 European companies such as Renault, Fiat, Philips, British Telecom, and

others were built on the EFQM model [10]. EFQM was established by 14 European large companies and was initially developed as a model to underpin the European Quality Award, called European Model BE in 1998. Most European universities have implemented EFQM as the basis for the measurement of their activities. Kanji defines Total Quality Management (TQM) as "a management philosophy that fosters an organizational culture committed to customer satisfaction through continuous improvement" and suggests that its principles have items. Different Quality Assurance models based on the TQM philosophy have been implemented in various countries such as USA, UK, Malaysia and Japan. All models of excellence are derived from TQM [11]. MBNQA is based on "Criteria for Performance Excellence" [12]. Tambi et al. (2008) have proposed that KBEM can be used as a tool for quality review and enhancement of higher education institutions [13]. These excellent models allow any service or department to be measured and scored against the criteria. Scores assign within the context of identified strength and areas of requirement improvement [14]. The main objective of the present study was the evaluation of sustainable development using BE models in used motor oil industry. In the present study were evaluated the factors and performance of industry in the site using the check list options. The models were used to compare and get scores.

METHODS

KBEM framework and organization performance are depending on CSFS. CSFs include the required activities to achieve the both of organizational vision and objectives. Therefore, CSFS are associated with key motors of performance. Figure 1 and 2 show the CSFS. KBEM dedicates to measure the organizational performance of internal stakeholders in various organizations. But Kanji Business Score (KBS) investigates organizational performance in term of external stakeholders. In the current study, these KBEMS values were calculated using equations 1 to 3 [15, 16].

$$OPI = \frac{A + B}{2} * 10 \quad (1)$$

$$KBEMS = A + B \quad (2)$$

$$B = \frac{\sum BI}{N} \quad (3)$$

In these equations, OPI is the final outcome of overall excellence of the organization in managing all CSFS. KBS is used to analyze various stakeholders using equation 3, that means there are N various scores for B

(government, customers, suppliers and etc.). Therefore, KBEMS is equal with performance excellence A+ Performance excellence B (Figure 1 and 2) [16].

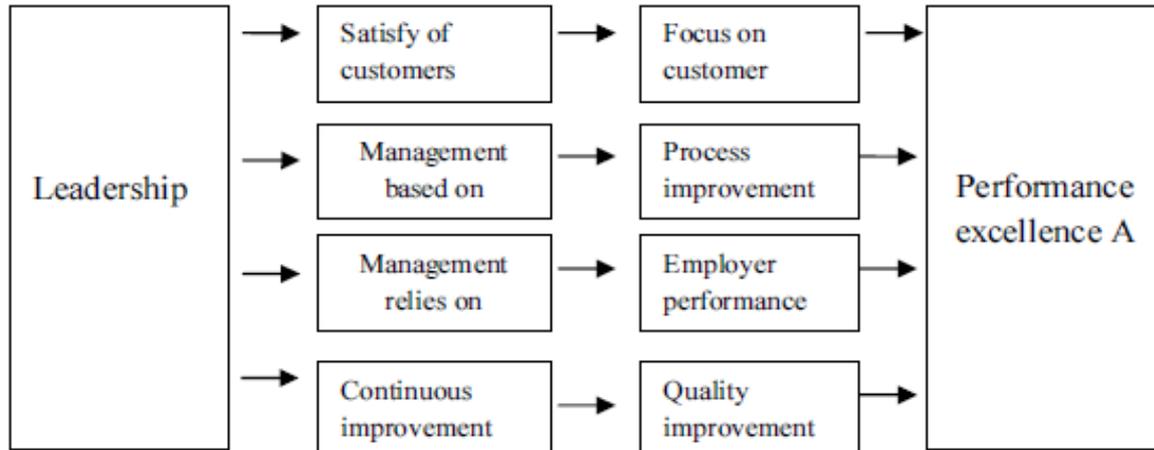


Fig. 1: Kanji Business Excellence Model (KBEM)

