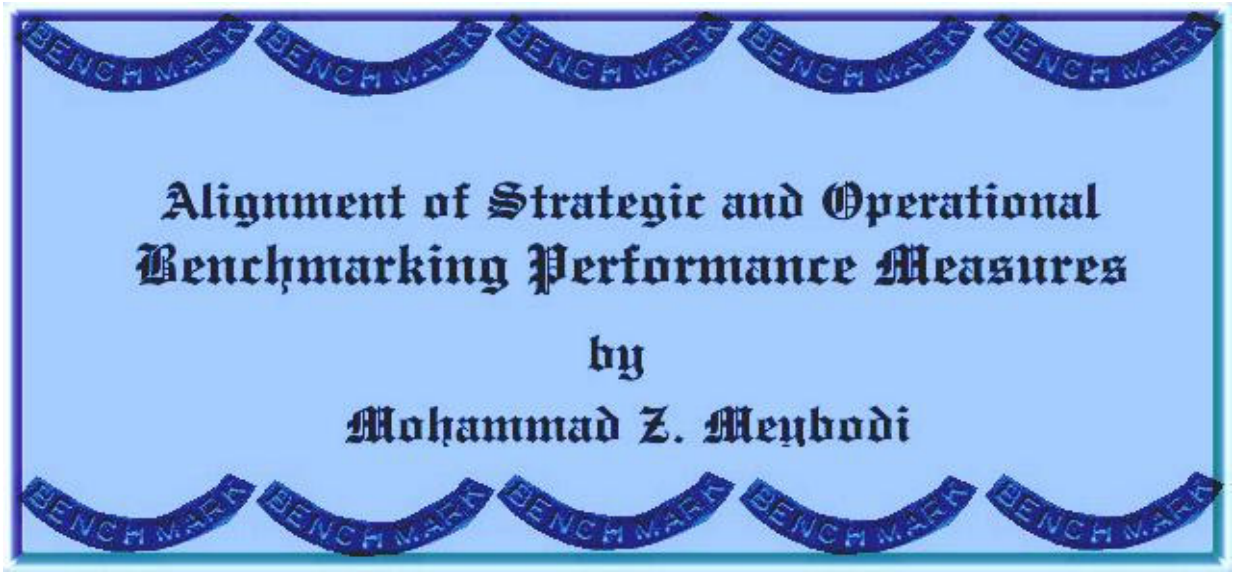

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Abstract

This article demonstrates the importance of consistent performance measures at various levels of organization prior to conducting benchmarking activities. Utilizing consistent performance measures requires a thorough understanding of organizational strategy and deployment of the strategy into functional strategies. The article examines the impact of managerial positions and organizational sizes on utilization of strategic and operational benchmarking performance measures. Statistical results show evidence of misalignment between organizational mission and goals and proactive development of their core competencies. The results indicate that managers with high-level positions as well as managers from large organizations typically place more emphasis on the strategic benchmarking performance measures. Also, managers with low-level positions and managers from small organizations often focus more on operational benchmarking performance measures. For the benchmarking process to be effective, successful resolution of such inconsistencies is critical.

Introduction

For the past two decades, world-class organizations have utilized benchmarking to improve aspects of their competitive advantages such as cost, quality, delivery, and customer service. Benchmarking may be defined as the process of learning from the best-in-class organizations, determining how the best-in-class achieve those performance levels, and utilizing the best practices to their own organization to achieve superior performance [Watson (1992 &1993), Camp (1989), Whiting (1991)]. As stated by Bogan and English (1994), benchmarking is a flexible tool that can be used for gradual continuous improvement, as well as for major changes of process reengineering. Benchmarking is an effective means for learning and change because it exposes employees to new approaches, systems, and procedures [Welch (1993), Kuebler (1993)]. Deming (1982) and a number of other quality advocates [Graham (1993), Ishikawa (1985), Venetucci (1992)] have strongly recommended the use of benchmarking as an essential component of continuous improvement.

