

The Effect of TQM on the Balanced Performance

Khleef A. Al-Khawaldeh and Majed S. Smadi

ABSTRACT

Total Quality Management (TQM) has become a part of business thinking and a managerial paradigm in the last two decades. Business firms attempt to improve their competitiveness through improving their performance. The purpose of this study is to investigate whether this in fact the case. The effect of TQM on performance has been extensively analyzed by researchers, but this sort of research has usually been biased to financial performance measures, which are insufficient to measure and integrate all factors that are significant for the success of the firm.

This study aimed to investigate the impact of TQM adoption on balanced performance as recently defined by the methodology of balanced scorecard and lagging factors of Baldrige Award (overall business results). To achieve this objective, a sample of (300) firms from Dubai manufacturing firms were selected to fill the developed questionnaire. About 42% of the distributed questionnaires were collected and subjected to statistical analysis. Results revealed that 71.5% of the variation in firms' balanced performance (as measured by financial performance, operational performance, customer satisfaction and employee satisfaction) is due to the application of all TQM constructs. These results support the proposition that TQM implementation leads to better performance in the manufacturing sector.

KEYWORDS: Total quality management, Performance, Balanced scorecard, Manufacturing firms.

1. INTRODUCTION

The relationship between TQM initiatives and improved performance is frequently discussed. Some studies have documented the success and failure of TQM practices in manufacturing and service sector (Powell, 1995; Adam et al., 1997; and Leal, 1997). Also, other studies have shown both the positive and negative associations of TQM practices and business performance in manufacturing sector (Adam, 1994; and Martenez, 1996).

TQM advocates claim that TQM generates improved products and services, reduced costs, increased satisfied customers and employees and improved bottom line

financial performance (Adam et al., 1997). On the other hand, other researchers such as Fisher (1992) and Eskildson (1995) have identified critics to this philosophy according to significant costs – such as excessive retraining costs, consumption of management time, increase of paperwork and formality, unrealistic employee commitment levels and other implementation obstacles.

Some of the studies in this field utilized quality awards such as Malcolm Baldrige National Award (Ittner and Larcker, 1996 and Terziovski et al., 1997), others used few quality constructs such as employee empowerment, customer focus, top management commitment and training to assess firm's efforts and practices of TQM (Adam, 1994 and Al-Madhoon, 1998). Measuring performance is mainly focused on a narrow perspective of financial measures such as revenues and

return on investment (Aloush, 1997 and Lukashah, 2002). Depending on firms' financial statements has many limitations due to the differences between capital structure of firms, depreciation accounting conventions and sometimes anonymity of such confidential information. This indicates the absence of uniform measure of performance. Different researchers adopted different indicators for measuring overall business performance. So far, no uniform measures have existed. Therefore, the constructs of balanced business performance are developed according to the core concepts of balanced scorecard approach and the criteria of Baldrige Award focusing on lagging factors.

Significance of the Study

The study gains its significance on the theoretical level from the fact that it focuses attention on a vital field of management which has witnessed a remarkable spread during the last decade and became part of the business thinking. The study will try to develop a systematic approach of evaluating the link between TQM implementation and organizational performance which may bridge the gap between literature and managerial practices. Also, it represents some managerial and organizational variables which may be considered critical in implementing TQM and achieving organizational performance in the developing countries' environment.

On the practical level, it will investigate the impact of TQM on the organizational performance. If performance outcome is influenced by the dimensions of TQM, then it is important to identify those dimensions which may help managers to recognize skills and demands required for effective TQM implementation. This study will contribute to quality management research. It will reinforce some of the results obtained in similar investigations carried out in other places. It also examines the relationship with different types of measurements of performance in greater depth.

2. THEORETICAL BACKGROUND

As early as 1983, Kaplan wrote about how organizations could measure their performance. He

argued that the missing measurements are of the non financial types. Examples of missing measurements would be those connected to long term competitive power and profitability (Cooper and Kaplan, 1988). However, measurement of performance in operation, besides monetary measurements, reached its break through at the end of 1990s. Ghayalini and Noble (1996) stated that the literature concerning performance measurement has had two main phases. The first phase began in the late 1880s and went through the 1980s. In this phase, the firms focused on the financial measures to control, monitor and improve their activities. However, in today's competitive conditions and production management techniques and philosophies, traditional performance measurement systems based on financial measures are not sufficient and appropriate to evaluate the performance of the firms. Neely et al. (1995) stated that lean production is imposing changes on the performance measurement systems too. With the changes in the production techniques quality, flexible and lead time became as important as cost (Ghalayini and Noble, 1996; and Ghalayini et al., 1997).

