Malcolm Baldrige Approach in University Management: An Importance – Performance Matrix Analysis (IPMA)

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Abstract: Academic management is an important activity in managing a university. Failure in managing academic and student affairs can void a university credibility and program accreditation by MQA. Ineffective management approach will halt the university's progress in achieving the academic excellence and creating Society 5.0. To overcome the issue, various approaches can be applied and one of them is the Malcolm Baldrige National Quality Award (MBNQA) approach which includes six important elements in management. Malcolm Baldridge model emphasizes Leadership role, Strategic Management, Customer Focus, Data Measurement, Human Resource Focus and Work Process in order to improve organizational performance (Result). However, there is a question on what factors should be given the priority in ensuring excellence in organizational management. Therefore, this study has been conducted in order to see what is the main factor among these six elements in MBNQA approach that is considered more important in achieving organizational goals. A sample of study have been conducted on 129 staffs in Universiti Teknologi MARA Kelantan Campus (UiTMCK). Hypothesis testing revealed that 5 out of 6 factors of management elements are having a positive relationship. While IPMA analysis shows that the Human Resource Focus is the most important factor, followed by Data Measurement, Work Process Focus and Customer Focus factors that influence the effectiveness of organization. Leadership factor gained the highest performance despite its less importance compared to other factors in IPMA analysis.

Keywords: Academic management, Customer focus, Data management, Malcolm Baldrige, Leadership, IPMA.

1. Introduction

Organizational performance is very important for every manager. To maintain an excellent performance every year is not an easy task. All the organization resources such as human resources, organization structure, organization strategy, work process and technology should be managed efficiently. One of the approaches to manage organization resources was introduced by Malcom Baldridge model and has been widely used by many organizations in the USA and abroad. According to Curkovic et al. (2000), the model covers all the important dimensions of total quality management.

Quality teaching in a university will be supported by a good culture in an organization. University as teaching institution must be recognised for their important part in seeking excellence in education (Edwards, 2018). Recognizing the needs of education excellence, university roles in producing holistic graduate needs to be supported by all staffs in an organisation. Top management will deliver their messages to the middle managers and from there, it will be translated into operational.

Effective management approach in communicating the university's vision and mission is important to ensure it will be embraced and turned into action to meet the university's objectives. In order to become an excellent organisation with outstanding achievement, it needs to be supported by all the leaders and staffs in the organisation. Sana and Shamila (2012) mentioned that the higher institutions have to compete each other locally or internationally and to survive, they need to enhance their service quality and develop a satisfied and committed student body.

Malcolm Baldrige approach is one of the methods that have been used by many organisations to improve their organisational performance. In Malcolm Baldrige model, seven important categories of an excellent organisation have been highlighted. These categories are very important and need to be managed seriously in order to achieve the organisation objectives. Failure to address all these important categories will expose the organisation to the inefficiency in management and may harm the organisation's objectives achievement and future development.

The model elements have been explained in detail in MBNQA (2020). The Malcolm Baldrige model started with the organisational leadership. Under leadership variable, the function of top management in leading the organization was emphasised. This includes how the management addresses the scope of authority for staffs, permissible moral conduct, standard operation procedure and social responsibilities in running the daily operation. Secondly, the model emphasises the importance of strategic planning in the organization. The review on organization's visions, missions, objectives, strengths, weaknesses, opportunities, threats, strategies and values have been taken care of. Thirdly, the model emphasises on the organization's customer focus variable. The elements of how the customers are acquired, served, and held are evaluated. Fourthly, the model focuses on the organisation's data measurement variable. Data here refers to all kinds of the organizational facts including staff number in top and middle management, supporting staff, customers' record and customers' satisfaction, strategic management data, etc. The model tries to see how the data were measured, analysed and used to back the organization's important activities and how the result being analyse. Fifthly is the organization's workforce focus variable. In this variable, the model tries to examine how the organization engages, manages and develops the entire workforce that actively involved in accomplishing the work of the organization to develop full potential, and how the workforce is aligned with the organization's objectives. Sixthly, the model emphasises on the work process management variable. In this component, the model studies the features of how the crucial task/delivery and backing processes are intended, achieved and enhanced. Finally, the body's outcomes (performance) factor was analysed. The variable also examines the organization's performance relative to its competitors.