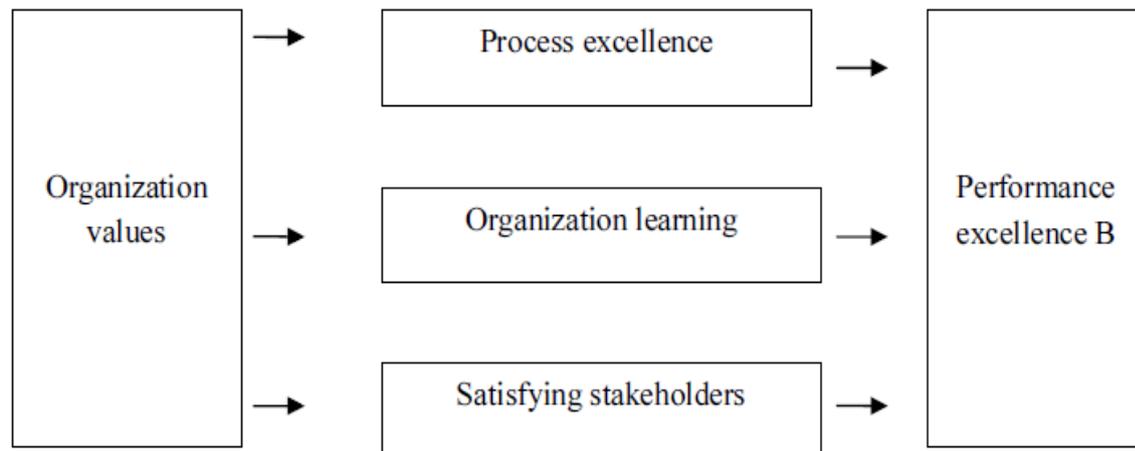


Fig.2: Kanji Business Score (KBS)

RESULTS AND DISCUSSION

BE or OE, within the context of TQM, may be described as an outstanding practice in managing the organization and achieving results based on fundamental TQM principles. Many models have been developed to measure the BE. Major BE models are the both of MBNQA and EFQM (Table 1). The EFQM is a non-prescriptive of TQM framework based on nine criteria. Five of them are 'Enablers' covering what an organization does and four of them are 'Results' caused by 'Enablers' and the feedback from results contribute to improving the 'Enablers' (Table 1). The EFQM has been compiled based on the assumption that excellence is achieved through leadership driving policy and strategy that are delivered through people, partnership, resources and

processes. The literature used in this model with the key elements TQM is in full agreement. There are important similar concepts between main models of BE in term of factors (Table 1) such as leadership, management and human resource development, processes management, training and learning. KBEM has no strategic planning criteria. These two models of KBEM and MBNQA have compatibility together. Various factors of the MBNQA have been covered in the framework of leadership factor of the KBEM. Measurement, analysis and knowledge management category of MBNQA 2007 examines how an organization selects, gathers, analyzes, manages, and improves its data, information, and knowledge assets and how it manages its information technology. The category also examines how an organization review and user review to improve its performance. Many factors of the

EFQM are same with KBEM. Table 1 shows comparison of models criteria's [17, 18].

The framework of two models of EFQM and MBNQA is depending on the scientific approaches based on identification and validation of the CSFS. Also, these frameworks have been achieved using integrated results and evidence of previous successful experiences. These approaches are not depending on the discipline empirical evidences. However, the KBEM has a major effect on organizational performance using accurate simulation of vital dimensions. KBEM can set up as an accurate methodology in order to estimate interactions among key motivations of performance [19]. Table 2 explains some concepts of models [20, 21].

There are several views in order to evaluate a company in term of BE. Numerous models have quality or quantity content. The check list method is used to cover all factors in the current study. Therefore, in quality view is used from equations. The objective of this

evaluation was to present a perspective from strength and weakness points and areas which need to improve in industry. In order to study different factors together are used from multiple weighting systems. That is why, a network of comparison scores is used (Table 3). Every one of KBEM factors has a worth equal with 50 scores in EFQM. Therefore, sum scores of factors were obtained about 900 scores in EFQM. Every one of the criteria of the EFQM must be matched with more than one dimension of KBEM [21, 22].

Figure 3 shows diagram of used motor oil industry as a case study (Baharan Shimi industry) in Iran. There were 27 staffs in site of the industry including a director, an engineer, a technician, laborers and etc. The check list was completed for them and other performance and properties. Table 4 shows results of the completed check list as comparison of scores system [22].

