

Analysis and Proposals for Procurement Process Performance Improvement Based on SCOR DS 14.0 (Case Study: PT. Telkom Warehouse Jogja Central Java)

Irma Mutiarani

¹Industrial Engineering Study Program, Faculty of Industrial Technology, Islamic University of Indonesia, Yogyakarta, Indonesia

Abstract: Procurement is a strategic function that determines the effectiveness of an organization's supply chain, especially in industries that depend on material availability such as telecommunications. PT Telkom Gudang Telkom Jogja in Central Java has implemented structured supplier management, but performance measurement is still limited to supplier evaluation and does not cover the entire procurement process. This study aims to measure the performance of the procurement process using KPIs based on the Supply Chain Operations Reference Digital Standard (SCOR DS) 14.0 from a Strategic Sourcing perspective, identify performance gaps, and formulate improvement proposals based on Best Practice and People that are mechanistically linked to the root cause. The study uses a qualitative and quantitative descriptive approach to operational data from January to May 2026, covering seven Strategic Sourcing hierarchies (S1.1-S1.9) with 20 KPIs. The results show that 10 of the 20 KPIs (50%) have not reached the target, with the largest gaps in the vendor certification compliance rate (26.47%), BOQ accuracy (13.08%), and BA Agreement approval lead time (9 days). Fishbone analysis revealed four sources of problems: internal Telkom factors, field supervisors, vendors, and external factors. Based on these findings, eight priority improvement programs were developed based on Best Practice and People SCOR DS 14.0, with priorities determined based on the company's level of control. This research contributes an integrated procurement evaluation framework that can be replicated in similar procurement units in the telecommunications industry and other sectors.

Keywords: Procurement performance, SCOR DS 14.0, Strategic Sourcing; gap analysis, Best Practices, People.

1. Introduction

Procurement is no longer seen as an administrative activity that is only oriented towards price, quality and timeliness, but has developed into a strategic function that determines the effectiveness of the organization's supply chain as a whole [1]. One approach that emphasizes this strategic role is Strategic Sourcing, a procurement approach that not only considers operational indicators but also the strategic competencies of suppliers, ranging from quality management, production capabilities, to the ability to create cost efficiencies for the organization [2]. The application of this approach is becoming increasingly relevant in industries that are highly dependent on the availability of infrastructure and materials, one of which is the telecommunications industry.

PT Telkom Indonesia, as the largest telecommunications and digital service provider in Indonesia, is highly

dependent on the supply of network materials such as Fiber to the Home (FTTH) devices. At the operational level, PT Telkom Gudang Telkom Jogja central java acts as a material management unit that covers the receipt, storage, and distribution of goods to work units. Although this unit has implemented a structured supplier management mechanism that includes legality selection, quality control, and supplier performance evaluation every two years, performance measurements have not been conducted on the entire procurement process itself. The ongoing evaluation has been limited to supplier assessments, so the company does not yet have a comprehensive picture of the extent to which each stage of the procurement process has achieved the set targets.

Initial measurements of several procurement performance indicators indicate significant gaps, including supplier certification compliance, Bill of Quantities (BOQ) accuracy, field survey accuracy, and cost estimation accuracy. This raises further questions about which processes within the procurement chain are the primary source of these gaps, and the underlying factors, as initial investigations indicate that some of the causes lie not only in the company's internal systems but also in the reliability of third parties directly involved in the field.

To address these needs, this study utilizes the Supply Chain Operations Reference Digital Standard (SCOR DS) 14.0 framework developed by ASCM. Unlike procurement evaluation approaches that typically focus on assessing supplier compliance or cost efficiency alone, SCOR DS 14.0 enables structured procurement performance measurement through a Strategic Sourcing perspective, while simultaneously mapping the company's actual process alignment with the S1.1-S1.9 standard stages [3]. Studies that specifically combine SCOR multi-hierarchical KPI measurements with root cause identification and the preparation of improvement proposals based on Best Practice and People (covering Experience and Training aspects) in an integrated manner are still relatively limited, especially in the context of telecommunications companies in Indonesia.

Based on these gaps, this study aims to (1) map and measure the performance of the procurement process of PT Telkom Gudang Telkom Jogja Central java using KPIs based on SCOR DS 14.0 from a Strategic Sourcing perspective, (2) identify gaps between actual performance and company targets, and (3) formulate improvement proposals based on Best Practice and People SCOR DS 14.0 which are based on the relationship between the mechanism of the root of the problem and the proposed solution, not just the proximity of the topic.

2. Literature Review

2.1 Strategic Sourcing in Supply Chain Management

Strategic Sourcing is a process related to the identification and selection of key suppliers capable of supporting an organization's needs on an ongoing basis. This process generally involves a thorough analysis of total spend and aims to build long-term relationships with supplier partners that can support profitability and customer satisfaction. Strategic sourcing can also be interpreted as an approach to insourcing or outsourcing decision-making that emphasizes a strategic perspective, especially for organizations whose competitive strategy is based on product differentiation or market focus [3].

