Design of Performance Measurement in Indonesia Plastics Seeds Coloring Company by using Stakeholder Perspective PRISM

Irwan Raharja, Dwi Irwati, Sawarni Hasibuan

ABSTRACT--- Plastic seed manufacturing industry is an important plastics industry in Indonesia, seen from the needs of plastic consumption to make this industry have considerable opportunities. The measurement system of manifacture industry performance has been so far only centered on financial indicator, whereas this industry is included on the industry which gets many attention from stakeholder related to the potential of environmental pollution caused. The purpose of this research is to develop framework of performance measurement in manufacture industry of plastic seeds coloring by adopting stakeholder perspective Prism. Prism performance measurements have advantages that provide a more comprehensive performance measurement overview than performance measurement using Balanced Scorecard. Steps of research begins with screening KPI, determining performance achievement target, measuring performance target achievementof each KPI and improvement recomendation. The PRISM performance measurement performed in company are then classified into the Traffic Light System category, and find 5 Key Performance Indicators (KPIs) in the red or critical category. Target achivement of KPI employed is the worst in the Case Study done, followed by KPI related product and one KPI related to product distribution system. The low target achievement of KPI employed has implication on the loss annual production 1,028,580 kg equals to $ 102,82.

Keywords: Performance Measurement, Prism, Stakeholder, Traffic Light System.

I. INTRODUCTION

Plastics industry is one of important industry sector and really relating to other industries. Plastic industry in Indonesia especially for finished products industry has potential to develop supported by increasing consumption and the use of various plastic products like packages, automotive/ electronic components and also other usages. Ministry of Industry always encourage the development of plastics industry for finished products because it has big market potential in Indonesia as well as overseas country.

The potential of platic products consumption in Indonesia is still dominated by packages (65%), while the rest 35% is used by big industries to make household items, pipes, furnitures, electronics, car spareparts and others. National consumption per capita per year is still 10 kg (Ministry of Industry, 2016) It is still relatively low compared to other ASEAN countries, like Singapore, Malaysia and Thailand, which achieves 40 kg per capita per year. So far, the consumption of platic packaged products encouraged by the growth of Food and Beverage Industry achieves 60%. In Indonesia, plastic package industry is recorded 892 units (Ministry of Industry, 2016). The market of rigid package products, flexible packaging and tyhermoforring products spread out in some areas in Indonesia. The potential of the national plastic industry, supported by a number of 925 companies that have a total production of 4.68 million tons per year for various plastic products and capable of absorbing a workforce of 37,327 people. In 2018, the demand for national plastic products amounted to 4.6 million tons, an increase of five percent in the last five years (Ministry of of Industry, 2018).

PT X is one of three industries which provide raw materials for coloring and compounding plastics seeds (the biggest overseas capital investment in Cikarang, Bekasi). Location of the factory in East Jakarta Industrial Park (EJIP) is very strategic and close to the customers. The factory has very big capacity 3,891 ton/month which supplies most of the need of Electronics Industry and Automotive Industry.

Until now the company has made performance measurement periodically but only limited to financial measurement. Now there is a tendency to use non financial measurement as the benchmark of company performance. Financial indicator generally “looks at the past“ which can help manager to identify cause of the problem, while nonfinancial indicator more “looks at the future” which enables quick response from the policy maker to unpredicted change or important change in business environtment [9][11].

The fact that many companies, in various field of activities, used combination of financial and non financial indicator to observe company performance now and in the future [5][8]. The use of NFPMS (Non Financial Performance Management System) showed that there are three variables those are (1) Involvement of the owner/leader of company (2) Size of the company (3) Use of modern manufacture technology, appear to be the most significant factrors related to the wider use of NFPMS. This result supports the argument and finding from the previous research that commitment of the owner/manager played important role in the effectivity of performance

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Irwan Raharja, Phd Scholar**,** Human Resources Management at Universitas Negeri Jakarta, Indonesia.

Dwi Irwati, Researcher and Lecturer at Polytechnic Gunakarya Indonesia,West Java, Indonesia.

