Performance Evaluation of Maintenance Management Strategy Using Malcolm Baldrige Criteria

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Abstract

This study aims to analyze the Maintenance Management strategy at PT Sumber Graha Sejahtera Luwu Branch by measuring Malcom Baldrige. Data collection techniques were carried out using questionnaires, interviews with the Maintenance Initiative Management Team, and data collection in the form of various internal company information used in the implementation of Maintenance Management initiatives. Data analysis using descriptive analysis and percentage analysis. The company's total score is based on the MBCfPE 2012 world class performance framework. The results show that the total score is obtained PT. Sumber Graha Sejahtera Luwu Branch for all MBNQA categories based on the results of the questionnaire is 724 or 72% of the maximum score of 1000. This means that for the performance assessment of PT. Sumber Graha Sejahtera Luwu Branch based on MBNQA, PT. Sumber Graha Sejahtera Luwu Branch won the title of Exellent and is included in the category *Industry Leaders* (point scale 676–775). Industry Leaders PT. Sumber Graha Sejahtera Luwu Branch is in a very good position.

Keywords: Performance Evaluation; Maintenance Management Strategy; Malcolm Baldrige Criteria

INTRODUCTION

Influence The business world will always face various challenges in its journey. Various things can become threats that disrupt the existence and sustainability of the company's business. The maintenance management section in particular is undergoing major changes (Schroder, 2011). Industry as well as society realizes that the efficient use of industrial assets is a key issue in supporting our current standard of living. In this context, PT Sumber Graha Sejahtera Luwu Branch seeks efficiency in producing good quality products without disrupting production for unnecessary damage. With today's ever-increasing demands for increased system productivity, availability and safety, product quality, customer satisfaction and taking into account the trend of declining profit margins, the importance of implementing an efficient maintenance strategy becomes unquestionable for PT Sumber Graha Sejahtera Luwu Branch. In this case the maintenance function plays an important role in the company's ability to compete on a cost basis (Vasiliev et al., 2018). For example, research over the last 20 years has shown that across Europe,

indirect maintenance costs equate to between 4% and 8% of total sales turnover (the same amount as direct costs). Thus, in countries where modern treatment practices have not been well adopted by industry, the potential savings from modern treatments are enormous (Nwogugu, 2021).

This modern and efficient maintenance practice implemented by PT Sumber Graha Sejahtera Luwu Branch involves, at a minimum, identification of the root causes of component failures, reduction of production system failures, elimination of costly unscheduled maintenance, and ultimately improvement in both productivity and product quality. At the end of this shift in focus on maintenance, there is a new role for the maintenance function, particularly for the manufacturing industry, taking into account a life cycle management oriented approach (Balashov *et al.*, 2018). To support this role, the concept of maintenance has undergone several major developments involving proactive consideration, which necessitated a change in transforming the traditional "fail and fix" maintenance practice to a "predict and prevent" electronic maintenance strategy (Osei-Kyei and Chan, 2017).

The approach of PT Sumber Graha Sejahtera Luwu Branch takes into account the potential impact on customer service, product quality and cost reduction (Lee 2004). The main advantage is that maintenance is carried out only when a certain level of equipment breakdown occurs rather than after a certain period of time or use. In other words, there is a shift from current mean-time-between failure (MTBF) practices to mean-time-between-degradation (MTBD) technologies (Tikhonov, 2019). E-Maintenance PT Sumber Graha Sejahtera Luwu Branch provides an opportunity for 3rd generation maintenance and is a sub-concept of e-manufacturing and e-business to support next generation manufacturing practices (NGMS).

Measurement of maintenance management performance at PT Sumber Graha Sejahtera Luwu Branch was carried out because it saw the trend of various studies that had developed a framework that considered non-financial and intangible asset measurements to achieve competitive advantage. The efficiency and effectiveness of maintenance systems play a critical role in the success of an organization and its sustainability. Therefore, the performance of PT Sumber Graha Sejahtera Branch Luwu system needs to be measured using a well-thought-out performance measurement system. The importance of performance measurement cannot be overemphasized, with many authors stressing its role in today's information-driven decision-making environment. It is the process language for any organization (Meng *et al.*, 2013). It shows where the organization is and where it is going. It serves as a guide as to whether the organization is on its way to achieving its goals. It is also a powerful behavioral tool, as it communicates to employees what is important and what is important to the achievement of organizational goals (Behrman and Perreault, 1982; Iskandar et al., 2023).