As stated, in today's conditions, firms must evaluate their performance in the terms of satisfaction of customer, quality, flexible and innovation. However, traditional performance measurement systems are not able to measure these strategic objectives (Manoochehri, 1999). In addition to these limitations of traditional performance measurement systems, it must be considered that, shortening the time of supply chain and adapting to the production planning have got important roles in the success of the firms but these success factors cannot be easily evaluated with financial measures (Ghalayini et al., 1997). In spite of these limitations of traditional performance measurement, one of the important disadvantages of non-traditional performance measurement is that there are so many non- financial measures that can be used in firms and so that the firms may face difficulties while determining non-financial measures (Medori and Steple, 2000).

The Balanced Scorecard (BSC) reflects the need for a balance between short and long time horizon for goals, between financial and non-financial measure parameter,

between lag and lead indicators and between internal and external perspectives (Kaplan and Norton, 1996). Kaplan and Norton distinguish between lead and lag indicators, performance drivers and outcome measures, i.e. between measures which provide an early warning and those which register the effects after the facts.

The tool is developed through research projects conducted by Kaplan and Norton (1992), where the term Balanced Scorecard is used for the first time. However, also similar models to Kaplan and Norton's were presented. The basic idea is to align financial measures and the non financial operative measures together in a balanced presentation. This shall empower management to overview the current situation. The concept is based upon four basic perspectives (details are available at: www.balancedscorecard.org). The four BSC Perspectives are:

- Financial perspective: Measures the ultimate results that the business provides to its shareholders. This includes profitability, revenue growth, return on investment, economic value added and shareholder value.
- Internal perspective: Focuses attention on the performance of the key internal processes that drive the business. This includes such measures as quality levels, productivity, cycle time and cost.
- Customer perspective: Focuses on customer's needs and satisfaction. This includes service levels, satisfaction ratings and repeat business.
- Innovation and learning perspective: Directs attention to the basis of a future success – the organization people and infrastructure. Key measures might include intellectual assets, employee satisfaction, market innovation and skills development.

The Malcolm Baldrige National Quality Award model provides firms with a means to measure their position against a set of universal criteria, and to identify their strengths and weaknesses in the areas of quality management practices and business results. In its seventh criterion, this award provides a similar, though slightly different framework as the balanced scorecard. This

criterion is classified into five major categories:

- Customer
- Financial and market
- Human resource
- Supplier and partner performance
- Organizational effectiveness

Basically, the difference between the Kaplan-Norton framework and the Baldrige Award criteria is a matter of semantics; the internal perspective includes most of the measures from Baldrige organizational effectiveness item, while innovation and learning encompass human resources measures. In both models, the focus is on a set of measures that provides a comprehensive perspective on organizational performance, and any measure an organization might use can be assigned to an appropriate category in either framework.

3. LITERATURE REVIEW

Ebrahimpour and Johnson (1992) investigated 222 American and Japanese manufacturing companies to find impact of TQM on operational and financial performance. Empirical results showed positive effects in Japanese companies while no significant relations in American companies. A study conducted by Flynn et al. (1994) on 42 American manufacturing plants revealed a positive relation between quality management dimensions and operational performance. Similar results were also found in a study of Adam (1994) who found significant relations between quality management dimensions and operational and financial performance in 187 American manufacturing companies.

Powell (1995) investigated 54 American manufacturing and service firms using twelve quality management dimensions and demonstrated that financial performance is positively correlated with intangible quality dimensions. In Italy, Forza (1995) found positive relationships between quality management practices and operational performance in a study carried out on 34 manufacturing plants. Another study by Ittner and Larcker (1996) on a sample of 299 companies from Canada, USA and Japan found no association between quality management factors and operational and financial performance.

Table 1.: Population and Sample according to Categories.

	CATEGORY	Pop.	Sam.
1	Food and Beverage and Tobacco	186	37
2	Textiles, Leather and Ready-made Garment	76	15
3	Wood, Wooden Product and Furniture	181	20
4	Paper , Paper products ,Printing and Publishing	102	20
5	Chemicals ,Petroleum ,Coal, Rubber and Plastic	181	35
6	Non-metal Mineral Products	148	30
7	Basic Metal Ind.	34	7
8	Metal Products ,Machinery and Equipment	653	130
9	Other Manufacturing Ind.	23	6
	TOTAL	1584	300

Table 2.: Characteristics of the Sample.

