



Development of Application Malcom Baldrige in Performance Assessment System of Health Management

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Abstract –Hospitals are required to be able to improve quality and maintain service standards that meet international standards as a whole. In this case, a health sector management performance appraisal system is needed to obtain information about the level of hospital management performance. This research builds a health management performance appraisal system with *Malcolm Baldrige*. *Malcolm Baldrige* is a performance framework that complies with international standards and is used in measuring hospital management performance. The indicators/criteria in this study are: leadership; strategic planning; patient focus; other customers and markets; measurement analysis and management; workforce focus; focus on work operations and results. The results of this study are in the form of a hospital management performance appraisal system that can provide information on the level of hospital performance. This study shows that the hospital is at the level of " *industry leader* " with a score of 677.20. This shows that the application of *Malcolm Baldrige's framework* is appropriate in the health sector management performance appraisal system.

keywords –, *Malcolm Baldrige* , performance indicators.

I. INTRODUCTION

The health sector is one of the sectors that is directly related to people's lives, therefore the provision of the need for health services must be prioritized. The hospital is a health service institution for the community with its own characteristics which are influenced by developments in health science, technological advances and the socio-economic life of the community which must continue to be able to improve quality services and be affordable by the community in order to realize the highest degree of health[1].

In its role, hospitals are required to be able to provide quality services in accordance with established standards and can reach all levels of society[2][3]. Standards that have been used by several hospitals to measure their management performance, such as: Hospital Accreditation Committee (KARS), *Joint Commission International* (JCI), ISO 9000, *Balanced Scorecard* and other quality management systems to improve service quality[4].

To improve quality and maintain hospital service standards, a performance appraisal is needed. Hospital performance appraisal is very difficult and complex to do, more information is needed in the non-financial field[5]. The performance appraisal system is carried out with the aim of controlling, monitoring and improving the service quality of health companies [6].

In order for performance appraisal to be carried out properly, companies need to establish relevant performance indicators. Performance indicators are not only financial indicators but also non-financial indicators, especially for measuring *outcomes* .

In 1987 the National Institute of Standards and Technology (NIST) developed the *Malcolm Baldrige National Quality Award* (MBNQA) with the basic aim of promoting quality awareness that is recognized and disseminated by American companies. At first, MBNQA was limited to manufacturing and for-profit service businesses, but in 1995, MBNQA was developed specifically for companies in the health sector [7].

The Malcolm Baldrige Criteria for Performance Excellence is a guide for a company to achieve high quality performance. Consists of 7 criteria namely Leadership; Strategic planning; Patient, other Customer and Market Focus; Knowledge Measurement, Analysis and Management; Workforce Focus; Work Operation Focus; and result. The advantage of the *Baldrige criterion* is its ability to provide a comprehensive and integrated assessment. Quality measurement using the *Baldrige* criteria is advantageous because it allows companies to carry out self - *assessments* (Gaspersz and Fontana, 2011). In addition to having complete criteria and in accordance with international standards, *Malcolm Baldrige's criteria* also have dependencies between one criterion and another [8].

One of the studies in performance appraisal is using the Balanced Scorecard Framework and the linguistic *fuzzy method* is also applied in performance evaluation in the operating room (operating room) to measure and improve the performance of the operating room. Using 4 basic perspectives, namely: finance; customer; internal business processes; learning and growth. The results of this study can help companies to evaluate and revise corporate strategy. [4]. However, *the Balanced Scorecard* is not strong enough to elevate the company's performance to become a company with a *great level of performance* or *excellence* . Because *the Balanced Scorecard* only has 4 perspectives/categories that focus on finance. Meanwhile, *Malcolm Baldrige* has 7 criteria that must be met by a company.

By consistently and continuously implementing *the Baldrige Excellence Framework* , hospital leaders will be able to meet JCI international standards and encourage hospitals to be able to compete in the 2015 MEA free competition era [9].

From the issues raised, it is hoped that the application of *Malcolm Baldrige's framework* will be able to provide a more comprehensive and thorough performance appraisal tool so as to produce a company strategy to improve management quality based on service standards set by the government. This research was conducted at the regional general hospital (RSUD) Dr. Ashari Malang.

II. METHOD

2.1 Malcolm Baldrige

Malcolm Baldrige criteria are a framework that contributes to increasing company performance requirements [7]. The *Malcolm Baldrige* criteria also provide a framework in the health sector to develop and manage quality systems for healthcare companies [7].

The *Malcolm Baldrige* National Quality Award is a national quality award in the United States for various companies, both business and non-profit, for excellent performance. The name of this award is taken from the name of Howard Malcolm Baldrige Jr, who was the United States secretary of commerce in 1981-1987. *Baldrige Criteria* is a criterion used to evaluate the company's excellent performance[10][11].

