

PERFORMANCE MANAGEMENT SYSTEM USING BALANCED SCORECARD FRAMEWORK AND ANALYTICAL HIERARCHY PROCESS A CASE STUDY IN INDONESIA MANUFACTURING COMPANY

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Abstract

Improving an increasingly competitive environment such as how easy it is for customers to get cheap and quality products from the import process pressures manufacturing companies to always increase their competitive advantage. It is important for a company to be able to anticipate threats and continuously update its strategy in order to maintain the performance of the company. This paper aims to identify, analyze, and define key performance indicators (KPI) for one of the manufacturing companies in Indonesia with the first step being to design the right performance management system (PMS) for the company. The integration of the Balanced Scorecard (BSC) and the Analytical Hierarchy Process (AHP) introduces a structured, data-driven approach to prioritizing key performance indicators (KPIs), enabling manufacturing companies like PT ABCD to align strategic objectives with operational performance more effectively, thereby enhancing decision-making accuracy and competitive advantage in a highly dynamic market. The balanced scorecard approach was used in this research to determine the right KPIs and were determined through focus group discussions with top management. The KPIs that have been set are then analyzed using the Analytical Hierarchy Process (AHP) to determine how the relationships between these KPIs are. The finding of this paper is to provide KPIs that companies can use as a first step in measuring the performance of manufacturing companies in Indonesia.

Keywords: Corporate Performance Management, Balanced Scorecard, Analytical Hierarchy Process, Manufacturing Company

Introduction

The global economy is becoming more interrelated because to the open market point that is expanding so quickly and widely. This encourages the beginning of partnership in a number of areas and creates chances for international investors to expand their operations in Indonesia, but it can also threaten companies that cannot increase their competitive advantage (Setiadi, 2023). The business environment, which is becoming more competitive, including in the manufacturing sector, will undoubtedly improve as a result of this circumstance. It has become essential to improve manufacturing organizations' performance. The higher performance of the organizations is evidence of the effectiveness of their internal business procedures. Companies must measure their performance in order to understand their vision, goal, and strategy (Akpa et al., 2021).

It is critical to continually make strategic decisions depending on corporate performance in order to develop a number of improvements that will enhance the standard of the company's performance and provide it the capacity to compete today and in the future on a national and worldwide scale. A system of control over the variables that impact the performance of the firm, which ultimately decides the success of the organization in reaching its goals, may be used to enhance the manufacturing company.

As a result, defining and identifying the key performance indicators for Indonesian manufacturing companies is a crucial first step (Amrina & Vils, 2015).

A business implements a straightforward performance management system to transform its developed strategies into execution and result (De Waal, 2017; Wijaya & Hidayat, 2022). The firm continually aims toward its long, medium, and short-term goals. A reliable performance management system (PMS) is necessary for organizations in order to increase the possibility that their objectives will be met. To assist the business reach its objective, PMS also examines and assesses internal and external elements (Dubey et al., 2017). When every stakeholder concentrates on the ultimate goal of the business, implementing a corporate strategy becomes one of the activities integrated into PMS (Gazzola & Colombo, 2014).

PT. ABCD is a manufacturing company in Indonesia that provides general equipment product such as air handling unit and general equipment product (modified machinery). More than a dozen rival businesses make and import these goods for sale to consumers. In this period of intense competition, almost identical product costs, and unpredictability, businesses are encouraged to seek for competitive advantages. Businesses employ all available resources in an effort to obtain a competitive edge (Dagnino et al., 2021).

Through the identification and assessment of critical indicators used to measure the success of the company, this paper explores the elements that determine PT ABCD's performance. The upper management of the organization participates in a focus group discussion, and the linkages between these KPIs are then examined using the Analytical Hierarchy Process (AHP).

The findings of the research include a number of significant indications that may be utilized for measuring the performance of a company. These KPIs will be employed in the beginning stages of the creation of an improved performance measuring system that helps businesses to be more competitive. The results, however, are very preliminary and represent the first phase of the research road plan for developing PMS for PT ABCD.

A systematic method of enhancing company performance through the growth of team employees' and individuals' performance is known as a performance management system (PMS) (DeNisi & Smith, 2014). By this definition, performance management refers to the knowledge and management of performance as it relates to the agreed-upon objectives, standards, and competencies of the firm. It is a means to improve results from the cooperation of individual, team, and organizational effort.