Table 1: Comparison of models criterias

KBEM (Full model)	EFQM	MBNQA	TQM
Leadership	Leadership	Leadership	Management and leadership
Satisfy of customers	Policy and strategy	Policy and strategy	Customer focus
Satisfy the external customers	Employees	Focus on market and customer	Information and analysis
Satisfy the internal customers	Resources and partnership	Information and analysis	Training
Fact-based management	process	Management and human resource development	Supplier management
Process	Customer results	Processes management	Strategic planning
Measurement	Employees results	Business results	Employee involvement
Management relies on employees	Community results		Human resource management
Team work	Key performance results		Teamwork
Employees make quality			Product and service design
Continuous improvement			Process control
Continuous improvement cycle			Benchmarking
Prevention			Continuous improvement
			Employee empowerment
			Quality assurance
			Social responsibility
			Employee satisfaction

Table 2: Explain some concepts of models

Factors	Description
Leadership	<ol style="list-style-type: none"> 1- Higher management actively directs our quality management program. 2- Managers actively communicate a quality commitment to the employees. 3- Employees are encouraged to help implement changes in the organization. 4- Managers and supervisors allow employees to make their own decisions. 5- Managers and supervisors motivate their employees and help them perform at a high level in their tasks.
Quality planning	<ol style="list-style-type: none"> 1- Development and implementation of strategies and plans based on data concerning, customers' requirements and the firm's capabilities. 2- The management sets objectives for managers. 3- The management sets objectives for all employees. 4- The management communicates its strategy and objectives to the whole staff. 5- Management involves the employees in the setting of its objectives and plans. 6- Results are evaluated by comparing them to planned results, in order to make improvements.
Employee management	<ol style="list-style-type: none"> 1- Training management in quality principles. 2- Training employees in quality principles. 3- Training employees in problem-solving skills. 4- Training in teamwork. 5- Employees' performance is measured in order to support quality programs. 6- There is bottom-up, top-down and horizontal communication among all the staff.
Suppliers of management	<ol style="list-style-type: none"> 1- Closer work with suppliers 2- Requirements are place upon suppliers in order to find quality specifications. 3- The management encourages the usage of few suppliers, emphasizing quality rather than price.
Customer focus	<ol style="list-style-type: none"> 1- Increased personal contacts between the organization and customers. 2- Customers' requirements are use as the basis for quality. 3- Managers and supervisors support activities improving customer satisfaction.
Process management	<ol style="list-style-type: none"> 1- Continuous control and improvement of key processes. 2- Preventing faulty products/services is a strong practice 3- quality measures 4- Employees have to know how to evaluate the different processes
Continuous improvement	<ol style="list-style-type: none"> 1- Program at finding time and cost losses in all internal processes. 2- This organization reinforces continuous study and improvement of all its products, services and processes. 3- Use of specific organizational structures (quality committee, work teams) to support quality improvement. 4- Identification of areas to improvement. 5- Information management to support quality management (analysis of data regarding, business performance, cost and financial aspects in order to support the development of improvement priorities).
Learning	<ol style="list-style-type: none"> 1- Managers and supervisors declared that all employees are train to help them understand how and why the organization performs. 2- Most employees had sufficient knowledge of the basic aspects of their sector. 3- Most employees understand the basic processes used to create products / services. 4- Higher management has developed an environment helping towards on-the-job training. 5- Managers and supervisors participate in specialist training.
Customer satisfaction	<ol style="list-style-type: none"> 1- This organization is not concerned about collecting information from its customers in order to measure their satisfaction. 2- Customer satisfaction has historically shown improvements. 3- This organization has implemented a process to listen to and solve customer complaints
Policy and strategy	<ol style="list-style-type: none"> 1- Policy and strategy are based on the present and future needs and expectations of stakeholders. 2- Policy and strategy are based on information from performance measurement, research, learning and creativity related activities. 3- Policy and strategy are developed, reviewed, updated and deployed through a framework of key processes. 4- Policy and strategy are communicated and implemented.
Partnerships and resources	<ol style="list-style-type: none"> 1- External partnerships are managed. 2- Finances are managed 3- Buildings, equipment and materials are managed. 4- Technology is managed. 5- Information and knowledge are managed.
Processes	<ol style="list-style-type: none"> 1- Processes are systematically designed and managed. 2- Processes are improved, as needed, using innovation in order to fully satisfy and generate increasing value for customers and other stakeholders. 3- Products and services are designed and developed based on customer requirements and expectations. 4- Products and services are produced, delivered and serviced. 5- Customer relationships are managed and enhanced.
Customer results	<ol style="list-style-type: none"> 1- Increased satisfaction 2- Increased loyalty 3- Improved quality 4- Reduced complaints
People results	<ol style="list-style-type: none"> 1- Increased engagement 2- Training delivery 3- Increased productivity
Society results	<ol style="list-style-type: none"> 1- Reduced waste 2- Reduced energy