Establishment Year	2004-1994	1994-1984	1984-1974	<1974
Frequency	48	26	39	13
Capital Investment (M \$)	>5M\$	3-5 M\$	1-3 M\$	<1M\$
Frequency	39	49	26	12
Number of Employees	>150	100-150	50-100	<50
Frequency	37	40	34	15

Martinez (1996) who investigated 217 Spanish manufacturing plants found some positive cases between quality management as measured by one quality management index and operational and financial performance. Another study in Spain was carried out by Leal (1997) on 113 Spanish manufacturing and service companies who found no significant relationship between quality management dimensions and financial performance.

Terziovski et al. (1997) studied 1341 manufacturing firms in Australia and Newzeland using ISO 9000 certification as TQM indicator and operational and financial performance. Empirical results of this study showed negative relationship between TQM indicator and performance. Aloush (1997) identified the relationship between TQM and achievement in Jordanian chemical manufacturing firms and found that there is no difference in the degree of implementation of TQM among the investigated sample, no effect on achievement as measured by the Return On Investment (ROI).

Samson and Terziovski (1999) studied 1024 manufacturing firms in Australia and Newzeland extending TQM dimension to six and performance as measured by operational performance, customer's satisfaction and employee satisfaction. They found that three dimensions were positively related (leadership, human resources and customer focus), the rest are not related. In order to eliminate the limitations of the traditional performance measurement systems, new performance measurement frameworks were proposed. These performance measurement frameworks are multi-dimensional and focus on non-financial measures in addition to financial measures. The main objective of designing these performance measurement systems is to balance the measures that provide information about the future performance of the firms and to determine external success as well as internal success (Bourne et al., 2000).

Jordanian banking sector is also examined by Belbessi (2000) throughout a study aimed at identifying the

relationship between the elements of TQM and performance of these banks. The study revealed that commercial banks adopt TQM in all its elements and these elements combined affect towards improving institutional performance as measured by profitability. In a study on Jordanian insurance companies, Lukashah (2002) explored the extent to which TQM is implemented in the insurance sector and associated TQM variables with competitiveness as measured by (ROI) and market share. The study advised policy makers in insurance companies to be aware of TQM elements and pay more attention to satisfy customers. Empirical results of this study showed no effect of TQM variables on (ROI) but a significant one on market share.

As can be seen from the literature review TQM impact on business, performance remains unclear and under examination, and there is still disagreement concerning the effectiveness of TQM. Different methodologies utilized by studies to measure both TQM constructs and performance constructs. So far no uniform measures have existed.

4. HYPOTHESES AND OPERATIONAL DEFINITIONS

Hypotheses

Based on the discussion above, it is interesting to find out whether TQM creates value in terms of organizational performance.

Main Hypothesis:

Ho: There are no significant effects of TQM implementation on the balanced performance.

Sub-Hypotheses:

Ho-1: There are no significant effects of Continuous Improvement (CI) on balanced performance.

Ho-2: There are no significant effects of Vision and Plan Statement (VPS) on balanced performance.

Ho-3: There are no significant effects of Customer Focus (CF) on balanced performance.

Ho-4: There are no significant effects of Leadership (L) on balanced performance.

Ho-5: There are no significant effects of Employee Empowerment (EE) on balanced performance.

Ho-6: There are no significant effects of Zero Defect Mentality (ZDM) on balanced performance.

Ho-7: There are no significant effects of Benchmarking (B) on balanced performance.

Ho-8: There are no significant effects of Flexible Manufacturing (FM) on balanced performance.

Ho-9: There are no significant effects of Evaluation And Measurements (EAM) on balanced performance.

Ho-10: There are no significant effects of Education And Training (EAT) on balanced performance.

Operational Definitions

TQM: TQM is an approach to doing business that attempts to maximize the competitiveness of an organization through the continual improvement of the quality of its products, services, people, processes and environment (Goetsch and Davis, 2006). TQM is measured through the extent to which firms are setting vision and plan statement focusing on customer, leading toward employee empowerment, zero defect mentality, benchmarking best practices, adopting flexible manufacturing, institutionalizing evaluation and measurements, and education and training.

Balanced Performance: Is a systematic process in place for managing the evaluation of firms' outcomes throughout balancing financial, operational, customer and employee perspectives. This definition is adopted according to Kaplan and Norton (1996) who defined performance measurement system as the ability to promote integration between the various areas of the business results. The balanced performance is measured by the following measures:

- **Financial Performance:** Financial performance is measured through annual sales, sales growth, profits, market share, and exports.