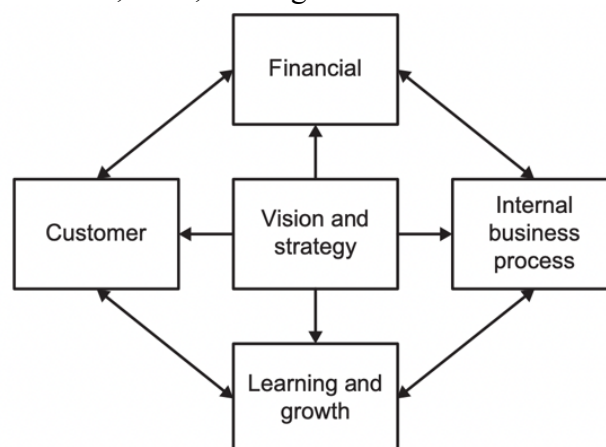


Figure 1. Balanced scorecard
Source: Kaplan & Norton, (1996)

The most popular performance management method in use today was created by Kaplan & Norton in 1992 and is known as the Balanced Scorecard (BSC). The BSC is regarded as the foundational element of all performance management frameworks that followed it (Parida et al., 2015). Four perspectives are used by BSC to measure an organization's performance: financial, customer, internal process, and learning and growth. These four viewpoints are then used to map the company's goals, along with its variables, targets, and activities. The objectives are the intended results, the variables are the chosen variables that may be used to track the objective's progress, and the initiatives are the schedule of tasks that must be completed to meet these aims.

The balanced scorecard clarifies the significance of non-financial variables in establishing strategic goals (Kotze et al., 2015). To accomplish their strategic goals, stakeholders define key performance indicators (KPIs). Key performance indicators are used to gauge and assess how well a business is fulfilling its strategic goals. The BSC model is expected to help the PT ABCD tie its strategies to excellent performance to create competitive advantages, one of which is by setting the right KPI.

Research Method

PT ABCD was selected for this study because it operates in Indonesia's competitive manufacturing sector, producing air handling units and modified machinery, which are essential for various industries. As an Indonesian manufacturer, it faces intense competition from both local and international firms, making it a representative case for analyzing performance management challenges in the manufacturing industry. The Balanced Scorecard (BSC) was chosen as the Performance Management System (PMS) framework, dividing performance metrics into financial, customer, internal process, and learning and growth categories. To determine the most relevant Key Performance Indicators (KPIs) for PT ABCD, qualitative data collection through focus group discussions was conducted. By selecting PT ABCD, the study provides valuable insights into how manufacturing companies can improve operational efficiency and strategic decision-making, helping them enhance competitiveness in the global market. The second set of questions dealt with KPIs and their associated percentages. However, data gathering was followed by a structured focus group discussion and an in-depth discussion with key PT ABCD officials (5 people).

The data for the second question (KPI-Weighting) were mostly acquired using a questionnaire and face-to-face interviews. Four pairwise comparison likert scale questionnaires were distributed to the five PT ABCD executives. Analytical Hierarchy Process (AHP), which was developed by Thomas L. Saaty in 1970s, is used to choose the suitable variables through the identification of the degree of importance (KPI-Weighting).

A total of 15 potential indicators were chosen and divided into four major perspectives. Following that, the Delphi technique was used to collect data for variable interrelationship analysis of the primary performance indicators with a designated team of five company's PMS specialists in order to reach a conclusion on the nine-point comparison scale. (saaty, 1980). Data for AHP analysis were obtained in two sessions using paired comparison questionnaires and criterion weighting questionnaires. AHP methodologies were then used to examine the primary performance indicators. Following the AHP, all judgments from the company's PMS specialists were subjected to a consistency test based on the consistency ratio (CR). Each CR's value was kept acceptable, which is less than 0.1 as indicated.

Result and Discussion

PT ABCD Company Performance Management System Review

PT ABCD has a vision of becoming an essential player in manufacturing product for general equipment/machinery through superior project management processes, efficient business processes, and applying technology 4.0 / IoT. PT ABCD has implemented a PMS using a balanced scorecard, starting from preparing strategy and strategy maps at the holding company, and will cascade on strategy maps for each strategic business unit.

PT ABCD has just used the balanced scorecard to measure company performance, especially in financial terms and one strategic objective in internal processes, so additional KPIs are needed that can measure company performance as a whole when viewed from four BSC perspectives (financial, customer, internal process, and learning & growth). The company launched several reforms, such as strengthening the organization and increasing internal capability.