Despite the importance of this model, the findings of the study in relation to important factors that influence the achievement of an organization are still not conclusive. Therefore, this study is needed to identify the contributing factors towards management context at UiTMCK. As such, this study aims to identify the main factor among the six elements of MBNQA approach which is considered the most important in achieving organization goals.

2. Literature Review

2.1 Quality Management

Research on this matter by Wilson and Collier (2000) who tried to find the causal performance linkages implied in the MBNQA model. The research concluded that the Leadership factor has the strongest influence on organization performance. However, it has no straight influence to financial performance. It is followed by Data Management, Process Management to influence the financial performance. A study by Lee, Rho and Lee (2003) in Korean manufacturing companies found that there is a strong and positive influence between Quality Information and Analysis, and Strategic Planning and Method Management. According to Ghosh et.al (2003), Strategic Planning Process has a positive influence on Business Result. Customer focus and Market focus also have significant influence on Strategic Planning factor, while the Leadership factor is also important to support the Stakeholder focus. A study by Prybutok and Cutshall (2004) also revealed that there are existing relationships among the customer focus, work process, human resource planning, data analysis and leadership factor. The above

ideas were supported by Nagasangari (2018) who did mentioned that a higher leaning institution's success is defined by the performance of its leadership, employees and quality of services produced.

These studies have proven that all the elements proposed in Malcolm Baldrige model are important elements for the achievement of an organization. In addition, previous studies have also shown that there is an internal relationship between the factors of this model. Among these elements, leadership is expected to be the most important factor followed by Data Management and Process Management elements. However, the lack of consensus regarding the most important factors in this study model provides a gap that needs to be filled in future studies.

2.2 Malcolm Baldridge Model

The United State government had introduced MBNQA in 1987 in order to support the non-profit organization, firm and universities in their quality management. Since then, it got strong support from many organizations who are interested with the model and helping them to create efficient and strong environment to foster outstanding performance. The diagram below summarizes the model.

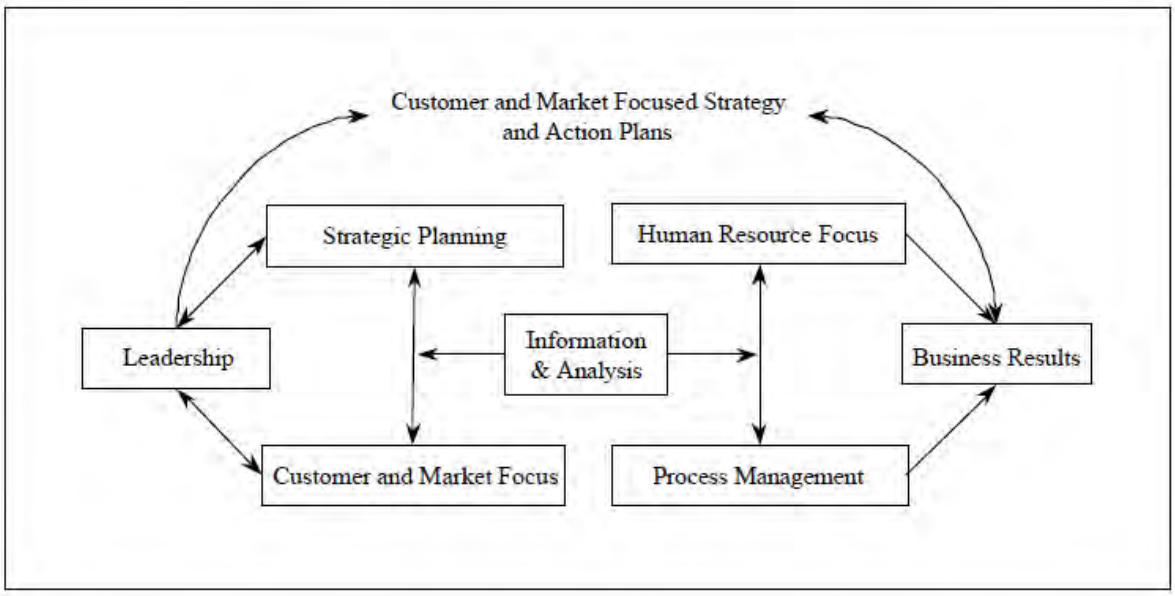

Fig 1. The Baldrige Award Criteria Framework: A Systems Perspective (NIST, 1999)

Based on Baldrige framework (NIST, 1999), we propose the following model and hypothesis:

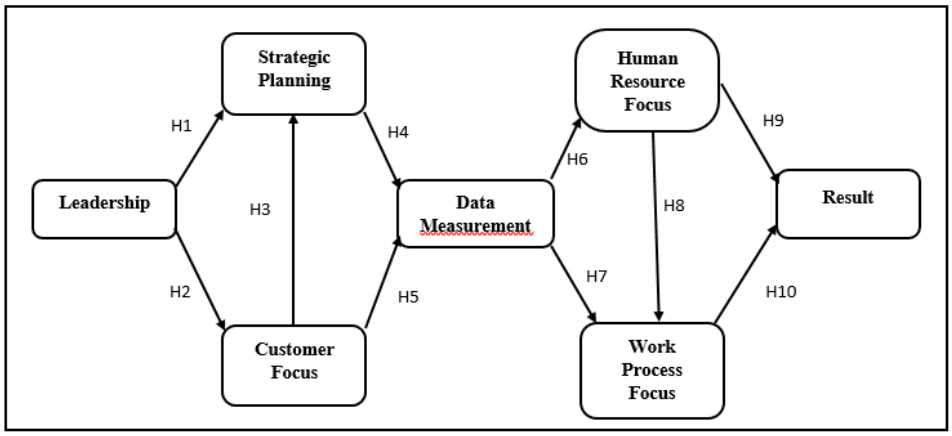

Fig 2. Direct Structural MBNQA Model

H1: Leadership is positively related to Strategic Planning.
H2: Leadership is positively related to Customer Focus.
H3: Customer Focus is positively related to Strategic Planning.
H4: Strategic Planning is positively related to Data Measurement.
H5: Customer Focus is positively related to Data Measurement.
H6: Data Measurement is positively related to Human Resource Focus.
H7: Data Measurement is positively related to Work Process Focus.
H8: Human Resource Focus is positively related to Work Process Focus.
H9: Human Resource Focus is positively related to Result.
H10: Work Process Focus is positively related to Result.

3. Methodology

Wilson & Collier (2000) have conducted a study on the MBNQA criteria used a comprehensive 101 questions. The instrumentation on information of these criteria were tested the relationships and causal model used structural models. They found that the underlying of the MBNQA is supported that "leadership drives the systems that causes results".

Instrumentation of information on all the variables were taken from Wilson & Collier (2000). The Leadership construct were measured by senior executive leadership, leadership system and corporate citizenship elements. Knowledge Management constructs were measured by management of information and data, competitive comparisons & benchmarking and analysis and use of company-level data elements. While the Strategic Planning construct were measured by strategy development and strategy deployment elements. Workforce construct were measured by human resource planning and evaluation, high performance works system, education, training & development and employee well-being and satisfaction elements. Process Management construct were measured by product design, process management and supplier management elements. Customer & Market Focus construct were measured by customer relationship managements and customer satisfaction results elements. Lastly, the Result of business performance was measured by company financial results elements.

The survey was conducted by using google form. Respondents were asked to rate their level of agreement in Likert scale of 1 to 5. The value of 1 shows the lowest level of agreement while the value of 5 shows the highest level of agreement on the question asked.

SmartPLS 3.0 was used in analyzing the data. A total of 5000 re-sample were used to generate the standard error of the estimate and t-values (Hair, 2011; Chin, 1998). SmartPLS 3.0 can give a better expected result by taking into consideration the error which will influence the correlation coefficient

among the variables and improve the analyzed theory (Hair et al., 2012). Convergent validity and discriminant validity have been confirmed.

Lastly, mean response was used to see the level of agreement by respondent(s) in all constructs used in the study.

4. Result

In this section, data analysis was involved with three types of analyses including measurement model, structural model and Importance-Performance Matrix Analysis (IPMA) analysis.

4.1 Measurement Model

Three main criterias are needed in the assessment and model measurement. These three assessments are convergent validity, discriminant validity and internal consistency reliability. (Ramayah et al., 2018). Convergent validity is the level of which many items measuring the same concept. It is achieved when all the value of average variance extracted (AVE) higher than 0.50 and composite reliability (CR) exceeded the minimum level of 0.7 (Hair et al, 2011). Reliability of the construct has been tested by using Cronbach alpha and rhoA value where the minimum value required is 0.7 (Cronbach, 1951). The result shows that all the Cronbach Alpha and rhoA value are ranging from 0.819 – 0.947 and 0.831-0.949 respectively.