Strategic Sourcing has evolved into a multidimensional approach that is no longer limited to considerations of price, quality, and on-time delivery. This strategy develops a strategic procurement framework to support Green Supply Chain Management by assessing supplier capabilities based on environmental and operational aspects simultaneously [4], while other research highlights the complexity of co-opetition relations between buyers or platform operators and local suppliers in the circular economy ecosystem [5]. These two studies confirm that strategic procurement decisions now involve dimensions of sustainability, risk readiness, as well as relational complexity among supply chain actors' relevant foundations for evaluating the suitability of Telkom's procurement process to structured Strategic Sourcing principles.

2.2 SCOR Digital Standard (SCOR DS) Framework 14.0

SCOR DS 14.0, developed by the Association for Supply Chain Management (ASCM), integrates the four main elements of processes, performance, practices, and people into a standard framework for mapping and evaluating supply chain performance in a structured manner [6],[3]. The SCOR process structure is

hierarchical, starting from Orchestrate at the strategic level (level 0), six core processes at level 1 (Plan, Order, Source, Transform, Fulfill, Return), to more detailed process elements at levels 2 and 3. This study focuses on the Source process with a Strategic Sourcing perspective, covering the S1.1 to S1.9 hierarchy, because the hierarchy represents the procurement stages from identifying needs to selecting suppliers that are relevant to the research object.

Compared to other performance evaluation frameworks Six Sigma-DMAIC, Balanced Scorecard, Lean Six Sigma, and Benchmarking SCOR DS 14.0 was chosen because it provides a standard and tiered supply chain process structure as well as performance metrics, Best Practice basis, and HR competency reference People in one integrated framework. The four comparison frameworks tend to focus on one specific process or problem (Six Sigma-DMAIC, Lean Six Sigma), measure strategic-organizational performance in general without a specific procurement process structure (Balanced Scorecard), or rely on the availability of external comparison objects (Benchmarking) so that they are less suitable for the needs of this study which requires mapping of cross-hierarchical procurement processes as well as the preparation of structured improvement proposals.

2.3 Procurement Performance Measurement Based on KPI SCOR

Key Performance Indicators (KPIs) in SCOR are represented as tiered metrics from strategic to operational levels, which are linked to performance attributes such as reliability, responsiveness, agility, cost, assets, environmental, and social [3]. This tiered structure allows organizations to systematically measure procurement process performance and compare it to established targets. Several previous studies have applied SCOR-based KPI measurements to various sectors, including the palm oil industry [7] and garments [8], both of which found that some supply chain performance metrics had not achieved the targets set by the company - a pattern also found in the procurement KPI measurements in this study.

2.4 Best Practice and People as Improvement Proposals

In SCOR, Best Practice is understood as the best practice developed from the experience of practitioners across industries, including process automation, technology implementation, and determining the optimal sequence of activities [9]. Best Practice functions as an instrument to correct KPI achievements in a targeted manner and based on SCOR standards, not just a normative concept [10]. Meanwhile, the People element emphasizes that the success of implementing processes, metrics, and Best Practices is also determined by the competence of the human resources who carry them out [6], which can be developed through two main channels: experience and training.

Previous studies that used SCOR as the basis for proposed improvements generally stopped at the stage of compiling recommendations based on Best Practice, and not many integrated the People element, especially the Experience and Training aspects, as part of the proposed improvements to procurement performance [7], [8], [10]. This gap is the position of this research: measuring procurement performance based on KPI SCOR DS 14.0, identifying the root causes of KPIs that have not been achieved, and compiling improvement proposals that explicitly link each Best Practice and People recommendation to the underlying root cause mechanism, not just based on topic proximity.

3. Methodology

This study uses a qualitative and quantitative descriptive approach to evaluate the performance of the procurement process at PT Telkom Gudang Telkom Jogja Central java, a material management unit that supports the construction and maintenance of Fiber to the Home (FTTH) networks. The research object is focused on material procurement activities in a Strategic Sourcing perspective, with a hierarchy coverage of S1.1 to S1.9 in the SCOR DS 14.0 framework.

The data used consists of primary and secondary data. Primary data was obtained through direct observation of the material management flow and coordination with suppliers, as well as interviews with staff and supervisors involved in procurement activities, including identification of procurement problems, the Strategic Sourcing process, prequalification, and supplier evaluation. Secondary data was obtained from historical procurement documents, company operational reports, and relevant literature studies, including SCOR DS

14.0 references. The operational data analyzed was data from January to May 2026.

Data analysis was conducted in several stages. First, the actual value of each procurement KPI was calculated using the company's measurement formula, then compared with the company's target to obtain a gap analysis for each indicator. Second, KPIs that had not achieved their targets were further analyzed using a fishbone diagram to identify the root causes of the problems, based on interviews, observations, and actual operational conditions. Third, based on the identified root causes, improvement proposals were compiled that referred to Best Practice and People in SCOR DS 14.0, with the People element further analyzed through the Experience and Training aspects to determine human resource development needs. Improvement proposals for each KPI that had similar root cause characteristics were then synthesized into a more integrated improvement program, with implementation priorities determined based on the company's level of control over the source of the problem (internal factors, external factors, and factors beyond the company's control).