Sawarni Hasibuan, Researcher and Lecturer at Mercu Buana Univeristy Jakarta, Indonesia.

measurement system development. Therefore wider adoption NFPMS steps must be emphasized by the company today for improve organizational decision making as a result will increase the level of competitiveness and performance [1] The important role of stakeholder of an organization, which has strategic purpose, determines the success and failure of the company performance [2][3][10]. Performance Prism model is a new alternative as a performance measurement system within the current perspective, going beyond the financial approach [4]. Model of performance meeasurement PRISM developed makes perfect the model of performance measurement balanced scorecard. Performance measurement system PRISM refelects some new stakeholder like employees, suppliers, allianse of workers and others which used to be ignored in other performance measurement [12][14]. PRISM consider contribution of stakeholder in achieving performance. Design and performance measurement is seen need to be implemented in plastics manufacture industry because plastics manufacture industry needs to satisfy the stakeholder for the sake of company existence and also to achieve competitive excellence. The purpose of this research is to develop the performance measurement system of manufacture industry in processing plastics seeds in Indonesia by using PRISM framework.

II. LITERATURE REVIEW

Process of coloring and compounding plastics is done through process of mixing resin (virgin) with color substance and additives, then they are melted at certain temperature, after that they are extruded to become plastics stand. Then the plastics stand is cut into plastics resin.

PRISM Method

Framework of performance measurement PRISM is developed with 5 related performance perspectives, they are [10]:

a. Stakeholder satisfaction, who are the stakeholders of the organisation and what are their desire and their needs

b. Strategy, what strategy is needed to give satisfaction to the desire and the needs of the stakeholder?

c. Process, what process are needed to reach the determined strategy?

d. Capability, what capabilities are need to run the existing process? Capability or capacity here is the ability owned by an organisation including human resource skills, business practice, technology application and supporting facilities.

e. Stakeholder contribution, what contribution is needed by the company from the stakeholder to develop the owned capability?

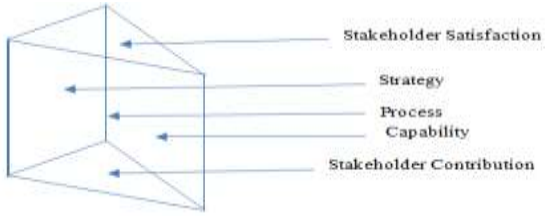

Fig. 1. Perspectif Performance Measurement PRISM

KPI dan Traffic Light System

Key Performance Indicator (KPI) or main performance indicator is an indicator which serves a series of measurement focusing on the most important aspect of organisation performance for the success of company noe and in the future. There are some advantages of setting the key performance indicators in the company:

1. With KPI performance of the company and each individual can be evaluated more efffectively and measureably and it can decrease subjectivity which often occurs in the process of performance measurement.
2. By setting KPI appropriately, each individual or division can understand about the expected result of performance. This thing will encourage individual or division in the company to work more optimally to achieved the determined working target.
3. By setting objective and measurable KPI, the establishment process of individual performance can be done more openly and systematically.

Traffic Light System is a method used to ease understanding the company performance achievement by the help of three color category, there are red, yellow and green. Limit of ech category is set through a discussion with stakeholder of the company. The color category can ease the company to evaluate company performance whether according to the target or not. Color classification as follows:

1. Red color indicates that score/level is at the border line 0 upto 3. This category is classified into performance measurement not so good, whose realisation is under the target set by the company.
2. Yellow color indicates that score/level is at the borderline 4 upto 7 which means that the company performance is classified into performance measurement adequate or realisation has not achieved maximum target.
3. Green color indicates taht score/level is at the borderline 8 upto 10 nwhich means that the company performance has achieved expected performance. Green clasification is very good because it has achieved maximum target set by the company.

In traffic light system the result of performance measurement PRISM in this case can be divided into 3 categories by color. Management determined the color criteria of traffic light system as follows:

a. Green color is target achievement KPI $\geq$ 80 %

b. Yellow color is target achievement KPI with the range 51 % - 79 %

c. Red color is target achievement $\leq$ 50 %

The same thing with traffic light system in PT X, performance classification Bad, Moderat/Fair and Good is used in this research. Red for the status scorecard environment bad, Yellow for work condition moderat/fair, and Green for work environment good/satisfying condition [6].

