

Designing Performance Measurement System for Animal Feed Company Using Balanced Scorecard and Analytical Hierarchy Process Method

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Abstract

Animal Feed Company (AFC) has the vision to be the largest agricultural company in Indonesia to provide the best quality and service. Tight competition in the current era encourages companies to improve their company performance on an ongoing basis. Currently, AFC does not have a formal system of performance measurement. The unavailability a formal performance measurement system caused the vision and mission tending to become slogans without being supported by proper strategic planning. Currently, AFC designs a performance measurement system adaptive to business processes using the Balanced Scorecard (BSC) method. Performance measurement in this study applies the Analytical Hierarchy Process (AHP) method as a method for determining to weight between perspectives, strategic objectives, and Key performance indicators (KPI) on a priority scale. This performance system design produces six strategic targets and 12 performance indicators (KPI). The implementation of this research design shows that the current performance indicator value of AFC in the second semester of 2019 is 6.04, which is at levels 4-7, and traffic lights symbolize the system as yellow. The performance shows that AFC performing quite well but still needs improvement in achieving the expected target.

Keywords

Analytical Hierarchy Process (AHP), Balanced Scorecard, Key Performance Indicator (KPI)

1. Introduction

In this era of globalization, competition in the livestock industry continues to increase. With the increase in population, the economy will automatically increase. The livestock sector is constantly increasing; it is difficult to separate it from the animal feed company, which is the most crucial factor in supporting the livestock sector. However, with high demand, the competition is getting tougher. This competition encourages the company to continue to be competitive by improving the company's performance sustainably.

Animal Feed Company (AFC) is a national company in the livestock industry with a vision of "To become the largest agriculture company in Indonesia" by committing itself to provide the best quality and service. Tight competition in the current era encourages companies to improve their company performance on an ongoing basis. Currently, AFC does not have a formal performance measurement system; this has resulted in the vision and mission tending to become slogans without being supported by proper strategic planning. One way to overcome this problem is by implementing a performance measurement system that is adaptive to business processes, including those often implemented by companies using the Balanced scorecard.

The Balanced scorecard can bring up a new concept of thought that could combine financial and non-financial aspects to become part of the information system for all workers at every level of the organization (Vanany 2009), as shown in Figure 1. The Balanced scorecard approach has strategic objectives and performance indicators based on the company's strategic vision and mission that answer the wishes of an organization in measuring each performance through strategic management, which consists of 4 perspectives, including customer, finance, learning and growth, internal business process. These 4 prescriptions can balance both long and short-term goals (Kaplan and Norton 1996).

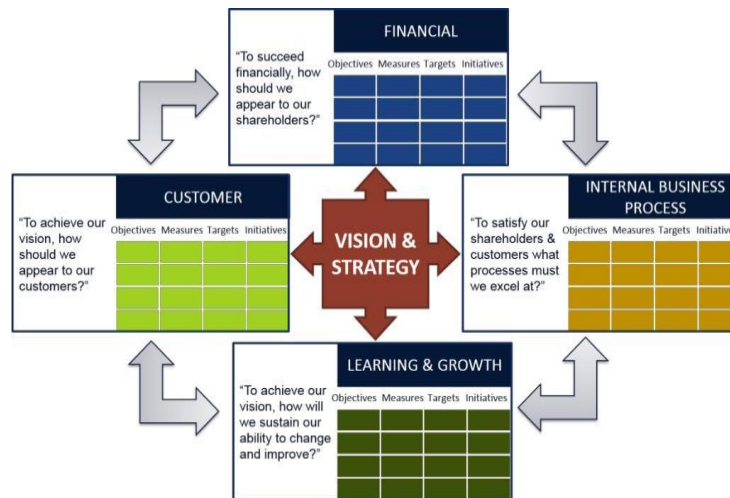


Figure 1. Four perspectives of the balanced scorecard in the framework Vanany (2009)

According to Mardjuki (2006), the performance measurement system is an important management tool. The importance of a performance measurement system in the company encourages AFC to re-analyze the problems faced by the company today so that it can design a company performance measurement system that is expected to be implemented and can maintain stability and improve company performance in fulfilling orders at this time and the future.