The use of benchmarking as an effective quality improvement tool was started by Xerox in the early 1980's to overcome severe international competition. Also, since 1987, benchmarking has been a major component of the Malcolm Baldrige National Quality Award criteria. Since 1987, out of a total of 1000 Baldrige points, benchmarking has consistently influenced more than 500 points, Bogan and English (1994). No other quality elements, such as process management, employee involvement, and quality planning, have had such a broad influence on the Baldrige criteria than benchmarking. More recently, the practice of benchmarking is being widely used for six sigma process and for organizations seeking ISO 9000 certification.

Since the early 1980's, application of benchmarking in various businesses, ranging from manufacturing to health care, marketing, supply chain, human resources, and accounting has been widely reported. Harrison (1999) presents a detailed analysis of the evolution of different aspects of benchmarking activities. A comparison of the Xerox and Kodak benchmarking process has been reported by Bogan and English (1994). Although the two benchmarking methods utilize different numbers of steps, their overall logic is quite similar. Zairi and Whymark (2000) report successful results of the application of benchmarking at British Royal mail. Applications of benchmarking to world-class purchasing and to U.S. service sectors have been reported respectively by [Newman, Hanna, and Duffett (1995) and Roth et.al. (1997)]. The use of benchmarking as an effective organizational learning tool has been presented by [Senge (1990), Garvin (1993), Ford and Evans (2001), Smith (1997), Hambly (1997), Watson (2001), Chen and Paetsch (1995), O'Dell and Grayson (2000), and Evans and Dean (2003)]. A comprehensive list of legal and ethical issues of benchmarking is presented by [Brue and Greg, (2002), Vaziri (1992), and Bogan and English (1994)].

Although the content of the above articles is diverse, their primary focus has been on short term financial and operational aspects of benchmarking. These articles generally address the technical aspects of departmental benchmarking along with

limited success stories. As argued by [Furey (1987), Goldwasser (1995), Kaplan (1992), and Talluri and Vazacopoulos (1998)], effective benchmarking is more than comparative analysis of quantitative and operational measures from one company to another. To take full advantage of benchmarking, the benchmarking activities need to be integrated into organizational strategy, and the process employs a broad range of performance measures consistent with organizational strategy.

The objective of this article is two fold: 1) to examine organizational strategy and evaluate consistency of the decisions at various levels of organizations. 2) to investigate the impact of managerial positions and organizational sizes on the deployment of strategic and operational benchmarking performance measures. Specifically, the focus of the article is to answer the following questions:

1. Are organizational core competencies consistent with their goals and objectives?
2. Are organizational competitive priorities consistent with their goals and objectives?
3. Are organizational competitive strengths consistent with their competitive priorities?
4. Are there relationships between managerial positions and deployment of benchmarking performance measures?
5. Are there relationships between organizational sizes and deployment of benchmarking performance measures?

Benchmarking and Performance Measurements

Total quality management (TQM), Just-in-time (JIT) systems, proliferation of new technologies, and a number of other important events during the last two decades have helped organizations to recognize the importance of benchmarking and performance measurements in managing complex processes. Managers across various industries have recognized the importance of managing processes and the truth that what gets measured is what gets managed and improves. The special focus of Malcolm Baldrige National Quality Award on benchmarking and performance measurements is a clear indication of the critical role of these elements in managing and improving organizational processes.

In the past, organizations generally used performance measurements that contributed mainly to short-term financial and technical results. How the organization achieved those results and their impact on the entire organization was unimportant [Eccles (1991), Eccles and Nohria (1992)]. Today, managers understand that focus on short-term financial and technical results without consideration of overall organizational strategy could produce devastating results over the long term. As a result, organizations are learning to manage the system in a way that crosses traditional departmental boundaries. In this new, horizontally integrated system, organizations need to accept a long-term perspective and utilize balanced, financial and non-financial performance measures to carefully improve the competitiveness of

the entire organization. This approach requires that benchmarking organizations develop a complete understanding of their own business strategy and the deployment of the strategy into functional strategies. This process will ensure that there is a consensus within the organization about long term and short-term performance measures that are consistent with organizational mission and goals [(Day 1992), Papke-Shields et. al. (2000), Madigan (1992)].

