

Design and Analysis of an ITSM Framework to Improve IT Governance and Customer Service at CV Bharata Nigar Persada

Reza Fahromi, Andysah Putra Utama Siahaan, Rian Farta Wijaya

Abstract

The development of information technology requires service companies to have structured IT service management to support operational efficiency and improve service quality for customers. CV Bharata Nigar Persada, a *Service & Parts Contract* company engaged in forklift and generator set maintenance, faces problems of delayed maintenance schedules (*service lost schedule*), unavailability of spare parts, and long handling times for damaged customer units. These problems indicate that the current IT service management is not yet optimal and has not reached an adequate maturity level. This research aims to design and analyse an *Information Technology Service Management* (ITSM) framework based on ITIL V3, focusing on the *Service Design* domain, to improve IT governance and customer service quality at CV Bharata Nigar Persada. The research used a qualitative descriptive method with a case study approach through observation, interviews, documentation study, maturity level measurement, gap analysis, and the design of the proposed ITSM framework (TO-BE). The results show that the maturity level of IT services in the existing condition is at Level 1 (*Initial*) to Level 2 (*Repeatable*), especially in the *Service Design*, *Incident Management*, and *Problem Management* domains. The proposed ITIL V3-based ITSM framework, which includes a service catalogue, a service level agreement (SLA), maintenance schedule control, spare part management, and the integration of incident and problem management, was shown through simulation to improve the effectiveness of service management, reduce the risk of schedule delays, accelerate damage handling, and increase customer satisfaction. This research is expected to serve as a reference for maintenance service companies in improving IT service governance in a structured and sustainable manner.

Keywords: *IT Service Management, ITIL V3, Service Design, IT Governance, Customer Service*

Reza Fahromi¹

¹Master of Information Technology, Panca Budi Development University, Indonesia
e-mail: reza.fahromi@gmail.com¹

Andysah Putra Utama Siahaan², Rian Farta Wijaya³

e-mail: andiesiahaan@gmail.com, lheny@pancabudi.ac.id

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Introduction

Information technology development has reached almost all aspects of business operations, including maintenance service companies such as CV Bharata Nigar Persada. This company offers services such as greasing, chain oil lubrication, periodic forklift maintenance, and periodic generator set maintenance. By following the maintenance schedule regularly and reporting the condition of customer units, service reliability, operational efficiency, and customer satisfaction become the keys to the company's success.

Service operations do not depend only on mechanical and physical aspects such as lubrication or regular servicing, but also on how the IT system supports schedule management, unit condition reporting, and service performance control. Without good IT governance and structured IT Service Management (ITSM), the company may face challenges such as a lack of schedule transparency, failure to monitor unit conditions, late service responses, and declining customer trust.

Studies show that good ITSM implementation can increase operational efficiency and service quality. Previous research shows that ITSM implementation has a positive and significant effect on company operational efficiency [1]. Based on this problem, an integrated system is needed for IT service management to make it easier for the company to manage IT services for its customers.

One of the ITSM frameworks used to increase the efficiency of IT services to users is ITIL (Information Technology Infrastructure Library) V3. The application of ITSM is expected to make IT service management better and able to solve several problems in an organization.

Previous studies also showed that the higher the maturity of ITSM/ITIL application in an organization, the greater the benefits and the fewer the challenges [2]. Maturity models and best practices such as ITIL, COBIT, and ISO/IEC 20000 can increase user satisfaction, productivity, and better resource utilization. The most important part of the ITIL lifecycle is service design, the guidance for implementing IT governance that enables a company to deliver, manage, and operate IT services as strategic assets. Without an appropriate service strategy, a company will not survive long amid tight competition and high customer demands.

At CV Bharata Nigar Persada, the service process and heavy equipment spare parts have been arranged in SOPs, but the procedures for handling problems, such as problem management or service delivery, have not been explained in detail. Interviews with the staff show that services related to customer service operations have not been optimal, so that the maturity of the service system is not yet known, and failed transactions slow down service sales and affect future system performance.