III. METODOLOGY

This research is descriptive research with the characteristic qualitative and quantitative.This research begins with literature study related with performance measurement concept PRISM, traffic light system and various relevant previous researches. Beginning KPI identification uses PRISM method based on 5 stakeholders those are Inventor, Customer, Employee, Supplier, and Government. For each stakeholder, it is elaborated by KPI based on facet performance satisfaction, contribution, strategy, process

and capabilities, and it is resulted 46 beginning performance indicator. Each stakeholder gives scoring level of interest each KPI to measure performance of plastics seeds coloring industry by using Likert Scale 1-5 (1=very unimportant, 2=unimportant, 3=neutral, 4= important, 5=very important). Data collected consisted of primary data and secondary data. Calculating average score each KPI used this equation:

Score $KPI_j = \sum_{i=1}^{n}(X_i)/n$

where: i= the i^{th} stakeholder for the j^{th} indicator

KPI with the average score $\geq$ 4.0 is selected as KPI performance measurement system in Indonesia plastics seeds manufacture industry by using PRISM method. The weight of each KPI is determined based on weight average method. Classification of performance refers to Traffic Light System. KPI is classified into criteria Good (Green), Moderat (Yellow) and Critical (Red).

Table I. Variable operationalization industrial performance measurement plastics seeds processing by using PRISM approach[1)]

Stakeholder	*Faset Performance Prism*	*KPI Code*	*Key Performance Indicator (KPI)*	*Mean*
Investor	*Satisfaction*	IS-1	ROA	*4.33*
		IS-2	ROS	*4.33*
	Contribution	IC-1	Infestations increasing level	3.33
	Strategy	IT-1	Company liquidity	3.00
	Process	IP-1	Financial audit	3.00
		IP-2	Making of lost profit report	3.00
	Capabilities	IB-1	*Management review*	*4.00*
		IB-2	Integration of enterprise	3.33
Customer	*Satisfaction*	CS-1	Number of customer complain	*4.40*
		CS-2	Index of customer satisfaction	*4.40*
	Contribution	CC-1	Level of sales growth	*4.00*
		CC-2	Idea and suggestion from customer	3.00
	Strategy	CT-1	Level of products appropriacy with customer formula	*4.60*
	Process	CP-1	Percentage of damage during delivery	*4.20*
		CP-2	Aproriacy of products distribution	*4.20*
	Capabilities	CB-1	Service level	3.40
		CB-2	Feasibility level of product distribution facility	3.20
Employee	*Satisfaction*	ES-1	Employee turnover level	*4.20*
		ES-2	Employee health level	*4.00*
	Contribution	EC-1	Employee presentation level	*4.20*
		EC-2	Employee productivity level	*4.20*
	Strategy	ET-1	Training effectively	*4.00*
		ET-2	Arrangement of *core competence (skill map)*	3.60
	Process	EP-1	Human resource competence in fulfilling customer requirement	3.80
		EP-2	Number of improper machinery and instrument	2.80
	Capabilities	EB-1	Work safety level	*4.40*
		EB-2	Employee discipline level	*4.40*
Supplier	*Satisfaction*	SS-1	Payment period	*4.33*
		SS-2	Sustainable cooperation	*4.67*
	Contribution	SC-1	Speed of supplier procurement process	*4.33*

	Strategy	SC-2	Product appropriacy level	*4.00*
		ST-1	Document completeness level	*4.33*
		ST-2	Demand prediction	*4.67*
	Process	SP-1	Percentage of unstandardized products	*4.00*
		SP-2	Checking of raw material supply	*4.00*
	Capabilities	SB-1	Giving information about supply condition	*4.00*
		SB-2	Administration discipline level of raw material reception	*4.33*
Government	*Satisfaction*	GS-1	Labor absorption	*4.67*
		GS-2	Obedience to the existing rules	*5.00*
	Contribution	GC-1	Asset guarantee	*4.00*
	Strategy	GT-1	Transparent employee recruitment	*4.67*
		GT-2	Control of rule implication	*5.00*
	Process	GP-1	Control of recruitment process	3.33
		GP-2	Audit ISO (internal dan external)	3.33
	Capabilities	GB-1	Implementation of employee recruitment system	*4.00*
		GB-2	Auditor competence	*5.00*

