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DESIGN OF PERFORMANCE MANAGEMENT SYSTEM FOR PRODUCTION BUSINESS PROCESS IN KALTIM 5 PLANT OF PT. PUPUK KALIMANTAN TIMUR USING INTEGRATED PERFORMANCE MANAGEMENT SYSTEM APPROACH

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Abstract

As the biggest production facilities, Kaltim 5 Pupuk Kaltim should perform as well both financial and non-financial perspective. Current performance measurement is majority focused on profit-oriented measurement and poor capture for non-financial aspect. Additional measures suggested are stakeholder satisfaction and quality of enterprise transformation. A problem that has been identified is that there is no holistic performance measurement in Plant 5 Operation Department, which is continuously captured & evaluated in a holistically form of production business process. This problem is solved by using Integrated Performance Management System (IPMS) approach. IPMS or well known as Knowledge-Based Performance Management System (KBPMS). The primary data in designing this IPMS is extracted by interviewing and discussing with Plant 5's parties related significant performance variables of production business process in three perspectives: business output, internal process and resource capability perspective. The research finds that there are several important performances variables regarding with these three perspectives which influence production business process. External stakeholder relation and COGM performance are significant performance variables of business output perspectives. Objective and Key Results (OKR) system and Predictive and Preventive Maintenance (PPM) implementation are significant performance variables of internal process perspectives. In the end, employee qualification fulfillment and work culture and system implementation are significant performance variables of resource capability perspectives. The implementation plan is conducted through four steps: current measurements, evaluation, diagnosis and follow up.

Keywords: Integrated Performance Management System (IPMS), Kaltim 5, Production Business Process.

1. Introduction

Fertilizer supply is a significant pillar for agriculture country like Indonesia. PT. Pupuk Kalimantan Timur is subsidiary company of Pupuk Indonesia Holding Company (PIHC) and as the biggest urea fertilizer producer in Indonesia takes an important rule to fulfill fertilizer demand for feeding the nation. As a biggest production facility, an efficient operation of Plant 5 Operation Department highly influences overall business performances of Pupuk Kaltim. Moreover, the raw material or natural gas price is quite high or expensive. Based on this background, business performance of Plant 5 Operation Department or Kaltim 5 itself shall be good performed in all aspect, especially operational excellence and resource empowerment. Not only the biggest, as the nearest production facilities with buffer zone society (Loktuan and Guntung District), environmental issue become main attention and concern in operating plant. Buffer zone society as external stake holder shall be well & socially maintained. Now-a-days, business performance is not only captured only from financial performance but also evaluated from several aspects, especially strategy aspect

which assure a company existence in future. Current measurement is majority focused on profit-oriented measurement. Poor capture for non-financial aspect, although financial aspect is also important. Those non-financial performance as explained in business issue above regarding with stakeholder satisfaction. Additional measures suggested are stakeholder satisfaction and quality of enterprise transformation (Chakravarthy, 1988).

2. Literature Review

Performance management system is a tool to measure and evaluate company's performance in achieving target or their vision and mission. According to Akhtar & Sushil (2018), the strategic performance management (SPM) is the process of measurement and management of an enterprise performance which describes the processes, methodologies, metrics and systems needed to measure and manage performance of the organization. It has evolved over a period of time from simple to strategically aligned multidimensional performance management. It is also known as enterprise performance management (EPM), business performance management (BPM) and corporate performance management (CPM). There are many types of Performance Management System (PMS) tools in the world. Akhtar & Sushil (2018), explain that different frameworks and models of SPM have been developed in last three decades, incorporating a variety of performance measures such as efficiency, effectiveness, productivity, quality, customer satisfaction, innovation and employee satisfaction in addition to financial to produce world-class enterprise performance; Six Sigma (1985), activity -based costing (ABC) (1988), total quality management (TQM), EFQM excellence model (1991), Malcolm Baldrige National Quality Award (MBNQA) (1987), balanced scorecard (BSC) (Kaplan and Norton, 1992, 1996) and performance prism (Neely and Adams, 2001). These models are not free from implementation issues and failures like other management tools and frameworks. A poor design and the difficulty of implementation are reasons of SPM failure (Bourne *et al.*, 2002, 2003). The reasons of the failure of BSC implementation are not selecting right and critical measures, not aligned with strategy, lack of senior management commitment, not sharing and communicating in the organization, too long development process and used only for compensation (Kaplan and Norton, 2000); the lack of acceptance by the employees, which is due to inadequate communication by the management, leads to weak BSC implementation (Chen and Jones, 2009).

