DEVELOPMENT OF FRAMEWORK FOR ACHIEVING SUSTAINABILITY THROUGH BENCHMARKING

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Abstract

Past literature has reported inconsistencies in the results concerning sustainability through the implementation of benchmarking. Hence this study has led to more research on the impact of other intervening variables that give explanation better on the correlation between the relations. Some theories in the previous studies have opined that correlations between capabilities, strategies and resources are the key factors for organizational

sustainability. This study therefore aimed to evaluate benchmarking dimensions as factors of quality practices while aiming at sustainability performance (SP). In this study, the dimensions of benchmarking that are considered are best practices identification (BPI), best practices comparison (BPC) and best practices implementation and improvements (BPII). In order to achieve this objective, theories like institutional and contingency are integrated to uncover the effects of benchmarking on the successful implementation of strategies. Survey questionnaires were administered to the top management of food and beverage companies while the analysis technique employed is SPSSV23.

Introduction

There are various definitions of benchmarking, but the concept comprises mainly measurements, best practices identification (BPI), comparison and implementation and improvements. The commonest definition by [1] goes thus: "benchmarking is searching for the best practice that will lead to outstanding performance through this best practice implementation in an industry".

In the evolution of benchmarking, different phases expressed by multiple definitions were proposed and in accordance with the definition, four important phases of evolution were passed by benchmarking [2, 3]. Some definitions were provided during the evolution of benchmarking by[4-12] International Benchmarking Clearing House[2, 13-18]) to mention few. According to the newest definition of benchmarking it is considered to be a process of understanding, identifying and adapting exceptional practice from any global organization to promote the performance of an organization. In other word, it is an activity that gives consideration externally for high performance and best practices. From different definitions, it can be concluded that "benchmarking is a continuity in the analysis of processes, product and service, performance, strategies and functions in comparison between and within best organizations by accessing information through suitable method of data collection with the aim of obtaining the present standard of an organization, and consequently applying changes to exceed or scale those standards by carrying out self - improvement".

Furthermore, benchmarking is regarded as the main investment as it is believed to be both time and resources-intensive[9, 13, 17, 19] hence, it should be meticulously implemented. Previous researches focused more on organizational criteria and pre-requisites for success in benchmarking; they are:
- Focused within continuous improvement, customer and employer [17]
- Flexibility and strategic focus, openness to changes, management support and eagerness to information sharing [10].
- Process understanding and commitment within an organization and the necessity for effective communication.

Developing models of sustainable business with integration of effect on environment, people and profit is lately and increasingly turning to be important issue. Through peer-company benchmarking, a company can be supported to set goals of performance. In that case, to benchmark sustainable business practice effectively, developing a methodology is necessary for the sustainable management evolution [20, 21]. However, according to [3, 14, 22] sustainable performance of a company comprises many factors that involve critical trade-offs and the performance of the companies may vary over the time.

[6, 7] reported that sustainable performance is achieved by a firm or company when there is creation of environmental balance. According to [23, 24] (2010), sustainability is a brilliant concept of business performance while developing constructive and innovative corporate culture is one of the important processes of transitioning sustainability. [8, 13, 25] opined that these important cultures create better performance for organization and maximize the use of present assets for the good result of economy, society and environment. The contribution from social, economic and environmental sustainability would ensure satisfaction in the society and among the customer, employee, supplier and shareholders.

With the past research studies on benchmarking and sustainability, the problems in agro-allied industries were found to be low in sustainable performance, weak in innovation capacity, limited in opportunities for growth and development; unfriendly operating environment; unavailability of product readily throughout the year; low level of disposable income; poor infrastructure; and increase in toxicity of waste generated. Therefore, more researches are needed on mechanism by which benchmarking as one of the TQM elements operates and its influences across multiple level of organizational development and competitiveness advantages measured by best practices identifications, best practices comparisons and best practices implementations and improvements in conjunction with the impacts assessment of social, economic and environmental development in food and beverage companies as a sub-set of Agro-allied industry.

Literature Review

Review on Benchmarking

Many researchers and scholars agree that a serious benchmarking is required by an organization to achieve sustainability performance from the perspective of the organization's decision-makers [1, 7, 12, 15, 17, 22, 25-40]

According to [6] benchmarking is defined to be an ongoing process. Furthermore, benchmarking is explained by[26] (2008) in some key themes of different variations and reported that benchmarking looks for best goods and services in an industry which eventually leads to outstanding performances through proper implementations of best practice.