- **Operational Performance:** For the operational performance measure, Corbett and Van Wassenhove's model (1993) has been adopted which considers the

measurements of the performance in three dimensions (cost, quality and time). This is measured by productive hours in relation to the total numbers of hours of direct workforce, percentage of defective products in process, punctual delivery dates from the moment the material is received to the moment the product is delivered to customer, innovations like the increasing of new products, new patents and so on and the rate of inventory turns.

- **Customer Satisfaction:** Customer satisfaction is defined as the degree to which a firm's customers continually perceive that their needs are being met by the firm's products and services (Anderson *et al.*, 1994). This is measured through: firm's responses to customers' claims, complaints and repeat business, providing a clean and comfortable customer reception area, and providing at least one means for hearing the voice of customer "such as hotline, toll- free telephone, report cards,...).

- **Employee Satisfaction:** Employee satisfaction is defined as the degree to which employees like their jobs (Spector, 1997 and Lam, 1995). This is measured through: working environment, time needed to resolve employee complaints, and participation in decision making which results in a high degree of employee morale and decrease in absenteeism percentage and turnover.

5. METHODOLOGY

TQM constructs were developed according to the contributions of Deming, Juran, Crosby, Feigenbaum and Ishikawa, the national and international excellence awards that provide a useful audit framework against which firms can evaluate their TQM implementation practices and the contribution of Saraph *et al.* (1989); Flynn *et al.* (1994); and Ahire *et al.* (1996).

An instrument consists of three parts written in the form of statements to which respondents responded using a 5-point Likert-type scale (ranging from (1) never true to (5) always true): the first part measures organizational characteristics of participants. The second part of the instrument is utilized to measure the constructs of TQM [independent variables: Continuous Improvement (CI), Vision and Plan Statement (VPS), Customer Focus (CF), Leadership (L), Employee Empowerment (EE), Zero

Defect Mentality (ZDM), Benchmarking (B), Flexible Manufacturing (FM), Evaluation And Measurements (EAM), Education And Training (EAT)]. The third part measures balanced performance [dependent variables: operational performance, financial performance, customer satisfaction and employee satisfaction].

Variables with composite measures were evaluated for their internal consistency through the Cronbach's Alpha measure. The higher the Cronbach's Alpha value, the greater is the internal consistency of the items making up a composite measure (Litwin, 1995). Reliabilities less than (0.60) are generally considered poor, within (0.70) range acceptable and those (0.80) and above are good (Nunnally, 1967). The Alpha's for the constructs as follows: CI (0.86), VPS (0.82), CF (0.85), L (0.82), EE (0.71), ZDM (0.77), B (0.88), FM (0.73), EAM (0.85), and EAT (0.79). Therefore, the reliability of the questionnaire is acceptable.

Population and Sample

The target population of this study consists of all manufacturing firms working in Dubai -UAE registered in Economic Development Department (EDD) and Dubai Chamber of Commerce and Industry according to the latest published records in 2004 with a total number of (1584) firms. These firms are located in Ras Al Khor Industrial Area, Al -Quoz Industrial Area, Al Safa Area, Al Khubaisi Area, Um-Ramool Industrial Area, Al-Qusais Industrial Area and Jebel Ali Industrial Area. A stratified proportional-random sample of (300) firms representing (20%) of the whole population constitutes the sample of the empirical study. The selected size of sample satisfies the statistical requirements of the representative sample (Berenson *et al.*, 2003). The unit of analysis in this study is the firm. The distribution of the population and sample is shown in Table (1).

Results of Statistical Analysis and Hypotheses Tests

Table (2) shows the characteristics of the sample according to their rigor (establishment date), capital investment in million dollars and their size (number of employees). To test whether data are normally distributed,

Table 3.: K-S Test Results.