Furthermore, optimistic about the endless positive opportunities ahead, the company is prepared to continue working by: maximizing performance by instilling the company's incorporated core values, performing the learning process in order to achieve growth, implementing a simple and genuine corporate culture, being proactive in running its business lines professionally in accordance with good governance, which supports the company's growth, and participating actively in the learning process.

Proposed Performance Indicator for PT ABCD

Determination of performance indicators will be mapped using a BSC consisting of financial, customer, internal process, and learning & growth perspectives (Kefe, 2019). A set of 60 potential performance indicators obtained from the company's KPI list, 15 indicators are determined which can reflect the company's performance, which is divided into each strategic objective as follows in table 1.

Table 1. Weight Score of Main Performance Indicators

Perspective	Strategic Objective	Indicators	Priority Vector Average (%)
Financial	Maximize profitability and financial performance	Return on equity	64.4
		Revenue	27.1
		Efficient cost structure	8.5
Customer	Customer 1 st choice	Customer satisfaction	52.7
	Right quality product	Customer complaints	29.1
	Reliable choice	Quality delivery performance	11.5
	Reasonable price	Gap in price benchmark	6.7
Internal Process	Generate new product	Market penetration from new product	15.3
		Profit from new product	14.4
	Quality management	Quality rate	44.8
		Delivery performance	12.2
		SKU compliance	13.3
Learning & Growth	Professional & Competent Team	Certification completion rate	10.8
		Labour availability	50.1
		Number of suggestion	39.1

Using the AHP technique, the relative relevance of the primary performance indicators was determined through data gathering and analysis. Furthermore, 15 indicators were chosen as the most significant indicators from a list of 60 indicators in the focus group discussion session. Table 1 lists the most feasible performance metrics for use in the creation of a new PMS. We offer the weight ratings of the indicators after assessing their hierarchical interrelationships.

Integrating BSC and AHP for Enhanced Performance Management in Manufacturing Companies

The findings of this study align with previous research on performance management systems (PMS), particularly in the integration of the Balanced Scorecard (BSC) and Analytical Hierarchy Process (AHP) as a structured approach to measuring corporate success. Prior studies, such as Kaplan & Norton (1996), emphasize the BSC framework as a fundamental tool for evaluating organizational performance across financial, customer, internal process, and learning & growth perspectives. Similarly, research by Hristov et al., (2022) highlights the importance of aligning strategic objectives with key performance indicators (KPIs) to ensure an effective PMS that drives decision-making. The application of AHP in prioritizing performance indicators is supported by Ali et al., (2017) multi-criteria decision-making approach, which has been widely used to quantify and rank key business metrics based on their significance. The selection of 15 indicators from an initial 60 is consistent with studies by Lastrucci et al., (2024) which stress the necessity of streamlining KPIs to enhance business performance monitoring. Additionally, Kotze et al. (2015) discuss the integration of non-financial indicators in strategic planning, reinforcing the significance of metrics such as customer satisfaction, quality rate, and labor availability, which were identified as key priorities for PT ABCD. By adopting the BSC-AHP approach, PT ABCD refines its performance measurement process, ensuring alignment between corporate strategy and operational execution. This supports findings by Nwanah et al., (2019) who argued that a well-structured PMS enhances organizational efficiency and competitive advantage in the manufacturing sector. Therefore, this study extends the theoretical foundation of performance management by validating the effectiveness of integrating hierarchical decision-making techniques within a BSC framework, offering a more holistic and data-driven PMS model applicable to other manufacturing firms. Give a suitable title for the following paragraph.

Conclusion

The findings of the research are a set of key indicators that determine the company's success. Based on a focus group discussion (and the company's current KPI), 60 performance indicators were divided into four performance perspectives (financial and one strategic aim on internal process). The 15 most significant indicators are used to analyze the gathered comments on the degree of relevance of the 60 performance indicators. The 15 indicators that are consistently seen as very significant can be used to establish a model for evaluating manufacturing company performance and can also be considered the first step in building a competitive benchmarking method. These performance indicators will be used to begin the development of a better performance measurement system for manufacturing company at the corporate level, allowing manufacturing company to be more competitive and sustainable.

This research is the first step in developing a performance management system (PMS) for Indonesian manufacturers. More in-depth research are necessary in order to

better grasp the primary performance metrics. Further research may be undertaken to standardize the methodologies for measuring performance indicators, identify relative weightings indicators, and develop a benchmarking model based on the identified most relevant indicators to compare the performance of Indonesian manufacturing enterprises

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