Furthermore, the basis for measuring the performance of maintenance management at PT Sumber Graha Sejahtera Luwu Branch is based on several existing theories such as Chandima (2012) states that measurement is the main management activity that provides information needed

by decision makers for decision making, performance monitoring, and effective resource allocation (Chandima Ratnayake & Marketet, 2012). It has been observed that PT Sumber Graha Sejahtera Luwu Branch that uses an integrated balanced performance measurement system performs better than companies that do not measure their performance.

Performance measurement has three basic functions: coordinating, monitoring, and diagnosing. Through these functions, if properly implemented and used, performance measurement can literally change people's lives and organizational effectiveness (Behrman and Perreault, 1982). Similarly, Mengistu (2021) looks at the performance hierarchy for different performance measures and provides four reasons why organizations need to measure them; for planning, screening, control and diagnosis (Mengistu and Panizzolo, 2021). In line with this, Trianni (2019) emphasized that the three significant levels of performance are organization, process and job/performer (Trianni et al., 2019). However, Sueyoshi (1992) argues that maintenance performance will depend on the perspective applied. For example, accountants will think of maintenance in terms of cost, top management is often only interested in budget performance, engineers will focus on engineering, production will look at performance in terms of equipment availability and support responsiveness.

After experiencing several existing industry challenges, PT Sumber Graha Sejahtera Luwu Branch faced the challenge of showing its best performance in operational management. In this case, maintenance management does not escape global scrutiny to show its performance. A concern that could arise is replacing the current maintenance management initiative at PT Sumber Graha Sejahtera Luwu Branch with something new from the parent company. If this happens, the company needs to prepare for a cultural change in exercising discipline in implementing routine maintenance and repair management plans. This can be avoided if the company is able to show objectively, measurably, and specifically performance achievements in the implementation of ongoing maintenance management initiatives. For this reason, measuring the performance of the implementation of maintenance management initiatives is absolute. This study aims to determine the Maintenance Management strategy at PT Sumber Graha Sejahtera Luwu Branch by measuring Malcom Baldrige.

LITERATURE REVIEW

According to Loerbrocks et al. (2021), maintenance has the characteristics of the process of leading and directing all parts of the organization, often as a business organization, through the management of resources (human, financial, material, intelligence or intangible) (Loerbroks et al., 2021). Meanwhile, management is said to function by carrying out a number of regular quantity measurements and adjusting the initial plans and actions to be taken to achieve the desired goals. Therefore, maintenance management has the characteristics of the process of

leading and directing the maintenance organization (Muhajir et al., 2019; Yung, 2015). Maintenance management itself is defined as a combination of technical, administrative and managerial aspects during the life cycle of a tool with the aim of maintaining, returning to conditions that allow it to produce the desired performance according to its function (White, 2009). Another definition of maintenance management is the management of all assets owned by the company, to maximize return on asset investment (Balashov et al., 2018).

Various studies have been conducted regarding the Performance of the Maintenance Management Strategy Using the Malcolm Baldrige Criteria. The differences in the results of these studies lead to pros and cons in concluding the results of the research. Research conducted by Sintari (2020) on Hospital's Performance with the Malcolm Baldrige Method explains that Malcolm Baldrige has been widely used to assess institutional performance. However, the data obtained from the assessment is still visualized in tabular form. Visualization for rendering data like this is less attractive and makes it difficult for the reader to interpret the data. The study said that by using the Malcolm Baldrige method data can be visualized in the form of bar charts, radar charts, and pie charts.

In line with the findings of Dasaranti (2018) regarding the Analysis of Hotel Quality Control in Papandayan Hotels Using the Malcolm Baldrige Method. This research shows that the quality control of Papandayan Hotel service products based on the company's perception is in the industry leader. While the results of research based on consumer perceptions, quality control of Papandayan Hotel service products are in the benchmark leader category. Furthermore, research conducted by Zulkifli Mohamed (2021) on the Malcolm Baldrige Approach in University Management: An Importance – Performance Matrix Analysis (IPMA). Hypothesis testing shows that 5 of the 6 elements of management factors have a positive relationship. While the IPMA analysis shows that the focus of human resources is the most important factor, followed by data measurement, Work Process Focus and Customer Focus are factors that influence organizational effectiveness. The leadership factor obtained the highest performance even though it was less important than the other factors in the IPMA analysis.