[1] examined benchmarking in relation to hotels in China in terms of supports by low carbon energy approaches, challenges and development. In this study, it is revealed that the major and minor streams of benchmarking energy of the hotels affirmed that the most popular method in benchmarking in reference to the floor level is the normalized energy use intensity (EUI). The findings showed that a conceptual hotel benchmarking can be achieved by coordination of different types of shareholders and implementation of proposed plan by energy improvement office, local construction ministry and tourism bureau.

Similarly, [24, 41] sustainability in supply chain for benchmarking through the strategies that are undertaken presently by companies at the fore-front in the application of ideas for supply chain sustainability. A three-pronged method was applied to first develop a model in order to know the steps taken on supply chain sustainability; secondly, the framework implementation by the multinational companies through examination of environmental report and lastly, a comprehensive study of three companies in order to give more perspectives on the results. The study concluded that, the companies can get

benefits from the whole supply system starting from conception of the evaluated sustainable initiatives rather than focusing on product families.

Moreover, [42, 43] reported that benchmarking quality improvements in a networking environment is a modern concept. This study investigated practices of benchmarking strategy deployment and how managers from networks of organization operated and formed as teams to work on projects related to benchmarking is described. Collection of data was done through interview with the managers of seven different New Zealand organizations with responsibility for strategy deployment. This study provides examples of benchmarking networking and the management is operated. It was revealed that the issues of strategy deployment were the same and the managers were able to effectively share ideas and experiences.

Similarly, [30] analyzed the modeling continuous improvement and benchmarking process by using benefit curves. A model developed was utilized on five safety and healthy scenario where the model is tested against continuous improvement and the philosophy of benchmarking in relation to cost reduction, performance improvement and reducing changes in organization and assessing performances with various work environments. The study concludes that the main benefits of benchmarking is linked to improving the business culture in the long and short term despite the short-term solutions provided by benchmarking to some challenges by identifying how the same challenges are addressed by other companies.

Using extended data envelopment analysis (DEA), Gonzalez-Padron, [4, 27] presented an approach to benchmarking efficiency of sales staffing in dealership. The study analyzed the efficiency of the dealers and compared the efficiency scores to financial and traditional benchmarking. The results showed that, the manufacturers obtained details of the views of the staff in care of the allocated sales in order to maximize the efficiency of the dealer.

In short, benchmarking according to [21, 32] is conceptualized in terms of capability identification and isolation, rent utilization, marketing, inventory control, cost control, capital investment, liquidity control, sales growth and employee productivity that lead to organizational sustainability performance.

Integration of Benchmarking for Sustainability

Economy involves rapid occurrence in changes. The modern economy does not involve large scale productions or consumptions of good and services. As there is rise in competition globally with more existing liberalized national economy, the companies are necessitated to possess the following:
- Technology before competition;
- Cost below competition; and
- Quality beyond competition [18, 40]

Therefore, many organizations must forge ahead to be faster, cheaper and better than their counterparts by considering benchmarking as catalyst for innovation and improvement. For the past twenty years, benchmarking as a topic has been popular with its importance as a practical approach to develop crucial aspects of business getting interesting. In addition, it is a managerial tool for achieving and exceeding objectives of performances by understanding the processes followed to be attained and learning from the best.

A similar study conducted by [44, 45] showed that sixty five percent of the 1000 fortune companies employed benchmarking as a tool of management to achieve competitive advantages. In the same vein, a survey was conducted in France by the Chambre de Commerce et d'Industrie and reported fifty percent of the 1000 companies to

be using benchmarking while eighty percent of the companies confirmed that, benchmarking is an efficient way to changes Similarly, benchmarking can be applied to many sectors such as financial services, insurance, construction, government, manufacturing, health services, government and banking (Jarrar & Zairi, 2001). For instance, benchmarking was adopted by learning and teaching. A method was developed in the study for performing benchmarking in an academic field. In studied the implementation of benchmarking in Airport and reported that in recent years, benchmarking within the airport sector has become well-established but the basic problems related with inter-airport comparison are yet to be effectively resolved particularly from different difficulties and countries due to variation in input and output.

A general method of developing successful practices in a certain way is benchmarking the firm performance in relation to best-performing competitors[26, 31] Learning best practice from firm with high performances is essential to the company in order to understand how to balance high sustainable performance and discover effective practice that can upgrade the whole industry.