Methodology and Data Collection

A questionnaire-based mail survey was used to examine the above questions. The part of the survey related to this article contains a series of questions on the use of strategic and operational benchmarking factors. Strategic questions are concerned with organizational mission and goals, as well as attitude toward customers, competition, technology, globalization, TQM, and employee developments. Operational items are related to specific technical performance measures such as cost, quality, and delivery.

The target population for this study consisted of manufacturing firms in the Midwestern United States. A sample of 500 manufacturing firms with more than 50 employees was chosen from manufacturers' directories of the states of Illinois, Indiana, Ohio, Michigan, and Wisconsin. The sample covers organizations in a variety of industries ranging from fabricated metal, communication, electronics, automotive, toots, chemicals, rubber, and paper products. In addition to general organization and managerial profile items, the survey contained a series of questions regarding organizational goals and objectives, competitive priorities, manufacturing performance objectives, and manufacturing action plans. Out of 91 completed surveys received, 84 surveys were usable, resulting in a response rate of 17 percent.

The survey data indicates the majority of respondents had various high level managerial positions in organizations with less than 500 employees. Presidents and vice presidents accounted for 29 percent, and plant managers accounted for 30 percent of the sample. About 35 percent of the sample had other managerial positions, such as operations/production managers, and quality managers, and the remaining 6 percent were production line supervisors. In terms of manufacturing experience, about 28 percent of the respondents had between 10 to 20 years, and 60 percent had more than 20 years of manufacturing experience.

Results

Table 1 (below) shows the ranking of the mean importance score for each element of corporate goals and objectives. The respondents were asked to rate each element based on the degree of importance (1=low importance, 5=high importance) to their company for the next five years. Summary data indicates that the respondents' top three corporate goals and objectives are building market share, maximizing profits, and focusing on customer satisfaction. The mean ratings for these factors are respectively 4.76, 4.61, and 4.52. Being in a better competitive position with respect to

quality and customer satisfaction is possible explanation for market expansion and profit making posture. However, the mean ratings for the last four factors in Table 1 are respectively 3.74, 4.14, 3.88, and 3.91. A simple t-test determined that these ratings are significantly lower than the ratings of the first three factors. The factors marked with an asterisk in Table 1 indicate these factors are statistically larger than the factors with no asterisk marks at a 0.05 level of significance. This is perhaps an indication of traditional reactive strategy in which the primary focus of managers is on marketing and financial goals. Understanding external environmental factors such as competition, global issues, technology, and development of core competencies to effectively deal with these factors are considered to be secondary. This is a rather disturbing posture because in today's global market world-class organizations focus more on building core competencies than on achieving marketing and financial goals. They develop core competencies first; then utilize a proactive strategy and look for opportunities to exploit their core competencies to achieve a competitive advantage. Understanding the causes for such strategic misalignment between organizational mission and goals and proactive development of core competencies is extremely important.

Table 1. Mean Importance and Standard Deviation For the Corporate Goals and Objectives (1=low importance, 5=high importance)

Factor	Mean	SD
Build market share	4.76*	1.27
Maximize profits	4.61*	1.32
Focus on customer satisfaction	4.52*	1.15
Build and exploit core competencies	3.74	1.39
Understand competitors' strategy	4.14	1.21
Understand global strategies	3.88	1.37
Understand technology	3.91	1.32

SD= Standard Deviation, * = Statistically larger than the other Means at alpha = 5%