METHODS

This study is a quantitative research with a case study approach using evaluative rules. Population is all data sources needed in a study (Saryono, 2013). The total population in PT. Sumber Graha Sejahtera Luwu Branchmore than 1.500 employees. The sample is part of the population to be studied (Hidayat, 2013). The sample selected in this study is part of the employees PT. Sumber Graha Sejahtera Luwu Branchas many as 20 employees. In this study using purposive sampling technique. Purposive sampling is a non-random sampling method in which the researcher ascertains the citation of illustrations through the method of determining a special identity that matches the research objective.

The methodology used in this study went through 6 stages, namely the Preparation stage by conducting Industry analysis and determining the company, the Literature and Data stage by studying various literature, articles and scientific journals and determining the data to be taken as data processing material, the Self-Assessment stage using the 2009 edition of the Baldrige Criteria, the Analysis phase is carried out by using all documentation, data and information obtained during the self-assessment process to be analyzed by re-validating the data findings and using various references, especially best-practices with the aim of formulating things that can be used in strategy formulation stage. Furthermore,

The data analysis method used is descriptive analysis and percentage analysis. Descriptive analysis is an analysis by verbally describing the resulting data, the resulting data are in the form of symptoms that appear in the research area such as an overview of the research area, both physical conditions and social conditions, as well as describing the results of the questionnaires, interviews and observations conducted by the researcher. While the percentage analysis is used to calculate the proportion of each alternative answer, so that the trend of respondents' answers and field phenomena can be known.

This study uses the MBCfPE 2012 world class performance framework. In Malcolm Baldrige it is structured with a combination of core values and concepts (Core Values and Concepts) that are closely synchronized with one another. These core values and concepts are the basis for incorporating core business requirements into a result-oriented work concept (result-oriented framework). Then it is used as a center to act or receive feedback. Following are the seven design criteria for Malcolm Baldrige (Prasetyo 2021), namely Leadership (120 Points), Strategic Planning (85 Points), Customer Focus (85 Points), Measurement, Analysis and Knowledge Management (90 Points), Human Resources Focus (85 Points), Focus on Operational Management/Process Management (85 Points) and Results (450 Points).

RESULTS AND DISCUSSION

The data analysis used in this study is in the form of a percentage which refers to the guidelines for using the MBNQE method. The author looks for the percentage weight of each statement by multiplying the number of respondents' answers with a predetermined score then all the results are added up, the percent score is obtained from the total score divided by the product of the number of respondents and the weight of the largest answer (Likert scale) that has been determined then looks for the average value of all statements in a categorical variable, by adding up all the percent scores/number of statements for each criterion, then converted into a Malcolm Baldrige score on that categorical variable.

The score obtained is obtained from the average percent value multiplied by the weight score of each MCBfPE criterion. In the next stage, the mapping result data is transformed into a

score using the mapping results table. It is transformed into a score using a table to help assess each item of MBCfPE performance criteria. The weight score for each MCBfPE criterion, the results are added up to obtain a total company performance score. The company's total score based on the 2012 MBCfPE world performance class framework. Table of scores for all categories based on the results of the PT. Sumber Graha Sejahtera Luwu Branch can be seen in Table 1.

Table 1. Branch Results

No	Category	Max Score	Branch	Achievement Percent
1	Leadership	120	90	76%
2	Strategic Planning	85	65	77%
3	Focus on Customers	85	62	74%
4	Measurement, Analysis, and Knowledge Management	90	65	73%
5	Focus on Labor	85	62	73%
6	Focus on Operational/Process Management	85	64	76%
7	Results	450	316	70%
	Amount	1000	724	72%

Source: Primary data processing

The table shows the total score obtained PT. Sumber Graha Sejahtera Luwu Branch for all MBNQA categories based on the results of the questionnaire is 724 or 72% of the maximum score of 1000. This means that for the performance assessment of PT. Sumber Graha Sejahtera Luwu Branch based on MBNQA, PT. Sumber Graha Sejahtera Luwu Branch won the title of Exellent and is included in the category *Industry Leaders* (point scale 676–775). Industry Leaders PT. Sumber Graha Sejahtera Luwu Branch is in a very good position.