The need for quantifying sustainable performance and analyzing environmental alternatives is paramount [5, 13, 16, 17, 19] To deal with quantification of sustainability, an important issue on the system boundary needs to be considered by analyzing single company and the whole supply chain focusing on direct and indirect effects of the internal process at the level of suppliers[3, 14, 33, 38, 43, 44, 46, 47]Nevertheless, there is still little literature that addressed sustainability by employing perspective from supply chain in a direct flow of goods

Benchmarking is considered to be an important component of total quality management[4, 8-10, 13, 25] Thus, it is a method of watching the performance of another company through the backstage from the branches where there is visibility in the hurried alignment and in all the stage tricks. According to Juran (1964) in a book titled Managerial Breakthrough (Figure 1), a question is asked: how do the other organizations get better result than us? The response to the question led to awareness on benchmarking being an approach that is fast improving among many organization that have implemented TQM as philosophy.
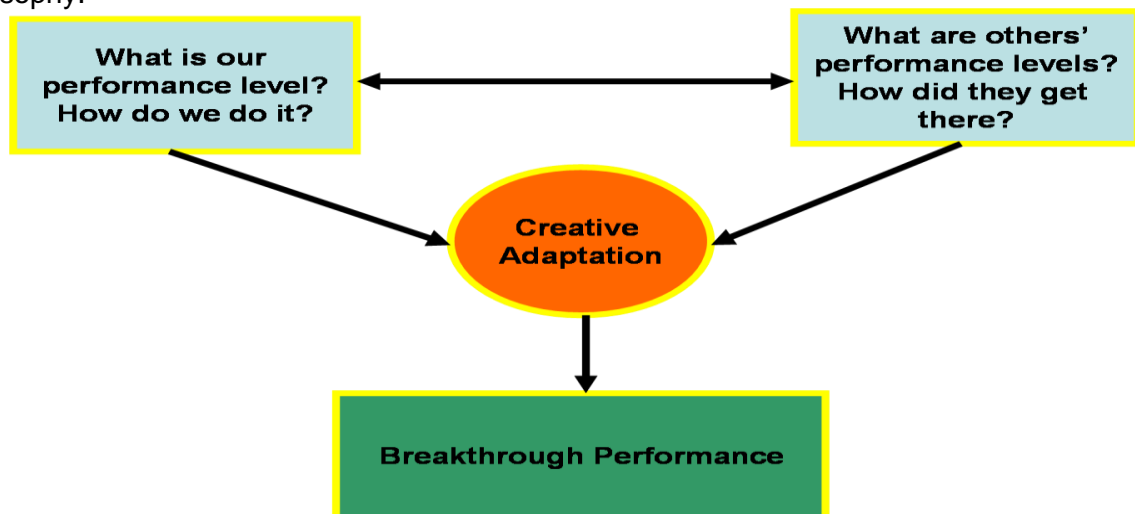

Figure 1: Breakthrough performance through benchmarking

The aim of benchmarking is to continuously comparing the process of product and strategy of a company within the "best in the class" organization and of those of the world leaders. The aim is to learn how excellence is achieved and then setting out to exceed or match it. Partly, the motives lie in the question, "If I can learn from someone who already

has achieved it, why reinvent the wheel?" However, benchmarking is not a solution that can serve as alternative to management process or other quality practices.

Therefore, this study aimed to examine the framework to be employed by food and beverage industry from benchmarking perspectives for environmentally sustainable initiatives i.e. by putting into consideration all phase of quality practices. This approach was implemented to benchmark sustainability performance among food and beverages companies of Malaysia and it was demonstrated to be reliable and robust for benchmarking performances of companies in most industries. The theoretical framework of the study is shown by Figure 2 below:

Benchmarking
Best Practices Identification
Best Practices Comparison
Best Practices Implementation and Improvement

→ **Sustainable Performance**

Figure 2**:** Theoretical research framework

Methodology

A critical, relevant and comprehensive literature review was conducted to tract the development of benchmarking in identifying relevant researches on food and beverage companies under agro-allied industry. This current research proceeds to incorporate current studies and identify practicable approaches of benchmarking. The incorporation of these approaches contain conceptual and initial prototype of the industry benchmarking in Malaysia to be proposed in the study. An in-depth literature review on this topic was done to achieve the study's objectives. The three dimensions of sustainability are environmental, social and economic (Carter & Roger, 2008) were explored. Total quality perspective that encompasses all stages of quality management is employed within the scope of the study to address the void in the emerged literature. From this premises, a framework was first developed in order to identify the initiative towards benchmarking sustainability. Then, a framework was used on sets of companies by evaluating the company environmental report (CER) in order to access the level of adoption of the initiatives. Lastly, an in-depth investigation of three leading companies was performed.