Table 2 (below) shows the ranking of the mean importance score for each element of competitive priorities. The importance ratings is similar to the one stated earlier. From Table 2, the respondents ranked product reliability, conformance quality, delivery reliability, product customization, and new product development speed as the top five important competitive priorities. The ranking of product reliability and conformance quality as the top two competitive priorities is consistent with corporate strategy and goals and with recent manufacturing literature. It indicates that managers believe that quality factors are still important elements of competitive advantage. However, the ranking of delivery reliability, product customization, and new product development speed as the next three competitive priorities indicate that the

respondents also believe on the importance of time based competition and product customization. Overall, one can argue that the importance ranking of the top five competitive priorities is consistent with recent manufacturing literature and with organizational strategy of market expansion, profitability, and customer satisfaction. Table 2 also shows that low price as an element of competitive priorities ranked sixth. This rather interesting result indicates, unlike traditional thinking, the responding managers believe that low price is no longer the primary elements of competitive advantage. The relatively low ranking of price along with the last four competitive priorities is perhaps an indication that these elements represent order qualifiers, and the top five factors are order winners. In other words, competitive market considers the last five competitive priorities as given. To attract customers, organizations need to perform on the basis of top five competitive elements.

Table 2. Mean Importance and Strength For Competitive Priorities
(1=low importance, 5=high importance) (1=weak strength, 5=strong strength)

	Importance		**Strength**			
Factor	**Mean**	**SD**	**Mean**	**SD**	**t-value**	**p-value***
Product reliability	4.69	1.16	3.56	1.24	4.21	0.000
Conformance quality	4.58	1.28	3.84	1.14	1.34	0.090
Delivery reliability	4.47	1.24	3.78	1.32	2.57	0.005
Product	4.35	1.36	3.42	1.09	3.46	0.000
customization	4.29	1.23	3.35	1.36	3.50	0.000
NPD speed	4.16	1.34	3.96	1.25	0.75	0.230
Price	4.03	1.32	3.82	1.19	0.78	0.210
Fast delivery	3.98	1.22	4.22	1.28	0.89	0.190
Performance	3.84	1.44	4.18	1.23	1.27	0.100
Service after sales	3.62	1.31	4.32	1.37	2.61	0.005
Volume flexibility						

- Small p-value indicates the difference between two means is statistically significant.

To understand relative strength of organizational core competencies, for each element of competitive priorities the respondents were asked to rate relative competitive strength of their organization with respect to the competitors who are doing best in that area. A five-point scale, where 1 corresponds to weak and 5 corresponds to strong, is used to indicate managers' perceptions of the company's current competitive strength relative to the best competitors. The mean strength scores for each element of competitive priorities are shown in Table 2. Statistical tests indicate that, for the top five competitive priorities, the mean strength is significantly lower than the mean importance. This is evident because with the exception of conformance quality, the p-value for other four competitive priorities is less than 0.005. This indicates, although managers ranked product reliability, conformance quality, delivery reliability, product customization, and new product development speed as the

top five important competitive priorities, organizational strength on those elements, however, is not that strong. On the other hand, the mean strength for the last three competitive priorities is larger than the mean importance indicating that managers believe their competitive capabilities in the areas of performance quality, service after the sales, and volume flexibility are quite strong. This imbalance between importance and strength for the top five competitive priorities is perhaps a critical area that needs to be investigated.

Table 3 (below) shows the listing of strategic and operational benchmarking factors. Respectively, Tables 4 and 5 (below) show the mean importance score for strategic and operational benchmarking factors. Each Table shows the mean and the standard deviation of importance ratings for two managerial positions and two organizational sizes. In Tables 4 and 5, the responses from the presidents, vice presidents, and plant managers are grouped under high managerial positions, and the responses from operations/production managers, quality managers, and supervisors are grouped under low managerial positions. Also, organizations with more than 100 employees are grouped under large organizations, and organizations with less than 100 employees are considered to be small organizations.