The design of a performance measurement system uses BSC (Balanced Scorecard) and AHP (Analytical Hierarchy Process). Implementation of BSC and AHP originates from the vision and mission of AFC, and the determination of performance measurement indicators is validated by conducting interviews and distributing questionnaires. The traffic light system in this performance measurement system is helpful as monitoring performance stability because there is no measurement performance at the company. The company can determine a formulation of appropriate plans to improve company performance in the future.

This study aims to produce and implement a performance measurement system at AFC as a guideline in maintaining the stability of performance because there is no performance measurement in the company to determine the formulation of appropriate strategic plans to improve the company's performance in the future.

2. Literature Review

2.1 Measurement of Performance

Measurement of performance ensures that the company used inputs effectively and efficiently to achieve agency goals. The achievement of performance shows whether the AFC achieves the target or not. Without a target, a person's performance is impossible to measure because there are no references or benchmarks in the activities he has done (Nurjaman 2006).

2.2 Balanced Scorecard

Kaplan and Norton (1996) introduced the Balanced Scorecard (BSC), i.e., a model for performance measurement that is most popular in Indonesia and the world for academics and practitioners in 1992 (Vanany 2009). According to Yuwono et al. (2007), BSC is a management system that can motivate improvement findings such as process, product, product, and customer development areas and explain the strategy.

2.3 SWOT Analysis

SWOT analysis is a strategic planning method used to evaluate the strengths, weaknesses, opportunities, and threats in a project or business to identify external and internal factors that are good and beneficial to achieve goals (Rangkuti 2011).

2.4 Analytical Hierarchy Process (AHP)

AHP or Analysis Hierarchy Process is a logical framework and problem solving that transforms instant awareness into integrated awareness by organizing feelings, judgments, perceptions and memories into a hierarchy that affects decision-making (Saaty 1994). Framework of AHP method contains a hierarchy. This hierarchy is a representation of a complex problem in a multilevel structure. The first level is the goal, followed by the next level, namely, criteria, sub-criteria, Until the last level is an alternative. The steps taken in using AHP are to create a pairwise comparison matrix, normalize the initial matrix, calculate the relative weight/priority, calculate the lambda max (λ_{maks}) and finally test the consistency of the calculation.

2.5 Traffic Light System Analysis

Traffic Light System according to Peryoga (2017) is a sign or symbol used to categorize whether a performance measurement indicator's value requires improvement. According to Prianto (2003), there are 3 (three) categories of Traffic Light Systems: Green (score 8 – 10) is a performance indicator that has achieved or succeeded in achieving a predetermined target. Yellow (score 4 – 7) is a performance indicator showing that the company almost achieved the performance target. The red color (score is at 0-3) is the result of achievement far from the target set by the company, so the company should immediately make improvements.

3. Methods

AFC is a growing animal feed company on a national scale; in its efforts to improve the performance of AFC to become the largest agriculture company in Indonesia in this highly competitive business environment, the step taken is to design a performance measurement system with a balanced scorecard. The following is a conceptual framework of thought in research.