With this background, a study on the design and analysis of an ITSM framework becomes very relevant for CV Bharata Nigar Persada. The focus of this research is how to design an ITSM framework that supports IT governance and increases service quality to customers. With the right framework, the company is expected to control service schedules better, increase the visibility of unit conditions, support faster decision making, and increase customer satisfaction.

This research analyses the causes of problems, prevents the same problems from recurring, reduces risk, and examines how problems can be solved faster. In the service design stage, problem management and incident management were combined to process service sales and spare parts, and the system maturity level was assessed through a maturity assessment. The proposed framework is expected to improve schedule control, improve the spare part stock system, and increase transparency and service levels to customers.

Literature Review

2.1 IT Governance

Information Technology Governance is a framework used to ensure that the use of information technology in an organization is aligned with its strategic goals [3], [4], [5], [6], supports operational efficiency, and gives more value to the organization [7]. IT Governance includes the processes, structures, and mechanisms designed to manage information technology effectively, ensure information security, and mitigate the risks related to its use [8].

IT Governance is usually based on international standard frameworks, such as:

- a. *COBIT (Control Objectives for Information and Related Technology)*: a framework that focuses on IT governance and management with the goal of giving full control over information systems and increasing IT value.
- b. *ISO/IEC 27001*: a standard for information security management that ensures the protection of sensitive data through clear security procedures and policies.
- c. *ITIL (Information Technology Infrastructure Library)*: an IT service management framework that focuses on user needs and service efficiency.

2.2 Information Technology Service Management (ITSM)

Information Technology Service Management (ITSM) is a structured approach that focuses on how an organization plans, manages, and delivers information technology services to fulfil customer needs or business goals. ITSM emphasizes service orientation and the alignment of IT services with organizational strategic targets, so that the IT function is not only a technology provider but also an enabler of business value. According to a recent study, ITSM provides a framework that enables an organization to increase service quality, optimize operational processes, and improve customer experience through a standardized and value-oriented approach [9].

ITSM and the ITIL framework share the same characteristics: they are process-oriented and use best practices to manage the lifecycle of IT services. Various studies show that combining ITSM practices and ITIL 4 can increase service value creation, drive financial efficiency, and significantly increase customer satisfaction in a digital business environment [10].

2.3 Information Technology Infrastructure Library (ITIL)

Information Technology Infrastructure Library (ITIL) is an international best practice framework that provides structured guidance for IT service management. ITIL was designed to help organizations provide services that are high quality, consistent, measurable, and aligned with business needs. In its development, ITIL has evolved from the process-based ITIL v2 and v3 to the Service Value System approach introduced in ITIL 4, to accommodate modern technology dynamics such as cloud computing, agile development, DevOps, and digital business processes [11].

ITIL provides four main dimensions that must be considered by an organization in developing IT services, namely: (1) Organizations and People, (2) Information and Technology, (3) Partners and Suppliers, and (4) Value Streams and Processes. These four dimensions ensure that every service component runs harmoniously to fulfil the target value [12].

2.4 Previous Related Studies

Several previous studies conducted by researchers at Universitas Pembangunan Panca Budi are relevant to this research. Noor and Novelan [13] evaluated IT service governance in a higher education institution using ITIL 4 by mapping existing processes to Incident Management, Service Request Management, Change Enablement, Service Level Management, and Continual Improvement, and found gaps in service standardization, performance monitoring, documentation, and continuous improvement. Nainggolan and Wijaya [14] analysed the DSS domain of COBIT 2019, which covers operations, incident, problem, and continuity management, for personnel information system services, and

identified gaps such as the absence of formal SOPs, limited documentation, inconsistent incident and problem management, and insufficient continuity planning. Hardinata *et al.* [15] found that the operations management process (DSS01) at Universitas Pembangunan Panca Budi Medan was at capability Level 2, while the target was Level 3.

In the business sector, Putra and Wijaya [16] found that the evaluated IT governance processes at an IT company were generally between Level 2 and Level 3, with limitations in performance measurement, documentation, and continuous monitoring, while Nahampun and Amin [17] showed that IT governance evaluation can be directed at improving the effectiveness of a service system, with recommendations for structured performance monitoring, periodic risk assessment, and improved documentation. From the customer perspective, Aisya *et al.* [18] proposed a conceptual framework in which digital customer experience and after-sales service quality drive customer loyalty through customer satisfaction, particularly in the industrial tools sector. These studies support the focus of this research, which applies ITIL V3 Service Design, Incident Management, and Problem Management to the after-sales maintenance services of CV Bharata Nigar Persada.