Construct	mean	s.d.	absolute	+ dev.	- dev.	(K-S)	p
Vision & plan statement	3.87	.67	.032	.149	-1.88	2.55	0.000
Leadership	3.95	1.26	.137	.098	-.841	2.08	0.000
Customer focus	2.45	.89	.106	.100	-0.116	3.58	0.002
Education & Training	3.32	1.66	.122	.933	-.811	3.46	0.002
Continuous improvement	3.43	.94	.171	.010	-.180	1.882	0.000
Evaluation and measurements	2.94	1.81	.048	.152	-0.165	2.71	0.003
Zero defect mentality	3.43	1.22	.149	.139	-.176	2.655	0.000
Employee empowerment	3.98	.91	.019	.075	-.017	1.77	0.000
Benchmarking	2.34	1.01	.098	.123	-0.131	2.64	0.007
Flexible manufacturing	4.05	.38	.124	.132	-.039	2.54	0.000
Operational perspective	4.02	.574	.105	.099	-.129	2.71	0.000
Employee perspective	3.98	.3817	.0481	.152	-.165	1.55	0.0003
Customer perspective	3.56	.499	.137	.098	-.884	2.64	0.0006
Financial perspective	2.98	1.20	.180	.790	-.610	2.22	0.000

Table 4.: Multicollinearity Test for Independent Variables.

Construct	1	2	3	4	5	6	7	8	9	10
1-Vision statement	1									
2-Leadership	.074	1								
3-Customer focus	.118	.371	1							
4-Education and Training	.232	.214	.310	1						
5-Continuous improvement.	.378	.401	.219	.211	1					
6-Evaluation and measurements	.094	.288	.190	.138	.210	1				
7-Zero defect mentality	.183	.078	.273	.111	.312	.159	1			
8-Employee empowerment	.142	.134	.176	.261	.288	.349	.159	1		
9-Benchmarking	.222	.004	.140	.078	.301	.116	.009	.293	1	
10-Flexible manufacturing	.039	.303	.35	.293	.394	.223	.228	.195	.120	1

Table 5.: The results of regression.

Construct	Calculated F	Sig.	R	R ²	Result
Vision statement	9.453	.0040	.925	0.855	Reject the null hyp.
Leadership	10.756	.0001	.822	0.675	Reject the null hyp.
Customer focus	8.889	.0002	.695	0.483	Reject the null hyp.
Education & Training	9.321	.0001	.895	0.801	Reject the null hyp.
Continuous improvement	13.001	.0001	.852	0.725	Reject the null hyp.
Evaluation and measurements	11.235	.0002	.888	0.788	Reject the null hyp.
Zero defect mentality	15.790	.0001	.952	0.906	Reject the null hyp.
Employee Involvement	14.345	.0001	.978	0.956	Reject the null hyp.
Benchmarking	12.890	.0010	.856	0.732	Reject the null hyp.
Flexible manufacturing	13.897	.0010	.796	0.633	Reject the null hyp.
All TQM constructs	10.845	.0001	.8456	0.715	Reject the null hyp.

Kolmogorov-Smirnov test (K-S test) was used prior to the hypothesis testing in order to use parametric statistical techniques which require normal distributed data. The results of (K-S) test are shown in Table (3). As seen from Table (3), data are normally distributed and parametric analysis methods can be used safely.

Multicollinearity test is used to test values of correlations among the independent variables. Higher values of correlations among independent variables may decrease the confidence of the regression analysis which represents the associations between dependent and independent variables. Table (4) shows the matrix and the values of correlations which are considered low and not significant.

Multiple regression is used to test the main hypothesis, and simple regression to test the ten sub-hypotheses and the criteria are the values of T, R and R². Table (5) summarizes the results of regression used to test the main hypothesis and its ten sub-hypotheses. Results of regression analysis indicate that there is a statically significant relationship between TQM implementation and balanced performance.

6. DISCUSSION

The value of coefficient of determination (R² = 71.5%) indicates that 71.5% of the variation in firms' balanced performance is due to the application of all TQM constructs. Also, the value of correlation coefficient (R = 0.845) indicates that there is a positive correlation between all TQM constructs and balanced performance (as measured by: financial performance, operational performance, customer satisfaction and employee satisfaction).

The Pearson correlation between the independent and dependent variables is between (.978) for employee involvement and (.695) for customer focus. These results support the proposition that TQM implementation leads to better performance in the manufacturing sector. Its adoption and implementation enhancement are associated with better performance and eventually can produce value to the firms.

Whereas the results pinpoint weakness of interests of

these firms regarding customer focus (R² = 48.3%). The reasons behind this fact are due to the nature of these firms and the conditions surrounding their competition across the borders of Dubai. The main concern of these firms is the export to international markets. So the customer seems to be out of their reach, consequently, the firms did not fully conduct market investigation, designers hardly went out to collect information for improving product design due to long distances. Designers only made use of customer complaints information and customer requirements specified in contracts for designing products. Customer expectations and future requirements remained unclear to a certain extent for designers.