IV. RESULT AND DISCUSSION

Based on the measurement average level of interest each KPI stakeholder perspective in Table II, it can be identified KPI which is scored Valid (average score $\geq$ 4). From 46 beginning KPI is rested 32 KPI. Distribution number of selected KPI based on 5 perspectives PRISM is shown in Fig. 2. The biggest KPI proportion is on perspective stakeholder satisfaction 31% followed by perspective capability 21%, perspective strategy and stakeholder contribution with the same proportion 18% and the lowest is in perspective process 12%.

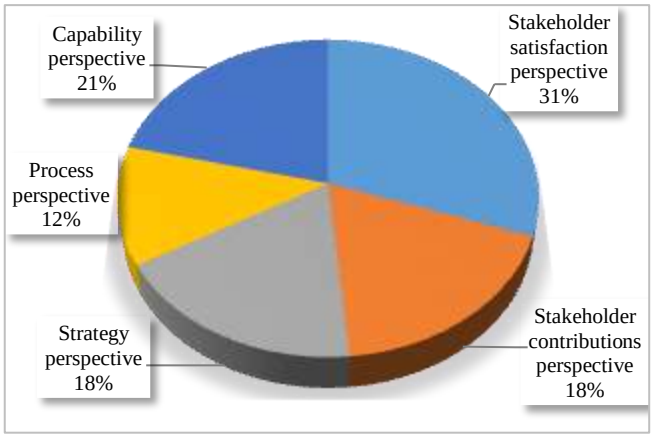

Fig. 2. KPI validation result in industrial manufacture plastics seeds processing based on PRISM.

Based on target achievement each KPI then is conducted classification by using Traffic Light System as presented in Table 2. The result of identification is gained 5 KPI in Red category/Critical, 8 KPI Yellow category and 20 Green category. KPI's are classified as Critical or Red category is as follows (1) employee health level, (2) level of product appropriacy with customer formula, (3) employee discipline level, (4) accuracy of product distribution, and (5) work safety level.

Based on stakeholders group, three critical KPI is related to human/employee (employee health level, level employee discipline level, and work safety level; one critical KPI is related to the product (product appropriacy with customer formula) and one critical KPI related to product distribution system (accuracy with product distribution).

Seen from the target achievement, all KPI in each stakeholder (Fig. 3) the best is in investor and government perspective with the average achievement 91.9% and 82.6% in the *Green* category. Average target achievement of stakeholder supplier and customer is still in the *Yellow* category with the score 68 % and 17.6%, an unfulfilled KPI target stakeholder is stakeholder employee with the target achievement KPI – 98.41%.

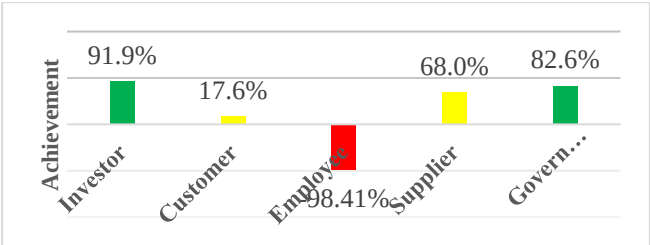

Fig. 3. Comparison of target achievement KPI based on *stakeholder*

The risk of expense burdened by the company as the effect of unachieved three critical stakeholder employee is projected USD 102,858 in a year for overtime of substitute worker. Following are illustration of loss production caused by sick employee and absent employee:

Loss production due to illness = 252 day/year x 7 hour/day x 465 kg = 820,260 kg

Loss production due to not present = 64 day/year x 7 hour/day x 465 kg = 208,320 kg