Table 3: Network of comparison scores

EFQM	KBEM	SCORE (UP TO)
Leadership	Leadership (60%)	60
	Satisfy of customers (10%)	10
	Fact-based management (10%)	10
	Management relies on employees (10%)	10
	Continuous improvement (10%)	10
Policy and strategy	100%	100
	Leadership (30%)	30
	Fact-based management (20%)	20
	Satisfy of customers (20%)	20
	Management relies on employees (20%)	20
Employees	Continuous improvement (10%)	10
	100%	100
	Management relies on employees (40%)	40
	Employees create quality (50%)	50
Resources and partnership	Continuous improvement (10%)	10
	100%	100
	Team work (50%)	50
	Measurement (50%)	50
process	100%	100
	Process or total work (50%)	50
	Fact-based management (40%)	40
	Continuous improvement (10%)	10
Employees results	100%	100
	Satisfy of customers (50%)	50
	Satisfy the external customers (25%)	25
	Satisfy the internal customers (25%)	25
Employees results	100%	100
	Prevention (50%)	50
	Management relies on employees (30%)	30
	Continuous improvement cycle (20%)	20
Community results	100%	100
	Satisfy the external customers (25%)	25
	Satisfy the internal customers (25%)	25
	Satisfy of customers (20%)	20
	Leadership (10%)	10
Key performance results	Continuous improvement (20%)	20
	100%	100
	Fact-based management (30%)	30
	Continuous improvement (40%)	40
	Continuous improvement cycle (30%)	30
	100%	100

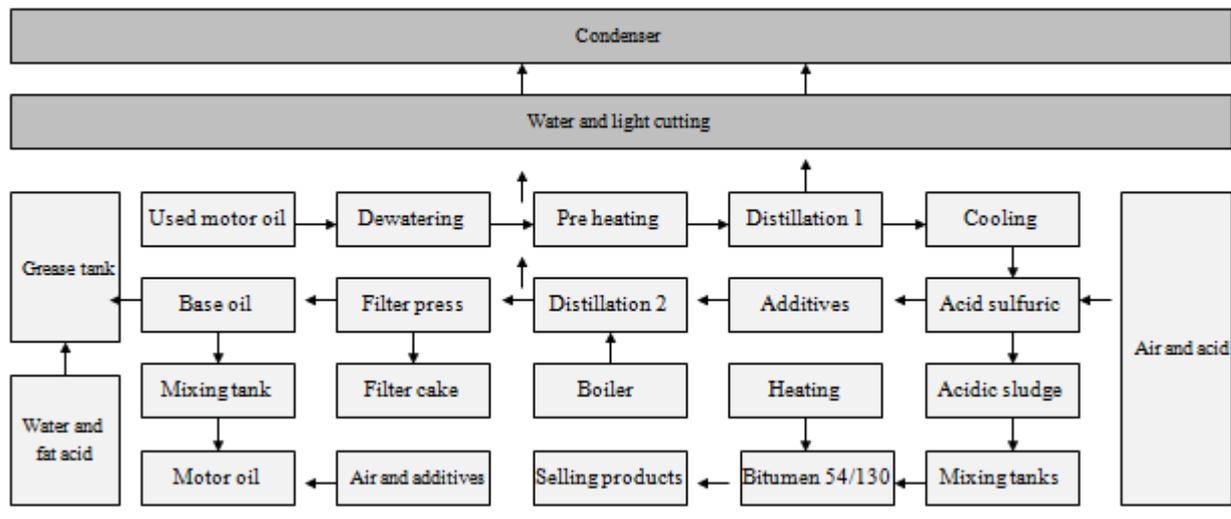


Fig.3: Diagram of used motor oil reprocessing industry

Table 4: Comparison of scores system in used motor oil industry

KBEM		EFQM	
Criteria	Score	Criteria	Scores
Leadership	90.33	Leadership	90.55
Satisfy the citizen and customers	77.5	Policy and strategy	87.7
Satisfy the external customers	60	Employees	85.83
Satisfy the internal customers	60	Resources and partnership	90
Fact-based management	74.16	process	81.66
Process or total work	80	Customer results	78.33
Measurement	60	Employees results	73.88
Management relies on employees	70.41	Community results	70
Team work	98	Key performance results	49.42
Employees make quality	70		
Continuous improvement	70.4		
Continuous improvement cycle	70.8		
Prevention	80		
Performance excellence index or OPI	768.2	Business excellence score or OPI	806.77

Based on quality assurance view-point the management can be defined as a tool required for leadership to cope with the complex changes. EFQM provides a strong tool to help leadership to drive changes. EFQM self-assessment focuses on strength and weaknesses areas to improvement. The study of Amiri showed that these two factors of the

focus on the customer and social results are strength points but process management, resources and partnership the weakness points in a case study of a hospital. These weakness points need to boost and improve [23]. Table 5 shows the results case study of Amiri, in a hospital.