According to Reilly and Campell (1990), accounting-based corporate performance measurement systems are the most common method of evaluating the performance of business firms. Throughout the world, firms report results to shareholder, regulator, tax authorities and other external bodies using principle of accounting which are remarkable similar. Likewise, managers use internal accounting system to judge the performance of country operations. Three decades ago, financial executive officers and mangers of MNCs rejected to use the financial measures as the only indicators of their sub-units' and their managers' performance. Moreover, the traditional financial and accounting indicators, such as return on investment, have been criticized as being inadequate and insensitive tools for decision making and the changing environmental conditions because they were developed for the financial reporting requirements in meeting the external users' needs (Kootanaee *et al.*, 2013; Letza, 1996). They began to look for new more realistic and relevant indicators of performance because the professional literature has believed and recommended that managers should be evaluated based on upgraded and integrated PMSs that should include both the financial and non-financial measures (Modell, 2012; Gosselin, 2005).

Beside that kind of performance management systems above, there is a performance management / measurement system which is already implemented in a lot of company/firms in Indonesia. It is called Knowledge Based Performance Management System (KBPMS) or Integrated Performance Management System (IPMS). According to Wibisono & Khan (2010) deliver that designing or making performance management system (PMS) is an integral part of management control system. It is called "Knowledge Based" due to several reasons. First, a lot of performance variables are involved in PMS implementation, then among them there are complex linkages. Second, prioritizing of those large number of performance variable needs supporting tool in resulting valid decision making. Third, there

is benchmarking process to compare and improve company competitiveness. Wibisono (2014) deliver that knowledge-based approach is used to make PMS valid, consistent and practical for implementation. Knowledge-based approach is not only practical, but also it was feedback/response from practitioners. Moreover, calculations involved in determining performance variable and benchmarking process can easily incorporated with expert's role of thumb and an explanatory figure become learning device for every organization's member. GAP analysis and Analytical Hierarchy Process (AHP) which incorporated in KBPMS features make calculation results or analysis of performance variable become real and effective decision-making tool. IPMS's performance variables are divided into three perspectives and nine sub-perspectives.

Here is the table of comparable parameter of existing developed PMS in recent three decades:

Table 1. Performance Management System Comparison

Aspects	BSC (1992)	Prism (2002)	IPMS (2006)
PMS Design Procedure	Described clearly	General description	Described clearly
Formulation of Performance Variable	General description supported by detail formulation at selected implemented variable	Detail formulation at each variable	Detail formulation at each variable which have inter-correlation
Quantity of Performance Variable	Grouped in 4 perspectives, each may contain several variables, depends on the organization/company	More than 200 individual performance variables	Grouped in 3 perspective which have inter-correlation.
Reason of Selecting Variable	Described clearly in each perspective	Described clearly in each perspective	Described clearly in each perspective
Consideration of Existing Performance	NO	NO	YES
Correlation of Each Variable	Described at the available perspective	Differentiated clearly	Described specifically according to inter-correlation of variables
Final Output	Financial aspect	Stakeholder satisfaction	Integration of financial and non-financial aspect of stake holder satisfaction

Source : (Wibisono, 2012)

Based on this comparison table, the main differences between IPMS and other PMS Model are in aspects of detail formulation of each performance variable which have inter-correlation and its detail correlation of each performance variable. Detail formulation of each performance variable is needed to translate the needs and wants of stakeholder. However, a detail correlation between performance variable is to show an important level of other performance variable to another.