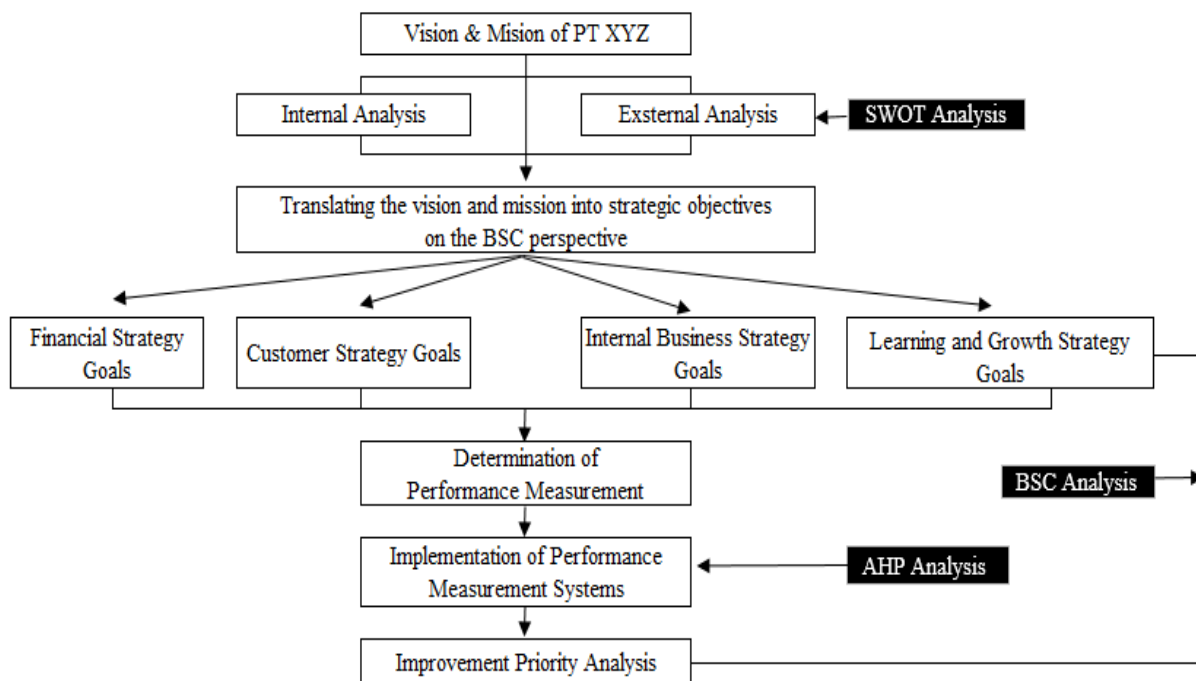


Figure 2. Research Framework

Figure 2 shows the framework for designing a performance measurement system with a balanced scorecard. This research begins with a SWOT analysis and the second analysis uses a balanced score to measure performance objectively by looking at finance, customers, learning and growth, internal business. The result of this study are both qualitative and quantitative. Researchers use the analytical hierarchy process to calculate key performance indicators and traffic light systems to determine priority improvements that affect the company's core business.

4. Data Collection

The data taken in this study is semester 2 of 2019 as well as using the interview method, questionnaire, and FGD from 6 functional ranks who are experts in their fields, namely accounting manager, HRGA manager, production manager, marketing manager, warehouse manager, laboratory manager in collecting primary data and secondary data comes from literature review, both books, journals, internet, and company reports.

5. Result and Discussion

5.1 Overview of AFC

AFC is a company engaged in the animal feed industry, which was established in July 2013 and started production in November 2014, located in the district. Pungging, Kab. Mojokerto. East Java. This animal feed factory can produce high-quality feed products to meet customer needs with various types of chicken feed, which are divided into three types as follows: broilers, layers, and breeder

AFC has the vision to become the largest agriculture company in Indonesia that provides the best quality, with the mission:

- a. Continuously providing high-quality products and meeting customer needs through the best service program.
- b. Forming a community of employees to grow together, share ownership, and develop the quality of life, work environment, and employee performance.
- c. It is creating sustainable long-term benefits in the relationship between the company and all of its business partners.
- d. Develop a healthy company in all aspects, such as compliance with regulations, the environment, and others.

5.2 SWOT Analysis

SWOT is a strategic planning method for evaluating the weaknesses, threats, strength, opportunity of an organization. SWOT analysis shows strengths and weaknesses from an internal system. Meanwhile, external factors consist of opportunities and threats. From the SWOT analysis results, the critical success factors are beneficial for determining the business strategy to achieve AFC's strategic goals.

