

DESIGN OF INTEGRATED PERFORMANCE MANAGEMENT SYSTEM (IPMS) IN INFORMATION TECHNOLOGY DEPARTMENT OF PT NUSANTARA TURBIN DAN PROPULSI

Sisca Yuliharyani^a, Muhammad Shalahuddin^b & Dermawan Wibisono^c

^{ab}Institut Teknologi Bandung, Indonesia.

^cInstitut Teknologi Bandung and Universitas Pertamina, Indonesia.

Corresponding Email: sisca_yuliharyani@sbm-itb.ac.id

Abstract

PT Nusantara Turbin dan Propulsi (NTP) is a subsidiary of PT Dirgantara Indonesia, which is a State-Owned Enterprise (SOE). The Information Technology (IT) Department of NTP currently uses KPIs that are determined by the company. But unfortunately, the design of a Performance Management System (PMS) that exists has no alignment with the corporate strategy. So, the IT Department is often seen as not contributing to the company's achievement. IT is indeed a secondary activity in NTP's value chain. Even though without IT Department support, the company's operation cannot run smoothly because almost all of the business processes are using IT applications provided by this department. The purpose of this study is to determine the appropriate variables and KPIs for IT Department of NTP using Integrated Performance Management System (IPMS) and mapping of Information Technology Service Management (ITSM), which contains service strategy, service design, service transition, service operation, and continual service improvement processes. With this approach, it is hoped that the contributions of the IT Department to the company can be seen significantly. In order to increase the support and attention of NTP's top management that is needed by the IT department nowadays, it is crucial that the performance of the IT Department take effect on the overall company's performance. In Q3 2020, the IT Department will implement a project to replace the ERP system from the old IBM mainframe platform into Python-based web-based applications. This migration project will be equipped by the PMS. With this study, the IT Department of NTP can adopt the design of IPMS that already cascade from corporate strategy and ITSM mapping to prevent the misalignment of strategy at the departmental level.

Keywords: Corporate Strategy, Information Technology Department, Information Technology Service Management, Integrated Performance Management System.

1. Introduction

PT Nusantara Turbin dan Propulsi (NTP) formerly named Universal Maintenance Center (UMC) was established in 1986 as a division of Industri Pesawat Terbang Nusantara (IPTN), which now has changed its name to PT Dirgantara Indonesia or Indonesian Aerospace. Indonesian Aerospace is an Indonesian state-owned enterprise that is engaged in the development, manufacture, and maintenance of civilian and military aircraft.

UMC has been projected as a business of engineering, maintenance, repair and overhaul in the field of turbines and rotating equipment. As a division, UMC's main function is to support the Indonesian Aerospace business as an aerospace company. In addition, UMC saw a business

opportunity for the industrial turbine MRO because the competencies needed were similar to UMC's competency in the aero-engine MRO (Maintenance, Repair, and Overhaul). In 1998, PT Nusantara Turbin and Propulsi or NTP were officially established and became a subsidiary of Indonesian Aerospace. In running its business, NTP has two Strategic Business Units (SBU), namely SBU of Aero Engine Services and SBU of Industrial Turbine Services.

The Information Technology (IT) Department is a department under the Directorate of Finance and Administration in charge of managing the company's information system. This department is led by the Head of IT Department who has job descriptions leading, planning, directing and controlling all construction activities, maintenance and development of Information Technology (IT) of the companies (hardware and software) to create an effective information system and efficient. In carrying out its operational activities, there are several regulations and best practices that become the reference, namely:

1. Regulation of ministers of state-owned enterprises (PERMEN BUMN) number PER-03-MBU-02-2018 concerning Guidelines for the preparation of information technology management for state-owned enterprises;
2. ITIL (Information Technology Infrastructure Library);
3. PMBOK (Project Management Body of Knowledge);
4. TOGAF (The Open Group Architecture Framework);
5. ISO 27001 Information Security Management;
6. COBIT (Control Objectives for Information and Related Technology).