Research Methodology

This research uses a qualitative descriptive approach aimed at understanding the condition of service governance at CV Bharata Nigar Persada, identifying problems that occur in the mechanic service process and spare part supply, and designing a proposed IT Service Management framework based on ITIL V3, especially in the Service Design, Incident Management, and Problem Management domains.

This approach was chosen because the research focuses on an in-depth understanding of the running service process, the obstacles that occur, and the perceptions of service implementers. In addition, this research also uses a light quantitative approach through maturity level assessment to determine the extent of ITSM implementation and the gaps that need to be fixed. Therefore, this research is a simple mixed-method study, with qualitative research as the main approach and quantitative research supporting the process maturity assessment.

Results

In its operations, CV Bharata Nigar Persada carries out routine maintenance of forklift and genset units, which includes changing the engine oil, hydraulic oil, oil filter, air filter, hydraulic filter, and fuel filter. Besides routine maintenance, the company also handles minor repairs such as replacing the braking system, clutch, and electrical components such as lamps. For complex damage, the company carries out major repairs such as engine overhauls to return the unit to optimum performance.

The analysis of the existing information technology condition at CV Bharata Nigar Persada was carried out to determine how far IT service governance supports Service & Parts Contract operations, especially maintenance schedule management, spare part supply, and the handling of damaged customer units. This analysis used the ITIL V3 lifecycle approach, which includes Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement (CSI).

4.1 Service Strategy Analysis

In terms of service strategy, CV Bharata Nigar Persada has a clear form of service, namely the Service & Parts Contract for forklifts and generator sets. This service includes regular periodic maintenance, minor and major repairs, and spare part supply in accordance with the contract with the customer. In general, the company's service portfolio has been formed operationally but has not been documented formally as a service portfolio or a structured service catalogue.

4.2 Service Design Analysis

The Service Design analysis shows that most of the main problems at CV Bharata Nigar Persada lie in this area. The IT service design that supports service operations and spare parts has not been planned in an integrated and systematic way. Maintenance schedule design is still manual, through simple recording and relying on the memory of staff and technicians. There is no reminder system or automatic control that ensures maintenance is carried out on time as stated in the contract.

In the spare part management aspect, the service design has not supported part supply optimally. There is no systematic analysis of part movement, reorder point, or safety stock. The spare part supply process is still reactive.

4.4 Service Transition Analysis

Generally, maintenance schedule changes are made ad hoc, because of previous delays or sudden priority repairs. Spare part replacement also often happens when a technician finds additional damage during maintenance. The company does not yet have documented change management and release management processes to ensure that every change is recorded, its impact evaluated, and communicated systematically. The absence of a formal Service Transition process increases the risk of service failure, both in terms of schedule and repair quality.

4.5 Service Operation Analysis

In Service Operation, IT services play a direct role in supporting the company's daily activities. The existing condition shows that operational processes still depend on manual coordination. Incidents in the form of sudden unit damage often occur and are handled directly by technicians without a clear escalation procedure. Recurring damage to certain units is not analysed systematically to find the root cause. Damage history is not documented centrally, so the handling is only temporary.

Service requests from customers are made through informal communication, such as phone calls or SMS, without an integrated recording system. This condition makes it difficult to measure breakdown handling time and service performance objectively. As a consequence, operational performance evaluation becomes limited and is not based on data.

4.6 Continual Service Improvement Analysis

The Continual Service Improvement analysis shows that the company does not yet have a periodic service evaluation mechanism. There is no Key Performance Indicator (KPI) used to measure service performance, such as maintenance schedule accuracy or spare part supply level. In addition, formal service performance measurement and trend analysis are not carried out periodically. This condition causes service improvements to be made incidentally rather than continuously. Without a structured CSI, it is difficult for the company to know its IT service maturity level and which areas really need improvement.