This study investigated on the effects of the dimensions of benchmarking on sustainability. The food and beverage companies of northern Malaysia are selected for the purpose of the study while data was collected for testing the model. This study also employed a quantitative approach in order to achieve the aim of the study and provide answers to the research questions. This comprises questionnaire survey distributed to the head sections of food and beverages companies in sub-department. There are 110 food and beverage companies selected from the directory of federation of Malaysian Manufacturing (FMM 2018, 5th Edition) headed by managers of different departments and sections. Similarly, the study takes into consideration the FMM food manufacturing group and the Malaysian Food Canners' Association (MFCA) for production and packaging of

food and beverage respectively. Aspects such as benchmarking, economics, sustainability and financial performance are captured by the questionnaire. The questions were jointly answered by either the directors of marketing, heading finance, operation management, legal or secretariat issues, exports, human resources technicalities, research and development, marketing or any other related department based on the company's discretion. Therefore, the survey questionnaire was distributed to selected directors of these sections using the study's sample. This research was conducted in the Malaysian food and beverages companies as a subset of Agro-based industry operating in conjunction with the agricultural industry by deriving and providing goods and services from agricultural produces.

Result Analysis

This section explains and illustrates the data analyses. The variables have been tested for the purpose of this study with reliability and validity tests. This chapter also reports the result of the hypotheses tested using multiple regression. SPSS version 23 was explored to make this test.

Overview of the Data Collection

About 110 sets of questionnaires were distributed to the target audience from food and beverage companies. From the entire questionnaire distributed, only 45 were recovered. The respondents answered all the questions in the questionnaire i.e. all the returned questionnaires were analyzed.

Data Screening

Screening test was conducted in order to prepare for analysis of data. These include normality testing and missing data. The following section presents the results from the screening method.

Missing Data

Missing data is related to existence of bias in the data set. As a result of unknown issue, some respondents in a survey-based study might not answer certain questions. According to [20, 21] the first step to the procedures of data screening is identifying the missing data prior to detecting outliers. However, this study used all the thirty one instruments of questionnaires for data analysis as all the entries from all the questionnaires are completely responded to.

Test of Normality

Kurtosis and Skewness are methods of statistics employed to determine the normality of the variable distribution. According to [19, 42, 43] Kurtosis is the measure of the flatness or peakedness of a distribution while the skewness is the measure of the distribution symmetry. When Kurtosis and Skewness are close to zero, normal distribution occurs. However, there is no formal cut-off point on the level of Kurtosis and Skewness when variables are no longer considered as normal [41] The results show that the data have normal distribution for all variables approximately with the z-values within the range of -1.96 and + 1.96 (Cramer & Howitt, 2004).

Table of Normality

	Number	Skewness	Kurtosis
Sustainability Performance	32	-0.608	0.121
BMI	32	-0.791	-0.698
BMC	32	-0.050	-0.455
BMII	32	-0.871	-0.498

Demographic Survey

Gender Distribution

Gender		Frequency	%
Valid	male	31	68.9
	female	14	31.1
	total	45	100

The distribution across the gender for this study is presented in Table 4.2. This shows that, there are more male respondents than the female respondents. The female respondents account for 31.1% (i.e. 14) while the male respondent on the other hand account for 68.9% (31).

Year of Experience

Years		Frequency	Percentage
Valid	< 3 years	7	15.6
	4 to 6 years	23	51.1
	7-9 years	9	20.0
	10 and above	6	13.3
	Total	**45**	**100.0**

The number of respondents by their year of experience is presented in Table 4.3. The results showed that respondents with 4 to 6 years of experiences are the majority as they are amounted to 23 (51.1%). This is followed by respondents with seven to nine years of experience with 9 (20.0%). Respondents with 3 years and below are 7 (15.6%) while respondents with 10 years and above are 6 (13.3%).

Qualification

Qualification of the Respondents   *Table 4*

Qualifications		Frequency	%
Valid	Post Graduate	21.0	46.7
	First Degree	19.0	42.2
	Secondary	5.0	11.1
	Certification	0.0	0.0
	Total	45	100.0

The number of respondents based on qualification is presented in Table 4.4. The table reveals that most respondents possess postgraduate degree. From the total responses, they account for 46.7%, 42.2 respondents possess first degree and respondents with school holder qualification account for 11.1% which there is no record for respondents with certification.

