
Product Requirement Document (PRD)

Project Title: KPN Logistics Intelligence Platform (KLIP)

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Date: [Insert Date]

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1. Product Overview

The **KPN Logistics Intelligence Platform (KLIP)** is a centralized, web-based solution designed to digitalize logistics data management, automate tracking, and enable real-time visibility across Trading, Logistics Operations, and Admin Support teams.
It eliminates manual spreadsheet processes and fragmented SAP exports by integrating SAP logistics data into a unified platform equipped with analytics dashboards, AI insights, and smart workflow automation.

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2. Problem Statement

Current logistics tracking relies heavily on manual data extraction from SAP into Excel.
This creates:

- Data duplication and inconsistent records.
- Slow and error-prone reporting.
- Limited visibility for management to track performance, gain/loss, and delivery SLAs.
- No predictive insights or automated alerts.

Without transformation, KPN risks **inefficient coordination, decision delay, and financial leakage due to manual reconciliation errors.**

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3. Objectives

- Provide **real-time logistics data visibility** across contracts, shipments, and deliveries.
- Enable **automated integration with SAP** for daily data refresh.

- Build **custom dashboards and KPIs** for management visibility.
- Leverage **AI to generate operational insights**, risk alerts, and recommendations.
- Support **multi-role access (Trading, Logistics Ops, Admin, Finance, Management)** with appropriate data visibility.

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4. Scope

In-Scope

- Integration with SAP logistics, trading, and finance tables.
- Web-based data management and visualization platform.
- Role-based access control and approval workflows.
- Automated data refresh (daily at 7:00 AM).
- AI-driven dashboards and insights.
- KPI and variance reporting (e.g., Gain/Loss, Quantity Deviation, SLA).
- Export-to-Excel functionality for auditors and admins.

Out-of-Scope

- SAP backend changes or data model redesign.
- Operational KPI calculation beyond defined contract metrics.

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5. Core Features

Feature	Description	Benefit
Data Sync & Integration	Connects with SAP (via API or middleware) to pull real-time data for contracts, delivery orders, weights, quality, and payments.	Eliminates manual export & data lag
Logistics Data Dashboard	Displays per-contract shipment details, gain/loss %, survey results, and payment completion.	Real-time visibility for management

Feature	Description	Benefit
Data Entry & Validation Portal	Allows manual entry/validation for non-SAP data (e.g., external shipment docs).	Completes missing data and ensures accuracy
AI Insights Engine	Analyzes trends (e.g., shipment delays, weight loss, unpaid contracts) and provides recommendations.	Early warnings & optimization
Smart Alerts	Automated email or dashboard notifications for anomalies or overdue shipments.	Proactive management
Search & Filter Interface	Filter by contract, location, date range, Incoterm, etc.	Quick decision-making
Role-based Access	Trading, Logistics, Admin, and Management see only relevant data.	Data security & accountability
Audit & History Log	Tracks user changes, exports, and approvals.	Compliance & traceability

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6. User Stories

ID	User	Story	Acceptance Criteria
US-01	Logistics Admin	I want to view all shipments linked to a contract and their status (arrived, unloaded, completed).	Dashboard lists all contracts with real-time updates and SLA timers.
US-02	Trading	I want to track product gain/loss across all deliveries.	Gain/Loss auto-calculated using SAP weight in/out data.
US-03	Finance	I want to verify that each contract's payment is completed.	Dashboard shows "Paid / Outstanding" indicator with source from SAP FI.
US-04	Management	I want to see which suppliers or locations cause delays or losses.	AI dashboard ranks top risk suppliers or routes.

ID	User	Story	Acceptance Criteria
US-05	Compliance	I want to see who modified or exported specific data.	System maintains full change and export logs.
US-06	System	Auto-refresh logistics data daily at 7 AM.	Cron job executes and sends success/failure logs.
US-07	AI Engine	I want to detect outlier shipment times and recommend improvement.	Insight cards generated for out-of-pattern SLA.

1. User Story Breakdown

US-01: View Shipments by Contract

User: Logistics Admin
Goal: Track all shipments linked to a contract (status, quantity, location, progress).

Process Flow:

1. System auto-syncs SAP deliveries, weight bridge, and transport status daily.
2. Admin can filter by contract, delivery date, product, or vessel.
3. Shipment record shows lifecycle from *Arrived → Sampling → Unloading → Completed*.

Fields Shown:

Category	Field	Source	Editable
Contract Info	Contract ID, Buyer, Supplier	SAP	No
Delivery Details	Delivery ID, Shipment Date, Vessel Name	SAP	No
Quantity Info	Qty Ordered, Qty Delivered, Gain/Loss %	SAP	No
Logistics Status	Status (Arrived / Unloading / Completed)	System	No
Supporting Docs	Delivery Note, Bill of Lading, Survey Report (upload link)	User	Yes
Remarks	Free-text notes per shipment	User	Yes

Edge Cases:

- Missing data → Highlighted red and flagged to admin.
- Multiple deliveries per contract → Grouped view with summary at top.