Table 5: Results of case study of Amiri in a hospital

KBEM		EFQM	
Criteria	Score	Criteria	Score
Leadership	63.4	Leadership	63.9
Satisfy the citizen and customers	70.5	Policy and strategy	64.2
Satisfy the external customers	64.6	Employees	62
Satisfy the internal customers	68.3	Resources and partnership	57.3
Fact-based management	59	process	59.9
Process or total work	59.2	Customer results	68.5
Measurement	48.4	Employees results	63.1
Management relies on employees	62.7	Community results	67.1
Team work	66.2	Key performance results	63.3
Employees make quality	60.3	-	-
Continuous improvement	67	-	-
Continuous improvement cycle	62.8	-	-
Prevention	63.5	-	-
Performance excellence index	744	Business excellence score	633

The EFQM concentrates on mission definition, the leadership and processes which are shared between the core activities of higher education. The study of Arjomandi *et al.*, using EFQM showed that the core activities of universities are all intertwined and so the implementation of policies and methods will guarantee the quality of all aspects of activities in higher education quality assessment [24]. Tambi has proposed the application of KBEM with a dedicated measurement instrument that was subjected to some standard statistical and mathematical techniques such as structural equations modeling partial least squares method and the transportation problem. The analysis returns value of path coefficients of causal relationships and performance indices of CSFS and BE. The KBEM had proven to be capable of prescribing improved index values and their corresponding performance indicators, i.e. measurement items. Thus, it is

suggested that the KBEM be used as a tool for quality improvement and review of higher education institutions [25]. The study of Dahlgaard-Park, to elaborate, interpret, discuss and decode excellence in a new way by focusing on some of the CSFS for Attaining and sustaining excellence showed that the findings will have a great value for researchers and for practitioners as well as organizations which are trying to attain excellence [26]. The study of Baidoun, presented that the results of a questionnaire survey to investigate factors of quality that are absolutely necessary TQM for successful implementation in Palestinian organizations. This study was carried out using of a possible list of 78 names of organizations, 78 were targeted, with 78 usable questionnaires. The results showed a response rate of 100 percent. The analysis led to the development of a criticality quality factor structure, comprising

19 factors sorted in descending order of criticality through three tiers [27].

The results study of Gopal *et al.*, based on the relationships between supply chain management and TQM has reported that the KBEM provided a good fit for the supply chain activities in 139 companies in Hong Kong [28]. The survey Tutuncu *et al.* showed that the relationship between organizational commitment and EFQM was significant in Meyer & Allen's Organizational Commitment scale. Findings suggested that leadership, partnership and resources, policy and strategy, affective commitment, processes, results, people development, involvement and continuance commitment were the determinants of organizational commitment and EFQM respectively [29]. The study of Hendrics, between 600 companies contains award and selected companies from the same industry, no significant differences in financial results were found in the implementation period (5 years before the award). During the post implementation period (5 years after the award was given) differences between the two groups of companies became bigger and bigger on several financial results. These 600 companies contain award experienced 1 year after the award of a further 8% mean increase in sales revenues, which increased to 17%, 3 years after the award, and 77%, 5 years after the award. The companies contain award showed further 5 years after the award a higher mean increase of 18% in operating income, 40% in total assets, and a 4.4% further reduction in cost over sales in North America [30, 31, and 32]. These results of studies are in good agreement with the findings of the present study.

CONCLUSION

KBEMS had a higher degree of integration and provided precedents. Also, it is used as a very detailed methodology for estimating the total parameters of the model simultaneously. The system was holistic and inclusive. Leadership had a key element of continuity in TQM and OE. These models were enabled to determine the strength and weakness points to improve. The objective of using models was present a realistic strategy for continuous improvement and sustainable development. Obtained result indicated that the case study industry was in sustainable development conditions.

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