Table 1. Convergent Validity

Construck	Item	Loading	Alpha	rhoA	CR	AVE
CF	CF1	0.833	0.877	0.879	0.910	0.67
	CF2	0.802				
	CF3	0.861				
	CF4	0.790				
	CF5	0.804				
DM	DM1	0.843	0.903	0.907	0.928	0.72
	DM2	0.872				
	DM3	0.868				
	DM4	0.829				
	DM5	0.830				
HRF	HRF1	0.833	0.827	0.839	0.886	0.661
	HRF2	0.859				
	HRF3	0.691				
	HRF4	0.858				
L	L1	0.804	0.879	0.888	0.911	0.672
	L2	0.814				
	L3	0.811				
	L4	0.838				
	L5	0.833				
R	R1	0.917	0.921	0.927	0.945	0.81
	R2	0.92				
	R3	0.921				
	R4	0.840				
SP	SP1	0.826	0.899	0.899	0.925	0.712
	SP2	0.856				
	SP3	0.832				
	SP4	0.83				
	SP5	0.874				
WPF	WPF1	0.822	0.934	0.938	0.95	0.794

Construck	Item	Loading	Alpha	rhoA	CR	AVE
	WPF2	0.864				
	WPF3	0.921				
	WPF4	0.92				
	WPF5	0.923				

CF: Customer Focus, DM: Data Measurement, HRF: Human Resource Focus, L: Leadership, R: Result, SP: Strategic Planning, WPF: Work Process Focus, Alpha: Cronbach Alpha, rhoA: Reliability indicator, CR: Composite Reliability, AVE: Average Variance Extracted.

Discriminant validity refers to the measurement of distinct concepts by examining the correlations between the measures of potentially overlapping. There has been criticism on the usage of Fornell-Larcker's (1981) criterion to detect discriminant validity. By using alternative approaches to assess discriminant validity, that is through Multi trait and Multimethod matrix, namely Heterotrait-Monotrait (HTMT) ratio of correlations. Discriminant validity is established for the constructs when the values are lower than the required threshold value of $HTMT_{.85}$ (Kline, 2011) and $HTMT_{.90}$ (Gold, 2001) (Ramayah et al., 2018). The result for this study shows that all the values in this study are lower than the required threshold value of $HTMT_{.90}$ (Gold, 2001). Hence, the measurement model is satisfactorily achieved as shown in Table 2.

Table 2. Discriminant Validity (Heterotrait-Monotrait (HTMT) Criteria)

	CF	DM	HRF	L	R	SP	WPF
CF							
DM	0.687						
HRF	0.800	0.777					
L	0.570	0.515	0.710				
R	0.794	0.777	0.893	0.595			
SP	0.723	0.758	0.815	0.629	0.795		
WPF	0.698	0.783	0.814	0.664	0.870	0.739	

CF: Customer Focus, DM: Data Measurement, HRF: Human Resource Focus, L: Leadership, R: Result, SP: Strategic Planning, WPF: Work Process Focus

4.2 Structural Model

Prior to evaluating the structural model, lateral collinearity must be checked to ensure it is not a problem in the structural model. Although the criteria of discriminant validity are met, lateral collinearity issue (predictor-criterion collinearity) may affect the finding. This typically occurs when two variables that are hypothesized to be causally related measure the same construct (Ramayah et al., 2018).

Table 3 presents the outcome of lateral collinearity test. VIF values for sixth independent variable are less than 5. Therefore, there is no element of lateral collinearity in this study (Hair et al., 2017).

Table 3. Lateral Collinearity Analysis

Construct	VIF VALUE						
	CF	DM	HRF	L	R	SP	WPF
CF		1.709				1.35	
DM			1				1.831
HRF					2.07		1.831
L	1					1.35	
R							
SP		1.709					

Construct	VIF VALUE						
	CF	DM	HRF	L	R	SP	WPF
WPF					2.07		

CF: Customer Focus, DM: Data Measurement, HRF: Human Resource Focus, L: Leadership, R: Result, SP: Strategic Planning, WPF: Work Process Focus
VIF ≤ 5.0 (Hair et al., 2017)

This study seeks to investigate the importance and performance of MBNQA factors in achieving organizational goal. For that purpose, ten direct hypotheses are developed between the constructs as mentioned in literature review. SmartPLS 3.0 bootstrapping function are generated to test the significance level and t-statistics for all path in the current model. Result of the test revealed that all ten relationships are found to be significant at 0.05 level and t-value ≥ 1.645, except for the leadership factor that does not influence human resource focus.