4. Results: Analysis and Discuss

4.1 Mapping and Measuring Procurement KPIs

The procurement process of PT Telkom Gudang Telkom Jogja Central java is mapped into seven SCOR DS 14.0 Strategic Sourcing hierarchies, namely S1.1 Define Business Need, S1.2 Conduct Supply Market Analysis, S1.3 Develop Sourcing Strategy, S1.5 Source the Supply Market, S1.6 Prequalify Suppliers, S1.8 Invite to Tender/RFQ, and S1.9 Analyze Offers & Select Supplier, resulting in a total of 20 measurable KPIs. This mapping shows that the company's procurement process is generally in line with the SCOR standardized Strategic Sourcing stages, including the main route per project, alternative routes to vendors when stock is not available, and to periodic standing processes such as vendor prequalification.

Table 4. 1 Procurement KPI Mapping and Measurement

SCOR Code	Hierarchy	Process at Telkom	KPI	PIC
Main Line (each project)				
S1.1	Define Business Need	Work order from Telkom (FTTH)	% of project requirements clearly documented	Telkom Manager
		Construction manager makes assignment letter	Lead time making assignment letter (day)	Construction Manager
		Kick-off work	On-time project kick-off (%)	Field supervisor
		Field survey alert & BOQ preparation	Accuracy of survey results (%) BOQ Accuracy (%)	Field supervisor
S1.3	Develop Sourcing Strategy	Cost estimation & budgeting	Lead time survey & BOQ Cost estimation accuracy (%)	Budgeting & E-commerce
		BA Agreement Validation & Approval	Lead time approval (day) Approval rate without revision (%)	Construction Manager, GM, Manager
S1.2	Conduct Supply Market Analysis	Input to Alista	Data input accuracy (%) Lead time input (day)	Inventory Staff
		Check the availability of material stock in the warehouse	Stock availability rate (%) Service level (%)	

Alternative Route If Stock Is Not Available (procurement to vendor)				
S1.8	Invitation to Tender / RFQ	Create order notes + PR to PO in SAP	PR to PO Lead time (days)	Procurement Staff
		Approval of procurement of goods/services	Cost variance (%) Lead time approval (day)	Procurement Supervisor
S1.9	Analyze Offers & Select Supplier	Vendor selection from Alista/SAP approved vendor list	Supplier qualification rate (%)	Procurement Staff
Standing Process (periodic, pre-condition procurement path)				
S1.5	Source the Supply Market	Identify potential vendors that can meet your needs	Number of potential vendors identified	Procurement Staff
S1.6	Prequalify Supplier	Official qualifications of Telkom vendors	Supplier prequalification pass rate (%)	Procurement Staff
			Certification compliance rate (%)	

Table 4.1 shows that each stage of Telkom's procurement process, from the main project path to the periodic standing process, has a clearly defined KPI and person in charge. This structure confirms that the company's procurement flow is aligned with the Strategic Sourcing SCOR DS 14.0 stages. This structural alignment then serves as the basis for measuring the extent to which each performance indicator is achieved against the company's set targets, as outlined in the following gap analysis.

4.2 Gap Analysis

The measurement results show that of the 20 KPIs, 10 (50%) have achieved the company's targets, while the remaining 10 (50%) have not. This balanced level of achievement indicates that although the process framework is in accordance with SCOR standards, consistent execution in the field remains a challenge for half of the performance indicators. The ten KPIs that have not achieved their targets and their magnitudes are as follows: gap is presented in Table 4.2 below.

Table 4. 2 Gap Analyses

No	Hierarchy	KPI	Actual Results	Target	Gap	Gap Description
1.	S1.1 Define Business Need	% Documented Project Requirements	93.20%	100%	6.80%	There are 46 items of material requirements not documented in the BOQ document.
2.	S1.1 Define Business Need	Accuracy of Survey Results	80%	95%	15%	The margin of difference between survey results and actual field conditions averages 20%.
3.	S1.1 Define Business Need	BOQ Accuracy	76.92%	90%	13.08%	There is a difference of 6 pieces of material due to changes in the network design during implementation.
4.	S1.1 Define Business Need	Survey Lead Time & BOQ	13 days	10 days	3 days	The survey process to finalize the BOQ took 3 days longer than the target.
5.	S1.3 Develop Sourcing Strategy	Cost Estimation Accuracy	80%	95%	15%	Average cost realization decreased by 20% from the initial estimate due to market price fluctuations.

6.	S1.3 Develop Sourcing Strategy	BA Agreement Approval Lead Time	30 days	21 days	9 days	The 3-tier approval process took 9 days longer than the target.
7.	S1.2 Conduct Supply Market Analysis	Lead Time Input to Alista	1 day	0.5 days	0.5 days	The process of inputting material requirements into the Alista system took twice as long as the target.
8.	S1.2 Conduct Supply Market Analysis	Stock Availability Rate	90%	95%	5%	On average, 1 in 10 material requests are not directly available at the Jogja warehouse.
9.	S1.6 Prequalify Suppliers	Supplier Pass Rate Prequalification	85.3%	90%	4.7%	There were 5 out of 34 vendors who did not pass Telkom's official qualification assessment process.
No	Hierarchy	KPI	Actual Results	Target	Gap	Gap Description
10.	S1.6 Prequalify Suppliers	Certification Compliance Rate	73.53%	100%	26.47%	Only 7 of the 34 vendors have ISO 14001 as it has not been designated as a mandatory requirement.