Table 3. Strategic and Operational/Technical Benchmarking Factors

Strategic Factors	**Operational/Technical Factors**
Develop mission and goals (DMG)	Reduce percent defects (RPD)
Develop core competencies (DCC)	Reduce percent errors (RPE)
Understand competitors' strategies (UCS)	Reduce labor costs (RLC)
Develop global strategies (DGS)	Reduce materials costs (RMC)
Develop technology strategies (DTS)	Reduce overhead costs (ROC)
Focus on customer satisfaction (FCS)	Reduce inventory costs (RIC)
Adopt TQM philosophy and practices (TQM)	Reduce set-up/changeover costs (RSUC)
Change organizational culture (COC)	Increase labor utilization (ILU)
Improve interfunctional communication (IIFC)	Increase equipment utilization (IEU)
Improve employee training (IET)	Improve process capability (IPC)
Improve employee empowerment (IEE)	Improve quality circle practices (IQCP)
Improve employee team work (IETW)	Utilize quality improvement tools (UQIT)
Install continuous improvement (ICI)	Utilize statistical process control charts (USPC)
Adopt quality at the source (AQS)	Increase delivery speed (IDS)
Improve supply chain management (ISCM)	Increase product development speed (IPDS)
Improve supplier relationships (ISR)	Reduce manufacturing lead time (RMLT)
Eliminate wastes (ELW)	Increase delivery reliability (IDR)
Reengineer new product development (RNPD)	Increase new product customization (INPC)

The respondents were asked to rate each factor based on the degree to which they believe the factors are important (1=low importance, 5=high importance) to be

used for benchmarking performance measures. The left portion of Table 4 indicates that, overall, managers with high-level positions rated strategic factors higher than the managers with low-level positions. This is evident because, with the exception of two factors, the mean ratings for these factors are above 4.00. Also, statistical tests indicates that out of 18 tests, 11 were statistically significant at least at a 0.05 level of significance; meaning for the strategic factors high-level managers rated these factors significantly higher than the managers with low-level positions.

For the strategic factors such as customer satisfaction, interfunctional communication, employee training, employee empowerment, continuous improvement, quality at the source, and supplier relationships, the mean ratings for high-level managers were not significantly different than the ratings for the low-level managers. One possible explanation for such result would be the popularity of these factors. Since these are well known TQM factors, managers at both levels believe in the importance of these strategic benchmarking factors. However, believing on the part of low-level managers does not necessarily translate to consistent actions.

It is interesting to note that managers with low-level positions rated the strategic factors employee training, employee empowerment, and quality at the source higher than the managers with high-level positions. This result was expected because low level managers are closer to the employee-related issues than high-level managers. The right side of Table 4 shows that, overall, managers from large organizations rated strategic factors higher than the managers of small organizations. This is evident because, for large organizations, the mean rating for all strategic factors is above 4.00. Also, statistical tests indicate that out of 18 tests, 13 were statistically significant; meaning managers of large organizations rated these strategic factors significantly higher than the managers of small organizations. However, for the strategic factors customer satisfaction, employee training, employee empowerment, continuous improvement, and quality at the source, the mean ratings for the large organizations were not significantly different than the mean ratings for small organizations. As explained earlier, since these are popular TQM factors, managers of both large and small organizations believe on the importance of these strategic factors.

Table 4. Importance Ratings For Strategic Benchmarking Factors

(1=low importance, 5=high importance)

	Managerial Position					Organizational Size				
	High		Low			Large		Small		
Factor	**Mean**	**SD**	**Mean**	**SD**	**t-value**	**Mean**	**SD**	**Mean**	**SD**	**t-value**
DMG	4.63	1.92	3.56	2.11	2.34*	4.72	1.71	3.79	1.82	2.36*
DCC	4.32	1.83	3.24	1.74	2.70*	4.46	1.64	3.57	1.57	2.48*
UCS	4.65	1.76	3.76	1.85	2.21**	4.68	1.54	3.76	1.63	2.60*
DGS	4.51	1.85	3.52	1.63	2.54*	4.73	1.82	3.42	1.78	3.25*
DTS	4.49	1.68	3.46	1.75	2.69*	4.63	1.76	3.75	1.64	2.32*
FCS	4.72	1.64	4.53	1.67	0.51	4.78	1.84	4.53	1.62	0.65
TQM	4.62	1.55	3.66	1.64	2.69*	4.65	1.63	3.84	1.72	2.16**
COC	4.32	1.87	3.34	1.62	2.51*	4.52	1.92	3.57	1.86	2.25**
IIFC	4.46	1.78	3.82	1.83	1.59	4.37	1.61	3.43	1.67	2.56*
IET	3.92	1.66	4.20	1.47	0.80	4.68	1.78	4.32	1.75	0.92
IEE	3.75	1.45	4.14	1.69	1.33	4.31	1.76	4.12	1.86	0.47
IETW	4.51	1.62	3.78	1.85	1.88**	4.71	1.64	3.78	1.94	2.32*
ICI	4.57	1.34	4.43	1.95	0.37	4.76	1.68	4.25	1.61	1.20
AQS	4.34	1.40	4.53	1.68	0.55	4.58	1.53	4.24	1.69	0.94
ISCM	4.47	1.87	3.67	1.48	2.12**	4.64	1.92	3.56	1.97	2.49*
ISR	4.56	1.74	3.98	1.78	1.47	4.52	1.86	3.62	1.73	2.24**
ELW	4.58	1.67	3.55	1.57	2.84*	4.71	1.78	3.76	1.68	2.45*
RNPD	4.46	1.66	3.53	1.52	2.61*	4.66	1.93	3.76	1.76	2.18**