Reliability Analysis

According to [38, 46] reliability is the degree of connection and internal consistency of items in a questionnaire. The internal consistencies in the items are measures by an indicator called Cronbach alpha coefficient. According to the analysis of the reliability test of this study, the three variables which are, best practices identifications, best practices comparisons and best practices implementations and improvement with 5 items for each variable respectively have the values of Cronbach alpha of 0,734, 0.672 and 0.711. The Cronbach alpha coefficient is 0.762 for sustainable performance (dependent variable) with 16 items. In exploratory research, the values of Cronbach alpha according to Nunnally and Bernstein (1994) between 0.7 and 0.8 are acceptable while 0.9 and above is considered the best. Thus, the reliability is above acceptable level for all the independent variables. For best practices comparison, the Cronbach alpha value is 0.672 which is lower but close to the acceptable value of 0.7, therefore, considering it acceptable [20] A satisfactory result of (0.762) is achieved for the reliability scale for the dependent variable. Table 4.5 presents the details of the reliability test and its interpretation.

Table 5

Reliability

Variable	Number of Items	Deleted Items	Cronbach Alpha	Interpretations
Best Practice Identification	5	1	0.734	Acceptable
Best practices Comparison	5	-	0.672	Acceptable
Best practices Implementation and Improvements	5	-	0.711	Acceptable
Sustainability Performance	16	-	0.762	Acceptable

Nunnally (1967) stated that values above 0.6 are acceptable for construct reliability. Therefore, all the values are reliable as they are more than the acceptable value.

Correlation Analysis

To examine the correlation between the variables which are best practices identifications, best practices comparisons and best practices implementations and improvements and sustainability performances, the analysis of Pearson correlation is conducted. The result from the Pearson correlation fulfills the research objectives. Researchers are allowed to use correlation coefficient to evaluate the level of linear relationships between the pairs of the variables [2, 22] Table 4.6 shows that the relationships between the variables are positive and significant. If the correlation value is between 0.5 and 0.8, the relationship between the variables is positively strong. Thus, the independent variables i.e. best practices identifications, best practices comparisons and best practices implementations and improvements have strong association with sustainability performance. The result from the correlation analysis also showed that, the strongest relationship is between best practices comparison and sustainability performance among all the three independent variables.

Table 6

Analysis of Correlation

Variable	SP	BMI	BMC	BMII
SP	1			
BPI	0.557	1		
BPC	0.728	0.526	1	
BPII	0.506	0.426	0.451	1

Analysis of Multiple Regression

This analysis is applied for two reasons: the first one is to calculate the R-squared and the second reason is to detect the contribution of each variable. The Table 4.7 and 4.8 show in details the analysis of the multiple regression. From Table 4.7, the result of R-squared (0.836) showed that, best practices identifications, best practices comparisons and best practices implementations and improvements are explained by 83.6% of the variance in sustainability performance as independent variables while only 16.4% of variance in sustainability performance is not explained by the predicting variables. This is considered as respectable and good results. Also, there is significant relationship statistically at 0.000 significant level from the ANOVA. Similarly, the Durbin-Watson is 2.054 which indicate that, there is no problem regarding autocorrelation as the value is within the acceptable range of 1.50 - 2.50

Table 7

Coefficient

Co-efficient	Sustainability Performances
Adjusted R-squared	0.84
F-value	759.42
Significance	0.000

The Table 4.8 presents the result from the analysis of regression; the result shows that, all the independent variables are significant: best practices identification ($\beta = 0.168$), best practices comparison ($\beta = 0.636$) and best practices implementation and improvements with negative value ($\beta = -0.099$).

Table 8

Analysis of Regression

Model	Standardized Beta	T-statistics	P-value
BMI	0.618	6.928	0.000
BMC	0.636	32.153	0.000
BMII	-0.099	-2.152	0.046

The results of the hypotheses and the summary of the hypothesis testing are discussed and presented in the following section:

Discussion and Conclusion

Findings

The results using statistical analyses that have been employed in testing the development of the hypothesis in the beginning of the study are presented in this section. Analyses on reliability test, Pearson correlation, descriptive analysis and multiple regression were conducted.