GapThe largest KPI was found in the vendor certification compliance rate (26.47%), followed by BOQ accuracy (13.08%) and BA Agreement approval lead time (9 days). Four of the ten unachieved KPIs were in the S1.1 (Define Business Need) hierarchy, indicating that the identification and documentation of project needs stage is a major weakness in Telkom's procurement process.

4.3 Root Cause Analysis of Unachieved KPIs

Root cause analysis using a fishbone diagram of the ten KPIs that had not been achieved revealed four interrelated patterns of problem sources:

- Telkom's internal factors include the lack of a document completeness validation mechanism before finalizing the BOQ, a three-tiered approval process (Construction Manager, General Manager, Telkom Manager) which extends the lead time, and limited storage capacity in the Jogja warehouse which limits stock availability.
- The Field supervisor (Field Supervisor) factors include human error in manual measurements (walking matter), differences in actual field conditions with KML data, and the weak negotiating position of Field supervisor when there are sudden changes in demand from Telkom or vendors.
- Vendor factors include incomplete legal documents and technical competency that does not meet assessment standards, as well as the lack of mandatory ISO 14001 certification in vendor qualifications, resulting in a low compliance rate.
- Factors beyond the company's control include regional licensing constraints (sub district to RT/RW), weather conditions that hamper surveys, and fluctuations in vendor market prices that cause cost realization to deviate from estimates.

This pattern indicates that Telkom's procurement performance gap does not stem from a single point, but rather from the interaction between internal document governance, third party reliability in the field, vendor capabilities, and external factors beyond the company's direct control.

4.4 Suggested Improvements Based on Best Practice and People

Based on the root cause pattern above, improvement proposals are prepared with reference to Best Practice (BP) and People (HS/HE/HT including Human Skill, Human Experience, and Human Training) SCOR DS 14.0, then synthesized into eight priority improvement programs based on the company's level of control over the source

of the problem in Table 4.3 below.

Table 4. 3 Proposed Improvements Based on Best Practice and People

Priority	Repair Program	Main Root of the Problem	KPI	Supporting SCOR Elements
1	Standardization & Digitization of Internal Documents	No validation of BOQ completeness, Alista downstream process	KPI 3, 4, 6, 7	BP.242 Specification Development, BP.101 Purchasing and Procurement Strategy
2	Strengthening Alista's Information & Technology Systems	System error, high input volume	KPI 7	HS.0042 Enabling Technology, BP.278 Portfolio Analysis
3	Improved Internal Coordination & Stakeholder Management	Layered approval, cross-functional coordination	KPI 2, 3, 6, 8	HS.0187 Stakeholder Management, HT.0141 Supply Chain Leadership, HS.0097 Product Development (PDR/CDR)
Priority	Repair Program	Main Root of the Problem	KPI	Supporting SCOR Elements
4	Strengthening Material Planning & Inventory Control	Limited warehouse capacity, less than optimal stock planning	KPI 5, 8	BP.014 Demand Planning and Forecasting, BP.266 Total Cost of Ownership Analysis, BP.193 Should Cost Modeling, BP.161 Spend Analysis
5	Competency Improvement & HR Development of field supervisor	Human error surveys, unsystematic documentation, weak negotiations	KPI 1, 2, 3, 4	HT.0134 Six Sigma Yellow Belt, HS.0056 Interpreting Specifications, HE.0278 Technical Specifications, HS.0113 Requirements Identification, HS.0061 Item Master and BOM
6	Strengthening Supplier Evaluation & Supplier Development	Vendor capacity & finances are inadequate	KPI 5, 8, 9	BP.097 Supplier Appraisal, BP.134 Supplier Evaluation, BP.245 Supplier Certification Program, BP.250 Supplier Credit Check, BP.162 Long-Term Supplier Agreement, BP.276 Dual Sourcing
7	Strengthening Regulatory Compliance & Vendor Certification	ISO 14001 is not yet mandatory; there is no roadmap & incentives yet	KPI 9, 10	HE.0216 Regulatory Policies and Compliance, HE.0123 Industry-Specific Regulatory Knowledge, HE.0084 EHS Systems, HT.0050 Environmental Regulation, HT.0116 Regulatory Compliance, HT.0080 ISO Certification
8	Strengthening Weather Risk Management, Licensing & Price Fluctuations	External factors beyond the company's control	KPI 1, 2, 4, 5	BP.014 Demand Planning and Forecasting, BP.193 Should Cost Modeling, BP.241 Supply Market Research

Priorities 1-4 focus on Telkom's internal factors because they are most directly controllable by the Company, priority 5 focuses on field supervisor factors as a third party working under Telkom's supervision; priorities 6-7 target vendor factors that require external coordination; while priority 8 targets factors beyond the company's control that require mitigation strategies, not structural solutions. This ordering is consistent with the principle

that issues that are most controllable by the organization should be resolved first before addressing factors that depend on external parties.