The *Malcolm Baldrige* Criteria for Performance Excellence is a guide for a company to achieve high quality performance which consists of 7 criteria, namely Leadership; Strategic planning; Focus on Customers; Knowledge Measurement, Analysis and Management; Focus on Labor; Process Management; and Results [12][8].

2.2 The Malcolm Baldrige Process

Malcolm Baldrige performance framework is used as a measurement of hospital management performance. Which step done is:

1. Preliminary survey of the performance of research objects.
The object used in this study is the hospital. Researchers conducted an initial survey of hospital management performance to determine compatibility between *Malcolm Baldrige's criteria* and the object of research.
2. Designing a list of questions according to *the ballridge assessment* .
The questions that will be asked correspond to the items in the *Malcolm Baldrige criteria* .
3. After the list of questions was compiled, it was then formed into a questionnaire and then distributed to hospital leaders to fill in the data. Interviews were conducted with 4 heads of departments at the hospital, such as: heads of services, heads of support, heads of administration, and heads of finance.
4. Processing the data obtained then scores adjusted to *Malcolm Baldrige's assessment standards*[13] . Ratings are made in percentage form based on the MBNQA *scoring guidelines* shown in Table 1 and Table 2.

Table 1. ADLI score based on *Malcolm Baldrige*

Score	Information
0%, 5%	The approach is not systematic, there is no dissemination, there is no improvement, the integration is done independently
10%, 15%, 20%, 25%	Early stage approach, dissemination is only a little, improvement is general in nature, integration is carried out in groups
30%, 35%, 40%, 45%	Approach and dissemination on specific items, improvement of key processes, integrated with organizational needs
50%, 55%, 60%, 65%	Effective approach on most items, good dissemination, fact-based improvement, integration with organizational needs
70%, 75%, 80%, 85%	Approach is effective on most items, dissemination without gaps, improvement based on facts and learning in the form of sharing, integration works well in responding to the criteria item items
90%, 95%, 100%	Responsive approach to all items, dissemination without any weaknesses, improvements and innovations based on facts and learning in the form of sharing to all sections, integration goes well in response to criteria items

Table 2. LeTCI score based on *Malcolm Baldrige*

Score	Information
0%, 5%	There are no organizational performance results, trend data are not reported, comparative information is not reported, results are not reported according to the organization's key mission / business needs
10%, 15%, 20%, 25%	Some organizational performance results are reported, no/only a few trend data are reported, no/little comparative information, results are reported for only a few key areas of the organization's key mission/business needs
30%, 35%, 40%, 45%	Good performance levels are reported, trends are improving, early stages of obtaining benchmarking information, results are reported for many areas critical to the organization's mission key business needs
50%, 55%, 60%, 65%	Performance levels are reported for many areas, no pattern of adverse trends, some trends and/or current levels of performance are evaluated against relevant benchmarks, organizational performance results are mostly related to customer, market, process needs
90%, 95%, 100%	Current performance at superior levels, superior improvement trends and/or superior performance levels are consistently reported, evidence of industry leadership is demonstrated, organizational performance results are all related to key customer needs, markets, processes, and action plans

- Conduct an overall assessment to get the final result in the form of a level of performance. The results of the performance level in *Malcolm Baldrige* are shown in Table 3.

Table 3. Performance level based on *Malcolm Baldrige*

Predicate level	Score	Levels
early development	0-275	Poor
early results	276-375	
early improvement	376-475	Average
good performance	476-575	
emerging industry leaders	576-675	
industry leader	676-775	Excellent
benchmark leader	776-875	
world leader	876-1000	

2.3 Deployment with Malcolm Baldrige

The process with the *Malcolm Baldrige performance framework* is:

Processing the data obtained then scores adjusted to *Malcolm Baldrige's assessment standards* . Ratings are made in percentage form based on the MBNQA scoring guidelines.

The first step:

Give a score according to the MBNQA *scoring guidelines* for the leadership criteria and sub-criteria. Then, calculate the average score obtained for the leadership criteria. Scores for the leadership criteria are shown in Table 4.1.

Table 4.1 Scores for leadership criteria

Leadership Sub 1a	Leadership Sub 2a	Leadership Sub 2b
60%	60%	75%
55%	60%	75%
55%	65%	80%
60%	60%	
60%	60%	
65%	65%	
60%	60%	
60%	60%	
Average Sub score 1 59%	Average Sub score 2	65%

Second step:

Calculate the average value obtained from each criterion and enter the value of each criterion into the *Malcolm Baldrige calculation table* as shown in Table 4. Next, multiply the average value by the max points and enter the value into the "item points" column. Then, add up the item points in the same criteria and enter the value into the "category points" column. Do the assessment in the same way for each criterion both process and outcome.