Quality of the model can be assessed through effect sizes (f^2), R^2 value and Q^2 value (Hair et al., 2017). The results showed that effect sizes (f^2) ranging from small to large, R^2 ranging from 0.47 to 0.78 and Q^2 are more than 0 indicating that the model has sufficient predictive relevance (Hair et al., 2017; Fornell & Cha, 1994). All the results of the hypothesis testing and quality of the model are described in Table 4 below.

Table 4. Hypothesis Testing

Hypothesis	Relationship	Std. Beta	Std. Error	Tvalue	Result	R^2	f^2	Q^2
H1	L -> SP	0.326	0.127	2.559**	Supported	0.484	0.155	
H2	L -> CF	0.509	0.141	3.625**	Supported	0.253	0.350	
H3	CF -> SP	0.478	0.128	3.733**	Supported	0.484	0.334	0.162
H4	SP -> DM	0.497	0.080	6.224**	Supported	0.517	0.305	0.343
H5	CF -> DM	0.298	0.080	3.703**	Supported		0.109	0.162
H6	DM -> HRF	0.674	0.059	11.509**	Supported	0.449	0.831	0.360
H7	DM -> WPF	0.438	0.085	5.136**	Supported	0.615	0.276	0.360
H8	HRF -> WPF	0.424	0.090	4.691**	Supported		0.260	0.286
H9	HRF -> R	0.420	0.080	5.245**	Supported	0.739	0.333	0.286
H10	WPF -> R	0.509	0.082	6.179**	Supported		0.488	0.486

CF: Customer Focus, DM: Data Measurement, HRF: Human Resource Focus, L: Leadership, R: Result, SP: Strategic Planning, WPF: Work Process Focus
**p<0.01, t value > 2.33; *p<0.05, t value > 1.645

4.3 Importance-Performance Matrix Analysis (IPMA)

IPMA was performed to obtain the diagnostic value of the model. This analysis is done by comparing the mean value of the dependent variables with the PLS expectation that will provide a measure to determine the importance of each construct in the study model.

Table 5 clearly showed that the Human Resource factor was the most important factor with the importance value (0.67) and performance value (60.42) followed by Data Management factor with importance value (0.63) and performance value (55.97). These two factors are considered more important than other factors. Work Process Focus was the third important factor with the importance value (0.47) and performance value (62.00) while the fourth important factor was Customer Focus with importance value (0.37) and performance value (55.52).

Figure 2 shows the position of the Human Resource factor and Data Measurement constructs located in the top right box, followed by Work Process Focus and Customer Focus. This position clearly shows that the Human Resource, Data Measurement, Work Process Focus and Customer Focus were among the important factors in influencing the organizational performance. Considering this IPMA analysis, the organization needs to focus on these four aspects to help them create efficient and strong

environment to foster outstanding performance. On the other hand, the Leadership Factor and Work Process Focus were seen as having the highest performance in the organization management.

Table 5. IPMA Analysis

Construct	Important (Total Effect)	Performance (Index Values)
CF	0.37	55.52
DM	0.63	55.97
HRF	0.67	60.42
L	0.31	66.43
SP	0.32	58.48
WPF	0.47	62.00

CF: Customer Focus, DM: Data Measurement, HRF: Human Resource Focus, L: Leadership, R: Result, SP: Strategic Planning, WPF: Work Process Focus