4.5 Priority Improvement Program Implementation Plan: Integrated BOQ Template and Material Procurement Verification SOP

Of the eight improvement programs in Table 4.3, this study follows up Program 1: Standardization & Digitalization of Internal Documents into a real implementation design, because this program is on the company's internal factors that can be most directly controlled, covers four KPIs at once (BOQ Accuracy, Survey & BOQ Lead Time, BA Agreement Approval Lead Time, Input Lead Time to Alista), and can be realized in the form of a real work tool that is ready to be tested, not just a conceptual recommendation.

4.5.1 Root Causes and Basis for Selecting Best Practices

The root of the problem in Program 1 was the lack of a validation mechanism for the completeness of the BOQ (Bill of Quantities) before the document was processed downstream to Alista, resulting in errors or incomplete data only being detected after the process had progressed far. This condition was reflected in the BOQ accuracy, which only reached 76.92% of the 90% target (a gap of 13.08%) and the survey & BOQ lead time exceeding the target by 3 days (Table 4.2). BP.242 Specification Development was chosen because it mechanistically addresses the problem at its source, namely developing document specification standards from the input stage, rather than correcting after errors occur in the system. BP.101 Purchasing and Procurement Strategy complements this by ensuring that document validation is integrated into the overall procurement strategy, rather than being a separate administrative step dependent on individual initiative. In the People element, HR needs are directed at improving the competency of procurement and Field supervisor staff in preparing technical specifications and interpreting document standards (HS.0056 Interpreting Specifications, HE.0278 Technical Specifications), rather than simply training in system usage.

4.5.2 Integrated BOQ Template Design

As an implementation of Program 1, an integrated spreadsheet based BOQ template was developed that sequentially links five process stages: Material Master, BOQ, Completeness Recap, BOQ Validation Checklist, and Alista Input Validation Checklist. This design provides a multi-level validation mechanism before the data is locked as official inventory data in the Alista system. The complete SOP flow is presented in Figure 4.1.

Prepared by:	PROCUREMENT	Date: __/__/__
Checked by:	Verification and Validation of Material Procurement Documents	Revision:
Approved by:		Doc No:
		Page:

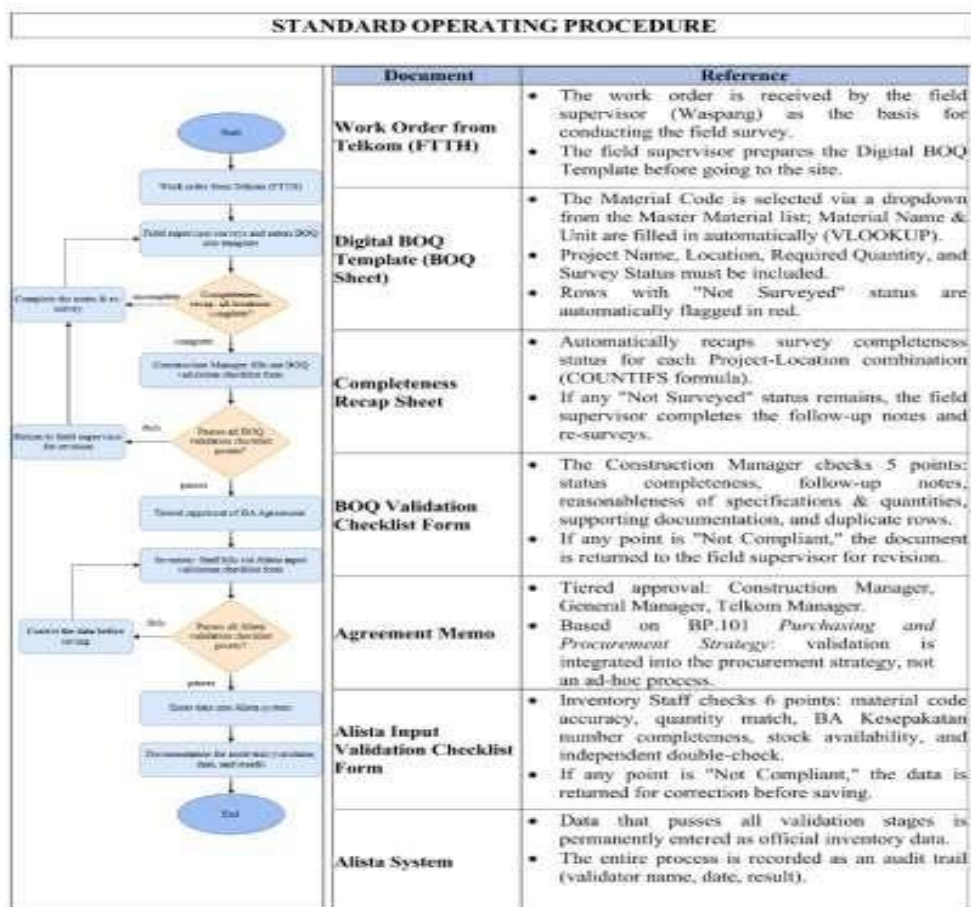


Figure 4.1 SOP for Verification and Validation of Material Procurement Documents

The procedure for using the template is as follows:

a) Master Material Preparation

Procurement staff establishes a standard material code (designator), material name, and unit, serving as a single source of truth for all material entries on any project.