Moreover, these results don't appear identical to some earlier studies like the study of Aloush (1997) who identified the relationship between TQM and achievement in Jordanian chemical manufacturing firms and found no effect on achievement as measured by the Return On Investment (ROI) and the study of Tarawneh (1999) who found no significant relationship between TQM and competitiveness (as measured by: productivity, sales growth, export growth, market share and ROI) in Jordanian pharmaceutical companies .

Although these results are consistent with the results of Al- Madhoun (1998) who found statistically strong correlation (R = 0.98) between TQM variables and acquired competitiveness in a study of Jordanian chemical detergents companies, the results seem to be high and near perfect. These variations in results may be due to the heterogeneous of definitions of both independent and dependent variables.

7. CONCLUSIONS

The results of this study suggest that TQM implementation in the manufacturing sector of economy is associated with better balanced performance. Its implementation is. Critical factors that can determine the success of TQM are determined and an operationalized tool which can be used for internal assessment of business performance by managers is proposed. This study investigates whether TQM is associated with

improvement in balanced performance in the manufacturing sector. The primary goal of any firm is to achieve financial profitability, high operational effectiveness and delight customers and employees.

It is vital that firms have empirical evidence of the effectiveness of TQM initiatives. Although there is a considerable doubt regarding efficacy of TQM as an initiative that can assist in achieving improved financial performance and the lack of empirical TQM studies in Dubai as well as other Arab countries. The results of this research show that there is a positive association between TQM and improvement in balanced performance.

This study pinpoints the absence of an overall performance program in manufacturing firms and showed that there are strong arguments that it should exist. But, due to the nature of this study, the absolute necessity to gain value from BSC has not been addressed but the support toward the adoption of balanced, non-traditional performance measure is cleared throughout discussing some key errors and disturbing factors in the traditional performance measures. Future researches may find their way toward investigating whether BSC does suit for short term success which most firms try to achieve quickly.

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Implications

Firms should combine their own uniqueness with the developed model of balanced performance consequently develop their own ways to excellence. Thus, firms can optimize the use of this model by blending it with and applying it to their own situations, allowing their own methods to better suit their situations. The study showed that one of the problems that firms usually meet is their dependence on the information provided about past situation (mainly financial). Measures that depend on past situation can't evaluate the performance of the firm sufficiently. In today's competitive and dynamic environment, firms must focus more to be flexible and must provide feedback rapidly. However, the measures that provide information about the past do not give the opportunity to firms to adapt to the changes in conditions rapidly, then the firms can't evaluate the opportunities and threats on time.

As management accounting continues to evolve and has become more involved in the strategic management of firms, it is necessary for them to understand how TQM strategies initiatives combined with balanced performance should be implemented and managed to achieve maximum benefits to the firm.

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أثر تطبيق إدارة الجودة الشاملة في الأداء المتوازن خليف الخوالدة وماجد الصمادي*

ملخص

تحاول الشركات زيادة قدرتها التنافسية من خلال تحسين مستوى أدائها. وقد تناول عدد من الباحثين السابقين موضوع تأثير تطبيق إدارة الجودة الشاملة على الأداء المؤسسي بالاعتماد على بعض المقاييس المالية. هدفت هذه الدراسة إلى قياس تأثير تبني إدارة الجودة الشاملة على الأداء المؤسسي باستخدام بطاقات الأداء المتوازن ومؤشرات الأداء الخاصة بجائزة Baldrige للجودة. ولتحقيق هذا الهدف، تم اختيار عينة من 300 شركة من الشركات الصناعية في دبي لتعبئة استبانة الدراسة وقد تم تجميع ما نسبته 42% من الاستبانات الموزعة وأخضعت للتحليل الإحصائي. وتشير نتائج الدراسة إلى أن ما نسبته 71.5% من التغيير في الأداء المتوازن لهذه الشركات (مقاساً بالأداء المالي والأداء العملياتي ورضا العملاء ورضا العاملين) يعود إلى مستوى تطبيقها لمفاهيم إدارة الجودة الشاملة. وتدعم هذه النتائج الطرح القائل إن تطبيق إدارة الجودة الشاملة يؤدي إلى أداء أفضل في القطاع الصناعي.

Dr. Khleef A. Al-Khawaldeh

Assistant Professor, Dept. of Business Administration, The Hashemite University, Al-Zarqa, Jordan.

Fields of Interest: Quality Management, Production and Processes Management, Institutional Performance Management.

Eng. Majed S. Smadi

MSc in Production and Processes Management, The Hashemite University 2005.

Fields of Interest: TQM, Processes Management, Institutional Performance Management.

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