SD= standard deviation, * = significant at 0.01, ** = significant at 0.05

Table 5. Importance Ratings For Operational/Technical Benchmarking Factors
(1=low importance, 5=high importance)

	Managerial Position					Organizational Size				
	High		Low			Large		Small		
Factor	Mean	SD	Mean	SD	t-value	Mean	SD	Mean	SD	t-value
RPD	4.02	1.83	4.73	1.87	1.74**	4.63	1.83	4.71	1.77	0.21
RPE	4.07	1.65	4.75	1.86	1.75**	4.57	1.53	4.73	1.64	0.41
RLC	3.65	1.92	4.63	1.72	2.40*	3.87	1.68	4.69	1.59	2.24**
RMC	3.54	1.82	4.58	1.69	2.65*	3.83	1.79	4.75	1.47	2.51*
ROC	4.22	1.75	4.71	1.58	1.25	4.42	1.67	4.68	1.69	0.69
RIC	4.13	1.62	4.75	1.69	1.82**	4.08	1.87	4.77	1.68	1.74**
RSUC	4.52	1.73	4.69	1.67	0.45	4.67	1.59	4.45	1.82	0.58
ILU	4.64	1.48	4.42	1.83	1.13	3.72	1.73	4.67	1.66	2.51*
IEU	3.83	1.67	4.68	1.76	1.72**	3.37	1.84	4.46	1.91	2.87*
IPC	4.13	1.59	4.76	1.55	1.79**	4.63	1.88	4.57	1.78	0.15
IQCP	3.63	1.78	4.71	1.58	2.87*	4.11	1.63	4.74	1.74	1.67**
UQIT	4.05	1.59	4.73	1.93	1.72**	4.33	1.77	4.79	1.85	1.12
USPC	4.08	1.73	4.78	1.61	1.87**	4.36	1.57	4.75	1.82	1.19
IDS	4.22	1.68	4.37	1.72	0.39	4.78	1.86	4.13	1.77	1.71**
IPDS	4.23	1.71	4.38	1.57	0.41	4.75	1.83	3.36	1.68	1.79**
RMLT	4.04	1.84	4.78	1.73	1.85**	4.62	1.74	3.53	1.79	2.76*
IDR	4.66	1.42	4.14	1.76	1.45	4.77	1.85	3.78	1.57	2.58*
INPC	4.55	1.72	3.62	1.81	2.36*	4.68	1.88	3.76	1.67	2.31**

Table 5 (above) shows that, unlike strategic factors, overall, managers with low-level positions rated operational factors higher than the managers with high-level positions. With the exception of one factor, the mean ratings for low-level managers are above 4.00. Also, statistical tests indicate that out of 18 tests, 12 were statistically significant at least at a 0.05 level of significance, meaning for operational factors, low-level managers rated these factors significantly higher than the managers with high-level positions. This result is consistent with manufacturing literature because low-level managers often have tendency to focus more on technical cost cutting and quality improvement measures. This is perhaps due to miscommunication with high-level managers or the result of inconsistent evaluation and reward system for low-level managers. That is, regardless of organizational strategy, low level managers are often rewarded based on their cost cutting measures or efficiency in capacity utilization.