SPM/PMS implementation issues and critical success factors are SPM use by the top management, right and adequate measures, use as strategic tool, quality of data, flow of data, good organizational acceptance, implementation by champions and aligned incentive scheme (Akhtar and Mittal, 2015). SPM/PMS implementation issues are the lack of leadership and resistance to change (Hacker and Brotherton, 1998), problem of identifying true drivers (Schneiderman, 1999; Bierbusse and Siesfeld, 1997), large number of measures (Bierbusse and Siesfeld, 1997), metrics poorly defined (Schneiderman, 1999), difficulty in decomposing goals to lower level in the organization (Schneiderman, 1999), goals are negotiated (Schneiderman, 1999), flow of information (Eccles, 1991), need for a highly developed IS (Bierbusse and Siesfeld, 1997), time and expense (Lewy and Du Mee, 1998; Schneiderman, 1999), and striving for perfection (Lewy and Du Mee, 1998; Schneiderman, 1999) and non-financial measures rarely monitored (Eccles, 1991).

3. Research Methodology

This research is demanding to analyze current issues or problems faced by Plant 5 Operation Department of PT. Pupuk Kalimantan Timur. The problem-solving processes are started with problem identification, business issue exploration, business solution, data collecting and processing and PMS framework design and implementation. This is work flow methodology in conducting this research:

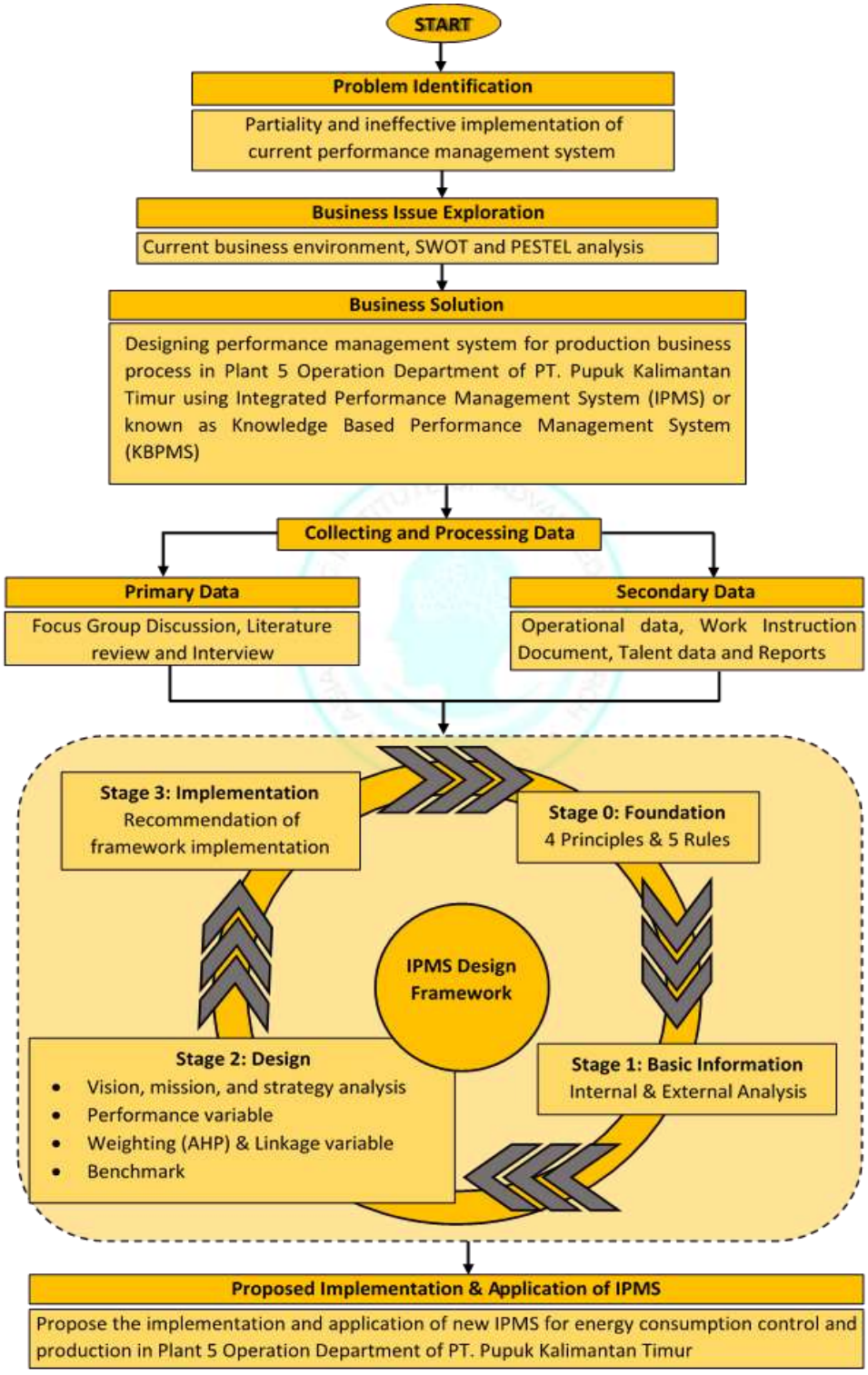

Figure 1. Research Methodology

3.1 Research Problem & Scope

A problem has been identified is that there is no holistic performance measurement in Plant 5 Operation Department which continuously captures & evaluates performance of significant aspects related holistic business process. This research will be focused in designing proposed performance measurement/management system of production business process in Plant 5 Operation Department or Kaltim 5 Plant. The framework used for designing or improving existing PMS is Integrated or Knowledge-Based Performance Management System (IPMS or KBPMS). The main result of design proposed new IPMS is resulting on selected performance variables which highly influence an achievement of production business process.

3.2 Research Approach

This research was conducted with focus group discussion (FGD) or brain storming, the objective is to collect pain point that will be reformed become innovation tool. Beside FGD, an interview with key performance person is also done. Key performance person is plant operator and management who decide how effective and efficient of the plant operated. This approach also allowed researcher to see or observe condition from informant point of view, so the considerations are not only based on numerical calculation & analysis.

3.3 Data Collection

In this research, data type is divided into two, primary and secondary data. Primary data is objectively extracted from FGD, interview and literature, no personal information blended. The interview question is designed based on informant experience related with research topic. Secondary data is obtained from plant operational data and reports. Data sources are varied from internal Plant 5 Operation Department and other department, depend on the kind of information contained. Data collection processes are based on digital communication platform, Digital Office (DOF).

4. Results and Analysis

4.1 New Defined Vision of Plant 5

Based on evaluation of existing vision that still have not perfectly adopted good vision criteria, thus considering several criteria of good vision above and align the Pupuk Kaltim vision, the author redefine new vision of Plant 5 Operation Department become: *"To be innovative & leading plant of Pupuk Kaltim which empowered by excellence human capital"*. Becoming the best production facility of Pupuk Kaltim which are empower by excellence employee and always conduct continuous improvement: high asset utilization, lowest energy consumption, excellence maintenance and cost-effective.

4.2 New Defined Mission of Plant 5

Considering several criteria of good mission above and align the Pupuk Kaltim mission, the author defines new mission of Plant 5 Operation Department become: *"Providing maximal benefits and added value for Pupuk Kaltim through empowerment of production facility in efficient and effective way"*. Becoming the best production facility of Pupuk Kaltim which contribute the highest tangible and intangible profitability by prioritizing cost-effective or right resource allocation. for Pupuk Kaltim. New defined mission above also aligns with Pupuk Kaltim mission as explained before. The point is vision and mission of Plant 5 Operation Department must be a cascade form of Pupuk Kaltim vision and mission. However, refers to flexibility criteria above both vision and mission can be changed related to future business process transformation.

4.3 Proposed Important Performance Variables and Its Priority Factors by AHP Calculation of Plant 5' Production Business Process

As explained in research methodology, the primary data and secondary data are processed to result these proposed performance variables which are highly influence a performance of Plant 5's production business process. Those performance variables and their priority factors of perspectives are shown in table 2 and table 3 respectively.