NTP is a profit-oriented company, therefore, top management is very concerned about achieving revenue and profit targets. IT Department is a department that is not directly related to the efforts to achieve revenue and profit targets which causes top management less supportive in achieving the performance of IT Department because they are considered to have contributed less to achieving revenue and profit (IT as support function or secondary activity in the value chain of NTP). Therefore, the IT Department needs to carry out performance measurements that are connected with achieving the company's revenue and profit targets and the corporate strategy. Besides as the profit-oriented company (concern about financial performance), NTP also pointed by the ministry of defense as a defense industry that supports the Indonesian military (non-financial aspect).

2. Conceptual Framework

The following conceptual framework is used in this paper.

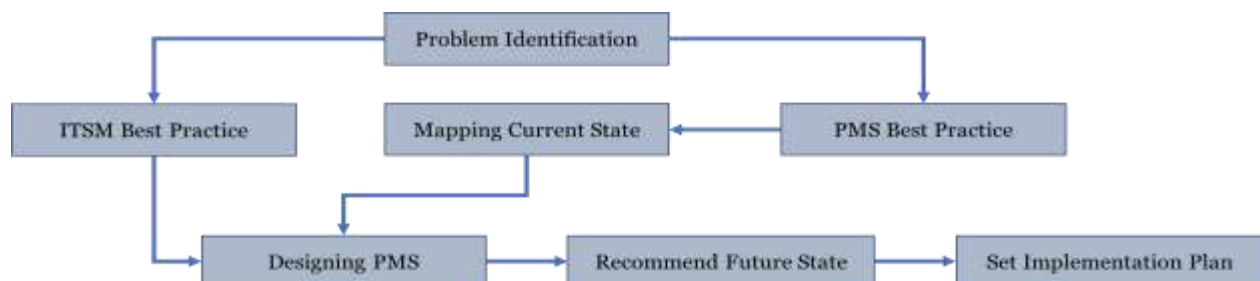


Figure 1 : Conceptual Framework

The following is an explanation of the conceptual framework above:

1. Problem Identification: understanding the existing conditions that occur in the IT Department and NTP which are the object of case studies in this study;

2. ITSM Best Practice: IT Service Management (ITSM) best practices as a reference in performance management for IT services;
3. PMS Best Practice: IPMS best practices as a reference in performance management;
4. Mapping Current State: mapping the existing PMS in the IT Department and NTP using the selected PMS framework;
5. Designing PMS: design new PMS based on the selected PMS framework, current state, and ITSM best practice;
6. Recommend Future State: make future state recommendations on IT Department and NTP;
7. Set Implementation Plan: set up an implementation plan to achieve recommend future state.

3. Performance Management System (PMS)

Performance Management System (PMS) is very crucial in the management of an organization or company. Companies need PMS to measure the achievement of objectives and evaluate whether the process is effective and efficient. In a large organization, PMS is not only needed at the corporate level but also at the departments or divisions below it. To ensure the company's performance is achieved, the PMS of a department or division must align with the corporate PMS. The Integrated Performance Management System (IPMS) is a performance management framework that was first introduced by Dermawan Wibisono in 2006. This framework combines the simplicity of the BSC and takes into account all stakeholders such as Performance Prism. This framework can also be used for non-profit organizations because performance indicators are not only focused on financial factors. The following table is the perspective of IPMS.

Table 1 IPMS Perspective

PERSPECTIVE	ASPECT
Organization Result	Financial
	Non-Financial
Internal Process	Innovation
	Operation Process
	Marketing
	After Sales Service
Resource Capability	Human Resources
	Technology & Infrastructure Resource
	Organizational Resource

IPMS framework is divided into 4 stages, namely:

1. Stage 0: Foundation, i.e. the guiding principle that should be the foundation for the design of PMS.
2. Stage 1: Basic Information, i.e. information needed as input in designing PMS especially from an external perspective, for example, related to regulations, markets, competitors, or the public.
3. Stage 2: Design, i.e. designing PMS includes determining the vision, mission, strategy, and PMS framework.