Maturity level measurement was carried out to determine how far IT service management at CV Bharata Nigar Persada has been implemented in a structured and managed manner. This measurement aimed to give an objective description of the existing condition and to become the basis for designing an ITIL V3-based ITSM framework appropriate to the organization's needs. The results of the maturity level measurement in the existing condition (AS-IS) are shown in Table 1.

Table 1. IT Service Maturity Level Measurement Result (AS-IS)

ITIL V3 Domain	Maturity Value	Maturity Level	Condition Description
Service Design	2.1	Level 2 – Repeatable	The process runs repeatedly and is not documented

ITIL V3 Domain	Maturity Value	Maturity Level	Condition Description
Incident Management	2.3	Level 2 – Repeatable	Incident handling is done directly without a formal procedure
Problem Management	1.9	Level 1 – Initial	There is no root cause analysis or problem documentation
Availability & Capacity Management	2.0	Level 2 – Repeatable	Capacity planning is not yet structured or measurable

The gap analysis was carried out by comparing the existing condition (AS-IS) with the expected condition (TO-BE), which is at least Level 3 (Defined). This level was chosen because it reflects service processes that are documented, standardized, and can be carried out consistently.

Table 2. Maturity Level Gap Analysis

ITIL V3 Domain	AS-IS	Target (TO-BE)	Gap	Operational Impact
Service Design	2.1	3	0.9	Uncontrolled schedule and unclear SLA
Incident Management	2.3	3	0.7	Incident handling time is not measured
Problem Management	1.9	3	1.1	Recurring damage is hard to prevent
Availability & Capacity	2.0	3	1.0	Limited technicians and spare parts

These findings are consistent with previous studies at Universitas Pembangunan Panca Budi, which also found service management gaps related to standardization, documentation, and monitoring [13], [14], as well as capability levels that were generally around Level 2 and had not yet reached the Level 3 target [15], [16]. The largest gap in this study, found in Problem Management, is also in line with the inconsistent incident and problem management reported in [14].

Based on the analysis of the existing condition (AS-IS), the service maturity level assessment, the ITSM framework design (TO-BE), the process improvement simulation, and the discussion of the implementation impact, it was found that the main problem at CV Bharata Nigar Persada is the absence of a structured IT service design, especially in the ITIL V3 Service Design domain.

The main findings show that uncontrolled maintenance schedules, uncertain spare part supply, and the long time needed to handle damaged units are consequences of the low IT service maturity level. Through the ITIL V3-based ITSM framework that focuses on Service Design, supported by Incident Management and Problem Management, this research shows that service process improvement can be carried out systematically and measurably.

Conclusion

Based on the analysis, design, simulation, and discussion, it can be concluded that the existing condition (AS-IS) of IT service governance at CV Bharata Nigar Persada has not been managed optimally, especially in the ITIL V3 Service Design domain. The maintenance scheduling process, spare part management, and damaged unit handling are still carried out manually and reactively, causing problems such as service lost schedule, unavailable spare parts, and delays in handling damaged customer units.

The maturity level measurement shows that most IT service domains, namely Service Design, Incident Management, Problem Management, and Availability and Capacity Management, are still at Level 1 (Initial) to Level 2 (Repeatable). This condition indicates that service processes run repeatedly but have not been documented and standardized formally.

The proposed ITIL V3-based ITSM framework (TO-BE), which focuses on the Service Design domain and is supported by Incident Management and Problem Management, can answer the company's main problems. The proposed framework includes a service catalogue, a service level agreement (SLA), maintenance schedule control, spare part management based on part analysis, and structured incident and problem handling mechanisms.

The simulation of service process improvement shows that implementing the proposed ITSM framework potentially gives significant improvement to maintenance schedule management, spare part availability, and the acceleration of handling damaged customer units. The simulation also shows improved operational efficiency and reduced risk of service disruption.

The implementation of the ITIL V3-based ITSM framework has a positive influence on service quality and customer satisfaction, as shown by improved schedule certainty, service transparency, and reduced breakdown time. This impact is in line with the company's goal of maintaining existing service contracts and increasing its reputation to attract new customers.

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