Integration: SAP MM (Delivery), SAP SD (Contract).

US-02: Gain/Loss Tracking

User: Trading / Logistics Ops
Goal: Monitor product gain/loss % from SAP and visualize trend.

Process Flow:

1. System calculates gain/loss automatically from SAP in/out weight.
2. User can compare actual result vs expected tolerance per contract.

Fields:

Category	Field	Source	Editable
Contract Info	Contract ID	SAP	No
Plant / Location	Loading Site, Unloading Site	SAP	No
Weight Info	Inbound Weight, Outbound Weight	SAP	No
Gain/Loss	Calculated automatically (%)	System	No
Remarks	Explanation if > tolerance	User	Yes

Dashboard Output:

- Line chart: Gain/Loss trend by month or supplier.
- AI insight: “Top 5 routes with consistent negative loss pattern.”

Edge Cases:

- Missing GR/PGI → Gain/Loss shows “Incomplete Data.”
- Mixed product deliveries → Breakdown by product category.

US-03: Payment Verification

User: Finance
Goal: Ensure each contract's logistics data aligns with payment status.

Process Flow:

1. SAP FI payment data integrated.
2. System compares "Delivered" vs "Paid" contracts.
3. Finance can filter unpaid / partially paid items.

Fields:

Category	Field	Source	Editable
Contract Info	Contract ID, Vendor	SAP	No
Financial Data	Invoice No, Payment Date, Amount	SAP	No
Payment Status	Paid / Partial / Unpaid	System	No
Document Link	Upload Proof of Payment / Notes	User	Yes

Dashboard Output:

- Payment Completion Ratio per supplier.
- AI card: "3 contracts delivered >30 days, unpaid."

US-04: Delay & Risk Monitoring

User: Management / Logistics Ops
Goal: Identify which suppliers, routes, or sites cause delays.

Process Flow:

1. SAP timestamps from GR/Delivery used to calculate SLA.
2. AI detects delay pattern beyond threshold.
3. Dashboard ranks top 5 delay sources.

Fields:

Category	Field	Source	Editable
Contract Info	Contract ID, Product	SAP	No
SLA Data	Planned vs Actual Arrival	SAP	No
Delay Cause	System suggestion + Remarks	System + User	Partial
Severity	Auto-calculated (Low/Med/High)	System	No

Dashboard Output:

- Heatmap by location (green = on time, red = delayed).
- AI insight: “Delays most frequent in Port Belawan — 22% of total shipments.”

US-05: Audit & Change Tracking

User: Compliance / Admin
Goal: Ensure all manual edits and uploads are traceable.

Process Flow:

- System logs every edit, upload, and export with timestamp and user ID.

Fields:

Category	Field	Source	Editable
Record Type	Shipment / Payment / Contract	System	No
Change Type	Add / Edit / Delete / Upload	System	No
User	Username / Department	System	No
Timestamp	Date & Time	System	No
Details	JSON of before vs after values	System	No

Dashboard Output:

- Change log table with filters.
- Export to Excel / CSV.

US-06: Auto Data Sync & Refresh

User: System (Background)
Goal: Automatically pull data from SAP daily at 07:00 AM and notify success/failure.

Process Flow:

1. Cron job runs SAP OData API sync.
2. Data validated against mapping schema.
3. Notifications sent to IT Admin.

Edge Cases:

- API failure → Retry 3x, alert via email.
- Partial sync → Only new records updated, flagged yellow.

US-07: AI Insights & Recommendation

User: Management
Goal: Get automated insights on logistics performance and financial risk.

Process Flow:

1. System runs daily analytics batch job (Python AI microservice).
2. AI generates “Insight Cards” shown on dashboard.

Insight Examples:

- “Supplier PT XYZ shows consistent gain-loss deviation (+3.2%) — suggest review.”
- “Contract 1123 pending payment 45 days — finance follow-up.”
- “Route Belawan → Surabaya exceeds SLA by avg. 6 hrs — logistics optimization suggested.”

Output Fields:

Field	Type	Description
Insight ID	System	Unique insight reference
Insight Category	Enum	Delay / Finance / GainLoss / Compliance

Field	Type	Description
Root Cause	Text	AI summary
Recommendation	Text	Action suggestion
Severity	Enum	Low / Medium / High
Status	Enum	New / Acknowledged / Closed

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2. Mock-up Menu & Access by Department

Department	Menu	Description	Access
Trading	Contract Overview	See all contracts & shipment summaries	View
	Gain/Loss Monitor	Auto-calc gain/loss	View
	Remarks	Add explanations to loss variance	Edit
Logistics Ops	Shipment Tracker	Full shipment lifecycle tracking	View/Edit non-SAP fields
	Delay Analysis	SLA status by route & supplier	View
	Upload Docs	Add BoL, Sampling, Survey docs	Edit
Admin Support	Data Validation	View and cross-check incomplete SAP records	Edit remarks
	Audit Log	Full system activity history	View
Finance	Payment Status	Monitor invoice & payment completion	View
	Upload Payment Proof	Add scanned PoP files	Edit