Material Code (Designator)	Material Name	Unit
SC-OF-SM-24	SC OF SM Kapasitas 24 Core	Unit
OS-SM-1	Optical Splitter SM 1:1	Unit
PC-APC/UPC-657-A1	Patch Cord APC/UPC 657-A1	Unit
ODP-SOLID-PL-8	ODP Solid Pole 8 Port	Unit
BC-TR-0.4	Bracket Tarik 0.4	Unit
DD-HDPE-40-1	Duct HDPE 40mm	Meter
DC-OF-SM-12D	Kabel Duct Fiber Optik Single Mode 12 Core G.652D	Meter
M-DC-OF-SM-12D	Material Kabel Duct FO SM 12 Core G.652D	Meter
J-DC-OF-SM-12D	Jasa Pemasangan Kabel Duct FO SM 12 Core G.652D	Meter
ODP-PB-16	ODP Pole Bracket 16 Port	Unit
CL-8	Closure 8 Port	Unit
TC-7	Tiang Cor 7 Meter	Unit

Figure 4.2 Sheet Master Material

b) BOQ Sheet

Field supervisors enter material requirements for each location by selecting a Material Code from a dropdown list sourced from the (Material Master). The Material Name and Unit fields are automatically populated using a VLOOKUP formula to prevent manual input errors. Each row must include the Project Name and survey status; rows with a status of "Not Yet Surveyed" are automatically highlighted in red as a visual indicator.

No	Project Name	Location	Material Code (dropdown)	Material Name	Unit	Quantity Required	Survey Status	Notes
1	Proyek A - Palagan Asri 4	Location 1	SC-09-KM-24	SC-09-KM-Kapasitas 24 Core	Unit	1	Surveyed	
2	Proyek A - Palagan Asri 4	Location 1	OG-5M-1	Optical Splice 5M 11	Unit	12	Surveyed	
3	Proyek A - Palagan Asri 4	Location 1	PC-APC-LPC-417-A1	Patch Cord APC/LPC 417-A1	Unit	18	Surveyed	
4	Proyek A - Palagan Asri 4	Location 1	ODF-5M-15-1	ODF 5M 15 1 Port	Unit	2	Surveyed	
5	Proyek A - Palagan Asri 4	Location 1	SC-09-KM-18	SC-09-KM-Kapasitas 18 Core	Unit	1	Surveyed	
6	Proyek A - Palagan Asri 4	Location 2	OG-5M-1	Optical Splice 5M 11	Unit	11	Surveyed	
7	Proyek A - Palagan Asri 4	Location 1	PC-APC-LPC-417-A1	Patch Cord APC/LPC 417-A1	Unit	18	Not Yet Surveyed	Missing confirmation of job done at
8	Proyek A - Palagan Asri 4	Location 1	PC-APC-LPC-417-A1	Patch Cord APC/LPC 417-A1	Unit	18	Surveyed	
9	Proyek A - Palagan Asri 4	Location 1	ODF-5M-15-1	ODF 5M 15 1 Port	Unit	276	Not Yet Surveyed	Location was inaccessible during survey
10	Proyek B - De Raya Godean	Location 4	SC-09-KM-24	SC-09-KM-Kapasitas 24 Core	Unit	1	Surveyed	
11	Proyek B - De Raya Godean	Location 4	OG-5M-1	Optical Splice 5M 11	Unit	8	Surveyed	
12	Proyek B - De Raya Godean	Location 4	BC-TB-0.4	Shielded Twill 0.4	Unit	180	Surveyed	
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								
27								
28								
29								
30								

Figure 4.3 BOQ Sheet

c) Completeness Recap

The system automatically (COUNTIFS formula) summarizes the survey completeness status per Project-Site combination, so that Construction Managers can immediately identify locations that still require follow-up without checking each material line one by one.

Project Name	Location	Total BOQ Items	Surveyed	Not Yet Surveyed	Completeness Status
Proyek A - Palagan Asri 4	Location 1	4	4	0	Complete
Proyek A - Palagan Asri 4	Location 2	3	2	1	Incomplete (1 item)
Proyek A - Palagan Asri 4	Location 3	2	1	1	Incomplete (1 item)
Proyek B - De Raya Godean	Location 4	3	3	0	Complete

Note: manually add new Project-Location combination rows here when new projects/locations appear in the BOQ sheet, then copy the formula from the row above.

Figure 4.4 Completeness Summary Sheet

d) Checklist BOQ Validation

Conducted after the Completeness Recap shows a "Complete" status for all locations, it includes five checks by the Construction Manager: completeness of the survey status, clarity of follow up notes, reasonableness of specifications and quantities to field conditions, availability of supporting documentation, and the absence of duplicate lines. Documents that do not pass are returned to Field supervisor for revision before entering the BA Agreement approval stage.