Table II. Selected KPIs, target and achievement of KPI

Stake-Holder	*Faset Performance Prism*	*KPI Code*	Target KPI	*Achievement*
Investor	*Satisfaction*	IS-1	38.8%	112.1%
		IS-2	23.7%	83.5%
	Capabilities	IB-1	Is don, eproduces decision, followed up well	80.0%
Customer	*Satisfaction*	CS-1	1 complaint / year	100.0%
		CS-2	85 points	101%
	Contribution	CC-1	2,900 MT/month	84.4%
	Strategy	CT-1	Customer complaint about quality (based on item %) 0.01 %	-280.0%
	Process	CP-1	There is no Non Conformity Report (NCR) about damage during delivery	100.0%
		CP-2	There is no *Non Conformity Report (NCR about wrong delivery*	0.0%
Employee	*Satisfaction*	ES-1	Maximal l 5%	239.23%
		ES-2	Tolerance of employee absence because of sick 2%/bulan	-1050.0%
	Contribution	EC-1	Number of employee attendance hour	99.2%
		EC-2	140 kg/jam	92.1%
	Strategy	ET-1	Percentage of effective training 98%	97.6%
	Capabilities	EB-1	*Zero Accident*	0.0%
		EB-2	Ratio of employee warning letter 0.03	-166.7%
Supplier	*Satisfaction*	SS-1	There is no late payment	100.0%
		SS-2	Cooperation is done sustainably	60.0%
	Contribution	SC-1	Process is according to the demand	60.0%
		SC-2	Product is appropriate	80.0%
	Strategy	ST-1	Document is complete	80.0%
		ST-2	Neutral	60.0%
	Process	SP-1	Neutral	60.0%
		SP-2	Checking of aw material is done	60.0%
	Capabilities	SB-1	Giving information is done	60.0%
		SB-2	Discipline	60.0%
Government	*Satisfaction*	GS-1	Moderate	60.0%
		GS-2	100%	98.2%
	Contribution	GC-1	High	80.0%
	Strategy	GT-1	Transparant	80.0%
		GT-2	Very high	100.0%
	Capabilities	GB-1	Good	80.0%
		GB-2	Fulfill the standard	80.0%

The cost of lost production due to illness = $ 0.1/kg x 820,260 kg = $ 82,026

The cost of lost production due to not present = $ 0.1/kg x 208,320 kg = $ 20,832

To overcome the low target achievement KPI of stakeholder employee needs commitment of management. Management has important role in making sure and providing the the resource and information needed to support the work according to the standard of health and work safety. Management also has the right to make policy and company value by prioritizing health and work safety.

Strong commitment of the organization for working safety increasement of health and desired working safety, and decrease the appearance of problem related to working safety [7].

V. CONCLUSION AND SUGGESTION

The research successfully recommended 32 KPI to measured performance-based PRISM in the plastics seeds manufacturing industry. The biggest proportion KPI is on perspective stakeholder satisfaction, followed by stakeholder capability, perspective stakeholder contribution, perspective strategy, and perspective process.bBased on perspective stakeholder satisfaction, obedience to the existing rule is the most important KPI.

From perspective stakeholder contribution, the most important is KPI speed of procurement process. For perspective strategy, prediction of demand and recruitment of employee transparently is the most important KPI. In perspective process, number of damaged products during delivery and products distribution accuracy is the most important. From perspective capability, the most important KPI is auditor competence.

Result of performance measurement using Prism framework in the company level, performance achievement in perspective investor and perspective government is the best in Green category. Target achievement in perspective supplier and perspective customer is in Moderate category. Performance target in perspective employee is the worst in Critical category/Red.

Some suggestion for improvement of stakeholder-based performance measurement system it is necessary to evaluate stakeholder which are also influencing like labor association, public and others [13]. Weighing the KPI is also necessary to be done by looking at level of importance of the business process in business critical organization

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AUTHORS PROFILE

Irwan Raharja is pursuing Doctorate (PhD Program) in Human Resources Management at Universitas Negeri Jakarta, Indonesia. He is working as a lecturer at Universitas Bina Sarana Informatika, Department of Accounting Information Systems, Indonesia.

Dwi Irwati, researcher and lecturer at Polytechnic Gunakarya Indonesia, graduation Master Degree in Industrial Engineering Major at Mercu Buana University Jakarta.

Sawarni Hasibuan, researcher, lecturer at Mercu Buana Univeristy Jakarta, graduation Doctoral Degree in Institute Pertanian Bogor. Jakarta