Department	Menu	Description	Access
Management	Executive Dashboard	High-level KPIs and AI insights	View
	AI Recommendations	Interactive insight cards	View/Comment
IT / System Admin	Integration Monitor	SAP sync logs, API health, user management	Full Access

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3. Dashboard Widgets per Department

Role	Dashboard Widgets	Key Insights
Trading	Contract Gain/Loss Trend, Top 5 Loss Suppliers	Profitability by trade flow
Logistics Ops	SLA Performance, Shipment Status Heatmap	Delay hotspots
Finance	Payment Ratio, Unpaid Contract List	Working capital health
Management	All KPIs + AI Insight Feed	Risk + performance in one view
Admin	Change Log, Upload Summary	Governance & traceability

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4. System Fields (Data Model Summary)

Table	Field	Source	Editable	Description
Contract	Contract_ID, Buyer, Supplier, Product, Qty	SAP	No	Core contract data
Shipment	Shipment_ID, Date, Port, Vessel, Status	SAP	No	Shipment record
Quality	COA_No, Density, FFA, Moisture	SAP	No	Quality parameters

Table	Field	Source	Editable	Description
Payment	Invoice_No, Amount, Date, Status	SAP FI	No	Financial linkage
Document	File_Name, Type, Upload_Date, Uploader	User	Yes	Supporting docs
Remarks	Text, Category, Related_ID, Date	User	Yes	User comments
Audit_Log	User_ID, Action, Timestamp, Before/After	System	No	Change tracking
AI_Insights	Insight_ID, Category, Severity, Text, Recommendation	AI Engine	No	Predictive intelligence

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5. Visual Navigation Mock-up (Text-based)

Home

- Dashboard
  - Overview
  - AI Insights
  - Reports
- Contracts
  - Contract List
  - Contract Detail
- Shipments
  - Shipment Tracker
  - Gain/Loss Monitor
  - Delay Analytics
- Finance
  - Payment Status
  - Proof Upload

├── Documents
│ └── Upload / View
├── Administration
│ ├── User Management
│ ├── Audit Logs
│ └── Integration Monitor

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7. AI Features & Insights

- **Predictive SLA Breach Detection:** ML model to detect likely delay based on historical shipment data.
- **Gain/Loss Root Cause Analysis:** AI compares quality, surveyor, and location data to find loss patterns.
- **Auto-Recommendations:** Suggest corrective actions (e.g., supplier review, freight optimization).
- **Management Summary:** Auto-generated weekly report in email, highlighting risks and achievements.

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8. Dashboard Design (Executive View)

Key KPIs:

- Shipment SLA Performance (% On-Time Deliveries)
- Gain/Loss Trend by Contract or Supplier
- Quality Deviation Report
- Payment Completion Ratio
- Top 5 High-Risk Contracts (AI flagged)
- Daily Logistics Volume Overview

Visual Layout:

- Left Panel → Filters (Date, Location, Contract, Supplier)
- Main Area → Charts & Summary Cards
- Right Panel → AI Insights & Recommendations Feed

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9. Data Model Overview

Core Tables:

- Contracts (from SAP SD)
- Deliveries (SAP MM)
- Survey Results (SAP QM)
- Payments (SAP FI)
- Quality & Weight Metrics (SAP LO)
- Master Data (Supplier, Product, Plant, Location)

Relationships:

- Contract → Deliveries (1:N)
- Delivery → Survey/Quality (1:1)
- Contract → Payments (1:N)

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10. Technical Architecture

Frontend: React.js / Next.js
Backend: Node.js with Express
Database: PostgreSQL
Integration: SAP OData APIs or middleware (SAP PI/PO)
AI Engine: Python (scikit-learn) integrated via microservice
Hosting: AWS / Azure (depending on KPN preference)
Security: OAuth2, RBAC, SSL, activity logging

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11. Success Metrics / KPIs

KPI	Target
% Reduction in Manual Excel Usage	≥ 90%
Data Refresh Success Rate	100% (daily)
User Adoption Rate (Active Users)	≥ 80% of targeted roles
Time to Decision (reporting)	-60% reduction
Error Reduction in Manual Reports	≥ 95%
AI Insight Accuracy (vs actual)	≥ 85%

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12. Risks & Mitigations

Risk	Mitigation
SAP integration delays	Early engagement with SAP Basis & Middleware team
Data duplication	Use unique IDs & daily sync logs
Low adoption	User training & dashboard simplification
Data overload	Limit history to 6 months for active dashboards
AI misinterpretation	Manual verification layer for critical insights

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