BOQ VALIDATION CHECKLIST FORM				
Filled in by the Construction Manager after the Completeness Summary shows "Complete" status				
Project Name _____				
Location _____				
Inspection Date _____				
Construction Manager Name _____				
No	Inspection Item	Verification Method	Result	Notes
1	The Completeness Summary sheet shows "Complete" status for all locations in this project	Check the "Completeness Status" column in the Completeness Summary sheet		
2	For rows that were previously marked "Not Yet Surveyed", the Notes column has been filled with the reason and follow-up action	Check the Notes column in the BOQ sheet		
3	Material specifications and quantities for each location are reasonable compared to actual field conditions (no under-over estimation)	Compare with survey photos/documentation		
4	Supporting documentation (photos, coordinates) is available and traceable per location	Check Field Supervisor photo-documentation archive		
5	No duplicate rows (the same Project-Location-Material combination recorded more than once)	Manually check filter in the BOQ sheet		
Final Validation Result:		LOLOS - Lanjut ke Approval BA Kesepakatan		
Construction Manager Signature: _____		(_____)		

Figure 4.5 Form BOQ Validation Checklist

e) Checklist Alista Input Validation

Conducted by Inventory Staff before the final BOQ data is input into the system, including six checks: conformity of material code, conformity of required quantity, completeness of BA Agreement number, availability of warehouse stock, to independent re-verification (double check) before the data is saved permanently.

ALISTA INPUT VALIDATION CHECKLIST FORM				
Filled in by the Inventory Staff before the final BOQ data is entered into the Alista system				
Project Name _____				
Agreement Report (BA) Number _____				
Input Date _____				
Inventory Staff Name _____				
No	Inspection Item	Verification Method	Result	Notes
1	The BOQ Completeness Summary shows "Complete" status for all locations in this project (mandatory prerequisite before input)	Check the Completeness Summary sheet		
2	Material codes in the BOQ match the master material codes in the Alista system	Match against the Alista master data		
3	Quantity required per location in the BOQ matches what will be entered into Alista	Match BOQ figures against input		
4	Agreement Report (BA) number and date are stated and correct	Check the Agreement Report (BA) document		
5	Warehouse stock availability for each material has been checked before input	Check stock in the Alista system		
6	Data has been double-checked before being permanently saved in the system	Independent officer verification		
Final Validation Result:		LOLOS - Data dapat disimpan ke sistem Alista		
Inventory Staff Signature: _____		(_____)		

Figure 4.6 Alista Input Validation Checklist Form

4.5.3 Relationship of Design to Best Practice and People

This template design directly operationalizes the SCOR elements proposed in Program 1. BP.242 Specification Development is realized through the provision that each material requirement line must have a definite and unambiguous value (supported by data validation that rejects empty/zero values), so that the requirement specification is validated from the input stage, not detected after the document is in the downstream stage. BP.101 Purchasing and Procurement Strategy is realized through a tiered approval flow that follows standard

and validated stages (BOQ - Completeness Recap - BOQ Validation Checklist - Alista Input Validation Checklist), not an ad-hoc process that relies on individual initiative.

In the People element, HS.0056 Interpreting Specifications is required so that Field supervisor can determine relevant materials based on actual field conditions when filling out the BOQ, while HE.0278 Technical Specifications is in the form of experience handling technical specifications to speed up the accurate filling process and reduce interpretation errors in the field. In addition, HT.0008 Automation Tools is reflected in the data validation and conditional formatting mechanisms in the template, which prevent incomplete data systematically rather than relying on manual accuracy.

Table 4. 4 Interrelationship of Application Stages BOQ Sheet with Root Cause and KPI

Stages	Repair Mechanism	Root Causes Addressed	Related KPIs
BOQ (dropdown + VLOOKUP)	Prevent code or material name errors from input	Lack of validation of BOQ completeness	BOQ Accuracy
Completeness Recap (COUNTIFS)	Automatic survey status detection per Project-Location	New error detected downstream of process	% Documented Project Needs; Accuracy of Survey Results
BOQ Validation Checklist	5 point validation by Construction Manager before approval Approval follows standard flow, integrated	Incomplete documents pass to the approval stage	Survey Lead Time & BOQ
BA Agreement	procurement strategy (BP.101)	Approval tiered without fixed document standards	Lead Time Approval BA Agreement
Alista Input Validation Checklist	6 point validation before data is permanently locked	Input error not detected in the system	Lead TimeInput to Alista
Alista System Audit Documentation	Validator records, dates, results	No process traceability	All KPIs of S1.1-S1.3 hierarchy

With this mechanism, the four KPIs targeted by Program 1 have an explicit and verifiable improvement path, rather than just a conceptual recommendation to "digitize documents." The draft template and SOP are pilot-ready: companies can immediately run them on a single pilot project to measure changes in the four KPIs before implementing them comprehensively, thus bridging the gap between SCOR based improvement proposals that typically stop at conceptual recommendations and the company's need for a solution that can be immediately operationalized.

5. Conclusions

This study develops a performance evaluation framework for the procurement process of PT Telkom Gudang Telkom Jogja Central java based on SCOR DS 14.0 from a Strategic Sourcing perspective, which integrates multi hierarchy KPI measurements (S1.1-S1.9), performance gap analysis, root cause identification, preparation of Best Practice and People-based improvement proposals, and implementation plans for priority improvement programs. The mapping results indicate that the company's procurement process is structurally aligned with the Strategic Sourcing SCOR DS 14.0 stages, with seven process hierarchies and 20 KPIs that have clear responsibilities at each stage. However, the gap analysis results show that of the 20 KPIs, only 10 KPIs (50%) have achieved the company's target, while the other 10 KPIs (50%) have not been achieved, with the largest gaps in vendor certification compliance rates, BOQ accuracy, and lead time approval of Minutes of Agreement. This condition indicates that the conformity of the process structure to the SCOR standard has not been followed by consistent execution in the field in half of the performance indicators, especially in the S1.1 (Define Business Need) hierarchy which is the main weak point in the procurement process.