H1: There is a correlation between best practices identifications and sustainability performances

The results presented above shows that there is positive and significant relationship between BPI and SP. Values of 0.168 and 6.928 were shown respectively for beta and t-value from the multiple regression. This indicates that the value is acceptable as it is close to 0.5 as the relationship is significant at the level of 0.000. Thus, the first hypothesis is accepted. This indicates that there is significant relationship between BPI and SP. The result is in accordance with the studies of [1, 7, 11, 23, 26, 31, 48] that reported that, there is significant and positive relationship between BPI and SP. The results indicate that most of the Malaysia food and beverage companies with higher SP attempted their best in identifying best practice among the leading companies in the industry.

H2: There is a correlation between best practices comparison and sustainability performances

The next hypothesis made an assumption that there is positive and significant relationship between BPC and SP. From the results of correlation analysis, there is positive and significant relationship between BPC and SP. Also, the value of the beta is 0.636 and t-value is 32.152. Therefore, at 0.000 the relationship is significant as it is < 0.05. Thus, it is concluded that, the second hypothesis is approved. The result shows that there is significant relationship between BPC and SP. The result is in consonance with the past studies of [7, 27]Arthur (2011) and Brook (2010) that found positive and significant relationship between BPC and SP. This study supports a necessary comparison to enhance SP where a company in terms of management and operation system compares its approach of practices to the leading companies that have achieved sustainable performance in the industry. Thus, there is strong possibility to achieving social, environmental and economic sustainability.

H3: There is a correlation between best practices implementations and improvements and sustainability performances

The third hypothesis stated that, there is significant relationship between BPII and SP. The outcome of the analysis of the regression shows that, the value of the beta for BPII is -0.099, t-value is -2.152 and the p-value is 0.046. This value shows that there is significant but negative relationship between BPII and SP. These findings are in conjunction with the study of [26]Anand and Kodali (2008) where best practices implementation and improvements has significant but negative relationship with sustainable performance. Thus, the result of this study assumed that to achieve sustainability performance, best practices implementation and improvements are essential practices.

T a b l e 9

Decisions of the Hypothesis Test

Hypotheses	Description	Results/decisions
H1	There is a significant relationships between best practices identifications and sustainability performances	Supported
H2	There is significant relationship between best practices comparison and sustainability performances	Supported
H3	There is a significant relationships between best practices implementation improvements and sustainability performances	Supported

Additionally, the analysis using multiple regression shows that, the independent variable, best practice comparison has the highest beta value (0.636), t-value (32.153) and significance level of 0.000 ($p < 0.05$). This shows that a best practices comparison has the strongest relationship with sustainability performances.

Conclusions

Therefore, this study revealed that the integration of strategies such as identification, comparison and implementation and improvements improves the sustainable performance of agro-allied industry. Also, it revealed that policy-makers should create more awareness on perception of strategic factors of benchmarking in the industry. The result of this study is helpful to Malaysian food and beverage companies and enlightens employees on the importance of benchmarking practices. Additionally, one of the achievements of this study is the application of SPSSV23 to examine the relationships between benchmarking and sustainable performance and using SPSSV23 to validate the model. The contributions of this study are viewed from two perspectives: practical and theoretical.

Theoretical Contribution

The theoretical contribution of this study is viewed from two perspectives. First, the investigation of factors that leads to sustainability performance. This serves as enlightenment for academics and researches to identify important elements of sustainability; also, the results, argument and the extensive literatures are important for reference in the future. Secondly, by paying attention to restructuring policies, strategies and practices by the decision and policy makers of the industry, the finding made from benchmarking can be implemented on technological advancement and implementation of managerial strategy.

Practical Contribution

This study practically contributes through the incorporation of strategic practices like quality processes, quality product and service, feedback systems with best practice identifications and implementation. The industry can be enhanced through these practices in order to facilitate sustainable performance as a whole and maximize competitive advantage. Some insights can be made available from the model to the public service and manufacturing organization in the entire ASEAN region. This study can also be taken as guideline in other sectors with the aim of achieving excellence.

Limitations and Future Studies

This study employed cross-sectional design; however benefits of benchmarking can be realized in a long-term. Also, the result might not be generalized in developed or other developing countries with different social, environmental and economic situation. In addition, there was low rate of responses from the companies due to confidential issues but the response rate can be justified enough for the result analysis. Therefore, future study can conduct a similar study in a longitudinal approach as the benefits of benchmarking and sustainable performance can be realized in long term rather than short term. Also, future study can investigate the relationship between the constructs in different country with different social, environmental and economic situation. Future researchers can employ qualitative method to collect data without minding the time and the cost consumption. Finally, more dimensions can be introduced into the constructs considered in this study.

Acknowledgement

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