Description Table 4.

Max points : fixed value by standard from *Malcolm Baldrige* .

Score : the average value obtained from each criterion.

Item points: the multiplication result between the max points and the score

Criteria points: the sum of the item points on the same criterion.

Table 4 . Calculations based on *Malcolm Baldrige*

KRITERIA	POIN MAKS	SKOR	POIN ITEM	POIN KRITERIA
Kepemimpinan	120			73,80
Kepemimpinan senior	70	59%	41,300	
Pemerintah dan tanggung jawab sosial	50	65%	32,500	
Perencanaan strategi	85			52,75
Pembangunan strategi	40	61%	24,40	
Penyebarnya strategi	45	63%	28,35	
Fokus pada pasien, pelanggan lain dan pasar	85			55,75
Pasien, pelanggan lain dan pengetahuan pasar layanan kesehatan	40	64%	25,60	
Pasien dan hubungan pelanggan lainnya dan kepuasan	45	67%	30,15	
Pengukuran, analisis dan manajemen pengetahuan	90			62,10
Pengukuran, analisis dan tinjauan kinerja organisasi	45	68%	30,60	
Informasi dan pengelolaan pengetahuan	45	70%	31,50	
Fokus tenaga kerja	85			64,10
Sistem kerja	35	76%	26,60	
Pembelajaran staf dan motivasi	25	77%	19,25	
Kesejahteraan staf dan kepuasan	25	73%	18,25	
Fokus operasi kerja	85			51,00
Proses layanan kesehatan	45	60%	27,00	
Mendukung proses dan perencanaan operasional	40	60%	24,00	
Hasil-hasil	450			317,70
Hasil layanan kesehatan dan penyedia layanan	100	72%	72,00	
Hasil fokus pasien dan pelanggan lain	70	66%	46,20	
Hasil keuangan dan pasar	70	57%	39,90	
Hasil sumber daya manusia	70	75%	52,50	
Hasil efektivitas organisasi	70	82%	57,40	
Hasil kepemimpinan dan tanggung jawab sosial	70	71%	49,70	
TOTAL	1000			677,20

Third step:

Conduct an overall assessment to get the final result in the form of a level of performance. Add up all the criteria points to get the final score and find out the level of hospital performance. As shown in Table 4, based on the calculation results, the score obtained by the hospital was 677.20, this means that the hospital's performance assessment received an excellent predicate and was included in the industry leader.

From the research results obtained based on *Malcolm Baldrige's framework*, it shows the level of performance at this hospital, namely: industry leader, with a score of 677.20. The industry leader level is a fairly good level of performance because the company is already at the initial excellent level. This level of performance can be increased by improving any criterion that has deficiencies. To find out which criteria have an influence on the assessment of management performance, the researcher continues the process of assessing between criteria using the ANP method.

III. RESULTS AND DISCUSSION

3.1 Research Results

The results of this study are a management performance appraisal system for evaluating the performance of management in the health sector. From the results of the assessment that has been obtained, a management quality improvement strategy will be developed in facing the evaluation of international field performance based on JCI.

In this study, the performance level results were obtained in the form of *an industry leader* with a score of 677.20. The performance level of this *industry leader* is quite good because it is included in the company's excellent level. Even though it can be seen in *Malcolm Baldrige's framework* that it is already at the level of industry leader performance, it is necessary to evaluate it with a method so that the validity of the system can be accepted.

The results are shown in the form of a chart of priority criteria that must be improved in management performance along with the strategy criteria that must be improved.

The process display on the system is a display that shows the process of an assessment of the performance management of the health sector running according to the questions and criteria that have been entered by the previous admin. There are several processes carried out in this system, such as: filling in *Malcolm Baldrige's data*.

3.1.1 Process with Malcolm Baldrige

From the research results obtained based on *Malcolm Baldrige's framework*, it shows the level of performance at this hospital, namely: *industry leader*, with a score of 677,200. The level of *industry leader* is a level of performance that is quite good because the company is already at the initial level of *excellent*. This level of performance can be increased by improving any criterion that has deficiencies.