Root cause analysis using a fishbone diagram revealed that the performance gap did not originate from a single point, but rather from the interaction of four factors: (1) Telkom's internal factors, such as the absence of a document completeness validation mechanism and a tiered approval process that extended lead times; (2) field supervisor (Field supervisor) factors, such as human error in manual measurements and weak negotiation positions in the field; (3) vendor factors, such as incomplete legal documents and the lack of mandatory ISO 14001 certification; and (4) factors beyond the company's control, such as regional licensing constraints and market price fluctuations.

Based on these findings, this study proposes eight priority improvement programs compiled with reference to Best Practice and People SCOR DS 14.0, with program priorities arranged based on the company's level of control over the source of the problem. The first priority program, Internal Document Standardization & Digitalization, is followed up to the implementation design stage in the form of a spreadsheet based Integrated BOQ Template along with a Material Procurement Verification and Validation SOP, which explicitly links each validation stage to its targeted KPIs (BOQ Accuracy, Survey & BOQ Lead Time, BA Agreement Approval Lead Time, and Input Lead Time to Alista). Thus, the evaluation framework developed in this study is not only useful for measuring procurement performance gaps based on SCOR KPIs, but also offers an approach that explicitly links each root cause with Best Practice and People based improvement proposals to a ready to be tested implementation design, so that it can serve as a reference for Telkom and similar companies in improving the performance of a more structured, measurable, and sustainable procurement process.

6. References

- [1] AD Andriana and S.Alawy, "Analysis of Raw Material Procurement at PT. Kohwa Precision Indonesia Using the Triple Exponential Smoothing Method," *UNIKOM Scientific Magazine*, vol. 20, no. 1, pp. 55–61, 2022.
- [2] S. Talluri and R. Narasimhan, "A methodology for strategic sourcing", *Eur. J. Oper. Res.*, vol. 154, no. 1, pp. 236–250, Apr. 2004, doi: 10.1016/S0377-2217(02)00649-5.
- [3] ASCM, "Supply Chain Operations Reference Digital Standard," SCOR Version 14.0.
- [4] S. Ghosh, MC Mandal, and A. Ray, "Strategic sourcing model for green supply chain management: an insight into automobile manufacturing units in India", *Benchmarking*, vol. 29, no. 10, pp. 3097–3132, Nov. 2022, doi: 10.1108/BIJ-06-2021-0333.
- [5] B. Niu, F. Xie, and L. Chen, "Analysis of global brands' green procurement strategy: Co-competitive local sourcing vs. overseas sourcing under delivery disruption," *Omega (United Kingdom)*, vol. 123, Feb. 2024, doi: 10.1016/j.omega.2023.102991.
- [6] ASC Council, "APICS Supply Chain Operations Reference Model (SCOR)", *Supply Chain Operations Management*, 2017.
- [7] H.Sarjono, K. Christofer, GF Nayoan, and MD Nugraha, "Performance Analysis in Palm Oil Industry Using Supply Chain Operations Reference (SCOR) Model," *Binus Business Review*, vol. 13, no. 2, pp. 213–222, Jul. 2022, doi: 10.21512/bbr.v13i2.8027.
- [8] A. Fole, T.Alisyahbana, NI Safutra, Muh. Ridzwan, and Alifah Dwi Wulandari Putri, "An Evaluation of Supply Chain Reliability Strategies in the Garment Industry Based on the SCOR 14.0 Racetrack Framework," *Cognitia: International Engineering Journal*, vol. 1, no. 3, pp. 92–106, Dec. 2025, doi: 10.63288/ciej.v1i3.11.
- [9] FBGeorgise, K.-D. Thoben, and M. Seifert, "Adapting the SCOR Model to Suit the Different Scenarios: A Literature Review & Research Agenda," *International Journal of Business and Management*, vol. 7, no. 6, March. 2012, doi: 10.5539/ijbm.v7n6p2.
- [10] R. Maas, T. Karaulova, E. Shevtshenko, J.Popell, and IO Raji, "Development of SCOR Database for Digitalization of Supply Chain Customer Feedback Analysis," *Engineering Economics*, vol. 34, no. 4, pp. 439–455, Oct. 2023, doi: 10.5755/j01.ee.34.4.31618.

INFO

Corresponding Author: [Irma Mutiarani](#), Industrial Engineering Study Program, Faculty of Industrial Technology, Islamic University of Indonesia, Yogyakarta, Indonesia.

How to cite/reference this article: [Irma Mutiarani](#), Analysis and Proposals for Procurement Process Performance Improvement Based on SCOR DS 14.0 (Case Study: PT. Telkom Warehouse Jogja Central Java), *Asian. Jour. Social. Scie. Mgmt. Tech.* 2026; 8(5): 181-194.