The ratings for the technical factors reducing overhead and set-up costs, increasing delivery and product development speed, and increasing delivery reliability for the two managerial levels were not significantly different. Perhaps due to popularity of these factors, managers at both levels believe on the improvement of these technical benchmarking factors. The right portion of Table 5 shows the mean ratings of technical factors for managers of large and small organizations. Statistical tests indicate that for 11 tests, there were significant differences between the mean ratings of managers from large organizations and the mean ratings of managers from small

organizations. Specifically, for technical factors such as reducing labor, materials, and inventory costs, as well as increasing labor and equipment utilizations, managers from small organizations rated significantly higher than the managers from large organizations. This result is not really surprising because smaller organizations typically place more emphasis on cost reduction measures and better utilization of labor and equipments. On the other hand, for technical factors, such as improving quality circle practices, increasing delivery and new product development speeds, reducing manufacturing lead-time, increasing delivery reliability, and increasing new product customization, managers from large organizations rated these factors significantly higher than the managers from small organizations.

Perhaps due to availability of more resources, larger organizations focus more on global quality, delivery, and customization issues than the smaller organizations. For technical factors reducing defects and errors, increasing process capability, utilization of quality improvement tools, and utilization of statistical process charts the mean ratings for large organizations were not significantly different than the mean ratings for small organizations. Again, since these are popular TQM factors, perhaps managers of both large and small organizations believe on the importance of these technical factors.

Conclusion

This article demonstrates how understanding organizational strategy is crucial to improve the effectiveness of benchmarking process. The article investigates the impact of managerial positions and organizational sizes on the deployment of strategic and operational benchmarking performance measures. Five questions were asked to investigate the consistency of the decisions and to examine the relationship between managerial positions and organization sizes on the selection of strategic and operational benchmarking performance measures. Below is a summary of the results:

- Possible misalignment between organizational mission and goals and proactive development of their core competencies. Also, inconsistencies between organizational competitive priorities and their core competencies. The causes for such strategic misalignment and imbalance need to be investigated prior to committing resources to external benchmarking.

- Overall managers with high-level positions rated strategic factors significantly higher than the managers with low-level positions. Also, managers from large organizations rated strategic factors significantly higher than the managers from small organizations.

- Managers with low-level positions rated the strategic factors employee training, employee empowerment, and quality at the source higher than the managers with high-level positions. This is perhaps due to low level managers often having a better understanding of the employee related issues than managers with high-level positions.

- Managers with low-level positions rated overall operational factors higher than the managers with high-level positions. This result is consistent with manufacturing literature because low-level managers often have tendency to focus more on operational cost cutting and quality improvement measures.

- For strategic factors such as customer satisfaction, interfunctional communication, employee training, employee empowerment, continuous improvement, quality at the source, and supplier relationships, the mean ratings for high-level managers were not significantly different than the mean ratings for low-level managers. Since these are well known TQM factors, perhaps managers at both levels believe on the importance of these strategic benchmarking factors.

- The mean ratings for operational factors reducing overhead and set-up costs, increasing delivery and product development speeds, and increasing delivery reliability for the two managerial levels were not significantly different. Since these are well-known just-in-time and new product development factors, perhaps managers at both levels believe on the improvement of these operational benchmarking factors.

- For operational factors such as reducing labor, materials, and inventory costs as well as increasing labor and equipment utilizations managers from small organizations rated these factors significantly higher than the managers from large organizations. This result is consistent with manufacturing literature because smaller organizations typically place more emphasis on cost reduction measures and better utilization of labor and equipments.

- For the operational factors such as reducing defects and errors, increasing process capability, utilization of quality improvement tools, and utilization of statistical process control charts, the mean ratings for large and small organizations were not significantly different. Since these are popular TQM factors, perhaps managers of both large and small organizations believe on the importance of these operational factors.

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