3.1.2 Malcolm Baldrige results

Malcolm Baldrige's results on the system shows the results of the performance level on the system, namely " *industry leader* ", which means that this company is at the first stage of *excellent level*. Display of *Malcolm Baldrige results* can be seen in Table

Table 5 . Malcolm Baldrige results

RESULTS				
1	Health Service Outcomes	100	72%	72.00
2	Outcome Focus Patients and other customers	70	66%	46,200
3	Financial and market results	70	57%	39,900
4	Human resource results	70	75%	52,500
5	Organizational effectiveness results	70	82%	57,400
6	Results of leadership and social responsibility	70	71%	49,700
		450		317,700
Total and conclusion			677,200	industry leader

Based on previous research on MBNQA, this study changes the 1995 MBNQA for the health care sector to the 2002 MBNQA application for the government sector. In addition, the researcher also used *Partial Least Square* (PLS) to test the instrument on criteria with one-to-one correspondence. As a result, a relationship was found between:

1. Leadership (*leadership, strategic planning, customer market*) is positively related to results (*human resources, process management, business results*).
2. *Information and analysis* are positively related to results (*human resources, process management, business results*).
3. *Information and analysis* is positively related to leadership (*leadership, strategic planning, customer market*) [7].

IV. CONCLUSION

From the results of the initial to final calculations on the system, it shows that the level of accuracy of the system created is the same as the actual data that has been calculated manually. This proves that this system can and should be used as a tool for hospital managers to evaluate management performance. In addition, it was also found that based on the results of the study, the level of performance at the Regional General Hospital (RSUD) Dr. Ashari Pemalang is *the industry leader*, with a score of 677,200. The level of *industry leader* is a level of performance that is quite good because the company is already at the initial level of *excellent*. This level of performance can be increased by improving any criterion that has deficiencies.

REFERENCE

- [1] D. Bork, R. Buchmann, I. Hawryszkiewicz, D. Karagiannis, N. Tantouris, and M. Walch, "Using Conceptual Modeling to Support Innovation Challenges in Smart Cities," *2016 IEEE 18th Int. Conf. High Perform. Comput. Commun. IEEE 14th Int. Conf. Smart City; IEEE 2nd Int. Conf. Data Sci. Syst.*, pp. 1317–1324, 2016, doi: 10.1109/HPCC-SmartCity-DSS.2016.0187.
- [2] Saluky, "Tinjauan Artificial Intelligence untuk Smart Government," *ITEJ (Information Technol. Eng. Journals)*, vol. 3, no. 1, pp. 8–16, 2018.
- [3] Saluky, "Development of enterprise architecture model for smart city," *ITEJ (Information Technol. Eng. Journals)*, vol. 2, no. 2, pp. 12–18, 2017.
- [4] Saluky, "Aplikasi Business Intelligence Menggunakan Metode Balanced Scorecard untuk Mengukur Kinerja Marketing Indosat Cirebon," *J. Inform.*, vol. 7, no. 2, 2011.
- [5] S. Suresh, "Big Data and Predictive Analytics. Applications in the Care of Children," *Pediatr. Clin. North Am.*, vol. 63, no. 2, pp. 357–366, 2016, doi: 10.1016/j.pcl.2015.12.007.
- [6] Q. L. Lin, L. Liu, H. C. Liu, and D. J. Wang, "Integrating hierarchical balanced scorecard with fuzzy linguistic for evaluating operating room performance in hospitals," *Expert Syst. Appl.*, vol. 40, no. 6, pp. 1917–1924, 2013, doi: 10.1016/j.eswa.2012.10.007.
- [7] S. M. Goldstein and S. Schweikhart, "Empirical Support for the Baldrige Award Support for the Baldrige Award Framework in U . S . Hospitals," *Health Care Manage. Rev.*, vol. 27, no. 1, pp. 62–75, 2002, doi: 10.1097/00004010-200201000-00006.
- [8] S. M. Meyer Goldstein, D. a Collier, S. M. Meyer, and D. a Collier, "An empirical test of the causal relationships in the Baldrige Health Care Pilot Criteria," *J. Oper. Manag.*, vol. 19, no. 4, pp. 403–426, 2001, doi: 10.1016/S0272-6963(01)00053-5.
- [9] Priyadi, "Manajemen Rumah Sakit Menghadapi Era Masyarakat Ekonomi Asean Tahun 2015," 2015. .
- [10] Y. M. Saluky, "A Review Learning Media Development Model," *Int. J. Technol. Model.*, vol. 1, no. 2, pp. 36–49, 2022.
- [11] Y. M. Saluky, "A Review: Application of AIOT in Smart Cities in Industry 4.0 and Society 5.0," *nternational J. Smart Syst.*, vol. 1, no. 1, pp. 1–4, 2023.
- [12] A. Gaspersz, V., Fontana, *Malcolm Baldrige Criteria For Performance Excellence*. Bogor: Vinchristo Publication, 2011.
- [13] Saluky, "A Survey on Abandoned Objects Detection from CCTV Surveillance," *ITEJ (Information Technol. Eng. Journals)*, vol. 5, no. 2, pp. 105–118, 2020.