Strong and committed leadership is very necessary to achieve a successful quality management system improvement program. Good leadership will provide strength, motivation and direction to achieve results and continuous improvement. In the Baldrige Criteria, leadership can be interpreted as a guide and motivator who provides direction in creating organizational values, direction, performance expectations, and social responsibility. If we compare the Heuristic journal with the title Measuring company performance using the Malcolm Baldrige Excellence Framework method written by Yudi Syahrullah and Yunia Ayu Lestari, where the leadership category has a score of 96 points. From the SNISTEK article entitled Analysis of Malcolm Baldrige's Approach to the Performance of the Batam City Regional General Hospital written by Heryenzus and Suali, where the leadership category has a score of 91.23. Meanwhile, researchers

obtained research results of 90 points from the maximum score in the Malclom Baldrige category of 120 points. This shows that each category of leadership examined has different leadership values both in terms of the number of employees who are used as respondents, and matters related to the relationship between leadership in a company studied.

Strategic planning, researchers get research results of 65 points from the maximum score in the Malclom Baldrige category of 85 points. Strategic planning relates to the leadership category, the strategy category explains how the company involves employees in discussing, compiling and developing the company's strategic objectives and the steps in implementing it. Communication between company leaders and employees is very important in the progress of the company in addition to advancing the company also creating a good work environment and sharing knowledge or experience between one party.

Focus on Customers, researchers got research results of 62 points from the maximum score in the Malclom Baldrige category of 85 points. Focus on customers in this category is well done in an effort to focus on customers. PT. Sumber Graha Sejahtera Luwu Branch open opportunities to receive input regarding complaints that occur to Air customers. For performance PT. Sumber Graha Sejahtera Luwu Branch In this category, it is necessary to carry out a survey regarding customer satisfaction/service and remind company management about creating communication media with customers so that customer complaints and input are conveyed clearly. Knowledge Measurement, Analysis, and Management, the results of this research are 65 points from the maximum score in the Malclom Baldrige category of 90 points. Organizational performance measurement must be based on information data. The measurement results in this category show PT. Sumber Graha Sejahtera Luwu Branchwhen it can be said to be good at measuring and analyzing performance for the purpose of improving employee performance.

Focus on the Workforce as a result of the research as much as 65 Points from the maximum score in the Malclom Baldrige category of 85 Points. Labor has an important role in the company so that a plan can run according to the goals to the fullest. In a company, workers have different positions or positions so that their work goes according to their abilities by paying attention to the vision and mission to achieve company goals.

Focus on Operations/Process Management, research results of 64 points from the maximum score in the Malclom Baldrige category of 85 points. This category is related to the labor category because we see that employees in the company certainly carry out activities/work called operations to manage the workforce and design work on how the company empowers employees effectively and efficiently. PT. Sumber Graha Sejahtera Luwu Branchthe employee presence process management category is an important element in a process in carrying out a work activity in an organization so that the strategic planning that is made can run as expected.

The results are the results of the research as much as 316 points from the maximum score in the Malclom Baldrige category of 450 points. This result category shows the results of

categories ranging from leadership to process management of how a company leader succeeds in leading a company.

CONCLUSION

Based on the research results and calculations from this study, the score obtained by PT. Sumber Graha Sejahtera Luwu Branchis 724. This means performance appraisal Sumber Graha Sejahtera Luwu Branch received the title of Excellence and was included in the category of Industry Leader (industry leader), with a point scale of 676-775. *Industry Leaders* means PT. Sumber Graha Sejahtera Luwu branch are in a good position because they are already at the third level, namely the Excellence position, which is close to the Word Leader level (world leader). The current level of performance is good in doing a job, and the leader is successful in carrying out the vision and mission to achieve company goals.

Even though this research has contributed to the development of science, especially complementing previous literature, this research has limitations, namely that the research object carried out is still very narrow so it cannot be generalized to other areas or objects. In addition, this research does not use control variables, which can cause bias in estimating the research model.

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