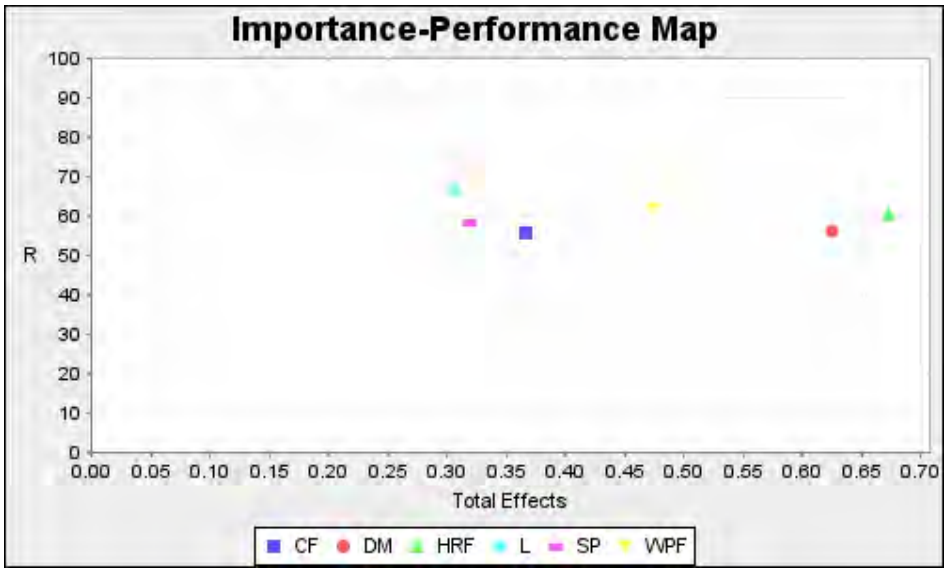

Fig. 3 IPMA diagram for Malcolm Baldrige factors

5. Discussion

The main objective of this study is to identify the most important factor among the six elements of MBNQA approach. This study showed that Baldrige framework has excellent goodness of fit measures. It also provides empirical evidence of the relationships underlying the Baldrige framework which also points to a number of important relationships that are useful in a better managerial understanding of the Baldrige framework and creating a quality management system in an organization.

The model provides the evidence that Strategic Planning process for the organization directly impacted by Leadership. Its plays a direct and significant role in the strategic planning regarded as a key factor of the successful organisation. This factor has the strongest indirect influence on organization and financial performance (Wilson & Collier, 2000). The results here are consistent with the positive relationship between Leadership and Customer Focus (Flynn et al., 1995; Ahire et al., 1996) and Strategic Planning (Anderson et al., 1994).

This study also supports the Baldrige framework which implies that a direct relationship exists between a Customer and market focus and Data Measurement. Data Measurement is the link between

the strategic planning and an organization's operational processes. It represents the mechanism to measure and evaluate feedback and improvement needed to ensure continuous improvement in an organisation. In Baldrige framework, its regarded as an important element and play important role in quality systems (Babbar, 1992; Miller, 1992).

The findings of the study also showed that Human Resource Focus and Work Process Management directly impacted organizational performance (Result). Excellence in academic management and stakeholders' satisfaction are among the result of a quality system. The results suggest that a Human Resource focus directly affect organizational performance as proposed by the Baldrige framework. It also affects directly Work Process focus which implies that Human Resource focus is critical component to obtain good performance. These results supported by several studies (Anderson et al., 1994; Flynn et al., 1995).

IPMA analysis in SmartPLS 3.0 was performed to predict the most important elements influencing organizational performance. The result revealed that the most important elements need to be given special attention is Human Resource Focus followed by Data Measurement, Work Process Focus and Customer Focus factors. The finding of this study did not deny the importance of Leadership as the key driver to the effectiveness of an organization and as a planner and monitor to the effectiveness of all the elements in the Baldrige model. Wilson and Collier (2000) proved that Leadership has the strongest indirect influence on organization and financial performance. It also in line with what is explicitly states by The Baldrige framework that "senior leaders set directions and build and sustain a leadership system conducive to high performance, individual development, initiative, and organizational learning. This category calls for information on the major aspects of leadership – creating values and expectations; setting directions; projecting a strong customer focus; developing and maintaining and effective leadership system; and effectively communicating values, directions, expectations, and a strong customer focus" (NIST, 1999). Overall, this study proved that the elements in MBNQA model are important factors that can predict the effectiveness of an organization's management (Lee et al., 2003; Ghosh et al., 2003; Prybutok & Cutshall, 2004).

6. Conclusion

In conclusion, efficient and effective organizations are very important to ensure the execution of excellent services to the stakeholders as part of the criteria in Society 5.0. The factors such as Human Resource Focus, Data Measurement, Work Process Focus and Customer Focus are important factors to influence the organization performance as compared to Leadership and Strategic Planning Factors. On the other hand, the Leadership factor, Human Resource Focus and Work Process Focus were seen as having the highest performance in organization management. This is consistent with the practices that the top management will ensure the organization's vision, mission, objectives and strategies are well disseminated and embraced by all staff in ensuring the achievement of organizational goals. The work process and standard operation procedure (SOP) must be in-place and fulfilled as a need to ensure the quality management standards are complied.

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