4. Stage 3: Implementation, i.e. the application of PMS including socialization, monitoring and controlling.
5. Stage 4: Refreshment, i.e. the evaluation of the PMS that has been applied.

4. IT Service Management

PMS is very closely related to ITSM for performance management in the IT Department. IT Service Management (ITSM) is the process of an organization in designing, planning, delivering, operating and controlling Information Technology (IT) services offered to customers. ITSM best practice that is most often used as a reference is Information Technology Infrastructure Library (ITIL), the latest version is ITIL version 4 which was released in 2019. ITIL helps define the direction of the service provider with a clear capability model and aligns them with the business strategy and customer needs. The following is an explanation of the ITSM process:

1. Service strategy, which is the strategy stage for determining IT services to be performed. This stage must align with the corporate strategic plan;
2. Service design, namely the design phase of IT services to be provided. This stage corresponds to stage 2: design of the IPMS framework. This stage determines the service standards to be provided, including the determination of the service level or Service Level Agreement (SLA) between the IT service provider department and the IT service user department.
3. Service transition, which is the implementation phase of IT services.
4. Service operation, which is the operational stage of IT services. This stage corresponds to stage 3: implementation of the IPMS framework.
5. Continual service improvement, which is the evaluation phase for improving the service quality. This stage matches stage 4: refreshment in the IPMS framework.

5. Current State

The following is a mapping of the current state of NTP in general and IT Department in particular with each stage of the IPMS.

5.1. Stage 0: Foundation

According to the IPMS framework, the foundation of PMS must pay attention to 4 principles, namely partnership, empowerment, integrated performance improvement, and independence. As an organization that has been running for more than 30 years, NTP has had an ongoing PMS. The PMS has evolved and changed according to the needs and external conditions that affect the company. NTP's PMS has looked at 4 principles of PMS foundation according to the IPMS framework.

5.2. Stage 1: Basic Information

Currently, NTP has a vision, mission, strategy, and PMS framework that is based on an analysis of internal and external factors. At this stage, NTP is compatible with the IPMS framework.

5.3. Stage 2: Design

NTP has a vision, mission, long term objectives, and long term strategies that have detailed contents mentioned in the Introduction. The long term objectives and long term strategies should be spelled out in the Rencana Jangka Panjang Perusahaan (RJPP) or strategic plan (5-year period) document. According to the regulation of ministers of state-owned enterprises (PERMEN BUMN) number PER-03-MBU-02-2018, state-owned enterprises and their subsidiaries should have an IT strategic plan or IT Master Plan.

NTP has an annual work plan including the required budget as outlined in the Rencana Kerja Anggaran Perusahaan (RKAP) document. The RKAP document is approved by the shareholders and becomes the main reference in the implementation of work on the NTP. The IT department's annual work plan is based on the annual NTP work plan that is tailored to IT development trends. In general, the IT Department's work plan consists of 2 types, namely:

1. IT Projects. A project is a temporary endeavor undertaken to create a unique product, service, or result (Project Management Institute, 2017). The characteristics that must be possessed by a project are temporary (have a clear beginning and end), unique product or result, and progressive elaboration (conduct incremental & continuous refining and working out the detail). IT projects performance appraisal is calculated from the percentage of project work.
2. IT Operations. An operation is the opposite of the project. The characteristics of operation are repetitive and repeated deliverable. The performance assessment of IT operations is calculated based on the percentage of SLA (Service Level Agreement) compliance agreed between the IT Department and IT service users.

NTP has 2 types of performance appraisals that are calculated quarterly. The performance evaluation is as follows:

1. Unit or department performance appraisal;
2. Individual performance appraisal.

The following is a summary of NTP's current state mapping according to the IPMS framework for stage 2: design.