Table 1. Results of SWOT Analysis with Balanced Scorecard Measurement

SWOT Analysis	BSC Perspective			
	Finance	Customer	Internal Business	Learning and Growth
Strength	The stability support of a solid and professional accounting team	Offering high-quality products	Has high technology and tested production machines and laboratories	Have competent and productive human resources
Weaknesses	Adjustments with regulators regarding policy adjustments with the government	Limited daily workers for loading and unloading	Has SILO corn storage with limited capacity	The number of human resources is still small for the product marketing department
Opportunities	Financial support from shareholders	The large population of breeders as the target of product sales	The availability of the primary raw material (corn) is abundant	Have a professional external training development team
Threats	The number of receivables from customers that have not been collected	There is a global crisis that causes the purchasing power of the market to decline	The emergence of many new competitors with superior technology	The process of adopting a high and fast competitor development

5.3 Performance Measurement Indicators of AFC

The SWOT analysis results are helpful as a reference for determining AFC's strategic goals. This strategic objective is linking the management strategy objectives contained in the vision and mission of the BSC measurement by determining the key to the performance of each variable for each BSC perspective. Then these strategic goals are used to determine specific and measurable Key Performance Indicators. Table 2 below is a grouping of the four strategic goals and Key performance indicators of the company, which will then be weighted using the Analytical Hierarchy Process (AHP) method.

Table 2. Explanation of AFC's Key Performance Indicators

Perspective	Target	Key Performance Indicator (KPI)
Customer	Service Quality Improvement	Improvement On-Time Delivery Increase of Accuracy That Ordered Quantity
	Expansion of Marketplace Amount	Increase in Customer Quantity Number of Customers with Clearly Payment
	Innovation Improvement	Development of New Product Types Feed Quality Improvement
Internal Business Process	Increase of Production Productivity	Increase in The Number of Production Targets Implementation of SMK3
	Increase of Human Resources Productivity	Increase in The Number of Employees Who Understand QMS Increase in The Number of Employees Who Follow QMS Training
Financial	Income Optimization	Increase in Company Revenue Increase in the Number of Accounts Receivable

5.4 Implementation of AFC Performance Measurement System

From the target data and KPI in table 1, then the performance appraisal of AFC is calculated as follows:

Table 3. The Results of The Overall Implementation of Performance Measurement

KPI	Achievement	Target	%	Value	Weight	Value	Criteria	Color
Improvement On Time Delivery	75	50	67%	15.00	0.282	4.23	Enough	Yellow
Increase of Accuracy That Ordered Quantity	48,000	49,500	97%	9.70	0.056	0.55	Good	Green
Increase in Customer Quantity	20	55	36%	3.64	0.056	0.21	Less	Red
Number of Customers with Clearly Payment	30	35	86%	8.57	0.056	0.48	Good	Green
Development of New Product Types	1	2	50%	5.00	0.147	0.73	Enough	Yellow
Feed Quality Improvement	1	5	20%	2.00	0.073	0.15	Less	Red
Increase in The Number of Production Targets	60,000	90,000	67%	6.67	0.061	0.41	Enough	Yellow
Implementation of SMK3	8	25	32%	3.20	0.012	0.04	Less	Red
Increase in The Number of Employees Who Understand QMS	13	30	43%	4.33	0.073	0.32	Enough	Yellow
Increase in The Number of Employees Who Follow QMS Training	3	15	20%	2.00	0.024	0.05	Less	Red
Increase in Company Revenue	300	321	93%	9.35	0.118	1.11	Good	Green
Increase in the Amount of Accounts Receivable	16	21	76%	7.62	0.039	0.30	Enough	Yellow
Total					1.000	8.57	Enough	Yellow

Table 3 shows that the final score for all KPI is 6.04 (Enough). While the results of performance measurement, evaluation of the stages of each KPI as follows:

- The green performance indicators, namely performance indicators at levels 8-10, are classified as good performance assessments, whose realization is almost or can even reach predetermined targets, including increased numbers, current payment customers, and total revenue. These performance indicators do not require improvement, but this does not mean that they do not require continuous monitoring. Continuous supervision can be used AFC to maintain performance indicators also improving future performance achievements.
- The yellow performance indicator is an indicator at levels 4 - 7 classified as adequate performance assessment, whose realization has not reached the target, even though the value has approached the predetermined target, including Increased timeliness of delivery, development of new types of products, increased number of production targets, increased employee understanding QMS, and increase in the number of collectible accounts.
- The Red performance indicators are performance indicators at levels 0 - 3 classified as inadequate performance assessment, whose realization is below the predetermined target, including Increasing the number of customers, developing IOT systems, implementing SMK3, increasing QMS trained employees. These indicators need improvement to improve the overall performance of AFC because if this is allowed to continue, it will cause losses for AFC.

5.5 Analysis of Improvement Priorities

The next step is to analyze the Key Performance Indicator (KPI) improvement, which is included in the red category because it causes a decrease in performance at AFC. Improvement analysis using Root Cause Analysis (RCA), namely the 5W + 1H (5Why + 1How) method, is to do "Why" to 5 questions then do "How" questions; after that, we will find solutions to existing problems, as shown in Table 4.

Table 4. Improvement Priorities by Using Root Cause Analysis Method

KPI	Customer Quantity Improvement	IoT System Development	Implementation of SMK3	Improved QMS Trained Employees
Why	Why is the number of customers still low? (Because it requires quite a lot of resources)	Why is the number of IoT systems still low? (Because the development of IoT system is expensive)	Why are there still a few K3 programs running? (Because of lack of Safety personnel)	Why is the number of employees at Pama QMS still low? (Because training is still rarely done)
Why	Why does increasing the number of customers take so long? (Because of lack of technical sales employees)	Why does IoT system development require a programmer? (Because creating applications requires a programmer's special skills)	Why does the implementation of SMK3 take such a long time? (Because increasing employee awareness requires a process)	Why is there a lack of motivation from AFC for employees? (Because there is no professional HR management system)
Why	Why does increasing the number of customers require a lot of Technical Sales? (Because to explain the product and buying process)	Why did IoT system development take so long? (Because creating an application requires many steps)	Why does the implementation of SMK3 require a lot of K3 experts? (Because to make sure the regulations related to K3 are adequately implemented)	Why is the performance of AFC employees still low? (Because there has never been a reward program for outstanding employees)
Why	Why is the cost of adding to the number of customers so expensive? (Because it requires marketing media such as t-shirts, calendars)	Why is the development of an IoT system expensive? (Because it requires special equipment and experts)	Why is the implementation of SMK3 expensive? (Because it requires K3 media and experts)	Why is quality management system training expensive? (Because it requires an external provider to hold training)
Why	Why is increasing the number of customers necessary? (Because to increase company revenue)	Why is the development of an IoT system so necessary? (So that the performance process is faster and more efficient)	Why is the application of SMK3 so necessary? (To increase productivity)	Why do employees understand that QMS is necessary? (Because it helps the company's QMS implementation process)
How	-To increase the number of Technical Sales -Adding the target market area	-Making warehouse application (FIFO) based on a mobile app - Making a work order application for web-based maintenance	- Create the P2K3 team - Adding safety personnel	-Provide QMS training -Motivate the importance of implementing QMS

6. Conclusion

The performance measurement system using BSC (balanced scorecard) method has four perspectives, six strategic objectives, and 12 performance measurement indicators (KPI). The implementation of this research design shows that the current performance indicator value of AFC in the second semester of 2019 is 6.04, which is at levels 4-7, and if the traffic light system symbolizes it is classified as yellow. This performance shows that AFC is performing exceptionally well but still needs improvement in achieving the expected target.

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