Table 2. Proposed Performance Variables for IPMS Perspectives

Perspective	Performance Variables	Strategic Measurement
Business Output	Fairness issue of COGM changes	Number of unreasonable COGM changes related the changes of raw material cost of Plant 5 Operation Department
	External Relationship issue/conflict	Number of social-industrial relationship issues/conflict with Loktuan & Guntung buffer zone society which is caused by inefficiency operation of Plant 5 Operation Department
	Internal Relationship issue/conflict	Number of social-industrial relationship issues/conflict with Plant 5 Operation Department 's employee which is caused controversial policies.
Internal Process	Technology and Innovation Implementation	Number of proven innovation (%) which contribute significant benefits and added value for Plant 5 Operation Department or Pupuk Kaltim
	Objective & Key Results Implementation	Percentage of daily energy consumption figure that exceed annual target of Plant 5 Operation Department
	Predictive & Preventive Maintenance system Implementation	Realization effectiveness (%) of weekly preventive & predictive maintenance of Plant 5 Operation Department to achieve plant reliability
Resource Capability	complete employee's competencies and qualification	% Of competency or ability qualification fulfilled based on talent/character to conduct job scope or business process based on OKR as operational strategy to reach mission & vision of Plant 5 Operation Department
	a new technology or new modification implementation	a percentage (%) of new technology applied that give good impact in at least one of seven sectors mentioned above
	working culture and system as a vision reaching-tools	Effectiveness percentage (%) of these working culture and system implementation among employee, shift group, level and division

Source : (Muhammad Fahmi, 2021)

Table 3. Priority Factor for Proposed Performance Variables of IPMS Perspectives

Perspective	Priority/Eigen Factor
Internal Process Perspective	0.60
Resource availability perspective	0.31
Business Output Perspective	0.10
Performance Variables	**Priority/Eigen Factor**
complete employee's competencies and qualification	0.49
External conflict with buffer zone society as external stakeholder	0.48
Implementation of Predictive & Preventive Maintenance (PPM) to maintain reliability	0.46
Implementation of Objective & Key Results to decrease energy consumption	0.46
Internal conflict with Plant 5 employee as Internal stakeholder	0.45
working culture and system as a tools and path to achieve mission and vision of Plant 5 Operation Department	0.42
a new technology or new modification implementation	0.09
Technology and innovation implementation to support Plant's 5 vision and mission achievement	0.08
Fairness issue of COGM changes	0.07

Source : (Muhammad Fahmi, 2021)

Based on table above, in perspective level, internal process perspective places the most important perspective. Additionally, for strategic objective level, complete employee's competencies are the most important strategic objective, although the weight factor value is not far different with five next ranked strategic objectives or performance variables. It indicates that those 6 strategic objectives (blue color) are the main pillars for reaching new vision and mission stated above through improvement of performance management system. In this case, we use the IPMS approach.

4.4 Implementation Plan and Result for Proposed IPMS

Regarding with implementation stage of proposed IPMS is conducted by adopted this work flow or steps that are shown in figure 2 below:

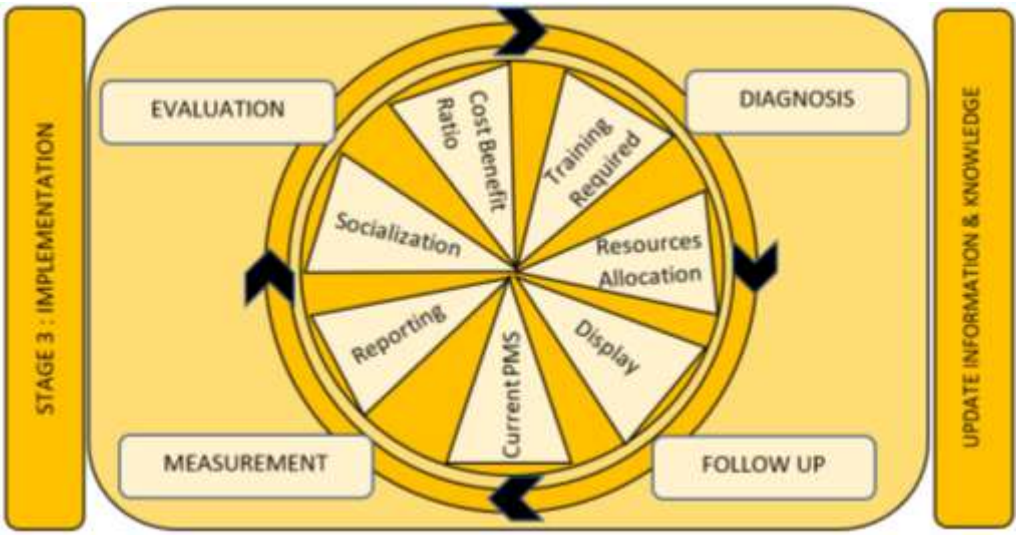

Figure 2. Work Flow of IPMS's Implementation Stage

In previous part, it has been explained that there is no holistic performance measurement which cover all parameter both financial and non-financial (internal process and resources). Whereas, many non-financial performance variables in internal business perspective and resources availability which actually support financial achievement but it is not given more attention yet. The reporting activities is presenting communicative and informative report format to have holistic and clear understanding. Then, the new proposed design of PMS and reporting system then need to be socialized to related parties. The parties which must be well communicated and socialized are all employee of Plant 5 Operation Department and all parties related with Plant 5 production business process. After socializing, cost and benefit analysis are conducted to know what is the performance variable or strategic objective which spend minimum cost and maximal benefit. All parties that involved in implementing these PMS, especially Kaltim 5's employees, need to qualify their competencies, mindset and skill through appropriate training required. In allocating resources, person in charge's responsibilities is measuring, reviewing, diagnosing, improving and taking decision for each performance or strategic objective/measurement include arrange training need/requirement. Beside reporting in certain report format, the implementation progress of those PMS is also represented in informative and communicative display form. The purpose is knowing an achievement progress of each performance parameter in the good view/display while encouraging every person in charge (for each performance measurement) to implement best improvement. The success of IPMS implementation cannot be fragmented from critical success factors and issues above, better managed and measured will contribute to higher potential success of IPMS implementation. This is a spider diagram of performance parameter comparison before and after those IPMS is implementing.

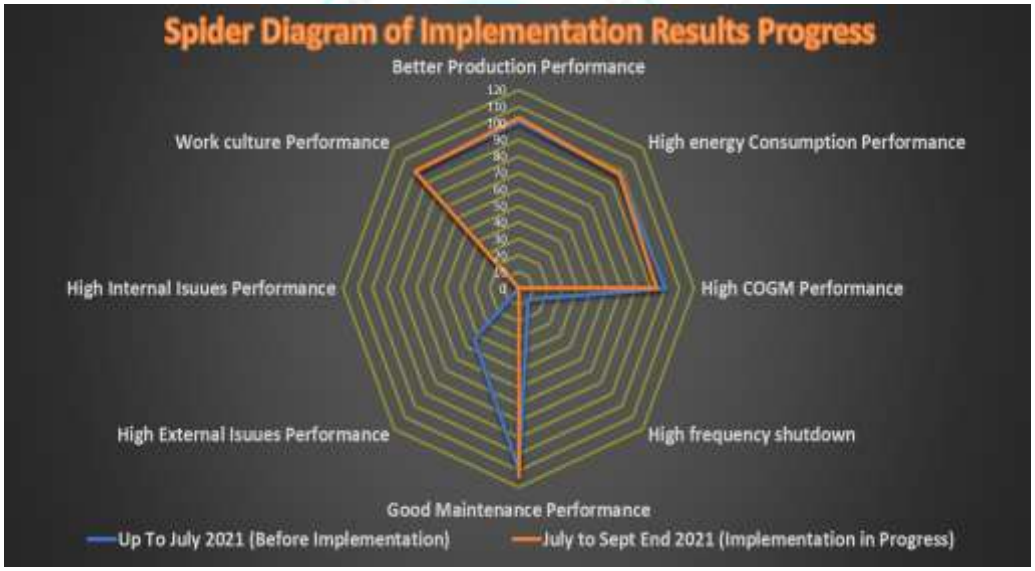

Figure 3. Performance Comparison of IPMS Implementation Results

5. Conclusion & Recommendation

Based on the explanation above related proposed design of integrated performance management system for Plant 5's production business process, these are conclusion and recommendation which can be delivered:

1. Implementing Integrated Performance Management System (IPMS) as performance management system in Plant 5 Operation Department which contain 3 perspectives, is the most contextual tools with all business issues that had been evaluated.
2. The most relevant and significant performance variables related Plant 5's production business process and their measurements have been identified and determined.

3. Leadership and commitment to change are the most critical success factors needed to implement this IPMS

Problem solving process by using this IPMS is the long journey which might need to be evaluated and update in the middle of process.

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