Table 2 NTP Current State

No	Item	Current State	Need Improvement
1	Vision	Exist	No
2	Mission	Exist	No
3	Long term strategy of NTP	There is no RJPP (strategic plan) document	Yes
4	Long term strategy of IT Department	There is no IT Master Plan document	Yes
5	The annual plan of NTP	There is an RKAP document	No
6	The annual plan of IT Department	There are 2 types, namely: <ul style="list-style-type: none"> IT Projects contained in the Smartsheet application IT Operations contained in the Quality Objective document which refers to the ISO 9001: 2015 standard 	Yes
7	Performance appraisals of NTP	There are 2 types, namely: <ul style="list-style-type: none"> Unit or department performance appraisal. The performance appraisal consists of 10 attributes of company performance appraisal, namely the Days Away From Work Case Rate (DAFWCR), regulations compliance, average collection period, cash in, contract acquisition, sales, quality performance, production realization, housekeeping, and profit. Individual performance appraisal. Individual 	Yes

No	Item	Current State	Need Improvement
		performance appraisal consists of 5 attributes for the staff level and 6 attributes for the managerial level, namely work performance, attendance, self-potential, work attitude, technical skills, and managerial skills specifically at managerial level.	
8	Performance appraisals of the IT Department	There are 2 types, namely: <ul style="list-style-type: none"> IT projects performance appraisal is calculated from the percentage of project work. IT operations performance appraisal is calculated based on the percentage of SLA (Service Level Agreement) compliance agreed between the IT Department and IT service users. <p>At present, there is no mapping between the performance appraisal of NTP and performance appraisals of the IT Department. This raises the risk of activities in the IT Department that do not support anything to the performance appraisal of NTP (no linkage to the corporate level)</p>	Yes

5.4. Stage 3: Implementation

The PMS used at the NTP has been socialized to all employees and has been running for years. NTP including the IT Department monitors its performance. The following is the current KPI of IT Department:

1. Percentage of IT Projects work;
2. Develop application (based on Quality Objective document);
3. Create an application report (based on Quality Objective document);
4. Create employee number/user (based on Quality Objective document);
5. Create a new transaction (based on Quality Objective document);
6. Hardware repair (based on Quality Objective document);
7. Software repair/installation (based on Quality Objective document);
8. Other user requests (based on Quality Objective document).

The IT Department must be able to maintain the balance of achievement of these KPIs and make sure that there are no KPIs with very low scores. According to the IPMS framework, one way to represent performance is to use radar charts (spider web charts). The following are the radar charts of the IT Department for the 2016-2018 period.

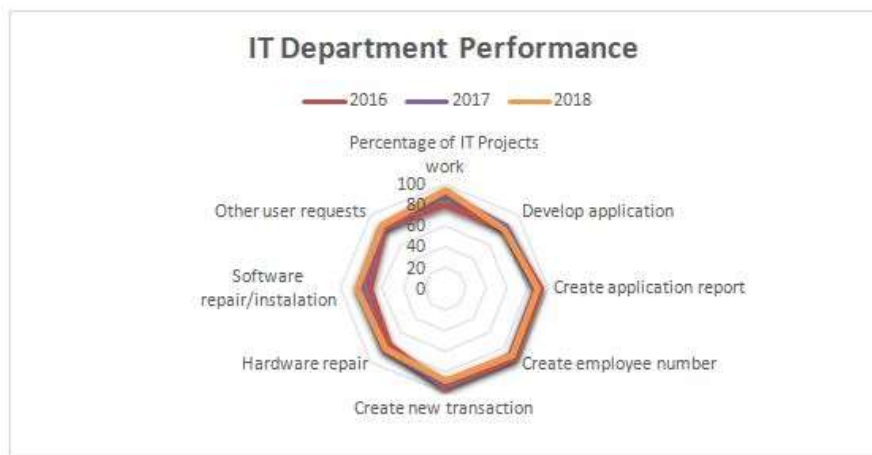


Figure 2 IT Department Performance

5.5. Stage 4: Refreshment

The following is an evaluation of PMS used in NTP at this time:

1. Positive things that must be maintained include:
 - a. Stage 0: Foundation is in accordance with the IPMS framework,
 - b. Stage 1: Basic information is in accordance with the IPMS framework,
 - c. Stage 2: Design in vision and mission are in accordance with the IPMS framework
 - d. Stage 3: Implementation is in accordance with the IPMS framework, performance appraisals of NTP have been linked to giving employee bonuses,
 - e. Stage 4: Refreshment, the PMS used in NTP needs to be evaluated because the PMS has not been effective in increasing company productivity.

2. Things that can still be improved or developed are on Stage 2: Design, among others:
 - a. NTP must make an RJPP document as a long term strategy for company development;
 - b. NTP must prepare IT Master Plan documents according to the RPJP document as a long term strategy for the development of corporate IT;
 - c. NTP must make a strategy based on PMS perspective according to the IPMS framework so that no perspective is missed;
 - d. The NTP must make cascading between the long-term strategy in the RJPP document and the IT Master Plan, the annual plan in the RKAP document, the IT Department's annual plan, and the assessment of department/individual performance. At present, the relationship between planning and performance evaluation is still lacking so that the performance of units/departments and individuals is not aligned with the company's planning.

6. Future State

In this paper, there are some improvements that must be made to the corporate level and the IT Department. Future state design discussed in this paper is to improve PMS by referring to the IPMS framework and ITIL. The following corporate (NTP) and IT Department performance indicators according to IPMS Perspective.

Table 3 Performance Variable Based on IPMS Perspective

PERSPECTIVE	ASPECT	VARIABLE OF CORPORATE	VARIABLE OF IT DEPARTMENT
Organization Result	Financial	Average collection period	Collection System
		Cash in	Cash Management System
		Profit	Finance System
	Non-Financial	Regulations compliance	Customs and Excises System
Internal Process	Innovation	Product and improvement development	IT Projects
	Operation Process	Quality performance	Quality Management System
		Production realization	Production System
		Housekeeping	-
	Marketing	Contract acquisition	Contract System
		Sales	Sales System
	After Sales Service	Customers satisfaction	Corporate Website
Resource Capability	Human Resources	Days Away From Work Case Rate (DAFWCR)	-
		Employee attendance	Portal Application
		Employee productivity	Human Resource System
		People development	Training System
	Technology & Infrastructure Resource	IT application and infrastructure availability	IT Network
			Servers
			End-User Device
		Plant tools and equipment availability	Plant Monitoring System
	Organizational Resource	Teamwork	Corporate Email

The following is a breakdown of IT Department output:

Table 4 IT Department Output

Perspective	Aspect	Variable	Definition	Indicator	Formula	Rating	Period	Target	Status
Organization Result	Financial	Collection System	A subsystem of the mainframe that serves to record company bills	% availability system	$\frac{\sum \text{available time}}{\sum \text{service hours}} \times 100\%$	90-100% excellent 80-90% good <80% bad	Annually	>80%	New
		Cash Management System	A subsystem of the mainframe that serves to record the company's cash position	% availability system	$\frac{\sum \text{available time}}{\sum \text{service hours}} \times 100\%$	90-100% excellent 80-90% good <80% bad	Annually	>80%	New
		Finance System	A subsystem of the mainframe that serves to produce the company's financial statements	% availability system	$\frac{\sum \text{available time}}{\sum \text{service hours}} \times 100\%$	90-100% excellent 80-90% good <80% bad	Annually	>80%	New
	Non-Financial	Customs and Excises System	System for integration with customs and excise as a requirement for obtaining bonded zone facilities	% availability system	$\frac{\sum \text{available time}}{\sum \text{service hours}} \times 100\%$	90-100% excellent 80-90% good <80% bad	Annually	>80%	New
Internal Process	Innovation	IT Projects	IT projects in the current year	% progress projects	$\sum \text{progress project}$	80-100% excellent 60-80% good 40-60% bad <40% very bad	Annually	>60%	New
	Operation Process	Quality Management System	A subsystem of the mainframe which functions to record the quality of the products produced by the company	% availability system	$\frac{\sum \text{available time}}{\sum \text{service hours}} \times 100\%$	90-100% excellent 80-90% good <80% bad	Annually	>80%	New

In Q3 2020, NTP has a large project in the improvement of IT corporate. NTP will replace the mainframe with web-based applications using Python technology. This project is urgent to do because mainframe technology has been used for so long that it is difficult to integrate with other applications nowadays. Even though the current trend of IT development, system integration is a necessity that cannot be avoided anymore. The demands of customs and excise authorities, tax authorities, and Bank Indonesia (central banks) have required the integration of corporate IT systems with IT authorities.

System integration capability can also be used to improve company efficiency. Currently, Supply Chain Management (SCM) technology that integrates corporate IT systems with suppliers and Customer Relationship Management (CRM) that integrates corporate IT systems with customers has been widely implemented throughout the world. There is an important consumer of NTP who has explored the integration of the system, but due to the unpreparedness of NTP's IT system, these opportunities cannot be exploited yet.

The project to replace the NTP ERP system platform from mainframes to Python-based web-based applications also opens the opportunity to slightly increase the scope of the project by developing PMS modules that align from setting the company's strategic plan to evaluating the performance of units/departments. With the development of this PMS module, it is expected that PMS NTP can be more agile and easier in dealing with changing business conditions that are very quickly.

Conclusions

The following conclusions are obtained after developing the Performance Management System (PMS) by using the Integrated Performance Management System (IPMS) for an IT Department:

1. IPMS is a PMS framework that takes into account the needs of all stakeholders and can be applied to various types of companies, one of which is NTP which is engaged in Maintenance, Repair, and Overhaul of aero engines and industrial turbines. On one hand, NTP is a profit-oriented company (financial aspect), in the other hand, NTP also pointed by the ministry of defense as the defense industry that supports the military of Indonesia and as the subsidiary of PT DI the one of a state-owned enterprise in Indonesia (non-financial aspect).
2. The performance measurement of a unit/department must be cascading from the company's business strategy so that the performance of the unit/department really supports the achievement of the company's strategy.
3. ITIL as ITSM best practice is very appropriate to be used as a reference for making PMS in the IT Department.
4. IT Department at NTP needs to make changes to the department's KPI so that it aligns with the company's strategy. The current KPI does not represent the company's strategy yet.
5. A company that is able to make alignments ranging from long-term business strategies, annual work plans, to the assessment of unit/department performance is expected to improve performance because it focuses on the same objectives and minimizes unnecessary activities.
6. Performance Management System (PMS) must utilize IT so that performance appraisal is more objective and agile. At present, the changes in the business world are so fast that companies must be agile, and PMS can only be agile if they utilize IT.

References

- i. Neely, Andi, Chris Adams, Mike Kennerley. (2002). *The Performance Prism, the Scorecard for Measuring and Managing Business Success*. Great Britain: Pearson Education Limited.
- ii. Project Management Institute. (2017). *A guide to the Project Management Body of Knowledge (PMBOK Guide) (6th ed.)*, Pennsylvania: Project Management Institute.
- iii. Wibisono, Dermawan. (2013). *Panduan Penyusunan Skripsi, Tesis, & Disertasi*. Yogyakarta: Penerbit ANDI.
- iv. Wibisono, Dermawan. (2016). *How to Create World Class Company*. Bandung: Penerbit ITB.
- v. Keel, Alan and Robert Hodges (2016). *IT Service Management*. IBM.